

**Project:**

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**Project Specification**

**Piping**

**Standardized Piping Parts ASME -  
EDITION**

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Title:

Doc.No.:

Prepared by:

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Checked by:

Rev.: 00

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**for**  
**ASME-Standardized Piping Components**

Standard	Designation	Edition Date
H 100	Steel pipes acc. to ASME B36.10 / ASME B36.19 / API 5L	2018-01
H 170A	Tubes acc. to SAE J1065	2023-01
H 180	Hydraulic Hose acc. to SAE J517	2019-05
H 200	Butt - Welding - Fittings acc. to ASME B16.9 / ASME B16.28	2018-02
H 220A	Mitre Bends acc. to AWWA C208	2014-09
H 234A	Weldolets	2022-07
H 237	Thredolets, Sockolets, Nipolets	1987-12
H 239A	Branch Reinforcements made from Pipe acc. to ASME / API	2019-09
H 280	Socket-Welding Steel Fittings, (Excerpt from ASME B16.11)	2020-01
H 287A	Socket-Welding Steel Fittings for ASME -Tubing	2004-05
H 310	Malleable Iron Threaded Fittings / ASME B16.3 / ASME B16.14 / ASME B16.39	2022-07
H 318	Welding ends with NPT-thread acc. to ASME B1.20.1	1998-10
H 347A	Gauge - Couplings for ASME / SAE-application	2001-12
H 373A	Quick-Couplings acc. to MIL-C-27487 / ASME Application	2020-03
H 380	Steel Fittings Threaded Excerpt from ASME B16.11 and BS 3799	2020-01
H 400	Flanges acc. to ASME B16.5 / ASME B16.47 / MSS-SP-44 / AWWA C207	2013-09
H 488A	SAE-Flanges acc. to SAE J518 for ASME-application	2017-12
H 500	Bolts with thread acc. to ASME B1.1	2019-09
H 581A	Washers acc. to ASME B18.22.1	2021-06
H 600	Gaskets acc. to ASME B16.21 and ASME B16.20	2023-05
H 780A	Supports for hydraulics for ASME-Application	2019-05
H 800A	Spectacle Blinds for ASME B16.5 - Flanges Class 150 - 1500	1997-01

Standard	Designation	Edition Date
9++AMP011-023	Capsule Pressure Gauge, Liquid filled (EN837-3) steel enameled or sst	2011-07
9++AMT001	Welding Nipple for Thermometer carbon steel	2012-01
9++AMT002	Welding Nipple for Thermometer stainless steel	2012-01
9++AMT011-024	Bimetallic Thermometer (connection: lower)	2007-10
9++AMT031-044	Bimetallic Thermometer (connection: centric, backside)	2007-10
9++ASJ006	Rubber Expansion Joint with Bracing Class 150	2007-08
9++AVD001-009	Swing Check Valve (E11W36J12) with hydraulic damping device (low backpressure)	2011-05

## Steel Pipes

acc. to ASME B36.10 / ASME B36.19 / API 5L 9)

H 100

Example of Designation: Designation of a seamless pipe of size 6" and wall thickness Schedule 40, random length with welding bevel acc. to ASME B16.25, material: ASTM A106 Gr.A

Part number

11122C302

6" / 168,3 x 7,11

PIPE SEAMLESS W. WELDING

ASTM A106 GR.A

BEVEL SCHED.40 H100/ASME B36.10

## Part numbering Code

## Position of Part No.

1. - 2.		3.		4.		5. - 6.		7. - 8.		9.	
3) Kind of Part		4) Surface finish		5) Length / End preparation		1) ASTM - Material		Wall thickness		10) Certificate	
	Cd.		Cd.		Cd.		Cd.	Cd.	Cd.		Cd.
Seamless Pipes	11	metallic	1	random	1	A 53 Gr.A	2A	2) 0	*	ASME	2
		galvanized	2	length		A 53 Gr.B	2B				
		outside bituminat. and limed	3	plain ends		A 283 Gr.B	A6				
Welded Pipes	12	protective coating inside and outside	4	random	2	A 106 Gr.A	2C			ASME	H
		protective coating inside	5	length with welding bevel		A 106 Gr.B	2D				
				ASME B16.25		A 139 Gr.B	2J				
Threaded Pipes	13	protective coating outside	6	definite length (6m) plain ends	4	A 333 Gr.1	1V				
		sandblasted inside	7	definite length (6m) with welding bevel		A 333 Gr.3	1W				
				ASME B16.25		A 335 Gr.P1	3P				
Spiral Welded Pipes	1S	metallic, pickled inside	8	definite length (6m) with welding bevel	5	A 335 Gr.P5	3Q				
		special finish	9	ASME B16.25		A 335 Gr.P11	3R				
		phosphated and oiled	A	random		A 335 Gr.P12	3S				
	E	galvanized, protective coating outside		length with NPT-thread	7	A 335 Gr.P22	3T				
				both ends + 1 socket		A 671 Gr.CA55	1E				
						A 671 Gr.CB70	1H				
						<b>Stainless steels</b>					
						A 312 Gr.TP304	3D				
						A 312 Gr.TP304L	3E				
						A 312 Gr.TP321H	3F				
						A 312 Gr.TP316	3G				
						A 312 Gr.TP316L	3H				
						A 312 Gr.TP321	3J				
						A 312 Gr.TP347	3K				
						A 790 Gr.S31803	N1				
						A 358 Gr.321 (C > 0.04, Cl.1)	B5				

Footnotes see page 2

- 1) Materials:  
All materials correspond with specified ASTM- resp. API-standards.  
Appropriate quality factors shall be taken from table on page 3.
- 2) Wall thickness code acc. to Standard H0011.  
Wall thicknesses used see piping specifications.
- 3) Code for kind of part
- 4) Code for surface finish;  
Surface finish with code 3 to 9 and E acc. to order.  
A acc. to manufacturer's standard, however 5 g/m<sup>2</sup> Znph (minimum)  
acc. to ISO 9717.
- 5) Code for end preparation;  
Welding bevel acc. to ASME B16.25: plain bevel for wall thickness from 3 to 22 mm  
compound bevel for wall thickness above 22 mm  
NPT-threaded ends acc. to ASME B1.20.1.  
Manufacturing lengths 4,88 m - 13,72 m (16 - 45 ft) = random length.  
Deviations from this shall be noticed to the purchaser.
- 6) Weight of stainless austenitic pipes shall be derived as follows:  $GR_{SS} = GR \times 1,01528$
- 7) PEC = allowable working pressure for pipe made of ASTM A53 Gr.B, welded (Type E)  
  
PES = allowable working pressure for pipe made of ASTM A312 Gr.TP304, welded (Type EFW)  
  
Correction factors for other materials see page 3.  
  
A hyphen in column PEC indicates that this wall thickness is not standardized by ASME B36.10.
- 8) For threaded pipes material ASTM A53 shall preferably be used with end preparation code 7.
- 9) Outside diameters acc. to API 5L are equal with the nominal size for sizes  $\geq 2 \frac{3}{8}$ ",  
outside diameters acc. to ASME B36.10 are equal with the nominal size for sizes  $\geq 14$ ".  
This may lead to confusion for sizes  $3 \frac{1}{2}$ " and 4".  
  
For other sizes outside diameters acc. to ASME and API 5L are either equal  
( $\geq 14$ " and  $\leq 1 \frac{1}{2}$ ") or are designated differently.  
**Size designations in computer print outs only follow ASME B36.10.**

Examples:

	Nom. size	O.D.	Nom. size	O.D.	Nom. size	O.D.
API 5L	2 3/8"	2 3/8"	3.5"	3.5"	4"	4"
ASME B36.10	2"	2 3/8"	3"	3.5"	4"	4.5"

**Quality factors E and allowable stress** acc. to ASME B31.3 and **correction factors K for allowable working pressure** at ambient temperatures up to 38°C for several materials.

API - / ASTM - material	Type or Class	Designation	Material- group	Allowable Stresses (ksi)	Factor			
					E	K		
A 53 Gr.A A 53 Gr.B	Type S Type S	Seamless pipes	C-Steel	16.0 20.0	1.00 1.00	0.94 1.176		
A 53 Gr.A <b>A 53 Gr.B</b>	Type E <b>Type E</b>	Electric resistance welded pipes		16.0 <b>20.0</b>	0.85 <b>0.85</b>	0.8 <b>1.0</b>		
A 283 Gr.B	EFW	Electric fusion welded pipes		15,3	0,80	0,72		
A 106 Gr.A A 106 Gr.B	SMLS SMLS	Seamless pipes		16.0 20.0	1.00 1.00	0.94 1.176		
API 5L Gr.A API 5L Gr.B	SMLS SMLS	Seamless pipes		16.0 20.0	1.00 1.00	0.94 1.176		
API 5L Gr.A API 5L Gr.B	ERW ERW	Electric resistance welded pipes		16.0 20.0	0.85 0.85	0.8 1.0		
A 333 Gr.1	SMLS	Seamless pipes		C-Steel and low alloy steel	18.3	1.00	1.076	
A 333 Gr.1	ERW	Electric resistance welded pipes			18.3	0.85	0.915	
A 335 Gr.P1 A 335 Gr.P5 A 335 Gr.P11 A 335 Gr.P12 A 335 Gr.P22 A 335 Gr.P91	SMLS SMLS SMLS SMLS SMLS SMLS	Seamless pipes			18.3 20.0 20.0 20.0 20.0 28.3	1.00 1.00 1.00 1.00 1.00 1.00	1.076 1.176 1.176 1.176 1.176 1.664	
A 671 Gr.CA55	12,22				Electric fusion welded pipes, 100% radiographed	18.3	1.00	1.076
A 671 Gr.CB70	13,23		Electric fusion welded pipes, double butt seam		23.3	0.85	1.165	
A 312 Gr.TP304	SMLS		Seam. pipes: also valid for Grade 316, 321, 347		Stainless austenitic steels	20.0	1.00	1.176
A 312 Gr.TP304L	SMLS		Seam. pipes: also valid for Grade 316L			16.7	1.00	0.982
<b>A 312 Gr.TP304</b> or A 358 Gr.321	<b>EFW</b>		Electric fusion welded pipes, double butt seam: also valid for Grade 316, 321, 347			20.0	<b>0.85</b>	<b>1.0</b>
A 312 Gr.TP304L	EFW	Electric fusion welded pipes, double butt seam: also valid for Grade 316L	16.7			0.85	0.835	

- For other materials or types of pipe (Classes) quality factor E shall be taken from table A-1B of ASME B31.3.

- Correction factors comprise the ratios of allowable stresses S and quality factor E and are derived as follows :

$$K = \frac{S}{S_C} \cdot \frac{E}{E_C} \quad \text{for carbon steel and alloy steel}; \quad K = \frac{S}{S_S} \cdot \frac{E}{E_S} \quad \text{for stainless steel}$$

S = allowable stress in ksi for concerning material acc. to ASME B31.3, table A-1

S<sub>C</sub> = allowable stress for A 53 Gr.B = 20.0 ksi, S<sub>S</sub> = 20.0 ksi for A 312 Gr.TP304

E = quality factor for concerning material

E<sub>C</sub> = quality factor for A 53 Gr.B, Type E = 0.85;

E<sub>S</sub> = quality factor for A 312 Gr.TP304 = 0.85

- **Conversion examples:**

a) What is the value of the allowable working pressure at 20°C for ERW-pipe 6" x Sched. 40 material ASTM A 333 Gr.1?

Result :     PEC = 70.74 bar  
                   K = 0.915  
                   PEC (A 333 Gr.1) = 70.74 x 0.915 = **64.72 bar**

b) What is the value of the allowable working pressure at 20°C for EFW-pipe 10" x Sched. 10S material ASTM A 312 Gr.TP304L?

Result :     PES = 31.88 bar  
                   K = 0.835  
                   PES (A 312 Gr.TP304L) = 31.88 x 0.835 = **26.62 bar**

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**Formulas**

DN	mm	Nominal diameter	
DA	mm	Outside diameter	
WD	mm	Wall thickness	
SCHED.		Schedule designation acc. to ASME B36.10 or B36.19	
CD		Wall thickness code acc. to Std. H0011	
FI	cm <sup>2</sup>	Cross section	$FI = \frac{DI^2 \cdot \pi}{4} \cdot 10^{-2}$
FR	cm <sup>2</sup>	Sectional area	$FR = \frac{\pi}{4} \cdot (DA^2 - DI^2) \cdot 10^{-2}$
W	cm <sup>3</sup>	Sectional modulus	$W = \frac{\pi}{32} \cdot \frac{DA^4 - DI^4}{DA} \cdot 10^{-3}$
JA	cm <sup>4</sup>	Moment of inertia	$JA = \frac{\pi}{64} \cdot (DA^4 - DI^4) \cdot 10^{-4}$
GR	kg/m	Weight of pipe / m	$GR = FR \cdot 0.785$
GW	kg/m	Weight of water filling / m	$GW = FI \cdot 0.1$
GS	kg/m	Sum of GR and GW	$GS = GR + GW$
PEC	bar	Max. allowable working pressure acc. to ASME B31.3 at ambient temperature (up to 38°C) for material A 53 Gr.B, welded (Type E)	$PEC = \frac{2 \cdot SVC \cdot 20000 \cdot E}{14,50 (DA-2 \cdot SVC \cdot 0,4)}$
PES	bar	Max. allowable working pressure acc. to ASME B31.3 at ambient temperature (up to 38°C) for material A 312 Gr.TP304 welded (EFW)	$PES = \frac{2 \cdot SVS \cdot 20000 \cdot E}{14,50 (DA-2 \cdot SVS \cdot 0,4)}$
DI	mm	Inside diameter	$DI = DA - 2 \cdot WD$
SVC	mm	Mathematical wall thickness for C-steel	$SVC = \frac{100 - C_{1,C}}{100} \cdot WD - C_{2,C}$
SVS	mm	Mathematical wall thickness for stainless steel	$SVS = \frac{100 - C_{1,S}}{100} \cdot WD - C_{2,S}$
C <sub>1,C</sub>	%	Wall thickness tolerance acc. to ASTM A53	12,5 %
C <sub>1,S</sub>	%	Wall thickness tolerance acc. to ASTM A312/530	12,5 %
C <sub>2,C</sub>	mm	Corrosion allowance for C-steel assumed	1,27 mm (≤ DN1/2" : 1 mm)
C <sub>2,S</sub>	mm	Corrosion allowance for stainless steel assumed	0 mm
E		Quality factor see table, page 3; for A 53 Gr.B : E = 0,85 for A312 Gr.TP304 : E = 0,85	

Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Schedule	Cd.	Fi cm <sup>2</sup>	FR cm <sup>2</sup>	W cm <sup>3</sup>	JA cm <sup>4</sup>	GR kg/m	GW kg/m	GS kg/m	PEC <sup>7)</sup> bar	PES <sup>7)</sup> bar
1/8"	10.3	10S	B	0.48	0.35	0.07	0.04	0.28	0.05	0.33	-	269.73
	1.24	40,40S,STD	3,C,E	0.37	0.47	0.09	0.04	0.37	0.04	0.40	121.82	390.53
	1.73	80,80S,XS	5,D,F	0.24	0.60	0.10	0.05	0.47	0.02	0.49	276.20	574.09
1/4"	13.7	10S	B	0.85	0.62	0.17	0.12	0.49	0.08	0.58	-	269.86
	1.65	40,40S,STD	3,C,E	0.67	0.81	0.20	0.14	0.63	0.07	0.70	174.07	378.82
	2.24	80,80S,XS	5,D,F	0.46	1.01	0.23	0.16	0.80	0.05	0.84	310.95	534.80
3/8"	17.1	10S	B	1.50	0.80	0.28	0.24	0.63	0.15	0.78	-	212.31
	1.65	40,40S,STD	3,C,E	1.22	1.07	0.35	0.30	0.84	0.12	0.96	147.06	306.11
	2.31	80,80S,XS	5,D,F	0.90	1.40	0.42	0.36	1.10	0.09	1.19	269.52	441.82
1/2"	21.3	5S	A	2.54	1.02	0.46	0.50	0.80	0.25	1.05	-	168.05
	1.65	10S	B	2.29	1.27	0.56	0.59	1.00	0.23	1.23	-	218.39
	2.11	40,40S,STD	3,C,E	1.95	1.61	0.66	0.71	1.27	0.20	1.46	165.59	293.54
	2.77	80,80S,XS	5,D,F	1.50	2.06	0.78	0.83	1.62	0.15	1.77	272.36	409.49
	3.73	160	9	1.08	2.48	0.86	0.92	1.95	0.11	2.06	397.91	546.24
	4.78	XXS	G	0.32	3.25	0.94	1.00	2.55	0.03	2.58	769.46	953.67
	7.47											
3/4"	26.7	5S	A	4.30	1.30	0.77	1.02	1.02	0.43	1.45	-	132.52
	1.65	10S	B	3.97	1.63	0.93	1.24	1.28	0.40	1.68	-	171.63
	2.11	40,40S,STD	3,C,E	3.45	2.15	1.16	1.55	1.69	0.35	2.03	113.22	238.49
	2.87	80,80S,XS	5,D,F	2.80	2.80	1.40	1.87	2.20	0.28	2.48	201.94	334.78
	3.91	160	9	1.91	3.69	1.65	2.21	2.90	0.19	3.09	353.83	500.16
	5.56	XXS	G	0.96	4.64	1.81	2.42	3.64	0.10	3.74	587.47	755.89
	7.82											
1"	33.4	5S	A	7.12	1.65	1.25	2.08	1.29	0.71	2.00	-	104.99
	1.65	10S	B	6.10	2.67	1.89	3.15	2.09	0.61	2.70	-	180.65
	2.77	40,40S,STD	3,C,E	5.57	3.19	2.18	3.64	2.50	0.56	3.06	123.46	223.46
	3.38	80,80S,XS	5,D,F	4.64	4.12	2.63	4.40	3.24	0.46	3.70	203.56	308.96
	4.55	160	9	3.37	5.40	3.12	5.21	4.24	0.34	4.57	335.34	449.96
	6.35	XXS	G	1.82	6.94	3.50	5.85	5.45	0.18	5.63	558.67	689.80
	9.09											
1 1/4"	42.2	5S	A	11.88	2.10	2.05	4.33	1.65	1.19	2.84	-	82.48
	1.65	10S	B	10.56	3.43	3.18	6.70	2.69	1.06	3.75	-	141.16
	2.77	40,40S,STD	3,C,E	9.67	4.32	3.85	8.13	3.39	0.97	4.36	106.23	183.95
	3.56	80,80S,XS	5,D,F	8.30	5.69	4.78	10.09	4.47	0.83	5.30	175.11	256.43
	4.85	160	9	6.83	7.15	5.62	11.85	5.61	0.68	6.30	259.23	345.08
	6.35	XXS	G	4.08	9.90	6.75	14.24	7.77	0.41	8.18	464.61	562.04
	9.70											
1 1/2"	48.3	5S	A	15.90	2.42	2.73	6.59	1.90	1.59	3.49	-	71.81
	1.65	10S	B	14.36	3.96	4.27	10.30	3.11	1.44	4.55	-	122.59
	2.77	40,40S,STD	3,C,E	13.16	5.16	5.35	12.93	4.05	1.32	5.37	97.83	165.13
	3.68	80,80S,XS	5,D,F	11.42	6.90	6.76	16.33	5.41	1.14	6.56	162.69	232.94
	5.08	160	9	9.09	9.23	8.34	20.14	7.25	0.91	8.16	263.36	338.31
	7.14	XXS	G	6.16	12.16	9.81	23.70	9.55	0.62	10.17	422.81	505.52
	10.15											
2"	60.3	5S	A	25.52	3.04	4.34	13.08	2.39	2.55	4.94	-	57.24
	1.65	10S	B	24.70	3.86	5.42	16.35	3.03	2.47	5.50	22.58	73.60
	2.11	40,40S,STD	3,C,E	23.55	5.01	6.89	20.76	3.93	2.36	6.29	45.56	97.38
	2.77	80,80S,XS	5,D,F	22.85	5.71	7.74	23.35	4.48	2.29	6.76	60.02	112.35
	3.18	160	9	22.18	6.38	8.54	25.76	5.01	2.22	7.23	74.26	127.09
	3.58	XXS	G	21.63	6.93	9.18	27.66	5.44	2.16	7.60	86.11	139.36
	3.91			20.88	7.68	10.02	30.21	6.03	2.09	8.12	102.79	156.64
	4.37			20.22	8.34	10.73	32.36	6.54	2.02	8.57	117.81	172.20
	4.78			19.03	9.53	11.97	36.09	7.48	1.90	9.38	146.05	201.46
	5.54			17.80	10.76	13.17	39.70	8.45	1.78	10.23	176.72	233.25
	6.35			16.63	11.92	14.22	42.88	9.36	1.66	11.02	207.24	264.90
	7.14			14.40	14.16	16.05	48.40	11.11	1.44	12.55	270.92	330.96
	8.74			11.44	17.12	18.07	54.49	13.44	1.14	14.58	368.41	432.20
	11.07											

Footnotes see page 2

Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Schedule	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	PEC <sup>7)</sup> bar	PES <sup>7)</sup> bar			
2 1/2"	73.0	5S	A	37.15	4.70	8.09	29.54	3.69	3.72	7.40	18.63	60.53			
	2.11			35.74	6.11	10.34	37.74	4.80	3.57	8.37	37.53	79.98			
	2.77			35.15	6.70	11.25	41.07	5.26	3.52	8.78	-	88.31			
	10S	3.05	B		34.88	6.98	11.67	42.59	5.48	3.49	8.96	49.40	92.19		
		3.18			34.05	7.81	12.92	47.16	6.13	3.40	9.53	61.07	104.20		
		3.58			33.26	8.59	14.07	51.34	6.74	3.33	10.07	72.24	115.69		
		3.96			32.43	9.42	15.26	55.70	7.40	3.24	10.64	84.39	128.19		
		4.37			31.61	10.24	16.41	59.89	8.04	3.16	11.20	96.64	140.80		
		4.78			30.86	11.00	17.43	63.63	8.63	3.09	11.72	108.08	152.58		
		5.16			30.21	11.64	18.29	66.77	9.14	3.02	12.16	118.08	162.88		
	40,40S,STD	5.49	3,C,E		28.56	13.30	20.41	74.50	10.44	2.86	13.29	144.46	190.04		
		6.35			27.32	14.53	21.92	80.00	11.41	2.73	14.14	165.02	211.22		
		7.01			23.16	18.70	26.50	96.72	14.68	2.32	16.99	240.19	288.67		
		7.53			15.88	25.98	32.70	119.34	20.39	1.59	21.98	401.66	455.25		
14.02	80,80S,XS	5,D,F	27.32	14.53	21.92	80.00	11.41	2.73	14.14	165.02	211.22				
3"	88.9	5S	A	56.32	5.75	12.19	54.20	4.52	5.63	10.15	15.28	49.52			
	2.11			54.58	7.50	15.65	69.57	5.88	5.46	11.34	30.75	65.35			
	2.77			53.85	8.23	17.07	75.88	6.46	5.38	11.84	-	72.12			
	10S	3.05	B		53.51	8.56	17.72	78.76	6.72	5.35	12.07	40.44	75.28		
		3.18			52.48	9.60	19.68	87.47	7.53	5.25	12.78	49.96	85.02		
		3.58			51.50	10.57	21.49	95.51	8.30	5.15	13.45	59.06	94.33		
		3.96			50.47	11.60	23.38	103.93	9.11	5.05	14.16	68.94	104.45		
		4.37			49.44	12.63	25.22	112.09	9.92	4.94	14.86	78.89	114.63		
		4.78			47.69	14.39	28.27	125.65	11.29	4.77	16.06	96.27	132.43		
		5.49			45.60	16.47	31.74	141.11	12.93	4.56	17.49	117.59	154.26		
	40,40S,STD	6.35	3,C,E		43.73	18.34	34.74	154.41	14.40	4.37	18.77	137.44	174.60		
		7.14			42.61	19.46	36.47	162.09	15.27	4.26	19.54	149.63	187.09		
		7.62			34.88	27.19	47.20	209.80	21.35	3.49	24.83	241.80	281.54		
		11.13			26.80	35.27	56.11	249.43	27.68	2.68	30.36	356.98	399.69		
15.24	80,80S,XS	5,D,F	42.61	19.46	36.47	162.09	15.27	4.26	19.54	149.63	187.09				
3 1/2"	101.6	5S	A	74.48	6.59	16.07	81.63	5.18	7.45	12.62	13.36	43.24			
	2.11			72.47	8.60	20.69	105.09	6.75	7.25	14.00	26.87	57.03			
	2.77			71.63	9.44	22.59	114.75	7.41	7.16	14.58	-	62.91			
	10S	3.05	B		71.24	9.83	23.46	119.18	7.72	7.12	14.84	35.33	65.66		
		3.18			70.05	11.02	26.10	132.58	8.65	7.00	15.66	43.62	74.12		
		3.58			68.93	12.15	28.54	144.99	9.54	6.89	16.43	51.55	82.21		
		3.96			67.72	13.35	31.11	158.06	10.48	6.77	17.25	60.15	90.99		
		4.37			66.53	14.54	33.62	170.78	11.41	6.65	18.07	68.80	99.82		
		4.78			63.79	17.29	39.23	199.27	13.57	6.38	19.95	89.24	120.69		
		5.74			62.07	19.00	42.61	216.45	14.92	6.21	21.12	102.38	134.10		
	40,40S,STD	6.35	3,C,E		59.88	21.19	46.79	237.67	16.63	5.99	22.62	119.56	151.65		
		7.14			57.33	23.74	51.47	261.47	18.64	5.73	24.37	140.26	172.79		
		8.08			80,80S,XS	5,D,F	57.33	23.74	51.47	261.47	18.64	5.73	24.37	140.26	172.79
		4"			114.3	5S	A	95.17	7.44	20.48	117.05	5.84	9.52	15.36	11.87
2.11	92.90		9.71	26.42	151.00			7.62	9.29	16.91	23.86	50.58			
2.77	91.95		10.66	28.88	165.04			8.37	9.19	17.56	-	55.79			
10S	3.05		B		91.51	11.10	30.01	171.48	8.71	9.15	17.87	31.36	58.22		
	3.18				90.16	12.45	33.42	191.02	9.78	9.02	18.79	38.71	65.70		
	3.58				88.88	13.73	36.60	209.18	10.78	8.89	19.66	45.73	72.85		
	3.96				87.52	15.09	39.95	228.34	11.85	8.75	20.60	53.34	80.60		
	4.37				86.16	16.45	43.23	247.06	12.91	8.62	21.53	60.99	88.39		
	4.78				84.92	17.69	46.20	264.02	13.89	8.49	22.38	68.12	95.65		
	5.16				83.61	18.99	49.25	281.47	14.91	8.36	23.27	75.65	103.32		
40,40S,STD	6.02		3,C,E		82.13	20.48	52.68	301.05	16.08	8.21	24.29	84.37	112.20		
	6.35				81.07	21.54	55.08	314.78	16.91	8.11	25.01	90.65	118.60		
	7.14				78.57	24.04	60.64	346.56	18.87	7.86	26.73	105.80	134.03		
	7.92				76.14	26.47	65.88	376.50	20.78	7.61	28.39	120.90	149.41		
80,80S,XS	8.56	5,D,F		74.17	28.44	70.00	400.03	22.32	7.42	29.74	133.41	162.16			
	11.13			66.53	36.07	84.96	485.56	28.32	6.65	34.97	184.68	214.40			
	13.49			59.88	42.72	96.67	552.45	33.54	5.99	39.53	233.30	263.96			
	17.12			50.34	52.27	111.31	636.16	41.03	5.03	46.06	311.11	343.30			

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DN	DA WD mm	Schedule	Cd.	Fi cm <sup>2</sup>	FR cm <sup>2</sup>	W cm <sup>3</sup>	JA cm <sup>4</sup>	GR kg/m	GW kg/m	GS kg/m	PEC <sup>7)</sup> bar	PES <sup>7)</sup> bar
5"	141.3											
	2.11			147.58	9.23	31.63	223.49	7.24	14.76	22.00	9.59	30.96
	2.77	5S	A	144.75	12.06	40.95	289.30	9.46	14.48	23.94	-	40.78
	3.18			143.01	13.80	46.60	329.22	10.83	14.30	25.13	25.32	46.91
	3.40	10S	B	142.08	14.73	49.59	350.34	11.56	14.21	25.77	-	50.21
	3.96			139.72	17.09	57.07	403.19	13.41	13.97	27.38	36.88	58.65
	4.78			136.31	20.50	67.69	478.20	16.09	13.63	29.72	49.14	71.09
	5.56			133.10	23.71	77.42	547.00	18.61	13.31	31.92	60.90	83.02
	6.55	40,40S,STD	3,C,E	129.08	27.73	89.29	630.83	21.77	12.91	34.67	75.95	98.30
	7.14			126.72	30.09	96.10	678.98	23.62	12.67	36.29	85.00	107.48
	7.92			123.62	33.19	104.83	740.60	26.05	12.36	38.41	97.04	119.70
	8.74			120.41	36.40	113.65	802.96	28.57	12.04	40.61	109.80	132.65
	9.53	80,80S,XS	5,D,F	117.36	39.45	121.83	860.73	30.97	11.74	42.71	122.19	145.24
	12.70	120	7	105.50	51.31	151.60	1071.03	40.28	10.55	50.83	172.97	196.79
	15.88	160	9	94.24	62.57	176.93	1250.02	49.12	9.42	58.54	225.64	250.27
19.05	XXS	G	83.65	73.16	198.16	1399.98	57.43	8.36	65.80	279.94	305.44	
6"	168.3											
	2.11			211.45	11.02	45.20	380.39	8.65	21.14	29.79	8.05	25.95
	2.77	5S	A	208.06	14.40	58.65	493.50	11.31	20.81	32.11	16.16	34.16
	3.18			205.97	16.50	66.83	562.40	12.95	20.60	33.55	21.23	39.29
	3.40	10S	B	204.85	17.61	71.18	598.94	13.83	20.48	34.31	-	42.04
	3.58			203.94	18.53	74.70	628.62	14.54	20.39	34.94	26.18	44.30
	3.96			202.02	20.45	82.07	690.62	16.05	20.20	36.25	30.90	49.08
	4.37			199.96	22.51	89.90	756.53	17.67	20.00	37.66	36.02	54.26
	4.78			197.91	24.56	97.62	821.43	19.28	19.79	39.07	41.15	59.45
	5.16			196.02	26.45	104.66	880.69	20.76	19.60	40.36	45.92	64.28
	5.56			194.04	28.43	111.96	942.16	22.31	19.40	41.72	50.96	69.39
	6.35			190.16	32.31	126.06	1060.82	25.36	19.02	44.38	60.96	79.51
	7.11	40,40S,STD	3,C,E	186.46	36.00	139.23	1171.62	28.26	18.65	46.91	70.65	89.32
	7.92			182.56	39.90	152.84	1286.16	31.33	18.26	49.58	81.04	99.84
	8.74			178.65	43.81	166.18	1398.44	34.39	17.87	52.26	91.63	110.57
	9.53			174.93	47.53	178.63	1503.21	37.31	17.49	54.81	101.91	120.97
	10.97	80,80S,XS	5,D,F	168.24	54.22	200.33	1685.81	42.56	16.82	59.39	120.82	140.13
	12.70	120	7	160.38	62.08	224.76	1891.37	48.73	16.04	64.77	143.86	163.46
	14.27	160	9	153.41	69.05	245.45	2065.43	54.21	15.34	69.55	165.07	184.94
	15.88			146.42	76.04	265.26	2232.16	59.69	14.64	74.33	187.13	207.28
	18.26	XXS	G	136.39	86.07	292.09	2457.92	67.57	13.64	81.21	220.31	240.90
19.05			133.14	89.32	300.37	2527.65	70.12	13.31	83.43	231.49	252.22	
21.95			121.54	100.92	328.31	2762.70	79.22	12.15	91.38	273.19	294.47	
22.23			120.45	102.01	330.81	2783.73	80.08	12.05	92.12	277.27	298.61	
8"	219.1											
	2.77	5S	A	358.20	18.83	100.54	1101.44	14.78	35.82	50.60	-	26.17
	3.18			355.46	21.57	114.78	1257.36	16.93	35.55	52.48	16.28	30.08
	3.76	10S	B	351.59	25.44	134.63	1474.87	19.97	35.16	55.13	-	35.64
	3.96			350.26	26.76	141.40	1549.05	21.01	35.03	56.04	23.68	37.56
	4.78			344.84	32.18	168.76	1848.81	25.26	34.48	59.75	31.50	45.46
	5.16			342.35	34.68	181.23	1985.35	27.22	34.23	61.46	35.14	49.13
	5.56			339.73	37.30	194.20	2127.49	29.28	33.97	63.25	38.99	53.01
	6.35	20	1	334.59	42.44	219.39	2403.42	33.32	33.46	66.78	46.60	60.69
	7.04	30	2	330.13	46.90	240.92	2639.29	36.82	33.01	69.83	53.28	67.44
	7.92			324.48	52.54	267.76	2933.28	41.25	32.45	73.70	61.85	76.09
	8.18	40,40S,STD	3,C,E	322.83	54.20	275.55	3018.69	42.55	32.28	74.83	64.39	78.66
	8.74			319.27	57.76	292.14	3200.44	45.34	31.93	77.27	69.88	84.20
	9.53			314.28	62.74	315.08	3451.73	49.25	31.43	80.68	77.65	92.04
	10.31	60	4	309.40	67.63	337.20	3694.07	53.09	30.94	84.03	85.37	99.83
	11.13			304.31	72.72	359.90	3942.75	57.08	30.43	87.52	93.53	108.07
	12.70	80,80S,XS	5,D,F	294.68	82.35	401.81	4401.84	64.64	29.47	94.11	109.26	123.96
	14.27			285.20	91.83	441.73	4839.13	72.08	28.52	100.60	125.16	140.01
	15.09	100	6	280.31	96.71	461.81	5059.10	75.92	28.03	103.95	133.53	148.47
	15.88			275.65	101.38	480.66	5265.67	79.59	27.56	107.15	141.64	156.65
	18.26	120	7	261.82	115.21	534.66	5857.15	90.44	26.18	116.62	166.33	181.59
19.05			257.30	119.72	551.67	6043.53	93.98	25.73	119.71	174.62	189.95	
20.62	140	8	248.45	128.57	584.18	6399.72	100.93	24.85	125.78	191.21	206.71	
22.23	XXS	G	239.54	137.49	615.78	6745.91	107.93	23.95	131.88	208.41	224.08	
23.01	160	9	235.28	141.75	630.48	6906.88	111.27	23.53	134.80	216.82	232.57	
25.40			222.46	154.57	673.09	7373.72	121.33	22.25	143.58	242.84	258.86	

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Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Schedule	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	PEC <sup>7)</sup> bar	PES <sup>7)</sup> bar
10"	273.0											
	3.40	5S	A	556.55	28.80	191.71	2616.78	22.61	55.66	78.26	-	25.78
	3.96			551.88	33.47	221.90	3029.00	26.27	55.19	81.46	18.98	30.07
	4.19	10S	B	549.97	35.38	234.20	3196.80	27.78	55.00	82.77	-	31.83
	4.78			545.07	40.28	265.44	3623.26	31.62	54.51	86.13	25.23	36.37
	5.16			541.93	43.42	285.34	3894.91	34.08	54.19	88.28	28.14	39.30
	5.56			538.63	46.71	306.10	4178.32	36.67	53.86	90.53	31.21	42.39
	6.35	20	1	532.16	53.19	346.55	4730.47	41.76	53.22	94.97	37.28	48.51
	7.09			526.12	59.23	383.78	5238.64	46.49	52.61	99.11	43.00	54.27
	7.80	30	2	520.36	64.99	418.91	5718.08	51.01	52.04	103.05	48.50	59.82
	8.74			512.79	72.56	464.52	6340.75	56.96	51.28	108.24	55.82	67.19
	9.27	40,40S,STD	3,C,E	508.54	76.80	489.80	6685.82	60.29	50.85	111.15	59.96	71.36
	11.13			493.78	91.57	576.05	7863.14	71.88	49.38	121.26	74.59	86.10
	12.70	60,80S,XS	4,D,F	481.49	103.86	645.93	8816.96	81.53	48.15	129.68	87.05	98.66
	14.27			469.36	115.99	713.20	9735.17	91.05	46.94	137.99	99.61	111.32
	15.09	80	5	463.08	122.27	747.32	10200.88	95.98	46.31	142.29	106.21	117.97
	15.88			457.08	128.27	779.54	10640.73	100.69	45.71	146.40	112.60	124.41
	18.26	100	6	439.22	146.13	872.86	11914.56	114.71	43.92	158.64	132.01	143.97
	20.62			421.86	163.49	960.00	13103.97	128.34	42.19	170.53	151.51	163.62
	21.44	120	7	415.91	169.44	989.05	13500.59	133.01	41.59	174.60	158.34	170.51
	22.23			410.22	175.13	1016.47	13874.76	137.48	41.02	178.50	164.95	177.17
23.83			398.81	186.54	1070.27	14609.17	146.43	39.88	186.31	178.42	190.75	
25.40	140,XXS	8,G	387.77	197.58	1120.88	15300.02	155.10	38.78	193.87	191.76	204.19	
28.58	160	9	365.89	219.46	1217.02	16612.31	172.27	36.59	208.86	219.13	231.78	
31.75			344.71	240.64	1304.76	17809.97	188.90	34.47	223.37	246.89	259.76	
12"	323.8											
	3.96	5S	A	784.17	39.80	314.52	5093.63	31.25	78.42	109.66	-	25.30
	4.37			780.10	43.87	345.76	5599.61	34.44	78.01	112.45	18.60	27.95
	4.57	10S	B	778.12	45.85	360.91	5845.00	35.99	77.81	113.80	-	29.24
	4.78			776.05	47.92	376.76	6101.65	37.62	77.60	115.22	21.24	30.59
	5.16			772.30	51.67	405.28	6563.46	40.56	77.23	117.79	23.68	33.05
	5.56			768.37	55.61	435.07	7045.97	43.65	76.84	120.49	26.26	35.65
	6.35	20	1	760.62	63.35	493.24	7988.10	49.73	76.06	125.79	31.36	40.78
	7.14			752.92	71.05	550.54	8915.99	55.78	75.29	131.07	36.48	45.94
	7.92			745.35	78.62	606.26	9818.31	61.72	74.54	136.25	41.56	51.04
	8.38	30	2	740.91	83.07	638.72	10344.06	65.21	74.09	139.30	44.56	54.06
	8.74			737.44	86.54	663.92	10752.23	67.93	73.74	141.67	46.91	56.43
	9.53	40S,STD	C,E	729.85	94.12	718.61	11637.91	73.88	72.99	146.87	52.08	61.64
	10.31	40	3	722.40	101.57	771.78	12498.97	79.73	72.24	151.97	57.21	66.80
	11.13			714.61	109.36	826.80	13389.98	85.85	71.46	157.31	62.62	72.24
	12.70	80S,XS	D,F	699.81	124.16	929.66	15055.84	97.47	69.98	167.45	73.03	82.72
	14.27	60	4	685.16	138.81	1029.33	16669.96	108.96	68.52	177.48	83.51	93.27
	15.88			670.30	153.67	1128.29	18272.58	120.63	67.03	187.66	94.34	104.17
	17.48	80	5	655.70	168.27	1223.44	19813.61	132.09	65.57	197.66	105.18	115.07
	19.05			641.53	182.44	1313.79	21276.79	143.22	64.15	207.37	115.88	125.85
	20.62			627.51	196.46	1401.21	22692.52	154.22	62.75	216.97	126.67	136.71
21.44	100	6	620.25	203.72	1445.72	23413.44	159.92	62.02	221.95	132.33	142.41	
22.23			613.29	210.68	1487.88	24096.15	165.38	61.33	226.71	137.81	147.92	
23.83			599.33	224.64	1571.09	25443.80	176.35	59.93	236.28	148.96	159.15	
25.40	120,XXS	7,G	585.78	238.19	1649.98	26721.44	186.98	58.58	245.56	159.98	170.24	
26.97			572.39	251.59	1726.20	27955.76	197.49	57.24	254.73	171.08	181.41	
28.58	140	8	558.81	265.16	1801.64	29177.58	208.15	55.88	264.03	182.55	192.96	
31.75			532.56	291.41	1942.40	31457.24	228.75	53.26	282.01	205.37	215.94	
33.32	160	9	519.80	304.17	2008.42	32526.34	238.78	51.98	290.76	216.80	227.44	

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Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Schedule	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	7) PEC bar	7) PES bar
14"	355.6											
	3.96	5S	A	949.40	43.75	380.34	6762.46	34.34	94.94	129.28	-	23.03
	4.78	10S	B	940.46	52.68	455.92	8106.28	41.36	94.05	135.40	19.33	27.84
	5.16			936.34	56.81	490.58	8722.58	44.59	93.63	138.23	21.55	30.08
	5.33			934.50	58.65	506.02	8996.97	46.04	93.45	139.49	22.55	31.08
	5.56			932.00	61.14	526.82	9366.93	48.00	93.20	141.20	23.90	32.43
	6.35	10	0	923.47	69.67	597.66	10626.41	54.69	92.35	147.04	28.54	37.10
	7.14			914.98	78.16	667.52	11868.59	61.36	91.50	152.86	33.19	41.78
	7.92	20	1	906.64	86.51	735.56	13078.25	67.91	90.66	158.57	37.80	46.42
	8.74			897.91	95.24	806.08	14332.09	74.76	89.79	164.55	42.67	51.31
	9.53	30,STD	2,E	889.54	103.61	873.06	15522.94	81.33	88.95	170.29	47.36	56.04
	10.31			881.31	111.84	938.27	16682.36	87.79	88.13	175.92	52.02	60.72
	11.13	40	3	872.70	120.45	1005.84	17883.91	94.55	87.27	181.82	56.93	65.66
	11.91			864.55	128.60	1069.21	19010.50	100.95	86.46	187.40	61.61	70.37
	12.70	XS	F	856.34	136.81	1132.48	20135.45	107.40	85.63	193.03	66.37	75.15
	14.27			840.13	153.02	1255.55	22323.67	120.12	84.01	204.13	75.87	84.71
	15.09	60	4	831.72	161.42	1318.44	23441.79	126.72	83.17	209.89	80.86	89.73
	15.88			823.67	169.48	1378.13	24503.13	133.04	82.37	215.41	85.68	94.58
	17.48			807.47	185.68	1496.38	26605.60	145.76	80.75	226.50	95.49	104.45
	19.05	80	5	791.73	201.42	1609.02	28608.36	158.11	79.17	237.28	105.18	114.20
	20.62			776.15	217.00	1718.37	30552.56	170.34	77.61	247.96	114.93	124.01
	22.23			760.33	232.82	1827.15	32486.71	182.76	76.03	258.79	125.00	134.13
	23.83	100	6	744.77	248.38	1931.96	34350.26	194.98	74.48	269.45	135.07	144.26
	25.40			729.66	263.49	2031.68	36123.27	206.84	72.97	279.80	145.01	154.26
	26.97			714.70	278.44	2128.36	37842.31	218.58	71.47	290.05	155.02	164.33
	27.79	120	7	706.95	286.19	2177.68	38719.08	224.66	70.70	295.36	160.28	169.62
	28.58			699.53	293.62	2224.43	39550.28	230.49	69.95	300.44	165.36	174.73
	31.75	140	8	670.12	323.03	2404.68	42755.27	253.58	67.01	320.59	185.90	195.40
	35.71	160	9	634.27	358.87	2613.96	46476.17	281.72	63.43	345.14	211.96	221.62
	50.80			506.71	486.44	3265.40	58058.75	381.85	50.67	432.53	315.36	325.67
	53.98			481.65	511.50	3376.24	60029.56	401.52	48.16	449.69	338.03	348.48
	55.88			466.98	526.17	3438.52	61136.86	413.04	46.70	459.74	351.72	362.26
	63.50			410.43	582.71	3660.59	65085.22	457.43	41.04	498.47	407.82	418.72
16"	406.4											
	4.19	5S	A	1244.23	52.94	526.93	10707.29	41.56	124.42	165.98	-	21.31
	4.78	10S	B	1236.86	60.31	598.51	12161.73	47.34	123.69	171.03	16.90	24.33
	5.16			1232.13	65.04	644.27	13091.64	51.06	123.21	174.27	18.84	26.28
	5.56			1227.16	70.02	692.16	14064.73	54.96	122.72	177.68	20.89	28.34
	6.35	10	0	1217.36	79.81	785.89	15969.30	62.65	121.74	184.38	24.94	32.41
	7.14			1207.61	89.56	878.50	17851.07	70.30	120.76	191.06	29.00	36.50
	7.92	20	1	1198.02	99.15	968.84	19686.85	77.83	119.80	197.63	33.02	40.54
	8.74			1187.98	109.19	1062.66	21593.19	85.71	118.80	204.51	37.26	44.80
	9.53	30,STD	2,E	1178.35	118.82	1151.93	23407.12	93.27	117.84	211.11	41.36	48.92
	10.53			1166.21	130.96	1263.37	25671.62	102.80	116.62	219.42	46.56	54.14
	11.13			1158.96	138.21	1329.40	27013.50	108.49	115.90	224.39	49.69	57.29
	11.91			1149.57	147.60	1414.33	28739.24	115.87	114.96	230.83	53.77	61.39
	12.70	40,XS	3,F	1140.09	157.08	1499.30	30465.73	123.31	114.01	237.32	57.91	65.55
	14.27			1121.38	175.79	1665.04	33833.65	138.00	112.14	250.14	66.18	73.86
	15.88			1102.35	194.82	1830.77	37201.27	152.94	110.23	263.17	74.70	82.43
	16.66	60	4	1093.19	203.99	1909.54	38801.87	160.13	109.32	269.45	78.85	86.59
	17.48			1083.60	213.58	1991.29	40463.04	167.66	108.36	276.02	83.22	90.99
	19.05			1065.35	231.82	2144.82	43582.76	181.98	106.54	288.51	91.62	99.44
	20.62			1047.26	249.91	2294.47	46623.69	196.18	104.73	300.90	100.08	107.93
	21.44	80	5	1037.88	259.29	2371.12	48181.08	203.54	103.79	307.33	104.51	112.39
	22.23			1028.88	268.30	2443.98	49661.68	210.61	102.89	313.50	108.80	116.70
	23.83			1010.76	286.41	2588.66	52601.54	224.83	101.08	325.91	117.51	125.46
	25.40	100	6	993.15	304.02	2726.91	55410.80	238.66	99.31	337.97	126.11	134.10
	26.19			984.34	312.83	2795.10	56796.53	245.57	98.43	344.01	130.45	138.47
	26.97			975.68	321.49	2861.55	58146.63	252.37	97.57	349.94	134.75	142.79
	28.53			958.49	338.68	2991.81	60793.56	265.87	95.85	361.72	143.40	151.48
30.18			940.46	356.71	3125.84	63517.08	280.01	94.05	374.06	152.59	160.72	
30.96	120	7	932.00	365.17	3187.88	64777.73	286.66	93.20	379.86	156.95	165.11	
31.75			923.47	373.70	3249.86	66037.21	293.35	92.35	385.70	161.39	169.56	
36.53	140	8	872.70	424.47	3607.02	73294.71	333.21	87.27	420.48	188.48	196.81	
40.49	160	9	831.72	465.45	3880.54	78852.60	365.38	83.17	448.55	211.30	219.74	

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DN	DA WD mm	Schedule	Cd.	Fi cm <sup>2</sup>	FR cm <sup>2</sup>	W cm <sup>3</sup>	JA cm <sup>4</sup>	GR kg/m	GW kg/m	GS kg/m	PEC <sup>7)</sup> bar	PES <sup>7)</sup> bar
18"	457.0											
	4.19	5S	A	1580.69	59.60	668.61	15277.74	46.79	158.07	204.86	-	18.93
	4.78	10S	B	1572.39	67.91	759.80	17361.43	53.31	157.24	210.55	15.02	21.62
	5.56			1561.44	78.85	879.25	20090.96	61.90	156.14	218.04	18.56	25.18
	6.35	10	0	1550.40	89.90	998.97	22826.43	70.57	155.04	225.61	22.16	28.79
	7.14			1539.39	100.91	1117.41	25532.87	79.21	153.94	233.15	25.76	32.41
	7.92	20	1	1528.56	111.74	1233.12	28176.77	87.71	152.86	240.57	29.33	35.99
	8.74			1517.22	123.08	1353.44	30926.18	96.62	151.72	248.34	33.09	39.77
	9.53	STD	E	1506.33	133.97	1468.10	33546.06	105.17	150.63	255.80	36.72	43.42
	10.31			1495.61	144.68	1580.09	36105.10	113.58	149.56	263.14	40.32	47.03
	11.13	30	2	1484.39	155.90	1696.54	38765.94	122.38	148.44	270.82	44.11	50.84
	11.91			1473.76	166.54	1806.09	41269.20	130.73	147.38	278.11	47.72	54.46
	12.70	XS	F	1463.03	177.27	1915.85	43777.13	139.16	146.30	285.46	51.39	58.15
	14.27	40	3	1441.82	198.48	2130.42	48680.12	155.81	144.18	299.99	58.70	65.50
	15.88			1420.23	220.07	2345.62	53597.32	172.75	142.02	314.78	66.24	73.07
	17.48			1398.93	241.36	2554.69	58374.56	189.47	139.89	329.36	73.77	80.64
	19.05	60	4	1378.19	262.10	2755.26	62957.78	205.75	137.82	343.57	81.20	88.10
	20.62			1357.61	282.69	2951.38	67439.08	221.91	135.76	357.67	88.66	95.59
	22.23			1336.66	303.63	3147.94	71930.31	238.35	133.67	372.02	96.35	103.32
	23.83	80	5	1316.01	324.29	3338.76	76290.67	254.57	131.60	386.17	104.04	111.04
	25.40			1295.89	344.40	3521.71	80471.01	270.36	129.59	399.94	111.61	118.65
26.97			1275.94	364.36	3700.46	84555.52	286.02	127.59	413.62	119.23	126.30	
28.58			1255.63	384.66	3879.48	88646.12	301.96	125.56	427.52	127.08	134.19	
29.36	100	6	1245.85	394.44	3964.67	90592.70	309.64	124.59	434.22	130.89	138.02	
30.18			1235.61	404.68	4053.15	92614.58	317.68	123.56	441.24	134.92	142.06	
31.75			1216.13	424.17	4219.53	96416.37	332.97	121.61	454.58	142.65	149.83	
34.93	120	7	1177.13	463.16	4544.54	103842.77	363.58	117.71	481.30	158.43	165.68	
39.67	140	8	1120.19	520.11	5000.13	114252.96	408.28	112.02	520.30	182.25	189.62	
45.24	160	9	1055.08	585.22	5493.38	125523.80	459.40	105.51	564.90	210.72	218.23	
20"	508.0											
	4.78	5S	A	1951.26	75.57	941.82	23922.17	59.32	195.13	254.45	-	19.43
	5.56	10S	B	1939.07	87.76	1090.45	27697.49	68.89	193.91	262.80	16.69	22.63
	6.35	10	0	1926.76	100.07	1239.57	31485.14	78.56	192.68	271.23	19.92	25.87
	7.14			1914.48	112.35	1387.27	35236.71	88.19	191.45	279.64	23.16	29.12
	7.92			1902.40	124.43	1531.72	38905.63	97.68	190.24	287.92	26.36	32.34
	8.74			1889.75	137.08	1682.10	42725.26	107.61	188.97	296.59	29.74	35.73
	9.53	20,STD	1,E	1877.59	149.24	1825.55	46369.09	117.15	187.76	304.91	33.00	39.00
	10.31			1865.63	161.20	1965.84	49932.31	126.54	186.56	313.11	36.22	42.24
	11.13			1853.09	173.74	2111.87	53641.54	136.38	185.31	321.69	39.62	45.65
	11.91			1841.21	185.62	2249.42	57135.14	145.71	184.12	329.83	42.86	48.91
	12.70	30,XS	2,F	1829.21	197.62	2387.37	60639.28	155.13	182.92	338.05	46.15	52.21
	14.27			1805.49	221.34	2657.55	67501.75	173.75	180.55	354.30	52.70	58.79
	15.09	40	3	1793.16	233.67	2796.57	71032.79	183.43	179.32	362.75	56.14	62.24
	15.88			1781.32	245.51	2929.15	74400.42	192.73	178.13	370.86	59.46	65.57
	17.48			1757.46	269.37	3193.66	81119.01	211.45	175.75	387.20	66.20	72.34
	19.05			1734.21	292.62	3448.05	87580.41	229.71	173.42	403.13	72.84	79.01
	20.62	60	4	1711.11	315.72	3697.38	93913.57	247.84	171.11	418.95	79.52	85.72
	22.23			1687.58	339.25	3947.90	100276.68	266.31	168.76	435.07	86.39	92.62
	23.83			1664.36	362.47	4191.74	106470.27	284.54	166.44	450.97	93.26	99.51
	25.40			1641.73	385.10	4426.12	112423.45	302.30	164.17	466.47	100.02	106.31
26.19	80	5	1630.40	396.43	4542.24	115372.99	311.19	163.04	474.23	103.44	109.74	
26.97			1619.26	407.57	4655.72	118255.24	319.94	161.93	481.87	106.82	113.13	
28.58			1596.37	430.46	4886.27	124111.27	337.91	159.64	497.54	113.82	120.16	
30.18			1573.79	453.04	5110.55	129807.93	355.63	157.38	513.01	120.81	127.18	
31.75			1551.79	475.04	5326.00	135280.28	372.91	155.18	528.08	127.70	134.10	
32.54	100	6	1540.78	486.05	5432.69	137990.39	381.55	154.08	535.63	131.18	137.59	
33.32			1529.95	496.88	5536.92	140637.88	390.05	152.99	543.05	134.62	141.05	
34.93			1507.70	519.13	5748.60	146014.50	407.51	150.77	558.29	141.75	148.21	
38.10	120	7	1464.38	562.45	6151.96	156259.69	441.52	146.44	587.96	155.89	162.41	
44.45	140	8	1379.51	647.32	6908.17	175467.42	508.15	137.95	646.10	184.60	191.24	
50.01	160	9	1307.28	719.55	7516.21	190911.63	564.85	130.73	695.58	210.18	216.93	

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DN	DA WD mm	Schedule	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	7) PEC bar	7) PES bar
22"	559.0											
	4.78	5S	A	2370.99	83.23	1143.36	31957.05	65.33	237.10	302.43	-	17.65
	5.56	10S	B	2357.55	96.67	1324.37	37016.06	75.89	235.75	311.64	15.16	20.55
	6.35	10	0	2343.97	110.25	1506.12	42096.06	86.55	234.40	320.94	18.09	23.49
	7.14			2330.43	123.79	1686.30	47132.18	97.17	233.04	330.22	21.03	26.44
	7.92			2317.10	137.12	1862.67	52061.74	107.64	231.71	339.35	23.94	29.36
	8.74			2303.13	151.09	2046.46	57198.51	118.60	230.31	348.92	27.00	32.43
	9.53	20,STD	1,E	2289.71	164.51	2221.95	62103.40	129.14	228.97	358.11	29.95	35.40
	10.31			2276.50	177.72	2393.71	66904.14	139.51	227.65	367.16	32.88	38.34
	11.13			2262.65	191.57	2572.68	71906.28	150.38	226.27	376.65	35.96	41.43
	11.91			2249.52	204.70	2741.40	76622.05	160.69	224.95	385.64	38.90	44.38
	12.70	30,XS	2,F	2236.26	217.96	2910.78	81356.42	171.10	223.63	394.73	41.88	47.37
	14.27			2210.01	244.21	3242.98	90641.21	191.70	221.00	412.70	47.82	53.33
	15.88			2183.27	270.95	3577.56	99992.84	212.70	218.33	431.03	53.93	59.47
	17.48			2156.84	297.38	3904.05	109118.18	233.44	215.68	449.12	60.04	65.59
	19.05			2131.07	323.15	4218.65	117911.39	253.67	213.11	466.78	66.05	71.63
	20.62			2105.46	348.76	4527.62	126547.01	273.78	210.55	484.32	72.09	77.69
	22.23	60	4	2079.35	374.87	4838.68	135240.98	294.27	207.94	502.21	78.30	83.93
	23.83			2053.57	400.65	5142.07	143720.74	314.51	205.36	519.87	84.51	90.15
	25.40			2028.43	425.79	5434.28	151888.19	334.25	202.84	537.09	90.62	96.29
	26.97			2003.44	450.78	5721.13	159905.64	353.86	200.34	554.21	96.75	102.45
	28.58	80	5	1977.97	476.25	6009.79	167973.52	373.85	197.80	571.65	103.07	108.79
	30.18			1952.83	501.39	6291.19	175838.90	393.59	195.28	588.88	109.38	115.12
	31.75			1928.31	525.91	6562.11	183411.00	412.84	192.83	605.67	115.59	121.36
	33.32			1903.95	550.27	6827.93	190840.51	431.96	190.39	622.36	121.83	127.62
34.93	100	6	1879.13	575.09	7095.28	198313.10	451.45	187.91	639.36	128.25	134.07	
36.53			1854.62	599.60	7355.80	205594.51	470.69	185.46	656.15	134.67	140.51	
38.10			1830.73	623.49	7606.47	212600.92	489.44	183.07	672.51	140.98	146.85	
41.28	120	7	1782.82	671.40	8099.44	226379.30	527.05	178.28	705.33	153.86	159.77	
47.63	140	8	1689.04	765.18	9026.43	252288.61	600.67	168.90	769.57	179.89	185.91	
53.98	160	9	1597.79	856.43	9880.30	276154.48	672.30	159.78	832.08	206.37	212.49	
24"	610.0											
	5.54	5S	A	2817.26	105.20	1575.47	48051.71	82.58	281.73	364.31	-	18.75
	6.35	10,10S	0,B	2802.04	120.42	1798.61	54857.66	94.53	280.20	374.74	16.57	21.51
	7.14			2787.24	135.23	2014.51	61442.44	106.15	278.72	384.88	19.26	24.21
	7.92			2772.66	149.81	2225.99	67892.66	117.60	277.27	394.86	21.92	26.88
	8.74			2757.38	165.09	2446.53	74619.10	129.60	275.74	405.33	24.72	29.69
	9.53	20,STD	1,E	2742.69	179.78	2657.27	81046.84	141.12	274.27	415.39	27.43	32.41
	10.31			2728.23	194.24	2863.70	87342.84	152.48	272.82	425.30	30.10	35.09
	11.13			2713.07	209.40	3078.95	93908.02	164.38	271.31	435.69	32.92	37.92
	11.91			2698.68	223.78	3282.04	100102.16	175.67	269.87	445.54	35.60	40.61
	12.70	XS	F	2684.15	238.31	3486.08	106325.50	187.08	268.42	455.49	38.33	43.35
	14.27	30	2	2655.40	267.07	3886.70	118544.50	209.65	265.54	475.19	43.76	48.80
	15.88			2626.07	296.40	4290.85	130870.89	232.67	262.61	495.28	49.35	54.40
	17.48	40	3	2597.08	325.38	4685.85	142918.41	255.43	259.71	515.13	54.92	60.00
	19.05			2568.80	353.67	5067.09	154546.14	277.63	256.88	534.51	60.41	65.51
	20.62			2540.67	381.80	5442.10	165983.91	299.71	254.07	553.78	65.92	71.04
	22.23			2511.98	410.48	5820.26	177517.99	322.23	251.20	573.43	71.60	76.73
	23.83			2483.64	438.83	6189.73	188786.91	344.48	248.36	592.85	77.25	82.41
	24.61	60	4	2469.87	452.59	6367.58	194211.21	355.28	246.99	602.27	80.02	85.18
	25.40			2455.98	466.49	6546.20	199659.10	366.19	245.60	611.79	82.83	88.00
	26.97			2428.47	493.99	6896.71	210349.68	387.79	242.85	630.63	88.42	93.61
	28.58			2400.43	522.04	7250.04	221126.16	409.80	240.04	649.84	94.18	99.39
	30.18			2372.72	549.75	7595.11	231650.76	431.55	237.27	668.82	99.92	105.15
	30.96	80	5	2359.27	563.20	7761.16	236715.30	442.11	235.93	678.04	102.73	107.97
	31.75			2345.69	576.78	7927.90	241800.88	452.77	234.57	687.34	105.58	110.83
33.32			2318.81	603.66	8255.00	251777.54	473.87	231.88	705.75	111.26	116.53	
34.93			2291.41	631.06	8584.60	261830.33	495.38	229.14	724.52	117.10	122.39	
36.53			2264.34	658.13	8906.37	271644.13	516.63	226.43	743.06	122.93	128.24	
38.10			2237.93	684.53	9216.55	281104.88	537.36	223.79	761.15	128.68	134.01	
38.89	100	6	2224.70	697.76	9370.58	285802.67	547.74	222.47	770.21	131.58	136.92	
39.67			2211.68	710.79	9521.32	290400.14	557.97	221.17	779.13	134.44	139.79	
46.02	120	7	2107.09	815.38	10699.90	326347.06	640.07	210.71	850.78	157.99	163.42	
52.37	140	8	2005.02	917.44	11794.91	359744.84	720.19	200.50	920.69	181.89	187.41	
59.54	160	9	1892.83	1029.64	12935.93	394545.90	808.27	189.28	997.55	209.33	214.95	

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Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Sched.	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	7) PEC bar	7) PES bar	
26"	660.0	10	0	3290.80	130.40	2110.55	69648.28	102.36	329.08	431.44	15.31	19.87	
	6.35			3274.75	146.44	2364.59	78031.55	114.96	327.48	442.43	17.79	22.37	
	7.14			3258.95	162.25	2613.59	86248.54	127.36	325.89	453.26	20.25	24.83	
	7.92			3242.37	178.82	2873.42	94822.79	140.37	324.24	464.61	22.83	27.42	
	8.74			3226.45	194.75	3121.86	103021.49	152.88	322.64	475.52	25.33	29.93	
	9.53			3210.76	210.43	3365.37	111057.13	165.19	321.08	486.27	27.80	32.40	
	10.31			3194.31	226.88	3619.44	119441.68	178.10	319.43	497.53	30.40	35.01	
	20,XS	11.13	1,F	E	3178.70	242.49	3859.32	127357.42	190.36	317.87	508.23	32.88	37.50
		11.91			3162.93	258.26	4100.47	135315.51	202.74	316.29	519.03	35.39	40.02
		12.70			3131.71	289.48	4574.41	150955.45	227.25	313.17	540.42	40.40	45.04
		14.27			3099.85	321.34	5053.13	166753.37	252.25	309.99	562.24	45.55	50.21
		15.88			3068.35	352.84	5521.65	182214.35	276.98	306.84	583.81	50.69	55.37
		17.48			3037.60	383.59	5974.44	197156.36	301.12	303.76	604.88	55.75	60.44
		19.05			3007.01	414.19	6420.42	211873.75	325.14	300.70	625.84	60.83	65.53
		20.62			2975.79	445.40	6870.76	226735.19	349.64	297.58	647.22	66.05	70.77
		22.23			2944.93	476.26	7311.37	241275.06	373.87	294.49	668.36	71.26	76.00
		23.83			2914.81	506.39	7737.04	255322.45	397.51	291.48	689.00	76.39	81.15
28"	711.0	10	0	3829.78	140.57	2454.42	87254.78	110.35	382.98	493.33	14.20	18.44	
	6.35			3812.47	157.88	2750.57	97782.61	123.94	381.25	505.18	16.51	20.75	
	7.14			3795.42	174.94	3040.99	108107.15	137.32	379.54	516.87	18.79	23.03	
	7.92			3777.53	192.82	3344.20	118886.46	151.37	377.75	529.12	21.18	25.44	
	8.74			3760.34	210.02	3634.30	129199.32	164.86	376.03	540.90	23.50	27.76	
	9.53			3743.40	226.95	3918.78	139312.58	178.16	374.34	552.50	25.79	30.06	
	10.31			3721.74	248.61	4280.69	152178.38	195.16	372.17	567.33	28.73	33.00	
	20,XS	11.13	1,F	M	3708.78	261.57	4496.32	159844.22	205.34	370.88	576.21	30.49	34.78
		11.91			3691.74	278.61	4778.52	169876.52	218.71	369.17	587.88	32.82	37.11
		12.70			3658.00	312.35	5333.59	189609.26	245.19	365.80	610.99	37.46	41.77
		14.27			3623.57	346.78	5894.90	209563.83	272.23	362.36	634.58	42.24	46.55
		15.88			3589.51	380.85	6444.87	229115.30	298.96	358.95	657.92	47.00	51.33
		17.48			3556.24	414.11	6977.00	248032.19	325.08	355.62	680.70	51.68	56.02
		19.05			3523.13	447.23	7501.72	266686.11	351.07	352.31	703.38	56.38	60.74
		20.62			3489.33	481.02	8032.20	285544.75	377.60	348.93	726.53	61.21	65.58
		22.23			3455.91	514.44	8551.83	304017.42	403.84	345.59	749.43	66.03	70.42
		23.83			3423.27	547.08	9054.45	321885.72	429.46	342.33	771.79	70.78	75.18
30"	762.0	5S	A	4409.62	150.75	2824.24	107603.49	118.34	440.96	559.30	13.25	17.20	
	6.35			4391.04	169.32	3165.71	120613.57	132.92	439.10	572.02	15.40	19.35	
	7.14			4372.74	187.63	3500.74	133378.32	147.29	437.27	584.56	17.52	21.48	
	10,10S	7.92	0,B	E	4353.54	206.83	3850.70	146711.62	162.36	435.35	597.71	19.76	23.72
		8.74			4335.08	225.28	4185.67	159474.05	176.85	433.51	610.36	21.91	25.89
		9.53			4316.90	243.47	4514.31	171995.29	191.12	431.69	622.81	24.05	28.03
		10.31			4297.82	262.55	4857.58	185073.71	206.10	429.78	635.88	26.29	30.28
		11.13			4279.71	280.66	5181.99	197433.69	220.32	427.97	648.29	28.43	32.42
		11.91			4261.41	298.96	5508.46	209872.51	234.68	426.14	660.82	30.60	34.60
		12.70			4225.16	335.21	6151.08	234356.19	263.14	422.52	685.66	34.93	38.93
		14.27			4188.14	372.23	6801.55	259139.20	292.20	418.81	711.01	39.37	43.39
		15.88			4151.51	408.85	7439.52	283445.62	320.95	415.15	736.10	43.80	47.83
		17.48			4115.73	444.64	8057.38	306986.35	349.04	411.57	760.61	48.16	52.21
	20,XS	19.05	30	U	4080.10	480.26	8667.26	330222.73	377.01	408.01	785.02	52.54	56.59
		20.62			4043.73	516.64	9284.46	353737.81	405.56	404.37	809.93	57.04	61.10
		22.23			4007.74	552.62	9889.64	376795.29	433.81	400.77	834.58	61.52	65.60
		23.83			3972.59	587.78	10475.62	399121.24	461.41	397.26	858.67	65.93	70.02
25.40		3937.59			622.78	11053.90	421153.43	488.88	393.76	882.64	70.36	74.46	
26.97		3901.85			658.51	11638.97	443444.57	516.93	390.19	907.12	74.91	79.03	
28.58		3866.50			693.86	12212.51	465296.65	544.68	386.65	931.33	79.45	83.58	
30.18		3831.98			728.39	12767.73	486450.34	571.79	383.20	954.99	83.92	88.06	
31.75													

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Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Sched.	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	7) PEC bar	7) PES bar			
32"	813.0	10 STD 20,XS 30 40	0 E M 1,F Q 2 3 T U V W	5030.32	160.92	3220.00	130892.85	126.32	503.03	629.35	12.41	16.11			
	6.35			5010.48	180.76	3610.03	146747.59	141.90	501.05	642.95	14.43	18.13			
	7.14			4990.92	200.32	3992.86	162309.60	157.25	499.09	656.34	16.42	20.12			
	7.92			4970.41	220.83	4392.90	178571.44	173.35	497.04	670.39	18.51	22.22			
	8.74			4950.68	240.55	4775.98	194143.51	188.83	495.07	683.90	20.53	24.25			
	9.53			4931.25	259.99	5151.97	209427.52	204.09	493.12	697.22	22.53	26.25			
	10.31			4910.86	280.38	5544.85	225398.29	220.10	491.09	711.19	24.63	28.36			
	11.13			4891.50	299.74	5916.31	240498.05	235.29	489.15	724.44	26.63	30.37			
	11.91			4871.93	319.31	6290.29	255700.40	250.65	487.19	737.85	28.67	32.40			
	12.70			4833.16	358.07	7026.87	285642.25	281.09	483.32	764.41	32.71	36.46			
	14.27			4793.57	397.67	7773.08	315975.80	312.17	479.36	791.53	36.87	40.63			
	15.88			4754.38	436.86	8505.58	345751.65	342.94	475.44	818.37	41.02	44.79			
	17.48			4716.08	475.16	9215.60	374614.24	373.00	471.61	844.61	45.10	48.88			
	19.05			4677.94	513.30	9917.05	403128.09	402.94	467.79	870.73	49.19	52.98			
	20.62			4638.98	552.25	10627.53	432009.18	433.52	463.90	897.42	53.39	57.20			
	22.23			4600.43	590.81	11324.81	460353.50	463.78	460.04	923.83	57.59	61.40			
	23.83			4562.76	628.48	12000.56	487822.90	493.35	456.28	949.63	61.71	65.53			
	25.40			4525.24	665.99	12668.02	514954.89	522.80	452.52	975.33	65.85	69.68			
	26.97			4486.93	704.30	13343.93	542430.65	552.88	448.69	1001.57	70.10	73.95			
	28.58			4449.02	742.22	14007.14	569390.06	582.64	444.90	1027.54	74.34	78.20			
	30.18			4411.98	779.26	14649.74	595511.84	611.72	441.20	1052.92	78.51	82.38			
	31.75														
	34"			864.0	10 STD 20,XS 30 40	0 E M 1,F Q 2 3 T U V W	5691.87	171.09	3641.70	157321.36	134.31	569.19	703.50	11.68	15.16
				6.35			5670.76	192.20	4083.51	176407.83	150.88	567.08	717.95	13.57	17.05
7.14		5649.96	213.00	4517.33			195148.53	167.21	565.00	732.20	15.44	18.93			
7.92		5628.13	234.83	4970.81			214739.11	184.34	562.81	747.16	17.41	20.90			
8.74		5607.14	255.82	5405.22			233505.58	200.82	560.71	761.54	19.31	22.81			
9.53		5586.46	276.51	5831.75			251931.50	217.06	558.65	775.71	21.19	24.69			
10.31		5564.75	298.21	6277.60			271192.40	234.10	556.48	790.57	23.17	26.67			
11.13		5544.14	318.82	6699.30			289409.57	250.27	554.41	804.69	25.05	28.56			
11.91		5523.31	339.65	7124.01			307757.15	266.63	552.33	818.96	26.96	30.47			
12.70		5482.03	380.94	7960.96			343913.46	299.04	548.20	847.24	30.76	34.28			
14.27		5439.85	423.11	8809.49			380569.98	332.14	543.99	876.13	34.67	38.20			
15.88		5398.10	464.87	9643.05			416579.72	364.92	539.81	904.73	38.56	42.11			
17.48		5357.29	505.68	10451.65			451511.27	396.96	535.73	932.69	42.40	45.95			
19.05		5316.63	546.34	11251.08			486046.67	428.88	531.66	960.54	46.24	49.80			
20.62		5275.09	587.87	12061.43			521053.67	461.48	527.51	988.99	50.19	53.76			
22.23		5233.98	628.99	12857.33			555436.84	493.75	523.40	1017.15	54.12	57.70			
23.83		5193.79	669.17	13629.27			588784.56	525.30	519.38	1044.68	58.00	61.58			
25.40		5153.76	709.21	14392.32			621748.22	556.73	515.38	1072.10	61.88	65.48			
26.97		5112.87	750.10	15165.65			655155.95	588.83	511.29	1100.11	65.87	69.48			
28.58		5072.39	790.57	15925.05			687962.28	620.60	507.24	1127.84	69.85	73.46			
30.18		5032.83	830.13	16661.45			719774.80	651.65	503.28	1154.94	73.76	77.39			
31.75															
36"		914.0	10 STD 20,XS 30 40	0 E M 1,F Q 2 S 3 U V W			6380.12	181.07	4080.32	186470.49	142.14	638.01	780.15	11.04	14.32
		6.35					6357.77	203.42	4576.04	209124.91	159.68	635.78	795.46	12.83	16.12
	7.14	6335.74			225.45	5062.93	231375.77	176.97	633.57	810.55	14.59	17.89			
	7.92	6312.62			248.56	5572.06	254643.03	195.12	631.26	826.38	16.45	19.75			
	8.74	6290.39			270.79	6059.93	276938.60	212.57	629.04	841.61	18.25	21.55			
	9.53	6268.48			292.70	6539.09	298836.41	229.77	626.85	856.62	20.02	23.33			
	10.31	6245.49			315.70	7040.13	321733.82	247.82	624.55	872.37	21.89	25.20			
	11.13	6223.66			337.53	7514.17	343397.36	264.96	622.37	887.33	23.67	26.98			
	11.91	6201.58			359.60	7991.75	365222.85	282.29	620.16	902.45	25.47	28.79			
	12.70	6157.83			403.35	8933.33	408253.29	316.63	615.78	932.42	29.06	32.39			
	14.27	6113.13			448.06	9888.56	451907.18	351.73	611.31	963.04	32.75	36.09			
	15.88	6068.86			492.32	10827.55	494818.96	386.47	606.89	993.36	36.43	39.77			
	17.48	6025.58			535.60	11739.02	536473.06	420.45	602.56	1023.01	40.04	43.40			
	19.05	5982.46			578.73	12640.73	577681.58	454.30	598.25	1052.55	43.67	47.03			
	20.62	5938.39			622.79	13555.37	619480.60	488.89	593.84	1082.73	47.40	50.77			
	22.23	5894.77			666.42	14454.32	660562.49	523.14	589.48	1112.61	51.11	54.49			
	23.83	5852.11			709.07	15326.78	700434.02	556.62	585.21	1141.83	54.76	58.15			
	25.40	5809.62			751.57	16189.78	739872.79	589.98	580.96	1170.94	58.43	61.82			
	26.97	5766.20			794.99	17064.99	779870.24	624.07	576.62	1200.69	62.19	65.59			
	28.58	5723.21			837.98	17925.06	819175.02	657.81	572.32	1230.13	65.94	69.35			
	30.18	5681.18			880.01	18759.64	857315.56	690.80	568.12	1258.92	69.63	73.05			
	31.75														

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Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Sched.	Cd.	Fi cm <sup>2</sup>	FR cm <sup>2</sup>	W cm <sup>3</sup>	JA cm <sup>4</sup>	GR kg/m	GW kg/m	GS kg/m	7) PEC bar	7) PES bar
38"	965.0	STD  XS	H J E L M N F Q R S T U V  W	7075.69	238.14	5651.48	272683.92	186.94	707.57	894.50	13.82	16.94
	7.92			7051.26	262.57	6220.69	300148.08	206.11	705.13	911.24	15.58	18.70
	8.74			7027.76	286.06	6766.28	326472.91	224.56	702.78	927.33	17.28	20.40
	9.53			7004.60	309.22	7302.29	352335.43	242.74	700.46	943.20	18.96	22.09
	10.31			6980.29	333.53	7862.93	379386.39	261.82	698.03	959.85	20.72	23.86
	11.13			6957.21	356.61	8393.52	404987.11	279.94	695.72	975.66	22.41	25.54
	11.91			6933.87	379.95	8928.22	430786.61	298.26	693.39	991.65	24.11	27.25
	12.70			6887.61	426.22	9982.88	481674.09	334.58	688.76	1023.34	27.51	30.66
	14.27			6840.32	473.50	11053.45	533329.14	371.70	684.03	1055.73	31.00	34.16
	15.88			6793.49	520.33	12106.45	584136.38	408.46	679.35	1087.81	34.48	37.64
	17.48			6747.70	566.13	13129.20	633483.79	444.41	674.77	1119.18	37.90	41.07
	19.05			6702.06	611.77	14141.60	682332.23	480.24	670.21	1150.44	41.33	44.51
	20.62			6655.42	658.41	15169.13	731910.55	516.85	665.54	1182.39	44.85	48.04
	22.23			6609.23	704.60	16179.65	780668.19	553.11	660.92	1214.03	48.37	51.56
	23.83			6564.06	749.77	17161.00	828018.20	588.57	656.41	1244.97	51.82	55.02
	25.40			6519.04	794.78	18132.29	874882.81	623.90	651.90	1275.81	55.28	58.49
	26.97			6473.04	840.78	19117.94	922440.81	660.01	647.30	1307.32	58.84	62.05
	28.58			6427.49	886.33	20087.14	969204.73	695.77	642.75	1338.52	62.38	65.60
30.18	6382.95	930.88	21028.23	1014611.97	730.74	638.29	1369.03	65.87	69.10			
31.75												
40"	1016.0	STD  XS  W	H J E L M N F Q R S T U V  W	7856.50	250.82	6272.39	318637.49	196.90	785.65	982.55	13.12	16.08
	7.92			7830.75	276.57	6905.02	350775.12	217.11	783.08	1000.18	14.79	17.76
	8.74			7793.47	313.85	7817.58	397133.06	246.38	779.35	1025.72	17.22	20.19
	9.53			7781.58	325.74	8107.61	411866.61	255.71	778.16	1033.86	18.00	20.97
	10.31			7755.96	351.36	8731.21	443545.29	275.82	775.60	1051.42	19.68	22.65
	11.13			7731.63	375.69	9321.52	473533.46	294.92	773.16	1068.08	21.27	24.25
	11.91			7707.02	400.30	9916.58	503762.26	314.23	770.70	1084.94	22.89	25.87
	12.70			7658.24	449.08	11090.73	563409.31	352.53	765.82	1118.35	26.12	29.10
	14.27			7608.37	498.94	12283.23	623987.94	391.67	760.84	1152.51	29.43	32.42
	15.88			7558.98	548.34	13456.77	683604.15	430.45	755.90	1186.34	32.73	35.73
	17.48			7510.67	596.65	14597.21	741538.22	468.37	751.07	1219.44	35.97	38.98
	19.05			7462.52	644.80	15726.71	798916.91	506.17	746.25	1252.42	39.23	42.24
	20.62			7413.29	694.03	16873.71	857184.40	544.81	741.33	1286.14	42.57	45.59
	22.23			7364.54	742.78	18002.34	914518.85	583.08	736.45	1319.54	45.90	48.93
	23.83			7316.86	790.46	19098.99	970228.46	620.51	731.69	1352.20	49.17	52.21
	25.40			7269.33	837.99	20184.98	1025397.02	657.82	726.93	1384.76	52.45	55.49
	26.97			7220.75	886.57	21287.66	1081412.91	695.96	722.07	1418.03	55.83	58.87
	28.58			7172.63	934.69	22372.53	1136524.59	733.73	717.26	1450.99	59.19	62.24
30.18	7125.57	981.75	23426.52	1190067.43	770.67	712.56	1483.23	62.49	65.55			
31.75												
42"	1067.0	STD  XS  W	J E L M N F Q R S T U V  W	8651.10	290.57	7625.07	406797.32	228.10	865.11	1093.21	14.08	16.90
	8.74			8611.91	329.76	8634.24	460636.87	258.86	861.19	1120.06	16.39	19.22
	9.53			8599.41	342.26	8955.06	477752.19	268.67	859.94	1128.62	17.13	19.96
	10.31			8572.48	369.19	9644.96	514558.38	289.82	857.25	1147.07	18.73	21.56
	11.13			8546.90	394.78	10298.19	549408.66	309.90	854.69	1164.59	20.25	23.08
	11.91			8521.02	420.65	10956.83	584546.74	330.21	852.10	1182.31	21.79	24.63
	12.70			8469.73	471.94	12256.89	653904.99	370.48	846.97	1217.45	24.86	27.70
	14.27			8417.28	524.39	13577.88	724379.91	411.64	841.73	1253.37	28.01	30.86
	15.88			8365.33	576.34	14878.51	793768.62	452.43	836.53	1288.96	31.15	34.00
	17.48			8314.50	627.17	16143.05	861231.77	492.33	831.45	1323.78	34.24	37.09
	19.05			8263.83	677.84	17396.07	928080.08	532.11	826.38	1358.49	37.33	40.19
	20.62			8212.03	729.64	18669.11	995996.94	572.77	821.20	1393.97	40.51	43.38
	22.23			8160.71	780.96	19922.39	1062859.28	613.05	816.07	1429.13	43.67	46.55
	23.83			8110.51	831.16	21140.74	1127858.70	652.46	811.05	1463.51	46.79	49.67
	25.40			8060.47	881.20	22347.86	1192258.38	691.75	806.05	1497.79	49.90	52.79
	26.97			8009.31	932.36	23574.13	1257679.82	731.91	800.93	1532.84	53.11	56.01
	28.58			7958.63	983.04	24781.22	1322077.87	771.69	795.86	1567.55	56.30	59.21
	30.18			7909.06	1032.62	25954.53	1384674.30	810.60	790.91	1601.51	59.44	62.35
31.75												

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Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Sched.	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	PEC <sup>7)</sup> bar	PES <sup>7)</sup> bar
44"	1118.0	STD	J	9512.30	304.58	8380.82	468487.85	239.09	951.23	1190.32	13.44	16.13
	8.74		E	9485.01	331.87	9118.95	509749.39	260.52	948.50	1209.02	14.90	17.59
	9.53		L	9458.10	358.78	9844.62	550314.40	281.64	945.81	1227.45	16.35	19.04
	10.31		M	9429.85	387.03	10604.18	592773.54	303.82	942.99	1246.80	17.87	20.57
	11.13		N	9403.02	413.86	11323.52	632984.97	324.88	940.30	1265.18	19.32	22.02
	11.91		F	9375.89	441.00	12048.96	673536.99	346.18	937.59	1283.77	20.79	23.49
	XS	12.70	Q	9322.07	494.81	13481.34	753607.11	388.42	932.21	1320.63	23.71	26.42
		14.27	R	9267.05	549.83	14937.41	835001.37	431.62	926.70	1358.32	26.72	29.44
		15.88	S	9212.53	604.35	16371.67	915176.13	474.42	921.25	1395.67	29.71	32.43
		17.48	T	9159.19	657.69	17766.72	993159.84	516.29	915.92	1432.21	32.66	35.38
		19.05	U	9106.00	710.88	19149.66	1070466.25	558.04	910.60	1468.64	35.60	38.34
		20.62	V	9051.62	765.26	20555.33	1149042.97	600.73	905.16	1505.89	38.63	41.37
		22.23	W	8997.74	819.14	21939.79	1226434.30	643.03	899.77	1542.80	41.65	44.39
		23.83		8945.02	871.86	23286.28	1301702.79	684.41	894.50	1578.91	44.62	47.37
		25.40		8892.46	924.42	24620.93	1376309.83	725.67	889.25	1614.91	47.59	50.34
		26.97		8838.73	978.15	25977.37	1452134.80	767.85	883.87	1651.72	50.65	53.40
		28.58		8785.48	1031.40	27313.20	1526807.87	809.65	878.55	1688.20	53.69	56.45
		30.18		8733.39	1083.49	28612.25	1599424.92	850.54	873.34	1723.88	56.68	59.45
31.75												
46"	1168.0	STD	J	10396.29	318.30	9156.42	534734.93	249.87	1039.63	1289.50	12.86	15.43
	8.74		E	10367.75	346.84	9963.77	581884.18	272.27	1036.78	1309.04	14.26	16.84
	9.53		L	10339.62	374.97	10757.64	628246.16	294.35	1033.96	1328.32	15.64	18.22
	10.31		M	10310.08	404.51	11588.74	676782.19	317.54	1031.01	1348.55	17.10	19.68
	11.13		N	10282.02	432.57	12375.99	722757.61	339.57	1028.20	1367.77	18.49	21.07
	11.91		F	10253.65	460.94	13170.05	769131.16	361.84	1025.36	1387.21	19.89	22.48
	XS	12.70	Q	10197.37	517.22	14738.39	860721.89	406.02	1019.74	1425.76	22.69	25.28
		14.27	R	10139.81	574.78	16333.27	953863.06	451.20	1013.98	1465.18	25.57	28.16
		15.88	S	10082.78	631.81	17904.87	1045644.53	495.97	1008.28	1504.25	28.43	31.03
		17.48	T	10026.97	687.62	19434.12	1134952.35	539.78	1002.70	1542.48	31.24	33.85
		19.05	U	9971.32	743.27	20950.66	1223518.71	583.47	997.13	1580.60	34.06	36.67
		20.62	V	9914.41	800.18	22492.74	1313575.80	628.14	991.44	1619.58	36.96	39.58
		22.23	W	9858.02	856.57	24012.15	1402309.72	672.41	985.80	1658.21	39.84	42.47
		23.83		9802.84	911.75	25490.48	1488643.91	715.73	980.28	1696.01	42.68	45.31
		25.40		9747.81	966.78	26956.39	1574253.21	758.92	974.78	1733.70	45.52	48.15
		26.97		9691.54	1023.05	28446.83	1661295.07	803.09	969.15	1772.25	48.44	51.08
		28.58		9635.79	1078.80	29915.23	1747049.66	846.86	963.58	1810.44	51.35	53.99
		30.18		9581.23	1133.36	31343.78	1830476.97	889.69	958.12	1847.81	54.21	56.85
31.75												
48"	1219.0	STD	J	11338.40	332.31	9982.89	608457.16	260.86	1133.84	1394.70	12.32	14.78
	8.74		E	11308.60	362.11	10864.04	662163.21	284.25	1130.86	1415.11	13.66	16.13
	9.53		L	11279.22	391.49	11730.63	714981.72	307.32	1127.92	1435.24	14.99	17.46
	10.31		M	11248.37	422.34	12638.01	770286.89	331.54	1124.84	1456.38	16.38	18.85
	11.13		N	11219.06	451.65	13497.68	822683.68	354.54	1121.91	1476.45	17.71	20.18
	11.91		F	11189.42	481.29	14364.95	875543.49	377.81	1118.94	1496.76	19.06	21.53
	XS	12.70	Q	11130.62	540.09	16078.30	979972.67	423.97	1113.06	1537.03	21.74	24.22
		14.27	R	11070.49	600.22	17821.29	1086207.70	471.17	1107.05	1578.22	24.49	26.97
		15.88	S	11010.90	659.82	19539.46	1190930.00	517.95	1101.09	1619.04	27.23	29.72
		17.48	T	10952.57	718.14	21211.92	1292866.73	563.74	1095.26	1659.00	29.92	32.42
		19.05	U	10894.40	776.31	22871.10	1393993.55	609.40	1089.44	1698.84	32.62	35.12
		20.62	V	10834.91	835.80	24558.82	1496860.23	656.10	1083.49	1739.59	35.40	37.90
		22.23	W	10775.96	894.75	26222.37	1598253.25	702.38	1077.60	1779.98	38.16	40.67
		23.83		10718.26	952.45	27841.52	1696940.66	747.67	1071.83	1819.50	40.87	43.38
		25.40		10660.72	1009.99	29447.67	1794835.49	792.84	1066.07	1858.92	43.59	46.11
		26.97		10601.87	1068.84	31081.31	1894405.78	839.04	1060.19	1899.23	46.38	48.91
		28.58		10543.55	1127.16	32691.40	1992540.84	884.82	1054.36	1939.18	49.16	51.69
		30.18		10486.48	1184.23	34258.39	2088048.73	929.62	1048.65	1978.27	51.90	54.43
31.75												

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Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Sched.	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	<sup>7)</sup> PEC bar	<sup>7)</sup> PES bar
52"	1321.0											
	9.53		K	13312.87	392.65	12781.39	844210.60	308.23	1331.29	1639.51	12.60	14.88
	10.31		L	13280.99	424.53	13802.97	911686.20	333.26	1328.10	1661.36	13.82	16.10
	11.13		M	13247.51	458.01	14872.99	982360.73	359.54	1324.75	1684.29	15.11	17.39
	11.91		N	13215.71	489.81	15887.05	1049339.71	384.50	1321.57	1706.07	16.33	18.62
	12.70		P	13183.53	521.99	16910.39	1116931.54	409.76	1318.35	1728.11	17.58	19.86
	14.27		Q	13119.71	585.81	18933.04	1250527.46	459.86	1311.97	1771.83	20.05	22.33
	15.88		R	13054.42	651.10	20991.97	1386519.59	511.12	1305.44	1816.56	22.58	24.87
	17.48		S	12989.69	715.83	23022.88	1520661.32	561.93	1298.97	1860.89	25.11	27.40
	19.05		T	12926.34	779.18	25001.03	1651318.14	611.66	1292.63	1904.29	27.59	29.89
	20.62		U	12863.14	842.38	26964.71	1781019.10	661.27	1286.31	1947.58	30.08	32.38
	22.23		V	12798.49	907.03	28963.46	1913036.73	712.02	1279.85	1991.87	32.63	34.94
	23.83			12734.40	971.12	30934.87	2043248.36	762.33	1273.44	2035.77	35.17	37.49
	25.40		W	12671.68	1033.84	32854.93	2170067.83	811.57	1267.17	2078.73	37.67	39.99
	26.97			12609.10	1096.42	34760.79	2295950.26	860.69	1260.91	2121.60	40.18	42.50
	28.58			12545.10	1160.42	36700.55	2424071.59	910.93	1254.51	2165.44	42.75	45.07
	30.18			12481.65	1223.87	38613.64	2550430.65	960.74	1248.17	2208.90	45.31	47.64
	31.75			12419.55	1285.97	40476.74	2673488.65	1009.49	1241.96	2251.44	47.83	50.16
	56"	1422.0										
9.53			K	15458.53	422.88	14833.40	1054654.61	331.96	1545.85	1877.82	11.70	13.82
10.31			L	15424.17	457.24	16021.02	1139094.43	358.94	1542.42	1901.35	12.84	14.95
11.13			M	15388.09	493.32	17265.27	1227560.97	387.26	1538.81	1926.07	14.03	16.15
11.91			N	15353.81	527.60	18444.78	1311424.00	414.17	1535.38	1949.55	15.17	17.29
12.70			P	15319.12	562.29	19635.39	1396076.54	441.39	1531.91	1973.31	16.32	18.44
14.27			Q	15250.32	631.09	21989.58	1563459.30	495.41	1525.03	2020.44	18.61	20.74
15.88			R	15179.92	701.49	24387.28	1733935.46	550.67	1517.99	2068.66	20.97	23.09
17.48			S	15110.12	771.29	26753.63	1902183.28	605.46	1511.01	2116.48	23.31	25.44
19.05			T	15041.78	839.63	29059.75	2066148.40	659.11	1504.18	2163.29	25.61	27.75
20.62			U	14973.60	907.81	31350.23	2229001.23	712.63	1497.36	2209.99	27.92	30.06
22.23			V	14903.84	977.57	33682.89	2394853.29	767.39	1490.38	2257.77	30.29	32.43
23.83				14834.68	1046.73	35984.91	2558527.00	821.68	1483.47	2305.15	32.65	34.79
25.40			W	14766.97	1114.44	38228.19	2718024.35	874.83	1476.70	2351.53	34.97	37.11
26.97				14699.42	1181.99	40456.11	2876429.71	927.86	1469.94	2397.81	37.29	39.44
28.58				14630.30	1251.11	42724.92	3037742.05	982.12	1463.03	2445.15	39.67	41.82
30.18				14561.78	1319.63	44963.79	3196925.33	1035.91	1456.18	2492.09	42.05	44.20
31.75				14494.70	1386.71	47145.38	3352036.79	1088.57	1449.47	2538.04	44.38	46.54
60"		1524.0										
	9.53		K	17788.05	453.42	17060.71	1300025.91	355.94	1778.80	2134.74	10.92	12.89
	10.31		L	17751.19	490.28	18428.69	1404266.46	384.87	1775.12	2159.99	11.97	13.95
	11.13		M	17712.48	528.99	19862.25	1513503.35	415.26	1771.25	2186.50	13.09	15.06
	11.91		N	17675.70	565.77	21221.52	1617080.03	444.13	1767.57	2211.70	14.15	16.12
	12.70		P	17638.49	602.98	22593.91	1721655.76	473.34	1763.85	2237.19	15.22	17.20
	14.27		Q	17564.65	676.82	25308.45	1928503.86	531.30	1756.46	2287.77	17.36	19.34
	15.88		R	17489.09	752.38	28074.45	2139273.10	590.62	1748.91	2339.53	19.55	21.54
	17.48		S	17414.16	827.31	30805.59	2347385.85	649.44	1741.42	2390.85	21.74	23.72
	19.05		T	17340.80	900.67	33468.46	2550296.42	707.03	1734.08	2441.11	23.89	25.87
	20.62		U	17267.59	973.88	36114.50	2751924.69	764.50	1726.76	2491.26	26.04	28.03
	22.23		V	17192.67	1048.80	38810.55	2957363.93	823.31	1719.27	2542.58	28.24	30.24
	23.83			17118.38	1123.09	41472.48	3160202.62	881.63	1711.84	2593.46	30.44	32.44
	25.40		W	17045.64	1195.83	44067.72	3357960.09	938.73	1704.56	2643.29	32.60	34.60
	26.97			16973.05	1268.41	46646.42	3554457.10	995.71	1697.31	2693.01	34.76	36.76
	28.58			16898.78	1342.69	49273.71	3754656.96	1054.01	1689.88	2743.89	36.98	38.99
	30.18			16825.13	1416.34	51867.60	3952311.45	1111.83	1682.51	2794.34	39.19	41.20
	31.75			16753.02	1488.45	54396.38	4145003.83	1168.44	1675.30	2843.74	41.37	43.38

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Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Sched.	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	7) PEC bar	7) PES bar										
64"	1626.0																					
	9.53												K	20280.99	483.96	19443.76	1580777.80	379.91	2028.10	2408.01	10.23	12.07
	10.31												L	20241.63	523.32	21004.86	1707695.15	410.81	2024.16	2434.97	11.22	13.07
	11.13												M	20200.30	564.65	22641.12	1840722.75	443.25	2020.03	2463.28	12.26	14.11
	11.91												N	20161.02	603.93	24192.90	1966883.03	474.09	2016.10	2490.19	13.26	15.11
	12.70												P	20121.28	643.68	25759.97	2094285.67	505.29	2012.13	2517.41	14.26	16.11
	14.27												Q	20042.41	722.55	28860.52	2346360.68	567.20	2004.24	2571.44	16.26	18.12
	15.88												R	19961.69	803.26	32021.14	2603318.83	630.56	1996.17	2626.73	18.32	20.18
	17.48												S	19881.63	883.32	35143.21	2857143.11	693.41	1988.16	2681.57	20.37	22.22
	19.05												T	19803.24	961.72	38188.49	3104723.92	754.95	1980.32	2735.27	22.38	24.24
	20.62												U	19724.99	1039.96	41215.75	3350840.33	816.37	1972.50	2788.87	24.39	26.25
	22.23												V	19644.92	1120.03	44301.51	3601712.45	879.23	1964.49	2843.72	26.46	28.32
	23.83												W	19565.50	1199.45	47349.48	3849512.91	941.57	1956.55	2898.12	28.51	30.38
	25.40													19487.73	1277.22	50322.34	4091206.43	1002.62	1948.77	2951.39	30.53	32.40
	26.97													19410.12	1354.84	53277.48	4331458.89	1063.55	1941.01	3004.56	32.56	34.43
	28.58													19330.68	1434.27	56289.57	4576341.85	1125.90	1933.07	3058.97	34.64	36.51
	30.18													19251.90	1513.05	59264.63	4818214.54	1187.74	1925.19	3112.93	36.70	38.58
31.75	19174.76	1590.19	62166.23	5054114.87	1248.30	1917.48	3165.78	38.74	40.62													
68"	1727.0																					
	11.91												N	22783.00	641.72	27326.94	2359681.21	503.75	2278.30	2782.05	12.48	14.22
	12.70												P	22740.75	683.98	29099.50	2512742.10	536.92	2274.08	2811.00	13.42	15.17
	14.27												Q	22656.90	767.83	32607.57	2815663.30	602.74	2265.69	2868.43	15.31	17.05
	15.88												R	22571.08	853.65	36184.86	3124562.31	670.12	2257.11	2927.22	17.24	18.99
	17.48												S	22485.94	938.78	39719.79	3429803.79	736.95	2248.59	2985.54	19.17	20.91
	19.05												T	22402.57	1022.16	43169.00	3727643.31	802.40	2240.26	3042.65	21.06	22.81
	20.62												U	22319.34	1105.39	46599.03	4023826.22	867.73	2231.93	3099.66	22.95	24.70
	22.23												V	22234.16	1190.57	50096.60	4325841.19	934.60	2223.42	3158.01	24.90	26.65
	23.83												W	22149.66	1275.06	53552.60	4624267.35	1000.93	2214.97	3215.89	26.83	28.59
	25.40													22066.91	1357.82	56924.66	4915444.44	1065.89	2206.69	3272.58	28.73	30.49
	26.97													21984.31	1440.41	60277.82	5204989.74	1130.73	2198.43	3329.16	30.63	32.40
	28.58													21899.77	1524.96	63696.86	5500223.71	1197.09	2189.98	3387.07	32.59	34.35
	30.18													21815.92	1608.81	67075.12	5791936.76	1262.92	2181.59	3444.51	34.53	36.30
	31.75													21733.79	1690.94	70371.18	6076551.52	1327.39	2173.38	3500.76	36.44	38.21
	72"												1829.0									
9.53		K	25728.72	544.74	24649.93	2254236.09	427.62	2572.87	3000.49	-	10.73											
10.31		L	25684.39	589.07	26633.29	2435614.46	462.42	2568.44	3030.86	-	11.61											
11.13		M	25637.83	635.64	28712.84	2625788.84	498.97	2567.38	3062.76	-	12.54											
11.91		N	25593.57	679.89	30685.69	2806206.46	533.71	2559.36	3093.07	-	13.42											
12.70		P	25548.79	724.67	32678.63	2988460.97	568.87	2554.88	3123.75	12.67	14.32											
14.27		Q	25459.91	813.55	36623.77	3349243.85	638.64	2545.99	3184.63	14.45	16.10											
15.88		R	25368.92	904.54	40648.04	3717263.46	710.06	2536.89	3246.95	16.28	17.92											
17.48		S	25278.66	994.80	44625.95	4081042.79	780.92	2527.87	3308.78	18.09	19.74											
19.05		T	25190.25	1083.21	48508.63	4436114.09	850.32	2519.03	3369.34	19.88	21.53											
20.62		U	25102.00	1171.46	52370.94	4789322.63	919.60	2510.20	3429.80	21.66	23.31											
22.23		V	25011.66	1261.80	56310.58	5149602.42	990.52	2501.17	3491.68	23.50	25.15											
23.83		W	24922.04	1351.43	60204.68	5505717.53	1060.87	2492.20	3553.07	25.32	26.98											
25.40			24834.25	1439.21	64005.41	5853294.92	1129.78	2483.43	3613.20	27.11	28.77											
26.97			24746.62	1526.84	67786.07	6199035.90	1198.57	2474.66	3673.23	28.91	30.57											
28.58			24656.92	1616.54	71642.27	6551685.15	1268.98	2465.69	3734.67	30.75	32.41											
30.18			24567.94	1705.52	75453.74	6900244.45	1338.83	2456.79	3795.63	32.59	34.25											
31.75	24480.78		1792.68	79173.69	7240434.13	1407.25	2448.08	3855.33	34.39	36.05												
76"	1930.0																					
	12.70												P	28490.33	764.97	36427.18	3515222.98	600.50	2849.03	3449.53	12.01	13.56
	14.27												Q	28396.46	858.83	40830.39	3940132.77	674.18	2839.65	3513.83	13.69	15.25
	15.88												R	28300.37	954.93	45323.19	4373687.58	749.62	2830.04	3579.65	15.42	16.98
	17.48												S	28205.04	1050.26	49765.48	4802369.23	824.45	2820.50	3644.96	17.14	18.70
	19.05												T	28111.64	1143.65	54102.67	5220907.45	897.77	2811.16	3708.93	18.83	20.39
	20.62												U	28018.41	1236.89	58418.31	5637366.90	970.96	2801.84	3772.80	20.52	22.09
	22.23												V	27922.96	1332.34	62821.61	6062285.11	1045.89	2792.30	3838.18	22.26	23.82
	23.83												W	27828.26	1427.04	67175.26	6482412.87	1120.22	2782.83	3903.05	23.98	25.55
	25.40													27735.49	1519.80	71425.76	6892585.72	1193.05	2773.55	3966.59	25.68	27.25
	26.97													27642.88	1612.41	75655.00	7300707.61	1265.74	2764.29	4030.03	27.38	28.95
	28.58													27548.07	1707.22	79970.00	7717104.68	1340.17	2754.81	4094.98	29.13	30.70
	30.18													27454.01	1801.28	84236.20	8128793.11	1414.01	2745.40	4159.41	30.86	32.44
31.75	27361.88	1893.42	88401.17	8530712.80	1486.33	2736.19	4222.52	32.57	34.15													

Footnotes see page 2

Pipes acc. to ASME B36.10 / ASME B36.19 9)

DN	DA WD mm	Sched.	Cd.	Fi cm2	FR cm2	W cm3	JA cm4	GR kg/m	GW kg/m	GS kg/m	7) PEC bar	7) PES bar
80"	2032.0											
	9.53		K	31823.76	605.51	30472.98	3096055.19	475.33	3182.38	3657.71	-	9.65
	10.31		L	31774.46	654.82	32929.10	3345596.29	514.04	3177.45	3691.48	-	10.45
	11.13		M	31722.66	706.62	35505.01	3607309.07	554.69	3172.27	3726.96	-	11.28
	11.91		N	31673.43	755.84	37949.42	3855661.50	593.34	3167.34	3760.68	-	12.08
	12.70		P	31623.61	805.66	40419.38	4106608.68	632.45	3162.36	3794.81	-	12.88
	14.27		Q	31524.72	904.56	45310.73	4603569.82	710.08	3152.47	3862.55	13.00	14.48
	15.88		R	31423.47	1005.81	50302.87	5110771.45	789.56	3142.35	3931.91	14.64	16.12
	17.48		S	31323.00	1106.27	55240.18	5612401.88	868.43	3132.30	4000.73	16.27	17.76
	19.05		T	31224.58	1204.70	60061.89	6102288.31	945.69	3122.46	4068.15	17.88	19.36
	20.62		U	31126.31	1302.96	64860.88	6589865.79	1022.83	3112.63	4135.46	19.48	20.97
	22.23		V	31025.70	1403.58	69758.61	7087475.27	1101.81	3102.57	4204.38	21.13	22.62
	23.83			30925.88	1503.40	74602.40	7579603.77	1180.17	3092.59	4272.76	22.77	24.26
	25.40		W	30828.08	1601.20	79332.64	8060196.09	1256.94	3082.81	4339.75	24.38	25.87
	26.97			30730.44	1698.84	84040.44	8538508.77	1333.59	3073.04	4406.63	25.99	27.49
	28.58			30630.47	1798.81	88844.96	9026647.82	1412.06	3063.05	4475.11	27.65	29.14
	30.18			30531.29	1897.99	93596.41	9509395.15	1489.92	3053.13	4543.05	29.30	30.79
	31.75			30434.12	1995.16	98236.34	9980811.66	1566.20	3043.41	4609.61	30.92	32.41

Footnotes see page 2

**Tubes**  
acc. to SAE J1065

Standard

**H 170 A**

Page 1 of 4

Example of Designation: Designation of a seamless tube with outside diameter 3/4" (19,05 mm) (=tube dash size -12) and wall thickness 0,095" (2,41 mm), manufacturing length, plain ends, material: A213 Gr. TP304L

Part number **17012YD02** -12/19,05x2,41 **Tube seamless manufact. length / plain H170A / SAE J1065 A213 Gr.TP304L annealed**

Part numbering Code											
Position of Part No.											
1. - 2.		3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Surface finish 3)		End-preparation 4)		Material 1)		Wallthick-ness		Certificate 6)	
	Cd.		Cd.		Cd.		Cd.	Cd.	Cd.		Cd.
Tubes seamless	17	annealed	0	manufacturing length plain ends	1	A179	1L	2)	0	ASME	2
						SAE Gr.1010	1M			SAE	
		Light-drawn 5) (H55)	3			A213 Gr.TP316	2W			ASME	H
						A213 Gr.TP304	2X			SAE	
						A213 Gr.TP304L	2Y				
						A213 Gr.TP316L	2Z				
						ASTM B 75	8X				
						UNS-No. C10200					
						SAE J524	E1				
						SAE J525	E2				
		phosphated and oiled	A								

- 1) Material code acc.to Std. H0005  
Materials acc.to ASTM- or SAE- Specifications  
SAE Gr.1010 acc. to SAE J403  
ASTM B75: UNS-No. C10200 (oxygen free copper), Temper Light-drawn (= H55)
- 2) Wall thicknesses acc.to SAE J1065 and manufacturer's standard.  
Wall thickness code see tables on page 2 to 4
- 3) Code for surface finish
- 4) Code for end preparation
- 5) For copper tubes UNS-No. C10200 only.
- 6) Certificate and requirements acc.to SAE J1065 and material specifications.  
For tubes with end coding H a "certified test report" shall be provided.
- a) Triple pressure values listed opposite numbers 1,2 and 3 of each tube OD were derived from the Barlow, Boardman and Lamé formulas, respectively with 12500 psi allowable stress factor for material SAE J524, J525 or J356. Single pressure values listed opposite number 2 are derived from Parker Catalogue 4300, page 15 (Steel SAE1010) respectively Graph A, page 9 by using a design factor of 4:1.

**Reference working pressures at approximately 4 : 1 design factor, psi**

Tube Dash Size	Nominal Tube Outside diameter inch	Nominal Tube Outside diameter inch mm	See Note a)	Nominal Tube Wall Thickness $\frac{\text{inch}}{\text{mm}}$											
				0,01	0,02	0,025	0,028	0,032	0,035	0,042	0,049	0,058			
				0,25	0,51	0,64	0,71	0,81	0,89	1,07	1,24	1,47			
				Wall thickness code											
				1	2	3	4	5	6	7	8	9			
<b>-2</b>	1/8	0,125	1	1750	4500		5600		7000	see Note on page 3					
		3,18	2				6800		9000						
			3				6650		8450						
<b>-3</b>	3/16	0,188	1	1250	2875		3750		4650						
		4,78	2				4250		5500						
			3				4250		5450						
<b>-4</b>	1/4	0,250	1		2000		2800		3500		4900	6800			
		6,35	2				3100		3950		5800				
			3				3100		3950		5750				
<b>-5</b>	5/16	0,312	1				2250		2800		3900	5170			
		7,92	2				2400		3100		4500				
			3				2450		3100		4500				
<b>-6</b>	3/8	0,375	1				1850		2350		3250	4300			
		9,53	2				2000		2500		3650				
			3				2000		2550		3650				
<b>-8</b>	1/2	0,500	1						1750		2450	3000			
		12,7	2						1850		2650		2700		
			3						1850		2700		2700		
<b>-10</b>	5/8	0,625	1						1400		1950	2400			
		15,88	2						1450		2100		2100		
			3						1500		2100		2100		
<b>-12</b>	3/4	0,750	1						1150		1650	2000			
		19,05	2						1200		1700		1750		
			3						1200		1700		1750		
<b>-14</b>	7/8	0,875	1						1000		1400				
		22,23	2						1050		1450		1500		
			3						1050		1450		1500		
<b>-16</b>	1	1,000	1						875		1200	1450			
		25,4	2						900		1250		1300		
			3						900		1250		1300		
<b>-18</b>	1 1/8	1,125	1								1100				
		28,58	2								1150		1150	1150	
			3								1150		1150	1150	
<b>-20</b>	1 1/4	1,250	1								1000	1200			
		31,75	2								1000		1000	1000	
			3								1000		1000	1000	
<b>-24</b>	1 1/2	1,500	1												
		38,1	2												
			3												
<b>-28</b>	1 3/4	1,750	1												
		44,45	2												
			3												
<b>-32</b>	2	2,000	1												
		50,8	2												
			3												
<b>-36</b>	2 1/4	2,250	1												
		57,15	2												
			3												

Footnotes see page 1

Reference working pressures at approximately 4 : 1 design factor, psi

Tube Dash Size	Nominal Tube Outside diameter inch	Nominal Tube Outside diameter inch mm	See Note a)	Nominal Tube Wall Thickness $\frac{\text{inch}}{\text{mm}}$									
				0,065	0,072	0,083	0,095	0,109	0,120	0,134	0,148	0,156	
				1,65	1,83	2,11	2,41	2,77	3,05	3,40	3,76	3,96	
				Wall thickness code									
				A	B	C	D	E	F	G	H	J	
<b>-2</b>	1/8	0,125	1										
		3,18	2										
			3										
<b>-3</b>	3/16	0,188	1										
		4,78	2										
			3										
<b>-4</b>	1/4	0,250	1	6500									
		6,35	2	8200									
			3	7800									
<b>-5</b>	5/16	0,312	1	5200									
		7,92	2	6250	6800								
			3	6150									
<b>-6</b>	3/8	0,375	1	4350									
		9,53	2	5050	5500	5550	6350						
			3	5000		6550	7600						
<b>-8</b>	1/2	0,500	1	3250									
		12,7	2	3650	3850	4150	4750	5450	6000				
			3	3650		4800	5550	6450	7200				
<b>-10</b>	5/8	0,625	1	2600									
		15,88	2	2850	3000	3300	3800	4350	4800				
			3	2850		3750	4350	5050	5600				
<b>-12</b>	3/4	0,750	1	2150									
		19,05	2	2350	2450	2750	3150	3650	4000				
			3	2350		3050	3550	4150	4600				
<b>-14</b>	7/8	0,875	1	1850									
		22,23	2	1950	2050	2350	2700	3100	3400				
			3	2000		2600	3000	3500	3900				
<b>-16</b>	1	1,000	1	1600									
		25,4	2	1700	1800	2050	2350	2700	3000	3350	3700		
			3	1750		2250	2600	3000	3350	3800	4200		
<b>-18</b>	1 1/8	1,125	1	1450									
		28,58	2	1500		1850	2100	2400	2650	3000	3300		
			3	1550		2000	2300	2650	2950	3300	3700		
<b>-20</b>	1 1/4	1,250	1	1300									
		31,75	2	1350	1450	1650	1900	2200	2400	2700	2950	3100	
			3	1350		1750	2050	2350	2650	2950	3300	3500	
<b>-24</b>	1 1/2	1,500	1	1100									
		38,1	2	1100	1230	1400	1600	1800	2000	2250	2450	2600	
			3	1150		1450	1700	1950	2150	2450	2700	2850	
<b>-28</b>	1 3/4	1,750	1	925									
		44,45	2	950		1200	1350	1550	1700	1900	2100	2250	
			3	950		1250	1450	1650	1850	2050	2250	2400	
<b>-32</b>	2	2,000	1	800									
		50,8	2	850	830	1050	1200	1350	1500	1650	1850	1950	
			3	850		1100	1250	1450	1600	1800	2000	2100	
<b>-36</b>	2 1/4	2,250	1	700									
		57,15	2	750		900	1050	1200	1350	1500	1650	1750	
			3	750		950	1100	1250	1400	1550	1750	1850	

Note:  
Wall thicknesses heaving values shown to right of double line are not normally considered suitable for 37 deg. single flaring to SAE J533.

Footnotes see page 1

**Reference working pressures at approximately 4 : 1 design factor, psi**

Tube Dash Size	Nominal Tube Outside diameter inch	Nominal Tube Outside diameter inch mm	See Note a)	Nominal Tube Wall Thickness								
				inch mm								
				0,165	0,180	0,188	0,203	0,220	0,238	0,250	0,259	
				4,19	4,57	4,78	5,16	5,59	6,05	6,35	6,58	
				Wall thickness code								
				K	L	M	N	P	Q	R	S	
<b>-2</b>	1/8	0,125	1									
		3,18	2									
			3									
<b>-3</b>	3/16	0,188	1									
		4,78	2									
			3									
<b>-4</b>	1/4	0,250	1									
		6,35	2									
			3									
<b>-5</b>	5/16	0,312	1									
		7,92	2									
			3									
<b>-6</b>	3/8	0,375	1									
		9,53	2									
			3									
<b>-8</b>	1/2	0,500	1									
		12,7	2									
			3									
<b>-10</b>	5/8	0,625	1									
		15,88	2	8000	8850							
			3									
<b>-12</b>	3/4	0,750	1									
		19,05	2	6320	7080	7450	7950	9100				
			3									
<b>-14</b>	7/8	0,875	1									
		22,23	2	5300	5870	6180	6750	7450	8200	8700	9080	
			3									
<b>-16</b>	1	1,000	1									
		25,4	2	4500	5000	5250	5750	6300	6950	7400	7750	
			3									
<b>-18</b>	1 1/8	1,125	1									
		28,58	2									
			3									
<b>-20</b>	1 1/4	1,250	1									
		31,75	2	3500	3750	3750	4250	4400	4830	5350	5700	5900
			3				4300					
<b>-24</b>	1 1/2	1,500	1									
		38,1	2	2800	3000	3150	3500	3630	3750	4350	4650	4820
			3				3500					
<b>-28</b>	1 3/4	1,750	1									
		44,45	2				2700					
			3				2950					
<b>-32</b>	2	2,000	1									
		50,8	2	2100	2250	2350	2550	2650	3000	3080	3280	3400
			3				2550					
<b>-36</b>	2 1/4	2,250	1									
		57,15	2				2100					
			3				2250					

Footnotes see page 1

# Hydraulic Hose

acc. to SAE J517

Standard

**H 180**

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Example of Designation:

Designation of a hose assembly, type 100R9A with permanently attached straight 4 bolts flange fitting (standard series) at both ends (SAE-type 390150) inclusive O-Ring, resistant against mineralic hydraulic oil, for tube, hose and flange dash size -16, fixed length L = 6 ft., 6 inches, material: hose & O-Ring NBR, with metal braid (stainless steel), fittings stainless steel

Part number  
**18959S662**

**-16 HOSE ASSEMBLY 100R9A NBR/METAL/SS**  
**+2xSAE 390150 L= 6FT./6IN. SAEJ517/516 H180**

Part numbering Code																	
Position of Part No.																	
1. - 2.		3.			4.			5. - 6.			7. - 8.		9.				
Kind of Part		SAE-Hose Type			Connection Type			Material			Length		Certificate				
	Cd.		8)	Cd.	6) 7) 8)	Cd.	1) 11)	Cd.	3)	Actual	Cd.		12)				
Hydraulic Hose	18	100R1A	42	1	<b>Hose (yardware only / no fittings attached)</b>	0	<b>Yardware /</b> <b>↓ Hose resistance against</b>	hydr. oil min. & water glycol	NBR reinforced with glass fibre sleeve	9F	Yard-ware	10)	00	ASME	2		
		100R2A or 100R2B	43	2		ASME SAE				H							
		100R3	44	3	<b>Hose Assemblies with permanently attached fem. 37 deg. flared fittings</b>	1	hydr. oil synth.	NBR reinforced with SS-braid	9J	9P	9T	9W	9V				
		100R4	45	4					fitting type							9P	9T
		100R5	46	5	2401xx both ends	F	hydr. oil synth.	FKM reinforced with glass fibre sleeve	9T	9W	9V						
		100R6	47	6	fitting type				9T							9W	9V
		100R7	48	7	2401xx at 1 end	F	hydr. oil synth.	FKM reinforced with SS-braid	9W	9V							
		100R8	49	8	2414xx other end				9W							9V	
		100R9A	50	9	<b>Hose Assemblies with permanently attached</b>		hydr. oil synth.	FKM reinforced	9V								
		100R10A	51	A					9V								
		100R11	52	B	<b>Flanged Head fittings Standard Pressure Series</b>		hydr. oil mineralic and water glycol	NBR reinforced with glass fibre sleeve	9G	9S	9N	9C	9D	9H	9T	9W	9V
		100R12	77	C					fitting type								
		100R13	78	D	3901xx both ends	G	hydr. oil mineralic and water glycol	NBR reinforced with glass fibre sleeve	9F	9J	9P	9Q	9R	9S	9T	9U	9V
		100R14A	79	E	fitting type				G								
		100R1AT	53	F	3901xx at 1 end	H	hydr. oil mineralic and water glycol	NBR reinforced with SS-braid	9P	9Q	9R	9S	9T	9U	9V	9W	9X
		100R2AT or 100R2BT	54	G	3902xx other end				9P								
		100R9AT	75	H	<b>Hose Assemblies with permanently attached Flanged Head fittings High Pressure Series</b>		hydr. oil mineralic and water glycol	NBR reinforced with glass fibre sleeve	9G	9S	9N	9C	9D	9H	9T	9W	9V
		100R10AT	76	J					fitting type								
		100R14B	80	K	<b>Hose Assemblies with permanently attached female 37 deg. flared type and flanged head fitting</b>		hydr. oil mineralic and water glycol	NBR reinforced with glass fibre sleeve	9G	9S	9N	9C	9D	9H	9T	9W	9V
		100R16	91	L					fitting type								
					4901xx both ends	H	hydr. oil mineralic and water glycol	NBR reinforced with glass fibre sleeve	9G	9S	9N	9C	9D	9H	9T	9W	9V
					fitting type				9G								
					4901xx at 1 end	J	hydr. oil mineralic and water glycol	NBR reinforced with SS-braid	9L	9M	9N	9O	9P	9Q	9R	9S	9T
					4902xx other end				9L								
					<b>Hose Assemblies with permanently attached female O-Ring fittings</b>		hydr. oil synthetic (phosphate ester)	FKM reinforced with glass fibre sleeve	9C	9D	9H	9I	9J	9K	9L	9M	9N
									fitting type								
					5301xx both ends	2	hydr. oil synthetic (phosphate ester)	FKM reinforced with glass fibre sleeve	9C	9D	9H	9I	9J	9K	9L	9M	9N
					fitting type				9C								
					5301xx at 1 end	L	hydr. oil synthetic (phosphate ester)	FKM reinforced with glass fibre sleeve	9T	9U	9V	9W	9X	9Y	9Z	9AA	9AB
					5314xx other end				9T								

Footnotes see page 2

**Footnotes:**

- 1) Materials:  
Quality of hoses acc.to SAE J517  
Quality of fittings acc.to SAE J516
- 2) Coding for hose type; exact dimensions and tolerances see SAE J517.
- 3) Code for length of hose or hose assembly.
- 4) Hose lengths in foot / inch are printed out in ft. / inch or ' / ".  
Do not use letters O and I for length coding.  
A "X" for length coding means a length  $\geq 33'$  (feet). Summarize the 7<sup>th</sup> and 8<sup>th</sup> digit.  
Examples: Code X2 means 33+2=35'  
Code XB means 33+11=44'
- 5) When using length coding SL then the hose assembly length must be input in mm by using column ABM1 and is printed out in m. (e.g. 2650 mm versus 2,65 m).
- 6) Hose assembly illustrations see page 12 and 13
- 7) Single hose fittings see Std. H393A
- 8) Fitting connecting end symbol acc.to SAE J846.  
It shall be inserted for xx in the SAE identification number, e.g. 2401**50**.  
Standardized fitting types and hoses see page 3.
- 9) Assembly sizes specified on computer printouts basically refer to  
TUBE DASH SIZE = the same FLANGE DASH SIZE = the same HOSE DASH SIZE.  
In cases where that is impossible tube dash sizes prevail  
(possible exception: tube dash size -5, -14 and -20).
- 10) Code 00 (double zero) only to be used for yardware however length to be given in m for material take off (column Quantity).
- 11) Fire proof sleeves shall be fixed with the hose on both ends (crimped connection)
- 12) Certificate and requirements acc.to SAE J517 and SAE J516  
For hoses with end coding H a "certified test report" shall be provided.

### Standardized Fitting Types by SAE J516

Fitting type, fitting shape and fitting connecting end symbols acc.to SAE J846.

Hose Type SAE J517	Fitting Connecting End Symbol <sup>8)</sup>	Fitting Type and Fitting Shape <sup>2)</sup>							
		2401	2414	3901	3902	4901	4902	5301	5314
100R1A	42	x	x	x	x	x	x	x	x
100R2A&B	43	x	x	x	x	x	x	x	x
100R3	44	x	x	-	-	-	-	x	x
100R4	45	x	x	x	x	x	x	x	x
100R5	46	x	x	x	x	-	-	x	x
100R6	47	x	x	-	-	-	-	x	x
100R7	48	x	x	-	-	-	-	x	x
100R8	49	x	x	-	-	-	-	x	x
100R9A	50	x	x	x	x	x	x	x	x
100R10A	51	x	x	x	x	x	x	x	x
100R11	52	x	-	x	x	x	x	x	x
100R1AT	53	x	x	x	x	x	x	-	-
100R2AT&BT	54	x	x	x	x	x	x	-	-
100R9AT	75	x	x	x	x	x	x	-	-
100R10AT	76	x	x	x	x	x	x	-	-
100R12	77	x	x	x	x	x	x	x	x
100R13	78	x	x	x	x	x	x		
100R14A	79								
100R14B	80								
100R16	91								

Fitting types marked by x are standardized by SAE J516, edition 1994.

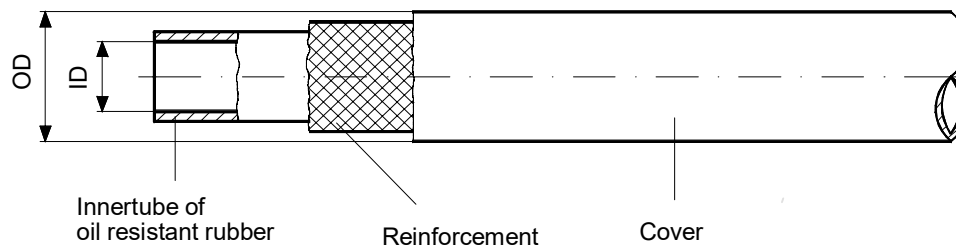
Fitting types not covered by SAE 516 shall be obtained from manufacturers.

Dimensional tables on next pages are only an excerpt of SAE J516 / 517.

Further footnotes see page 2

## Hose Dimensions acc. to SAE J517

Temperature Range of Application: see tables below



Hose assembly illustrations see page 12 and 13.

Hose Type: **100R1A** / -40 °C to 100 °C \*)  
 Hose Reinforcement : Single wire braid

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Basic mm	Hose I.D. Tolerance		Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
				+	-	Min. mm	Max. mm	inch	mm	psi	MPa		
-3	-3	3/16	4,8	0,6	0,2	11,9	13,5	3,50	89	3000	20,7	0,19	-
-4	-4	1/4	6,4			15,1	16,7	4,00	102	2750	19,0	0,28	6
-5	-5	5/16	7,9			16,7	18,3	4,50	114	2500	17,2	0,40	8
-6	-6	3/8	9,5			19,0	20,6	5,00	127	2250	15,5	0,45	10
-	(-6.5)	13/32	10,3	0,8	0,4	19,8	21,4	5,50	140	2250	15,5	0,52	-
-8	-8	1/2	12,7			22,2	23,8	7,00	178	2000	13,8	0,58	12
-10	-10	5/8	15,9			25,4	27,0	8,00	203	1500	10,3	0,68	16
-12	-12	3/4	19,0			29,4	31,0	9,50	241	1250	8,6	0,79	20
-14	-14	7/8	22,2			32,5	34,1	11,00	279	1125	7,8	0,99	-
-16	-16	1	25,4			36,9	39,3	12,00	305	1000	6,9	1,19	25
-20	-20	1 1/4	31,8	1,2		44,4	47,6	16,50	419	625	4,3	1,46	32
-24	-24	1 1/2	38,1			50,8	54,0	20,00	508	500	3,4	1,67	38
-32	-32	2	50,8			65,1	68,3	25,00	635	375	2,6	2,42	-

Hose Type: **100R1AT** / -40 °C to 100 °C \*)  
 Hose Reinforcement : Single wire braid

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Basic mm	Hose I.D. Tolerance		Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
				+	-	Min. mm	Max. mm	inch	mm	psi	MPa		
-3	-3	3/16	4,8	0,6	0,2		12,5	3,50	89	3000	20,7		-
-4	-4	1/4	6,4			14,1	4,00	102	2750	19,0	0,22	6	
-5	-5	5/16	7,9			15,7	4,50	114	2500	17,2	0,27	8	
-6	-6	3/8	9,5			18,1	5,00	127	2250	15,5	0,33	10	
-	(-6.5)	13/32	10,3	0,8	0,4		18,9	5,50	140	2250	15,5		-
-8	-8	1/2	12,7			21,5	7,00	178	2000	13,8	0,44	12	
-10	-10	5/8	15,9			24,7	8,00	203	1500	10,3	0,52	16	
-12	-12	3/4	19,0			28,6	9,50	241	1250	8,6	0,64	20	
-14	-14	7/8	22,2			31,8	11,00	279	1125	7,8	0,74	-	
-16	-16	1	25,4			36,6	12,00	305	1000	6,9	0,80	25	
-20	-20	1 1/4	31,8	1,2		44,8	16,50	419	625	4,3		32	
-24	-24	1 1/2	38,1			52,0	20,00	508	500	3,4		38	
-32	-32	2	50,8			65,9	25,00	635	375	2,6		-	

Bracketed sizes shall be avoided.

\*) see page 6

Hose Type: **100R2A or 100R2B** / -40 °C to 100 °C \*)

Hose Reinforcement: Type 100R2A: 2 Braids of wire

Type 100R2B: 2 Spiral plies and 1 braid of wire

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size Inch	Basic mm	Hose I.D. Tolerance		Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
				+	-	Min. mm	Max. mm	inch	mm	psi	MPa		
-3	-3	3/16	4,8	0,6	0,2	15,1	16,7	3,50	89	5000	34,5		-
-4	-4	1/4	6,4			16,7	18,3	4,00	102	5000	34,5	0,45	6
-5	-5	5/16	7,9			18,3	19,8	4,50	114	4250	29,3	0,55	8
-6	-6	3/8	9,5			20,6	22,2	5,00	127	4000	27,6	0,65	10
-8	-8	1/2	12,7	0,8	0,4	23,8	25,4	7,00	178	3500	24,1	0,80	12
-10	-10	5/8	15,9			27,0	28,6	8,00	203	2750	19,0	0,93	16
-12	-12	3/4	19,0			31,0	32,5	9,50	241	2250	15,5	1,10	20
-14	-14	7/8	22,2			34,1	35,7	11,00	279	2000	13,8	1,30	-
-16	-16	1	25,4	1,0	0,4	38,5	40,9	12,00	305	2000	13,8	1,53	25
-20	-20	1 1/4	31,8			49,2	52,4	16,50	419	1625	11,2		32
-24	-24	1 1/2	38,1	1,2	0,4	55,6	58,7	20,00	508	1250	8,6		38
-32	-32	2	50,8			68,3	71,4	25,00	635	1125	7,8		-
-40	-40	2 1/2	63,5	1,6	0,4	80,9	84,1	30,00	762	1000	6,9		-

Hose Type: **100R2AT or 100R2BT** / -40 °C to 100 °C \*)

Hose Reinforcement: Type 100R2AT: 2 Braids of wire

Type 100R2BT: 2 Spiral plies and 1 braid of wire

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Basic mm	Hose I.D. Tolerance		Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
				+	-	Min. mm	Max. mm	inch	mm	psi	MPa		
-3	-3	3/16	4,8	0,6	0,2		14,1	3,50	89	5000	34,5		-
-4	-4	1/4	6,4			15,7	17,3	4,00	102	5000	34,5	0,34	6
-5	-5	5/16	7,9			17,3	19,7	4,50	114	4250	29,3	0,40	8
-6	-6	3/8	9,5			19,7	23,1	5,00	127	4000	27,6	0,46	10
-8	-8	1/2	12,7	0,8	0,4		23,1	7,00	178	3500	24,1	0,53	12
-10	-10	5/8	15,9			26,3	26,3	8,00	203	2750	19,0	0,75	16
-12	-12	3/4	19,0			30,2	30,2	9,50	241	2250	15,5	0,93	20
-14	-14	7/8	22,2			33,4	33,4	11,00	279	2000	13,8	1,20	-
-16	-16	1	25,4	1,0	0,4		38,9	12,00	305	2000	13,8	1,40	25
-20	-20	1 1/4	31,8			49,6	49,6	16,50	419	1625	11,2	2,18	32
-24	-24	1 1/2	38,1	1,2	0,4		56,0	20,00	508	1250	8,6		38
-32	-32	2	50,8			68,6	68,6	25,00	635	1125	7,8		-

Hose Type: **100R3** / -40 °C to 100 °C \*)

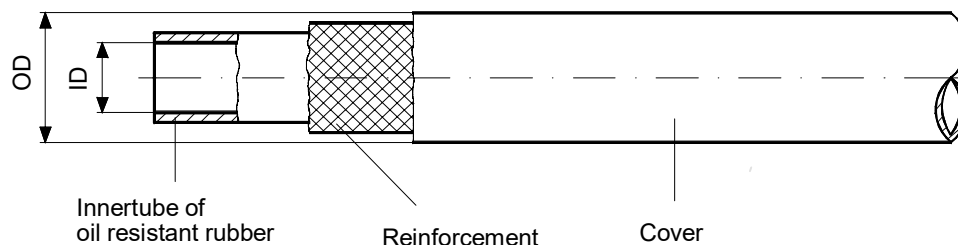
Hose Reinforcement: 2 Braids of suitable textile yarn

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size Inch	Basic mm	Hose I.D. Tolerance		Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
				+	-	Min. mm	Max. mm	inch	mm	psi	MPa		
-3	-3	3/16	4,8	0,6	0,3	11,9	13,5	3,00	76	1500	10,3		-
-4	-4	1/4	6,4			13,5	15,1	3,00	76	1250	8,6	0,18	6
-5	-5	5/16	7,9			16,7	18,3	4,00	102	1200	8,3	0,24	8
-6	-6	3/8	9,5			18,3	19,8	4,00	102	1125	7,8	0,33	10
-8	-8	1/2	12,7	0,8	0,3	23,0	24,6	5,00	127	1000	6,9	0,42	12
-10	-10	5/8	15,9			26,2	27,8	5,50	140	875	6,0	0,58	16
-12	-12	3/4	19,0			31,0	32,5	6,00	152	750	5,2	0,71	20
-16	-16	1	25,4			36,9	39,3	8,00	203	565	3,9	0,74	25
-20	-20	1 1/4	31,8	1,1	0,4	42,9	46,0	10,00	254	375	5,6	1,09	32

\*) see page 6

**Hose Dimensions acc. to SAE J517**

Temperature Range of Application: see tables below



Hose assembly illustrations see page 12 and 13.

Hose Type: **100R4** / -40 °C to 100 °C \*)

Hose Reinforcement: Ply (plies) of woven or braided textile fibers with a suitable spiral of body wire

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-12	-12	3/4	19,0	0,8	0,8		34,9	5,00	127	300	2,1	0,62	20
-16	-16	1	25,4				41,3	6,00	152	250	1,7	0,74	25
-20	-20	1 1/4	31,8	1,2	1,2		50,8	8,00	203	200	1,4	1,34	32
-24	-24	1 1/2	38,1				57,2	10,00	254	150	1,0	1,68	38
-32	-32	2	50,8				69,9	12,00	305	100	0,7	1,93	-
-40	-40	2 1/2	63,5				82,6	14,00	356	62	0,4	2,56	-
-48	-48	3	76,2	1,6	1,6		95,3	18,00	457	56	0,4	2,91	-
-56	-56	3 1/2	88,9				107,9	21,00	533	45	0,3	3,70	-
-64	-64	4	101,6				120,7	24,00	610	35	0,2	4,58	-

Hose Type: **100R5** / -40 °C to 100 °C \*)

Hose Reinforcement: 2 Textile braids separated by a high tensile steel wire braid

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-4	-4	3/16	4,8	0,7		12,7	13,7	3,00	76	3000	20,7	0,19	-
-5	-5	1/4	6,4			14,3	15,3	3,38	86	3000	20,7	0,24	6
-6	-6	5/16	7,9	0,8		16,7	17,6	4,00	102	2250	15,5	0,34	8
-8	-8	13/32	10,3			18,9	20,0	4,62	117	2000	13,8	0,39	-
-10	-10	1/2	12,7	1,0		22,8	24,0	5,50	140	1750	12,1	0,55	12
-12	-12	5/8	15,9	1,1	0,0	26,8	28,0	6,50	165	1500	10,3	0,68	16
-16	-16	7/8	22,2			30,6	32,2	7,38	187	800	5,5	0,65	-
-20	-20	1 1/8	28,6			37,3	38,9	9,00	229	625	4,3	0,77	-
-24	-24	1 3/8	34,9	1,2		43,7	45,2	10,50	267	500	3,4	1,00	-
-32	-32	1 13/16	46,0			55,2	57,6	13,25	337	350	2,4	1,40	-
-40	-40	2 3/8	60,3	1,6		71,8	74,2	24,00	610	350	2,4	2,13	-
-48	-48	3	76,2			89,3	91,7	33,00	838	200	1,4	3,18	-

\*) Temperature range for application with water and water based hydraulic fluid may vary due to manufacturer's standard.

Hose Type: **100R6** / -40 °C to 100 °C \*)  
 Hose Reinforcement: 1 braided ply of suitable textile yarn

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-3	-3	3/16	4,8	0,6	0,3	10,3	11,9	2,00	51	500	3,4	0,10	-
-4	-4	1/4	6,4			11,9	13,5	2,50	64	400	2,8	0,16	6
-5	-5	5/16	7,9			13,5	15,1	3,00	76	400	2,8	0,19	8
-6	-6	3/8	9,5			15,1	16,7	3,00	76	400	2,8	0,22	10
-8	-8	1/2	12,7	0,8		19,0	20,6	4,00	102	400	2,8	0,30	12
-10	-10	5/8	15,9			22,2	23,8	5,00	127	350	2,4	0,37	16
-12	-12	3/4	19,0			27,8	25,4	6,00	152	300	2,1	0,47	20

Hose Type: **100R7** / -40 °C to 93 °C \*)  
 Hose Reinforcement: Suitable synthetic fiber reinforcement

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.	
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa			
-3	-3	3/16	4,8	0,6	0,2		11,4	3,50	89	3000	20,7	0,09	-	
-4	-4	1/4	6,4			13,7	13,7	4,00	102	2750	19,0	0,10	6	
-5	-5	5/16	7,9			15,6	15,6	4,50	114	2500	17,2	0,13	8	
-6	-6	3/8	9,5			18,4	18,4	5,00	127	2250	15,5	0,15	10	
-8	-8	1/2	12,7	0,8		0,4	22,5	22,5	7,00	178	2000	13,8	0,24	12
-10	-10	5/8	15,9				25,8	25,8	8,00	203	1500	10,3	0,27	16
-12	-12	3/4	19,0				28,6	28,6	9,50	241	1250	8,6	0,31	20
-16	-16	1	25,4				36,7	36,7	12,00	305	1000	6,9	0,37	25

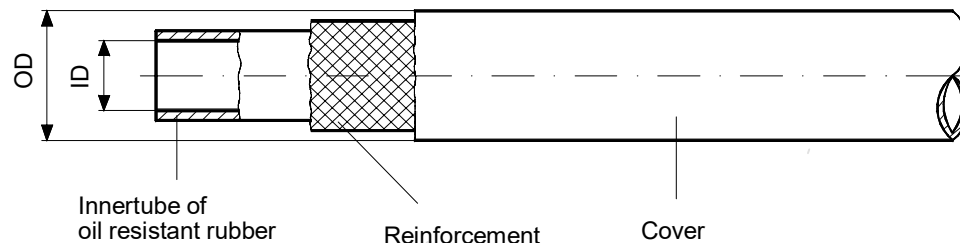
Hose Type : **100R8** / -40 °C to 93 °C \*)  
 Hose Reinforcement : Suitable synthetic fiber reinforcement

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.	
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa			
-3	-3	3/16	4,8	0,6	0,2		14,6	3,50	89	5000	34,5	0,06	-	
-4	-4	1/4	6,4			16,8	16,8	4,00	102	5000	34,5	0,12	6	
-6	-6	3/8	9,5			20,3	20,3	5,00	127	4000	27,6	0,16	10	
-8	-8	1/2	12,7			24,6	24,6	7,00	178	3500	24,1	0,22	12	
-10	-10	5/8	15,9	0,8		0,4	29,8	29,8	8,00	203	2750	19,0	0,26	16
-12	-12	3/4	19,0				33,0	33,0	9,50	241	2250	15,5	0,30	20
-16	-16	1	25,4				38,6	38,6	12,00	305	2000	13,8	0,39	25

\*) see page 6

**Hose Dimensions acc. to SAE J517**

Temperature Range of Application: see tables below



Hose assembly illustrations see page 12 and 13.

Hose Type: **100R9A** / -40 °C to 100 °C \*)

Hose Reinforcement: 4 Spiral plies of wire wrapped in alternating directions

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size Inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-6	-6	3/8	9,5	0,6	0,2	20,6	22,2	5,00	127	4500	31,0	0,685	10
-8	-8	1/2	12,7	0,8	0,4	23,8	25,4	7,00	178	4000	27,6	0,774	12
-12	-12	3/4	19,0			30,6	32,2	9,50	241	3000	20,7	1,220	20
-16	-16	1	25,4	1,0		38,5	40,9	12,00	305	3000	20,7	1,860	25
-20	-20	1 1/4	31,8	1,2		49,2	52,4	16,50	419	2500	17,2	2,990	32
-24	-24	1 1/2	38,1			55,6	58,7	20,00	508	2000	13,8	4,860	38
-32	-32	2	50,8			69,9	73,0	26,00	660	2000	13,8	5,750	-

Hose Type: **100R9AT** / -40 °C to 100 °C \*)

Hose Reinforcement: 4 Spiral plies of wire wrapped in alternating directions

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-6	-6	3/8	9,5	0,6	0,2		21,1	5,00	127	4500	31,0	0,685	10
-8	-8	1/2	12,7	0,8	0,4		24,3	7,00	178	4000	27,6	0,774	12
-12	-12	3/4	19,0				31,9	9,50	241	3000	20,7	1,220	20
-16	-16	1	25,4	1,0			40,5	12,00	305	3000	20,7	1,860	25
-20	-20	1 1/4	31,8	1,2			50,7	16,50	419	2500	17,2	2,990	32

\*) see page 6

Hose Type: **100R10A** / -40 °C to 100 °C \*)

Hose Reinforcement: 4 Spiral plies of heavy wire wrapped in alternating directions

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.	
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa			
-3	-3	3/16	4,8	0,6	0,2	18,3	19,8	4,00	102	10000	68,9		-	
-4	-4	1/4	6,4			19,8	21,4	5,00	127	8750	60,3	0,64	6	
-6	-6	3/8	9,5			23,0	24,6	6,00	152	7500	51,7	1,12	10	
-8	-8	1/2	12,7	1,0		27,0	28,6	8,00	203	6250	43,1	1,21	12	
-12	-12	3/4	19,0	1,2	0,0	35,7	37,3	11,00	279	5000	34,5	1,83	20	
-16	-16	1	25,4	1,6		43,3	45,6	14,00	356	4000	27,6	2,43	25	
-20	-20	1 1/4	31,8			49,2	52,4	18,00	457	3000	20,7	3,69	32	
-24	-24	1 1/2	38,1			55,6	58,7	22,00	559	2500	17,2	5,07	38	
-32	-32	2	50,8			1,8	69,1	72,7	28,00	711	2500	17,2	6,73	-

Hose Type: **100R10AT** / -40 °C to 100 °C \*)

Hose Reinforcement: 4 Spiral plies of heavy wire wrapped in alternating directions

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-12	-12	3/4	19,0	1,2	0,0		36,8	11,00	279	5000	34,5		20
-16	-16	1	25,4	1,6		45,5	14,00	356	4000	27,6		25	
-20	-20	1 1/4	31,8			52,3	18,00	457	3000	20,7		32	
-24	-24	1 1/2	38,1			58,7	22,00	559	2500	17,2		38	
-32	-32	2	50,8			1,8	72,1	28,00	711	2500	17,2		-

Hose Type: **100R11** / -40 °C to 100 °C \*)

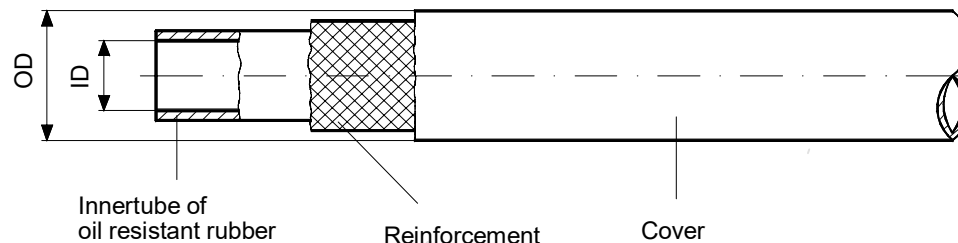
Hose Reinforcement: 6 Spiral plies of wire wrapped in alternating directions

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.	
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa			
-3	-3	3/16	4,8	0,6	0,2	21,4	23,0	4,00	102	12500	86,2		-	
-4	-4	1/4	6,4			23,0	24,6	5,00	127	11250	77,6		6	
-6	-6	3/8	9,5			26,2	27,8	6,00	152	10000	68,9		10	
-8	-8	1/2	12,7	1,0		30,2	31,8	8,00	203	7500	51,7		12	
-12	-12	3/4	19,0	1,2	0,0	38,9	40,5	11,00	279	6250	43,1		20	
-16	-16	1	25,4	1,6		47,2	49,6	14,00	356	5000	34,5		25	
-20	-20	1 1/4	31,8			53,2	56,4	18,00	457	3500	24,1		32	
-24	-24	1 1/2	38,1			59,5	62,7	22,00	559	3000	20,7		38	
-32	-32	2	50,8			1,8	73,8	77,0	28,00	711	3000	20,7		-
-40	-40	2 1/2	63,5				89,7	92,9	36,00	914	2500	17,2		-

\*) see page 6

## Hose Dimensions acc. to SAE J517

Temperature Range of Application: see tables below



Hose assembly illustrations see page 12 and 13.

Hose Type: **100R12** / -40 °C to 121 °C \*)

Hose Reinforcement: 4 Spiral plies of wire wrapped in alternating directions

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-6	-6	3/8	9,5	0,6	0,2	19,5	21,0	5,00	127	4000	27,6	0,59	10
-8	-8	1/2	12,7	0,8	0,4	23,0	24,6	7,00	178	4000	27,6	0,80	12
-10	-10	5/8	15,9			26,6	28,2	8,00	203	4000	27,6	1,10	16
-12	-12	3/4	19,0	29,9		31,5	9,50	241	4000	27,6	1,40	20	
-16	-16	1	25,4	1,0		36,8	39,2	12,00	305	4000	27,6	1,99	25
-20	-20	1 1/4	31,8	1,2		45,4	48,6	16,50	419	3000	20,7	2,59	32
-24	-24	1 1/2	38,1			51,9	55,0	20,00	508	2500	17,2	2,99	38
-32	-32	2	50,8			65,1	68,3	25,00	635	2500	17,2	4,09	-

Hose Type: **100R13** / -40 °C to 121 °C \*)

Hose Reinforcement: Multiple-spiral plies of heavy wire wrapped in alternating directions

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-12	-12	3/4	19,0	0,8	0,4	31,0	33,2	9,50	241	5000	34,5	1,59	20
-16	-16	1	25,4	1,0		37,6	39,8	12,00	305			2,20	25
-20	-20	1 1/4	31,8	1,2		48,3	51,3	16,50	419			3,69	32
-24	-24	1 1/2	38,1			55,8	58,5	20,00	508			4,79	38
-32	-32	2	50,8			69,5	72,7	25,00	635			7,48	-

\*) see page 6

Hose Type: **100R14A** / -54 °C to 204 °C \*)

Hose Reinforcement: PTFE lined ; Reinforcement with a single braid of 303xx series stainless steel;

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-3	-3	1/8	3,2	0,6	0,4	5,3	6,8	1,50	38	1500	10,3		-
-4	-4	3/16	4,8	0,4		7,1	8,2	2,00	51				6
-5	-5	1/4	6,4	0,5		8,9	10,1	3,00	76				8
-6	-6	5/16	7,9			10,4	11,6	4,00	102				10
-7	-7	3/8	9,5	0,6		12,2	13,4	5,00	127	1000	6,9		-
-8	-8	13/32	10,3			12,9	14,3	5,25	133				12
-10	-10	1/2	12,7			15,3	16,8	6,50	165	800	5,5		16
-12	-12	5/8	15,9			18,6	20,1	7,75	197				20
-14	-14	3/4	19,0			21,3	23,3	9,00	229				-
-16	-16	7/8	22,2			24,6	26,9	9,00	229				25
-18	-18	1	25,4	0,8	27,8	29,8	12,00	305	600	4,1		-	
-20	-20	1 1/8	28,6		31,9	33,5	16,00	406				32	

Hose Type: **100R14B** / -54 °C to 204 °C \*)

Hose Reinforcement: PTFE lined ; Reinforcement with a single braid of 303xx series stainless steel;  
additional feature of an electrically conductive inner surface;

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size inch	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa		
-3	-3	1/8	3,2	0,6	0,4	5,3	6,8	1,50	38	1500	10,3		-
-4	-4	3/16	4,8	0,4		7,1	8,2	2,00	51				6
-5	-5	1/4	6,4	0,5		8,9	10,1	3,00	76				8
-6	-6	5/16	7,9			10,4	11,6	4,00	102				10
-7	-7	3/8	9,5	0,6		12,2	13,4	5,00	127	1000	6,9		-
-8	-8	13/32	10,3			12,9	14,3	5,25	133				12
-10	-10	1/2	12,7			15,3	16,8	6,50	165	800	5,5		16
-12	-12	5/8	15,9			18,6	20,1	7,75	197				20
-14	-14	3/4	19,0			21,3	23,3	9,00	229				-
-16	-16	7/8	22,2			24,6	26,9	9,00	229				25
-18	-18	1	25,4	0,8	27,8	29,8	12,00	305	600	4,1		-	
-20	-20	1 1/8	28,6		31,9	33,5	16,00	406				32	

Hose Type: **100R16** / -40 °C to 100 °C \*)

Hose Reinforcement: 1 or 2 steel wire reinforcement acc. to hose design

Tube Dash Size	Hose Dash Size	Nominal Hose I.D. Size mm	Hose I.D.			Hose O.D.		Min. Bend Radius		Max. Operatg. Pressure		Weight kg / m	Referred Metric Tube O.D.		
			Basic mm	Tolerance + mm	- mm	Min. mm	Max. mm	inch	mm	psi	MPa				
-6	-6	6,4	0,6	0,2	0,4		14,48		50,8	5000	34,5	0,27	10		
-8	-8	7,9					15,75		57,2	4250	29,3	0,36	12		
-10	-10	9,5					18,8		63,5	4000	27,6	0,42	16		
-	(-13)	12,7					21,97		88,9	3500	24,1	0,51	-		
-16	-16	15,9				0,8	0,4		25,4		101,6	2750	19,0	0,66	25
-	(-19)	19,0							28,96		120,6	2250	15,5	0,80	-
-25	-25	25,4				1,0			36,58		152,4	2000	13,8	1,22	-
-32	-32	31,8				1,2			44,32		209,5		11,2		-

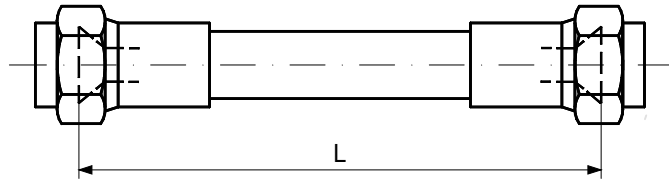
Bracketed sizes shall be avoided.

\*) see page 6

**Hose Assemblies with crimped fittings 9)**  
 Standardized Fitting Types and Fitting Shapes see table on page 3.

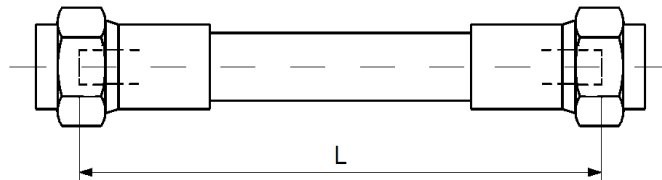
**Straight Female 37 deg. Flared Type** Permanently Attached  
 Hose -Fittings Style 2401xx at both ends

Connection Type  
 Code



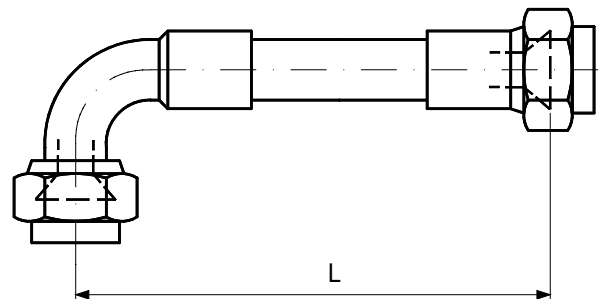
1

**Straight Female O-Ring** Permanently Attached  
 Hose -Fittings Style 5301xx at both ends



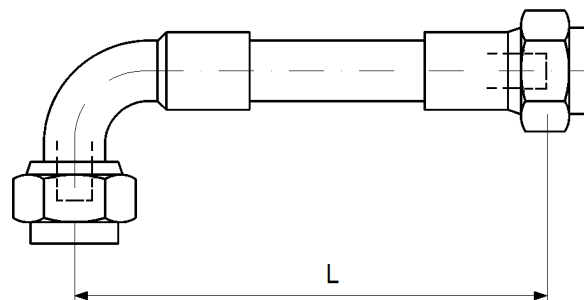
2

**Female 37 deg. Flared Type** Permanently Attached Hose Fittings  
 - Straight Style 2401xx at 1 end  
 - 90 deg. Short Drop Angel Style 2414xx at the other end



F

**Female O-Ring** Permanently Attached Hose Fittings  
 - Straight Style 5301xx at 1 end  
 - 90 deg. Short Drop Angel Style 5314xx at the other end



L

Footnotes see page 2

**Hose Assemblies with crimped fittings 9)**  
 Standardized Fitting Types and Fitting Shapes see table on page 3.

Connection Type  
Code

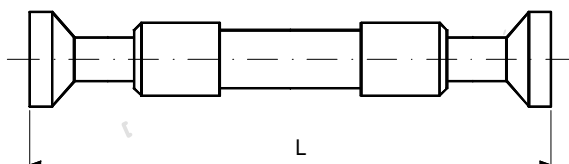
**Straight 4-Bolts Split Flange Type** Permanently Attached

Hose Fittings at both ends

- a) Style 3901xx = Standard pressure
- b) Style 4901xx = High pressure

5

A

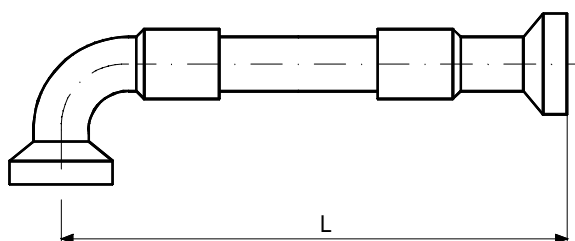


**4-Bolts Split Flange Type** Permanently Attached Hose fittings

- a) Style 3901xx (= Standard pressure) at 1 end  
 Style 3902xx (= Standard pressure) at the other end
- b) Style 4901xx (= High pressure) at 1 end  
 Style 4902xx (= High pressure) at the other end

G

H

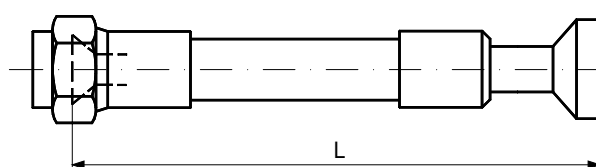


**Female 37 deg. Flared Type and 4-Bolts Split Flange Type**

Hose -Fitting

- Straight Style 2401xx at 1 end
- Straight Style 4901xx at the other end

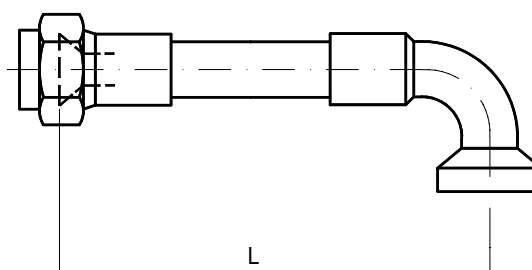
J



Hose -Fitting

- Straight Style 2401xx at 1 end
- 90 deg. Short Drop Angel Style 4902xx at the other end

K



Footnotes see page 2

**Butt-Welding Fittings**

acc. to ASME B16.9 and ASME B16.28

**H 200****Contents**

Page

Tolerances

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**Elbows**

Part numbering Code

3

Dimensions:

Reducing Elbow,  $R = 1,5D$   
Long Radius (L.R.)

4

Elbows  $90^\circ$ ,  $45^\circ$  and  $180^\circ$ ,  $R = 1,5D$   
Long Radius (L.R.)

5

Elbows  $90^\circ$  and  $180^\circ$ ,  $R = D$ , Short Radius (S.R.)  
Elbow  $90^\circ$ ,  $R = 5D$ 

6

Elbows  $90^\circ$  and  $45^\circ$ ,  $R = 3D$ 

7

**Tees and Crosses**

Part numbering Code

8

Tees and Crosses, equal and reduced  
(Dimensions)

9 - 14

**Concentric and Eccentric Reducers**

Part numbering Code

15

Concentric and Eccentric Reducers  
(Dimensions)

16 - 19

**Caps**

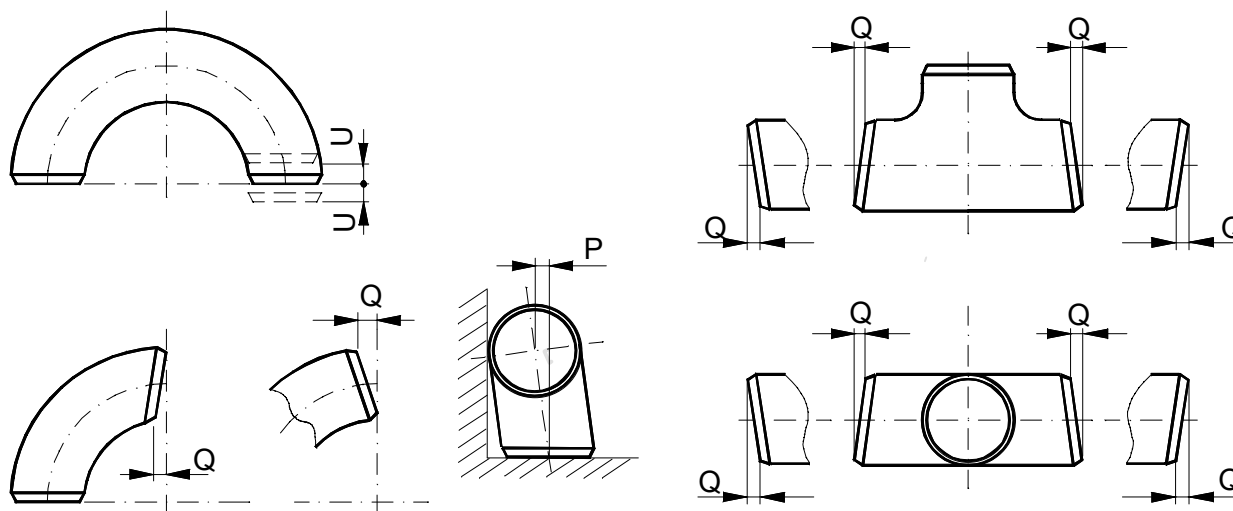
Part numbering Code

20

Caps (Dimensions)

21

**Dimension allowances for fittings acc. to ASME B16.9 and ASME B16.28**



Tolerances in mm

For all fittings				Elbow 90°, 45° Tees and Crosses Center to End A, B, C, M	Reducers Length H	Caps Over all length E	Elbow 180°		
Nominal diameter DN	Outside diameter at bevel D	Inside diameter	Connect. Wall- thickness s1, s2				Center to end C	Back to Face H	Alignment of Ends U
1/2" up to 2 1/2"	+1,52 -0,76	±0,76	*)	±1,52	±1,52	±3,05	±6,35	±6,35	±0,76
3" up to 3 1/2"	±1,52	±1,52		±1,52	±1,52	±3,05	±6,35	±6,35	±0,76
4"	±1,52	±1,52		±1,52	±1,52	±3,05	±6,35	±6,35	±0,76
5" up to 8"	+2,29 -1,52	±1,52		±1,52	±1,52	±6,35	±6,35	±6,35	±0,76
10" up to 18"	+4,06 -3,05	±3,05		±2,29	±2,29	±6,35	±9,65	±6,35	±1,52
20" up to 24"	+6,35 -4,83	±4,83		±2,29	±2,29	±6,35	±9,65	±6,35	±1,52
26" up to 30"	+6,35 -4,83	±4,83		±3,05	±4,83	±9,65			
32" up to 48"	+6,35 -4,83	±4,83		±4,83	±4,83	±9,65			

\*) Not less than 87,5% of nominal thickness

Tolerances in mm

Nominal diam. DN	Angularity tolerances	
	off Angle Q	off Plan P
1/2" up to 4"	0,76	1,52
5" up to 8"	1,52	3,05
10" up to 12"	2,29	4,83
14" up to 16"	2,29	6,35

Nominal diam. DN	Angularity tolerances	
	off Angle Q	off Plan P
18" up to 24"	3,05	9,65
26" up to 30"	4,83	9,65
32" up to 42"	4,83	12,70
44" up to 48"	4,83	19,05

## Elbows

**H 200**

acc. to ASME B16.9 and ASME B16.28

Page 3

Example of Designation: Designation of a seamless elbow 90°, long radius (L.R.), nominal diameter 6", connecting wallthickness s1 = Sched. 40, material: ASTM A234 Gr.WPA, surface finish: metallic

Part number  
**21214A302      6" / 168,3 \* 7,11      Seamless Elbow 90° L.R.      A234 Gr.WPA**  
**Sched. 40 H200/ASME B16.9**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Surface finish		ASTM - Material		Connecting Wallthickn.		Certificate	
3)		4)		1)		Cd. Cd.		7)	
Cd.		Cd.		Cd.		Cd. Cd.		Cd.	
Red. seamless Elbow 90° (L.R.) R = 1,5D		metallic		A234 Gr. WPA		2)		ASME 2	
		outside		A234 Gr. WPB		* 0		8)	
Seamless Elbow 90° (S.R.) R = D		bituminated and limed		A234 Gr. WP1				ASME H	
				A234 Gr. WP5					
Seamless Elbow 90° (L.R.) R = 1,5D		protective coating inside and outside		A234 Gr. WP11					
				A234 Gr. WP12					
Seamless Elbow 180° (S.R.) R = D		protective coating inside		A234 Gr. WP22					
				A403 Gr. WP304					
Seamless Elbow 180° (L.R.) R = 1,5D		protective coating outside		A403 Gr. WP304L					
				A403 Gr. WP316					
Welded Elbow 90° (S.R.) R = D		sandblasted inside		A403 Gr. WP316L					
				A403 Gr. WP321					
Seamless Elbow 45° (L.R.) R = 1,5D		Special finish		A420 Gr. WPL3					
				A420 Gr. WPL6					
Welded Elbow 90° (L.R.) R = 1,5D				A403 Gr. WP321H					
				A403 Gr. WP321-WX					
Welded Elbow 45° (L.R.) R = 1,5D				A403 Gr. S31803					
				A234 Gr. WP91					
Seamless Elbow 90° R = 5D									
Welded Elbow 90° R = 5D									
Seamless Elbow 90° R = 2,5D									
Welded Elbow 90° R = 2,5D									
Seamless Elbow 45° R = 2,5D									
Welded Elbow 45° R = 2,5D									
Seamless Elbow 90° R = 3D									
Welded Elbow 90° R = 3D									
Seamless Elbow 45° R = 3D									
Welded Elbow 45° R = 3D									

**Footnotes:**

- 1) Materials acc. to ASTM - specifications  
All welds for - WX - materials have been radiographed.
- 2) Wallthickness code acc. to Std. H0011  
Connecting wallthicknesses acc. to Std. H100 and piping specifications.

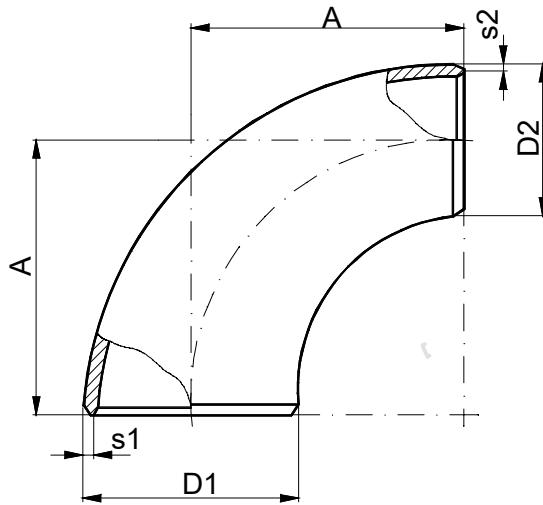
3) Code for kind of part

The **allowable working pressure** for elbows with **R · 1,5D** is the **same as for the straight seamless pipe** with the same outside diameter, the same connecting wallthickness and comparable material.  
 For **elbows acc.to ASME B16.28** with R = D thus can only be utilized up to **80% of the allowable working pressure** of the straight seamless pipe.

- 4) Code for surface finish  
Surfaces with code 3 to 9 acc. to order.

- 5) Weight refer to Type "Standard Wall".
- 6) Dimension A, B, C, H may also be furnished with 28.4, 11.2, 57.2, 42.9 (mm) (manufacturer's standard).
- 7) Certificate acc.to ASME- / ASTM - Standards
- 8) For piping components with end coding H a "certified test report" acc.to ASTM A530 shall be provided.

**Reducing Elbow 90° acc. to ASME B16.9**  
 R = 1.5D, long Radius (L.R.)



Welding bevel  
 for s1 or s2 acc. to ASME B16.9

Dimensions in mm

Nominal diam.		Outside diameter at bevel		Center to End A	*)		5) Weight kg/ piece
DN1	DN2	D1	D2		s1	s2	
2"	1 1/2"	60,3	48,3	76,2	2)		0,52
	1 1/4"		42,2				0,46
	1"		33,4				0,41
2 1/2"	2"	73,0	60,3	95,2			1,0
	1 1/2"		48,3				0,85
	1 1/4"		42,2				0,8
3"	2 1/2"	88,9	73,0	114,3			1,7
	2"		60,3				1,37
	1 1/2"		48,3				1,22
(3 1/2")	3"	101,6	88,9	133,3			2,5
	2 1/2"		73,0				2,12
	2"		60,3				1,8
4"	(3 1/2")	114,3	101,6	152,4			3,43
	3"		88,9				3,0
	2 1/2"		73,0				2,64
	2"		60,3		2,31		
5"	4"	141,3	114,3	190,5	5,31		
	(3 1/2")		101,6		4,8		
	3"		88,9		4,4		
	2 1/2"		73,0		4,0		
6"	5"	168,3	141,3	228,6	8,5		
	4"		114,3		7,2		
	(3 1/2")		101,6		6,7		
	3"		88,9		6,2		
8"	6"	219,1	168,3	304,8	15,6		
	5"		141,3		13,8		
	4"		114,3		12,4		

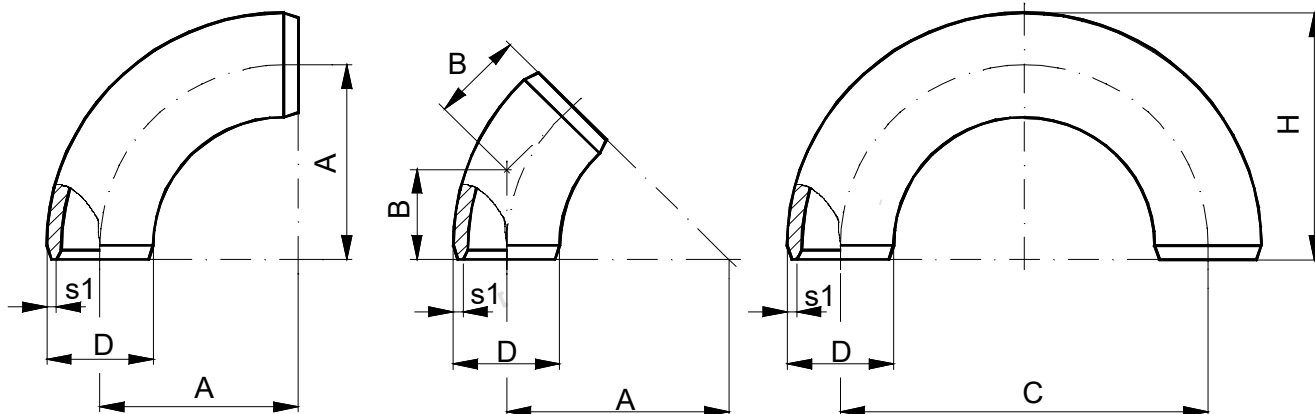
Nominal diam.		Outside diameter at bevel		Center to End A	*)		5) Weight kg/ piece
DN1	DN2	D1	D2		s1	s2	
10"	8"	273	219,1	381	2)		28,9
	6"		168,3				23,7
	5"		141,3				21,8
12"	10"	323,8	273	457,0			45,5
	8"		219,1				37,4
	6"		168,3				32,2
14"	12"	355,6	323,8	533,4			61,9
	10"		273				53,4
	8"		219,1				45,4
16"	14"	406,4	355,6	610,0			80,5
	12"		323,8				72,6
	10"		273				64,1
18"	16"	457,0	406,4	685,8			103,6
	14"		355,6				93,0
	12"		323,8				85,0
	10"		273		76,5		
20"	18"	508,0	457,0	762,0	130,0		
	16"		406,4		117,5		
	14"		355,6		106,8		
	12"		323,8		98,9		
24"	10"	610,0	273	914,0	90,4		
	22"		559,0		191,1		
	20"		508,0		175,7		
	18"		457,0		161,9		
	16"		406,4		149,4		
8"	14"	355,6	355,6	138,8	138,8		
	12"		323,8		130,8		

\*) Connecting wallthickness

Further footnotes see page 3

**Elbows 90°, 45° and 180° acc. to ASME B16.9**  
 R = 1.5D, long Radius (L.R.)

Welding bevel for s1 acc. to ASME B16.9



Dimensions in mm

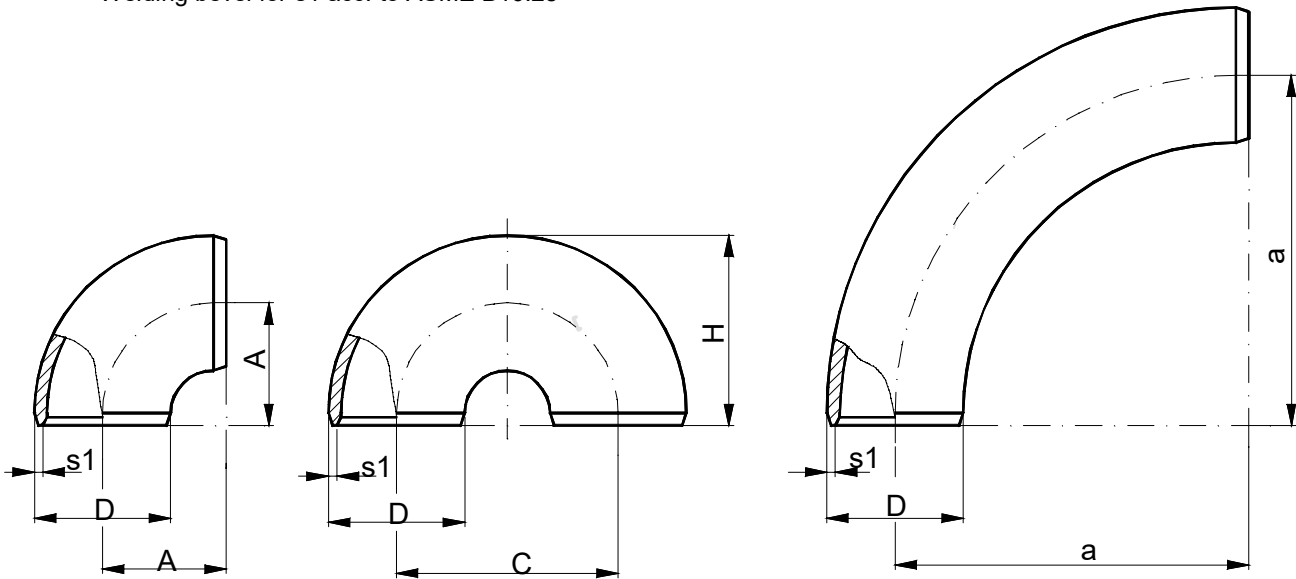
Nominal diameter DN	Outside diameter at bevel D	Center to End Elbow		Elbow 180°		Connect. wall-thickness s1	Weight <sup>5)</sup> kg / piece		
		90°/45° A	45° B	Center to End C	Back to Face H		90°	45°	180°
1/2"	21,3	38	16	76	48	2)	0,07	0,04	0,16
6) 3/4"	26,7	38	19	76	51		0,07	0,04	0,16
1"	33,4	38	22	76	56		0,15	0,11	0,31
1 1/4"	42,2	48	25	95	70		0,26	0,17	0,53
1 1/2"	48,3	57	29	114	83		0,37	0,23	0,76
2"	60,3	76	35	152	106		0,67	0,37	1,36
2 1/2"	73,0	95	44	190	132		1,33	0,74	2,67
3"	88,9	114	51	229	159		2,08	1,1	4,19
(3 1/2")	101,6	133	57	267	184		2,92	1,49	5,9
4"	114,3	152	64	305	210		3,95	1,95	7,94
5"	141,3	190	79	381	262		6,67	3,31	13,5
6"	168,3	229	95	457	313		10,4	5,13	20,9
8"	219,1	305	127	610	414		20,9	10,3	41,9
10"	273	381	159	762	518		37	18,3	79,4
12"	323,8	457	190	914	619		54	27	109,3
14"	355,6	533	222	1067	711		69,9	34,7	140,2
16"	406,4	610	254	1219	813		91,2	45,4	183,7
18"	457,0	686	286	1372	914		116,1	58,1	233,1
20"	508,0	762	318	1524	1016		143,8	71,7	288,9
22"	559,0	838	343	1676	1118		174,6	87,1	349,7
24"	610,0	914	381	1829	1219		207,7	103,9	417,3
26"	660,0	991	406	-	-		244,5	122	-
28"	711,0	1067	438	-	-		308	154	-
30"	762,0	1143	470	-	-		326,6	162,4	-
32"	813,0	1219	502	-	-	386	193	-	
34"	864,0	1295	533	-	-	420	210	-	
36"	914,0	1372	565	-	-	471,7	235	-	
38"	965,0	1448	600	-	-	544	272	-	
40"	1016	1524	632	-	-	590	295	-	
42"	1067	1600	660	-	-	644,1	320,7	-	
44"	1118	1676	695	-	-	726	363	-	
46"	1168	1753	727	-	-	816	408	-	
48"	1219	1829	759	-	-	907	454	-	

Footnotes see page 3

**Elbows 90° and 180° acc. to ASME B16.28**  
 R = D, short Radius (S.R.)

**Elbow 90°**  
 R = 5D acc. to manufacturer's standard

Welding bevel for s1 acc. to ASME B16.28



Dimensions in mm

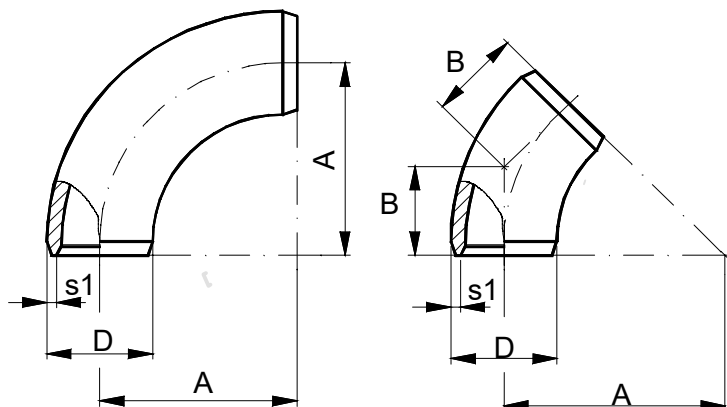
Nom. diam. DN	Outside diameter at bevel D	Elbows R = D			R = 5D 90° Center to End a	Connect. wall-thickness s1	5) Weight kg / piece		
		90° Center to End A	180° Center to end C	Back to Face H			90° R = D	180°	R = 5D 90°
1"	33,4	25,4	50,8	41,1	145	2)	0,10	0,21	0,58
1 1/4"	42,2	31,7	63,5	52,3	185		0,17	0,35	1,0
1 1/2"	48,3	38,1	76,2	61,9	215		0,25	0,50	1,34
2"	60,3	50,8	101,6	81,0	270		0,45	0,90	2,4
2 1/2"	73,0	63,5	127,0	100,0	350		0,87	1,78	4,96
3"	88,9	76,2	152,4	120,6	410		1,38	2,78	7,4
(3 1/2")	101,6	88,9	177,8	139,7	-		1,93	3,90	-
4"	114,3	101,6	203,2	158,7	540		2,62	5,26	14,1
5"	141,3	127,0	254,0	196,8	660		4,42	8,94	22,7
6"	168,3	152,4	304,8	236,5	780		6,89	13,9	34,6
8"	219,1	203,2	406,4	312,4	1020		13,8	27,9	67
10"	273,0	254,0	508,0	390,6	1300		24,5	49,4	123,4
12"	323,8	304,8	609,2	466,8	1550		36,1	72,6	180,2
14"	355,6	355,6	711,0	533,4	1700		46,3	93,0	217,6
16"	406,4	406,4	813,0	610,0	1940		61,2	122,5	284,9
18"	457,0	457,0	914,0	685,8	2250		77,6	155,1	371,7
20"	508,0	508,0	1016,0	762,0	2490		96,2	192,3	465,4
22"	559,0	559,0	1118,0	838,2	2750		117,0	235,0	557,8
24"	610,0	610,0	1219,0	914,0	3000		138,3	277,6	665,0
26"	660,0	660,0	1320,8	990,6	3250		158,6	317,2	780,9
28"	711,0	711,0	1422,4	1067,0	3500	184,2	368,4	906,6	
30"	762,0	762,0	1524,0	1143,0	3750	211,7	423,4	1042	
32"	813,0	813,0	1625,6	1219,0	4000	241,0	482,0	1186	

Footnotes see page 3

**Elbows 45° and 90° according to ASME B16.9**

R = 3D

Welding bevel for s1 according to ASME B16.9



Dimensions in mm

Nominal diameter DN	Outside diameter at bevel D	Center to End Elbow		Connect. wall-thickness s1	Weight <sup>5)</sup> kg / piece	
		90°/45° A	45° B		90°	45°
3/4"	26,7	57	24	2)	0,15	0,08
1"	33,4	76	31		0,30	0,15
1 1/4"	42,2	95	39		0,51	0,25
1 1/2"	48,3	114	47		0,73	0,37
2"	60,3	152	63		1,30	0,65
2 1/2"	73,0	190	79		2,58	1,29
3"	88,9	229	95		4,06	2,03
3 1/2"	101,6	267	111		5,69	2,85
4"	114,3	305	127		7,70	3,85
5"	141,3	381	157		13,0	6,50
6"	168,3	457	189		20,3	10,2
8"	219,1	610	252		40,8	20,4
10"	273	762	316		72,2	36,1
12"	323,8	914	378		106,1	53,0
14"	355,6	1067	441		136,3	68,2
16"	406,4	1219	505		178,6	89,3
18"	457,0	1372	568		226,7	113,4
20"	508,0	1524	632		280,5	140,3
22"	559,0	1676	694		340,0	170,0
24"	610,0	1829	757		405,5	202,8
26"	660,0	1981	821		475,7	237,9
28"	711,0	2134	883		552,6	276,3
30"	762,0	2286	964		635,0	317,5
32"	813,0	2438	1010		723,2	361,6
34"	864,0	2591	1073		817,3	408,7
36"	914,0	2743	1135		915,9	457,9
38"	965,0	2896	1200		1021,0	510,5
40"	1016,0	3048	1264		1132,5	566,3
42"	1067,0	3200	1326	1249,3	624,7	
44"	1118,0	3353	1389	1372,1	686,1	
46"	1168,0	3505	1453	1499,0	749,5	
48"	1219,0	3658	1516	1633,3	816,7	

Footnotes see page 3

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# Tees and Crosses

acc. to ASME B16.9

**H 200**

Page 8

Example of Designation: Designation of a seamless tee, equal, nominal diameter 10", connecting wallthickness s1 and s2 = Sched. 160, material: ASTM A234 Gr.WPB, surface finish: protective coating outside

Part number  
**23164W992     273 \* 28,58 / 273 \* 28,58     Seamless Tee protective coat. outside     A234 Gr.WPB**  
**Sched. 160/160 H200/ASME B16.9**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Surface finish		ASTM - Material		Connecting Wallthickn.		Certificate	
5)		4)		1)		2)		3)	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.
Tee, seamless equal and reducing	231	metallic	1	A234 Gr. WPA	4A	2)	3)	ASME	2
		outside	3	A234 Gr. WPB	4W	*	*	ASME	8)
Tee, welded equal and reducing	232	bituminated and limed		A234 Gr. WP1	4B			ASME	H
		A234 Gr. WP5		4C					
Cross equal and reducing	233	protective coating inside and outside	4	A234 Gr. WP11	4D				
		A234 Gr. WP12		4E					
		protective coating inside	5	A234 Gr. WP22	4F				
		A403 Gr. WP304		4G					
		protective coating outside	6	A403 Gr. WP304L	4H				
		A403 Gr. WP316		4J					
		sandblasted inside	7	A403 Gr. WP316L	4K				
		A403 Gr. WP321		4L					
		Special finish	9	A420 Gr. WPL3	4N				
				A420 Gr. WPL6	4P				
				A403 Gr. WP321H	E1				
				A403 Gr. WP321-WX	E2				
			A403 Gr. S31803	W1					
			A234 Gr. WP91	W2					

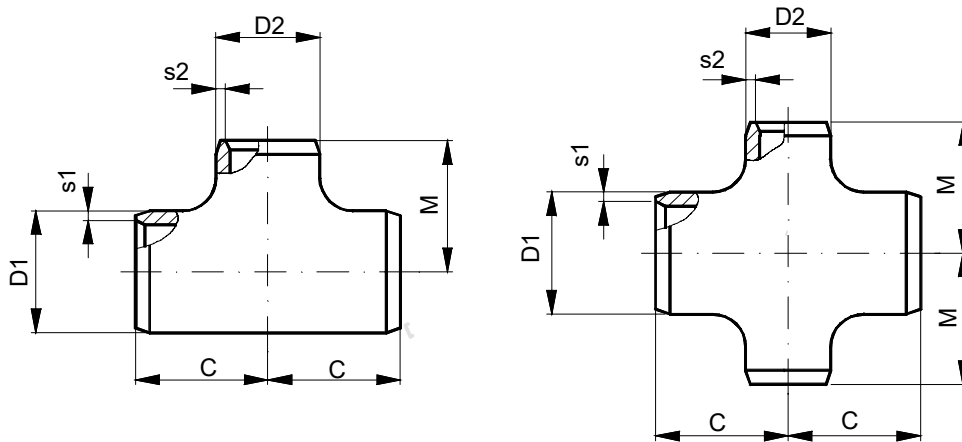
- 1) Materials acc. to ASTM - specifications  
All welds for - WX - materials have been radiographed
- 2) Wallthickness code for run pipe
- 3) Wallthickness code for branch pipe
- 4) Code for surface finish  
Surfaces with code 3 to 9 acc. to order.
- 5) Code for kind of part

The **allowable working pressure** of the **tee** is the **same as for the straight seamless pipe** with the same outside diameter, the same connecting wallthickness and comparable material.

- 6) Weight refer to Type "Standard Wall".
- 7) Certificate acc.to ASME- / ASTM - Standards
- 8) For piping components with end coding H a "certified test report" acc.to ASTM A530 shall be provided.

**Tees and Crosses, equal and reducing acc. to ASME B16.9**

Welding bevel for s1 and s2 acc. to ASME B16.9



Dimensions in mm

Nominal diameter		Outside diameter at bevel D1 / D2	Center to end		Connect. wall-thickness s1 / s2	Weight <sup>6)</sup> kg / piece	
Run pipe DN1	Branch DN2		C	M		Tee	Cross
1/2"	1/2"	21,3	25	25	2) 3)	0,11	
	3/8"	17,3				0,10	
	1/4"	13,7				0,10	
3/4"	3/4"	26,7	29	29		0,17	
	1/2"	21,3				0,15	
	3/8"	17,3				0,15	
1"	1"	33,4	38	38		0,34	0,29
	3/4"	26,7				0,29	
	1/2"	21,3				0,29	
1 1/4"	1 1/4"	42,2	48	48		0,61	0,6
	1"	33,4			0,53		
	3/4"	26,7			0,50		
	1/2"	21,3			0,50		
1 1/2"	1 1/2"	48,3	57	57	0,92	0,87	
	1 1/4"	42,2			0,80		
	1"	33,4			0,76		
	3/4"	26,7			0,73		
	1/2"	21,3			0,73		
2"	2"	60,3	64	64	1,34	1,3	
	1 1/2"	48,3		60	1,21		
	1 1/4"	42,2		57	1,16		
	1"	33,4		51	1,12		
	3/4"	26,7		44	1,09		
2 1/2"	2 1/2"	73,0	76	76	2,36	2,22	
	2"	60,3		70	2,08		
	1 1/2"	48,3		67	2,04		
	1 1/4"	42,2		64	1,99		
	1"	33,4		57	1,96		
3"	3"	88,9	86	86	3,37	3,34	
	2 1/2"	73,0		83	3,09		
	2"	60,3		76	2,95		
	1 1/2"	48,3		73	2,92		
	1 1/4"	42,2		70	2,88		

Footnotes see page 7

**Tees and Crosses, equal and reducing acc. to ASME B16.9, cont'd**

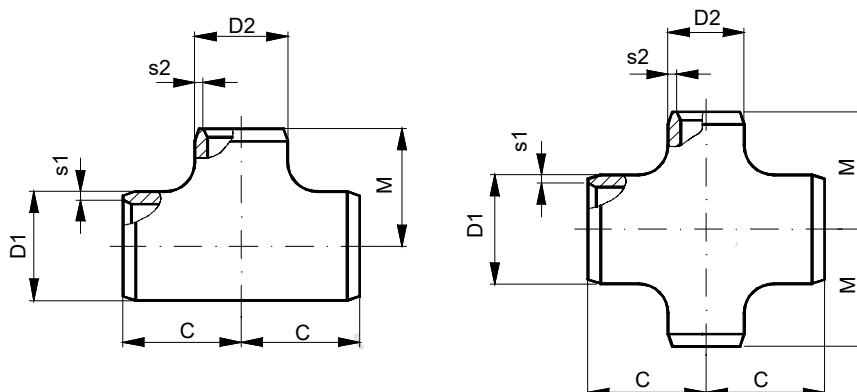
Dimensions in mm

Nominal diameter		Outside diameter at bevel D1 / D2	Center to End		Connect. wall-thickness s1 / s2	Weight <sup>6)</sup> kg / piece	
Run pipe DN1	Branch DN2		C	M		Tee	Cross
(3 1/2")	(3 1/2")	101,6	95	95	2) 3)	4,47	4,12
	3"	88,9		92		4,09	
	2 1/2"	73,0		89		3,99	
	2"	60,3		83		3,85	
	1 1/2"	48,3		79		3,85	
4"	4"	114,3	105	105		5,72	5,33
	(3 1/2")	101,6		102		5,26	
	3"	88,9		98		5,17	
	2 1/2"	73,0		95		5,13	
	2"	60,3		89		4,99	
	1 1/2"	48,3		86	4,94		
5"	5"	141,3	124	124	8,98	9,5	
	4"	114,3		117	8,21		
	(3 1/2")	101,6		114	8,07		
	3"	88,9		111	7,98		
	2 1/2"	73,0		108	7,89		
	2"	60,3		105	7,8		
6"	6"	168,3	143	143	13,3	11,11	
	5"	141,3		137	12,1		
	4"	114,3		130	11,9		
	(3 1/2")	101,6		127	11,8		
	3"	88,9		124	11,7		
	2 1/2"	73,0		121	11,7		
8"	8"	219,1	178	178	24,4	21,12	
	6"	168,3		168	22,1		
	5"	141,3		162	21,8		
	4"	114,3		156	21,7		
	(3 1/2")	101,6		152	21,6		
10"	10"	273	216	216	41,4	35,73	
	8"	219,1		203	37,6		
	6"	168,3		194	37,1		
	5"	141,3		191	36,9		
	4"	114,3		184	36,8		
12"	12"	323,8	254	254	59,9	62,60	
	10"	273		241	54,9		
	8"	219,1		229	53,5		
	6"	168,3		219	53,1		
	5"	141,3		216	53,1		
14"	14"	355,6	279	279	72,1		
	12"	323,8		270	66,7		
	10"	273		257	65,3		
	8"	219,1		248	64,9		
	6"	168,3		238	64,4		
16"	16"	406,4	305	305	99,3		
	14"	355,6		305	95,3		
	12"	323,8		295	92,5		
	10"	273		283	88,5		
	8"	219,1		273	83,9		
	6"	168,3		264	79,8		

Footnotes see page 7

**Tees and Crosses, equal and reducing acc. to ASME B16.9, cont'd**

Welding bevel for s1 and s2 acc. to ASME B16.9



Dimensions in mm

Nominal diameter		Outside diameter at bevel D1 / D2	Center to End		Connect. wall-thickness s1 / s2	Weight <sup>6)</sup> kg / piece	
Run pipe DN1	Branch DN2		C	M		Tee	Cross
18"	18"	457,0	343	343	2) 3)	127,9	
	16"	406,4		330		122	
	14"	355,6		330		118,8	
	12"	323,8		321		115,2	
	10"	273		308		110,7	
	8"	219,1		298		104,8	
20"	20"	508,0	381	381		160,6	
	18"	457,0		368		159,1	
	16"	406,4		356		149,2	
	14"	355,6		356		143,3	
	12"	323,8		346		139,7	
	10"	273		333		133,8	
22"	22"	559,0	419	419	198,2		
	20"	508,0		406	191,9		
	18"	457,0		394	185,1		
	16"	406,4		381	178,7		
	14"	355,6		381	172,4		
	12"	323,8		371	171		
	10"	273		359			
24"	24"	610,0	432	432	223,6		
	22"	559,0		432			
	20"	508,0		432	205,5		
	18"	457,0		419	205,5		
	16"	406,4		406	196,4		
	14"	355,6		406	190,1		
	12"	323,8		397	185,5		
	10"	273		384	178,7		
26"	26"	660,0	495	495	287,6		
	24"	610,0		483	279,4		
	22"	559,0		470	271,2		
	20"	508,0		457	263,5		
	18"	457,0		444	254,9		
	16"	406,4		432	246,8		
	14"	355,6		432	239		
	12"	323,8		422	234,1		

Footnotes see page 7

**Tees and Crosses, equal and reducing acc. to ASME B16.9, cont'd**

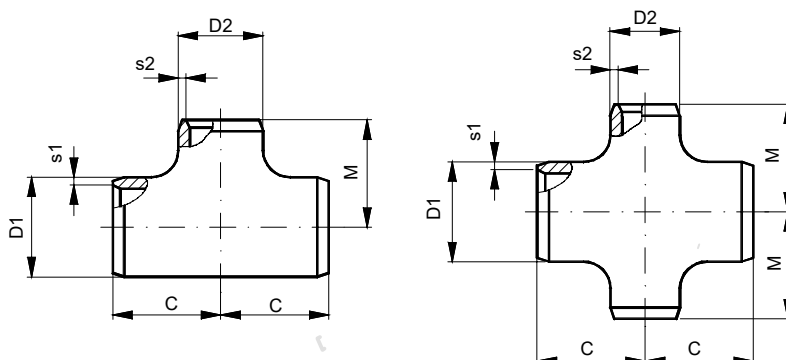
Dimensions in mm

Nominal diameter		Outside diameter at bevel D1 / D2	Center to End		Connect. wall-thickness s1 / s2	Weight kg / piece	
Run pipe DN1	Branch DN2		C	M		Tee	Cross
28"	28"	711,0	521	521	2) 3)	337	
	26"	660,0		521		325,2	
	24"	610,0		508		319,8	
	22"	559,0		495		310,7	
	20"	508,0		483		301,6	
	18"	457,0		470		292,1	
	16"	406,4		457		283	
	14"	355,6		457		274	
	12"	323,8	448				
30"	30"	762,0	559	559		387,8	
	28"	711,0		546	378,3		
	26"	660,0		546	370,6		
	24"	610,0		533	360,6		
	22"	559,0		521	350,2		
	20"	508,0		508	339,7		
	18"	457,0		495	329,8		
	16"	406,4		483	319,3		
	14"	355,6		483	308,9		
	12"	323,8		473			
	10"	273	460				
32"	32"	813,0	597	597		451	
	30"	762,0		584	441,4		
	28"	711,0		572	429,1		
	26"	660,0		572	420,5		
	24"	610,0		559	410		
	22"	559,0		546			
	20"	508,0		533	406		
	18"	457,0		521	390		
	16"	406,4		508	381		
	14"	355,6		508			
34"	34"	864,0	635	635		515,3	
	32"	813,0		622	503,9		
	30"	762,0		610	492,1		
	28"	711,0		597	480,4		
	26"	660,0		597	471,3		
	24"	610,0		584	459,5		
	22"	559,0		572	447,2		
	20"	508,0		559	435,4		
	18"	457,0		546	423,2		
	16"	406,4		533	411,4		
36"	36"	914,0	673	673		586,9	
	34"	864,0		660	573,3		
	32"	813,0		648	561,1		
	30"	762,0		635	547,5		
	28"	711,0		622	535,7		
	26"	660,0		622	525,3		
	24"	610,0		610	512,1		
	22"	559,0		597	499		
	20"	508,0		584	486,3		
	18"	457,0		571	473,6		
16"	406,4	559	460,4				

Footnotes see page 7

**Tees and Crosses, equal and reducing acc. to ASME B16.9, cont'd**

Welding bevel for s1 and s2 acc. to ASME B16.9



Dimensions in mm

Nominal diameter		Outside diameter at bevel D1 / D2	Center to End		Connect. wall-thickness s1 / s2	Weight kg / piece <sup>6)</sup>	
Run pipe DN1	Branch DN2		C	M		Tee	Cross
38"	38"	965,0	711	711	2) 3)	638	
	36"	914,0		711		638	
	34"	864,0		698		627	
	32"	813,0		686		615	
	30"	762,0		673		604	
	28"	711,0		648		581	
	26"	660,0		648		581	
	24"	610,0		635		570	
	22"	559,0		622		558	
	20"	508,0		610		547	
18"	457,0	597	535				
40"	40"	1016	749	749		690	
	38"	965,0		749	690		
	36"	914,0		737	690		
	34"	864,0		724	690		
	32"	813,0		711	690		
	30"	762,0		698	643		
	28"	711,0		673	620		
	26"	660,0		673	620		
	24"	610,0		660	608		
	22"	559,0		648	596		
20"	508,0	635	585				
18"	457,0	622	573				
42"	42"	1067	762	711		795	
	40"	1016		711	755		
	38"	965,0		711	755		
	36"	914,0		711	755		
	34"	864,0		711	755		
	32"	813,0		711	755		
	30"	762,0		711	742		
	28"	711,0		698	729		
	26"	660,0		698	729		
	24"	610,0		660	689		
	22"	559,0		660	689		
	20"	508,0		660	689		
	18"	457,0		648	676		
16"	406,4	635	663				

Footnotes see page 7

**Tees and Crosses, equal and reducing acc. to ASME B16.9, cont'd**

Dimensions in mm

Nominal diameter		Outside diameter at bevel D1 / D2	Center to End		Connect. wall-thickness s1 / s2	Weight kg / piece	
Run pipe DN1	Branch DN2		C	M		Tee	Cross
44"	44"	1117,8	813	762	2) 3)	899	
	42"	1067		762		843	
	40"	1016		749		829	
	38"	965,0		737		815	
	36"	914,0		724		801	
	34"	864,0		724		801	
	32"	813,0		711		787	
	30"	762,0		711		787	
	28"	711,0		698		773	
	26"	660,0		698		773	
	24"	610,0		698		773	
	22"	559,0		686		759	
	20"	508,0		686		759	
46"	46"	1168	581	800		1007	
	44"	1117,8		800	947		
	42"	1067		787	932		
	40"	1016		775	917		
	38"	965,0		762	902		
	36"	914,0		762	902		
	34"	864,0		749	887		
	32"	813,0		749	887		
	30"	762,0		737	872		
	28"	711,0		737	872		
	26"	660,0		737	872		
	24"	610,0		724	857		
	22"	559,0		724	857		
48"	48"	1219	889	838		1113	
	46"	1168		838	1049		
	44"	1117,8		838	1049		
	42"	1067		813	1018		
	40"	1016		813	1018		
	38"	965,0		813	1018		
	36"	914,0		787	986		
	34"	864,0		787	986		
	32"	813,0		787	986		
	30"	762,0		762	954		
	28"	711,0		762	954		
	26"	660,0		762	954		
	24"	610,0		737	922		
22"	559,0	737	922				

Footnotes see page 7

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# Concentric and Ecc. Reducers

acc. to ASME B16.9

**H 200**

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Example of Designation: Designation of a welded concentric reducer, DN1 = 10" and DN2 = 6", connecting wallthickness s1 = XS and s2 = XS, material: ASTM A234 Gr.WP5, surface finish: metallic

Part number  
**24314CFF2 273 \* 12,7 / 168,3 \* 10,97 Reducer concentric welded A234 Gr.WP5**  
**Sched. XS/XS H200/ASME B16.9**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part	5)	Surface finish	4)	ASTM - Material	1)	Connecting Wallthickn.		7) Certificate	
	Cd.		Cd.		Cd.	Cd.	Cd.	Cd.	Cd.
Seamless Concentric Reducer	241	metallic	1	A234 Gr. WPA	4A	2)	3)	ASME	2
		outside	3	A234 Gr. WPB	4W				
Seamless Eccentric Reducer	242	bituminated and limed		A234 Gr. WP1	4B				
				A234 Gr. WP5	4C				
Welded Concentric Reducer	243	protective coating inside and outside	4	A234 Gr. WP11	4D				
				A234 Gr. WP12	4E				
Welded Eccentric Reducer	244	protective coating inside	5	A234 Gr. WP22	4F				
				A403 Gr. WP304	4G				
		protective coating outside	6	A403 Gr. WP304L	4H				
				A403 Gr. WP316	4J				
				A403 Gr. WP316L	4K				
		sandblasted inside	7	A403 Gr. WP321	4L				
				A420 Gr. WPL3	4N				
		Special finish	9	A420 Gr. WPL6	4P				
				A403 Gr. WP321H	E1				
		A403 Gr. WP321-WX	E2						
		A403 Gr. S31803	W1						
A234 Gr. WP91	W2								

- 1) Materials acc. to ASTM - specifications  
All welds for - WX - materials have been radiographed
- 2) Wallthickness code for large size   } Wallthickness code acc. to Std. H0011
- 3) Wallthickness code for reduced size   } Connecting wallthicknesses acc. to Std. H100 and piping specifications.
- 4) Code for surface finish  
Surfaces with code 3 to 9 acc. to order.
- 5) Code for kind of part

The **allowable working pressure** of the reducer is the **same as for the straight seamless pipe** with the same outside diameter, the same connecting wallthickness and comparable material.

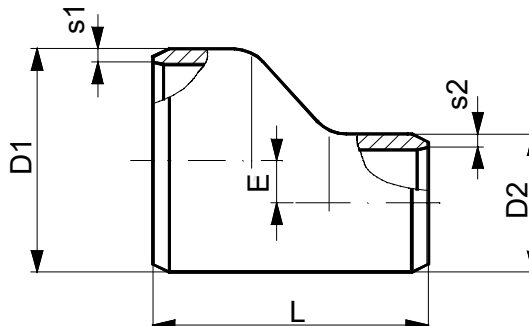
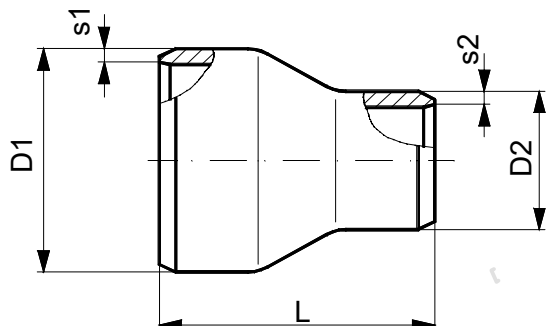
- 6) Weight refer to Type "Standard Wall".
- 7) Certificate acc. to ASME- / ASTM - Standards
- 8) For piping components with end coding H a "certified test report" acc. to ASTM A530 shall be provided.

**Reducers acc. to ASME B16.9**

concentric

eccentric

Welding bevel for s1 and s2 acc. to ASME B16.9



Dimensions in mm

Nominal diameter		Outside diameter at bevel		Length L	Eccentricity E	Connect. wall-thickness s1 / s2	Weight kg / piece concentric and eccent. 6)
Large DN1	Reduced DN2	Large D1	Reduced D2				
3/4"	1/2"	26,7	21,3	38	2,7	2) 3)	0,06
	3/8"		17,1		4,8		0,05
1"	3/4"	33,4	26,7	51	3,35		0,11
	1/2"		21,3		6,05		0,1
1 1/4"	1"	42,4	33,4	51	4,4		0,15
	3/4"		26,7		7,75		0,13
	1/2"		21,3		10,45		0,12
1 1/2"	1 1/4"	48,3	42,2	64	3,05		0,23
	1"		33,4		7,45		0,21
	3/4"		26,7		10,8		0,18
	1/2"		21,3		13,5	0,17	
2"	1 1/2"	60,3	48,3	76	6,0	0,36	
	1 1/4"		42,2		9,05	0,34	
	1"		33,4		13,45	0,30	
	3/4"		26,7		16,8	0,27	
2 1/2"	2"	73,0	60,3	89	6,35	0,62	
	1 1/2"		48,3		12,35	0,56	
	1 1/4"		42,2		15,4	0,53	
	1"		33,4		19,8	0,49	
3"	2 1/2"	88,9	73,0	89	7,95	0,88	
	2"		60,3		14,3	0,74	
	1 1/2"		48,3		20,3	0,68	
	1 1/4"		42,2		23,35	0,65	
(3 1/2")	3"	101,6	88,9	102	6,35	1,26	
	2 1/2"		73,0		14,3	1,13	
	2"		60,3		20,65	0,96	
	1 1/2"		48,3		26,65	0,89	
	1 1/4"		42,2		29,7	0,86	

Footnotes see page 14

**Reducers acc. to ASME B16.9, cont'd**

Dimensions in mm

Nominal diameter		Outside diameter at bevel		Length L	Eccentricity E	Connect. wall-thickness s1 / s2	Weight <sup>6)</sup> kg / piece concentric and eccent.
Large DN1	Reduced DN2	Large D1	Reduced D2				
4"	(3 1/2")	114,3	101,6	102	6,35	2) 3)	1,5
	3"		88,9		12,7		1,4
	2 1/2"		73,0		20,65		1,25
	2"		60,3		27		1,09
	1 1/2"		48,3		33		1,02
5"	4"	141,3	114,3	127	13,5		2,4
	(3 1/2")		101,6		19,85	2,24	
	3"		88,9		26,2	2,1	
	2 1/2"		73,0		34,15	1,93	
	2"		60,3		40,5	1,73	
6"	5"	168,3	141,3	140	13,5		3,49
	4"		114,3		27	3,1	
	(3 1/2")		101,6		33,35	2,9	
	3"		88,9		39,7	2,8	
	2 1/2"		73,0		47,65	2,6	
8"	6"	219,1	168,3	152	25,4		5,39
	5"		141,3		38,9	4,9	
	4"		114,3		52,4	4,46	
	(3 1/2")		101,6		58,75	4,27	
10"	8"	273	219,1	178	26,95		9,14
	6"		168,3		52,35	7,87	
	5"		141,3		65,85	7,29	
	4"		114,3		79,35	6,8	
12"	10"	323,8	273	203	25,4		13,6
	8"		219,1		52,35	11,8	
	6"		168,3		77,75	10,4	
	5"		141,3		91,25	9,7	
14"	12"	355,6	323,8	330	15,9		25,6
	10"		273		41,3	23,4	
	8"		219,1		68,25	20,4	
	6"		168,3		93,65	18,1	
16"	14"	406,4	355,6	356	25,4		31,1
	12"		323,8		41,3	29,7	
	10"		273		66,7	27,3	
	8"		219,1		93,65	24,1	
18"	16"	457,0	406,4	381	25,3		37,8
	14"		355,6		50,7	35,5	
	12"		323,8		66,6	34,1	
	10"		273		92,0	31,5	
20"	18"	508,0	457,0	508	25,5		56,4
	16"		406,4		50,8	53,4	
	14"		355,6		76,2	50,4	
	12"		323,8		92,1	48,5	
22"	20"	559,0	508,0	508	25,5		62,5
	18"		457,0		51,0	59,5	
	16"		406,4		76,2	56,4	
	14"		355,6		101,6	53,4	
24"	22"	610,0	559,0	508	25,5		68,6
	20"		508,0		51,0	65,5	
	18"		457,0		76,5	62,5	
	16"		406,4		101,6	59,5	

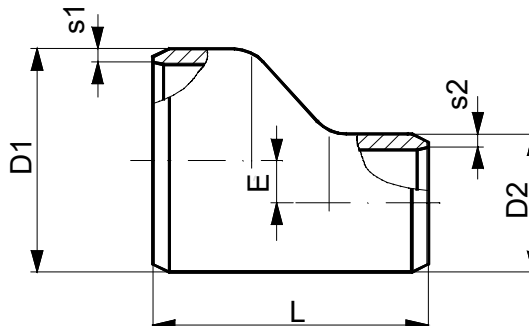
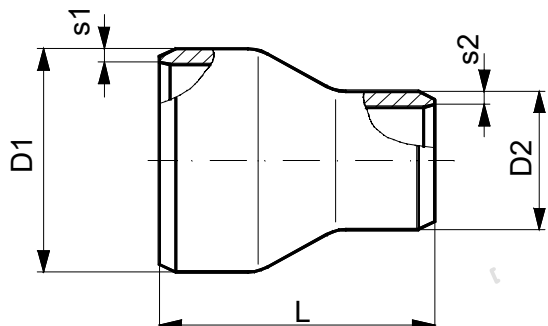
Footnotes see page 14

Reducers acc. to ASME B16.9, cont'd

concentric

eccentric

Welding bevel for s1 and s2 acc. to ASME B16.9



Dimensions in mm

Nominal diameter		Outside diameter at bevel		Length L	Eccentricity E	Connect. wall-thickness s1 / s2	Weight kg / piece concentric and eccent. 6)
Large DN1	Reduced DN2	Large D1	Reduced D2				
26"	24"	660,0	610,0	610	25,0	2) 3)	89,5
	22"		559,0		50,5		85,9
	20"		508,0		76,0		82,3
	18"		457,0		101,5		78,6
28"	26"	711,0	660,0	610	25,5		96,8
	24"		610,0		50,5		93,2
	22"		559,0		76,0		89,5
	20"		508,0		101,5		85,9
30"	28"	762,0	711,0	610	25,5		104,1
	26"		660,0		51,0		100,5
	24"		610,0		76,0		96,7
	22"		559,0		101,5		93,2
32"	30"	813,0	762,0	610	25,5	111,4	
	28"		711,0		51,0	107,7	
	26"		660,0		76,5	104,1	
	24"		610,0		101,5	100,5	
34"	32"	864,0	813,0	610	25,5	118,6	
	30"		762,0		51,0	114	
	28"		711,0		76,5	111,4	
	26"		660,0		102,0	107,7	
36"	34"	914,0	864,0	610	25,0	125,9	
	32"		813,0		50,5	122,3	
	30"		762,0		76,0	118,6	
	28"		711,0		101,5	115	
	26"		660,0		127,0	111,4	
38"	36"	965,0	914,0	610	25,5	133,1	
	34"		864,0		50,5	129,5	
	32"		813,0		76,0	125,8	
	30"		762,0		101,5	122,2	
	28"		711,0		127,0	118,6	
	26"		660,0		152,5	114,9	

Footnotes see page 14

## Reducers acc. to ASME B16.9, cont'd

Dimensions in mm

Nominal diameter		Outside diameter at bevel		Length L	Eccentricity E	Connect. wall- thickness s1 / s2	Weight kg / piece concentric and eccent. 6)
Large DN1	Reduced DN2	Large D1	Reduced D2				
40"	38"	1016	965,0	610	25,5	2) 3)	150,3
	36"		914,0		51,0		136,8
	34"		864,0		76,0		133,1
	32"		813,0		101,5		129,5
	30"		762,0		127,0		125,8
42"	40"	1067	1016	610	25,5	2) 3)	147,6
	38"		965,0		51,0		144
	36"		914,0		76,5		140,4
	34"		864,0		101,5		136,8
	32"		813,0		127,0		133,1
	30"		762,0		152,5		129,5
44"	42"	1118	1067	610	25,5	2) 3)	154,9
	40"		1016		51,0		151,2
	38"		965,0		76,5		147,6
	36"		914,0		102,0		144
46"	44"	1168	1118	711	25,0	2) 3)	189,1
	42"		1067		50,5		184,9
	40"		1016		76,2		180,7
	38"		965,0		101,5		176,4
48"	46"	1219	1168	711	25,5	2) 3)	197,6
	44"		1118		50,5		193,4
	42"		1067		76,0		189,2
	40"		1016		101,5		184,9

Footnotes see page 14

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# Caps

acc. to ASME B16.9

**H 200**

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Example of Designation: Designation of a cap, nominal diameter 12", connecting wallthickness s1 = Std., material: ASTM A420 Gr.WPL3, surface finish: metallic

Part number  
**25114NE02**      **12" / 323,8 \* 9,53**      **Cap**      **A420 Gr.WPL3**  
**Sched. Std. H200/ASME B16.9**

Part numbering Code										
Position of Part No.										
1. - 3.		4.		5. - 6.		7. - 8.		9.		
Kind of Part		Surface finish		ASTM - Material		Connecting Wallthick.		Certificate		
7)		3)		1)		2)		8)		
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	
Cap	251	metallic	1	A234 Gr. WPA	4A	2)	0	ASME	2	
		outside	3	A234 Gr. WPB	4W	*)		9)	ASME	H
		bituminated and limed		A234 Gr. WP1	4B					
		protective coating inside and outside	4	A234 Gr. WP5	4C					
		protective coating inside	5	A234 Gr. WP11	4D					
		protective coating inside		A234 Gr. WP12	4E					
		protective coating inside	6	A234 Gr. WP22	4F					
		protective coating inside		A403 Gr. WP304	4G					
		protective coating outside	7	A403 Gr. WP304L	4H					
		protective coating outside		A403 Gr. WP316	4J					
		sandblasted inside	8	A403 Gr. WP316L	4K					
		sandblasted inside		A403 Gr. WP321	4L					
		Special finish	9	A420 Gr. WPL3	4N					
				A420 Gr. WPL6	4P					

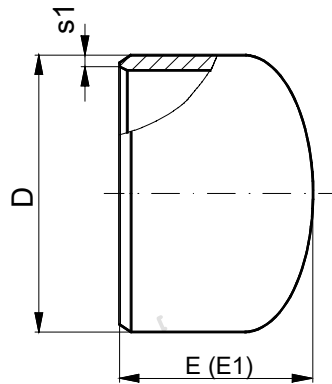
- 1) Materials acc. to ASTM - specifications  
All welds for - WX - materials have been radiographed
- 2) Wallthickness code acc.to Std. H0011  
Connecting wallthicknesses acc.to Std. H100 and piping specifications.
- 3) Code for surface finish  
Surfaces with code 3 to 9 acc. to order.
- 4) Weight refer to Type "Standard Wall".
- 5) Length E applies for thicknesses not exceeding that given in column "Limiting Wallthickness for length E".
- 6) Length E1 applies for thicknesses greater than given in column "Limiting Wallthickness" and for DN24" and smaller. For DN26" and larger, length E1 shall be agreed between manufacturer and purchaser.
- 7) Code for kind of part

The **allowable working pressure** of the **cap** is the **same as for the straight seamless pipe** with the same outside diameter, the same connecting wallthickness and comparable material.

- 8) Certificate acc.to ASME- / ASTM - Standards
- 9) For piping components with end coding H a "certified test report" acc.to ASTM A530 shall be provided.

**Caps acc. to ASME B16.9**

Welding bevel for s1 acc. to ASME B16.9



Dimensions in mm

Nominal diameter DN	Outside diameter at bevel D	Connect. wall-thickness s1	5) Length E	6) Length E1	Limiting wallthickn. for Length E	4) Weight kg / piece
1/2"	21,3	2)	25	25	4,57	0,032
3/4"	26,7				3,81	0,059
1"	33,4		38	38	4,57	0,10
1 1/4"	42,2				4,83	0,14
1 1/2"	48,3		44	44	5,08	0,17
2"	60,3				5,59	0,23
2 1/2"	73,0		51	51	7,11	0,37
3"	88,9				7,62	0,64
(3 1/2")	101,6		64	64	8,13	0,96
4"	114,3				8,64	1,16
5"	141,3		76	76	9,65	1,91
6"	168,3				10,92	2,91
8"	219,1		102	102	12,7	5,13
10"	273					9,08
12"	323,8		152	152	178	13,4
14"	355,6					16
16"	406,4		178	178	203	20,1
18"	457,0					25,9
20"	508,0		229	229	254	32,5
22"	559,0					39,3
24"	610,0		254	254	305	46,3
26"	660,0					50,8
28"	711,0		267	267	upon agreement	56
30"	762,0					56,7
32"	813,0		305	305	upon agreement	65,8
34"	864,0					72,6
36"	914,0		343	343	upon agreement	79,4
38"	965,0					86,2
40"	1016	305	305	upon agreement	95,3	
42"	1067				104	
44"	1118	343	343	upon agreement	120,2	
46"	1168				136	
48"	1219	159				

Footnotes see page 19

## Mitre Bends

according to AWWA C208-83

Part No.:

2	2	3)	2)	⋮	1)	4)	5)	7)
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Standard

**H 220A**

Page 1 of 4

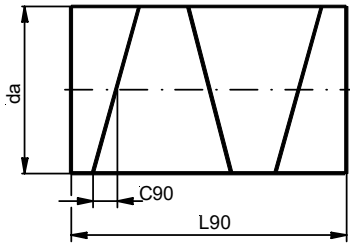
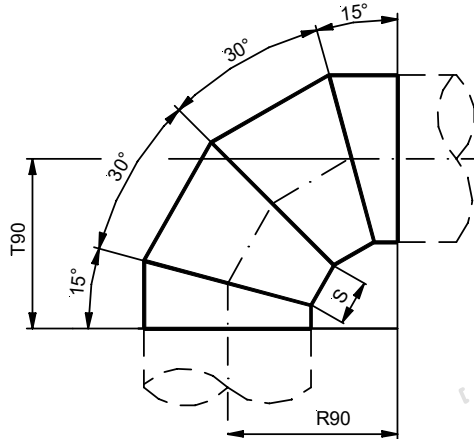
Example of Designation: Designation of a 4 piece mitre bend 90° with outside diameter 711 mm, and mitre wall thickness s = 12.7 mm, connecting wall thickness 9.53 mm, metallic, material: API 5L Gr.B

Part number  
**22113BEF2      711 \* 9,53      MITRE BEND 90 DEGR. 4 PIECE      API 5L GR.B**  
**TM = 12.7mm H220A/AWWA C208-83/FIG.2C/E = 0.85**

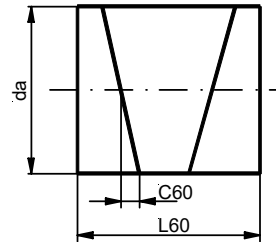
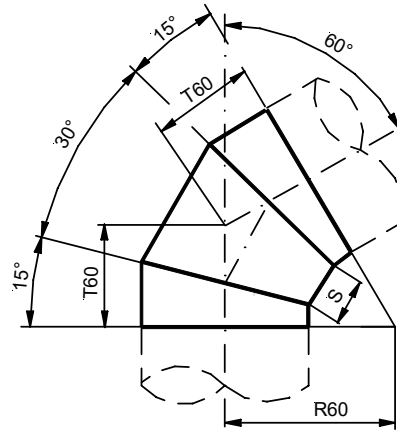
Part numbering Code										
Position of Part No.										
1. - 3.		4.		5. - 6.			7. - 8.		9.	
3) Kind of Part		2) Type / Finish		1) 6) Material			Wall thickness		7) Certificate	
Cd.	Cd.	Cd.	Cd.	Cd.	Code	Code	Code	Code	Code	
Mitre Bend 90°	221	metallic	1	A139 Gr.B	2J	* 4)	0	ASME	2	
	224	protective coating outside	6	API 5L Gr.B	3B	* 4)	+ 5)	ASME 8)	H	
		A283 Gr.B	A6							
Mitre Bend 60°	224									
Mitre Bend 45°	229									
Mitre Bend 30°	22A									

- 1) Materials:  
 API 5L Gr.B may be substituted by ASTM A53 Gr.B or ASTM A106 Gr.B.  
 ASTM A283 Gr.B may be substituted by equivalent plate material e.g. ASTM A285 Gr.B.  
 Protective coating outside in accordance with order.
- 2) Code for surface finish
- 3) Code for kind of part
- 4) Wall thickness **code for mating pipe** according to Standard H100 for ASME- / API-pipes  
 Matching of wall thickness to the mating pipe shall be made by manufacturer according to ASME B16.25.
- 5) **Code for mitre-wall thickness** according to Standard H100 for ASME- or API-wall thickness.  
 This code is only necessary if mitre thickness is not equal to the mating thickness.
- 6) Manufacturing and testing of finished product according to ASME B16.9  
 Welding joint efficiency E = 0.85  
 Tolerances: ≤ DN1200 according to ASME B16.9  
 ≥ DN1400 according to BS 534
- 7) Requirements and certificate according to ASTM-Standard
- 8) For piping components with end coding "H" a certified test report according to ASTM A530 shall be provided.
- 9) Outside diameters refer to ASME-/ ANSI B36.10.

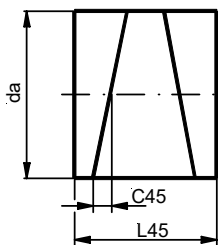
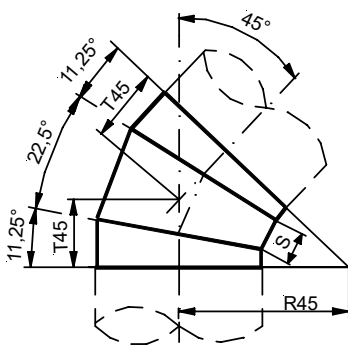
4 Piece Elbow 90°



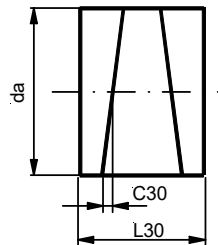
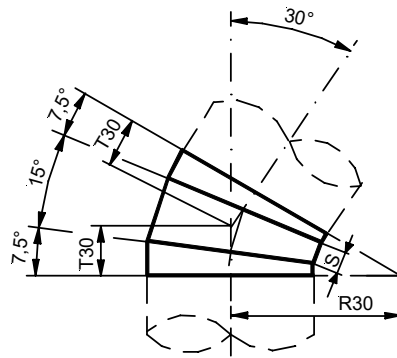
3 Piece Elbow 60°



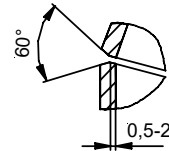
3 Piece Elbow 45°



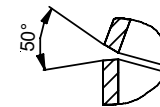
3 Piece Elbow 30°



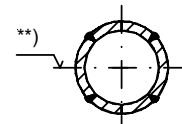
Welding bevel for Carbon-Steel  
DN 200 - 300



DN 400 - 2000



Position of longitudinal weld \*)



\*) The longitudinal weld of pipes must be situated in the middle of the quadrants and must be arranged in reverse order from segment to segment.

\*\*\*) Curvature plane

**Mitre Bends according to AWWA C208-83**

**3 Piece Elbows 30°, 45° and 60° according to table 2B**

Nom. diam. DN	Outside diameter da 9)		R30	R45	R60	C30	C45	C60	T30	T45	T60	*) L30	*) L45	*) L60	S
	inch	mm													
150	6 5/8	168,3	662,9	467,2	368,5	11,1	16,7	22,5	177,6	193,5	212,8	349	372	395	152,4
200	8 5/8	219,1	688,3	492,6	393,9	14,4	21,8	29,4	184,4	204,1	227,4	362	392	422	152,4
250	10 3/4	273	715,3	519,6	420,9	18,0	27,2	36,6	191,7	215,2	243,0	377	413	451	152,4
300	12 3/4	323,9	758,8	557,0	455,2	21,3	32,2	43,4	203,3	230,7	262,8	400	443	488	157,2
350	14	355,6	804,8	592,8	485,9	23,4	35,4	47,6	215,7	245,5	280,5	424	472	521	165,1
400	16	406,4	878,5	650,1	535,0	26,8	40,4	54,4	235,4	269,3	308,9	463	517	573	177,8
450	18	457	952,0	707,4	584,0	30,1	45,5	61,2	255,1	293,0	337,2	501	563	626	190,5
500	20	508	1025,7	764,8	633,2	33,4	50,5	68,1	274,8	316,8	365,6	540	608	679	203,2
550	22	559	1099,5	822,2	682,4	36,8	55,6	74,9	294,6	340,6	394,0	579	654	731	215,9
600	24	610	1173,2	879,6	731,6	40,2	60,7	81,7	314,4	364,4	422,4	618	700	784	228,6
650 **)	26	660	1246,4	936,5	780,3	43,4	65,6	88,4	334,0	387,9	450,5	656	745	836	241,3
700 **)	28	711	1320,2	994,0	829,5	46,8	70,7	95,3	353,7	411,7	478,9	695	791	889	254,0
750	30	762	1393,9	1051,4	878,7	50,2	75,8	102,1	373,5	435,5	507,3	734	837	942	266,7
800 **)	32	813	1467,6	1108,8	927,9	53,5	80,9	108,9	393,2	459,3	535,7	773	882	994	279,4
850 **)	34	864	1541,4	1166,2	977,1	56,9	85,9	115,8	413,0	483,1	564,1	812	928	1047	292,1
900	36	914	1614,6	1223,2	1025,8	60,2	90,9	122,5	432,6	506,7	592,2	850	973	1099	304,8
950 **)	38	965	1640,1	1248,7	1051,3	63,5	96,0	129,3	439,5	517,2	609,6	864	994	1127	304,8
1000 **)	40	1016	1665,6	1274,2	1076,8	66,9	101,0	136,1	446,3	527,8	621,7	877	1014	1154	304,8
1050	42	1067	1691,1	1299,7	1102,3	70,2	106,1	143,0	453,1	538,3	636,4	891	1034	1181	304,8
1100 **)	44	1118	1716,6	1325,2	1127,8	73,6	111,2	149,8	460,0	548,9	651,1	904	1054	1209	304,8
1150 **)	46	1168	1741,6	1350,2	1152,8	76,9	116,2	156,5	466,7	559,3	665,5	917	1074	1236	304,8
1200	48	1219	1767,1	1375,7	1178,3	80,2	121,2	163,3	473,5	569,8	680,3	931	1095	1263	304,8
1300 **)	52	1321	1818,1	1426,7	1229,3	87,0	131,4	177,0	487,2	590,9	709,7	957	1135	1318	304,8
1350	54	1372	1843,6	1452,2	1254,8	90,3	136,5	183,8	494,0	601,5	724,4	971	1155	1345	304,8
1400 **)	56	1422	1868,6	1477,2	1279,8	93,6	141,4	190,5	500,7	611,9	738,9	984	1175	1372	304,8
1500	60	1524	1919,6	1528,2	1330,8	100,3	151,6	204,2	514,4	633,0	768,3	1011	1216	1426	304,8
1600 **)	64	1626	1970,6	1579,2	1381,8	107,0	161,7	217,8	528,0	654,1	797,8	1038	1256	1481	304,8
1650	66	1676	1995,6	1604,2	1406,8	110,3	166,7	224,5	534,7	664,5	812,2	1051	1276	1508	304,8
1700 **)	68	1727	2021,1	1629,7	1432,3	113,7	171,8	231,4	541,6	675,0	826,9	1064	1297	1535	304,8
1800	72	1829	2072,1	1680,7	1483,3	120,4	181,9	245,0	555,2	696,2	856,4	1091	1337	1590	304,8
1900 **)	76	1930	2122,6	1731,2	1533,8	127,0	192,0	258,6	568,7	717,1	885,5	1118	1377	1644	304,8
1950	78	1981	2148,1	1756,7	1559,3	130,4	197,0	265,4	575,6	727,6	900,2	1131	1398	1671	304,8
2000 **)	80	2032	2173,6	1782,2	1584,8	133,8	202,1	272,2	582,4	738,2	915,0	1145	1418	1699	304,8
2100	84	2134	2224,6	1833,2	1635,8	140,5	212,2	285,9	596,1	759,3	944,4	1171,5	1459	1753	304,8
2200 **)	88	2236	2275,6	1884,2	1686,8	147,2	222,4	299,6	609,7	780,4	973,9	1198	1499	1808	304,8
2250	90	2286	2300,6	1909,2	1711,8	150,5	227,4	306,3	616,4	790,8	988,3	1212	1519	1835	304,8
2400	96	2438	2376,6	1985,2	1787,8	160,5	242,5	326,6	636,8	822,3	1032,2	1252	1579	1916	304,8

\*) The total length L30, L45 and L60 do not include the width of the cutting tool.

\*\*\*) These DN (Nominal diameters) not covered by AWWA C208-83

Further footnotes see page 1.

**Mitre Bends according to AWWA C208-83**

**4 Piece Elbow 90° according to Table 2C**

Nom. diam. DN	Outside diameter da 9)		R90 = T90	C90	*) L90	S
	inch	mm				
150	6 5/8	168,3	368,5	22,5	592	152,4
200	8 5/8	219,1	393,9	29,4	633	152,4
250	10 3/4	273	420,9	36,6	677	152,4
300	12 3/4	323,9	455,2	43,4	732	157,2
350	14	355,6	485,9	47,6	781	165,1
400	16	406,4	535,0	54,4	860	177,8
450	18	457	584,0	61,2	939	190,5
500	20	508	633,2	68,1	1018	203,2
550	22	559	682,4	74,9	1097	215,9
600	24	610	731,6	81,7	1176	228,6
650 **)	26	660	780,3	88,4	1254	241,3
700 **)	28	711	829,5	95,3	1334	254,0
750	30	762	878,7	102,1	1413	266,7
800 **)	32	813	927,9	108,9	1492	279,4
850 **)	34	864	977,1	115,8	1571	292,1
900	36	914	1025,8	122,5	1649	304,8
950 **)	38	965	1051,3	129,3	1690	304,8
1000 **)	40	1016	1076,8	136,1	1731	304,8
1050	42	1067	1102,3	143,0	1772	304,8
1100 **)	44	1118	1127,8	149,8	1813	304,8
1150 **)	46	1168	1152,8	156,5	1853	304,8
1200	48	1219	1178,3	163,3	1894	304,8
1300 **)	52	1321	1229,3	177,0	1976	304,8
1350	54	1372	1254,8	183,8	2017	304,8
1400 **)	56	1422	1279,8	190,5	2057	304,8
1500	60	1524	1330,8	204,2	2139	304,8
1600 **)	64	1626	1381,8	217,8	2221	304,8
1650	66	1676	1406,8	224,5	2262	304,8
1700 **)	68	1727	1432,3	231,4	2303	304,8
1800	72	1829	1483,3	245,0	2385	304,8
1900 **)	76	1930	1533,8	258,6	2466	304,8
1950	78	1981	1559,3	265,4	2507	304,8
2000 **)	80	2032	1584,8	272,2	2548	304,8
2100	84	2134	1635,8	285,9	2630	304,8
2200 **)	88	2236	1686,8	299,6	2712	304,8
2250	90	2286	1711,8	306,3	2752	304,8
2400	96	2438	1787,8	326,6	2874	304,8

\*) The total length L90 do not include the width of the cutting tool.

\*\*) These DN (Nominal diameters) not covered by AWWA C208-83

Further footnotes see page 1

# Weldolets for ASME-pipelines

Standard

**H 234A**

Page 1 of 15

Example of Designation: Designation of a Weldolet type Extra Strong for run pipe DN 10" with matching wall thickness s1 = Schedule 60 and branch pipe DN 2" with matching wall thickness s2 = Schedule 80, material: ASTM A105

Part number  
**234F5B452 273.0 \* 12.7 / 60.3 \* 5.54 WELDOLET EXTRA STRONG ASTM A105 SCHED.60/80 H234A/MSS SP97**

Part numbering Code										
Position of Part No.										
1. - 3.		4.		5. - 6.			7. - 8.		9.	
Kind of Part		Type 3)		Material 1)			Wall thickness		Certificate 4)	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	
Weldolets	234	Standard	E	A105	5B	* 2)	* 2)	ASME	2	
		Extra strong	F	A182 Gr.F1	5E			ASME 5)	H	
		Double extra strong	G	A182 Gr.F5	5F					
		Light Weight	L	A182 Gr.F11	5J					
				A182 Gr.F12	5K					
		Schedule 160	9	A182 Gr.F22	5L					
				A182 Gr.F304	5M					
				A182 Gr.F316	5P					
				A182 Gr.F321	5Q					
				A350 Gr.LF1	5W					
				A350 Gr.LF3	5Y					
				A182 Gr.F304L	F4					
		A182 Gr.F316L	F6							
		A182 Gr.F321H	F7							

- 1) Materials:  
Materials according to relevant ASTM-specifications.
- 2) Code for matching wall thickness according to Standard H0011.  
Matching wall thickness see Standard H100 and piping specifications.
- 3) Code for type.
- 4) Certificate according to ASTM-specifications.
- 5) For piping components with end coding H a "certified test report" acc. to ASTM A530 shall be provided.

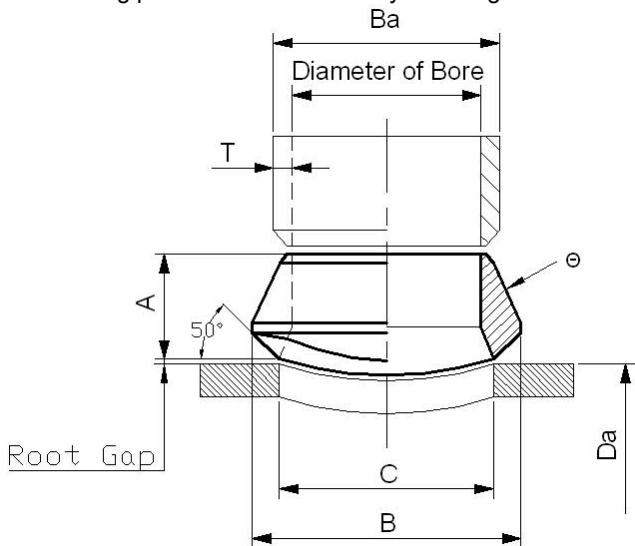
The enclosed tables show the allowable operation pressure for Weldolets®.

They cover the types:

- Standard
- Schedule 40
- Extra strong (XS)
- Schedule 80
- Schedule 160
- Double Extra Strong (XXS)
- Light Weight

The table for Schedule 40 is an exact copy of the table for type Standard, as both schedules are identical up to nominal bore 10" inclusive. Relative to this, the table for Schedule 80 is identical to the table for Type XS up to nominal bore 8" inclusive. Therefore type Schedule 40 and 80 have been omitted.

The working pressure is calculated by following formula:



$$\sigma = \frac{10 P_E^* F_B}{F} \cong \frac{K}{1,8}$$

or:

$$P_E = \frac{F * K}{1,8 * 10 * F_B}$$

$$F = A (0.5 T + 0.5 A \tan \Theta)$$

$$F_B = 0.25 C Da + 0.5 A (Ba - 2 T)$$

$K$  = high temperature yield point in  $N/mm^2$

$P_E$  = allowable pressure for Weldolets® in bar

$T$  = wall thickness of branch

$Ba$  = outside diameter of branch pipe

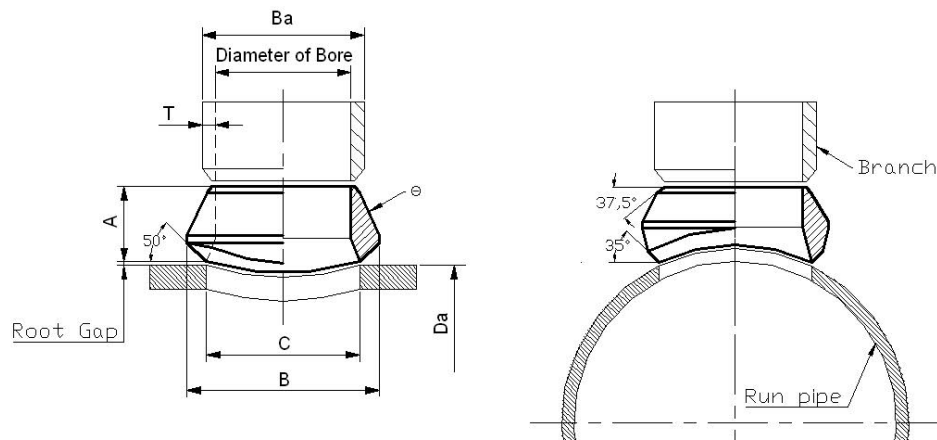
$Da$  = outside diameter of run pipe

$C$  = diameter of opening in run pipe

$A$  = height of the Weldolet®

$\Theta$  = angle of gradient (see drawing above)

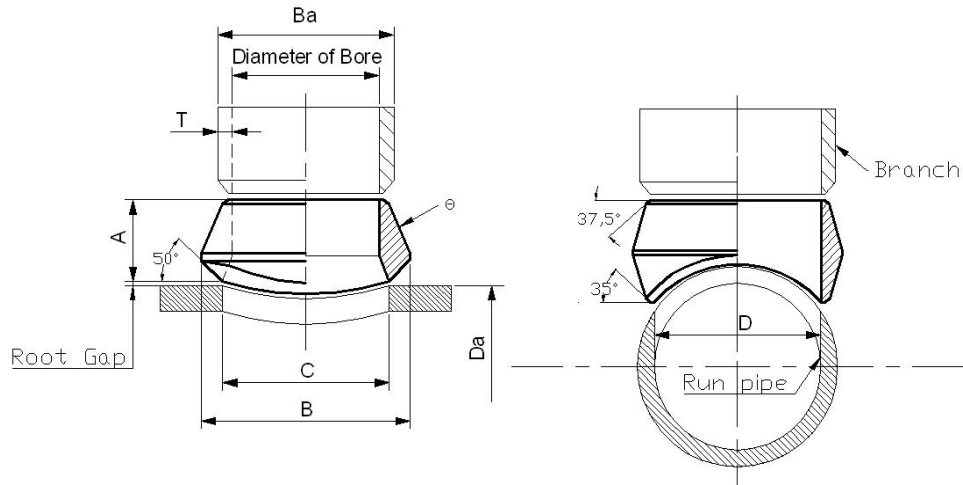
**Reducing Sizes  
Type: Standard**



Dimensions									
Run pipe DN inch	Branch pipe		A		B	C		Diameter of Bore mm	Weight kg/piece
	DN inch	Wall thickness mm	inch	mm	inch	inch	mm		
3/8 up to 36	1/8	1,73	9/16	14,300	1	5/8	15,875	6,832	0,04
3/8 up to 36	1/4	2,24	9/16	14,300	1	5/8	15,875	9,245	0,04
1/2 up to 36	3/8	2,31	3/4	19,050	1 1/4	3/4	19,050	12,522	0,07
3/4 up to 36	1/2	2,77	3/4	19,050	1 3/8	15/16	23,825	15,798	0,08
1 up to 36	3/4	2,87	7/8	22,225	1 3/4	1 3/16	30,175	20,929	0,11
1 1/4 up to 36	1	3,38	1 1/16	27,000	2 1/8	1 7/16	36,525	26,644	0,23
1 1/2 up to 36	1 1/4	3,56	1 1/4	31,750	2 9/16	1 3/4	44,450	35,052	0,36
2 up to 36	1 1/2	3,68	1 5/16	33,350	2 7/8	2	50,800	40,894	0,45
2 1/2 up to 36	2	3,91	1 1/2	38,100	3 1/2	2 9/16	65,100	52,502	0,79
3 up to 36	2 1/2	5,16	1 5/8	41,275	4 1/16	3	76,200	62,713	1,13
3 1/2 up to 36	3	5,49	1 3/4	44,450	4 13/16	3 11/16	93,675	77,927	1,81
4 up to 36	3 1/2	5,74	1 7/8	47,625	5 5/8	4 7/16	112,725	90,119	2,50
5 up to 36	4	6,02	2	50,800	6	4 3/4	120,650	102,260	2,86
6 up to 36	5	6,55	2 1/4	57,150	7 1/16	5 9/16	141,300	128,194	4,65
8 up to 36	6	7,11	2 3/8	60,325	8 1/2	6 11/16	169,875	154,051	5,45
10 up to 36	8	8,18	2 3/4	69,850	10 3/8	8 11/16	220,675	202,717	10,45
12 up to 36	10	9,27	3 1/16	77,800	12 11/16	10 13/16	274,650	254,508	16,36
14 up to 36	12	9,53	3 3/8	85,725	14 7/8	12 13/16	325,450	304,800	26,76
16 up to 36	14	9,53	3 1/2	88,900	16 1/8	14 1/16	357,200	336,550	29,24
18 up to 36	16	9,53	3 11/16	93,675	18 1/4	16 1/16	408,000	387,350	34,02
20 up to 36	18	9,53	3 13/16	96,850	20 1/2	18 1/16	458,000	438,150	44,00
22 up to 36	20	9,53	4	101,600	22 1/2	20	508,000	488,950	53,52
26 up to 36	24	9,53	4 9/16	115,900	27 1/8	24 3/16	614,375	590,550	101,00
28 up to 36	26	9,53	4 11/16	119,075	29 1/16	26 1/4	666,750	641,350	120,00
32 up to 36	30	9,53	5 3/8	136,525	34 1/16	31 9/16	801,700	742,950	190,00

# H 234A

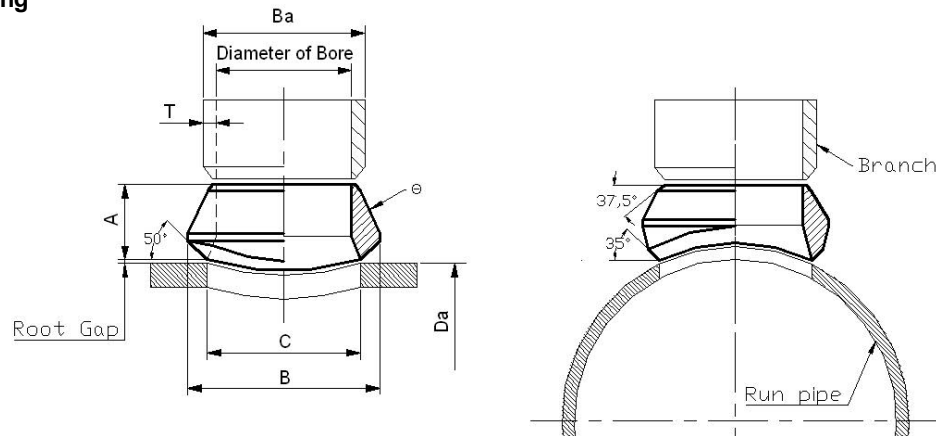
**Full Sizes**  
**Type: Standard**



Dimensions

Run pipe DN inch	Branch pipe		A		B	C		D	Diameter of Bore mm	Weight kg/piece
	DN inch	Wall thickness mm	inch	mm	inch	inch	mm	inch		
1/2	1/2	2,77	3/4	19,050	1 3/8	15/16	23,825	5/8	15,798	0,07
3/4	3/4	2,87	7/8	22,225	1 5/8	1 3/16	30,175	13/16	20,929	0,11
1	1	3,38	1 1/16	27,000	2	1 7/16	36,525	1 1/32	26,644	0,18
1 1/4	1 1/4	3,56	1 1/4	31,750	2 3/8	1 3/4	44,450	1 3/8	35,052	0,32
1 1/2	1 1/2	3,68	1 5/16	33,350	2 7/8	2	50,800	1 5/8	40,894	0,36
2	2	3,91	1 1/2	38,100	3 1/2	2 9/16	65,100	2 1/16	52,502	0,68
2 1/2	2 1/2	5,16	1 5/8	41,275	4 1/16	3	76,200	2 7/16	62,713	1,02
3	3	5,49	1 3/4	44,450	4 13/16	3 11/16	93,675	3 1/16	77,927	1,70
3 1/2	3 1/2	5,74	1 7/8	47,625	5 3/8	4 7/16	112,725	3 9/16	90,119	2,27
4	4	6,02	2	50,800	6	4 3/4	120,650	4	102,260	3,04
5	5	6,55	2 1/8	53,975	7 1/8	5 13/16	147,650	5 1/16	128,194	3,86
6	6	7,11	2 3/8	60,325	8 1/2	6 11/16	169,875	6 1/16	154,051	6,36
8	8	8,18	2 3/4	69,850	10 3/8	8 11/16	220,675	7 15/16	202,717	12,72
10	10	9,27	3 1/16	77,800	12 9/16	10 13/16	274,650	10	254,508	17,72
12	12	9,53	3 3/8	85,725	14 7/8	12 13/16	325,450	12	304,800	29,54
14	14	9,53	3 1/2	88,900	16 1/8	14 1/16	357,200	13 1/4	336,550	31,75
16	16	9,53	3 11/16	93,675	18 1/4	16 1/16	408,000	15 1/4	387,350	41,73
18	18	9,53	4 1/16	103,200	20 3/4	18 5/8	473,075	17 1/4	438,150	56,70
20	20	9,53	4 5/8	117,475	23 1/16	20 1/16	509,600	19 1/4	488,950	79,38
24	24	9,53	5 3/8	136,525	27 7/8	25 1/8	638,200	23 1/4	590,550	114,00
30	30	9,53	5 3/8	136,525	34 1/16	31 9/16	801,700	29 1/4	742,950	230,00

**Reducing Sizes  
Type: Extra Strong**

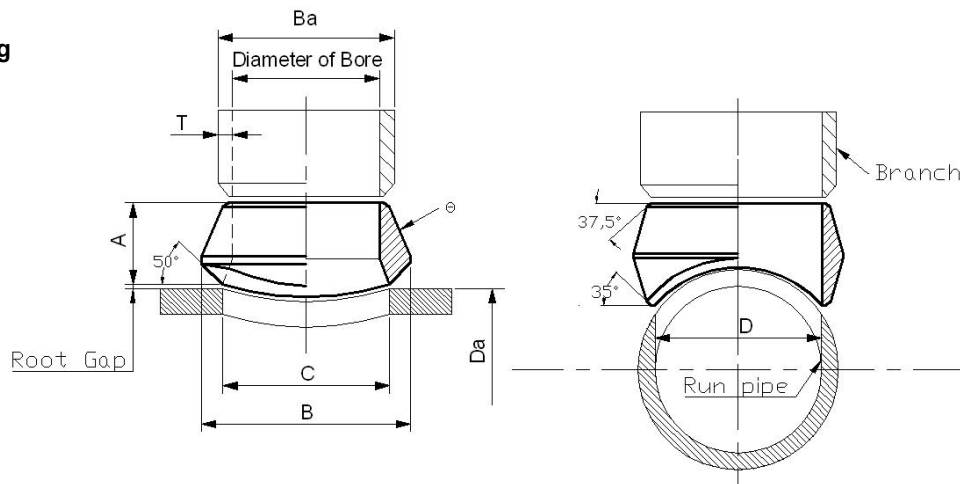


Dimensions									
Run pipe DN inch	Branch pipe		A		B	C		Diameter of Bore mm	Weight kg/piece
	DN inch	Wall thickness mm	inch	mm	inch	inch	mm		
3/8 up to 36	1/8	2,41	9/16	14,300	1	5/8	15,875	5,460	0,05
3/8 up to 36	1/4	3,02	9/16	14,300	1	5/8	15,875	7,670	0,05
1/2 up to 36	3/8	3,20	3/4	19,050	1 1/4	3/4	19,050	10,740	0,07
3/4 up to 36	1/2	3,73	3/4	19,050	1 3/8	15/16	23,825	13,860	0,09
1 up to 36	3/4	3,91	7/8	22,225	1 3/4	1 3/16	30,175	18,840	0,14
1 1/4 up to 36	1	4,55	1 1/16	27,000	2 1/8	1 7/16	36,525	24,300	0,21
1 1/2 up to 36	1 1/4	4,85	1 1/4	31,750	2 9/16	1 3/4	44,450	32,461	0,41
2 up to 36	1 1/2	5,08	1 5/16	33,350	2 7/8	2	50,800	38,100	0,50
2 1/2 up to 36	2	5,54	1 1/2	38,100	3 1/2	2 9/16	65,100	49,250	0,79
3 up to 36	2 1/2	7,01	1 5/8	41,275	4 1/16	3	76,200	59,000	1,18
3 1/2 up to 36	3	7,62	1 3/4	44,450	4 13/16	3 11/16	93,675	73,660	1,86
4 up to 36	3 1/2	8,08	1 7/8	47,625	5 3/8	4 7/16	112,725	85,446	2,54
5 up to 36	4	8,56	2	50,800	6	4 3/4	120,650	97,180	2,90
6 up to 36	5	9,53	2 1/4	57,150	7 1/16	5 9/16	141,300	122,250	4,72
8 up to 36	6	10,97	3 1/16	77,800	8 7/8	6 11/16	169,875	146,320	10,43
10 up to 36	8	12,70	3 7/8	98,425	11 1/2	8 11/16	220,675	193,670	16,78
12 up to 36	10	12,70	3 11/16	93,675	12 3/4	10 7/16	265,100	247,650	20,87
14 up to 36	12	12,70	4 1/16	103,200	14 15/16	12 1/2	317,500	298,450	27,67
16 up to 36	14	12,70	3 5/16	100,025	17	13 13/16	350,850	330,200	31,75
18 up to 36	16	12,70	4 3/16	106,400	18 3/8	15 7/8	403,250	381,000	46,27
20 up to 36	18	12,70	4 3/8	111,120	20 5/8	17 15/16	455,650	431,800	58,97
22 up to 36	20	12,70	4 11/16	119,075	22 15/16	20 1/16	509,600	482,600	71,67
26 up to 36	24	12,70	5 1/2	139,700	27 7/8	25 1/8	638,200	584,200	142,00
28 up to 36	26	12,70	5 3/4	146,500	30 1/8	27 1/4	692,150	635,000	168,00

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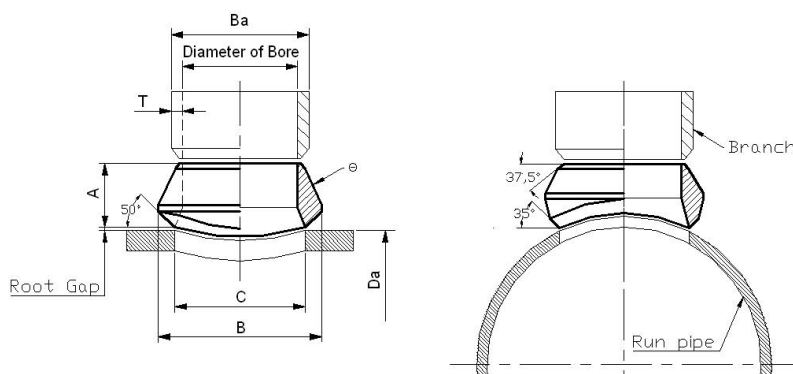
**Full Sizes**  
**Type: Extra Strong**



Dimensions

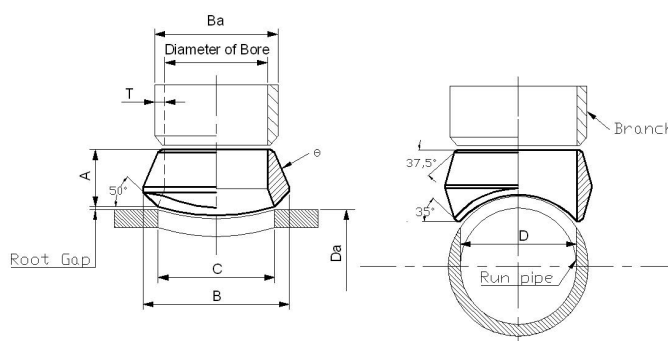
Run pipe DN inch	Branch pipe		A		B	C		D	Diameter of Bore mm	Weight kg/piece
	DN inch	Wall thickness mm	inch	mm	inch	inch	mm	inch		
1/2	1/2	3,73	3/4	19,050	1 3/8	15/16	23,825	5/8	13,86	0,07
3/4	3/4	3,91	7/8	22,225	1 5/8	1 3/16	30,175	13/16	18,84	0,11
1	1	4,55	1	25,400	2	1 7/16	36,525	1 1/32	24,30	0,18
1 1/4	1 1/4	4,85	1 1/8	28,600	2 7/16	1 3/4	44,450	1 3/8	32,46	0,32
1 1/2	1 1/2	5,08	1 1/4	31,750	2 7/8	2	50,800	1 5/8	38,10	0,41
2	2	5,54	1 1/2	38,100	3 1/2	2 9/16	65,100	2 1/16	49,25	0,73
2 1/2	2 1/2	7,01	1 5/8	41,275	4 1/16	3	76,200	2 7/8	59,00	1,13
3	3	7,62	1 3/4	44,450	4 13/16	3 11/16	93,675	3 1/16	73,66	1,86
3 1/2	3 1/2	8,08	1 7/8	47,625	5 3/8	4 7/16	112,725	3 9/16	85,45	2,30
4	4	8,56	2	50,800	6	4 3/4	120,650	4	97,18	3,40
5	5	9,53	2 1/16	52,400	7 1/8	5 13/16	147,650	5 1/16	122,25	4,31
6	6	10,97	3 1/16	77,800	8 7/8	6 11/16	169,875	6 1/16	146,32	6,80
8	8	12,70	3 7/8	94,425	10 5/8	8 11/16	220,675	7 5/8	193,67	14,52
10	10	12,70	3 3/4	95,250	12 7/8	10 7/8	276,250	9 3/4	247,65	20,87
12	12	12,70	3 15/16	100,025	15 3/16	13	330,200	11 3/4	298,45	27,67
14	14	12,70	4 1/8	104,800	16 11/16	14 5/16	363,600	13	330,20	34,02
16	16	12,70	4 7/16	112,700	18 7/8	16 1/2	419,100	15	381,00	52,16
18	18	12,70	4 11/16	119,075	21 1/8	18 5/8	473,200	17	431,80	58,97
20	20	12,70	5	127,000	23 3/8	20 13/16	528,650	19	482,60	84,82
24	24	12,70	5 1/2	139,700	27 7/8	25 1/8	638,200	23	584,20	146,00
26	26	12,70	5 3/4	146,050	30 1/8	27 1/4	692,150	25	635,00	182,00

**Reducing Sizes**  
**Type: Double Extra Strong**



Dimensions									
Run pipe DN inch	Branch pipe		A		B	C		Diameter of Bore mm	Weight kg/piece
	DN inch	Wall thickness mm	inch	mm	inch	inch	mm		
3/4 up to 12	1/2	7,47	1 1/8	28,575	1 3/8	9/16	14,288	6,400	0,25
1 up to 12	3/4	7,82	1 1/4	31,750	1 3/4	3/4	19,050	11,020	0,71
1 1/4 up to 12	1	9,09	1 1/2	38,100	2	1	25,400	15,210	0,83
1 1/2 up to 12	1 1/4	9,70	1 3/4	44,450	2 7/16	1 7/16	33,338	22,750	1,25
2 up to 12	1 1/2	10,15	2	50,800	2 3/4	1 1/2	38,100	27,940	1,75
2 1/2 up to 12	2	11,07	2 3/16	55,562	3 3/16	1 11/16	42,862	38,176	2,13
3 up to 12	2 1/2	14,02	2 7/16	61,912	3 13/16	2 1/8	53,975	44,980	3,38
3 1/2 up to 12	3	15,24	2 7/8	73,025	4 3/4	2 7/8	73,025	58,420	6,32
5 up to 12	4	17,11	3 5/16	84,138	6	3 7/8	98,425	80,060	10,50
6 up to 12	5	19,05	3 11/16	93,662	7 3/8	4 13/16	122,240	103,200	14,25
8 up to 12	6	21,95	4 1/8	104,780	8 11/16	5 3/4	146,050	124,380	28,00
10 up to 12	8	22,23	4 3/8	111,120	11 3/16	6 13/16	173,040	174,625	-

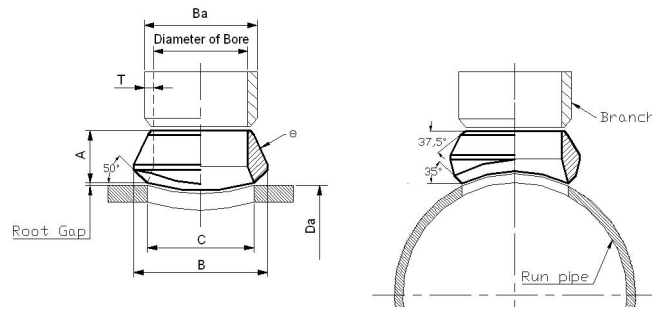
**Full Sizes**  
**Type: Double Extra Strong**



Dimensions									
Run pipe DN inch	Branch pipe		A		B	C		Diameter of Bore mm	Weight kg/piece
	DN inch	Wall thickness mm	inch	mm	inch	inch	mm		
1/2	1/2	7,47	1 1/8	28,575	1 3/8	9/16	14,288	6,400	0,11
3/4	3/4	7,82	1 1/4	31,750	1 3/4	3/4	19,050	11,020	0,32
1	1	9,09	1 1/2	38,100	2	1	25,400	15,210	0,38
1 1/4	1 1/4	9,70	1 3/4	44,450	2 7/16	1 5/16	33,338	22,750	0,57
1 1/2	1 1/2	10,15	2	50,800	2 3/4	1 1/2	38,100	27,940	0,79
2	2	11,07	2 3/16	55,562	3 3/16	1 11/16	42,862	38,170	0,97
2 1/2	2 1/2	14,02	2 7/16	61,912	3 13/16	2 1/8	53,975	44,980	1,53
3	3	15,24	2 7/8	73,025	4 3/4	2 7/8	73,025	58,420	2,87
4	4	17,11	3 5/16	84,138	6	3 7/8	98,425	80,060	4,76
5	5	19,05	3 11/16	93,662	7 3/8	4 13/16	122,240	103,200	6,46
6	6	21,95	4 1/8	104,780	8 11/16	5 3/4	146,050	124,380	13,72
8	8	22,23	4 3/8	111,120	11 3/16	6 13/16	173,040	174,625	-

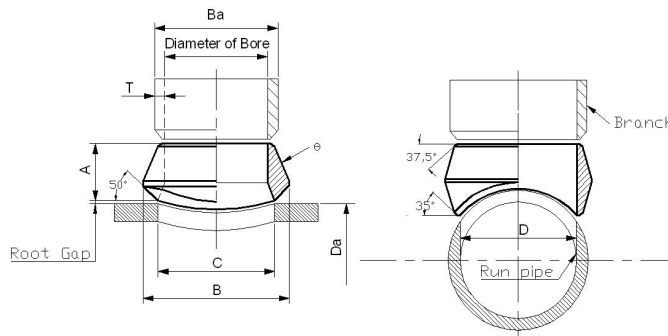
# H 234A

## Reducing Sizes Type: Schedule 160



Dimensions									
Run pipe DN inch	Branch pipe		A		B	C		Diameter of Bore mm	Weight kg/piece
	DN inch	Wall thickness mm	inch	mm	inch	inch	mm		
3/4 up to 12	1/2	4,78	1 1/8	28,575	1 3/8	9/16	14,288	11,830	0,11
1 up to 12	3/4	5,56	1 1/4	31,750	1 3/4	3/4	19,050	15,590	0,32
1 1/4 up to 12	1	6,35	1 1/2	38,100	2	1	25,400	20,700	0,38
1 1/2 up to 12	1 1/4	6,35	1 3/4	44,450	2 7/16	1 5/16	33,338	29,460	0,57
2 up to 12	1 1/2	7,14	2	50,800	2 3/4	1 1/2	38,100	33,980	0,79
2 1/2 up to 12	2	8,74	2 3/16	55,562	3 3/16	1 11/16	42,862	42,900	0,97
3 up to 12	2 1/2	9,53	2 7/16	61,912	3 13/16	2 1/8	53,975	53,975	1,53
3 1/2 up to 12	3	11,13	2 7/8	73,025	4 3/4	2 7/8	73,025	66,670	2,87
5 up to 12	4	13,49	3 5/16	84,138	6	3 7/8	98,425	87,300	4,76
6 up to 12	5	15,88	3 11/16	93,662	7 3/8	4 13/16	122,240	109,550	6,46
8 up to 12	6	18,26	4 1/8	104,780	8 11/16	5 3/4	146,050	131,800	12,70
10 up to 12	8	23,01	4 3/8	111,120	11 3/16	6 13/16	173,040	173,050	20,41
12	10	28,58	4 15/16	125,410	12 5/16	8 1/2	215,900	215,900	38,56

## Full Sizes Type: Schedule 160



Dimensions									
Run pipe DN inch	Branch pipe		A		B	C		Diameter of Bore mm	Weight kg/piece
	DN inch	Wall thickness mm	inch	mm	inch	inch	mm		
1/2	1/2	4,78	1 1/8	28,575	1 3/8	9/16	14,288	11,830	0,11
3/4	3/4	5,56	1 1/4	31,750	1 3/4	3/4	19,050	15,590	0,32
1	1	6,35	1 1/2	38,100	2	1	25,400	20,700	0,38
1 1/4	1 1/4	6,35	1 3/4	44,450	2 7/16	1 5/16	33,338	29,460	0,57
1 1/2	1 1/2	7,14	2	50,800	2 3/4	1 1/2	38,100	33,980	0,79
2	2	8,74	2 3/16	55,562	3 3/16	1 11/16	42,862	42,900	0,97
2 1/2	2 1/2	9,53	2 7/16	61,912	3 13/16	2 1/8	53,975	53,980	1,53
3	3	11,13	2 7/8	73,025	4 3/4	2 7/8	73,025	66,670	2,87
4	4	13,49	3 5/16	84,138	6	3 7/8	98,425	87,300	4,76
5	5	15,88	3 11/16	93,662	7 3/8	4 13/16	122,240	109,550	6,46
6	6	18,26	4 1/8	104,780	8 11/16	5 3/4	146,050	131,800	13,72
8	8	23,01	4 3/8	111,120	11 3/16	6 13/16	173,040	173,050	21,32
10	10								87,00
12	12								137

Operation pressure in bar for Weldolets® - Standard  
Material: C22.8 at temperatures up to 100° C 6)

		Run pipe dimension																					
		DN	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	
Branch pipe dimension	DN	OD	26,7	33,4	48,3	60,3	73,0	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914	
	1/2	21,3	531	470	374	322	280	241	198	165	142	112	92	79	72	63	56	52	43	37		29	
	3/4	26,7	440	451	366	317	278	242	200	168	145	115	95	81	74	66	59	53	45	39		30	
	1	33,4		428	400	352	311	273	249	194	168	135	112	97	89	78	70	63	53	47		37	
	1 1/2	48,3			370	330	297	264	224	193	169	138	115	100	92	82	73	66	56	49		39	
	2	60,3				311	282	253	215	187	165	135	113	99	91	81	73	66	60	49		39	
	2 1/2	73,0					278	251	215	188	166	137	115	100	93	82	74	68	57	49		40	
	3	88,9						227	196	171	153	126	106	93	86	77	69	63	53	47		37	
	4	114,3							186	163	146	122	104	91	84	75	68	62	53	46		37	
	5	141,3								147	147	124	105	94	87	78	71	65	55	48		38	
	6	168,3									134	113	97	86	80	72	66	60	51	45		36	
	8	219,1										110	96	85	79	71	65	60	51	46		37	
	10	273,0											92	82	76	69	63	58	50	45		36	
	12	323,9												80	75	68	62	57	50	45		36	
	15	355,6													72	65	60	55	49	43		35	
	16	406,4														62	57	52	46	41		33	
	18	457,2															57	50	43	38		31	
	20	508																60	41	37		30	
	24	610																		52	39		32

Operation pressure in bar for Weldolets® - Extra Strong  
Material: C22.8 at temperatures up to 100° C 6)

		Run pipe dimension																					
		DN	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	
Branch pipe dimension	DN	OD	26,7	33,4	48,3	60,3	73,0	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914	
	1/2	21,3	604	530	418	357	309	265	216	180	154	122	100	85	78	68	61	55	47	40		31	
	3/4	26,7	500	505	406	351	306	264	182	182	157	125	103	88	80	71	63	57	48	42		32	
	1	33,4		446	442	387	342	298	248	209	182	146	120	104	95	84	75	68	57	49		39	
	1 1/2	48,3			382	362	324	288	243	208	183	149	123	106	98	87	78	71	60	52		41	
	2	60,3				342	308	275	234	203	178	146	121	105	98	87	78	71	60	52		41	
	2 1/2	73,0					306	273	234	204	180	148	124	107	100	89	80	73	61	53		43	
	3	88,9						249	214	187	165	137	115	100	93	83	75	68	57	50		40	
	4	114,3							204	179	159	132	112	98	91	81	74	67	57	49		40	
	5	141,3								154	160	135	115	102	95	85	77	70	60	52		42	
	6	168,3									211	181	157	140	130	118	108	100	86	75		60	
	8	219,1										198	174	155	147	134	123	113	99	98		71	
	10	273,0											113	102	95	86	79	73	63	55		45	
	12	323,9												105	106	98	90	83	78	55		52	
	15	355,6													97	84	77	72	62	55		46	
	16	406,4														85	74	68	60	53		44	
	18	457,2															76	65	56	50		42	
	20	508																69	56	50		42	
	24	610																		58	52		44

6) Multiplication factors for different materials and temperatures see page 15.

Operation pressure in bar for Weldolets<sup>®</sup> - Double Extra Strong  
Material: C22.8 at temperatures up to 100° C 6)

		Run pipes dimension											
		DN	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	10
Branch pipe dimension	DN	OD	26,7	33,4	48,3	60,3	73,0	88,9	114,3	141,3	168,3	219,1	273
	1/2	21,3	1879	1664	1329	1142	995	857	702	588	507	401	
	3/4	26,7	1490	1347	1112	973	861	752	625	530	460	369	
	1	33,4		1164	979	868	775	684	575	492	430	347	
	1 1/2	48,3			835	760	695	627	543	474	422	349	
	2	60,3				638	591	541	476	422	380	319	
	2 1/2	73,0					636	584	515	459	412	348	
	3	88,9						545	485	434	434	333	
	4	114,3							465	420	383	328	
	5	141,3								441	405	350	
	6	168,3									390	340	
8	219,1										272		
10	273,0												

Operation pressure in bar for Weldolets<sup>®</sup> - Schedule 160  
Material: C22.8 at temperatures up to 100° C 6)

		Run pipe dimension											
		DN	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	10
Branch pipe dimension	DN	OD	26,7	33,4	48,3	60,3	73,0	88,9	114,3	141,3	168,3	219,1	273
	1/2	21,3	1142	1042	884	795	703	620	523	448	392	317	263
	3/4	26,7	1079	995	847	756	679	603	510	439	385	313	261
	1	33,4		856	740	667	605	541	462	402	355	290	244
	1 1/2	48,3			665	611	564	514	451	398	357	298	254
	2	60,3				548	509	469	416	372	336	284	244
	2 1/2	73,0					504	466	416	374	340	289	250
	3	88,9						458	410	370	337	288	250
	4	114,3							413	375	343	296	257
	5	141,3								408	375	325	286
	6	168,3									359	315	278
8	219,1										277	247	
10	273,0											267	

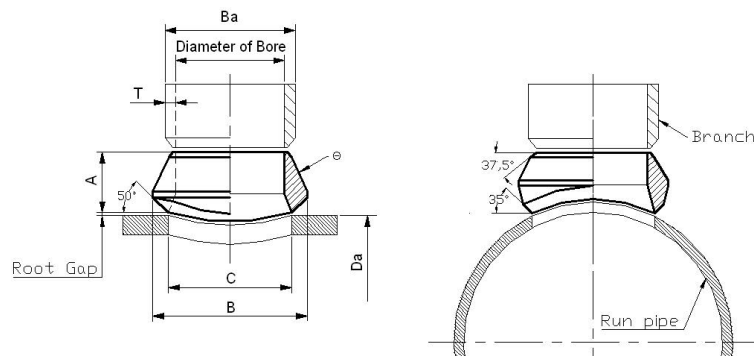
The max. allowable operation pressure of a branch connection is the lowest value resulting from:

- the Weldolet
- the undisturbed run pipe and
- the undisturbed branch pipe.

Except in special cases the Schedule no. of the Weldolet shall correspond with the Schedule no. of the run pipe. Welding bevel must correspond with bevelling of nozzle pipe.

6) Multiplication factors for different materials and temperatures see page 15.

Reducing and Full Sizes  
Type: Light Weight



Built-in-dimensions see table for type Standard.

Max. allowable working pressure are also valid for branch pipes with wall thicknesses greater or less than specified in the tables below.

		Operation pressure in bar for Weldolets® - Light Weight Material C22.8 at temperatures up to 100° C 7) 8)																
		Run pipe dimension																
		DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	
Branch pipe 2" with wall thickness ≈ 1,8 mm	Run pipe wall thickness	OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914	
		1,8	45,7															
		2,1	53,4	41,1														
		2,3	58,4	45,1	36,5													
		2,5	63,7	49,0	39,8													
		2,9	74,0	56,8	46,0	38,7	29,6	23,8	20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2	
		3,2	81,7	62,8	50,4	42,4	31,8	26,2	22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8	
		3,6	92,0	70,9	56,5	48,3	36,8	29,5	24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8	
		4,0	102,4	79,0	63,8	53,2	41,1	32,9	27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7	
		4,5	115,0	88,7	71,8	59,8	46,2	37,0	30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0	
		5,0		98,9	79,8	66,7	51,3	41,4	34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3	
		5,4				71,9	55,6	44,6	37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3	
		5,6					57,0	46,4	38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7	
		5,9						48,6	41,0	37,3	32,4	28,9	25,8	21,4	18,5		14,1	
	6,1							42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6		

		Operation pressure in bar for Weldolets® - Light Weight Material: C22.8 at temperatures up to 100° C 7) 8)																
		Run pipe dimension																
		DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	
Branch pipe 2 1/2" with wall thickness ≈ 1,8 mm	Run pipe wall thickness	OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914	
		1,8	45,7															
		2,1	53,5	41,6														
		2,3	58,4	45,1	36,5													
		2,5	63,5	49,2	39,8													
		2,9	73,8	56,8	46,0	38,7	29,6	23,8	20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2	
		3,2	81,1	62,8	50,4	42,4	31,8	26,2	22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8	
		3,6	91,8	70,9	56,5	48,3	36,8	29,5	24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8	
		4,0	101,9	79,0	63,8	53,2	41,1	32,9	27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7	
		4,5	114,8	88,7	71,8	59,8	46,2	37,0	30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0	
		5,0		98,9	79,8	66,7	51,3	41,4	34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3	
		5,4							37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3	
		5,6							38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7	
		5,9							41,9	37,3	32,4	28,9	25,8	21,4	18,5		14,1	
	6,1							42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6		

Footnotes see page 15.

Operation pressure in bar for Weldolets® - Light Weight Material: C22.8 at temperatures up to 100° C 7) 8)																		
Run pipe dimension																		
DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36			
OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914			
Branch pipe 3" with wall thickness ≈ 1,8 mm	Run pipe- wall thickness	1,8	45,7															
		2,1	53,4	41,1														
		2,3	58,4	45,1	36,5													
		2,5	63,7	49,0	39,8													
		2,9	74,0	56,8	46,0	38,7	29,6	23,8	20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2	
		3,2	81,7	62,8	50,4	42,4	31,8	26,2	22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8	
		3,6	92,0	70,9	56,5	48,3	36,8	29,5	24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8	
		4,0	102,4	79,0	63,8	53,2	41,1	32,9	27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7	
		4,5	115,0	88,7	71,8	59,8	46,2	37,0	30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0	
		5,0		98,9	79,8	66,7	51,3	41,4	34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3	
		5,4				71,9	55,6	44,6	37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3	
		5,6					57,0	46,4	38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7	
		5,9						48,6	41,0	37,3	32,4	28,9	25,8	21,4	18,5		14,1	
		6,1							42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6	

Operation pressure in bar for Weldolets® - Light Weight Material: C22.8 at temperatures up to 100° C 7) 8)																	
Run pipe dimension																	
DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36		
OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914		
Branch pipe 4" with wall thickness ≈ 2,1mm	Run pipe- wall thickness	1,8															
		2,1		41,1													
		2,3		45,1	36,5												
		2,5		49,0	39,8												
		2,9		56,8	46,0	38,7	29,6	23,8	20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2
		3,2		62,8	50,4	42,4	31,8	26,2	22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8
		3,6		70,9	56,5	48,3	36,8	29,5	24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8
		4,0		79,0	63,8	53,2	41,1	32,9	27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7
		4,5		88,7	71,8	59,8	46,2	37,0	30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0
		5,0		98,9	79,8	66,7	51,3	41,4	34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3
		5,4				71,9	55,6	44,6	37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3
		5,6					57,0	46,4	38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7
		5,9						48,6	41,0	37,3	32,4	28,9	25,8	21,4	18,5		14,1
		6,1							42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6

Footnotes see page 15.

Operation pressure in bar for Weldolets® - Light Weight Material: C22.8 at temperatures up to 100° C 7) 8)																		
Run pipe dimension																		
DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36			
OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914			
Branch pipe 5" with wall thickness ≈ 2,3 mm	Run pipe- wall thickness	1,8																
		2,1																
		2,3			36,5													
		2,5			39,8													
		2,9			46,0	38,7	29,6	23,8	20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2	
		3,2			50,4	42,4	31,8	26,2	22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8	
		3,6			56,5	48,3	36,8	29,5	24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8	
		4,0			63,8	53,2	41,1	32,9	27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7	
		4,5			71,8	59,8	46,2	37,0	30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0	
		5,0			79,8	66,7	51,3	41,4	34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3	
		5,4				71,9	55,6	44,6	37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3	
		5,6					57,0	46,4	38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7	
		5,9						48,6	41,0	37,3	32,4	28,9	25,8	21,4	18,5		14,1	
		6,1							42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6	

Operation pressure in bar for Weldolets® - Light Weight Material: C22.8 at temperatures up to 100° C 7) 8)																	
Run pipe dimension																	
DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36		
OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914		
Branch pipe 6" with wall thickness ≈ 2,9mm	Run pipe- wall thickness	1,8															
		2,1															
		2,3															
		2,5															
		2,9				38,7	29,6	23,8	20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2
		3,2				42,4	31,8	26,2	22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8
		3,6				48,3	36,8	29,5	24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8
		4,0				53,2	41,1	32,9	27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7
		4,5				59,8	46,2	37,0	30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0
		5,0				66,7	51,3	41,4	34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3
		5,4				71,9	55,6	44,6	37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3
		5,6					57,0	46,4	38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7
		5,9						48,6	41,0	37,3	32,4	28,9	25,8	21,4	18,5		14,1
		6,1							42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6

Footnotes see page 15.

Operation pressure in bar for Weldolets® - Light Weight Material: C22.8 at temperatures up to 100° C 7) 8)																
Run pipe dimension																
DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	
OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914	
Run pipe- wall thickness	1,8															
	2,1															
	2,3															
	2,5															
	2,9					29,6	23,8	20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2
	3,2					31,8	26,2	22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8
	3,6					36,8	29,5	24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8
	4,0					41,1	32,9	27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7
	4,5					46,2	37,0	30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0
	5,0					51,3	41,4	34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3
	5,4					55,6	44,6	37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3
	5,6					57,0	46,4	38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7
5,9						48,6	41,0	37,3	32,4	28,9	25,8	21,4	18,5		14,1	
6,1							42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6	

Operation pressure in bar for Weldolets® - Light Weight Material: C22.8 at temperatures up to 100° C 7) 8)																
Run pipe dimension																
DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	
OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914	
Run pipe- wall thickness	1,8															
	2,1															
	2,3															
	2,5															
	2,9						23,8	20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2
	3,2						26,2	22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8
	3,6						29,5	24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8
	4,0						32,9	27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7
	4,5						37,0	30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0
	5,0						41,4	34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3
	5,4						44,6	37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3
	5,6						46,4	38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7
5,9						48,6	41,0	37,3	32,4	28,9	25,8	21,4	18,5		14,1	
6,1							42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6	

Footnotes see page 15.

Operation pressure in bar for Weldolets® - Light Weight Material: C22.8 at temperatures up to 100° C 7) 8)															
Run pipe dimension															
DN	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36
OD	88,9	114,3	141,3	168,3	219,1	273	323,9	355,6	406,4	457,2	508	610	711		914
Branch pipe 12" with wall thickness ≈ 2,9mm Run pipe - wall thickness	2,9						20,2	18,2	16,1	14,3	12,8	10,6	9,2		7,2
	3,2						22,1	20,1	17,6	15,7	14,1	11,7	10,0		7,8
	3,6						24,9	22,5	19,7	17,6	15,9	13,3	11,3		8,8
	4,0						27,3	25,0	22,0	19,7	17,6	14,8	12,6		9,7
	4,5						30,0	28,3	24,8	21,9	19,8	16,6	14,3		11,0
	5,0						34,6	31,4	27,4	24,6	21,8	18,0	15,7		12,3
	5,4						37,3	34,0	29,4	26,4	23,6	19,5	16,6		13,3
	5,6						38,9	35,4	30,5	27,5	24,5	20,3	17,4		13,7
	5,9						41,0	37,3	32,4	28,9	25,8	21,4	18,5		14,1
6,1						42,5	38,3	33,4	29,8	26,5	22,0	18,8		14,6	

Non suitable for oil or gas transmission piping services.

- 7) Percentage of working hoop stress to specified minimum yield strength of run pipe: 50%.
- 8) For working pressure at various operating temperatures and different materials, please refer table below.

Multiplication factors for different materials and temperatures							
Material	Temp.factor	Correction factors for nominal pressure					
		20°C	50°C	100°C	150°C	200°C	250°C
A105	Carbon steel	1.10	1.079	1.0	0.974	0.947	0.899
A182-F1 b)	C ½ Mo	1.222	1.207	1.147	1.106	1.089	1.063
A182-F5 b)	4/6 Cr	0.917	0.899	0.829	0.794	0.761	0.733
A182-F11 b)	1 ¼ Cr ½ Mo	1.222	1.220	1.050	0.999	0.979	0.958
A182-F12 b)	1 Cr ½ Mo	1.222	1.220	1.050	0.999	0.979	0.958
A182-F22 b)	2 ¼ Cr 1 Mo	1.222	1.187	1.056	1.004	0.966	0.953
A182-F304H b)	18 Cr 8 Ni	0.917	0.887	0.769	0.671	0.605	0.564
A182-F304L b)		0.764	0.739	0.640	0.558	0.503	0.470
A182-F316L b)	18 Cr 8 Ni Mo	0.764	0.740	0.649	0.595	0.553	0.520
A182-F321 b)	18 Cr 8 Ni Ti	0.917	0.893	0.802	0.748	0.709	0.668

Multiplication factors for different materials and temperatures							
Material	Temp. factor	Correction factors for nominal pressure					
		300°C	350°C	400°C	450°C	500°C	550°C
A105	Carbon steel	0.834	0.799	0.766	0.710	0.681	
A182-F1 b)	C ½ Mo	1.035	1.010	0.974	0.914	0.806	
A182-F5 b)	4/6 Cr	0.707	0.681	0.662	0.637	0.595	
A182-F11 b)	1 ¼ Cr ½ Mo	0.914	0.866	0.824	0.768		
A182-F12 b)	1 Cr ½ Mo	0.914	0.866	0.824	0.768		
A182-F22 b)	2 ¼ Cr 1 Mo	0.948	0.944	0.935	0.910	0.864	
A182-F304H b)	18 Cr 8 Ni	0.536	0.518	0.507	0.496	0.469	
A182-F304L b)		0.447	0.432	0.421	0.413	0.400	
A182-F316L b)	18 Cr 8 Ni Mo	0.493	0.470	0.449	0.430	0.413	
A182-F321 b)	18 Cr 8 Ni Ti	0.636	0.608	0.587	0.568	0.548	

- a) For wall thicknesses ≤ 10mm this value is 5% higher. This does not apply to tubes having a wall thickness ≤ 3 mm, and an outside diameter ≤ 30mm.  
For tubes of these dimensions this value is 6% lower.
- b) Calculated using hot yield strength values from table A3 of ASME B31.7-1969.

**Example for purchasing :** Designation of a sockolet, Type 60001b., for ~ n pipe outside diameter •114,3mm and branch pipe outside diameter •88,9mm, certificate 3.1B, material: 15Mo3, finish: metallc

Sockolet 6000 lb.    114, 3 / 88, 9    H237    cert. 3. 1B    15Mo3

Part No. for purchasing example: 

2	3	7	4	4	1	0	0	1
---	---	---	---	---	---	---	---	---

### Part numbering Code

#### Position of Part No.

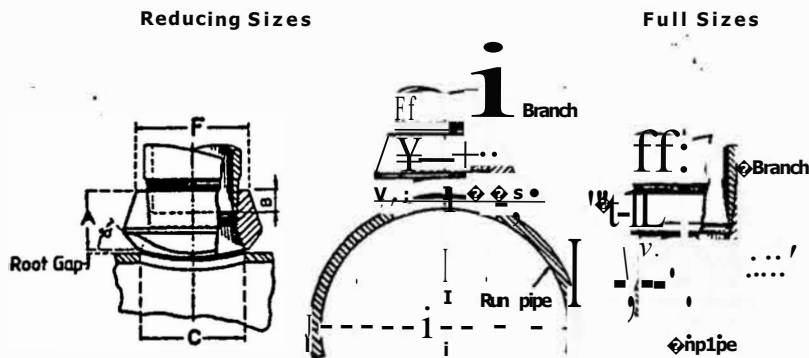
1.- 3.		4.		5.-6.			7.-8.		9.		
Kind of Part		Type 31		Material "			Wall thick. -		Certificate		
		Code	Code				Code	Code	61	Code	
Thredolets, Sockolets, Nipolets	237	Thredolet 30001b., 'Mlitw.	1	-C22			23	* 21	* 21	3.1B	1
		C 22, 8 IC22N\	32	TTSt35V			35				
		Thredolet 6000 lb •• 'Mlitw.	2	15Mo3			41	0 S	0 S1	2.2	W
		Sockolet 30001b,	3	13CrMo44			42			2, 1	B
		Sockolet 6000 lb.	4	1.4541			E				
		Nipolet 3000 lb., weld; end	5	1.4571			74			ANSI	2
		Nipolet 6000 lb., weld.end	6	1.4306			76				
		Thredolet 30001b., NPT-thrd.	7	1.4436			77				
		Thredolet 6000 lb., NPT-thrd.	8	A105			SB				
		Nipolet 3000 lb., 'Mlitw,	9	A 182 Gr.FI			SE				
		Nipolet 6000 lb., 'Mlitw.	A	A 182 Gr.FI1			SJ				
		Nipolet 3000 lb., NPT-thrd,	B	A 182 Gr.F12			SK				
		Nipolet 6000 lb., NPT-thrd.	C	A 182 Gr.F304			SM				
		Nipolet 3000 lb., NPT-thrd.		A 182 Gr.F304L			S4				
		Nipolet 6000 lb., NPT-thrd.		A 182 Gr.F316			SP				
Nipolet 3000 lb., NPT-thrd,		A 182 Gr.F316L			S6						
Nipolet 6000 lb., NPT-thrd.		A 182 Gr.F321			SQ						
Nipolet 3000 lb., NPT-thrd.		A350 Gr,LF1			SW						

- 1) Material code acc. to 'Ste, M 0004 d1H 000S  
Stainless steels acc. to DIN 17440  
13CrMo44/15Mo3 acc. to DIN17175  
TTSt35V acc. to DIN 17102 (StEW680)  
C 22, 8 acc. to VdTUV-Wstbl, 350  
C 22 acc. to DIN 17200  
Other materials acc. to ASTM - specifications
- 2) Run pipe and branch pipe : Wallthickness code acc. to Std. H-OOH1 and H0011.  
wallthickness code only to be given for nipolets with welding ends •
- 3) Code for type
- 4) Maximum allowable working pressures see Std 11 -  
3000 lb, Q Type Extra strong .  
6000 lb. Type Schedule 160
- 5) Run and branch: for threaded and socket weld connection no wallthickness code Is necessary ( •Code 00 )
- 6) Certificate acc. to DIN 50049 for DIN- materials, and acc. to ASTM for ANSI- materials  
-Code for certificate acc. to Std. M0009

INDUSTRIEANLAGENBAU

Edition Dec. 19P?

**THREDOLETS**



Dimensions In mm.

Reducing Sizes

Run pipe ON	Branch ON	A	C	F	B	Weight kg/piece
Nominal pressure- 30001b. 4)						
36 <sup>11</sup> 1/4 <sup>11</sup>	1/8 <sup>11</sup>	19,0	15,88	22,23	6,4	0,05
36 <sup>11</sup> - 3/8 <sup>11</sup>	1/4 <sup>11</sup>	19,0	15,88	22,23	8,1	0,05
36 <sup>11</sup> - 1/2 <sup>11</sup>	3/8 <sup>11</sup>	20,64	19,05	25,4	9,1	0,09
36 <sup>11</sup> - 3/4 <sup>11</sup>	1/2 <sup>11</sup>	25,4	23,81	31,75	10,9	0,11
36 <sup>11</sup> - 1 1/4 <sup>11</sup>	3/4 <sup>11</sup>	26,99	30,16	36,51	12,7	0,16
36 <sup>11</sup> - 1 1/2 <sup>11</sup>	1 1/4 <sup>11</sup>	33,33	36,51	46,04	14,7	0,28
36 <sup>11</sup> - 2 1/2 <sup>11</sup>	2 1/4 <sup>11</sup>	33,33	44,45	55,56	17,0	0,41
36 <sup>11</sup> - 3 1/2 <sup>11</sup>	3 1/4 <sup>11</sup>	34,93	50,8	61,91	17,8	0,45
36 <sup>11</sup> - 4 1/2 <sup>11</sup>	4 1/4 <sup>11</sup>	38,1	65,09	74,61	19,1	0,79
36 <sup>11</sup> - 5 1/2 <sup>11</sup>	5 1/4 <sup>11</sup>	46,04	76,2	87,31	23,6	1,36
36 <sup>11</sup> - 6 1/2 <sup>11</sup>	6 1/4 <sup>11</sup>	50,8	93,7	104,8	25,9	1,97
36 <sup>11</sup> - 7 1/2 <sup>11</sup>	7 1/4 <sup>11</sup>	57,15	120,65	130,18	27,7	3,22
36 <sup>11</sup> - 8 1/2 <sup>11</sup>	8 1/4 <sup>11</sup>	66,68	141,3	160,31		5,44
36 <sup>11</sup> - 9 1/2 <sup>11</sup>	9 1/4 <sup>11</sup>	68,26	169,8	188,91		E,94
Nominal pressure- 60001b, 4)						
36 <sup>11</sup> - 3/8 <sup>11</sup>	1/4 <sup>11</sup>	28,58	14,29	31,75	8,1	0,14
36 <sup>11</sup> - 1/2 <sup>11</sup>	3/8 <sup>11</sup>	28,58	14,29	31,75	9,1	0,14
36 <sup>11</sup> - 3/4 <sup>11</sup>	1/2 <sup>11</sup>	31,75	19,05	39,69	10,9	0,20
36 <sup>11</sup> - 1 1/4 <sup>11</sup>	3/4 <sup>11</sup>	36,51	25,4	46,04	12,7	0,34
36 <sup>11</sup> - 1 1/2 <sup>11</sup>	1 1/4 <sup>11</sup>	39,69	33,34	57,15	14,7	0,56
36 <sup>11</sup> - 2 1/2 <sup>11</sup>	2 1/4 <sup>11</sup>	41,28	38,1	65,09	17,0	0,71
36 <sup>11</sup> - 3 1/2 <sup>11</sup>	3 1/4 <sup>11</sup>	42,85	49,2	76,2	17,8	0,89
36 <sup>11</sup> - 4 1/2 <sup>11</sup>	4 1/4 <sup>11</sup>	52,40	69,9	92,08	19,1	2,30

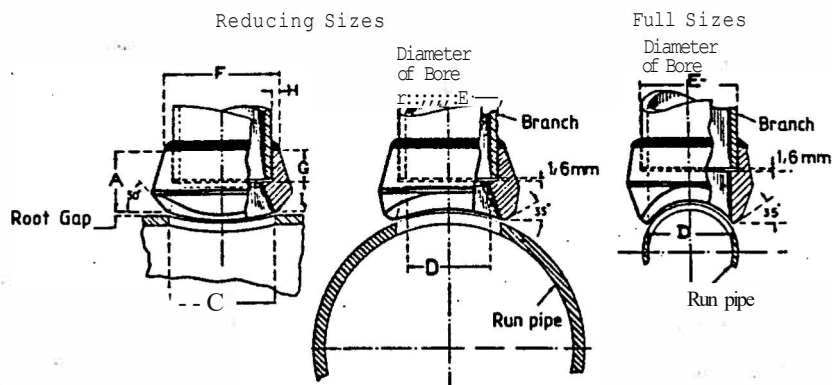
Dimensions In mm

Full Sizes

Run pipe ON	Branch ON	A	C	D	F	B	Weight kg/piece
Nominal pressure φ 30001b •							
1/2 <sup>11</sup>	1/2 <sup>11</sup>	25,4	23,81	15,88	31,75	10,9	0,07
3/4 <sup>11</sup>	3/4 <sup>11</sup>	26,99	30,16	20,64	36,51	12,7	0,11
1 <sup>11</sup>	1 <sup>11</sup>	33,34	36,51	26,99	46,04	14,7	0,20
1 1/4 <sup>11</sup>	1 1/4 <sup>11</sup>	33,34	44,45	34,93	55,56	17,0	0,32
1 1/2 <sup>11</sup>	1 1/2 <sup>11</sup>	34,93	50,8	41,28	61,91	17,8	0,41
2 <sup>11</sup>	2 <sup>11</sup>	38,10	65,09	52,39	74,61	19,1	0,64
2 1/2 <sup>11</sup>	2 1/2 <sup>11</sup>	46,04	76,20	63,50	87,31	23,6	1,13
3 <sup>11</sup>	3 <sup>11</sup>	50,8	93,66	77,79	104,78	25,9	1,95
4 <sup>11</sup>	4 <sup>11</sup>	57,15	120,65	103,19	130,18	27,7	3,01
5 <sup>11</sup>	5 <sup>11</sup>	61,91	133,35	128,59	160,34		4,17
6 <sup>11</sup>	6 <sup>11</sup>	65,09	169,8	153,99	188,91		7,12

Footnotes see page 1.

SOCKOLETS



Dimensions In mm Reducing Sizes

Run pipe ON	Branch ON	A	C	D	E	F	G	H	I	Weight kg/piece
Nominal pressure- 3000lb. 4)										
3611-1/411	1/811	19,0	15,88	6,83	10,67	22,23	9,50	8,50	9,50	0,05
3611-3/811	1/411	19,0	15,88	9,25	14,10	22,23	9,50	4,00	9,50	0,05
3611-1/211	3/811	20,64	19,05	12,52	17,51	25,40	9,50	4,00	11,14	0,09
3611-3/411	1/211	25,40	23,81	15,80	21,72	31,75	9,50	8,15	15,90	0,14
3611-111	3/411	26,99	30,16	20,93	27,05	36,51	12,70	4,80	14,29	0,15
3611-1 1/411	111	33,33	36,51	26,64	33,78	46,04	12,70	6,35	20,63	0,27
3611-1 1/211	1 1/411	33,33	44,45	35,08	42,55	55,56	12,70	6,35	20,63	0,39
3611-211	1 1/211	34,93	50,80	40,89	48,64	61,91	12,70	6,00	22,23	0,47
3611-2 1/211	211	38,10	65,09	52,50	61,11	74,61	15,88	6,75	22,22	0,73
3611-311	2 1/211	46,04	76,20	62,71	73,81	87,31	15,88	6,75	30,16	1,25
3611-411	311	50,80	93,70	77,93	89,79	104,10	15,88	7,50	34,92	1,72
3611-511	411	57,15	120,65	102,26	115,44	130,18	19,05	7,50	38,10	3,29
3611-611	511	66,68	141,30	128,19	142,70	160,31	32,54	8,70	34,14	5,44
3611-811	511	68,26	169,90	154,05	169,90	187,30	32,54	8,70	35,72	6,58
Nominal pressure- 6000lb. 4)										
3611-3/411	1/211	31,75	19,05	11,80	21,72	39,69	9,50	9,13	22,25	0,23
3611-111	3/411	36,51	25,40	15,60	27,05	45,24	12,70	<b>8,33</b>	23,81	0,36
3611-1 1/411	111	39,69	33,34	20,70	33,78	57,15	12,70	11,91	26,99	0,59
3611-1 1/211	1 1/411	41,28	38,10	29,45	42,55	65,09	12,70	11,51	28,58	0,73
3611-211	1 1/211	42,85	49,20	34,00	48,64	76,20	12,70	16,27	30,15	0,91
3611-2 1/211	<b>211</b>	52,40	69,90	42,90	61,11	92,08	15,88	15,48	36,52	2,33

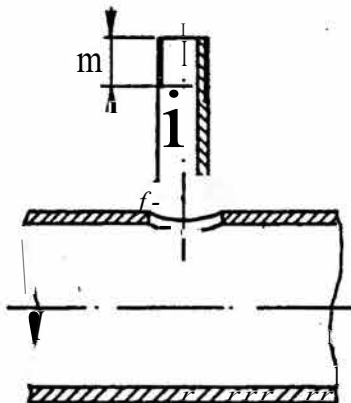
Dimensions In mm Full Sizes

Run pipe ON	Branch ON	A	C	D	E	F	G	H	I	Weight kg/piece
Nominal pressure - 3000lb. 4)										
1/211	1/211	25,40	23,81	15,80	24,72	31,75	<b>9,50</b>	5,16	15,90	0,06
3/411	3/411	26,99	30,16	20,93	27,05	36,51	12,70	4,76	14,29	0,11
111	111	33,34	36,51	26,64	33,78	46,04	12,70	<b>6,35</b>	20,64	0,20
1 1/411	1 1/411	33,34	44,45	35,05	42,55	<b>55,56</b>	12,70	<b>6,35</b>	20,64	0,29
1 1/211	1 1/211	34,93	50,80	40,89	48,64	61,91	12,70	<b>5,95</b>	22,23	0,39
211	211	38,10	65,09	52,50	61,11	74,61	15,88	6,75	22,22	0,62
2 1/211	2 1/211	46,04	76,20	62,71	73,81	87,31	15,88	6,75	30,16	1,02
311	311	50,80	93,66	77,93	88,79	104,78	15,88	7,54	34,92	1,70
411	411	55,56	120,65	102,26	115,44	130,18	19,05	7,54	36,51	2,99
511	511	61,91	133,35	128,19	142,72	160,34	36,50	8,73	25,41	4,08
611	611	65,09	169,90	154,05	169,95	188,91	38,90	8,73	26,19	7,03

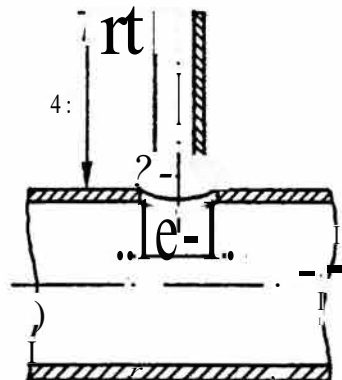
Footnotes see page 1.

**NIPOLETS**

**Threaded-Connection (male)  
(Witworth and NPT)**



**Welding -Connection**



**Dimensions in mm**

Run pipe ON	Branch ON	A	C	B	Weight kg/piece
Nominal pressure- 3000lb. 4)					
36 <sup>II</sup> - 3/4 <sup>II</sup>	1/2 <sup>II</sup>	88,9	23,8	10,9	
36 <sup>II</sup> - p.	3/4 <sup>II</sup>	88,9	30,1	12,7	
36 <sup>II</sup> -1 1/4 <sup>II</sup>	1 <sup>II</sup>	88,9	36,5	14,7	
36 <sup>II</sup> -1 1/2 <sup>II</sup>	1 1/4 <sup>II</sup>	88,9	44,4	17,0	
36 <sup>II</sup> - 2 <sup>II</sup>	1 1/2 <sup>II</sup>	88,9	50,8	17,8	
36 <sup>II</sup> -2 1/2 <sup>II</sup>	2 <sup>II</sup>	88,9	65,1	19,1	
Nominal pressure- 6000lb. 4)					
36 <sup>II</sup> - 3/4 <sup>II</sup>	1/2 <sup>II</sup>	88,9	14,3	10,9	
36 <sup>II</sup> - 1 <sup>II</sup>	3/4 <sup>II</sup>	88,9	19,0	12,7	
36 <sup>II</sup> -1 1/4 <sup>II</sup>	1 <sup>II</sup>	88,9	25,4	14,7	
36 <sup>II</sup> -1 1/2 <sup>II</sup>	1 1/4 <sup>II</sup>	88,9	33,4	17,0	
36 <sup>II</sup> - 2 <sup>II</sup>	1 1/2 <sup>II</sup>	88,9	38,1	17,8	
36 <sup>II</sup> -2 1/2 <sup>II</sup>	2 <sup>II</sup>	88,9	42,8	19,1	

Footnotes see page 1.

**Branch Reinforcements**  
made from Pipe according to ASME / API

Standard

H239A

Page 1 of 7

Example of Designation: Designation of a reinforcement pad made from run pipe with run pipe outside diameter  $D_a = 610$  mm and wall thickness 9.53 mm, and branch pipe nominal diameter DN300, material: API 5L Gr.B

Part number  
**239P3BK02      610 x 9.53 / 300      REINFORCEMENT PAD      API 5L GR.B**  
**MADE FROM RUN-PIPE-MATERIAL H239A**

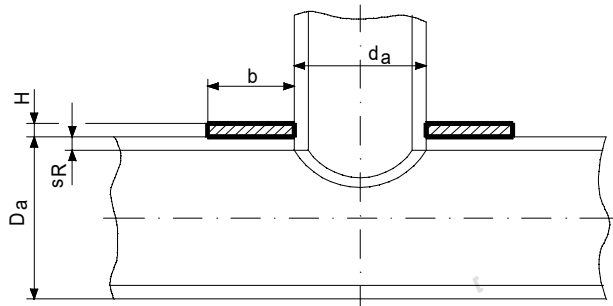
Part numbering Code										
Position of Part No.										
1. - 3.		4.		5. - 6.			7. - 8.		9.	
Kind of Part		Type		Material 1)			Wall thickness-Code		Certificate 3)	
	Cd.		Cd.							
Branch Reinforcement	239	Reinforcement Pad	P	A53 Gr.B		2B	2)	0	ASME / ANSI	2
				A106 Gr.B		2D				
				A139 Gr.B		2J				
				API 5L Gr.B		3B				
				A312 Gr.TP304		3D				
				A312 Gr.TP304L		3E				
				A312 Gr.TP316		3G				
				A312 Gr.TP316L		3H				
				A335 Gr.P11		3R				
				A283 Gr.B		A6				
				A358 Gr.321 (C>0.04%, Cl.1)		B5				
A790 Gr.S31803		N1								

- 1) Material according to ASTM- / API- standards
- 2) Wall thickness code according to Standard H0011 for run pipe thickness (= pad thickness). Appropriate pipes see Standard H100
- 3) Certificate according to ASME-/ ASTM-Standards

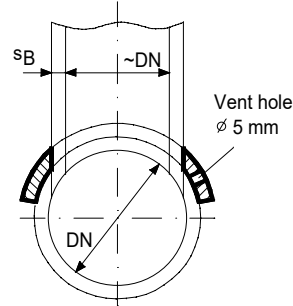
Calculation for pad width "b" according to AD2000-Merkblatt B9

**Reinforcement Pad**

Quantity in pieces. No separate delivery of material, as pad is manufactured from run pipe on site.



Pad thickness  $H = s_R$  of run pipe  
 $b =$  Pad width



$s_B =$  Wall thickness of branch pipe

Pad widths in following table are minimum dimensions.

Run Pipe	Run Pipe	Wall thicknesses and Pad widths in mm													
Nom. diam.	Outside diam.	for													
DN	Da (mm)	Code 0		Code 1		Code 2		Code 3		Code 4		Code 5		Code 6	
		b		b		b		b		b		b		b	
4"	114,3	3,05	<b>22</b>	-	-	4,78	<b>30</b>	6,02	<b>34</b>	-	-	8,56	<b>41</b>	-	-
5"	141,3	3,4	<b>26</b>	-	-	-	-	6,55	<b>40</b>	-	-	9,53	<b>49</b>	-	-
6"	168,3	3,4	<b>29</b>	-	-	-	-	7,11	<b>45</b>	-	-	10,97	<b>57</b>	-	-
8"	219,1	3,76	<b>35</b>	6,35	<b>48</b>	7,04	<b>51</b>	8,18	<b>56</b>	10,31	<b>63</b>	12,7	<b>77</b>	15,09	<b>91</b>
10"	273,0	4,19	<b>42</b>	6,35	<b>54</b>	7,8	<b>60</b>	9,27	<b>66</b>	12,7	<b>79</b>	15,09	<b>91</b>	18,26	<b>110</b>
12"	323,9	4,57	<b>48</b>	6,35	<b>58</b>	8,38	<b>68</b>	10,31	<b>76</b>	14,27	<b>91</b>	17,48	<b>105</b>	21,44	<b>129</b>
14"	355,6	6,35	<b>61</b>	7,92	<b>69</b>	9,53	<b>77</b>	11,13	<b>83</b>	15,09	<b>98</b>	19,05	<b>115</b>	23,83	<b>143</b>
16"	406,4	6,35	<b>65</b>	7,92	<b>74</b>	9,53	<b>82</b>	12,7	<b>96</b>	16,66	<b>111</b>	21,44	<b>129</b>	26,19	<b>158</b>
18"	457	6,35	<b>69</b>	7,92	<b>78</b>	11,13	<b>94</b>	14,27	<b>108</b>	19,05	<b>126</b>	23,83	<b>143</b>	29,36	<b>177</b>
20"	508	6,35	<b>73</b>	9,53	<b>91</b>	12,7	<b>107</b>	15,09	<b>117</b>	20,62	<b>138</b>	26,19	<b>158</b>	32,54	<b>196</b>
22"	559	6,35	<b>76</b>	9,53	<b>96</b>	12,7	<b>112</b>	-	-	22,23	<b>151</b>	28,58	<b>172</b>	34,93	<b>210</b>
24"	610	6,35	<b>80</b>	9,53	<b>100</b>	14,27	<b>125</b>	17,48	<b>139</b>	24,61	<b>166</b>	30,96	<b>187</b>	38,89	<b>234</b>
26"	660	7,92	<b>94</b>	12,7	<b>122</b>	-	-	-	-	-	-	-	-	-	-
28"	711	7,92	<b>98</b>	12,7	<b>126</b>	15,88	<b>142</b>	-	-	-	-	-	-	-	-
30"	762	7,92	<b>101</b>	12,7	<b>131</b>	15,88	<b>147</b>	-	-	-	-	-	-	-	-
32"	813	7,92	<b>104</b>	12,7	<b>135</b>	15,88	<b>152</b>	17,48	<b>160</b>	-	-	-	-	-	-
34"	864	7,92	<b>107</b>	12,7	<b>139</b>	15,88	<b>157</b>	17,48	<b>165</b>	-	-	-	-	-	-
36"	914	7,92	<b>110</b>	12,7	<b>143</b>	15,88	<b>161</b>	19,05	<b>177</b>	-	-	-	-	-	-
38"	965	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40"	1016	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42"	1067	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44"	1118	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46"	1168	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48"	1219	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Run Pipe	Run Pipe	Wall thicknesses and Pad widths in mm													
Nom. diam.	Outside diam.	for													
		Code		Code		Code		Code		Code		Code		Code	
		0	b	1	b	2	b	3	b	4	b	5	b	6	b
DN	Da (mm)														
52"	1321	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56"	1422	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60"	1524	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64"	1626	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68"	1727	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72"	1829	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76"	1930	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80"	2032	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84"	2134	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90"	2286	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96"	2438	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Pad widths in following table are minimum dimensions.

		Wall thicknesses and Pad widths in mm													
		for													
		Code		Code		Code		Code		Code		Code		Code	
DN	Da (mm)	7	b	8	b	9	b	A	b	B	b	C	b	D	b
4"	114,3	11,13	<b>67</b>	-	-	13,49	<b>81</b>	2,11	<b>17</b>	3,05	<b>22</b>	6,02	<b>37</b>	8,56	<b>52</b>
5"	141,3	12,7	<b>77</b>	-	-	15,88	<b>96</b>	2,77	<b>23</b>	3,4	<b>26</b>	6,55	<b>40</b>	9,53	<b>58</b>
6"	168,3	14,27	<b>86</b>	-	-	18,26	<b>110</b>	2,77	<b>25</b>	3,4	<b>29</b>	7,11	<b>45</b>	10,97	<b>66</b>
8"	219,1	18,26	<b>110</b>	20,62	<b>124</b>	23,01	<b>139</b>	2,77	<b>28</b>	3,76	<b>35</b>	8,18	<b>56</b>	12,7	<b>77</b>
10"	273,0	21,44	<b>129</b>	25,4	<b>153</b>	28,58	<b>172</b>	3,4	<b>37</b>	4,19	<b>42</b>	9,27	<b>66</b>	12,7	<b>79</b>
12"	323,9	25,4	<b>153</b>	28,58	<b>172</b>	33,32	<b>200</b>	3,96	<b>44</b>	4,57	<b>48</b>	9,53	<b>73</b>	12,7	<b>86</b>
14"	355,6	27,79	<b>167</b>	31,75	<b>191</b>	35,71	<b>215</b>	3,96	<b>46</b>	4,78	<b>52</b>	9,53	<b>77</b>	12,7	<b>90</b>
16"	406,4	30,96	<b>186</b>	36,53	<b>220</b>	40,49	<b>243</b>	4,19	<b>51</b>	4,78	<b>55</b>	9,53	<b>82</b>	12,7	<b>96</b>
18"	457	34,93	<b>210</b>	39,67	<b>238</b>	45,24	<b>272</b>	4,19	<b>54</b>	4,78	<b>58</b>	9,53	<b>87</b>	12,7	<b>101</b>
20"	508	38,1	<b>229</b>	44,45	<b>267</b>	50,01	<b>301</b>	4,78	<b>62</b>	5,54	<b>67</b>	9,53	<b>91</b>	12,7	<b>107</b>
22"	559	41,28	<b>248</b>	47,63	<b>286</b>	53,98	<b>324</b>	4,78	<b>65</b>	5,54	<b>70</b>	-	-	-	-
24"	610	46,02	<b>277</b>	52,37	<b>315</b>	59,54	<b>358</b>	5,54	<b>74</b>	6,35	<b>80</b>	-	-	-	-
26"	660	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28"	711	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30"	762	-	-	-	-	-	-	6,35	<b>89</b>	7,92	<b>101</b>	-	-	-	-
32"	813	-	-	-	-	-	-	17,48	<b>160</b>	-	-	-	-	-	-
34"	864	-	-	-	-	-	-	17,48	<b>165</b>	-	-	-	-	-	-
36"	914	-	-	-	-	-	-	19,05	<b>177</b>	-	-	-	-	-	-
38"	965	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40"	1016	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42"	1067	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44"	1118	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46"	1168	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48"	1219	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52"	1321	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56"	1422	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60"	1524	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64"	1626	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68"	1727	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72"	1829	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76"	1930	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80"	2032	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84"	2134	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90"	2286	-	-	-	-	-	-	-	-	-	-	-	-	-	-
96"	2438	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Pad widths in following table are minimum dimensions.

		Wall thicknesses and Pad widths in mm for													
		Code		Code		Code		Code		Code		Code		Code	
DN	Da (mm)	E	b	F	b	G	b	H	b	J	b	K	b	L	b
4"	114,3	6,02	37	8,56	52	17,12	103	7,92	48	-	-	-	-	10,31	62
5"	141,3	6,55	40	9,53	58	19,05	115	7,92	48	8,74	53	-	-	10,31	62
6"	168,3	7,11	45	10,97	66	21,95	132	7,92	48	8,74	53	9,53	58	10,31	62
8"	219,1	8,18	56	12,7	77	22,23	134	7,92	55	8,74	58	9,53	60	-	-
10"	273,0	9,27	66	12,7	79	25,4	153	-	-	8,74	64	-	-	10,31	70
12"	323,9	9,53	73	12,7	86	25,4	153	7,92	66	8,74	70	-	-	-	-
14"	355,6	9,53	77	12,7	90	-	-	-	-	8,74	73	-	-	10,31	80
16"	406,4	9,53	82	12,7	96	-	-	-	-	8,74	78	-	-	10,31	86
18"	457	9,53	87	12,7	101	-	-	-	-	8,74	83	-	-	10,31	91
20"	508	9,53	91	12,7	107	-	-	7,92	83	8,74	87	-	-	10,31	95
22"	559	9,53	96	12,7	112	-	-	7,92	87	8,74	91	-	-	10,31	100
24"	610	9,53	100	12,7	117	-	-	7,92	90	8,74	95	-	-	10,31	105
26"	660	9,53	104	12,7	122	-	-	-	-	8,74	99	-	-	10,31	109
28"	711	9,53	108	12,7	126	-	-	-	-	8,74	103	-	-	10,31	113
30"	762	9,53	112	12,7	131	-	-	-	-	8,74	107	-	-	10,31	117
32"	813	9,53	115	12,7	135	-	-	-	-	8,74	110	-	-	10,31	121
34"	864	9,53	119	12,7	139	-	-	-	-	8,74	113	-	-	10,31	124
36"	914	9,53	122	12,7	143	-	-	-	-	8,74	117	-	-	10,31	128
38"	965	9,53	126	12,7	147	-	-	7,92	113	8,74	120	-	-	10,31	131
40"	1016	9,53	129	12,7	151	-	-	7,92	116	8,74	123	-	-	10,31	135
42"	1067	9,53	132	12,7	154	-	-	7,92	119	8,74	126	-	-	10,31	138
44"	1118	9,53	135	12,7	158	-	-	7,92	122	8,74	129	-	-	10,31	141
46"	1168	9,53	138	12,7	162	-	-	7,92	125	8,74	132	-	-	10,31	144
48"	1219	9,53	141	12,7	165	-	-	7,92	127	8,74	135	-	-	10,31	147
52"	1321	-	-	-	-	-	-	7,92	133	-	-	9,53	147	10,31	153
56"	1422	-	-	-	-	-	-	7,92	138	-	-	9,53	152	10,31	159
60"	1524	-	-	-	-	-	-	7,92	142	-	-	9,53	158	10,31	165
64"	1626	-	-	-	-	-	-	7,92	147	-	-	9,53	163	10,31	170
68"	1727	-	-	-	-	-	-	7,92	152	-	-	-	-	10,31	175
72"	1829	-	-	-	-	-	-	7,92	156	-	-	9,53	173	10,31	180
76"	1930	-	-	-	-	-	-	7,92	160	-	-	-	-	10,31	185
80"	2032	-	-	-	-	-	-	7,92	164	-	-	9,53	182	10,31	190
84"	2134	-	-	-	-	-	-	-	-	-	-	-	-	10,31	195
90"	2286	-	-	-	-	-	-	-	-	-	-	-	-	10,31	202
96"	2438	-	-	-	-	-	-	-	-	-	-	-	-	10,31	208

Pad widths in following table are minimum dimensions.

		Wall thicknesses and Pad widths in mm													
		for													
DN	Da (mm)	Code		Code		Code		Code		Code		Code		Code	
		M	b	N	b	P	b	Q	B	R	b	S	b	T	b
4"	114,3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5"	141,3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6"	168,3	-	-	-	-	12,7	<b>77</b>	-	-	15,88	<b>96</b>	-	-	19,05	<b>115</b>
8"	219,1	11,13	<b>67</b>	-	-	-	-	14,27	<b>86</b>	15,88	<b>96</b>	17,48	<b>84</b>	19,05	<b>115</b>
10"	273,0	11,13	<b>73</b>	-	-	-	-	14,27	<b>86</b>	15,88	<b>96</b>	17,48	<b>93</b>	19,05	<b>115</b>
12"	323,9	11,13	<b>80</b>	-	-	-	-	-	-	15,88	<b>96</b>	17,48	<b>101</b>	19,05	<b>115</b>
14"	355,6	-	-	11,91	<b>87</b>	-	-	14,27	<b>95</b>	15,88	<b>101</b>	17,48	<b>106</b>	-	-
16"	406,4	11,13	<b>89</b>	11,91	<b>92</b>	-	-	14,27	<b>102</b>	15,88	<b>108</b>	17,48	<b>113</b>	19,05	<b>119</b>
18"	457	-	-	11,91	<b>98</b>	-	-	-	-	15,88	<b>114</b>	17,48	<b>120</b>	19,05	<b>126</b>
20"	508	11,13	<b>100</b>	-	-	-	-	-	-	15,88	<b>120</b>	17,48	<b>127</b>	19,05	<b>133</b>
22"	559	11,13	<b>104</b>	11,91	<b>108</b>	-	-	14,27	<b>119</b>	15,88	<b>126</b>	17,48	<b>133</b>	19,05	<b>139</b>
24"	610	11,13	<b>109</b>	11,91	<b>113</b>	-	-	-	-	15,88	<b>132</b>	-	-	19,05	<b>145</b>
26"	660	11,13	<b>113</b>	11,91	<b>118</b>	-	-	14,27	<b>130</b>	15,88	<b>137</b>	17,48	<b>144</b>	19,05	<b>151</b>
28"	711	11,13	<b>118</b>	11,91	<b>122</b>	-	-	14,27	<b>134</b>	-	-	17,48	<b>150</b>	19,05	<b>157</b>
30"	762	11,13	<b>122</b>	11,91	<b>126</b>	-	-	14,27	<b>139</b>	-	-	17,48	<b>155</b>	19,05	<b>162</b>
32"	813	11,13	<b>126</b>	11,91	<b>130</b>	-	-	14,27	<b>144</b>	-	-	-	-	19,05	<b>167</b>
34"	864	11,13	<b>130</b>	11,91	<b>134</b>	-	-	14,27	<b>148</b>	-	-	-	-	19,05	<b>172</b>
36"	914	11,13	<b>133</b>	11,91	<b>138</b>	-	-	14,27	<b>152</b>	-	-	17,48	<b>169</b>	-	-
38"	965	11,13	<b>137</b>	11,91	<b>142</b>	-	-	14,27	<b>156</b>	15,88	<b>166</b>	17,48	<b>174</b>	19,05	<b>182</b>
40"	1016	11,13	<b>140</b>	11,91	<b>146</b>	-	-	14,27	<b>160</b>	15,88	<b>170</b>	17,48	<b>179</b>	19,05	<b>187</b>
42"	1067	11,13	<b>144</b>	11,91	<b>149</b>	-	-	14,27	<b>164</b>	15,88	<b>174</b>	17,48	<b>183</b>	19,05	<b>191</b>
44"	1118	11,13	<b>147</b>	11,91	<b>153</b>	-	-	14,27	<b>168</b>	15,88	<b>178</b>	17,48	<b>187</b>	19,05	<b>196</b>
46"	1168	11,13	<b>151</b>	11,91	<b>156</b>	-	-	14,27	<b>172</b>	15,88	<b>182</b>	17,48	<b>191</b>	19,05	<b>200</b>
48"	1219	11,13	<b>154</b>	11,91	<b>159</b>	-	-	14,27	<b>176</b>	15,88	<b>186</b>	17,48	<b>196</b>	19,05	<b>205</b>
52"	1321	11,13	<b>160</b>	11,91	<b>166</b>	12,7	<b>172</b>	14,27	<b>183</b>	15,88	<b>193</b>	17,48	<b>204</b>	19,05	<b>213</b>
56"	1422	11,13	<b>166</b>	11,91	<b>172</b>	12,7	<b>178</b>	14,27	<b>190</b>	15,88	<b>201</b>	17,48	<b>211</b>	19,05	<b>221</b>
60"	1524	11,13	<b>172</b>	11,91	<b>178</b>	12,7	<b>184</b>	14,27	<b>196</b>	15,88	<b>208</b>	17,48	<b>219</b>	19,05	<b>229</b>
64"	1626	11,13	<b>177</b>	11,91	<b>184</b>	12,7	<b>190</b>	14,27	<b>203</b>	15,88	<b>215</b>	17,48	<b>226</b>	19,05	<b>236</b>
68"	1727	11,13	<b>183</b>	11,91	<b>190</b>	12,7	<b>196</b>	14,27	<b>209</b>	15,88	<b>221</b>	17,48	<b>233</b>	19,05	<b>243</b>
72"	1829	11,13	<b>188</b>	11,91	<b>195</b>	12,7	<b>202</b>	14,27	<b>215</b>	15,88	<b>228</b>	17,48	<b>239</b>	19,05	<b>250</b>
76"	1930	11,13	<b>193</b>	11,91	<b>200</b>	12,7	<b>207</b>	14,27	<b>221</b>	15,88	<b>234</b>	17,48	<b>246</b>	19,05	<b>257</b>
80"	2032	11,13	<b>198</b>	11,91	<b>206</b>	12,7	<b>213</b>	14,27	<b>227</b>	15,88	<b>340</b>	17,48	<b>252</b>	19,05	<b>264</b>
84"	2134	11,13	<b>203</b>	11,91	<b>211</b>	12,7	<b>218</b>	14,27	<b>232</b>	15,88	<b>246</b>	17,48	<b>258</b>	-	-
90"	2286	11,13	<b>210</b>	11,91	<b>218</b>	12,7	<b>226</b>	14,27	<b>240</b>	15,88	<b>254</b>	17,48	<b>267</b>	-	-
96"	2438	11,13	<b>217</b>	11,91	<b>225</b>	12,7	<b>233</b>	14,27	<b>248</b>	15,88	<b>263</b>	17,48	<b>276</b>	-	-

Pad widths in following table are minimum dimensions.

		Wall thicknesses and Pad widths in mm													
		for													
		Code		Code		Code		Code		Code		Code		Code	
DN	Da (mm)	U	b	V	b	W	b	Y	b	Z	b		b		b
4"	114,3	-	-	22,23	<b>134</b>	-	-	-	-	-	-				
5"	141,3	20,62	<b>124</b>	22,23	<b>134</b>	-	-	-	-	-	-				
6"	168,3	-	-	22,23	<b>134</b>	25,4	<b>153</b>	-	-	-	-				
8"	219,1	-	-	22,23	<b>134</b>	25,4	<b>153</b>	-	-	31,75	<b>191</b>				
10"	273,0	20,62	<b>124</b>	22,23	<b>134</b>	-	-	-	-	36,53	<b>220</b>				
12"	323,9	20,62	<b>124</b>	22,23	<b>134</b>	-	-	-	-	45,24	<b>272</b>				
14"	355,6	20,62	<b>124</b>	22,23	<b>134</b>	25,4	<b>153</b>	-	-	50,8	<b>305</b>				
16"	406,4	20,62	<b>124</b>	22,23	<b>134</b>	25,4	<b>153</b>	-	-	-	-				
18"	457	20,62	<b>131</b>	22,23	<b>136</b>	25,4	<b>153</b>	-	-	-	-				
20"	508	20,62	<b>138</b>	22,23	<b>144</b>	25,4	<b>154</b>	-	-	-	-				
22"	559	20,62	<b>145</b>	22,23	<b>151</b>	25,4	<b>161</b>	-	-	-	-				
24"	610	20,62	<b>151</b>	22,23	<b>157</b>	25,4	<b>169</b>	-	-	-	-				
26"	660	20,62	<b>157</b>	22,23	<b>164</b>	25,4	<b>175</b>	6,35	<b>83</b>	-	-				
28"	711	20,62	<b>163</b>	22,23	<b>170</b>	25,4	<b>182</b>	6,35	<b>86</b>	-	-				
30"	762	20,62	<b>169</b>	22,23	<b>176</b>	25,4	<b>188</b>	6,35	<b>89</b>	-	-				
32"	813	20,62	<b>174</b>	22,23	<b>181</b>	25,4	<b>194</b>	6,35	<b>92</b>	-	-				
34"	864	20,62	<b>180</b>	22,23	<b>187</b>	25,4	<b>200</b>	6,35	<b>95</b>	-	-				
36"	914	20,62	<b>185</b>	22,23	<b>192</b>	25,4	<b>206</b>	6,35	<b>97</b>	-	-				
38"	965	20,62	<b>190</b>	22,23	<b>197</b>	25,4	<b>212</b>	6,35	<b>100</b>	-	-				
40"	1016	20,62	<b>195</b>	22,23	<b>203</b>	25,4	<b>217</b>	6,35	<b>103</b>	-	-				
42"	1067	20,62	<b>200</b>	22,23	<b>208</b>	25,4	<b>222</b>	6,35	<b>105</b>	-	-				
44"	1118	20,62	<b>204</b>	22,23	<b>212</b>	25,4	<b>228</b>	6,35	<b>108</b>	-	-				
46"	1168	20,62	<b>209</b>	22,23	<b>217</b>	25,4	<b>233</b>	6,35	<b>110</b>	-	-				
48"	1219	20,62	<b>213</b>	22,23	<b>222</b>	25,4	<b>238</b>	6,35	<b>112</b>	-	-				
52"	1321	20,62	<b>222</b>	22,23	<b>231</b>	25,4	<b>247</b>	6,35	<b>117</b>	-	-				
56"	1422	20,62	<b>230</b>	22,23	<b>239</b>	25,4	<b>257</b>	6,35	<b>121</b>	-	-				
60"	1524	20,62	<b>238</b>	22,23	<b>248</b>	25,4	<b>266</b>	6,35	<b>126</b>	-	-				
64"	1626	20,62	<b>246</b>	22,23	<b>256</b>	25,4	<b>274</b>	6,35	<b>130</b>	-	-				
68"	1727	20,62	<b>254</b>	22,23	<b>264</b>	25,4	<b>283</b>	-	-	-	-				
72"	1829	20,62	<b>261</b>	22,23	<b>271</b>	25,4	<b>291</b>	-	-	-	-				
76"	1930	20,62	<b>268</b>	22,23	<b>279</b>	25,4	<b>299</b>	-	-	-	-				
80"	2032	20,62	<b>275</b>	22,23	<b>286</b>	25,4	<b>306</b>	-	-	-	-				
84"	2134	20,62	<b>282</b>	22,23	<b>293</b>	-	-	-	-	-	-				
90"	2286	20,62	<b>292</b>	22,23	<b>303</b>	-	-	-	-	-	-				
96"	2438	20,62	<b>301</b>	22,23	<b>313</b>	-	-	-	-	-	-				

**Socket–Welding Forged Steel Fittings**  
**according to ASME B16.11,**  
**MSS SP-79 and MSS SP-83**

Standard

**H 280**

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Table 1:  
Correlation of fittings class with schedule number or wall designation of pipe for calculation of ratings.

Pressure Class Designation of Fitting	Pipe used for Rating Basis	
	Schedule	Wall Designation
Class 3000	80	XS
Class 6000	160	-
Class 9000	-	XXS

Table 2:  
Common dimensions for all fittings and relevant tolerances.

Nom. Diam. DN inch	Socket Bore Diam. B min. mm	Depth of Socket T min. mm	Min. Inside Diameter D			Socket Wall Thickness C						Min. Body Wall Thickness G			Tolerances ± for Dimensions		
			Cl. 3000 mm	Class 6000 mm	Class 9000 mm	Class 3000		Class 6000		Class 9000		Cl. 3000 mm	Class 6000 mm	Class 9000 mm	A mm	E mm	F mm
						mm	min mm	mm	min mm	mm	min mm						
1/8"	10.8	9.5	6.1	3.2	-	3.18	3.18	3.96	3.43	-	-	2.41	3.15	-	1.0	1.5	1.5
1/4"	14.2	9.5	8.5	5.6	-	3.78	3.30	4.60	4.01	-	-	3.02	3.68	-	1.0	1.5	1.5
3/8"	17.6	9.5	11.8	8.4	-	4.01	3.50	5.03	4.37	-	-	3.20	4.01	-	1.5	3.0	3.0
1/2"	21.8	9.5	15.0	11.0	5.6	4.67	4.09	5.97	5.18	9.35	8.18	3.73	4.78	7.47	1.5	3.0	3.0
3/4"	27.2	12.5	20.2	14.8	10.3	4.90	4.27	6.96	6.04	9.78	8.56	3.91	5.56	7.82	1.5	3.0	3.0
1"	33.9	12.5	25.9	19.9	14.4	5.69	4.98	7.92	6.93	11.38	9.96	4.55	6.35	9.09	2.0	4.0	4.0
1 1/4"	42.7	12.5	34.3	28.7	22.0	6.07	5.28	7.92	6.93	12.14	10.62	4.85	6.35	9.70	2.0	4.0	4.0
1 1/2"	48.8	12.5	40.1	33.2	27.2	6.35	5.54	8.92	7.80	12.70	11.12	5.08	7.14	10.15	2.0	4.0	4.0
2"	61.2	16.0	51.7	42.1	37.4	6.93	6.04	10.92	9.50	13.84	12.21	5.54	8.74	11.07	2.0	4.0	4.0
2 1/2"	73.9	16.0	61.2	54.0 *)	-	8.76	7.67	17.0 *)	-	-	-	7.01	-	-	2.5	5.0	5.0
3"	89.8	16.0	76.4	66.7 *)	-	9.52	8.30	18.6 *)	-	-	-	7.62	-	-	2.5	5.0	5.0
4"	115.2	19.0	100.7	87.3 *)	-	10.69	9.35	21.7 *)	-	-	-	8.56	-	-	2.5	5.0	5.0

\*) Not covered by ASME B16.11

# Socket–Welding Forged Steel Fittings Elbows / ASME B16.11

**H 280**

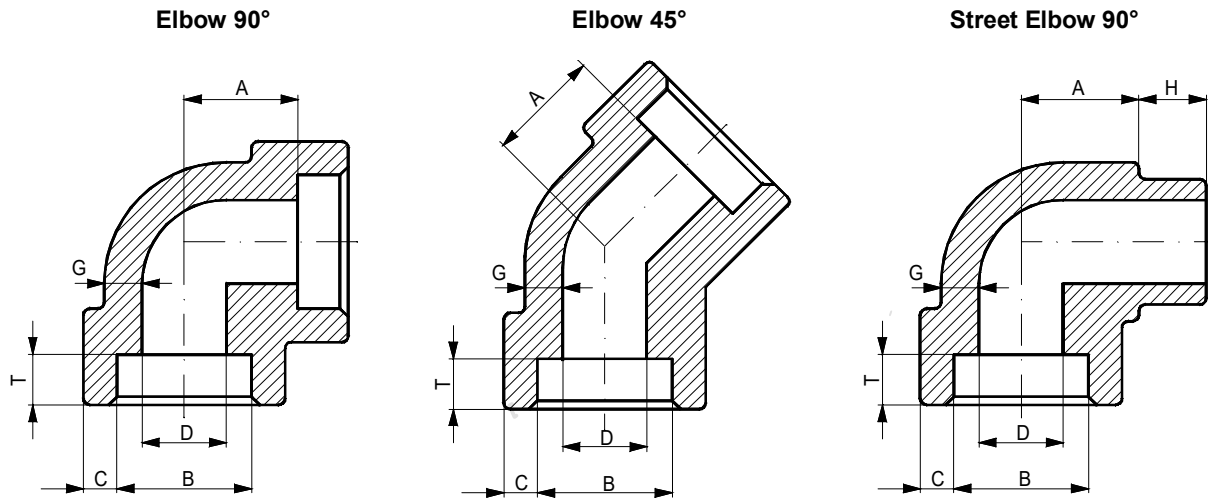
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Example of Designation: Designation of an elbow 90°, class 6000 for nominal diameter 2", material: A182 Gr.F316

Part number **28125P002**    **2 INCH**    **SOCKET-WELD ELBOW 90DEGR**    **ASTM A182 GR.F316**  
**CLASS 6000 H280/ASME B16.11**

Part numbering Code										
Position of Part No.										
1. - 3.		4.			5. - 6.		7. - 8.		9.	
Kind of Part		Type 2)			Material 1)				Certificate 4)	
	Cd.		Cd.		Cd.	Cd.	Cd.		Cd.	
Socket-Welding Forged Steel Fittings Elbows	281	90° - class 3000	1	A105	5B	0	0	ASME	2	
		90° - class 6000	2	A182 Gr.F1	5E			ASME 5)	H	
		90° - class 9000	3	A182 Gr.F5	5F					
		45° - class 3000	4	A182 Gr.F304	5M					
		45° - class 6000	5	A182 Gr.F316	5P					
		45° - class 9000	6	A182 Gr.F321	5Q					
		Street 90°, class 3000 3)	7	A350 Gr.LF2	5X					
		Street 90°, class 6000 3)	8	A182 Gr.F304L	F4					
		Street 90°, class 9000 3)	9	A182 Gr.F316L	F6					
				A182 Gr.F51 (S31803)	T1					

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Street elbows are not covered by ASME B16.11.
- 4) Requirements and certificate according to ASTM- / ASME-standards.
- 5) For piping components with end coding H a “certified test report” shall be provided.



Nom. Diam.	Center to Bottom Socket A						Dimension H			Weight kg/100 pieces					
	for						for			for					
	Elbow 90°			Elbow 45°			Street Elbow 90°			Elbow 90°			Elbow 45°		
DN inch	Class 3000 mm	Class 6000 mm	Class 9000 mm	Class 3000 mm	Class 6000 mm	Class 9000 mm	Class 3000 mm	Class 6000 mm	Class 9000 mm	Class 3000	Class 6000	Class 9000	Class 3000	Class 6000	Class 9000
1/8"	11.0	11.0	-	8.0	8.0	-	6.3	9.5	-	-	-	-	-	-	-
1/4"	11.0	13.5	-	8.0	8.0	-	9.5	9.5	-	6.5	13.5	-	19.5	20.0	-
3/8"	13.5	15.5	-	8.0	11.0	-	9.5	9.5	-	10.5	11.5	-	18.0	19.0	-
1/2"	15.5	19.0	25.5	11.0	12.5	15.5	9.5	9.5	-	19.5	22.5	-	17.0	17.5	-
3/4"	19.0	22.5	28.5	12.5	14.0	19.0	9.5	12.7	-	28.0	62.5	-	23.0	50.0	-
1"	22.5	27.0	32.0	14.0	17.5	20.5	12.7	15.9	-	46.0	109	-	34.5	88.0	-
1 1/4"	27.0	32.0	35.0	17.5	20.5	22.5	15.9	14.3	-	65.0	178	-	65.0	169	-
1 1/2"	32.0	38.0	38.0	20.5	25.5	25.5	14.3	20.6	-	96.0	230	-	79.5	185	-
2"	38.0	41.0	54.0	25.5	28.5	28.5	20.6	-	-	150	358	-	120	293	-
2 1/2"	41.0	58.0 *)	-	28.5	39.0 *)	-	-	-	-	225	655	-	220	650	-
3"	57.0	66.0 *)	-	32.0	34.0 *)	-	-	-	-	400	860	-	580	710	-
4"	66.5	80.0 *)	-	41.0	45.5 *)	-	-	-	-	1430	1650	-	1030	1420	-

Further dimensions see page 2

\*) Not covered by ASME B16.11

# Socket-Welding Forged Steel Fittings Branches / ASME B16.11

**H 280**

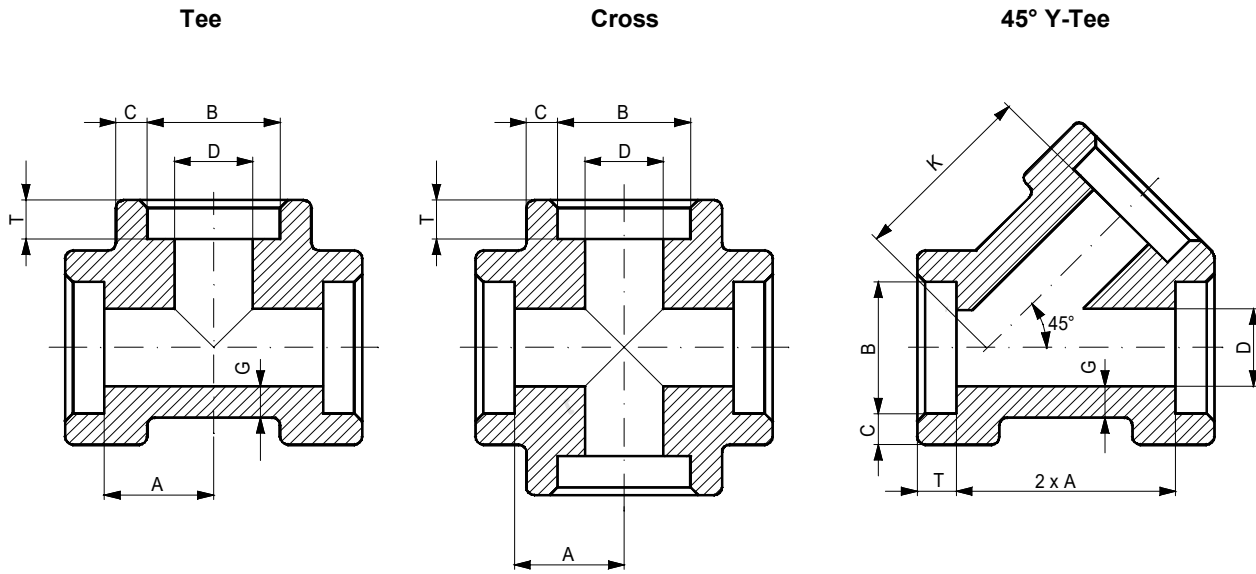
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Example of Designation:      Designation of a cross, class 3000 for nominal diameter 1 1/2",  
material: A105

Part number                      1 1/2 \* 1 1/2 INCH      **SOCKET-WELD CROSS      ASTM A105**  
**28345B002**                      **CLASS 3000 H280/ASME B16.11**

Part numbering Code									
Position of Part No.									
1. - 3.		4.			5. - 6.		7. - 8.		9.
Kind of Part		Type 2)			Material 1)				Certificate 4)
	Cd.		Cd.		Cd.	Cd.	Cd.		Cd.
Socket -Welding Forged Steel Fittings Branches	283	Tee - class 3000	1	A105	5B	0	0	ASME	2
		Tee - class 6000	2	A182 Gr.F1	5E			ASTM 5)	H
		Tee - class 9000	3	A182 Gr.F5	5F				
		Cross - class 3000	4	A182 Gr.F304	5M				
		Cross - class 6000	5	A182 Gr.F316	5P				
		Cross - class 9000	6	A182 Gr.F321	5Q				
		45° Y-Tee - class 3000 3)	7	A350 Gr.LF2	5X				
		45° Y-Tee - class 6000 3)	8	A182 Gr.F304L	F4				
		45° Y-Tee - class 9000 3)	9	A182 Gr.F316L	F6				
		Couplet - class 3000	A	A182 Gr.F51	T1				
		Couplet - class 6000	B	(S31803)					
		Boss - class 3000	C						
		Boss - class 6000	D						
		Boss - class 9000	E						

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) 45° Y-Tee's are not covered by ASME B16.11.
- 4) Requirements and certificate according to ASTM- / ASME-standards.
- 5) For piping components with end coding H a "certified test report" shall be provided.

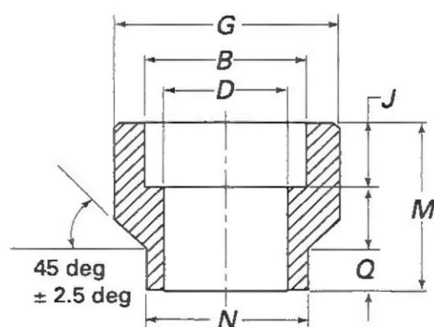


Nom-diam.	Center to Bottom of Socket			Dimension K for 45° Y-Tee			Weight kg/100 pieces for					
	A						Tee			Cross		
	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class
DN inch	3000 mm	6000 mm	9000 mm	3000 mm	6000 mm	9000 mm	3000	6000	9000	3000	6000	9000
1/8"	11.0	11.0	-	-	-	-	14.0	-	-	14.0	-	-
1/4"	11.0	13.5	-	-	-	-	19.5	20.0	-	24.5	26.0	-
3/8"	13.5	15.5	-	-	-	-	18.0	19.0	-	20.0	22.5	-
1/2"	15.5	19.0	25.5	35.0	44.5	-	17.0	17.5	-	37.0	41.5	-
3/4"	19.0	22.5	28.5	41.3	50.8	-	23.0	50.0	-	45.6	112	-
1"	22.5	27.0	32.0	50.8	58.7	-	34.5	88.0	-	75.0	173	-
1 1/4"	27.0	32.0	35.0	58.7	68.3	-	65.0	96.0	-	100	120	-
1 1/2"	32.0	38.0	38.0	68.3	98.4	-	79.5	185	-	135	375	-
2"	38.0	41.0	54.0	95.2	119	-	120	293	-	182	650	-
2 1/2"	41.0	58.0 *)	-	119	-	-	220	650	-	350	1060	-
3"	57.0	66.0 *)	-	-	-	-	580	710	-	1410	1360	-
4"	66.5	80.0 *)	-	-	-	-	1030	1420	-	2350	2600	-

Further dimensions see page 2

\*) Not covered by ASME B16.11

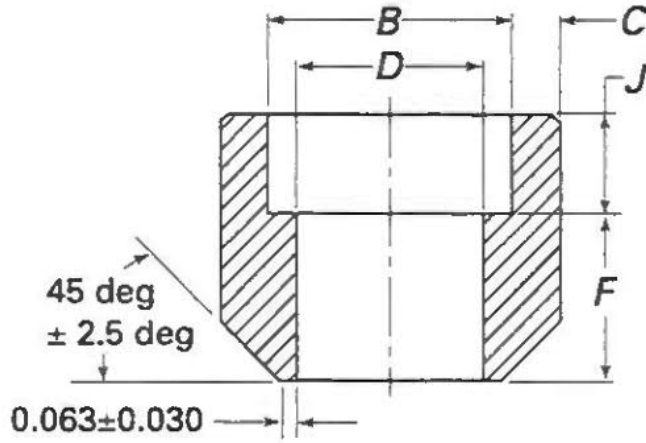
Couplet



Nom. Diam.	G												Weight	
	J		M		N		Q		Class 3000		Class 6000		Class 3000	Class 6000
DN	min.		Tol.		Tol.		Tol.		Tol.		Tol.			
inch	mm	mm	±mm	mm	±mm	mm	±mm	mm	±mm	mm	±mm	mm	±mm	kg/100 pieces for
1/4"	9.5	30.2	0.8	17.5	1.5	9.5	0.8	23.8	1.5	25.4	1.5	7.0	8.0	
3/8"	9.5	30.2	0.8	20.7	1.5	9.5	0.8	27.0	1.5	31.8	1.5	8.0	12.0	
1/2"	9.5	33.4	0.8	23.8	1.5	9.5	0.8	33.4	1.5	38.1	1.5	11.0	18.0	
3/4"	12.5	34.9	0.8	27.0	1.5	9.5	0.8	38.1	1.5	44.5	1.5	14.0	23.0	
1"	12.5	42.9	0.8	33.4	1.5	9.5	0.8	46.1	1.5	57.2	1.5	27.0	59.0	
1 1/4"	12.5	47.6	0.8	42.9	1.5	9.5	0.8	55.6	1.5	63.5	1.5	41.0	66.0	
1 1/2"	12.5	50.8	0.8	49.2	1.5	9.5	0.8	63.5	1.5	76.2	1.5	57.0	98.0	
2"	19.0	57.2	1.5	61.9	1.5	9.5	0.8	79.4	1.5	92.1	1.5	94.0	163	
2 1/2"	19.0	63.5	1.5	73.0	1.5	9.5	0.8	92.1	1.5	108.0	1.5	137	239	
3"	19.0	69.9	1.5	88.9	1.5	9.5	0.8	111.1	1.5	127.0	1.5	213	362	
4"	19.0	76.2	1.5	114.3	1.5	9.5	0.8	141.3	1.5	158.8	1.5	354	594	

Further dimensions see page 2.

**Boss**



Nom. Diam.				Weight kg/100 pieces for		
	J	F		Class 3000	Class 6000	Class 9000
DN inch	min. mm	mm	Tol. ±mm			
1/8	9.5	16.0	1.5	3.0	4.0	-
1/4"	9.5	16.0	1.5	5.0	5.0	-
3/8"	9.5	17.5	3.0	6.0	8.0	-
1/2"	9.5	22.5	3.0	11.0	14.0	18.0
3/4"	12.5	24.0	3.0	16.0	22.0	28.0
1"	12.5	28.5	4.0	27.0	36.0	45.0
1 1/4"	12.5	30.0	4.0	37.0	47.0	62.0
1 1/2"	12.5	32.0	4.0	46.0	62.0	78.0
2"	19.0	41.0	4.0	85.0	130	154
2 1/2"	19.0	43.0	5.0	134	-	-
3"	19.0	44.5	5.0	177	-	-
4"	19.0	48.0	5.0	267	-	-

Further dimensions see page 2.

# Socket–Welding Forged Steel Fittings Couplings / ASME B16.11

**H 280**

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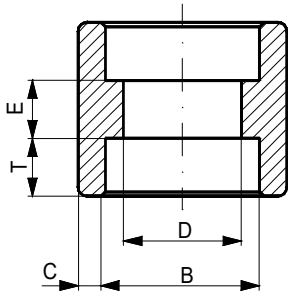
Example of Designation: Designation of a coupling, class 3000 for nominal diameter 3/4", material: A182 Gr.F321

Part number **28415Q002**    **3/4 INCH**    **SOCKET-WELD COUPLING**    **ASTM A182 GR.F321**  
**CLASS 3000 H280/ASME B16.11**

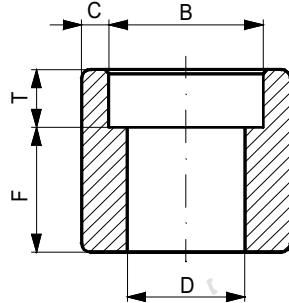
Part numbering Code										
Position of Part No.										
1. - 3.		4.		5. - 6.		7. - 8.		9.		
Kind of Part	Cd.	Type 2)		Material 1)				Certificate 4)		
			Cd.		Cd.	Cd.	Cd.		Cd.	
Socket-Welding Forged Steel Fittings Couplings	284	Coupling – class 3000		1	A105	5B	0	0	ASME	2
		Coupling – class 6000		2	A182 Gr.F1	5E			ASTM 5)	H
		Coupling – class 9000		3	A182 Gr.F5	5F				
		Half Coupling Class 3000		4	A182 Gr.F304	5M				
		Half Coupling Class 6000		5	A182 Gr.F316	5P				
					A182 Gr.F321	5Q				
		Half Coupling Class 9000		6	A350 Gr.LF2	5X				
					A182 Gr.F304L	F4				
		Reducing coupling Class 3000 3)		7	A182 Gr.F316L	F6				
					A182 Gr.F51 (S31803)	T1				
		Reducing coupling Class 6000 3)		8						
		Reducing coupling Class 9000 3)		9						

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Reducing couplings are not covered by ASME B16.11.
- 4) Requirements and certificate according to ASTM- / ASME-standards.
- 5) For piping components with end coding H a "certified test report" shall be provided.

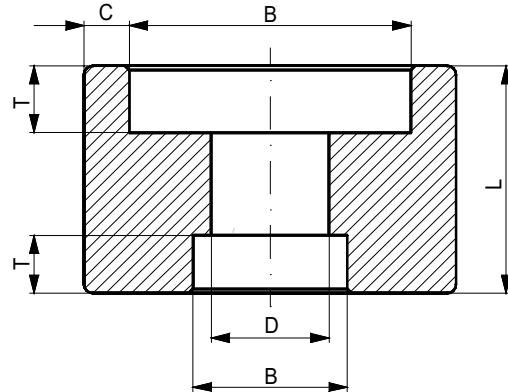
**Coupling**



**Half-coupling**



**Reducing coupling**



Nom. Diam. DN inch	Laying Lengths E mm   F mm		Weight kg/100 pieces for					
			Coupling			Half-coupling		
			Class 3000	Class 6000	Class 9000	Class 3000	Class 6000	Class 9000
1/8"	6.5	16.0	5.0	-	-	5.0	-	-
1/4"	6.5	16.0	5.0	-	-	9.0	-	-
3/8"	6.5	17.5	5.0	-	-	9.0	-	-
1/2"	9.5	22.5	14.0	23.0	-	18.0	23.0	-
3/4"	9.5	24.0	18.0	27.0	-	23.0	36.0	-
1"	12.5	28.5	23.0	63.0	-	27.0	63.0	-
1 1/4"	12.5	30.0	45.0	73.0	-	50.0	68.0	-
1 1/2"	12.5	32.0	59.0	118	-	63.0	150	-
2"	19.0	41.0	95.0	204	-	104	204	-
2 1/2"	19.0	43.0	136	231 *)	-	172	227 *)	-
3"	19.0	44.5	172	281 *)	-	204	454 *)	-
4"	19.0	48.0	281	612 *)	-	272	839 *)	-

Further dimensions see page 2.

\*) Class 6000 coupling and half coupling not covered by ASME B16.11

**Reducing Coupling**

Nominal diameter	3/8"		1/2"		3/4"		1"			1 1/4"	1 1/2"			2"	
	1/4"	3/8"	1/4"	1/2"	1/4"	3/4"	1/2"	1/4"	1"	1"	3/4"	1/2"	1 1/2"	1"	
Length L	25.5	28.5	28.5	35.5	35.5	39	39	39	39	39	39	39	51	51	
Weight Cl.3000 #)	7	12	13	20	22	32	35	38	44	58	63	67	92	114	
Weight Cl.6000 #)	8	15	16	26	28	42	46	49	54	70	74	78	131	147	

#) Weight – kg/100 pieces

# Socket–Welding Forged Steel Fittings Caps / ASME B16.11

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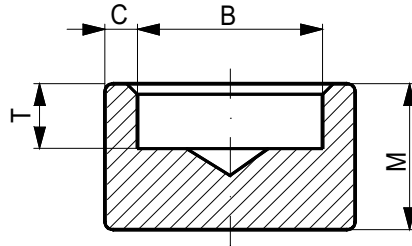
Example of Designation:      Designation of a cap, class 6000 for nominal diameter 1",  
material: A182 Gr.F304L

Part number                      1 INCH      **SOCKET-WELD CAP**      **ASTM A182 GR.F304L**  
**2852F4002**                      **CLASS 6000 H280/ASME B16.11**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Type 2)		Material 1)				Certificate 3)	
	Cd.		Cd.		Cd.	Cd.	Cd.		Cd.
Socket-Welding Forged Steel Fittings Caps	285	Cap – class 3000	1	A105	5B	0	0	ASME	2
		Cap – class 6000	2	A182 Gr.F1	5E			ASTM 4)	H
				A182 Gr.F5	5F				
				A182 Gr.F304	5M				
				A182 Gr.F316	5P				
				A182 Gr.F321	5Q				
				A350 Gr.LF2	5X				
				A182 Gr.F304L	F4				
				A182 Gr.F316L	F6				
				A182 Gr.F51 (S31803)	T1				

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Requirements and certificate according to ASTM- / ASME-standards.
- 4) For piping components with end coding H a “certified test report” shall be provided.

**Cap**



Nominal diameter	M			Weight kg/100 pieces		
	Class 3000 mm	Class 6000 mm	Class 9000 mm	Class 3000	Class 6000	Class 9000
1/8"	14.3	15.9	-	2.0	3.0	-
1/4"	14.3	15.9	-	3.0	4.0	-
3/8"	14.3	15.9	-	4.0	6.0	-
1/2"	15.9	17.4	20.2	7.0	9.0	17.0
3/4"	18.9	20.4	25.2	10.0	15.0	28.0
1"	22.1	23.7	26.7	19.0	27.0	44.0
1 1/4"	22.1	23.7	26.7	27.0	36.0	59.0
1 1/2"	23.7	25.2	28.2	37.0	50.0	77.0
2"	28.7	31.7	35.0	63.0	98.0	134
2 1/2"	31.7	35.0	-	111	146	-
3"	35.0	38.4	-	177	252	-
4"	41.4	47.4	-	349	520	-

Further dimensions see page 2.

# Socket–Welding Forged Steel Fittings Unions / MSS SP-83

**H 280**

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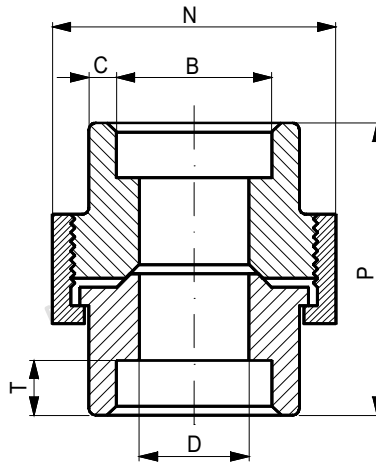
Example of Designation: Designation of an union, class 3000. for nominal diameter 1 1/4", material: A350 Gr.LF2

Part number  
**28615X002      1 1/4 INCH      SW-STRAIGHT UNION      ASTM A350 GR.LF2  
CLASS 3000 H280/MSS SP-83**

Part numbering Code													
Position of Part No.													
1. - 3.		4.		5. - 6.		7. - 8.		9.					
Kind of Part		Type 2)		Material 1)				Certificate 4)					
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.				
Socket-Welding Forged Steel Fittings Unions	286	Straight union Class 3000	1	A105	5B	0	0	ASME	2				
				A182 Gr.F1	5E			ASTM 5)	H				
		Straight union Class 6000	2	A182 Gr.F5	5F								
				A182 Gr.F304	5M								
		Straight union 3) Cl. 3000 with O-Ring	3	A182 Gr.F316	5P								
				A182 Gr.F321	5Q								
		Straight union 3) Cl. 6000 with O-Ring	4	A350 Gr.LF2	5X								
				A105 / Bronze-trim	8U								
				A182 Gr.F304L	F4								
				A182 Gr.F316L	F6								
		A182 Gr.F51 (S31803)	T1										

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Straight unions with O-ring are not covered by MSS SP-83.  
Without sketch.
- 4) Requirements and certificate according to ASTM- / ASME-standards.
- 5) For piping components with end coding H a "certified test report" shall be provided.

**Union**



Nominal diameter DN inch	Spanner width N *)		Length P		Weight kg/100 pieces	
	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm	Class 3000	Class 6000
1/8"	-	-	41.4	41.4	-	-
1/4"	32	46	41.4	45.9	15.0	50.0
3/8"	38	51	46.0	49.0	22.0	65.0
1/2"	46	60	49.0	56.9	38.0	91.0
3/4"	51	72	56.9	62.0	46.0	180
1"	60	80	67.0	71.1	70.0	200
1 1/4"	72	94	71.1	76.5	120	250
1 1/2"	80	100	76.5	86.1	150	390
2"	94	122	86.1	107.3	260	650
2 1/2"	122	-	103.3	109.0	610	-
3"	144	-	109.0	-	880	-
4"	180	-	150 *)	-	1350	-

\*) Not covered by MSS SP-83  
Further dimensions see page 2.

# Socket–Welding Forged Steel Fittings

## Reducer inserts / MSS SP-79

**H 280**

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Example of Designation: Designation of a reducer insert, class 3000 for nominal diameter 1 1/4", and 1/2", material: A105

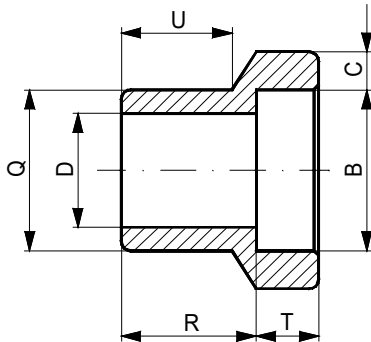
Part number **28715B002**     **1 1/4 \* 1/2 INCH**     **SW-REDUCER INSERT**     **ASTM A105**  
**CLASS 3000 H280/MSS SP-79**

Part numbering Code											
Position of Part No.											
1. - 3.		4.		5. - 6.		7. - 8.		9.			
Kind of Part 3)		Type 2)		Material 1)				Certificate 4)			
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.			
Socket-Welding Forged Steel Fittings Reducer insert	287	Class 3000	1	A105	5B	0	0	ASME	2		
				A182 Gr.F1	5E			ASTM 5)	H		
	Class 6000	2	A182 Gr.F5	5F							
			A182 Gr.F304	5M							
			A182 Gr.F316	5P							
			A182 Gr.F321	5Q							
			A350 Gr.LF2	5X							
			A182 Gr.F304L	F4							
			A182 Gr.F316L	F6							
			A182 Gr.F51 (S31803)	T1							

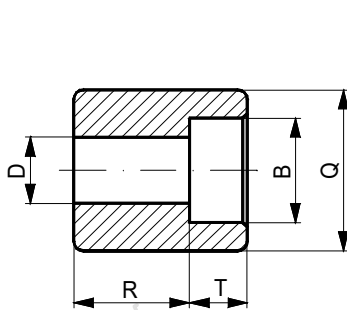
- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for pressure class.
- 3) The selection of type of fitting was made due to MSS SP-79 and manufacturer catalogue Trouvay–Cauvin.  
The present selection is not mandatory.
- 4) Requirements and certificate according to ASTM- / ASME-standards.
- 5) For piping components with end coding H a “certified test report” shall be provided.

**Reducer inserts**

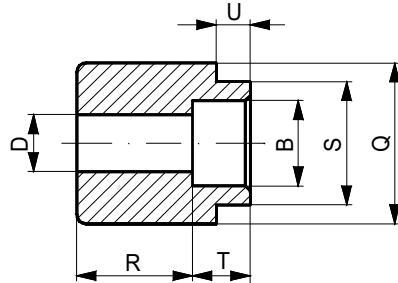
**Type 1**



**Type 2**



**Type 3 \*)**



Nominal diameter DN		Type		Q	R		S		U		Weight kg/100 pieces	
		Class 3000	Class 6000		Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm	Class 3000	Class 6000
inch	inch			mm	mm	mm	mm	mm	mm	mm	mm	mm
3/8"	1/4"	1	1	17.1	19.1	21.3	-	-	14.2	15.7	4.0	6.0
1/2"	3/8"	1	1	21.3	20.6	23.1	-	-	15.7	15.7	6.0	9.0
	1/4"	1	1		20.6	20.6	-	-	15.7	15.7	6.0	8.0
	1/8" *)	3	-		15.5	-	17	-	7	-	5.0	-
3/4"	1/2"	1	1	26.7	22.4	25.4	-	-	17.5	19.1	10.0	14.0
	3/8"	2	1		15.7	22.4	-	-	-	19.1	8.0	12.0
	1/4"	2	2		17.5	22.4	-	-	-	-	10.0	12.0
	1/8" *)	3	-		15.5	-	17	-	7	-	8.0	-
1"	3/4"	1	1	33.4	23.9	28.4	-	-	19.1	20.6	16.0	24.0
	1/2"	2	1		15.7	28.4	-	-	-	20.6	12.0	21.0
	3/8"	2	2		17.5	22.1	-	-	-	-	15.0	19.0
	1/4"	2	2		19.1	23.9	-	-	-	-	18.0	21.0
1 1/4"	1"	1	1	42.2	25.4	30.2	-	-	20.6	22.4	25.0	38.0
	3/4"	2	2		17.5	20.6	-	-	-	-	23.0	28.0
	1/2"	2	2		19.1	22.4	-	-	-	-	27.0	31.0
	3/8"	2	2		20.6	23.9	-	-	-	-	29.0	34.0
	1/4"	2	2		22.4	25.4	-	-	-	-	33.0	37.0
1 1/2"	1 1/4"	1	1	48.3	28.4	35.1	-	-	22.4	25.4	31.0	48.0
	1"	2	2		17.5	29.2	-	-	-	-	27.0	44.0
	3/4"	2	2		18.1	25.4	-	-	-	-	34.0	45.0
	1/2"	2	2		20.6	26.9	-	-	-	-	38.0	48.0
	3/8"	2	2		22.4	28.4	-	-	-	-	42.0	51.0
2"	1 1/2"	1	1	60.3	31.8	38.9	-	-	25.4	28.7	51.0	79.0
	1 1/4"	2	2		20.6	23.9	-	-	-	-	47.0	57.0
	1"	2	2		22.4	25.4	-	-	-	-	62.0	72.0
	3/4"	2	2		23.9	26.9	-	-	-	-	70.0	79.0
	1/2"	2	2		25.4	28.4	-	-	-	-	72.0	80.0
2 1/2"	2"	1	1	73.0	46.0	42.7	-	-	38.1	31.8	95.0	130
	1 1/2"	2	2		35.1	35.1	-	-	-	-	103	114
	1 1/4"	2	2		36.6	36.6	-	-	-	-	121	129
	1"	2	2		38.1	38.1	-	-	-	-	142	148
	3/4"	2	2		39.6	38.1	-	-	-	-	156	155
	1/2" *)	-	3		-	46.5	-	41	-	7	-	162

Further dimensions see page 2 (reduced sizes).

\*) Type 3 is taken from manufacturer catalogue Trouvay-Cauvin.

Nominal diameter DN		Type		Q	R		S		U		Weight kg/100 pieces	
		Class 3000	Class 6000		Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm	Class 3000	Class 6000
inch	inch			mm								
3"	2 1/2"	1	1	89.6	38.1	57.2	-	-	31.8	44.5	127	251
	2"	2	2		25.4	31.8	-	-	-	-	123	161
	1 1/2"	2	2		28.4	31.8	-	-	-	-	153	176
	1 1/4"	2	2		30.2	31.8	-	-	-	-	172	186
	1"	2	2		39.6	31.8	-	-	-	-	229	199
4"	3"	1	-	114.3	33.3	-	-	-	-	-	198	-
	2 1/2"	2	-		38.1	-	-	-	-	-	294	-
	2"	2	-		38.1	-	-	-	-	-	336	-
	1 1/2"	2	-		41.1	-	-	-	-	-	373	-
	1 1/4"	2	-		42.9	-	-	-	-	-	401	-

Further dimensions see page 2 (reduced sizes).

## Socket - Welding Steel Fittings for ASME-Tubing

Standard

**H 287 A**

Page 1 of 5

Part No.

2	8	7	2)	1)	3)	4)
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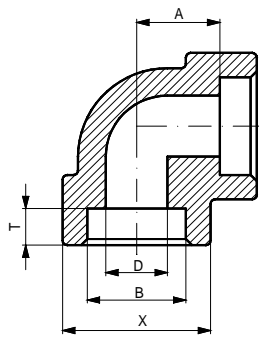
Example of Designation: Designation of an elbow 90°, class 3000, for Tube Dash Size -12 (outside diameter 19,05 mm), material: A182 Gr.F316

Partnumber  
**2871SP0Q2 -12 / 19,05 SW-Elbow 90° class 3000 for ASME-tube  
 H287A ASTM A182 Gr.F316**

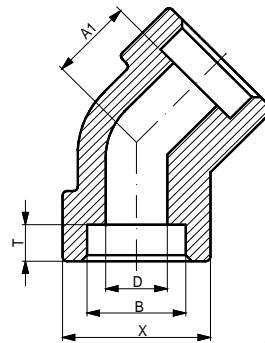
Partnumbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Type of fitting 2)		Material 1)		Class 3)		Certificate 4)	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Code	Code	Code	Code
Socket - Welding Steel Fittings for Tubes	287	Elbow 90°	1	ASTM A182 Gr.F304L	F4	1000	0N	ASME/	2
		Elbow 45°	2	ASTM A182 Gr.F316L	F6	3000	0Q	MSS	
		Tee equal	3	ASTM A182 Gr.F304	5M	6000	0U		5)
		Cross	4	ASTM A182 Gr.F316	5P			ASME/	H
		Coupling	5	A105	5B			MSS	
		Half Coupling	6						
		Reducing Coupling	7						
		Cap	8						
		Reducer Insert 6)	9						

- 1) Materials:  
 A105 for class 3000 and 6000.  
 Stainless steels:  
 ASTM A182 for Class 1000, 3000, 6000.
- 2) Code for type of fitting  
 These fittings take pattern from ASME B16.11, MSS-SP79 and MSS-SP114.
- 3) Code for class: class 1000 for stainless steel only  
 class 3000 and 6000 for all materials
- 4) Requirements for dimensions acc. to this standard, for materials and certificate acc. to ASTM-/ MSS-Standards  
 Not specified dimensions shall be furnished accordingly.  
***Manufacturer's dimensions may slightly deviate from specified standard dimensions.***
- 5) For SW-fittings with end coding H a certified test report acc. to appropriate ASTM-material standard shall be provided.
- 6) Reducer inserts take pattern from MSS-SP114 for class 1000.  
 MSS-SP79 for class 3000 and 6000.

Elbow - 90°



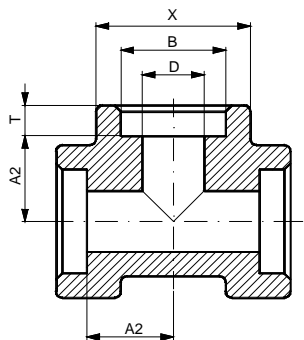
Elbow - 45°



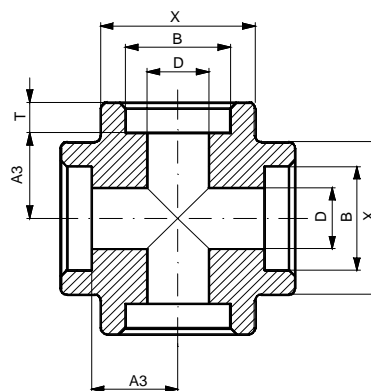
Dimensions in mm

Tube Size		Elbow 90° Dimension A			Elbow 45° Dimension A1			Weight kg / 100 pieces					
TDS	inch	1000	3000	6000	1000	3000	6000	Elbow 90°			Elbow 45°		
								1000	3000	6000	1000	3000	6000
-2	1/8		12,04	12,04		7,98	7,98						
-3	3/16		11,61	11,61		8,31	8,31						
-4	1/4		11,18	11,18		8,64	8,64						
-5	5/16		11,1	11,1		7,04	7,04						
-6	3/8		11,84	11,84		10,31	10,31						
-8	1/2		15,09	15,09		11,02	11,02						
-10	5/8		17,55	17,55		15,01	15,01						
-12	3/4		20,57	20,57		16,00	16,00						
-16	1		23,05	23,05		17,45	17,45						
-20	1 1/4		31,88	31,88		-	-						
-24	1 1/2		40,13	40,13		-	-						
-32	2		-	-		-	-						

Tee - equal



Cross

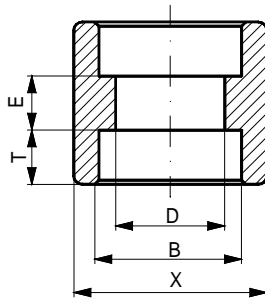


Dimensions in mm

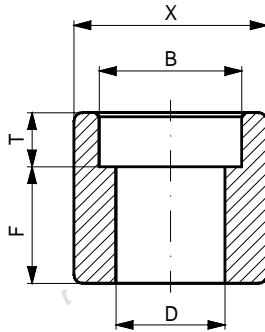
Tube Size		Tee Dimension A2			Cross Dimension A3			Weight kg / 100 pieces					
TDS	inch	1000	3000	6000	1000	3000	6000	Tee			Cross		
								1000	3000	6000	1000	3000	6000
-2	1/8		12,04	12,04		12,04	12,04						
-3	3/16		11,61	11,61		11,61	11,61						
-4	1/4		11,18	11,18		11,18	11,18						
-5	5/16		11,1	11,1		11,1	11,1						
-6	3/8		11,84	11,84		11,84	11,84						
-8	1/2		15,09	15,09		15,85	15,85						
-10	5/8		17,55	17,55		17,55	17,55						
-12	3/4		20,57	20,57		20,57	20,57						
-16	1		23,05	23,05		23,05	23,05						
-20	1 1/4		31,88	31,88		-	-						
-24	1 1/2		40,13	40,13		-	-						
-32	2		-	-		-	-						

Common dimensions B, D, T, X see page 5.

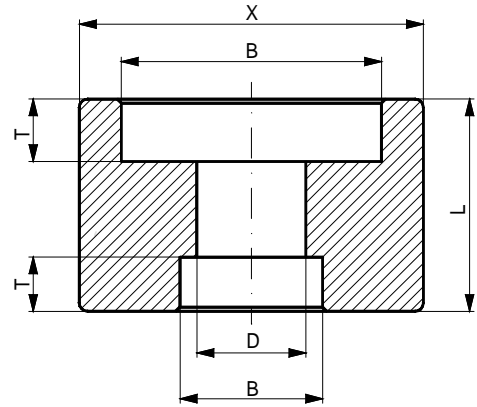
**Coupling**



**Half Coupling**



**Reducing Coupling**



Dimensions in mm

Tube Size		Laying length		Weight kg / 100 pieces					
				Coupling			Half Coupling		
TDS	inch	E	F	1000	3000	6000	1000	3000	6000
-2	1/8	6,3	10,0						
-3	3/16	6,45	11,0						
-4	1/4	6,35	12,0						
-5	5/16	6,45	12,0						
-6	3/8	7,16	15,76						
-8	1/2	6,3	16,69						
-10	5/8	7,92	20,09						
-12	3/4	7,87	20,8						
-16	1	11,02	25,7						
-20	1 1/4	11,18	27,12						
-24	1 1/2	10,41	27,48						
-32	2	-	-						

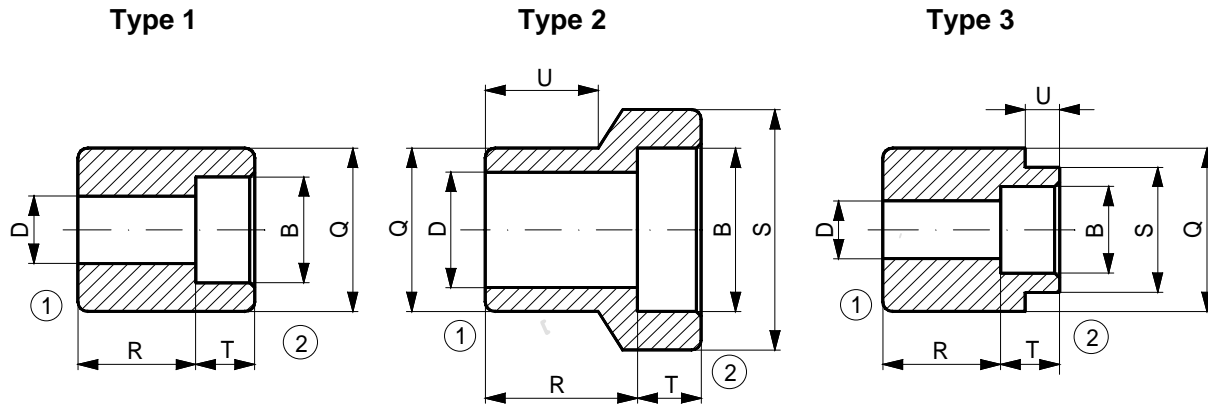
**Reducing Coupling**

Tube size	Big	3/8		1/2			5/8			3/4		
	Small	5/16	1/4	3/8	5/16	1/4	1/2	3/8	1/4	5/8	1/2	3/8
Length L (mm)		24,5		27			32			33,5		
Weight kg/100 pcs.	3000											
	6000											

Tube size	Big	1				1 1/4		1 1/2			2		
	Small	3/4	1/2	5/8	1/4	1	3/4	1 1/4	1	3/4	1 1/2	1 1/4	1
Length L (mm)		40				43		44,5			50		
Weight kg/100 pcs.	3000												
	6000												

Common dimensions B, D, T, X see page 5.

Reducer Insert



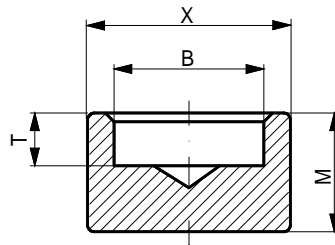
Dimensions in mm

Tube Size ①	Tube Size ②	Type	Q	R			S			U			Weight kg / 100 pieces		
				1000	3000	6000	1000	3000	6000	1000	3000	6000	1000	3000	6000
3/8	1/4	2	9,53		14,73	14,73		13,46	13,46		11,94	11,94			
1/2	3/8	2	12,7		16,66	16,66		16,00	16,00		14,22	14,22			
	1/4	1			16,00	16,00		-	-		-	-			
5/8	1/2	2	15,87		19,44	19,44		20,57	20,57		16,00	16,00			
	3/8	1			17,42	17,42		-	-		-	-			
	1/4	3			21,34	21,34		12,70	12,70		7,87	7,87			
3/4	5/8	2	19,05		21,87	21,87		23,88	23,88		17,53	17,53			
	1/2	2			19,92	19,92		20,57	20,57		17,53	17,53			
	3/8	3			23,01	23,01		16,00	16,00		10,41	10,41			
	1/4	3			23,88	23,88		12,70	12,70		7,87	7,87			
1	3/4	2	25,4		22,61	22,61		28,70	28,70		19,05	19,05			
	5/8	3			24,16	24,16		23,88	23,88		14,22	14,22			
	1/2	3			25,50	25,50		20,57	20,57		12,70	12,70			
	3/8	3			26,31	26,31		16,00	16,00		10,41	10,41			
	1/4	3			26,92	26,92		12,70	12,70		7,87	7,87			
1 1/4	1	2	31,75		25,32	25,32		35,05	35,05		22,35	22,35			
	3/4	3			28,70	28,70		28,70	28,70		14,22	14,22			
	1/2	3			31,09	31,09		20,57	20,57		12,7	12,7			
	3/8	3			30,88	30,88		16,00	16,00		10,67	10,67			
	1/4	3			30,48	30,48		12,70	12,70		7,87	7,87			
1 1/2	1 1/4	2	38,1		26,29	26,29		44,45	44,45		20,57	20,57			
	1	3			30,15	30,15		35,05	35,05		16,00	16,00			
	3/4	3			31,75	31,75		28,70	28,70		14,22	14,22			

Dimension D to be looked up for the small size ② in the table page 5.

Further common dimensions B and T see page 5.

**Cap**



Dimensions in mm

Tube Size		Dimension M			Weight kg/100 pcs.		
TDS	inch	1000	3000	6000	1000	3000	6000
-2	1/8		8	10			
-3	3/16		10	12			
-4	1/4		12	14			
-5	5/16		14	16			
-6	3/8		16	18			
-8	1/2		18	20			
-10	5/8		20	24			
-12	3/4		25	27			
-16	1		27	30			
-20	1 1/4		30	32			
-24	1 1/2		32	35			
-32	2		35	38			

**Common dimensions for all fittings (mm)**

Tube Size		Socket Bore Diameter (B)			Depth of Socket (T)		Inside Diameter (D)			Outside Diameter (X)		
TDS	inch	1000	3000	6000	1000	3000	1000	3000	6000	1000	3000	6000
-2	1/8		3,3	3,3		3,96		2,39	2,39		9,53	9,53
-3	3/16		4,9	4,9		5,16		3,58	3,58		11,13	11,13
-4	1/4		6,5	6,5		6,35		4,78	4,78		12,70	12,70
-5	5/16		8,1	8,1		7,95		6,35	6,35		14,27	14,27
-6	3/8		9,7	9,7		8,74		7,95	7,95		15,88	15,88
-8	1/2		12,9	12,9		10,31		11,13	11,13		20,65	20,65
-10	5/8		16,1	16,1		11,91		12,70	12,70		23,83	23,83
-12	3/4		19,3	19,3		12,70		16,69	16,69		28,58	28,58
-16	1		25,6	25,6		14,30		23,01	23,01		34,93	34,93
-20	1 1/4		32,0	32,0		15,88		27,00	27,00		44,45	44,45
-24	1 1/2		38,4	38,4		17,02		33,35	33,35		50,80	50,80
-32	2		51,1	51,1		19,84		46,05	46,05		66,68	66,68

Dimensions were preferably adopted from Parker-catalogue 4280, March 96.

**Malleable Iron Threaded Fittings  
Elbows, Return Bends, Tees and Crosses  
ASME B16.3**

Standard

**H310**

Page 1 of 42

Example of Designation: Designation of a street elbow 90°, class 150, size 1 1/2“, material: ASTM A197 galvanized

Part number 1 1/2 INCH THREADED STREET ELBOW ASTM A197 GALVANIZED  
**31146L012** 90 DGR. CLASS 150 H310/ASME B16.3

Part numbering Code										
Position of Part No.										
1. - 3.		4.		5. - 6.		7. - 8.		9.		
Kind of Part 2)		Type of fitting 3)		Material 1)		Class 4)		Certificate 5)		
	Cd.		Cd.		Cd.		Cd.		Cd.	
Elbow	311	90° straight	1	A197 galvanized	6L	150	01	ASME	2	
		45° straight	3	A197	6M	300	02			
		Street elbow 90°	4							
		Street elbow 45°	6							
		90° reducing	8							
		45° reducing 6)	9							
Return Bend	312	Closed pattern	1							
		Medium pattern	2							
		Open pattern	3							
Tee and Cross	313	Tee-straight	1							
		Tee-reducing	2							
		Y-Branch straight	5							
		Street Tee	6							
		Cross-straight	8							
		Cross reducing	9							

- 1) Materials:  
According to ASTM-Standard.  
Zinc coating:  
Hot dipped in accordance with ASTM A153 or electrodeposited zinc coated conforming to ASTM B633 Type 1, service condition 4.  
Hot-dipped coatings shall be a minimum thickness of 86 µm (0.0034 in.) and applied prior threading.  
Electrodeposited zinc shall be a minimum thickness of 25 µm (0.001 in.) and may be applied either before or after threading.

- 2) Code for kind of part.  
3) Code for type of fitting.  
4) Code for Class:  
Allowable Pressure – Temperature Ratings according to ASME B16.3 (see page 2 Table 1 and A1).  
5) Certificate according to ASME- / ASTM-standards  
6) These fittings are not figured in the following pages

Nipples see standard H380 „Threaded Forged Steel Fittings“ according to BS 3799  
Welding ends see standard H318.

ASME B16.3 / TABLE 1: PRESSURE - TEMPERATURE RATINGS

Temperature [°F]	Class 150 [psig]	Class 300 [psig]		
		Sizes ¼" – 1"	Sizes 1 ¼" – 2"	Sizes 2 ½" – 3"
- 20 to 150	300	2000	1500	1000
200	265	1785	1350	910
250	225	1575	1200	825
300	185	1360	1050	735
350	150 <sup>1)</sup>	1150	900	650
400		935	750	560
450		725	600	475
500		510	450	385
550		300	300	300

- 1) Permissible for service temperature up to 366 °F, reflecting the temperature of saturated steam at 150 psig.

ASME B16.3 / TABLE A1: PRESSURE - TEMPERATURE RATINGS

Temperature [°C]	Class 150 [bar]	Class 300 [bar]		
		Sizes ¼" – 1"	Sizes 1 ¼" – 2"	Sizes 2 ½" – 3"
- 29 to 66	20.7	137.9	103.4	69.0
100	17.5	119.6	90.5	61.5
125	15.2	106.4	81.1	56.1
150	12.8	93.1	71.8	50.7
175	10.5 <sup>1)</sup>	79.9	62.5	45.2
200		66.6	53.1	39.8
225		53.4	43.8	34.3
250		40.1	34.5	28.9
275		26.9	25.2	23.4
288		20.7	20.7	20.7

- 1) Permissible for service temperature up to 186 °C at 10,3 bar, the corresponding pressure of saturated steam.

GENERAL NOTES:

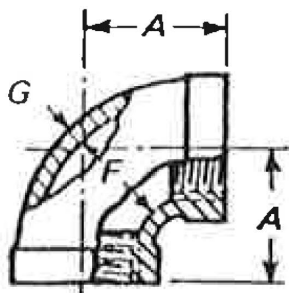
(a) 1 bar = 14,5 psi = 10<sup>5</sup> Pa

(b) °C = 0,5556 (°F-32)

**Elbow 90° straight** Class 150

①

According to ASME B16.3

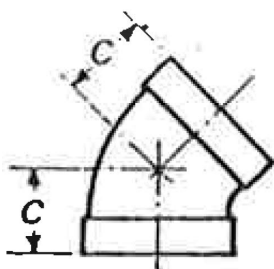


Size		A [mm]	G [mm]	Fmin. / Fmax. [mm]	Weight [kg/pc]
NPS	DN				
1/8	6	17.5	2.3	10.2 / 10.9	-
1/4	8	20.6	2.3	13.7 / 14.7	-
3/8	10	24.1	2.5	17.0 / 18.3	-
1/2	15	28.4	2.5	21.3 / 22.9	-
3/4	20	33.3	3	26.7 / 28.2	-
1	25	38.1	3.3	33.3 / 35.1	-
1 1/4	32	44.5	3.6	42.2 / 43.9	-
1 1/2	40	49.3	3.8	48.3 / 50.0	-
2	50	57.2	4.3	60.2 / 62.0	-
2 1/2	65	68.6	75.4	72.9 / 75.4	-
3	80	78.2	5.8	88.9 / 91.4	-
4	100	96.3	116.8	114.3 / 116.8	-
5	125	114.3	143.8	141.2 / 143.8	-
6	150	130.3	170.7	168.1 / 170.7	-

**Elbow 45° straight** Class 150

②

According to ASME B16.3

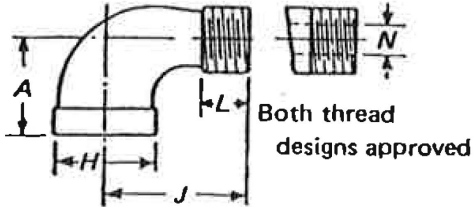


Size		C [mm]	Weight [kg/pc]
NPS	DN		
1/4	8	18.5	-
3/8	10	20.3	-
1/2	15	22.4	-
3/4	20	24.9	-
1	25	28.4	-
1 1/4	32	32.8	-
1 1/2	40	36.3	-
2	50	42.7	-
2 1/2	65	49.5	-
3	80	55.1	-
4	100	66.3	-
5	101	77.5	-
6	102	87.9	-

**Street Elbow 90° Class 150**

④

According to ASME B16.3

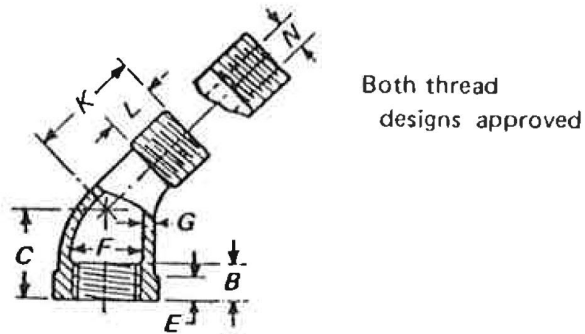


Size		A	H	J	L	N	Weight
NPS	DN	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/pc]
1/8	6	17.5	17.5	25.4	6.6	5.1	-
1/4	8	20.6	21.3	30.2	10.2	6.6	-
3/8	10	24.1	25.7	36.6	10.4	9.4	-
1/2	15	28.4	30.5	41.4	13.5	13	-
3/4	20	33.3	37.1	48	14	17.5	-
1	25	38.1	45	54.4	17.3	23.1	-
1 1/4	32	44.5	54.6	62.2	18	30.2	-
1 1/2	40	49.3	61.7	68.3	18.3	35.3	-
2	50	57.2	75.2	82.8	19.3	45.5	-
2 1/2	65	68.6	91.2	98	29	55.9	-
3	80	78.2	108.7	114.6	30.5	70.6	-
4	100	96.3	137.2	144.5	33	94	-
5	125	114.3	167.1	174.2	35.8	119.1	-
6	150	130.3	197.4	204	38.4	144	-

**Street Elbow 45° Class 150**

⑤

According to ASME B16.3

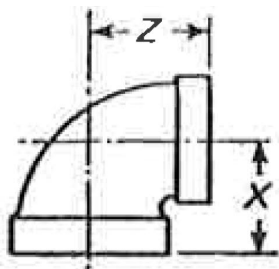


Size		B	C	E	Fmin. / Fmax.	G	K	L	N	Weight
NPS	DN	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/pc]
1/4	8	8.1	18.5	5.3	13.7 / 14.7	2.3	23.9	10.2	6.6	-
3/8	10	9.1	20.3	5.8	17 / 18.3	2.5	26.2	10.4	9.4	-
1/2	15	10.9	22.4	6.4	21.3 / 22.9	2.5	29.2	13.5	13	-
3/4	20	12.7	24.9	6.9	26.7 / 28.2	3.0	32.8	14	17.5	-
1	25	14.7	28.4	7.6	33.3 / 35.1	3.3	37.3	17.3	23.1	-
1 1/4	32	17	32.8	8.6	42.2 / 43.9	3.6	43.4	18.0	30.2	-
1 1/2	40	17.8	36.3	9.4	48.3 / 50	3.8	47.8	18.3	35.3	-
2	50	19.1	42.7	10.7	60.2 / 62	4.3	56.4	19.3	45.5	-
2 1/2	65	23.4	49.5	12.2	72.9 / 75.4	5.3	65.3	29	55.9	-
3	80	24.9	55.1	14	88.9 / 91.4	5.8	76.2	30.5	70.6	-
4	100	27.4	66.3	16.8	114.3 / 116.8	6.6	94	33	94	-

**Elbow 90° reducing** Class 150

According to ASME B16.3

8

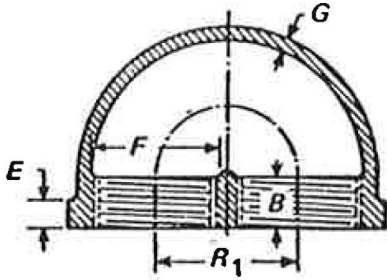


Size		X [mm]	Z [mm]	Weight [kg/pc]
NPS	DN			
1/4 - 1/8	8 - 6	18.8	19.3	-
3/8 - 1/4	10 - 8	22.4	22.9	-
3/8 - 1/8	10 - 6	20.6	21.6	-
1/2 - 3/8	15 - 10	26.4	26.2	-
1/2 - 1/4	15 - 8	24.6	24.9	-
3/4 - 1/2	20 - 15	30.5	31	-
3/4 - 3/8	20 - 10	28.4	28.7	-
3/4 - 1/4	20 - 8	26.7	27.4	-
1 - 3/4	25 - 20	34.8	36.8	-
1 - 1/2	25 - 15	32	34.5	-
1 - 3/8	25 - 10	30	32.3	-
1 1/4 - 1	32 - 25	40.1	42.4	-
1 1/4 - 3/4	32 - 20	36.8	41.1	-
1 1/4 - 1/2	32 - 15	34	38.9	-
1 1/2 - 1 1/4	40 - 32	46.2	47.8	-
1 1/2 - 1	40 - 25	41.9	45.7	-
1 1/2 - 3/4	40 - 20	38.6	44.5	-
2 - 1 1/2	50 - 40	51.3	54.9	-
2 - 1 1/4	50 - 32	48.3	53.3	-
2 - 1	50 - 25	43.9	51.3	-
2 - 3/4	50 - 20	40.6	50	-
2 1/2 - 2	65 - 50	60.7	66	-
2 1/2 - 1 1/2	65 - 40	54.9	63.8	-
3 - 2 1/2	80 - 65	71.9	75.9	-
3 - 2	80 - 50	64	73.4	-
4 - 3	100 - 80	83.8	91.4	-

**Return Bend closed pattern** Class 150

According to ASME B16.3

①

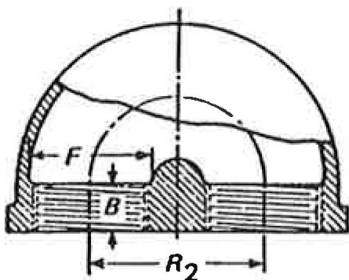


Size		B [mm]	E [mm]	Fmin. / Fmax. [mm]	G [mm]	R1 [mm]	Weight [kg/pc]
NPS	DN						
1/2	15	10.9	6.4	21.3 / 22.9	3	25.4	-
3/4	20	12.7	6.9	26.7 / 28.2	3.3	31.8	-
1	25	14.7	7.6	33.3 / 35.1	3.8	38.1	-
1 1/4	32	17	8.6	42.2 / 43.9	4.1	44.5	-
1 1/2	40	17.8	9.4	48.3 / 50	4.6	55.6	-
2	50	19.1	10.7	60.2 / 62	5.1	66.5	-

**Return Bend medium pattern** Class 150

According to ASME B16.3

②

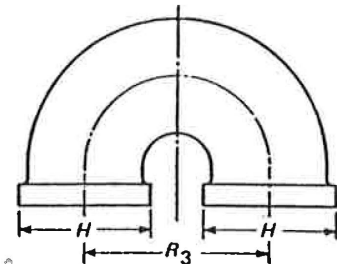


Size		B [mm]	Fmin. / Fmax. [mm]	R2 [mm]	Weight [kg/pc]
NPS	DN				
1/2	15	10.9	21.3 / 22.9	31.8	-
3/4	20	12.7	26.7 / 28.2	38.1	-
1	25	14.7	33.3 / 35.1	47.5	-
1 1/4	32	17	42.2 / 43.9	57.2	-
1 1/2	40	17.8	48.3 / 50	63.5	-
2	50	19.1	60.2 / 62	76.2	-

**Return Bend open pattern** Class 150

According to ASME B16.3

③

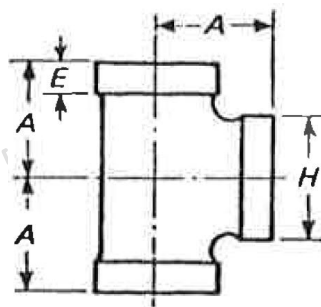


Size		H [mm]	R3 [mm]	Weight [kg/pc]
NPS	DN			
1/2	15	30.5	38.1	-
3/4	20	37.1	50.8	-
1	25	45	63.5	-
1 1/4	32	54.6	76.2	-
1 1/2	40	61.7	88.9	-
2	50	75.2	101.6	-
2 1/2	65	91.2	114.3	-
3	80	108.7	127	-
4	100	137.2	152.4	-

**Tee straight** Class 150

According to ASME B16.3

①

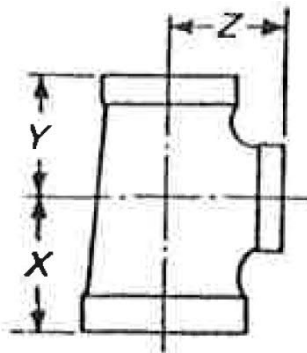


Size		A [mm]	E [mm]	H [mm]	Weight [kg/pc]
NPS	DN				
1/8	6	17.5	5.1	17.5	-
1/4	8	20.6	5.3	21.3	-
3/8	10	24.1	5.8	25.7	-
1/2	15	28.4	6.4	30.5	-
3/4	20	33.3	6.9	37.1	-
1	25	38.1	7.6	45.0	-
1 1/4	32	44.5	8.6	54.6	-
1 1/2	40	49.3	9.4	61.7	-
2	50	57.2	10.7	75.2	-
2 1/2	65	68.6	12.2	91.2	-
3	80	78.2	14.0	108.7	-
4	100	96.3	16.8	137.2	-
5	125	114.3	19.8	167.1	-
6	150	130.3	22.9	197.4	-

**Tee reducing** Class 150

According to ASME B16.3

2

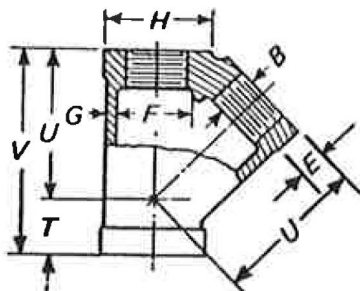


NPS	Size		X [mm]	Y [mm]	Z [mm]	Weight [kg/pc]
		DN				
1/4 - 1/4 - 1/8		8 - 8 - 6	18.8	18.8	19.3	-
3/8 - 3/8 - 1/4		10 - 10 - 8	22.4	22.4	22.9	-
3/8 - 3/8 - 1/8		10 - 10 - 6	20.6	20.6	21.6	-
1/2 - 1/2 - 3/8		15 - 15 - 10	26.4	26.4	26.2	-
1/2 - 1/2 - 1/4		15 - 15 - 8	28.4	24.6	24.9	-
3/4 - 3/4 - 1/2		20 - 20 - 15	33.3	30.5	31	-
3/4 - 3/4 - 3/8		20 - 20 - 10	30.5	28.4	28.7	-
3/4 - 3/4 - 1/4		20 - 20 - 8	28.4	26.7	27.4	-
1 - 1 - 3/4		25 - 25 - 20	28.2	34.8	36.8	-
1 - 1 - 1/2		25 - 25 - 15	38.1	32	34.5	-
1 - 1 - 3/8		25 - 25 - 10	34.8	30	32.3	-
1 - 1 - 1/4		25 - 25 - 8	32	28.2	31	-
1 1/4 - 1 1/4 - 1		32 - 32 - 25	40.1	40.1	42.4	-
1 1/4 - 1 1/4 - 3/4		32 - 32 - 20	36.8	36.8	41.1	-
1 1/4 - 1 1/4 - 1/2		32 - 32 - 15	34	34	38.9	-
1 1/4 - 1 1/4 - 3/8		32 - 32 - 10	32	32	36.6	-
1 1/2 - 1 1/2 - 1 1/4		40 - 40 - 32	46.2	46.2	47.8	-
1 1/2 - 1 1/2 - 1		40 - 40 - 25	41.9	41.9	45.7	-
1 1/2 - 1 1/2 - 3/4		40 - 40 - 20	38.6	38.6	44.5	-
1 1/2 - 1 1/2 - 1/2		40 - 40 - 15	35.8	35.8	42.2	-
1 - 1 - 1 1/2		25 - 25 - 40	45.7	45.7	41.9	-
2 - 2 - 1 1/2		50 - 50 - 40	51.3	51.3	54.9	-
2 - 2 - 1 1/4		50 - 50 - 32	48.3	48.3	53.3	-
2 - 2 - 1		50 - 50 - 25	43.9	43.9	51.3	-
2 - 2 - 3/4		50 - 50 - 20	40.6	40.6	50	-
2 - 2 - 1/2		50 - 50 - 15	37.8	37.8	47.8	-
2 1/2 - 2 1/2 - 2		65 - 65 - 50	60.7	60.7	66	-
2 1/2 - 2 1/2 - 1 1/2		65 - 65 - 40	54.9	54.9	63.8	-
2 1/2 - 2 1/2 - 1 1/4		65 - 65 - 32	51.8	51.8	62.2	-
2 1/2 - 2 1/2 - 1		65 - 65 - 25	47.5	47.5	60.2	-
2 1/2 - 2 1/2 - 3/4		65 - 65 - 20	44.2	44.2	58.9	-
3 - 3 - 2 1/2		80 - 80 - 65	71.9	71.9	75.9	-
3 - 3 - 2		80 - 80 - 50	64	64	73.4	-
3 - 3 - 1 1/2		80 - 80 - 40	58.2	58.2	71.1	-
3 - 3 - 1 1/4		80 - 80 - 32	55.1	55.1	69.6	-
3 - 3 - 1		80 - 80 - 25	50.8	50.8	67.6	-
3 - 3 - 3/4		80 - 80 - 20	47.5	47.5	66.3	-
4 - 4 - 3		100 - 100 - 80	83.8	83.8	91.4	-
4 - 4 - 2 1/2		100 - 100 - 65	77.5	77.5	89.2	-
4 - 4 - 2		100 - 100 - 50	69.6	69.6	86.6	-
4 - 4 - 1 1/2		100 - 100 - 40	63.8	63.8	84.3	-
5 - 5 - 3		125 - 125 - 80	89.2	89.2	107.2	-
6 - 6 - 4		150 - 150 - 100	104.9	104.9	125.5	-
6 - 6 - 3		150 - 150 - 80	92.5	92.5	120.7	-
6 - 6 - 2 1/2		150 - 150 - 65	86.1	86.1	118.4	-
6 - 6 - 2		150 - 150 - 50	78.2	78.2	115.8	-

**Y-Branch straight** Class 150

According to ASME B16.3

5

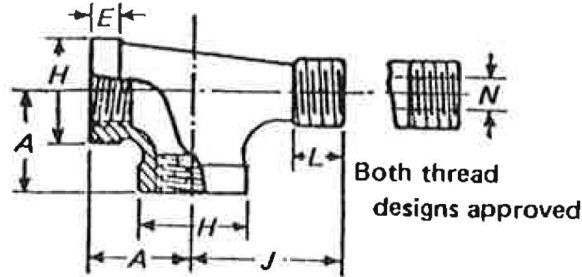


Size		B [mm]	E [mm]	F min. / F max. [mm]	G [mm]	H [mm]	T [mm]	U [mm]	V [mm]	Weight [kg/pc]
NPS	DN									
3/8	10	9.1	5.8	17.0 / 18.3	2.5	25.7	12.7	36.3	49.0	-
1/2	15	10.9	6.4	21.3 / 22.9	2.5	30.5	15.5	43.4	58.9	-
3/4	20	12.7	6.9	26.7 / 28.2	3.0	37.1	18.3	52.1	70.4	-
1	25	14.7	7.6	33.3 / 35.1	3.3	45.0	21.6	61.7	83.3	-
1 1/4	32	17.0	10.2	42.2 / 43.9	3.6	54.6	25.9	74.2	100.1	-
1 1/2	40	17.8	9.4	48.3 / 50.0	3.8	61.7	27.9	83.3	111.3	-
2	50	19.1	10.7	60.2 / 62.0	4.3	75.2	31.5	99.8	131.3	-
2 1/2	65	23.4	12.2	72.9 / 75.4	5.3	91.2	38.6	120.1	158.8	-
3	80	24.9	14.0	88.9 / 91.4	5.8	108.7	43.4	141.0	184.4	-
4	100	27.4	16.8	114.3 / 116.8	6.6	137.2	51.1	177.0	228.1	-

**Street Tee Class 150**

According to ASME B16.3

6

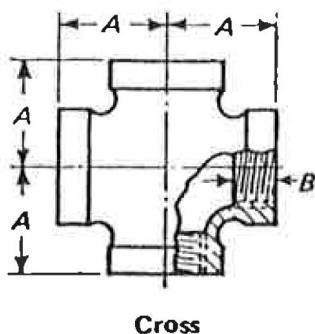


Size		A [mm]	E [mm]	H [mm]	J [mm]	L [mm]	N [mm]	Weight [kg/pc]
NPS	DN							
1/4	8	20.6	5.3	21.3	30.2	10.2	6.6	-
3/8	10	24.1	5.8	25.7	36.6	10.4	9.4	-
1/2	15	28.4	6.4	30.5	41.4	13.5	13	-
3/4	20	33.3	6.9	37.1	48	14	17.5	-
1	25	38.1	7.6	45	54.4	17.3	23.1	-
1 1/4	32	44.5	8.6	54.6	62.2	18	30.2	-
1 1/2	40	49.3	9.4	61.7	68.3	18.3	35.3	-
2	50	57.2	10.7	75.2	82.8	19.3	45.5	-
4	100	96.3	16.8	137.2	144.5	33	94	-

**Cross straight** Class 150

According to ASME B16.3

8

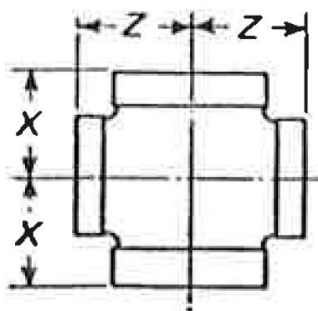


Size		A [mm]	B [mm]	Fmin. / Fmax. [mm]	Weight [kg/pc]
NPS	DN [ ]				
1/8	6	17.5	6.4	10.2 / 10.9	-
1/4	8	20.6	8.1	13.7 / 14.7	-
3/8	10	24.1	9.1	17 / 18.3	-
1/2	15	28.4	10.9	21.3 / 22.9	-
3/4	20	33.3	12.7	26.7 / 28.2	-
1	25	38.1	14.7	33.3 / 35.1	-
1 1/4	32	44.5	17	42.2 / 43.9	-
1 1/2	40	49.3	17.8	48.3 / 50	-
2	50	57.2	19.1	60.2 / 62	-
2 1/2	65	68.6	23.4	72.9 / 75.4	-
3	80	78.2	24.9	88.9 / 91.4	-
4	100	96.3	27.4	114.3 / 116.8	-
5	125	114.3	30	141.2 / 143.8	-
6	150	130.3	32.5	168.1 / 170.7	-

**Cross reducing** Class 150

According to ASME B16.3

9

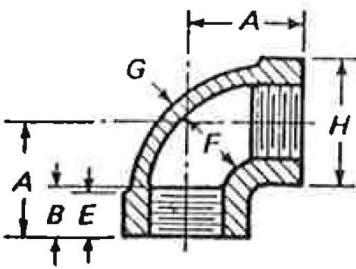


Size		X [mm]	Z [mm]	Weight [kg/pc]
NPS	DN			
3/4 - 3/4 - 1/2 - 1/2	20 - 20 - 15 - 15	30.5	31	-
1 - 1 - 3/4 - 3/4	25 - 25 - 15 - 15	34.8	36.8	-
1 - 1 - 1/2 - 1/2	25 - 25 - 20 - 20	32	34.5	-
1 1/4 - 1 1/4 - 1 - 1	32 - 32 - 25 - 25	40.1	42.4	-
1 1/4 - 1 1/4 - 3/4 - 3/4	32 - 32 - 20 - 20	36.8	41.1	-
1 1/2 - 1 1/2 - 1 1/4 - 1 1/4	40 - 40 - 32 - 32	46.2	47.8	-
1 1/2 - 1 1/2 - 1 - 1	40 - 40 - 25 - 25	41.9	45.7	-
1 1/2 - 1 1/2 - 3/4 - 3/4	40 - 40 - 15 - 15	38.6	44.5	-
2 - 2 - 1 1/2 - 1 1/2	50 - 50 - 40 - 40	51.3	54.9	-
2 - 2 - 1 1/4 - 1 1/4	50 - 50 - 32 - 32	48.3	53.3	-
2 - 2 - 1 - 1	50 - 50 - 25 - 25	43.9	51.3	-
2 - 2 - 3/4 - 3/4	50 - 50 - 20 - 20	40.6	50	-
2 1/2 - 2 1/2 - 2 - 2	65 - 65 - 50 - 50	60.7	66	-
3 - 3 - 2 - 2	80 - 80 - 50 - 50	64	73.4	-

**Elbow 90° straight** Class 300

According to ASME B16.3

①

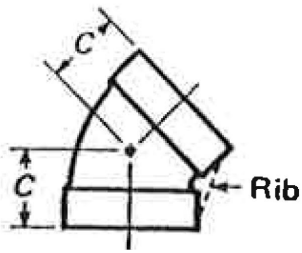


Size		A [mm]	B [mm]	E [mm]	G [mm]	H [mm]	Fmin. / Fmax. [mm]	Weight [kg/pc]
NPS	DN							
1/4	8	23.9	10.9	9.7	3.6	23.6	13.7 / 14.7	-
3/8	10	26.9	11.9	11.2	3.8	28.4	17 / 18.3	-
1/2	15	31.8	14.5	12.7	4.1	34	21.3 / 22.9	-
3/4	20	36.6	16.3	14.2	4.6	41.4	26.7 / 28.2	-
1	25	41.4	19.1	15.7	5.1	49.5	33.3 / 35.1	-
1 1/4	32	49.3	21.3	17.5	5.6	60.7	42.2 / 43.9	-
1 1/2	40	54.1	22.1	19.1	6.1	68.1	48.3 / 50	-
2	50	63.5	25.4	21.3	6.6	83.3	60.2 / 62	-
2 1/2	65	74.7	29.7	23.9	7.9	98	72.9 / 75.4	-
3	80	85.9	31.2	25.4	8.9	117.3	88.9 / 91.4	-

**Elbow 45° straight** Class 300

According ASME B16.3

②

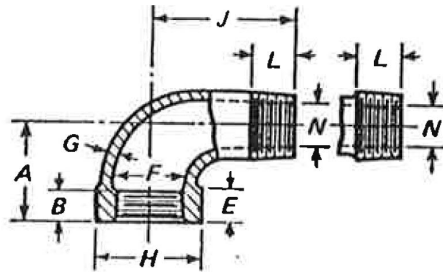


Size		C [mm]	Weight [kg/pc]
NPS	DN		
1/4	8	20.6	-
3/8	10	22.4	-
1/2	15	25.4	-
3/4	20	28.7	-
1	25	33.3	-
1 1/4	32	38.1	-
1 1/2	40	42.9	-
2	50	50.8	-
2 1/2	65	57.2	-
3	80	63.5	-

**Street Elbow 90° Class 300**

④

According to ASME B16.3

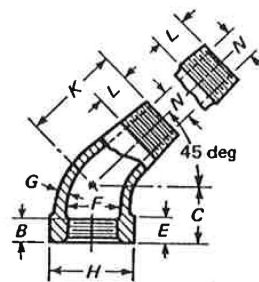


Size		A	B	E	Fmin. / Fmax.	H	J	L	N	Weight
NPS	DN	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/pc]
1/4	8	23.9	10.9	9.7	13.7 / 14.7	23.6	36.6	10.2	6.6	-
3/8	10	26.9	11.9	11.2	17 / 18.3	28.4	41.4	10.4	9.1	-
1/2	15	31.8	14.5	12.7	21.3 / 22.9	34	50.8	13.5	12.4	-
3/4	20	36.6	16.3	14.2	26.7 / 28.2	41.4	55.6	14.0	17.0	-
1	25	41.4	19.1	15.7	33.3 / 35.1	49.5	65	17.3	22.4	-
1 1/4	32	49.3	21.3	17.5	42.2 / 43.9	60.7	73.2	18	29.5	-
1 1/2	40	54.1	22.1	19.1	48.3 / 50	68.1	79.5	18.3	34.3	-
2	50	63.5	25.4	21.3	60.2 / 62	83.3	93.7	19.3	44.5	-
2 1/2	65	74.7	29.7	23.9	72.9 / 75.4	98	114.3	29	54.9	-
3	80	85.9	31.2	25.4	88.9 / 91.4	117.3	130.3	30.5	67.8	-

**Street Elbow 45° Class 300**

⑤

According to ASME B16.3

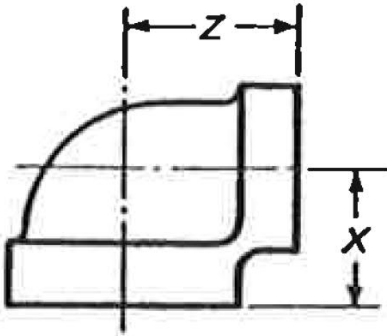


Size		B	C	E	Fmin. / Fmax.	G	H	K	L	N	Weight
NPS	DN	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg/pc]
1/4	8	10.9	-	9.7	13.7 / 14.7	3.6	23.6	-	10.2	6.6	-
3/8	10	11.9	-	11.2	17 / 18.3	3.8	28.4	-	10.4	9.1	-
1/2	15	14.5	25.4	12.7	21.3 / 22.9	4.1	34	35.1	13.5	12.4	-
3/4	20	16.3	28.7	14.2	26.7 / 28.2	4.6	41.4	39.6	14	17	-
1	25	19.1	33.3	15.7	33.3 / 35.1	5.1	49.5	46	17.3	22.4	-
1 1/4	32	21.3	38.1	17.5	42.2 / 43.9	5.6	60.7	54.1	18	29.5	-
1 1/2	40	22.1	42.9	19.1	48.3 / 50	6.1	68.1	58.7	18.3	34.3	-
2	50	25.4	50.8	21.3	60.2 / 62	6.6	83.3	68.3	19.3	44.5	-
2 1/2	65	29.7	-	23.9	72.9 / 75.4	7.9	98	-	29	54.9	-
3	80	31.2	-	25.4	88.9 / 91.4	8.9	117.3	-	30.5	67.8	-

**Elbow 90° reducing** Class 300

According to ASME B16.3

8

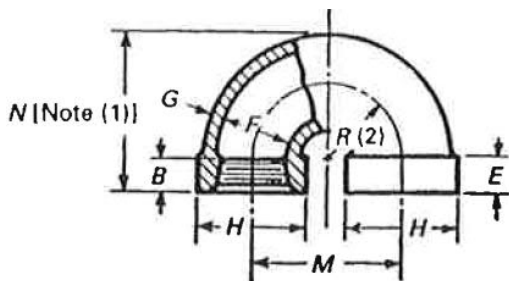


Size		X [mm]	Z [mm]	Weight [kg/pc]
NPS	DN			
1/2 - 3/8	15 - 10	30.2	30.2	-
3/4 - 1/2	20 - 15	33.3	35.1	-
1 - 3/4	25 - 20	38.1	39.6	-
1 1/4 - 1	32 - 25	44.5	46	-
1 1/2 - 1 1/4	40 - 32	50.8	52.3	-
2 - 1 1/2	50 - 40	57.2	60.5	-
2 1/2 - 2	65 - 50	68.3	69.9	-
3 - 2 1/2	80 - 65	77.7	84.1	-

**Return Bend closed pattern** Class 300

According to ASME B16.3

1



Notes:

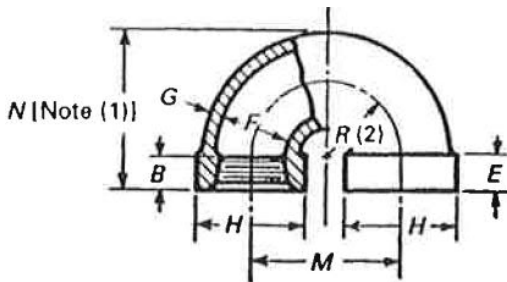
- (1) Dimension N may be varied to comply with manufacturer's practice...
- (2) It is recommended that the distance from the end of the fitting to the center of the radius R be approximately equal to the dimension B; radius R is recommended as being one-half of dimension M

Size		B [mm]	E [mm]	Fmin. / Fmax. [mm]	G [mm]	H [mm]	M [mm]	Weight [kg/pc]
NPS	DN							
1	25	19.1	15.7	33.3 / 35.1	5.1	49.5	44.5	-
1 1/4	32	21.3	17.5	42.2 / 43.9	5.6	60.7	57.2	-
1 1/2	40	22.1	19.1	48.3 / 50	6.1	68.1	76.2	-
2	50	25.4	21.3	60.2 / 62	6.6	83.3	101.6	-

**Return Bend medium pattern** Class 300

According to ASME B16.3

2



Notes:

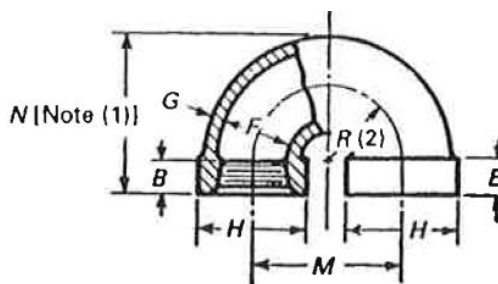
- (1) Dimension N may be varied to comply with manufacturer's practice...
- (2) It is recommended that the distance from the end of the fitting to the center of the radius R be approximately equal to the dimension B; radius R is recommended as being one-half of dimension M

Size		B [mm]	E [mm]	Fmin. / Fmax. [mm]	G [mm]	H [mm]	M [mm]	Weight [kg/pc]
NPS	DN							
1	25	19.1	15.7	33.3 / 35.1	5.1	49.5	63.5	-
1 1/4	32	21.3	17.5	42.2 / 43.9	5.6	60.7	63.5	-
1 1/2	40	22.1	19.1	48.3 / 50	6.1	68.1	88.9	-
2	50	25.4	21.3	60.2 / 62	6.6	83.3	152.4	-

**Return Bend open pattern** Class 300

According to ASME B16.3

3



Notes:

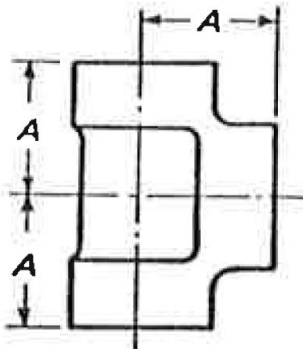
- (1) Dimension N may be varied to comply with manufacturer's practice...
- (2) It is recommended that the distance from the end of the fitting to the center of the radius R be approximately equal to the dimension B; radius R is recommended as being one-half of dimension M

Size		B [mm]	E [mm]	Fmin. / Fmax. [mm]	G [mm]	H [mm]	M [mm]	Weight [kg/pc]
NPS	DN							
1	25	19.1	15.7	33.3 / 35.1	5.1	49.5	76.2	-
1 1/4	32	21.3	17.5	42.2 / 43.9	5.6	60.7	76.2	-
1 1/2	40	22.1	19.1	48.3 / 50	6.1	68.1	152.4	-
2	50	25.4	21.3	60.2 / 62	6.6	83.3	203.2	-

**Tee straight** Class 300

According to ASME B16.3

①

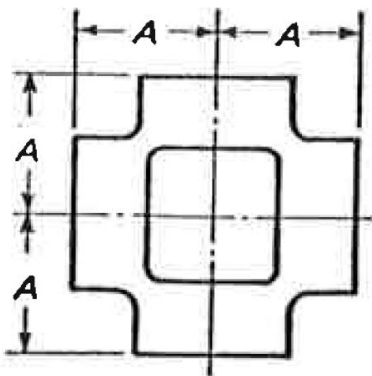


Size		A [mm]	Weight [kg/pc]
NPS	DN		
1/4	8	23.9	-
3/8	10	26.9	-
1/2	15	31.8	-
3/4	20	36.6	-
1	25	41.4	-
1 1/4	32	49.3	-
1 1/2	40	54.1	-
2	50	63.5	-
2 1/2	65	74.7	-
3	80	85.9	-

**Cross straight** Class 300

According to ASME B16.3

⑧

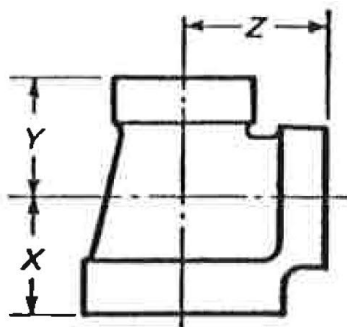


Size		A [mm]	Weight [kg/pc]
NPS	DN		
1/4	8	23.9	-
3/8	10	26.9	-
1/2	15	31.8	-
3/4	20	36.6	-
1	25	41.4	-
1 1/4	32	49.3	-
1 1/2	40	54.1	-
2	50	63.5	-
2 1/2	65	74.7	-
3	80	85.9	-

**Tee reducing** Class 300

According to ASME B16.3

②



Size NPS	DN	Dimensions			Weight [kg/pc]
		X [mm]	Y [mm]	Z [mm]	
1/2 - 1/2 - 3/8	15 - 15 - 10	30.2	30.2	30.2	-
3/4 - 3/4 - 1/2	20 - 20 - 15	33.3	33.3	35.1	-
1 - 1 - 3/4	25 - 25 - 20	38.1	38.1	39.6	-
1 - 1 - 1/2	25 - 25 - 15	36.6	36.6	38.1	-
1 - 1 - 3/8	25 - 25 - 10	33.3	33.3	36.6	-
1 1/4 - 1 1/4 - 1	32 - 32 - 25	44.5	44.5	46	-
1 1/4 - 1 1/4 - 3/4	32 - 32 - 20	41.4	41.4	44.5	-
1 1/4 - 1 1/4 - 1/2	32 - 32 - 15	38.1	38.1	42.9	-
1 1/2 - 1 1/2 - 1 1/4	40 - 40 - 32	50.8	50.8	52.3	-
1 1/2 - 1 1/2 - 1	40 - 40 - 25	46	46	50.8	-
1 1/2 - 1 1/2 - 3/4	40 - 40 - 20	42.9	42.9	47.8	-
1 1/2 - 1 1/2 - 1/2	40 - 40 - 15	41.4	41.4	46	-
2 - 2 - 1 1/2	50 - 50 - 40	57.2	57.2	60.5	-
2 - 2 - 1 1/4	50 - 50 - 32	54.1	54.1	58.7	-
2 - 2 - 1	50 - 50 - 25	50.8	50.8	57.2	-
2 - 2 - 3/4	50 - 50 - 20	46	46.0	54.1	-
2 - 2 - 1/2	50 - 50 - 15	44.5	44.5	52.3	-
2 1/2 - 2 1/2 - 2	65 - 65 - 50	68.3	68.3	69.9	-
2 1/2 - 2 1/2 - 1 1/2	65 - 65 - 40	62	62	66.8	-
3 - 3 - 2 1/2	80 - 80 - 65	77.7	77.7	84.1	-
3 - 3 - 2	80 - 80 - 50	71.4	71.4	79.5	-

**Malleable Iron Threaded Fittings  
Couplings, Caps, Plugs and Bushings  
ASME B16.3 / ASME B16.14**

Example of Designation: Designation of a threaded coupling, class 150, reduced sizes 1 1/2" x 3/4", material: ASTM A197

Part number 31426M012      1 1/2 x 3/4 INCH      THREADED COUPLING REDUC. CLASS 150 H310/ASME B16.3      ASTM A197

Part numbering Code										
Position of Part No.										
1. - 3.		4.			5. - 6.		7. - 8.		9.	
Kind of Part 2)	Cd.	Type of fitting 3)		Material 1)		Class 4)		Certificate 5)		
		Page	Cd.		Cd.		Cd.		Cd.	
Coupling	314	Straight (cast)		1	A197 galvanized	6L	150	01	ASME	2
		Straight reducing sizes		2	A197	6M	300	02		
		Straight (wrought)		3						
Cap, Plug, Bushing	315	Cap with recess		1						
		Cap without recess		5						
		Square head plug (solid or cored) 6)		7						
		Countersunk plug (square socket or hexagon) 6)		8						
		Bushing 6)		9						
		Slotted head plug 6)		A						
		Face bushing 6)		B						

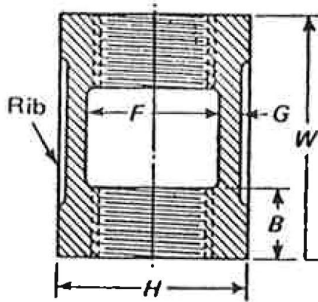
- 1) Materials:  
See page 1.
- 2) Code for kind of part.
- 3) Code for type of fitting.
- 4) Code for Class:  
Allowable Pressure - Temperature Ratings according to ASME B16.3 (see page 2 Table 1 and A1).
- 5) Certificate according to ASME- / ASTM-standards.
- 6) Plugs and bushings are standardized by ASME B16.14.  
Pressure ratings for these items see ASME B16.3 for malleable iron.

Nipples see standard. H380 „Threaded Forged Steel Fittings“ according to BS 3799  
Welding ends see standard H318

**Coupling straight** cast Class 150

According to ASME B16.3

①

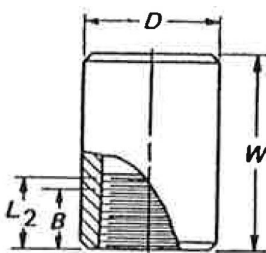


Size		B [mm]	H [mm]	Fmin. / Fmax. [mm]	G [mm]	W [mm]	Thick. of Ribs [mm]	Weight [kg/pc]
NPS	DN							
1/8	6	6.4	17.5	10.2 / 10.9	2.3	24.4	2.3	-
1/4	8	8.1	21.3	13.7 / 14.7	2.3	26.9	2.3	-
3/8	10	9.1	25.7	17.0 / 18.3	2.5	29.5	2.5	-
1/2	15	10.9	30.5	21.3 / 22.9	2.5	34	2.5	-
3/4	20	12.7	37.1	26.7 / 28.2	3	38.6	3.0	-
1	25	14.7	45	33.3 / 35.1	3.3	42.4	3.3	-
1 1/4	32	17	54.6	42.2 / 43.9	3.6	49	3.6	-
1 1/2	40	17.8	61.7	48.3 / 50	3.8	54.6	3.8	-
2	50	19.1	75.2	60.2 / 62	4.3	64.3	4.3	-
2 1/2	65	23.4	91.2	72.9 / 75.4	5.3	73.2	5.3	-
3	80	24.9	108.7	88.9 / 91.4	5.8	80.8	5.8	-
4	100	27.4	137.2	114.3 / 116.8	6.6	93.7	6.6	-

**Coupling straight** wrought Class 150

According to ASME B16.3

③



**Wrought**

Size		B [mm]	L2 [mm]	W [mm]	*) steel couplings		Weight [kg/pc]
NPS	DN				D [mm]	W [mm]	
1/8	6	5.1	6.7	24.4	17.5	20.6	-
1/4	8	5.3	10.2	26.9	21.3	30.2	-
3/8	10	5.8	10.4	29.5	25.7	30.2	-

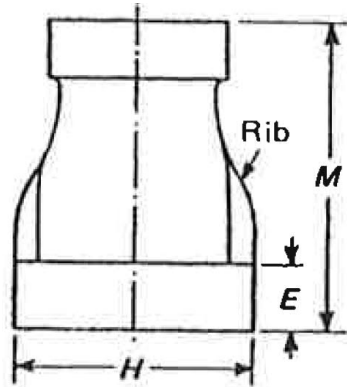
Notes:

\*) Steel couplings are made without recess. Dimension B for steel couplings is minimum length of perfect thread, and the length of useful thread (B plus threads with fully formed roots and flat crests) shall be not less than L2 (effective length of external thread) B1.20.1 pipe threads, general purpose (inch). See ASME B16.3 Section 7.

**Coupling reduced** Class 150

According to ASME B16.3

②



Size		B [mm]	H [mm]	*) **)		Thick. of Ribs [mm]	Weight [kg/pc]
NPS	DN			M [mm]			
1/8	6	5.1	17.5	-	2.3	-	
1/4	8	5.3	21.3	25.4	2.3	-	
3/8	10	5.8	25.7	28.7	2.5	-	
1/2	15	6.4	30.5	31.8	2.5	-	
3/4	20	6.9	37.1	36.6	3.0	-	
1	25	7.6	45	42.9	3.3	-	
1 1/4	32	10.2	54.6	52.3	3.6	-	
1 1/2	40	9.4	61.7	58.7	3.8	-	
2	50	10.7	75.2	71.4	4.3	-	
2 1/2	65	12.2	91.2	82.6	5.3	-	
3	80	14	108.7	93.7	5.8	-	
4	100	16.8	137.2	111.3	6.6	-	

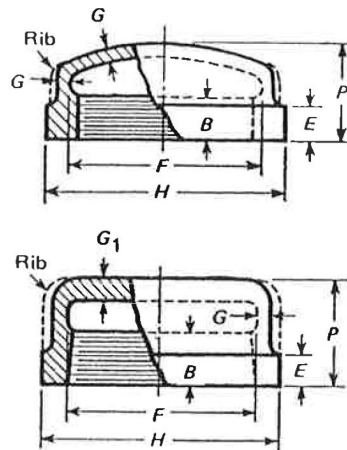
Notes:

- \*) Dimension M for all reductions of reducing couplings (concentric only) shall be the same as shown for the largest opening. Dimension M for excentric couplings is not standard; such information should be obtained from manufacturer.
- \*\*) Couplings NPS 3/8 and smaller may be cast or be made of steel rod with a minimum yield strength of 30 ksi at the option of the manufacturer.

**Cap with recess** Class 150

According to ASME B16.3

①



Size		Thick. of									Weight [kg/pc]
NPS	DN	B [mm]	L2 [mm]	E [mm]	Fmin. / Fmax. [mm]	G [mm]	H [mm]	P [mm]	Ribs [mm]	G1 [mm]	
1/8	6	6.4	6.7	5.1	10.2 / 10.9	2.3	17.5	13.5	-	-	-
1/4	8	8.1	10.2	5.3	13.7 / 14.7	2.3	21.3	16	-	-	-
3/8	10	9.1	10.4	5.8	17 / 18.3	2.5	25.7	18.8	-	-	-
1/2	15	10.9	13.6	6.4	21.3 / 22.9	2.5	30.5	22.1	2.5	-	-
3/4	20	12.7	13.9	6.9	26.7 / 28.2	3	37.1	24.6	3	3.3	-
1	25	14.7	17.3	7.6	33.3 / 35.1	3.3	45	29.5	3.3	3.8	-
1 1/4	32	17	18	8.6	42.2 / 43.9	3.6	54.6	32.5	3.6	4.3	-
1 1/2	40	17.8	18.4	9.4	48.3 / 50	3.8	61.7	33.8	3.8	4.8	-
2	50	19.1	19.2	10.7	60.2 / 62	4.3	75.2	36.8	4.3	5.6	-
2 1/2	65	23.4	28.9	12.2	72.9 / 75.4	5.3	91.2	43.2	5.3	6.4	-
3	80	24.9	30.5	14	88.9 / 91.4	5.8	108.7	45.7	5.8	7.4	-
4	100	27.4	33	16.8	114.3 / 116.8	6.6	137.2	52.8	6.6	9.1	-
5	125	30	35.7	19.8	141.2 / 143.8	7.6	167.1	58.9	7.6	-	-
6	150	32.5	38.4	22.9	168.1 / 170.7	8.6	197.4	64.8	8.6	-	-

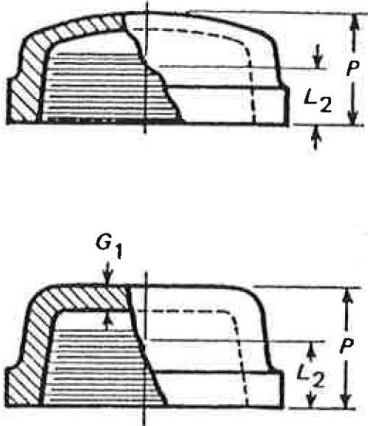
Notes:

- 1) Caps sizes DN 6 (1/8"), DN 8 (1/4") and DN 10 (3/8") may be malleable castings or made from steel rod with a minimum yield strength of 30 ksi at the option of the manufacturer. When made of steel rod, diameters shall be 12.7 mm (0.5"), 17.53 mm (0.69") and 21.34 mm (0.84"). Caps made from steel rod have no recess.
- 2) Caps may be made without recess. Caps so made shall be of such height P that the length of the perfect thread shall be not less than B, and the length of useful thread (B plus threads with fully formed roots and flat crests) shall be not less than L2 (effective length of external thread) required by ASME B1.20.1 pipe threads.

**Cap without recess** Class 150

According to ASME B16.3

5



Size		L2 [mm]	P [mm]	G1 [mm]	Weight [kg/pc]
NPS	DN				
1/8	6	6.7	13.5	-	-
1/4	8	10.2	16	-	-
3/8	10	10.4	18.8	-	-
1/2	15	13.6	22.1	-	-
3/4	20	13.7	24.6	3.3	-
1	25	17.3	29.5	3.8	-
1 1/4	32	18	32.5	4.3	-
1 1/2	40	18.4	33.8	4.8	-
2	50	19.2	36.8	5.6	-
2 1/2	65	28.9	43.2	6.4	-
3	80	30.5	45.7	7.4	-
4	100	33	52.8	9.1	-
5	125	35.7	58.9	-	-
6	150	38.4	64.8	-	-

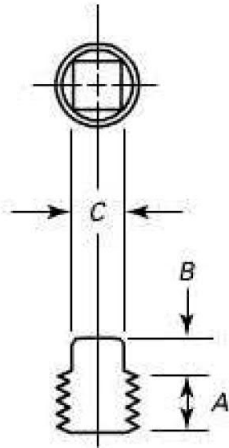
Notes:

- 1) Caps sizes DN 6 (1/8"), DN 8 (1/4") and DN 10 (3/8") may be malleable castings or made from steel rod with a minimum yield strength of 30 ksi at the option of the manufacturer. When made of steel rod, diameters shall be 12.7 mm (0.5"), 17.53 mm (0.69") and 21.34 mm (0.84"). Caps made from steel rod have no recess.
- 2) Caps may be made without recess. Caps so made shall be of such height P that the length of the perfect thread shall be not less than B, and the length of useful thread (B plus threads with fully formed roots and flat crests) shall be not less than L2 (effective length of external thread) required by ASME B1.20.1 pipe threads.

**Square head plug solid** Class 150

According to ASME B16.14

7

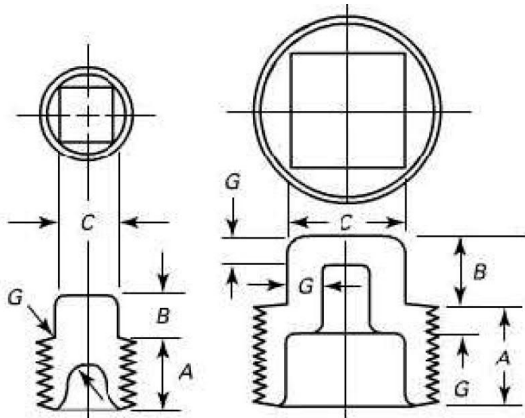


Size		A [mm]	B [mm]	C [inch]	Weight [kg/pc]
NPS	DN				
1/8	6	9.4	6.1	9/32	-
1/4	8	11.2	7.1	3/8	-
3/8	10	12.2	7.9	7/26	-
1/2	15	14.2	9.7	9/16	-
3/4	20	16	11.2	5/8	-
1	25	19.1	12.7	13/16	-
1 1/4	32	20.3	14.2	15/16	-
1 1/2	40	21.1	15.8	1 1/8	-
2	50	22.4	17.3	1 5/16	-
2 1/2	65	27.2	18.8	1 1/2	-
3	80	28.7	20.3	1 11/16	-

**Square head plug cored** Class 150

According to ASME B16.14

7

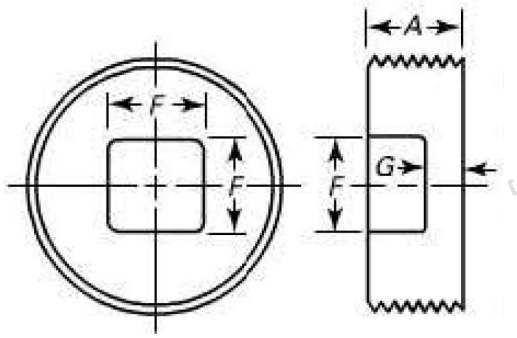


Size		A [mm]	B [mm]	C [inch]	G [mm]	Weight [kg/pc]
NPS	DN					
1/2	15	14.2	9.7	9/16	4.1	-
3/4	20	16	11.2	5/8	4.6	-
1	25	19.1	12.7	13/16	5.1	-
1 1/4	32	20.3	14.2	15/16	5.6	-
1 1/2	40	21.1	15.8	1 1/8	6.1	-
2	50	22.4	17.3	1 5/16	6.6	-
2 1/2	65	27.2	18.8	1 1/2	7.4	-
3	80	28.7	20.3	1 11/16	7.9	-

**Countersunk plug square socket Class 150**

8

According to ASME B16.14

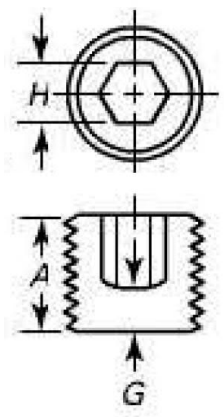


Size		A [mm]	G [mm]	F [inch]	Weight [kg/pc]
NPS	DN				
1/2	15	14.2	4.1	3/8	-
3/4	20	16	4.6	1/2	-
1	25	19.1	5.1	1/2	-
1 1/4	32	20.3	5.6	3/4	-
1 1/2	40	21.1	6.1	3/4	-
2	50	22.4	6.6	7/8	-
2 1/2	65	27.2	7.4	1 1/8	-
3	80	28.7	7.9	1 3/8	-
4	100	31	9.4	2	-

**Countersunk plug hexagon Class 150**

8

According to ASME B16.14

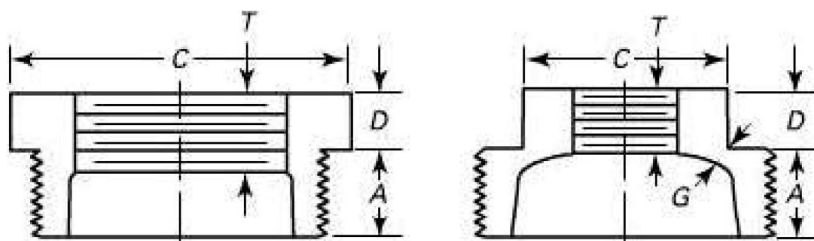


Size		A [mm]	G [mm]	H [inch]	Weight [kg/pc]
NPS	DN				
1/8	6	9.4	1.5	3/16	-
1/4	8	11.2	2.3	1/4	-
3/8	10	12.2	3.3	5/16	-
1/2	15	14.2	4.1	3/8	-
3/4	20	16	4.6	9/10	-
1	25	19.1	5.1	5/8	-

**Bushing outside and inside head** Class 150

According to ASME B16.14

9



Outside head

inside head

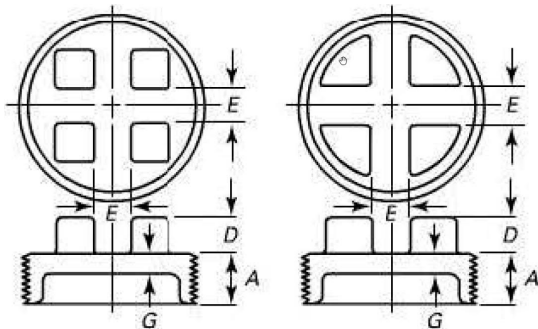
Size		A [mm]	T [mm]	D [mm]	outside	inside	G [mm]	Weight	
NPS	DN				C [mm]	C [mm]		outside [kg/pc]	inside [kg/pc]
1/4 - 1/8	8 - 6	11.2	6.6	3.6	16.3	-	-	-	-
3/8 - 1/4	10 - 8	12.2	10.2	4.1	17.3	-	-	-	-
3/8 - 1/8	10 - 6	12.2	6.4	4.1	17.3	-	-	-	-
1/2 - 3/8	15 - 10	14.2	10.4	4.8	22.1	-	-	-	-
1/2 - 1/4	15 - 8	14.2	8.1	4.8	22.1	-	-	-	-
1/2 - 1/8	15 - 6	14.2	6.4	4.8	22.1	-	-	-	-
3/4 - 1/2	20 - 15	16.0	13.5	5.6	29.2	-	-	-	-
3/4 - 3/8	20 - 10	16.0	9.1	5.6	29.2	-	-	-	-
3/4 - 1/4	20 - 8	16.0	8.1	5.6	29.2	-	-	-	-
3/4 - 1/8	20 - 6	16.0	6.4	5.6	29.2	-	-	-	-
1 - 3/4	25 - 20	19.1	12.7	6.4	36.1	-	-	-	-
1 - 1/2	25 - 15	19.1	10.9	6.4	36.1	-	-	-	-
1 - 3/8	25 - 10	19.1	9.1	7.6	-	28.5	-	-	-
1 - 1/4	25 - 8	19.1	8.1	7.6	-	28.5	-	-	-
1 - 1/8	25 - 6	19.1	6.4	7.6	-	28.5	-	-	-
1 1/4 - 1	32 - 25	20.3	14.7	7.1	44.7	-	-	-	-
1 1/4 - 3/4	32 - 20	20.3	12.7	7.1	44.7	-	-	-	-
1 1/4 - 1/2	32 - 15	20.3	10.9	8.6	-	34.0	4.8	-	-
1 1/4 - 3/8	32 - 10	20.3	9.1	8.6	-	28.5	4.8	-	-
1 1/4 - 1/4	32 - 8	20.3	8.1	8.6	-	28.5	4.8	-	-
1 1/2 - 1 1/4	40 - 30	21.1	18.0	7.9	50.8	-	-	-	-
1 1/2 - 1	40 - 25	21.1	14.7	7.9	50.8	-	-	-	-
1 1/2 - 3/4	40 - 20	21.1	12.7	9.4	-	41.4	5.1	-	-
1 1/2 - 1/2	40 - 15	21.1	10.9	9.4	-	34.0	5.1	-	-
1 1/2 - 3/8	40 - 10	21.1	9.1	9.4	-	28.5	5.1	-	-
1 1/2 - 1/4	40 - 8	21.1	8.1	9.4	-	28.5	5.1	-	-
2 - 1 1/2	50 - 40	22.4	17.8	8.6	63.0	-	-	-	-
2 - 1 1/4	50 - 32	22.4	17.0	8.6	63.0	-	-	-	-
2 - 1	50 - 25	22.4	14.7	10.4	-	49.5	5.6	-	-
2 - 3/4	50 - 20	22.4	12.7	10.4	-	41.4	5.6	-	-
2 - 1/2	50 - 15	22.4	10.9	10.4	-	34.0	5.6	-	-
2 - 3/8	50 - 10	22.4	9.1	10.4	-	28.5	5.6	-	-
2 - 1/4	50 - 8	22.4	8.1	104.0	-	28.5	5.6	-	-

NPS	Size		A [mm]	T [mm]	D [mm]	outside C [mm]	inside C [mm]	G [mm]	Weight	
	DN								outside [kg/pc]	inside [kg/pc]
2 1/2 - 2	65 - 50		27.2	19.1	9.4	75.7	-	-	-	-
2 1/2 - 1 1/2	65 - 40		27.2	17.8	11.2	68.1	-	-	-	-
2 1/2 - 1 1/4	65 - 32		27.2	17.0	11.2	-	60.7	6.1	-	-
2 1/2 - 1	65 - 25		27.2	14.7	11.2	-	49.5	6.1	-	-
2 1/2 - 3/4	65 - 20		27.2	12.7	11.2	-	41.4	6.1	-	-
2 1/2 - 1/2	65 - 15		27.2	10.9	11.2	-	34.0	6.1	-	-
3 - 2 1/2	80 - 65		28.7	23.4	10.2	98.0	-	-	-	-
3 - 2	80 - 50		28.7	19.1	12.2	83.3	-	-	-	-
3 - 1 1/2	80 - 40		28.7	17.8	12.2	-	68.1	6.6	-	-
3 - 1 1/4	80 - 32		28.7	17.0	12.2	-	60.7	6.6	-	-
3 - 1	80 - 25		28.7	14.7	12.2	-	49.5	6.6	-	-
3 - 3/4	80 - 20		28.7	12.7	12.2	-	41.4	6.6	-	-
3 - 1/2	80 - 15		28.7	10.9	12.2	-	34.0	6.6	-	-
4 - 3	100 - 80		31.0	24.9	12.7	117.3	-	-	-	-
4 - 2 1/2	100 - 65		31.0	23.4	15.2	-	98.0	7.9	-	-
4 - 2	100 - 50		31.0	19.1	15.2	-	83.3	7.9	-	-
4 - 1 1/2	100 - 40		31.0	17.8	15.2	-	68.1	7.9	-	-
4 - 1 1/4	100 - 32		31.0	17.0	15.2	-	60.7	7.9	-	-
4 - 1	100 - 25		31.0	14.7	15.2	-	49.5	7.9	-	-
5 - 4	125 - 100		33.3	27.4	12.7	147.1	-	-	-	-
5 - 3	125 - 80		33.3	24.9	15.2	-	117.3	9.7	-	-
5 - 2 1/2	125 - 65		33.3	23.4	15.2	-	98.0	9.7	-	-
5 - 2	125 - 50		33.3	19.1	15.2	-	83.3	9.7	-	-
6 - 5	150 - 125		35.6	30.0	16.0	179.1	-	-	-	-
6 - 4	150 - 100		35.6	27.4	19.1	-	147.1	10.9	-	-
6 - 3	150 - 80		35.6	24.9	19.1	-	117.3	10.9	-	-
6 - 2 1/2	150 - 65		35.6	23.4	19.1	-	98.0	10.9	-	-
6 - 2	150 - 50		35.6	19.1	19.1	-	83.3	10.9	-	-
8 - 6	200 - 150		39.9	32.5	21.1	210.3	-	-	-	-
8 - 5	200 - 125		39.9	30.0	21.1	-	179.1	14.0	-	-
8 - 4	200 - 100		39.9	27.4	21.1	-	132.1	14.0	-	-
8 - 3	200 - 80		39.9	24.9	21.1	-	117.3	14.0	-	-

**Slotted head plug Class 150**



According to ASME B16.14

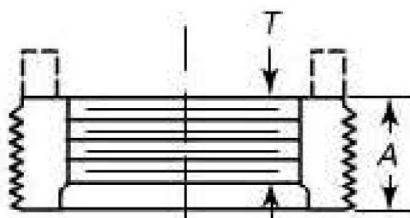


NPS	Size		A [mm]	D [mm]	E [mm]	G [mm]	Weight [kg/pc]
	DN						
4	100		31	25.4	22.4	9.4	-
5	125		33.3	25.4	22.4	11.7	-
6	150		35.6	31.8	31.8	13.2	-
8	200		39.9	35.1	38.1	16.8	-

**Face bushing** Class 150



According to ASME B16.14



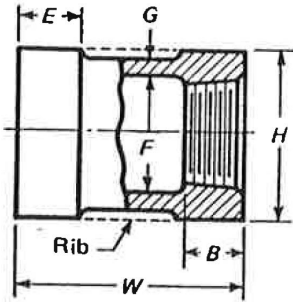
Size		A [mm]	T [mm]	Weight [kg/pc]
NPS	DN			
1/4 - 1/8	8 - 6	11.2	6.6	-
3/8 - 1/4	10 - 8	12.2	10.2	-
3/8 - 1/8	10 - 6	12.2	6.4	-
1/2 - 3/8	15 - 10	14.2	10.4	-
1/2 - 1/4	15 - 8	14.2	8.1	-
1/2 - 1/8	15 - 6	14.2	6.4	-
3/4 - 1/2	20 - 15	16	13.5	-
3/4 - 3/8	20 - 10	16	9.1	-
3/4 - 1/4	20 - 8	16	8.1	-
3/4 - 1/8	20 - 6	16	6.4	-
1 - 3/4	25 - 20	19.1	12.7	-
1 - 1/2	25 - 15	19.1	10.9	-
1 - 3/8	25 - 10	19.1	9.1	-
1 - 1/4	25 - 8	19.1	8.1	-
1 - 1/8	25 - 6	19.1	6.4	-
1 1/4 - 1	32 - 25	20.3	14.7	-
1 1/4 - 3/4	32 - 20	20.3	12.7	-
1 1/4 - 1/2	32 - 15	20.3	10.9	-
1 1/4 - 3/8	32 - 10	20.3	9.1	-
1 1/4 - 1/4	32 - 8	20.3	8.1	-
1 1/2 - 1 1/4	40 - 30	21.1	18.0	-
1 1/2 - 1	40 - 25	21.1	14.7	-
1 1/2 - 3/4	40 - 20	21.1	12.7	-
1 1/2 - 1/2	40 - 15	21.1	10.9	-
1 1/2 - 3/8	40 - 10	21.1	9.1	-
1 1/2 - 1/4	40 - 8	21.1	8.1	-
2 - 1 1/2	50 - 40	22.4	17.8	-
2 - 1 1/4	50 - 32	22.4	17.0	-
2 - 1	50 - 25	22.4	14.7	-
2 - 3/4	50 - 20	22.4	12.7	-
2 - 1/2	50 - 15	22.4	10.9	-
2 - 3/8	50 - 10	22.4	9.1	-
2 - 1/4	50 - 8	22.4	8.1	-
2 1/2 - 2	65 - 50	27.2	19.1	-
2 1/2 - 1 1/2	65 - 40	27.2	17.8	-
2 1/2 - 1 1/4	65 - 32	27.2	17.0	-
2 1/2 - 1	65 - 25	27.2	14.7	-
2 1/2 - 3/4	65 - 20	27.2	12.7	-
2 1/2 - 1/2	65 - 15	27.2	10.9	-

Size		A [mm]	T [mm]	Weight [kg/pc]
NPS	DN			
3 - 2 1/2	80 - 65	28.7	23.4	-
3 - 2	80 - 50	28.7	19.1	-
3 - 1 1/2	80 - 40	28.7	17.8	-
3 - 1 1/4	80 - 32	28.7	17	-
3 - 1	80 - 25	28.7	14.7	-
3 - 3/4	80 - 20	28.7	12.7	-
3 - 1/2	80 - 15	28.7	10.9	-
4 - 3	100 - 80	31	24.9	-
4 - 2 1/2	100 - 65	31	23.4	-
4 - 2	100 - 50	31	19.1	-
4 - 1 1/2	100 - 40	31	17.8	-
4 - 1 1/4	100 - 32	31	17	-
4 - 1	100 - 25	31	14.7	-
5 - 4	125 - 100	33.3	27.4	-
5 - 3	125 - 80	33.3	24.9	-
5 - 2 1/2	125 - 65	33.3	23.4	-
5 - 2	125 - 50	33.3	19.1	-
6 - 5	150 - 125	35.6	30.0	-
6 - 4	150 - 100	35.6	27.4	-
6 - 3	150 - 80	35.6	24.9	-
6 - 2 1/2	150 - 65	35.6	23.4	-
6 - 2	150 - 50	35.6	19.1	-
8 - 6	200 - 150	39.9	32.5	-
8 - 5	200 - 125	39.9	30	-
8 - 4	200 - 100	39.9	27.4	-
8 - 3	200 - 80	39.9	24.9	-

**Coupling straight** with Bands Class 300

According to ASME B16.3

①

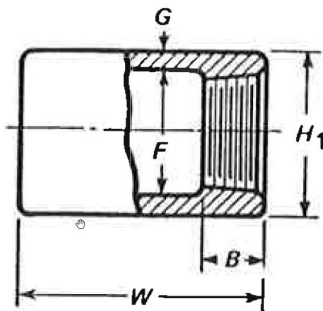


Size		B [mm]	E [mm]	Fmin. / Fmax. [mm]	G [mm]	H [mm]	W [mm]	Weight [kg/pc]
NPS	DN							
1/4	8	10.9	9.7	13.7 / 14.7	3.6	23.6	34.8	-
3/8	10	11.9	11.2	17 / 18.3	3.8	28.4	41.1	-
1/2	15	14.5	12.7	21.3 / 22.9	4.1	34	47.5	-
3/4	20	16.3	14.2	26.7 / 28.2	4.6	41.4	53.8	-
1	25	19.1	15.7	33.3 / 35.1	5.1	49.5	60.2	-
1 1/4	32	21.3	17.5	42.2 / 43.9	5.6	60.7	72.9	-
1 1/2	40	22.1	19.1	48.3 / 50	6.1	68.1	72.9	-
2	50	25.4	21.3	60.2 / 62	6.6	83.3	91.9	-
2 1/2	65	29.7	23.9	72.9 / 75.4	7.9	98	104.6	-
3	80	31.2	25.4	88.9 / 91.4	8.9	117.3	104.6	-

**Coupling straight** without Bands Class 300

According to ASME B16.3

①

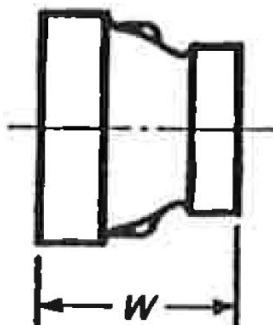


Size		B [mm]	Fmin. / Fmax. [mm]	G [mm]	H1 [mm]	W [mm]	Weight [kg/pc]
NPS	DN						
1/4	8	10.9	13.7 / 14.7	3.6	20.8	34.8	-
3/8	10	11.9	17 / 18.3	3.8	24.6	41.1	-
1/2	15	14.5	21.3 / 22.9	4.1	29.5	47.5	-
3/4	20	16.3	26.7 / 28.2	4.6	35.8	53.8	-
1	25	19.1	33.3 / 35.1	5.1	43.4	60.2	-
1 1/4	32	21.3	42.2 / 43.9	5.6	53.3	72.9	-
1 1/2	40	22.1	48.3 / 50	6.1	60.5	72.9	-
2	50	25.4	60.2 / 62	6.6	73.4	91.9	-
2 1/2	65	29.7	72.9 / 75.4	7.9	88.6	104.6	-
3	80	31.2	88.9 / 91.4	8.9	106.7	104.6	-

**Coupling reduced** Class 300

According to ASME B16.3

②

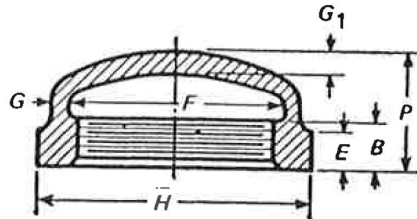


Size		W [mm]	Weight [kg/pc]
NPS	DN		
3/8 - 1/4	10 - 8	36.6	-
1/2 - 3/8	15 - 10	42.9	-
1/2 - 1/4	15 - 8	42.9	-
3/4 - 1/2	20 - 15	44.5	-
3/4 - 3/8	20 - 10	44.5	-
3/4 - 1/4	20 - 8	44.5	-
1 - 3/4	25 - 20	50.8	-
1 - 1/2	25 - 15	50.8	-
1 - 3/8	25 - 10	50.8	-
1 - 1/4	25 - 8	50.8	-
1 1/4 - 1	32 - 25	60.5	-
1 1/4 - 3/4	32 - 20	60.5	-
1 1/4 - 1/2	32 - 15	60.5	-
1 1/2 - 1 1/4	40 - 32	68.3	-
1 1/2 - 1	40 - 25	68.3	-
1 1/2 - 3/4	40 - 20	68.3	-
1 1/2 - 1/2	40 - 15	68.3	-
2 - 1 1/2	50 - 40	81	-
2 - 1 1/4	50 - 32	81	-
2 - 1	50 - 25	81	-
2 - 3/4	50 - 20	81	-
2 - 1/2	50 - 15	81	-
2 1/2 - 2	65 - 50	93.7	-
2 1/2 - 1 1/2	65 - 40	93.7	-
3 - 2 1/2	80 - 65	103.1	-
3 - 2	80 - 50	103.1	-
3 - 1 1/2	80 - 40	103.1	-

**Cap with recess** Class 300

According to ASME B16.3

①

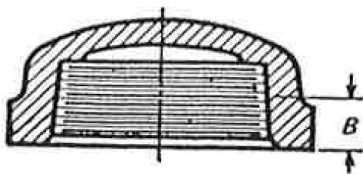


Size		B [mm]	E [mm]	Fmin. / Fmax. [mm]	G [mm]	G1 [mm]	H [mm]	P [mm]	Weight [kg/pc]
NPS	DN								
1/4	8	10.9	9.7	13.7 / 14.7	3.6	4.6	23.6	19.8	-
3/8	10	11.9	11.2	17 / 18.3	3.8	4.8	28.4	21.1	-
1/2	15	14.5	12.7	21.3 / 22.9	4.1	5.1	34	24.9	-
3/4	20	16.3	14.2	26.7 / 28.2	4.6	5.8	41.4	27.4	-
1	25	19.1	15.7	33.3 / 35.1	5.1	6.4	49.5	32	-
1 1/4	32	21.3	17.5	42.2 / 43.9	5.6	7.1	60.7	35.1	-
1 1/2	40	22.1	19.1	48.3 / 50	6.1	7.6	68.1	36.3	-
2	50	25.4	21.3	60.2 / 62	6.6	8.4	83.3	42.7	-
2 1/2	65	29.7	23.9	72.9 / 75.4	7.9	9.9	98	52.3	-
3	80	31.2	25.4	88.9 / 91.4	8.9	11.2	117.3	55.1	-

**Cap without recess** Class 300

According to ASME B16.3

⑤

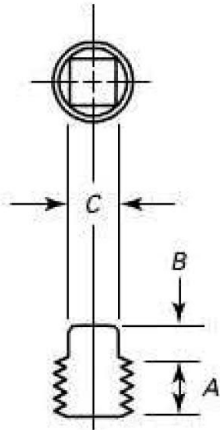


Size		B [mm]	Weight [kg/pc]
NPS	DN		
1/4	8	10.9	-
3/8	10	11.9	-
1/2	15	14.5	-
3/4	20	16.3	-
1	25	19.1	-
1 1/4	32	21.3	-
1 1/2	40	22.1	-
2	50	25.4	-
2 1/2	65	29.7	-
3	80	31.2	-

**Square head plug solid** Class 300

According to ASME B16.14

7

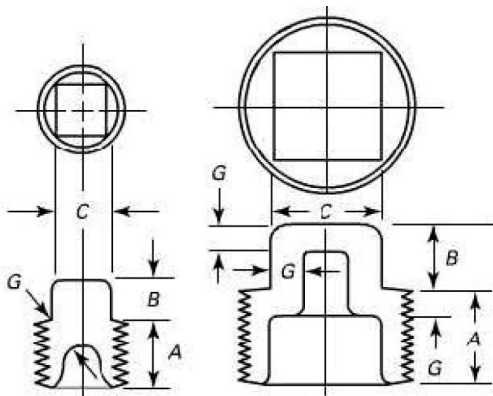


Size		A [mm]	B [mm]	C [inch]	Weight [kg/pc]
NPS	DN				
1/8	6	9.4	6.1	9/32	-
1/4	8	11.2	7.1	3/8	-
3/8	10	12.2	7.9	7/26	-
1/2	15	14.2	9.7	9/16	-
3/4	20	16	11.2	5/8	-
1	25	19.1	12.7	13/16	-
1 1/4	32	20.3	14.2	15/16	-
1 1/2	40	21.1	15.8	1 1/8	-
2	50	22.4	17.3	1 5/16	-
2 1/2	65	27.2	18.8	1 1/2	-
3	80	28.7	20.3	1 11/16	-

**Square head plug cored** Class 300

According to ASME B16.14

7

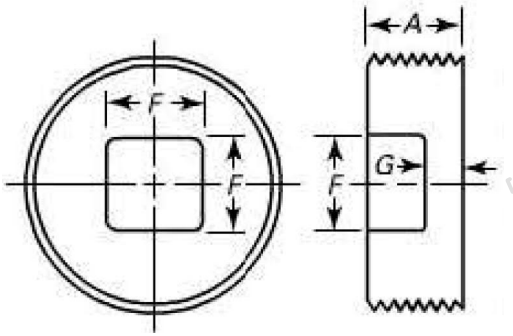


Size		A [mm]	B [mm]	C [inch]	G [mm]	Weight [kg/pc]
NPS	DN					
1/2	15	14.2	9.7	9/16	4.1	-
3/4	20	16	11.2	5/8	4.6	-
1	25	19.1	12.7	13/16	5.1	-
1 1/4	32	20.3	14.2	15/16	5.6	-
1 1/2	40	21.1	15.8	1 1/8	6.1	-
2	50	22.4	17.3	1 5/16	6.6	-
2 1/2	65	27.2	18.8	1 1/2	7.4	-
3	80	28.7	20.3	1 11/16	7.9	-

**Countersunk plug square socket Class 300**

According to ASME B16.14

8

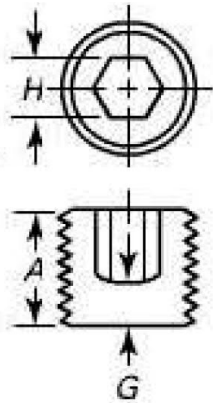


Size		A [mm]	G [mm]	F [inch]	Weigh [kg/pc]
NPS	DN				
1/2	15	14.2	4.1	3/8	-
3/4	20	16	4.6	1/2	-
1	25	19.1	5.1	1/2	-
1 1/4	32	20.3	5.6	3/4	-
1 1/2	40	21.1	6.1	3/4	-
2	50	22.4	6.6	7/8	-
2 1/2	65	27.2	7.4	1 1/8	-
3	80	28.7	7.9	1 3/8	-
4	100	31	9.4	2	-

**Countersunk plug hexagon Class 300**

According to ASME B16.14

8

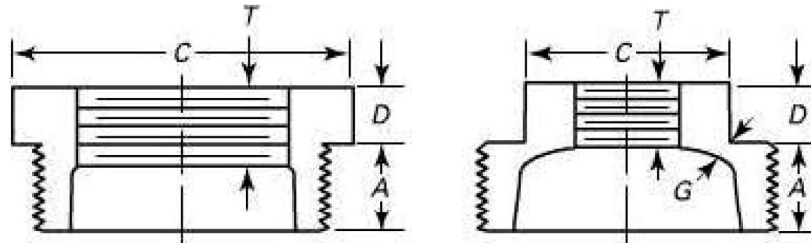


Size		A [mm]	G [mm]	H [inch]	Weight [kg/pc]
NPS	DN				
1/8	6	9.4	1.5	3/16	-
1/4	8	11.2	2.3	1/4	-
3/8	10	12.2	3.3	5/16	-
1/2	15	14.2	4.1	3/8	-
3/4	20	16	4.6	9/10	-
1	25	19.1	5.1	5/8	-

**Bushing outside and inside Head Class 300**

According to ASME B16.14

9



Outside head

inside head

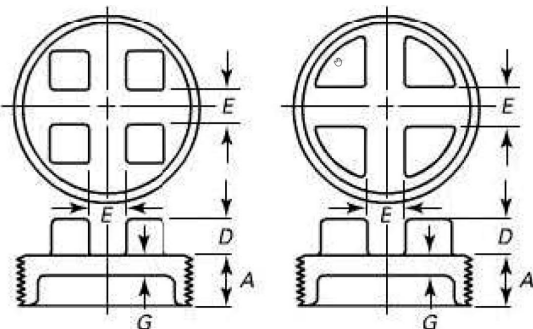
Size		A [mm]	T [mm]	D [mm]	outside	inside	G [mm]	Weight	
NPS	DN				C [mm]	C [mm]		outside [kg/pc]	inside [kg/pc]
1/4 - 1/8	8 - 6	11.2	6.6	3.6	16.3	-	-	-	-
3/8 - 1/4	10 - 8	12.2	10.2	4.1	17.3	-	-	-	-
3/8 - 1/8	10 - 6	12.2	6.4	4.1	17.3	-	-	-	-
1/2 - 3/8	15 - 10	14.2	10.4	4.8	22.1	-	-	-	-
1/2 - 1/4	15 - 8	14.2	8.1	4.8	22.1	-	-	-	-
1/2 - 1/8	15 - 6	14.2	6.4	4.8	22.1	-	-	-	-
3/4 - 1/2	20 - 15	16.0	13.5	5.6	29.2	-	-	-	-
3/4 - 3/8	20 - 10	16.0	9.1	5.6	29.2	-	-	-	-
3/4 - 1/4	20 - 8	16.0	8.1	5.6	29.2	-	-	-	-
3/4 - 1/8	20 - 6	16.0	6.4	5.6	29.2	-	-	-	-
1 - 3/4	25 - 20	19.1	12.7	6.4	36.1	-	-	-	-
1 - 1/2	25 - 15	19.1	10.9	6.4	36.1	-	-	-	-
1 - 3/8	25 - 10	19.1	9.1	7.6	-	28.5	-	-	-
1 - 1/4	25 - 8	19.1	8.1	7.6	-	28.5	-	-	-
1 - 1/8	25 - 6	19.1	6.4	7.6	-	28.5	-	-	-
1 1/4 - 1	32 - 25	20.3	14.7	7.1	44.7	-	-	-	-
1 1/4 - 3/4	32 - 20	20.3	12.7	7.1	44.7	-	-	-	-
1 1/4 - 1/2	32 - 15	20.3	10.9	8.6	-	34.0	4.8	-	-
1 1/4 - 3/8	32 - 10	20.3	9.1	8.6	-	28.5	4.8	-	-
1 1/4 - 1/4	32 - 8	20.3	8.1	8.6	-	28.5	4.8	-	-
1 1/2 - 1 1/4	40 - 30	21.1	18.0	7.9	50.8	-	-	-	-
1 1/2 - 1	40 - 25	21.1	14.7	7.9	50.8	-	-	-	-
1 1/2 - 3/4	40 - 20	21.1	12.7	9.4	-	41.4	5.1	-	-
1 1/2 - 1/2	40 - 15	21.1	10.9	9.4	-	34.0	5.1	-	-
1 1/2 - 3/8	40 - 10	21.1	9.1	9.4	-	28.5	5.1	-	-
1 1/2 - 1/4	40 - 8	21.1	8.1	9.4	-	28.5	5.1	-	-
2 - 1 1/2	50 - 40	22.4	17.8	8.6	63.0	-	-	-	-
2 - 1 1/4	50 - 32	22.4	17.0	8.6	63.0	-	-	-	-
2 - 1	50 - 25	22.4	14.7	10.4	-	49.5	5.6	-	-
2 - 3/4	50 - 20	22.4	12.7	10.4	-	41.4	5.6	-	-
2 - 1/2	50 - 15	22.4	10.9	10.4	-	34.0	5.6	-	-
2 - 3/8	50 - 10	22.4	9.1	10.4	-	28.5	5.6	-	-
2 - 1/4	50 - 8	22.4	8.1	10.4	-	28.5	5.6	-	-

NPS	Size	A [mm]	T [mm]	D [mm]	outside	inside	G [mm]	Weight	
	DN				C [mm]	C [mm]		outside [kg/pc]	inside [kg/pc]
2 1/2 - 2	65 - 50	27.2	19.1	9.4	75.7	-	-	-	-
2 1/2 - 1 1/2	65 - 40	27.2	17.8	11.2	68.1	-	-	-	-
2 1/2 - 1 1/4	65 - 32	27.2	17.0	11.2	-	60.7	6.1	-	-
2 1/2 - 1	65 - 25	27.2	14.7	11.2	-	49.5	6.1	-	-
2 1/2 - 3/4	65 - 20	27.2	12.7	11.2	-	41.4	6.1	-	-
2 1/2 - 1/2	65 - 15	27.2	10.9	11.2	-	34.0	6.1	-	-
3 - 2 1/2	80 - 65	28.7	23.4	10.2	98.0	-	-	-	-
3 - 2	80 - 50	28.7	19.1	12.2	83.3	-	-	-	-
3 - 1 1/2	80 - 40	28.7	17.8	12.2	-	68.1	6.6	-	-
3 - 1 1/4	80 - 32	28.7	17.0	12.2	-	60.7	6.6	-	-
3 - 1	80 - 25	28.7	14.7	12.2	-	49.5	6.6	-	-
3 - 3/4	80 - 20	28.7	12.7	12.2	-	41.4	6.6	-	-
3 - 1/2	80 - 15	28.7	10.9	12.2	-	34.0	6.6	-	-
4 - 3	100 - 80	31.0	24.9	12.7	117.3	-	-	-	-
4 - 2 1/2	100 - 65	31.0	23.4	15.2	-	98.0	7.9	-	-
4 - 2	100 - 50	31.0	19.1	15.2	-	83.3	7.9	-	-
4 - 1 1/2	100 - 40	31.0	17.8	15.2	-	68.1	7.9	-	-
4 - 1 1/4	100 - 32	3.0	17.0	15.2	-	60.7	7.9	-	-
4 - 1	100 - 25	31.0	14.7	15.2	-	49.5	7.9	-	-
5 - 4	125 - 100	33.3	27.4	12.7	147.1	-	-	-	-
5 - 3	125 - 80	33.3	24.9	15.2	-	117.3	9.7	-	-
5 - 2 1/2	125 - 65	33.3	23.4	15.2	-	98.0	9.7	-	-
5 - 2	125 - 50	33.3	19.1	15.2	-	83.3	9.7	-	-
6 - 5	150 - 125	35.6	30.0	16.0	179.1	-	-	-	-
6 - 4	150 - 100	35.6	27.4	19.1	-	147.1	10.9	-	-
6 - 3	150 - 80	35.6	24.9	19.1	-	117.3	10.9	-	-
6 - 2 1/2	150 - 65	35.6	23.4	19.1	-	98.0	10.9	-	-
6 - 2	150 - 50	35.6	19.1	19.1	-	83.3	10.9	-	-
8 - 6	200 - 150	39.9	32.5	21.1	210.3	-	-	-	-
8 - 5	200 - 125	39.9	30.0	21.1	-	179.1	14.0	-	-
8 - 4	200 - 100	39.9	27.4	21.1	-	132.1	14.0	-	-
8 - 3	200 - 80	39.9	24.9	21.1	-	117.3	14.0	-	-

### Slotted head plug Class 300



According to ASME B16.14

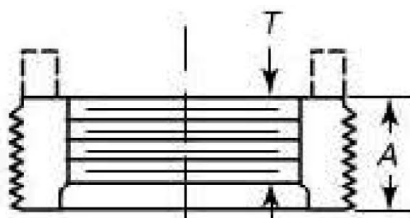


NPS	Size	A [mm]	D [mm]	E [mm]	G [mm]	Weight [kg/pc]
	DN					
4	100	31	25.4	22.4	9.4	-
5	125	33.3	25.4	22.4	11.7	-
6	150	35.6	31.8	31.8	13.2	-
8	200	39.9	35.1	38.1	16.8	-

**Face bushing** Class 300



According to ASME B16.14



Size		A [mm]	T [mm]	Weight [kg/pc]
NPS	DN [mm]			
1/4 - 1/8	8 - 6	11.2	6.6	-
3/8 - 1/4	10 - 8	12.2	10.2	-
3/8 - 1/8	10 - 6	12.2	6.4	-
1/2 - 3/8	15 - 10	14.2	10.4	-
1/2 - 1/4	15 - 8	14.2	8.1	-
1/2 - 1/8	15 - 6	14.2	6.4	-
3/4 - 1/2	20 - 15	16	13.5	-
3/4 - 3/8	20 - 10	16	9.1	-
3/4 - 1/4	20 - 8	16	8.1	-
3/4 - 1/8	20 - 6	16	6.4	-
1 - 3/4	25 - 20	19.1	12.7	-
1 - 1/2	25 - 15	19.1	10.9	-
1 - 3/8	25 - 10	19.1	9.1	-
1 - 1/4	25 - 8	19.1	8.1	-
1 - 1/8	25 - 6	19.1	6.4	-
1 1/4 - 1	32 - 25	20.3	14.7	-
1 1/4 - 3/4	32 - 20	20.3	12.7	-
1 1/4 - 1/2	32 - 15	20.3	10.9	-
1 1/4 - 3/8	32 - 10	20.3	9.1	-
1 1/4 - 1/4	32 - 8	20.3	8.1	-
1 1/2 - 1 1/4	40 - 30	21.1	18.0	-
1 1/2 - 1	40 - 25	21.1	14.7	-
1 1/2 - 3/4	40 - 20	21.1	12.7	-
1 1/2 - 1/2	40 - 15	21.1	10.9	-
1 1/2 - 3/8	40 - 10	21.1	9.1	-
1 1/2 - 1/4	40 - 8	21.1	8.1	-
2 - 1 1/2	50 - 40	22.4	17.8	-
2 - 1 1/4	50 - 32	22.4	17.0	-
2 - 1	50 - 25	22.4	14.7	-
2 - 3/4	50 - 20	22.4	12.7	-
2 - 1/2	50 - 15	22.4	10.9	-
2 - 3/8	50 - 10	22.4	9.1	-
2 - 1/4	50 - 8	22.4	8.1	-
2 1/2 - 2	65 - 50	27.2	19.1	-
2 1/2 - 1 1/2	65 - 40	27.2	17.8	-
2 1/2 - 1 1/4	65 - 32	27.2	17.0	-
2 1/2 - 1	65 - 25	27.2	14.7	-
2 1/2 - 3/4	65 - 20	27.2	12.7	-
2 1/2 - 1/2	65 - 15	27.2	10.9	-

Size		A [mm]	T [mm]	Weight [kg/pc]
NPS	DN [mm]			
3 - 2 1/2	80 - 65	28.7	23.4	-
3 - 2	80 - 50	28.7	19.1	-
3 - 1 1/2	80 - 40	28.7	17.8	-
3 - 1 1/4	80 - 32	28.7	17	-
3 - 1	80 - 25	28.7	14.7	-
3 - 3/4	80 - 20	28.7	12.7	-
3 - 1/2	80 - 15	28.7	10.9	-
4 - 3	100 - 80	31	24.9	-
4 - 2 1/2	100 - 65	31	23.4	-
4 - 2	100 - 50	31	19.1	-
4 - 1 1/2	100 - 40	31	17.8	-
4 - 1 1/4	100 - 32	31	17	-
4 - 1	100 - 25	31	14.7	-
5 - 4	125 - 100	33.3	27.4	-
5 - 3	125 - 80	33.3	24.9	-
5 - 2 1/2	125 - 65	33.3	23.4	-
5 - 2	125 - 50	33.3	19.1	-
6 - 5	150 - 125	35.6	30.0	-
6 - 4	150 - 100	35.6	27.4	-
6 - 3	150 - 80	35.6	24.9	-
6 - 2 1/2	150 - 65	35.6	23.4	-
6 - 2	150 - 50	35.6	19.1	-
8 - 6	200 - 150	39.9	32.5	-
8 - 5	200 - 125	39.9	30	-
8 - 4	200 - 100	39.9	27.4	-
8 - 3	200 - 80	39.9	24.9	-

**Malleable Iron Threaded Fittings  
Unions  
ASME B16.39**

Example of Designation: Designation of a straight threaded union, class 300, tapered, male/female, size 1 1/2", material: ASTM A197

Part number **31646M022**    1 1/2 INCH    THREADED UNION CLASS 300    ASTM A197  
STRAIGHT FEM/MALE TAPER.SEAL. H310/ASME B16.39

Part numbering Code										
Position of Part No.										
1. - 3.		4.			5. - 6.		7. - 8.		9.	
Kind of Part		Fitting type / End connection Sealing type 3) 5) 6)			Material 1)		Class 4)		Certificate 7)	
	Cd.		Cd.		Cd.		Cd.		Cd.	
Union	316	Straight flat sealing female/female	1	A197 galvanized	6L	150	01	ASME	2	
		Straight tapered female/female	2	A197	6M	300	02			
		Straight flat sealing male/female 2)	3	A197 galv./Bronze	6J					
		Straight tapered male/female	4	A197 / Bronze	6K					
		Elbow flat sealing female/female 2)	5							
		Elbow tapered female/female	6							
		Elbow flat sealing male/female 2)	7							
		Elbow tapered male/female	8							

- 1) Materials:  
Bronze for seat material according to manufacturer's option, for body material see page 1.
- 2) These fittings are not figured in the following pages.
- 3) Code for type of fitting
- 4) Code for Class:  
Allowable Pressure - Temperature Ratings according to ASME B16.39 (see page 37 Table B1).
- 5) Tapered sealing may be:  
Ball to cone, ball to ball or ball and socket with metal to metal sealing surfaces of either in iron, copper or copper alloy.
- 6) Flat sealing according to BS/EN 10242 or manufacturer's standard.
- 7) Certificate according to ASME- / ASTM-standards

Nipples see standard H380 „Threaded Forged Steel Fittings“ according to BS 3799  
Welding ends see standard H318.

## ASME B16.39 / TABLE 1: PRESSURE - TEMPERATURE RATINGS

Temperature [°C]	Class 150 [bar]	Class 300 [bar]
- 29 to 66	20.7	41.4
100	17.5	37.5
125	15.2	34.6
150	12.9	31.7
175	10.6	28.9
200	8.2	26
225	5.9	23.1
232	5.2	-
250	-	20.3
275	-	17.4
288	-	15.9

## ASME B16.39 / TABLE A1: PRESSURE - TEMPERATURE RATINGS

Temperature [°F]	Class 150 [psi]	Class 300 [psi]
- 20 to 151	300.23	600.47
212	253.81	543.89
257	220.46	501.83
302	187.1	459.77
347	153.74	419.16
392	118.93	377.1
437	85.57	23.1
450	75.42	-
482	-	294.43
527	-	252.37
550	-	230.61

## GENERAL NOTES:

(a) 1 bar = 14,5 psi = 10<sup>5</sup> Pa

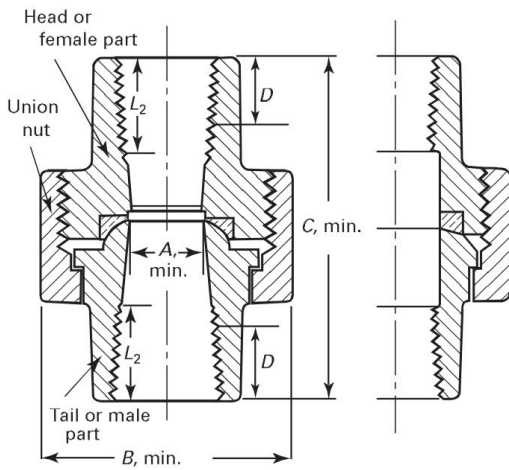
(b) °C = 0,5556 (°F-32)

**Union Straight flat sealing female/female Class 150**

①

According to ASME B16.39

**Straight Flat**



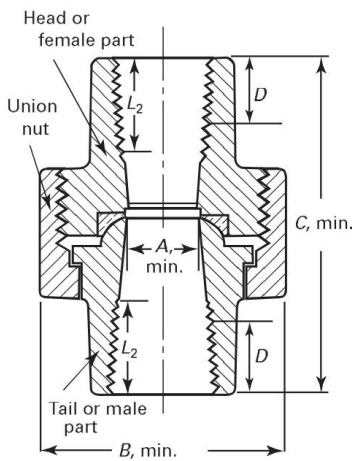
Size		A min. [mm]	B min. [mm]	C min. [mm]	D min. [mm]	Weight [kg/pc]
NPS	DN					
1/8	6	5.5	23.5	32	6.7	-
1/4	8	9	28	36.5	10.2	-
3/8	10	13	32	41	10.4	-
1/2	15	15.5	37	43.5	13.6	-
3/4	20	20.5	43.5	49.5	13.9	-
1	25	25.5	52.5	52.5	17.3	-
1 1/4	32	33.5	63.5	57.5	18	-
1 1/2	40	39.5	71.5	61	18.4	-
2	50	51.5	86.5	70	19.2	-
2 1/2	65	60.5	104.5	82	28.9	-
3	80	76	120.5	89	30.5	-
4	100	102.5	152.5	98	33	-

Footnotes see page 36

**Union Straight tapered female/female Class 150**

②

According to ASME B16.39



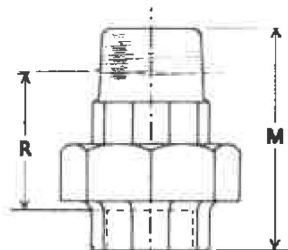
Size		A min. [mm]	B min. [mm]	C min. [mm]	D min. [mm]	Weight [kg/pc]
NPS	DN					
1/8	6	5.5	23.5	32	6.7	-
1/4	8	9	28	36.5	10.2	-
3/8	10	13	32	41	10.4	-
1/2	15	15.5	37	43.5	13.6	-
3/4	20	20.5	43.5	49.5	13.9	-
1	25	25.5	52.5	52.5	17.3	-
1 1/4	32	33.5	63.5	57.5	18	-
1 1/2	40	39.5	71.5	61	18.4	-
2	50	51.5	86.5	70	19.2	-
2 1/2	65	60.5	104.5	82	28.9	-
3	80	76	120.5	89	30.5	-
4	100	102.5	152.5	98	33	-

Footnotes see page 36

**Union Straight tapered male/female Class 150**

④

According to manufacturer's standard

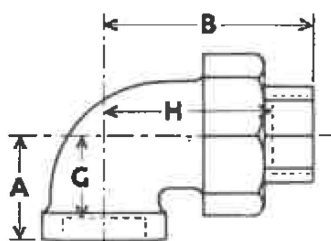


Size		M [mm]	R [mm]	Weight [kg/pc]
NPS	DN			
1/4	8	55.6	36.5	0.09
3/8	10	60.3	41.3	0.14
1/2	15	66.7	41.3	0.23
3/4	20	76.2	47.6	0.32
1	50	84.1	49.2	0.45
1 1/4	32	92.1	57.2	0.77
1 1/2	40	100.0	65.1	0.99
2	50	108.0	69.9	1.59

**Elbow tapered female/female Class 150**

⑥

According to manufacturer's standard

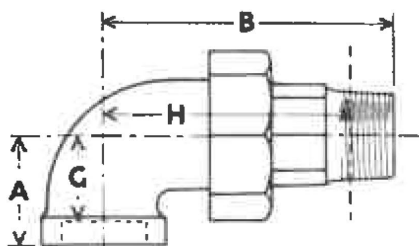


Size		A [mm]	B [mm]	G [mm]	H [mm]	Weight [kg/pc]
NPS	DN					
1/4	8	20.6	42.9	11.1	33.3	0.14
3/8	10	24.6	47.6	15.9	38.1	0.18
1/2	15	28.6	54.0	15.9	41.3	0.23
3/4	20	33.3	66.7	19.1	52.4	0.36
1	50	38.1	73.0	20.6	55.6	0.54
1 1/4	32	44.5	81.0	27.0	63.5	0.86
1 1/2	40	49.2	85.7	31.8	68.3	1.04
2	50	57.2	98.4	38.1	79.4	1.72

**Elbow tapered male/female Class 150**

⑧

According to manufacturer's standard



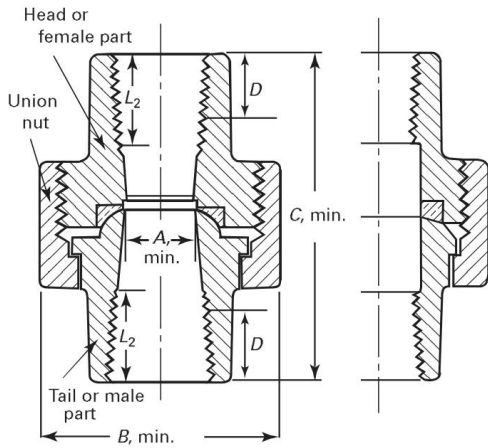
Size		A [mm]	B [mm]	G [mm]	H [mm]	Weight [kg/pc]
NPS	DN					
1/4	8	20.6	60.3	11.1	50.8	0.14
3/8	10	24.6	66.7	15.9	57.2	0.18
1/2	15	28.6	74.6	15.9	61.9	0.27
3/4	20	33.3	90.5	19.1	76.2	0.45
1	50	38.1	100.0	20.6	82.6	0.64
1 1/4	32	44.5	109.5	27.0	92.1	0.99
1 1/2	40	49.2	117.5	31.8	100.0	1.32
2	50	57.2	127.0	38.1	108.0	2.08

**Union Straight flat sealing female/female Class 300**

①

According to ASME B16.39

Straight Flat



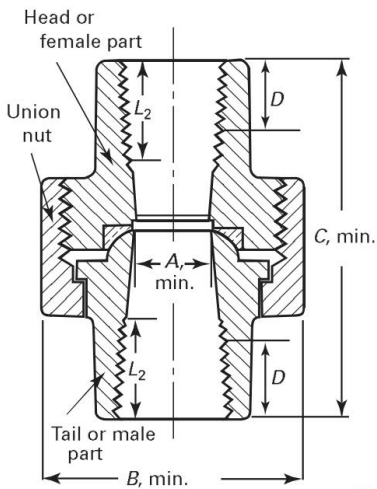
Size		A min. [mm]	B min. [mm]	C min. [mm]	D min. [mm]	Weight [kg/pc]
NPS	DN					
1/8	6	5.5	23.5	32	7.5	-
1/4	8	7.5	34	39.5	11	-
3/8	10	10.5	38	43.5	12	-
1/2	15	13.5	44.5	46	14.5	-
3/4	20	19	54.5	54	16.5	-
1	25	24	63	58.5	19	-
1 1/4	32	32.5	76.5	67.5	21.5	-
1 1/2	40	38	83.5	72.5	22	-
2	50	49	100.5	82	25.5	-
2 1/2	65	59	120	84.5	29.5	-
3	80	73.5	136.5	104	31	-
4	100	97	178	113.5	34	-

Footnotes see page 36

**Union Straight tapered female/female Class 300**

②

According to ASME B16.39



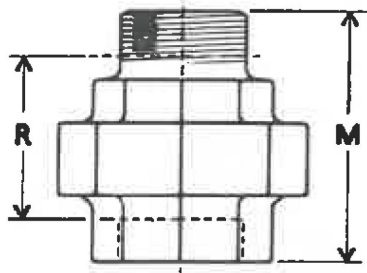
Size		A min. [mm]	B min. [mm]	C min. [mm]	D min. [mm]	Weight [kg/pc]
NPS	DN					
1/8	6	5.5	23.5	32	7.5	-
1/4	8	7.5	34	39.5	11	-
3/8	10	10.5	38	43.5	12	-
1/2	15	13.5	44.5	46	14.5	-
3/4	20	19	54.5	54	16.5	-
1	25	24	63	58.5	19	-
1 1/4	32	32.5	76.5	67.5	21.5	-
1 1/2	40	38	83.5	72.5	22	-
2	50	49	100.5	82	25.5	-
2 1/2	65	59	120	84.5	29.5	-
3	80	73.5	136.5	104	31	-
4	100	97	178	113.5	34	-

Footnotes see page 36

**Union Straight tapered male/female** Class 300

④

According to manufacturer's standard

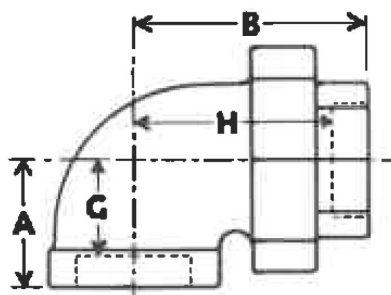


Size		M [mm]	R [mm]	Weight [kg/pc]
NPS	DN			
1/4	8	57.2	38.1	0.14
3/8	10	63.5	44.5	0.23
1/2	15	68.3	42.9	0.32
3/4	20	79.4	50.8	0.54
1	50	85.7	50.8	0.77
1 1/4	32	95.3	60.3	1.18
1 1/2	40	100.0	65.1	1.54
2	50	109.5	71.4	2.27
2 1/2	65	128.6	81.0	3.86
3	80	139.7	88.9	5.44

**Elbow tapered female/female** Class 300

⑥

According to manufacturer's standard

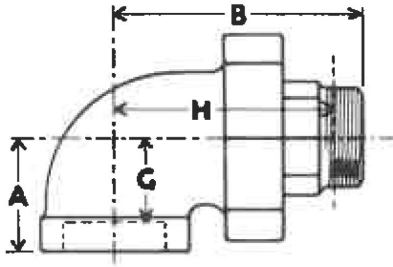


Size		A [mm]	B [mm]	G [mm]	H [mm]	Weight [kg/pc]
NPS	DN					
1/4	8	23.8	65.1	14.3	55.6	0.23
3/8	10	27.0	73.0	17.5	63.5	0.32
1/2	15	31.8	81.0	19.1	68.3	0.45
3/4	20	36.5	95.3	22.2	81.0	0.77
1	50	41.3	104.8	23.8	87.3	1.09
1 1/4	32	49.2	117.5	31.8	100.0	1.77
1 1/2	40	54.0	123.8	36.5	106.4	2.22
2	50	63.5	136.5	44.5	117.5	3.4
2 1/2	65	74.6	163.5	50.8	139.7	5.9
3	80	85.7	182.6	60.3	157.2	8.62

**Elbow tapered male/female Class 300**

8

According to manufacturer's standard



Size		A [mm]	B [mm]	G [mm]	H [mm]	Weight [kg/pc]
NPS	DN					
1/4	8	17.5	50.8	14.3	41.3	0.23
3/8	10	27.0	57.2	17.5	47.6	0.27
1/2	15	31.8	61.9	19.1	49.2	0.41
3/4	20	36.5	73.0	22.2	58.7	0.68
1	50	41.3	81.0	23.8	63.5	0.99
1 1/4	32	49.2	93.7	31.8	76.2	1.63
1 1/2	40	54.0	100.0	36.5	82.6	2.04
2	50	63.5	114.3	44.5	95.3	3.13
2 1/2	65	74.6	138.1	50.8	114.3	5.44
3	80	85.7	150.8	60.3	125.4	8.16

	<b>Welding ends</b> with NPT-thread acc. to ASME B1.20.1 Part No. <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">8</td> <td style="text-align: center;">2)</td> <td style="text-align: center;">1)</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">3)</td> </tr> </table>	3	1	8	2)	1)	0	0	3)	Standard  <b>H 318</b>  Page 1 of 2
3	1	8	2)	1)	0	0	3)			

Example of Designation:      Designation of a welding end with nominal diameter 4" and wallthickness s = 6,02 mm (Sched. 40), material: A53 Gr.A

Partnumber **31832A002**      **4" Welding end / NPT-Thread**  
**Sched. 40 / L = 100 H318 / ASME B36.10 A53 Gr.A**

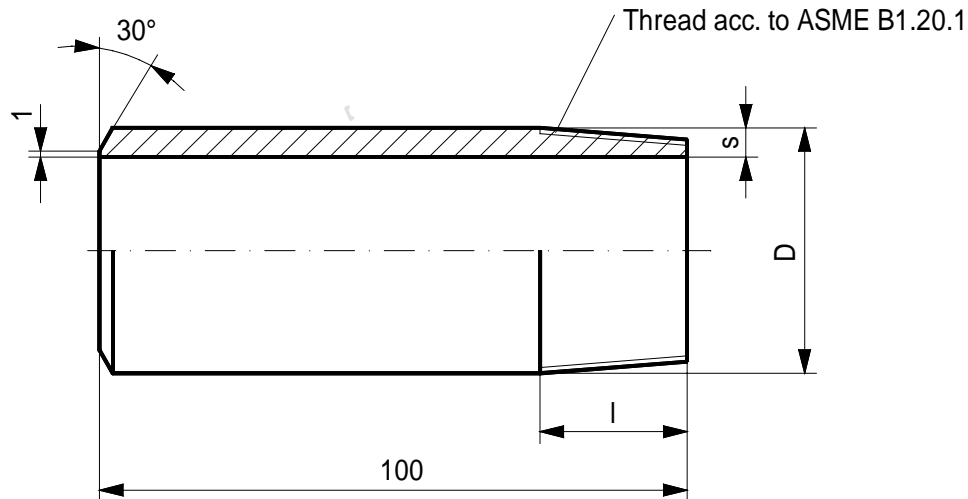
Partnumbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part	Cd.	2)		1)		Wallthick-ness		3)	
		Type	Cd.	Material	Cd.	Cd.	Cd.	Certificate	Cd.
Welding ends with NPT-thread	318	Schedule 40	3	A53 Gr.A	2A	0	0	ASME	2
		Schedule 80	5	A53 Gr.B	2B			4)	
		Schedule 160	9	A106 Gr.A	2C			ASME	H
				A106 Gr.B	2D				
		Schedule 40S	C						
		Schedule 80S	D	A312 Gr.TP304	3D				
				A312 Gr.TP304L	3E				
				A312 Gr.TP316	3G				
				A312 Gr.TP316L	3H				
				A312 Gr.TP321	3J				

- 1) Materials acc. to ASTM - Standards
- 2) Code for type (Schedule)
- 3) Certificate acc. to corresponding ASTM- resp. ASME-Standards
- 4) For welding ends with end coding H a "certified test report" acc. to ASTM A530 shall be provided.

**Welding ends with NPT-thread acc. to ASME B1.20.1**

manufactured of C-Steel-pipe acc. to ASME B36.10

manufactured of SS-pipe acc. to ASME B36.19



Total length **L = 100 mm** for all nominal diameters

Dimensions in mm

Nominal diam. DN		Outside diameter D	l	Wallthickness s for			Weight kg 100 / pieces for		
mm	inch			Schedule 40 / 40S	Schedule 80 / 80S	Schedule 160	Schedule 40 / 40S	Schedule 80 / 80S	Schedule 160
8	1/4	13,7	15	2,24	3,02	-	5,87	7,39	-
10	3/8	17,1	15	2,31	3,20	-	7,85	10,21	-
15	1/2	21,3	20	2,77	3,73	4,78	11,76	15,04	18,03
20	3/4	26,7	20	2,87	3,91	5,56	15,63	20,37	26,78
25	1	33,4	25	3,38	4,55	6,35	23,21	30,03	39,32
32	1 1/4	42,2	25	3,56	4,85	6,38	31,42	41,43	52,05
40	1 1/2	48,3	25	3,68	5,08	7,14	37,57	50,20	67,18
50	2	60,3	25	3,91	5,54	8,74	50,50	69,43	102,92
65	2 1/2	73,0	38	5,16	7,01	9,52	80,09	105,92	138,39
80	3	88,9	38	5,49	7,62	11,13	104,79	141,71	197,98
100	4	114,3	44	6,02	8,56	13,49	149,17	207,10	311,21

## Gauge - Couplings for ASME / SAE- application

Standard

**H347A**

Page 1 of 5

Example of Designation: Designation of a Screw Coupling with NPT-thread, series heavy for tube dash size -4 ( = 1/4 inch NPT ) material : steel, O-Ring NBR

Partnumber  
**347ES1002**     **-4 \* 1/4 inch**     **Screw Coupling NPT-thread Steel / NBR heavy H374A**

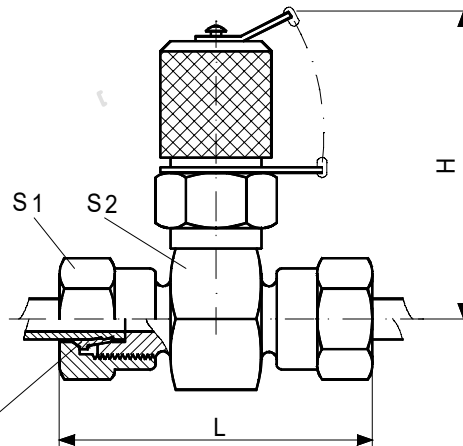
Partnumbering Code										
Position of Part No.										
1.-3.		4.		5.-6		7.-8		9.		
Kind of Part		Type of Fitting		Material		Wallthick-ness		Certificate		
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Code	Code	Code	Code	
Gauge Couplings Series Standard	337	Tee Adaptor MV (Std. or Heavy) 3)	A	Steel nickel plated	5A	0	0	ASME	2	
		Gauge Coupling MAV (Std. or Heavy)	B	Steel	5B					
		Bulkhead Gauge Adaptor with NPT-thread 2)	C	Brass	8V					
		Bulkhead Gauge Adaptor with UNF-thread and sealing shoulder ring 2)	D	Stainless steel	J5	<b>Fittings with Soft sealing and / or welding nipple connection</b>				
		Screw Coupling with NPT-thread 2) 3)	E	Stainless steel Gr. 316	J8					
		Screw Coupling with UNF-thread 2) 3)	F	Steel / NBR (O-ring)	S1					
		Screw Coupling with UNF-thread 2) 3)	F	Steel / FKM (O-ring)	S2					
		Direct Gauge Adaptor with NPT-thread 2)	G	Stainless steel / NBR (O-ring)	S3					
		Direct Gauge Adaptor with UNF-thread and sealing shoulder ring 2)	H	Stainless steel / FKM (O-ring)	S4					
		Pressure Switch Adaptor NPT-thread 2)	J	Steel nickel plated / NBR (O-ring)	S5					
Welding Adaptor NPT-thread 2)	L	Steel nickel plated / FKM (O-ring)	S6							
Welding Adaptor UNF-thread 2)	M									
Gauge Couplings Series Heavy	347									

- 1) Materials acc.to manufacturer's standard
- 2) For this type of fitting the partnumber only comply with heavy series.
- 3) Basically with soft sealings
- 4) Requirements and certificate acc.to ASME - / SAE - Standards

**Tee Adaptor MV** complete with screw coupling: type code **(A)**  
 (Standard or Heavy)

(Details for screw coupling see page 4)

"Mini-Measuring System"

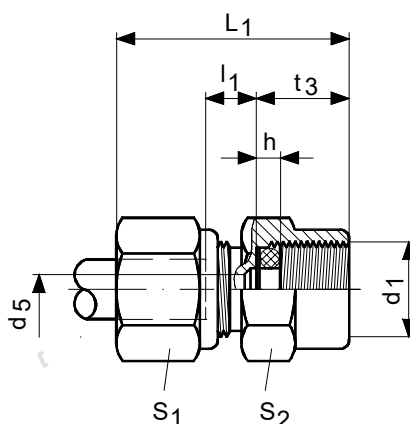


- a) Cutting ring or
- b) Welding nipple connection

Series	Tube Dash Size	Nominal Pressure	L *)	H *)	Width over flats *)		Weight kg / 100 pcs.
					S1	S2	
Standard	-4	3000 lb.	49,5	49	24	14	
	-6		52,5	49	24	19	
	-8		52,5	49	24	22	
	-12		54,5	52	30	27	
	-16		60,5	55	36	36	
	-20		60,5	57,5	41	41	
	-24		68,5	60	46	50	
Heavy	-4	6000 lb.	54,5	49	24	17	
	-6		56,5	49	24	22	
	-8		56,5	49	24	24	
	-12		68,5	55	36	36	
	-16		74,5	57,5	41	46	
	-20		80,5	60	46	50	
	-24		91	64,5	55	60	

\*) Reference values

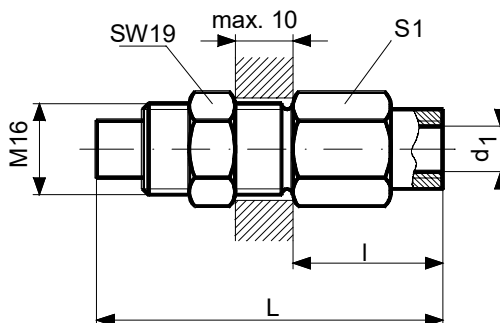
**Gauge Coupling MAV** : type code **(B)**  
(Standard or Heavy)



Series	Tube Dash Size	Nominal Pressure	Connecting thread d1	L1	d5	l1	t3	h	Width over flats		Weight kg / 100 pcs.
									S1	S2	
Standard	- 4	3000 lb.	1/4 NPT	37	2,5	7,5	14,5	4,5	19	14	4,6
	- 5			17		5,3					
	- 6			19		6,2					
	- 8			22		7,0					
Heavy	- 4	6000 lb.	1/4 NPT	48	3,5	11	20	5	27	17	10,5
	- 5			19		10,7					
	- 6			22		12,5					
	- 8			24		13,4					

**Bulkhead Gauge Adaptor** with NPT-thread: type code **(C)**  
with UNF-thread and sealing shoulder ring (metallic): type code **(D)**

"Mini-Measuring System"



Series	Tube Dash Size	Nominal Pressure	Connecting thread d1		L *)	l *)	Width over flats S1 *)	Weight kg / 100 pcs.
			NPT	UNF				
Heavy	- 4	6000 lb.	1/4	7/16	59		19	
	- 8		1/2		65		27	

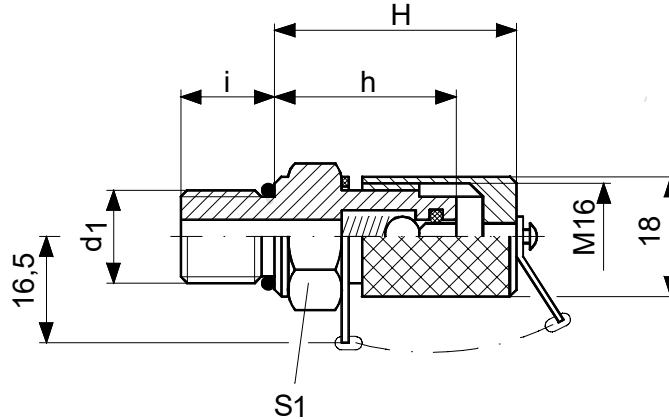
\*) Reference values

**Screw Coupling with protection cap** made of metal with NPT-Stud thread: type code **(E)**

UNF-Stud thread: type code **(F)**

For UNF-thread: Stud and sealing acc. to SAE J514 (ASME B1.1) J1926

"Mini-Measuring System"

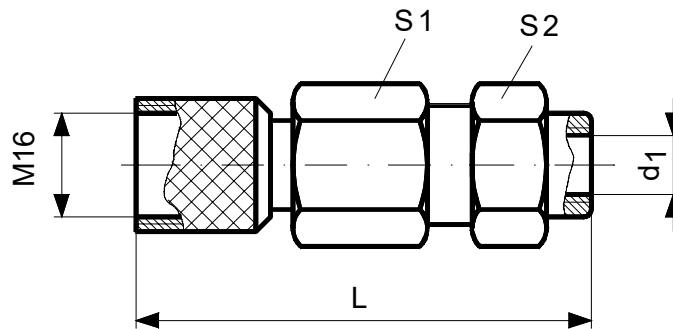


Series	Tube Dash Size	Nominal Pressure	d1 Stud thread			i *)	H *)	h *)	Width *) over flats S1	Weight kg / 100 pcs.
			NPT (ASME B1.20.1)	UNF (ASME B1.1)						
Heavy	- 4	6000 lb.	1/4	7/16	12	38	26	19		

**Direct Gauge Adaptor** with NPT-thread: type code **(G)**

with UNF-thread and sealing shoulder ring (metallic) **(H)**

"Mini-Measuring System"

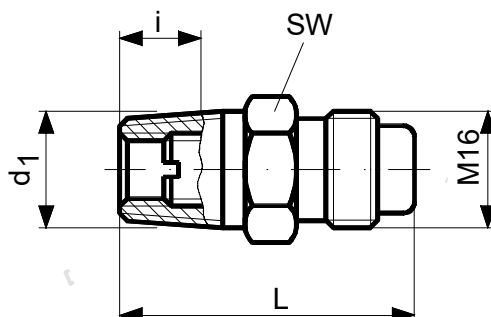


Series	Tube Dash Size	Nominal Pressure	Thread-Connection d1		L *)	Width over flats *)		Weight kg / 100 pcs.
			NPT	UNF		S1	S2	
Heavy	- 4	6000 lb.	1/4	7/16	61	19	19	
	- 8		1/2		67	19	27	

\*) Reference values

**Pressure Switch Adaptor** with NPT-thread: type code **(J)**

"Mini-Measuring System"

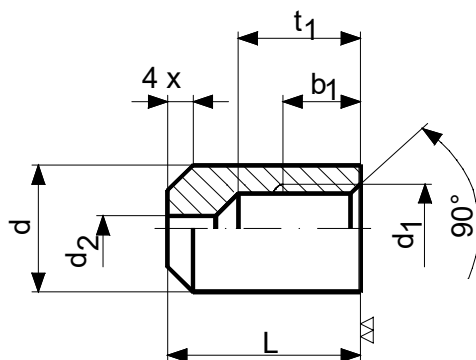


Series	Tube Dash Size	Nominal Pressure	Stud Thread d1	L *)	i *)	SW *)	Weight kg / 100 pcs.
Heavy	- 4	6000 lb.	1/4" NPT	38		17	

**Welding Adaptor** with NPT-thread: type code **(L)**

with UNF-thread: type code **(M)**

"Mini-Measuring System"



Details of tapped acc. to SAE J1926 UNF-

Series	Tube Dash Size	Nominal Pressure	Thread Connection d1		d	d2	L	t1	b1	Weight kg / 100 pcs.
			NPT (ASME B1.20.1)	UNF (ASME B1.1)						
Heavy	- 4	6000 lb.	1/4	7/16	20	3	30	18,5	12	

\*) Reference values

# Quick - Couplings

MIL-C-27487 / ASME-Application

Standard

**H373A**

Page 1 of 5

Example of Designation: Designation of a coupler with internal NPT-thread 2" (Type V)  
 Material: brass, flat ring gasket of NBR

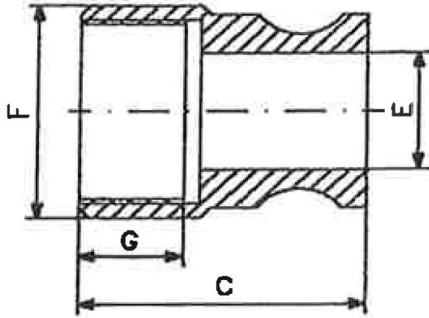
Part number  
**37358V002      2 INCH      QUICK-COUPLING/COUPLER      BRASS (ASTM B36)/NBR**  
**INTERN.NPT-THR. TYPE V H373A/MIL-C-27487/MS27024**

Part numbering Code										
Position of Part No.										
1. - 3.		4.			5. - 6.		7. - 8.		9.	
Kind of part		Type 2)			Material 1)				Certificate 6)	
	Cd.		Cd.		Cd.	Code	Code		Cd.	
Quick-Coupling MIL-C-27487 (CAM-LOCKING Type)	373	Adaptor with internal NPT-thread Type I	1	Bronze	8W	0	0	ASME	2	
		Adaptor with hose shank Type II	2	Brass (ASTM B36)	8V					
				Aluminium	J3					
				Aluminium bronze	J4					
				Adaptor with external NPT-thread Type III	3	Stainless Steel	J5			
						ASTM Gr. 316	J8			
				Coupler with internal NPT-thread 3) Type V	5					
				Coupler with hose shank 3) Type VI	6					
				Coupler with external NPT-thread 3) Type VII	7					
				Cap for Adaptor 3) Type IX	9					
		Plug for Coupler Type X	A							

- 1) Material:  
 Stainless Steel, Aluminium, Bronze, Brass and Aluminium bronze according to manufacturer's standard  
 Flat ring gasket of NBR (Perbuan) according to manufacturer's standard
- 2) Code for type
- 3) Couplers and caps for adaptors will be delivered with flat ring sealing made of NBR.
- 4) Reference values  
 Allowable working pressure shall be specified by manufacturer.
- 5) NPT-thread shall be according to ASME B1.20.1.
- 6) Requirements and certificate according to MIL- / ASTM- / ASME-standard

**Adaptor** with internal NPT-thread  
Type I / MS27020

①



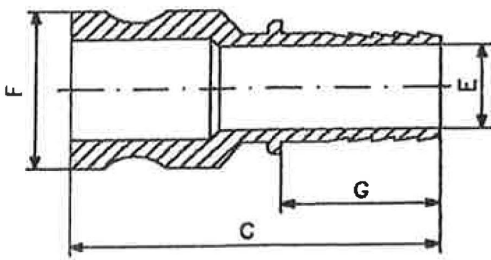
Thread (Shank) 5) [inch]	Size NPS	Working Pressure 4) [bar]					Weight [kg/pc]
			C [mm]	E [mm]	F [mm]	G [mm]	
1/2"	15	20	47	18	30	15	0.14
3/4"	20		50	20	37	15	0.21
1"	25		55	24	44	20	0.29
1 1/4"	32		62	35	57	17	0.49
1 1/2"	40	16	62	36	58	12	0.55
2"	50		76	45.5	72	16	0.90
2 1/2"	65	14	95	58	93	21	1.34
3"	80		95	73	111	25	2.10
4"	100	10	95	95	130	35	3.30

Footnotes see page 1

**Adaptor** with hose shank

②

Type II / MS27021

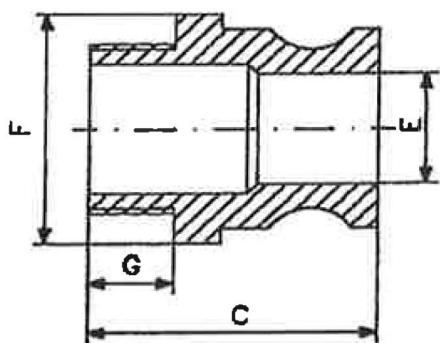


Thread (Shank) 5) [inch]	Size NPS	Working Pressure 4) [bar]					Weight [kg/pc]
			C [mm]	E [mm]	F [mm]	G [mm]	
1/2"	15	20	78	10	24	40	0.11
3/4"	20		85	14	32	45	0.18
1"	25		83	20	37	35	0.21
1 1/4"	32		86	27	45.5	35	0.31
1 1/2"	40	16	95	33.5	53.5	37	0.53
2"	50		103	44	63.3	46	0.67
2 1/2"	65	14	120	58	76	55	1.03
3"	80		138	67.5	91	60	1.85
4"	100	10	180	88	119	110	3.33

Footnotes see page 1

**Adaptor with external NPT-thread**  
Type III / MS27022

3

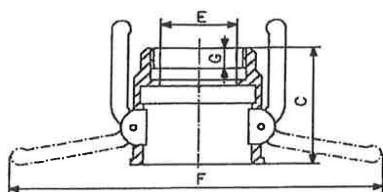


Thread (Shank) 5) [inch]	Size NPS	Working Pressure 4) [bar]					Weight [kg/pc]
			C [mm]	E [mm]	F [mm]	G [mm]	
1/2"	15	20	60	14	30	20	0.13
3/4"	20		65	21	37	20	0.20
1"	25		75	24	46	20	0.25
1 1/4"	32		81	30	51	20	0.38
1 1/2"	40	16	85	38	62	20	0.66
2"	50		90	40	72	20	0.73
2 1/2"	65	14	100	55	88	25	1.20
3"	80		105	70	104	25	1.70
4"	100	10	115	90	131	25	2.60

Footnotes see page 1

**Coupler with internal NPT-thread** 3) 5)  
Type V / MS27024

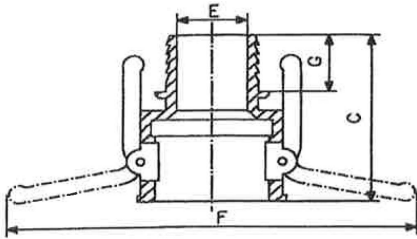
5



Thread (Shank) 5) [inch]	Size NPS	Working Pressure 4) [bar]					Weight [kg/pc]
			C [mm]	E [mm]	F [mm]	G [mm]	
1/2"	15	20	47	18	65	15	0.14
3/4"	20		50	20	110	13	0.21
1"	25		55	25.5	120	10	0.29
1 1/4"	32		62	35	180	12	0.49
1 1/2"	40	16	62	38	185	12	0.55
2"	50		76	50	195	16	0.90
2 1/2"	65	14	95	58	210	31	1.34
3"	80		95	73	225	25	2.20
4"	100	10	95	95	280	41	3.30

Footnotes see page 1

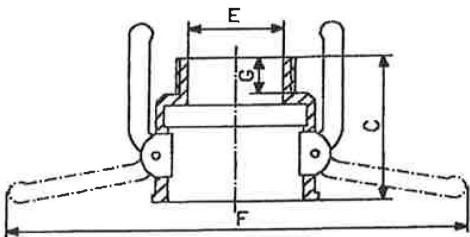
**Coupler with hose shank** 3) **6**  
 Type VI / MS27025



Thread (Shank) 5) [inch]	Size NPS	Working Pressure 4) [bar]					Weight [kg/pc]
			C [mm]	E [mm]	F [mm]	G [mm]	
1/2"	15	20	65	10	70	40	0.15
3/4"	20		71	16	110	30	0.21
1"	25		82	19	120	35	0.34
1 1/4"	32		88	26	180	35	0.55
1 1/2"	40	16	96	33	186	40	0.66
2"	50		110	43	195	46	0.94
2 1/2"	65	14	155	56	210	55	1.60
3"	80		165	63	245	60	1.95
4"	100	10	175	90	275	110	3.50

Footnotes see page 1

**Coupler with external NPT-thread** 3) **7**  
 Type VII / MS27026

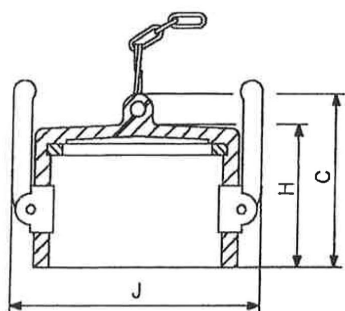


Thread (Shank) 5) [inch]	Size NPS	Working Pressure 4) [bar]					Weight [kg/pc]
			C [mm]	E [mm]	F [mm]	G [mm]	
1/2"	15	20	50	14	65	15	0.14
3/4"	20		55	21	110	13	0.21
1"	25		63	24	120	10	0.35
1 1/4"	32		65	32	180	11	0.49
1 1/2"	40	16	65	38	185	12	0.55
2"	50		80	49	195	16	0.90
2 1/2"	65	14	91	60	210	31	1.34
3"	80		91	75	225	25	1.66
4"	100	10	91	98	280	31	3.30

Footnotes see page 1

**Cap** for Adaptor 3) **9**

Type IX / MS27028

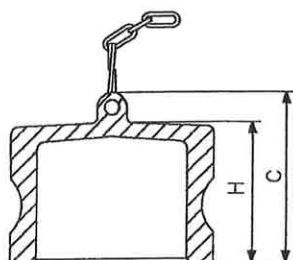


Thread (Shank) 5) [inch]	Size NPS	Working Pressure 4) [bar]				Weight [kg/pc]
			C [mm]	H [mm]	J [mm]	
1/2"	15	17.5	43	33	43	-
3/4"	20		46	37	51	-
1"	25		54	41	62	-
1 1/4"	32		64	51	79	-
1 1/2"	40		64	51	87	-
2"	50	10.5	70	57	97	-
2 1/2"	65		79	62	110	-
3"	80	8.75	79	64	140	-
4"	100		86	67	168	-

Footnotes see page 1

**Plug** for Coupler **A**

Type X / MS27029



Thread (Shank) 5) [inch]	Size NPS	Working Pressure 4) [bar]			Weight [kg/pc]
			C [mm]	H [mm]	
1/2"	15	17.5	36	26	-
3/4"	20		38	29	-
1"	25		49	37	-
1 1/4"	32		56	43	-
1 1/2"	40		57	44	-
2"	50	10.5	62	49	-
2 1/2"	65		71	54	-
3"	80	8.75	70	54	-
4"	100		76	57	-

Footnotes see page 1

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Plugs, Caps – ASME B16.11	12-13
Unions – BS 3799	14-15
Swage nipples – BS 3799	16-17
Hexagonal nipples – BS 3799	
Hexagon Head Bushing – ASME B16.11	18-20
Round nipples – BS 3799	21-22

Table 1:  
Correlation of Fittings Class with Schedule Number or Wall Designation  
of Pipe for Calculation of Ratings.

Pressure Class Designation of Fitting	Pipe used for Rating Basis	
	Schedule	Wall Designation
class 2000	80	XS
class 3000	160	-
class 6000	-	XXS

Table 2:  
Common dimensions for all fittings  
Thread type: NPT according to ASME B2.1

Nominal diameter DN Inch	Wall thickness G			Thread	
	Class 2000 mm	Class 3000 mm	Class 6000 mm	B mm	L <sub>2</sub> mm
1/8"	3.18	3.18	6.35	6.4	6.7
1/4"	3.18	3.30	6.60	8.1	10.2
3/8"	3.18	3.51	6.98	9.1	10.4
1/2"	3.18	4.09	8.15	10.9	13.6
3/4"	3.18	4.32	8.53	12.7	13.9
1"	3.68	4.98	9.93	14.7	17.3
1 1/4"	3.89	5.28	10.59	17.0	18.0
1 1/2"	4.01	5.56	11.07	17.8	18.4
2"	4.27	7.14	12.09	19.1	19.2
2 1/2"	5.61	7.65	15.29	23.6	28.9
3"	5.99	8.84	16.64	25.9	30.5
4"	6.55	11.18	18.67	27.7	33.0

# Threaded Forged Steel Fittings

## Elbows / ASME B16.11

**H380**

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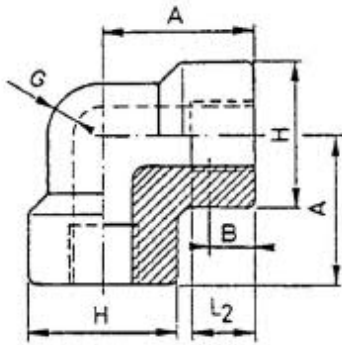
Example of designation: Designation of a street elbow 90°, class 3000 for nominal diameter 2"  
Material: A350 Gr.LF2

Part number **38185X002**    **2 INCH**    **STREET ELBOW 90DEGR.**    **ASTM A350 GR.LF2**  
**CLASS 3000 H380**

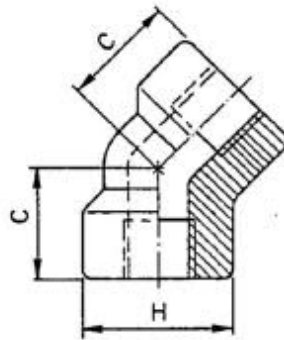
Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Fitting type 2)		Material 1)				Certificate 4)	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.
Threaded Steel Fittings Elbows	381	90° - class 2000	1	A105 galvanized	5A	0	0	ASME	2
		90° - class 3000	2	A105	5B			ASME	H
		90° - class 6000	3	A182 Gr. F5	5F				
		45° - class 2000	4	A182 Gr. F304	5M				
		45° - class 3000	5	A182 Gr. F316	5P				
		45° - class 6000	6	A182 Gr. F321	5Q				
		Street elbow 90° class 2000 3)	7	A350 Gr. LF2	5X				
				B111/C71640	8N				
		Street elbow 90° class 3000 3)	8	A182 Gr. F304L	F4				
				A182 Gr. F316L	F6				
Street elbow 90° class 6000 3)	9								

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Street elbows are not covered by ASME B16.11.
- 4) Requirements and certificate according to ASTM- / ASME-standards.

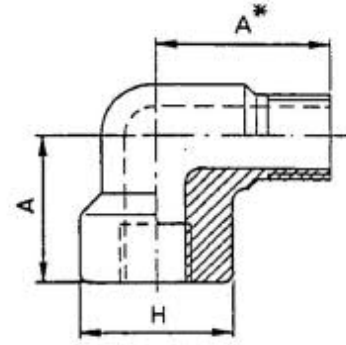
**Elbow 90°**



**Elbow 45°**



**Street elbow 90°**



Nominal diameter DN inch	A			C			H			A*		
	Class 2000 mm	Class 3000 mm	Class 6000 mm	Class 2000 mm	Class 3000 mm	Class 6000 mm	Class 2000 mm	Class 3000 mm	Class 6000 Mm	Class 2000 mm	Class 3000 mm	Class 6000 mm
1/8"	21	21	25	17	17	19	22	22	25	25.4	25.4	31.8
1/4"	21	25	28	17	19	22	22	25	33	26.5	26.5	32
3/8"	25	28	33	19	22	25	25	33	38	32	32	35.5
1/2"	28	33	38	22	25	28	33	38	46	35.5	35.5	41
3/4"	33	38	44	25	28	33	38	46	56	41	41	50
1"	38	44	51	28	33	35	46	56	62	50	50	61
1 1/4"	44	51	60	33	35	43	56	62	75	61	61	70
1 1/2"	51	60	64	35	43	44	62	75	84	70	70	82.5
2"	60	64	83	43	44	52	75	84	102	82.5	82.5	110
2 1/2"	76	83	95	52	52	64	92	102	121	-	-	-
3"	86	95	106	64	64	79	109	121	146	-	-	-
4"	106	114	114	79	79	79	146	152	152	-	-	-

Nominal diameter DN inch	Weight in kg/piece					
	Elbow 90°		Elbow 45°		Street Elbow 90°	
	Class 3000	Class 6000	Class 3000	Class 6000	Class 3000	Class 6000
1/8"	0.136	0.136	0.09	0.136	0.09	0.136
1/4"	0.115	0.3	0.25	0.25	0.14	0.325
3/8"	0.235	0.4	0.225	0.35	0.27	0.44
1/2"	0.39	0.675	0.305	0.6	0.46	0.78
3/4"	0.57	1.125	0.49	1.0	0.67	1.235
1"	0.99	1.585	0.84	1.36	1.18	1.905
1 1/4"	1.25	2.6	1.020	2.09	1.52	3.09
1 1/2"	2.13	4.1	1.7	3.6	2.45	4.77
2"	3.3	7.13	2.56	7.7	3.86	-
2 1/2"	5.35	9.4	7.0	7.0	-	-
3"	8.0	18.0	6.0	14.3	-	-
4"	13.5	15.8	11.3	11.8	-	-

# Threaded Forged Steel Fittings

## Branches / ASME B16.11

**H380**

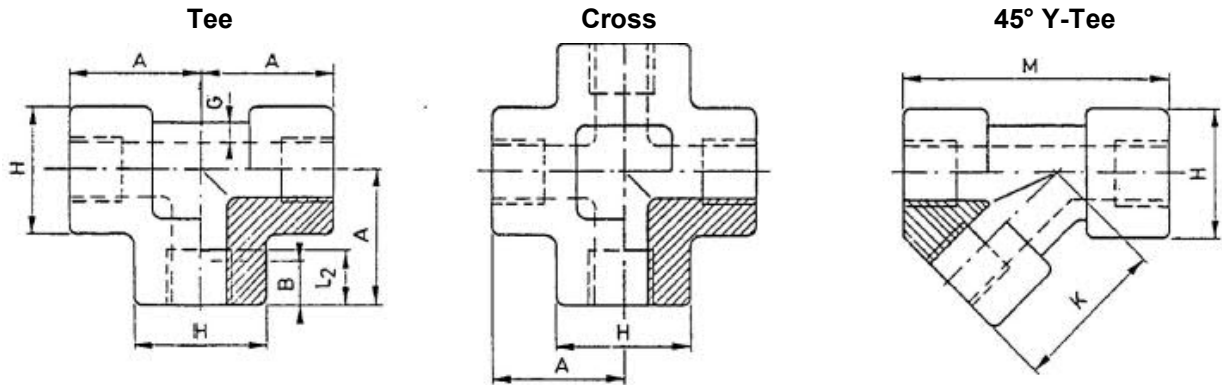
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Example of designation: Designation of a threaded reducing tee, class 6000 for run nominal diameter 1" and branch nominal diameter 1/2", material: A182 Gr.F316

Part number **38335P002**      **1 \* 1/2 INCH**      **THREADED TEE**      **ASTM A182 GR.F316**  
**CLASS 6000 H380/ASME B16.11**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Fitting type 2)		Material 1)				Certificate 4)	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.
Threaded Steel Fittings Branches	383	Tee - class 2000 equal or reducing	1	A105 galvanized	5A	0	0	ASME	2
		Tee - class 3000 equal or reducing	2	A105	5B			ASME	H
	Tee - class 6000 equal or reducing	3	A182 Gr. F5	5F					
	Tee - class 6000 equal or reducing	3	A182 Gr. F304	5M					
	Tee - class 6000 equal or reducing	3	A182 Gr. F316	5P					
	Tee - class 6000 equal or reducing	3	A182 Gr. F321	5Q					
	Cross - class 2000	4	A350 Gr. LF2	5X					
	Cross - class 3000	5	B111/C71640	8N					
	Cross - class 6000	6	A182 Gr. F304L	F4					
	45° Y-Tee - class 2000 3)	7	A182 Gr. F316L	F6					
	45° Y-Tee - class 3000 3)	8							
	45° Y-Tee - class 6000 3)	9							
	Couplet - class 3000	A							
	Couplet - class 6000	B							
Boss - class 3000	C								
Boss - class 6000	D								

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) 45° Y-Tees are not covered by ASME B16.11.
- 4) Requirements and certificate according to ASTM- / ASME-standards

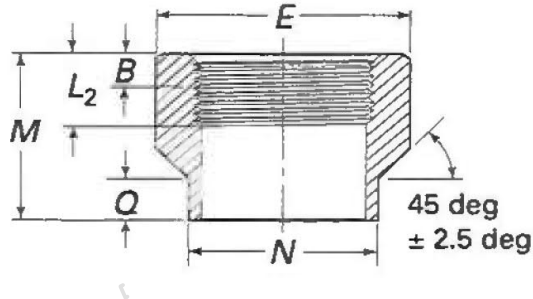


Nominal diameter DN inch	A			H			M			K	
	Class 2000 mm	Class 3000 mm	Class 6000 mm	Class 2000 mm	Class 3000 mm	Class 6000 mm	Class 2000 mm	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm
1/8"	21	21	25	22	22	25	-	-	-	-	-
1/4"	21	25	28	22	25	33	63.5	63.5	63.5	44.5	44.5
3/8"	25	28	33	25	33	38	63.5	63.5	63.5	44.5	44.5
1/2"	28	33	38	33	38	46	63.5	63.5	76.2	44.5	54.0
3/4"	33	38	44	38	46	56	76.2	76.2	88.9	54.0	63.5
1"	38	44	51	46	56	62	88.9	88.9	101.6	63.5	71.4
1 1/4"	44	51	60	56	62	75	101.6	101.6	114.3	71.4	81.0
1 1/2"	51	60	64	62	75	84	114.3	114.3	152.4	81.0	111.1
2"	60	64	83	75	84	102	152.4	152.4	190.5	111.1	135.0
2 1/2"	76	83	95	92	102	121	190.5	190.5	-	135.0	-
3"	86	95	106	109	121	146	-	-	-	-	-
4"	106	114	114	146	152	152	-	-	-	-	-

Nominal diameter DN inch	Weight in kg/piece					
	Tee		Cross		45° Y-Tee	
	Class 3000	Class 6000	Class 3000	Class 6000	Class 3000	Class 6000
1/8"	0.13	0.20	0.26	0.22	-	-
1/4"	0.17	0.38	0.22	0.47	0.50	0.59
3/8"	0.32	0.59	0.40	0.67	0.48	0.53
1/2"	0.52	0.96	0.63	1.12	0.42	0.83
3/4"	0.73	1.5	0.93	1.9	0.68	1.86
1"	1.26	2.05	1.47	2.9	1.19	1.92
1 1/4"	1.64	3.3	1.77	4.2	1.33	2.55
1 1/2"	2.81	5.3	3.42	6.35	2.04	5.37
2"	4.0	9.3	5.0	9.8	3.74	13.15
2 1/2"	6.15	14.0	7.32	16.0	9.8	-
3"	10.5	20.0	11.2	32.6	-	-
4"	16.5	16.7	19.0	28.1	-	-

Dimensions B, L2, G see page 2.

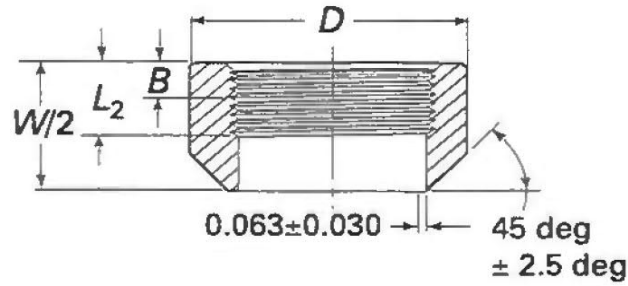
Couplet



Nom. Diam.											Weight	
											kg/100 pieces for	
	DN inch	M		N		Q		E		Class 3000	Class 6000	
mm		Tol. mm	mm	Tol. mm	mm	Tol. mm	mm	Tol. mm	mm			Tol. mm
1/4"	30.2	0.8	17.5	1.5	9.5	0.8	23.8	1.5	25.4	1.5	7.0	8.0
3/8"	30.2	0.8	20.7	1.5	9.5	0.8	27.0	1.5	31.8	1.5	8.0	12.0
1/2"	33.4	0.8	23.8	1.5	9.5	0.8	33.4	1.5	38.1	1.5	11.0	18.0
3/4"	34.9	0.8	27.0	1.5	9.5	0.8	38.1	1.5	44.5	1.5	14.0	23.0
1"	42.9	0.8	33.4	1.5	9.5	0.8	46.1	1.5	57.2	1.5	27.0	59.0
1 1/4"	47.6	0.8	42.9	1.5	9.5	0.8	55.6	1.5	63.5	1.5	41.0	66.0
1 1/2"	50.8	0.8	49.2	1.5	9.5	0.8	63.5	1.5	76.2	1.5	57.0	98.0
2"	57.2	1.5	61.9	1.5	9.5	0.8	79.4	1.5	79.4	1.5	94.0	163
2 1/2"	63.5	1.5	73.0	1.5	9.5	0.8	92.1	1.5	92.1	1.5	137	239
3"	69.9	1.5	88.9	1.5	9.5	0.8	111.1	1.5	111.1	1.5	213	362
4"	76.2	1.5	114.3	1.5	9.5	0.8	141.3	1.5	141.3	1.5	354	594

Further dimensions see page 2.

**Boss**



Nom. Diam.	Weight				
	W/2	D		kg/100 pieces for	
DN inch	min. mm	Class 3000 mm	Class 6000 mm	Class 3000	Class 6000
1/8	16.0	16	22	2.0	4.0
1/4"	17.5	19	25	3.0	4.0
3/8"	19.0	22	32	4.0	7.0
1/2"	24.0	28	38	7.0	14.0
3/4"	25.5	35	44	11.0	18.0
1"	30.0	44	57	20.0	34.0
1 1/4"	33.5	57	64	37.0	47.0
1 1/2"	39.5	64	76	51.0	76.0
2"	43.0	76	92	73.0	116
2 1/2"	46.0	92	108	102	158
3"	54.0	108	127	152	248
4"	60.5	140	159	202	421

Further dimensions see page 2.

# Threaded Forged Steel Fittings Couplings / ASME B16.11

**H380**

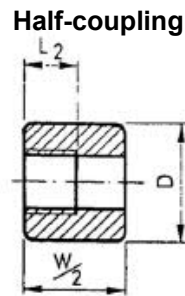
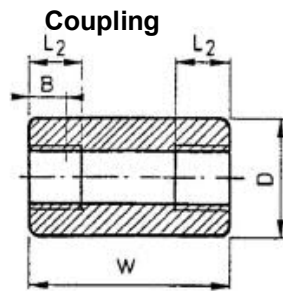
Page 9 of 22

Example of designation: Designation of a threaded coupling, class 6000 for nominal diameter 1 1/4" material: A182 Gr.F304

Part number **38435M002**    **1 \* 1/4 INCH**    **THREADED HALF-COUPLING**    **ASTM A182 GR.F304**  
**CLASS 6000 H380/ASME B16.11**

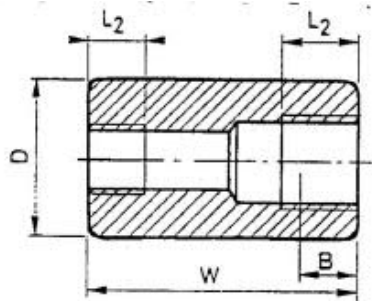
Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Fitting type 2)		Material 1)				Certificate 4)	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.
Threaded Steel Fittings Couplings	384	Coupling - class 3000	0	A105 galvanized	5A	0	0	ASME	2
		Coupling - class 6000	1	A105	5B			ASME	H
		Half-coupling class 3000	2	A182 Gr. F5	5F				
				A182 Gr. F304	5M				
		Half-coupling class 6000	3	A182 Gr. F316	5P				
				A182 Gr. F321	5Q				
		Reducing coupling class 3000 3)	4	A350 Gr. LF2	5X				
				B111/C71640	8N				
				A182 Gr. F304L	F4				
		Reducer inserts class 3000	6	A182 Gr. F316L	F6				

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Reducing coupling and reducer inserts are not covered by ASME B16.11.
- 4) Requirements and certificate according to ASTM- / ASME-standards.

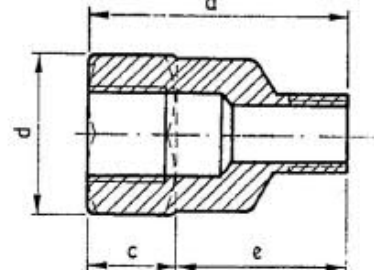


Nominal diameter DN	W Class 3000 and Class 6000	D		Weight in kg/piece			
		Class 3000	Class 6000	Coupling		Half-Coupling	
				Class 3000	Class 6000	Class 3000	Class 6000
inch	mm	mm	mm	Class 3000	Class 6000	Class 3000	Class 6000
1/8"	32	16	22	0.05	0.05	0.05	0.05
1/4"	35	19	25	0.05	0.11	0.03	0.06
3/8"	38	22	32	0.06	0.18	0.03	0.09
1/2"	48	28	38	0.14	0.32	0.07	0.16
3/4"	51	35	44	0.22	0.45	0.10	0.22
1"	60	44	57	0.42	0.90	0.21	0.45
1 1/4"	67	57	64	0.72	1.10	0.37	0.52
1 1/2"	79	64	76	1.07	1.85	0.52	0.95
2"	86	76	92	1.40	2.80	0.69	1.40
2 1/2"	92	92	108	2.50	4.10	1.15	2.00
3"	108	108	127	3.70	6.40	1.60	3.00
4"	121	140	159	6.50	10.70	3.20	5.20

**Reducing coupling**



**Reducer inserts  
female > male**



Nominal diameter DN		W Class 3000 mm	D Class 3000 mm	a mm	d mm	c mm	e mm	Weight in kg/piece	
inch	inch							Reducing coupling Class 3000	Reducer inserts Class 3000
3/8"	1/4"	38	22	38	22	14	24	0.07	0.09
1/2"	3/8"	47.5	28.5	46	29	16	30	0.15	0.14
	1/4"	47.5	28.5	46	29	16	30	0.19	0.12
3/4"	1/2"	51	35	50	35	19	31	0.24	0.16
	1/4"	51	35	47	25	16	31	0.29	0.15
1"	3/4"	60.5	44.5	60	46	22	38	0.50	0.34
	1/2"	60.5	44.5	60	46	22	38	0.54	0.33
	1/4"	60.5	44.5	61	46	22	39	0.58	0.31
1 1/4"	1"	66.5	57	68.5	54	25	43.5	0.83	0.47
1 1/2"	1"	79.5	63.5	71	63	25	46	1.28	0.56
	3/4"	79.5	63.5	68	63	25	43	1.37	0.55
	1/2"	79.5	63.5	68	63	25	43	1.49	0.54
2"	1 1/2"	85.5	76	74	77	31	43	1.61	1.00
	1"	85.5	76	74	77	31	43	1.93	0.95
2 1/2"	2"	92	92	115	94	50	65	2.77	2.35
3"	2"	108	108	110	116	40	70	5.08	4.85
4"	3"	120	140	129	146	50	79	8.23	8.00
	2"	120	140	120	146	45	75	9.62	6.35

Dimensions B and  $L_2$  see page 2.

**Threaded Forged Steel Fittings  
Plugs, Caps / ASME B16.11**

Example of designation:

Designation of a threaded cap, class 6000 for nominal diameter 1 1/2" material: A350 Gr.LF2

Part number

**38525X002**

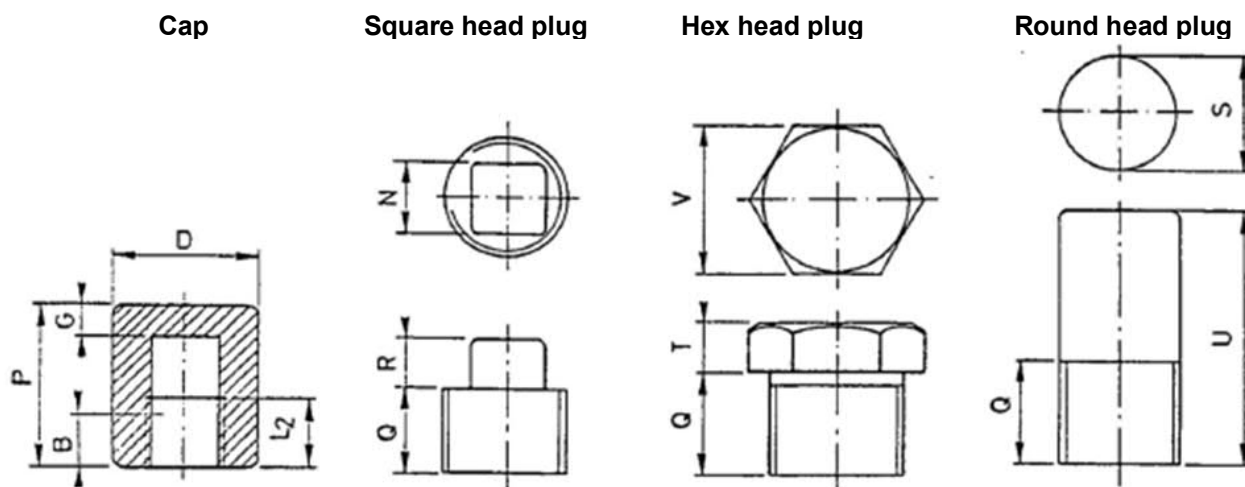
**1 1/2 INCH**

**THREAD. SQUARE HEAD PLUG  
H380/ASME B16.11**

**ASTM A350 GR.LF2**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Fittingtype 2)		Material 1)				Certificate 3)	
	Cd.		Cd.		Cd.	Cd.	Cd.		Cd.
Threaded Steel Fittings Plugs, Caps	385	Cap - class 3000	0	A105 galvanized	5A	0	0	ASME	2
		Cap - class 6000	1	A105	5B			ASME	H
		Square head plug	2	A182 Gr. F5	5F				
		Hex head plug	3	A182 Gr. F304	5M				
		Round head plug	4	A182 Gr. F316	5P				
				A182 Gr. F321	5Q				
				A350 Gr. LF2	5X				
				B111/C71640	8N				
				A182 Gr. F304L	F4				
				A182 Gr. F316L	F6				

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Requirements and certificate according to ASTM- / ASME-standards.



Nominal diameter DN inch	D		P		Q mm	R mm	N mm	T mm	V mm	U mm	S mm
	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm							
1/8"	16	22	19	22	10	6	7.15	6	11.11	35	10
1/4"	19	25	25	27	11	6	9.55	6	15.88	41	14
3/8"	22	32	25	27	13	8	11.11	8	17.46	41	18
1/2"	28	38	32	33	14	10	14.29	8	22.23	44	21
3/4"	35	44	37	38	16	11	15.88	10	26.99	44	27
1"	44	57	41	43	19	13	20.64	10	34.99	51	33
1 1/4"	57	64	44	46	21	14	23.81	14	44.45	51	43
1 1/2"	64	76	44	48	21	16	28.58	16	50.80	51	48
2"	76	92	48	51	22	18	33.27	18	63.50	64	60
2 1/2"	92	108	60	64	27	19	38.10	19	76.20	70	73
3"	108	127	65	68	28	21	42.86	21	88.90	70	89
4"	140	159	68	75	32	25	63.50	25	117.48	76	114

Nominal Diameter DN inch	Weight in kg/piece				
	Cap		Square head	Hexagon head	Round head
Class 3000	Class 6000				
1/8"	0.05	0.05	0.05	0.05	0.05
1/4"	0.05	0.09	0.05	0.03	0.05
3/8"	0.08	0.14	0.05	0.04	0.09
1/2"	0.12	0.25	0.05	0.07	0.14
3/4"	0.20	0.36	0.14	0.14	0.18
1"	0.31	0.70	0.18	0.21	0.36
1 1/4"	0.60	0.80	0.27	0.42	0.54
1 1/2"	0.73	1.40	0.41	0.58	0.73
2"	1.05	2.30	0.64	1.00	1.36
2 1/2"	3.35	4.90	1.13	1.85	2.27
3"	5.30	8.10	1.63	3.00	3.40
4"	10.20	13.40	3.90	6.00	5.94

Dimensions B, L<sub>2</sub> and G see Page 2.

**Threaded Forged Steel Fittings**

**Unions / BS 3799**

Example of designation:

Designation of a threaded union female/female, class 6000 for nominal diameter 3/4" material: A182 Gr.F304

Part number  
**38635M002**

**3/4 INCH**

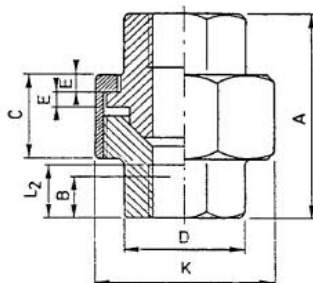
**UNION FEMALE/FEMALE  
CL.6000 H380/BS3799**

**ASTM A182 GR.304**

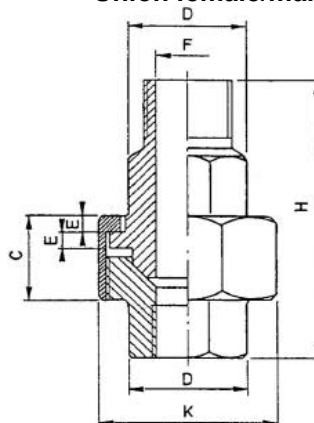
Part numbering Code											
Position of Part No.											
1. - 3.		4.		5. - 6.		7. - 8.		9.			
Kind of Part		Fitting type 2)		Material 1)				Certificate 4)			
	Cd.		Cd.		Cd.	Cd.	Cd.		Cd.		
Threaded Steel Fittings Unions	386	Female/female class 3000 3)	2	A105 galvanized	5A	0	0	ASME	2		
				A105	5B			ASME	H		
		Female/female class 6000	3	A182 Gr. F5	5F						
				A182 Gr. F304	5M						
		Female/male class 3000	4	A182 Gr. F316	5P						
				A182 Gr. F321	5Q						
		Female/male class 6000	5	A350 Gr. LF2	5X						
				B111/C71640	8N						
				A105/Bronze-TRIM	8U						
				A182 Gr. F304L	F4						
				A182 Gr. F316L	F6						

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Only Unions female / female are covered by BS 3799.
- 4) Requirements and certificate according to ASTM- / ASME-standards.

Union female/female



Union female/male



Nominal diameter DN inch	A		K		D		H		C	E	F
	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 6000 mm	Class 3000 mm	Class 3000 mm	Class 3000 mm
1/8"	40	54	32	46	17	30	-	-	16	3.2	-
1/4"	43	54	32	46	19	30	63	72.5	18	3.2	7.5
3/8"	48	57	36	51	22	36	69	77	19	3.2	11
1/2"	51	69	43	60	30	43	77	94.5	21	4	14
3/4"	57	72	50	72	36	52	80	98.5	24	4.8	19
1"	64	80	60	80	41	59	97	108	25	4.8	24.5
1 1/4"	70	89	70	94	50	74.5	101	120	29	5.6	32.5
1 1/2"	79	108	78	100	60	77	110	138	30	5.6	38
2"	89	114	95	122	70	90	120	146	37	6.4	49
2 1/2"	118	130	125	144	85	109	-	-	48	9.6	-
3"	121	150	140	180	100	140	-	-	51	12.7	-
4" *)	150	-	180	-	137	-	-	-	-	-	-

Nominal diameter DN inch	Weight in kg/piece			
	Union female/female		Union female/male	
	Class 3000	Class 6000	Class 3000	Class 6000
1/8"	0.14	0.45	-	-
1/4"	0.14	0.45	0.18	0.43
3/8"	0.20	0.60	0.25	0.65
1/2"	0.35	0.85	0.45	1.10
3/4"	0.43	1.40	0.55	1.45
1"	0.65	1.75	0.85	2.15
1 1/4"	0.98	3.00	1.25	3.40
1 1/2"	1.26	4.00	1.70	4.15
2"	2.01	6.10	2.60	5.80
2 1/2"	5.50	9.40	-	-
3"	8.00	15.50	-	-
4" *)	12.80	-	-	-

\*) Not covered by BS 3799

**Threaded Forged Steel Fittings**

**Swage nipples / BS 3799**

Example of designation:

Designation of a swage nipple, eccentric, class 3000, plain ends, for nominal diameter 3/4" material: A105

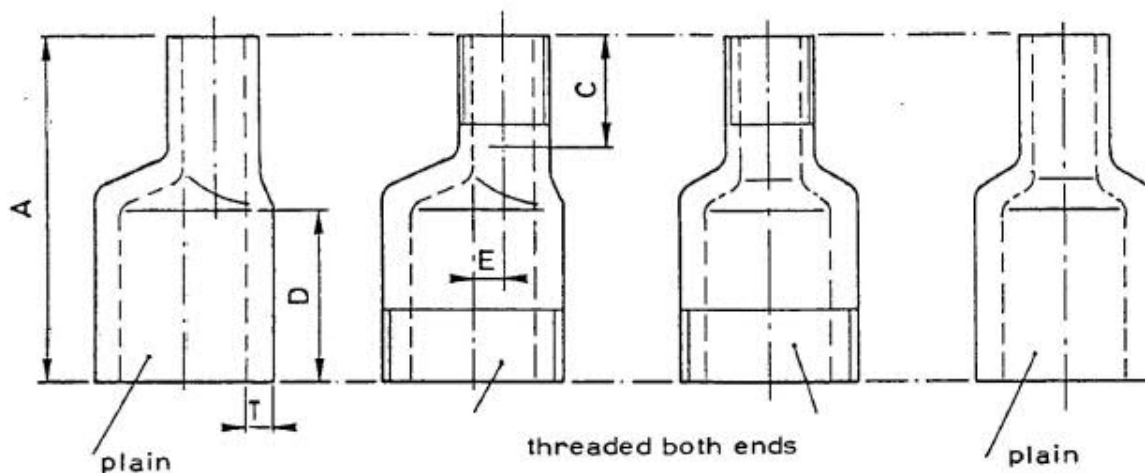
Part number  
**38735B002**

**3/4 INCH SWAGE NIPPLE ECCENTRIC ASTM A105  
PLAIN END CL.3000 H380/BS3799**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Fitting type 2)		Material 1)				Certificate 3)	
Cd.		Cd.		Cd.		Cd.	Cd.		Cd.
Threaded Steel Fittings Swage nipples	387	Concentric class 3000 Plain ends	1	A105 galvanized	5A	0	0	ASME	2
				A105	5B			ASME	H
		Concentric class 6000 Plain ends	2	A182 Gr. F5	5F				
				A182 Gr. F304	5M				
		Eccentric class 3000 Plain ends	3	A182 Gr. F316	5P				
				A182 Gr. F321	5Q				
		Eccentric class 6000 Plain ends	4	A350 Gr. LF2	5X				
				B111/C71640	8N				
		Concentric class 3000 Threaded both ends	5	A182 Gr. F304L	F4				
				A182 Gr. F316L	F6				
		Concentric class 6000 Threaded both ends	6						
		Eccentric class 3000 Threaded both ends	7						
		Eccentric class 6000 Threaded both ends	8						

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Requirements and certificate according to ASTM- / ASME-standards.

Swage nipples



Nominal diameter		A	D	C	E		Plain or threaded Class 3000 mm	T		Weight in kg/piece	
DN inch	DN inch				Class 3000 mm	Class 6000 mm		plain Class 6000 mm	threaded Class 6000 mm	Class 3000	Class 6000
3/8"	1/4"	76	48	16	1.6	1.6	Schedule 80	Schedule 160	Double extra strong	0.06	0.07
1/2"	3/8"	89	56	19	1.6	1.6				0.08	0.11
	1/4"	89	56	19	3.2	3.2				0.08	0.10
3/4"	1/2"	95	57	22	2.4	2.4				0.14	0.22
	3/8"	95	57	22	4.0	3.0				-	-
1"	3/4"	102	64	22	2.8	2.0				0.24	0.39
	1/2"	102	64	22	5.2	4.4				0.22	0.36
1 1/4"	1" *)	90								0.39	0.63
1 1/2"	1"	114	70	25	6.7	6.4				0.53	0.83
	3/4"	114	70	25	9.5	8.3				0.54	0.81
	1/2"	114	70	25	11.9	10.7				0.48	0.72
2"	1 1/2"	165	108	29	5.6	5.2				0.82	1.31
	1"	165	108	29	12.7	11.5				0.78	1.18
	3/4"	165	108	29	15.5	13.5				-	-
	1/2"	165	108	29	17.5	15.9				-	-
2 1/2"	2"	178	114	32	4.8	3.2				1.23	2.10
	1 1/2"	178	114	32	10.3	8.3				-	-
3"	2 1/2"	203	133	41	7.1	6.7				-	-
	2"	203	133	41	11.9	9.9				2.08	3.40
	1 1/2"	203	133	41	17.5	15.5				-	-
4"	3"	229	140	48	11.9	10.7				4.52	7.64
	2 1/2"	229	140	48	19.1	17.5				-	-
	2" *)	229	140	48	22.4	19.4				4.35	7.25

\*) Not covered by BS 3799

**Threaded Forged Steel Fittings  
Hexagon nipples – BS 3799 /  
Hexagon head bushing ASME B16.11**

Example of designation:

Designation of threaded hexagon nipple, class 3000, for nominal diameter 3/4" material: A105 galvanized

Part number  
**38815A002**

**3/4 INCH**

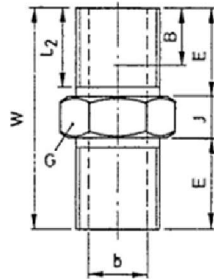
**HEXAGON NIPPLE  
CL.3000 H380/BS3799**

**ASTM A105 GALVANIZED**

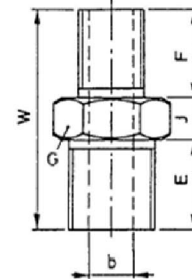
Part numbering Code												
Position of Part No.												
1. - 3.		4.		5. - 6.		7. - 8.		9.				
Kind of Part		Fitting type 2)		Material 1)				Certificate 3)				
Cd.		Cd.		Cd.		Cd.	Cd.		Cd.			
Threaded Steel Fittings Hexagon nipples	388	Hexagon Nipple Class 3000	1	A105 galvanized	5A	0	0	ASME	2			
				A105	5B			ASME	H			
			Hexagon Nipple Class 6000	2	A182 Gr. F5	5F						
					A182 Gr. F304	5M						
			Hexagon nipple reduced Class 3000	3							A182 Gr. F316	5P
											A182 Gr. F321	5Q
											A350 Gr. LF2	5X
											B111/C71640	8N
			Hexagon nipple reduced Class 6000	4							A182 Gr. F304L	F4
											A182 Gr. F316L	F6
			Hexagon head bushing Class 3000	5								
			Hexagon head bushing Class 6000	6								

- 1) Materials:  
All materials correspond with specified ASTM-standards.
  - 2) Code for fitting type.
  - 3) Requirements and certificate according to ASTM- / ASME-standards
- For threaded male/female reducing fittings see also group 384 (couplings).

Hexagon nipple



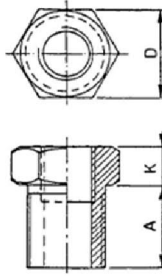
Hexagon nipple reducing



Nominal diameter		W	E	F	J	G	b		Weight in kg/piece			
DN inch	DN inch						Hexagon nipple		Hex. nipple reduced			
							Class 3000	Class 6000	Class 3000	Class 6000		
1/8"	1/8"	26	10	-	6	11	5	2	0.03	0.03	-	-
1/4"	1/4"	36	15	-	6	15	8	6	0.03	0.03	-	-
	1/8"	31	15	10	6	15	5	2	-	-	0.03	0.04
3/8"	3/8"	40	16	-	8	18	11	8	0.04	0.05	-	-
	1/4"	39	16	15	8	18	8	6	-	-	0.05	0.06
1/2"	1/2"	48	20	-	8	22	14	11	0.07	0.11	-	-
	3/8"	44	20	16	8	22	11	8	-	-	0.08	0.10
	1/4"	43	20	15	8	22	8	6	-	-	0.08	0.11
3/4"	3/4"	52	21	-	10	27	19	13	0.10	0.16	-	-
	1/2"	50	21	20	9	27	14	11	-	-	0.10	0.15
	3/8"	46	21	16	9	27	11	8	-	-	0.11	0.13
1"	1"	60	25	-	10	35	24	17	0.19	0.32	-	-
	3/4"	56	25	21	10	35	19	13	-	-	0.20	0.30
	1/2"	55	25	20	10	35	14	11	-	-	0.21	0.29
	1/4" *)	55	25	20	10	35	-	-	-	-	0.21	0.25
1 1/4"	1 1/4" *)	72	-	-	-	46	32.5	23	0.27	0.49	-	-
	1" *)	71	-	-	-	46	-	-	-	-	0.40	0.58
1 1/2"	1 1/2"	68	26	-	16	50	38	30	0.33	0.67	-	-
	1"	67	26	25	16	50	24	17	-	-	0.60	0.74
	3/4"	63	26	21	16	50	19	13	-	-	0.65	0.74
	1/2"	62	26	20	16	50	14	11	-	-	0.65	0.77
2"	2"	71	27	-	17	62	49	39	0.56	0.95	-	-
	1 1/2"	70	27	26	17	62	38	30	-	-	0.85	1.10
	1"	70	27	25	18	62	24	17	-	-	1.00	1.30
	3/4"	65	27	21	17	62	19	13	-	-	-	-
	1/2"	65	27	20	18	62	14	11	-	-	-	-
2 1/2"	2 1/2" *)	104	-	-	-	77	59	45	1.30	2.15	-	-
	2" *)	92	-	-	-	77	-	-	-	-	1.45	1.90
3"	3" *)	108	-	-	-	94	73.5	58.5	1.56	2.70	-	-
	2" *)	94.5	-	-	-	94	-	-	-	-	2.35	2.93
4"	4" *)	125	-	-	-	116	97	80	2.81	5.02	-	-
	3" *)	122	-	-	-	116	-	-	-	-	4.50	5.85
	2" *)	108	-	-	-	116	-	-	-	-	5.20	5.83

\*) Not covered by BS 3799

**Hexagon Head Bushing**



male > female

Nominal diameter		A	K	D	Weight in kg/piece Class 3000 Class 6000
DN inch	DN inch				
1/4"	1/8"	11	3	15.88	0.01
3/8"	1/4"	13	4	17.46	0.01
1/2"	3/8"	14	5	22.23	0.02
	1/4"	14	5	22.23	0.03
3/4"	1/2"	16	6	26.99	0.06
	3/8"	16	6	26.99	0.04
1"	3/4"	19	6	34.93	0.06
	1/2"	19	6	34.93	0.09
	1/4"	19	6	34.93	0.11
1 1/4"	1"	21	7	44.45	0.12
1 1/2"	1"	21	8	50.80	0.24
	3/4"	21	8	50.80	0.28
	1/2"	21	8	50.80	0.31
2"	1 1/2"	22	9	63.50	0.28
	1"	22	9	63.50	0.47
	3/4"	22	9	63.50	-
	1/2"	22	9	63.50	-
2 1/2"	2"	27	10	76.20	0.53
3"	2"	28	10	88.90	1.06
4"	3"	32	13	117.48	1.42
	2"	32	13	117.48	2.50

# Threaded Forged Steel Fittings

## Round nipples / BS 3799

**H380**

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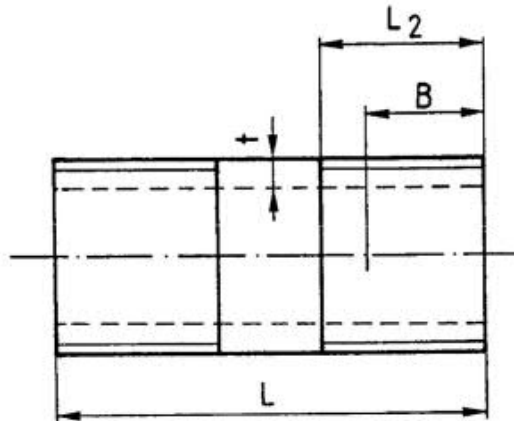
Example of designation: Designation of a threaded round nipple, length 50mm, Sched. XXS (cl. 6000), for nominal diameter 1/2" material: A182 Gr.F321

Part number **38975Q002**    **1/2 INCH**    **ROUND-NIPPLE SCHED.XXS ASTM A182 GR.F321**  
**L=50MM CL.6000 H380/BS3799**

Part numbering Code										
Position of Part No.										
1. - 3.		4.			5. - 6.		7. - 8.		9.	
Kind of Part		Fitting type 2)			Material 1)				Certificate 4)	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	
Threaded Steel Fittings Round nipples	389	Length 50 mm Sched.80 class 2000	1	A105 galvanized	5A	0	0	ASME	2	
		Length 100 mm Sched.80 class 2000	2	A105	5B			ASME	H	
		Length 150 mm Sched.80 class 2000	3	A182 Gr. F5	5F					
		Length 50 mm Sched.160 class 3000 3)	4	A182 Gr. F304	5M					
		Length 100 mm Sched.160 class 3000 3)	5	A182 Gr. F316	5P					
		Length 150 mm Sched.160 class 3000 3)	6	A182 Gr. F321	5Q					
		Length 50 mm Sched. XXS class 6000	7	A350 Gr. LF2	5X					
		Length 100 mm Sched. XXS class 6000	8	B111/C71640	8N					
		Length 150 mm Sched. XXS class 6000	9	A182 Gr. F304L	F4					
						A182 Gr. F316L	F6			

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for fitting type.
- 3) Round nipple Schedule 160 are not covered by BS 3799.
- 4) Requirements and certificate according to ASTM- / ASME-standards.

**Round nipples**



Nominal diameter	Wall thickness $t$			Weight in kg/piece								
	Class 2000 *)	Class 3000	Class 6000	Length L 50mm			Length L 100mm			Length L 150mm		
				Class 2000 *)	Class 3000	Class 6000	Class 2000 *)	Class 3000	Class 6000	Class 2000 *)	Class 3000	Class 6000
1/8"	Schedule 80	Schedule 160 **)	-	0.02	0.03	-	0.05	0.06	-	0.07	0.09	-
1/4"			-	0.04	0.05	-	0.08	0.10	-	0.12	0.15	-
3/8"			-	0.06	0.07	-	0.11	0.14	-	0.17	0.21	-
1/2"			-	-	-	0.16	0.20	0.26	0.24	0.29	0.38	
3/4"			-	-	-	0.22	0.29	0.37	0.33	0.44	0.55	
1"			-	-	-	0.32	0.42	0.55	0.49	0.64	0.82	
1 1/2"			-	-	-	0.54	0.73	0.97	0.81	1.09	1.43	
2"			-	-	-	0.75	1.11	1.37	1.12	1.67	2.02	
2 1/2"			-	-	-	1.14	1.47	2.08	1.71	2.20	3.06	
3"			-	-	-	1.53	2.14	2.81	2.29	3.20	4.15	
4"	-	-	-	-	-	-	3.35	5.03	6.15			

Dimensions B and  $L_2$  see page 2.

\*) Class 2000 not covered by BS 3799

\*\*) Wall thickness for class 3000 nipples may also be delivered with schedule 80 (see BS 3799).

	<b>Flanges</b> <b>according to ASME B16.5 / ASME B16.47 Series A /</b> <b>MSS SP-44 / AWWA C207</b>	Standard  <b>H 400</b>  Page 1 of 52
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Tolerances #)	according to ASME B16.5		ASME B16.47 (MSS SP-44)	
	Nominal Pipe Size		Nominal Pipe Size	
Outside diameter *)	up to 24" ≥ 24"	± 1.6 mm ± 3.2 mm		
Inside diameter (Welding neck flange and smaller bore of SW-flange)	≤ 10" 12" up to 18" ≥ 20"	± 1.0 mm ± 1.5 mm + 3.0 mm - 1.5 mm	≥ 26"	+ 3.0 mm - 2.0 mm
Inside diameter (Welding neck flange with backing ring)	≤ 10" ≥ 12"	+ 0.0 mm - 1.0 mm + 0.0 mm - 1.5 mm		
Inside diameter or bore (Counterbore) (Lapped-, Slip-on- and Threaded flange)	≤ 10" ≥ 12"	+ 1.0 mm - 0.0 mm + 1.5 mm - 0.0 mm		
Socket weld	1/2" up to 3"	± 0.25 mm		
Outside diameter of facing	2.0 mm raised face	± 1.0 mm	≥ 26"	± 0.5 mm
	7.0 mm raised face	± 0.5 mm	≥ 26"	± 1.0 mm
	Tongue & Groove or Male & Female	± 0.5 mm		
Bore of backing rings (Welding neck flanges)	2" up to 24"	+ 0.25 mm - 0.0 mm		
Outside diameter of welding end	≤ 5"	+ 2.0 mm - 1.0 mm	≥ 26"	+ 5.0 mm - 2.0 mm
	≥ 6"	+ 4.0 mm - 1.0 mm		
Outside diameter of hub at base *)		± 2.0 mm		
Drilling Bolt circle diameter center to center of adjacent bolt holes		± 1.5 mm		± 1.5 mm ± 0.8 mm
Eccentricity between bolt circle diameter and machined facing diameter	≤ 2 1/2"	± 0.8 mm		
	≥ 3"	± 1.5 mm	≥ 26"	± 1.5 mm
Width of Land *)	all sizes	± 0.8 mm		
Angle of Hub bevel	all sizes	± 2 1/2°		
Overall length	≤ 10"	± 2.0 mm		
	≥ 12"	± 3.0 mm	≥ 26"	+ 3.0 mm - 5.0 mm
Flange thickness	≤ 18"	+ 3.0 mm - 0.0 mm	<u>Flange thickness tf</u> tf ≤ 50mm 50mm < tf ≤ 75mm tf > 75 mm	<u>Tolerances</u> +5.0mm, - 0.0mm +8.0mm, - 0.0mm +10.0mm, -0.0mm
	≥ 20"	+ 5.0 mm - 0.0 mm		
Thickness of hub		87,5% of pipe thickness		87,5% of pipe thickness

Threaded Flanges: Thread shall coincide with the axis of the flange and variation in alignment shall not exceed 0,5 % (0,29°).

\*) These tolerances are not covered by ASME B16.5.

#) Tolerances according to AWWA C207 are not adopted in this standard.

# Welding Neck Flanges

## Class 150 - 2500 / ASME B16.5

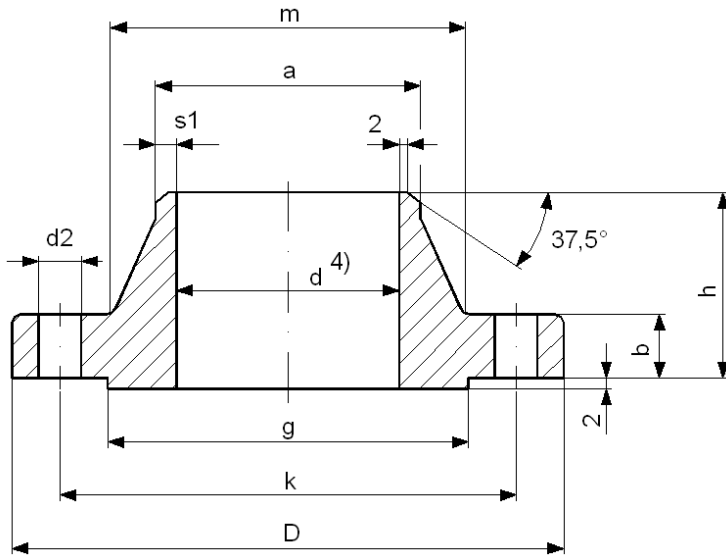
Example of Designation: Designation of a welding neck flange with flange facing RTJ, nominal diameter 8", class 400 and mating pipe wall thickness s1 = Schedule 80, material: A105

Part number  
**41345B502 8(INCH)/219.1x12.7(MM) WN-FLANGE/RTJ CLASS 400 ASTM A105  
 SCHED.80 H400/ASME B16.5**

Part numbering Code												
Position of Part No.												
1. - 2.		3.		4.		5. - 6.		7.- 8.		9.		
Kind of Part	Cd.	Class 5)	Cd.	Flange Facing 2)	Cd.	ASTM-material 1)		Wall thickness		Certificate 8)		
							Cd.	Cd.	Cd.	Cd.		Cd.
Welding Neck Flange	41	150	1	Flat Face (FF) 6)	0	A105	5B	* 3)	0	ASME	2	
		300	2	Raised Face (RF)	1	A181 Cl.70	5D			9)	H	
		400	3	Large Tongue (LT)	2	A182 Gr.F1	5E			ASME		
		600	4	Large Groove (LG)	3	A182 Gr.F5	5F					
		900	5	Ring Type Joint (RTJ)	4	A182 Gr.F11	5J					
		1500	6	Large Male (LM)	5	A182 Gr.F12	5K					
		2500	7	Large Female (LF)	6	A182 Gr.F22	5L					
						Raised Face (RF) 125 RMS 7)	9	A182 Gr.F304	5M			
								A182 Gr.F316	5P			
								A182 Gr.F321	5Q			
								A182 Gr.F304L	F4			
								A182 Gr.F316H	F5			
								A182 Gr.F316L	F6			
								A182 Gr.F321H	F7			
								A182 Gr.F51 (S31803)	T1			
						A182 Gr.F91	T2					

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Flange facings and roughness according to ASME B16.5.
- 3) Wall thickness code according to Standard H0011.  
Mating wall thickness s1 see corresponding piping specifications.
- 4) Dimension "d" is given by inside diameter of mating pipe.  
Specified dimension "d" correspond with a mating pipe wall thickness "Standard wall".
- 5) Code for class.
- 6) Class 150 - Steel flanges may also be ordered with flat face (FF).
- 7) Raised face - Flanges with roughness 125 RMS are only available if class ≥ 300.
- 8) Standard certificate according .to corresponding ASTM- / ASME-standards (i.e. no test report).
- 9) For flanges with end coding H a "certified test report" according to ASTM A530 shall be provided.

**Welding Neck Flange Class 150 / ASME B16.5**



Welding bevel for s1 acc. to ASME B16.5

Possible facings: 2)

- Form FF            Form RF
- Form LT           Form LG
- Form RTJ          Form LM
- Form LF

Dimensions in mm

Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Num-ber	Bolts		Weight kg/piece
			b min.	h	k	a	m			Thread	d2	
1/2"	90	15,8	9,6	46	60,3	21,3	30	34,9	4	1/2"	15,9	0,5
3/4"	100	20,9	11,2	51	69,9	26,7	38	42,9	4	1/2"	15,9	0,7
1"	110	26,6	12,7	54	79,4	33,4	49	50,8	4	1/2"	15,9	1,1
1 1/4"	115	35,1	14,3	56	88,9	42,2	59	63,5	4	1/2"	15,9	1,5
1 1/2"	125	40,9	15,9	60	98,4	48,3	65	73	4	1/2"	15,9	1,8
2"	150	52,5	17,5	62	120,7	60,3	78	92,1	4	5/8"	19	2,7
2 1/2"	180	62,7	20,7	68	139,7	73	90	104,8	4	5/8"	19	4,4
3"	190	77,9	22,3	68	152,4	88,9	108	127	4	5/8"	19	5,2
(3 1/2")	215	90,1	22,3	70	177,8	101,6	122	139,7	8	5/8"	19	6,4
4"	230	102,3	22,3	75	190,5	114,3	135	157,2	8	5/8"	19	7,5
5"	255	128,2	22,3	87	215,9	141,3	164	185,7	8	3/4"	22,2	9,2
6"	280	154,1	23,9	87	241,3	168,3	192	215,9	8	3/4"	22,2	11
8"	345	202,7	27,0	100	298,5	219,1	246	269,9	8	3/4"	22,2	18,3
10"	405	254,6	28,6	100	362	273	305	323,8	12	7/8"	25,4	25
12"	485	304,8	30,2	113	431,8	323,8	365	381	12	7/8"	25,4	39
14"	535	*)	33,4	125	476,3	355,6	400	412,8	12	1"	28,6	51
16"	595		35,0	125	539,8	406,4	457	469,9	16	1"	28,6	60
18"	635		38,1	138	577,9	457,0	505	533,4	16	1 1/8"	31,7	71
20"	700		41,3	143	635	508	559	584,2	20	1 1/8"	31,7	88
24"	815		46,1	151	749,3	610	663	692,2	20	1 1/4"	35	119

Bracketed nominal diameters shall be avoided.

\*) To be specified by purchaser.

Further footnotes see page 3.

## Welding Neck Flange Class 300 / ASME B16.5

Drawing and possible facings see page 4

Dimensions in mm

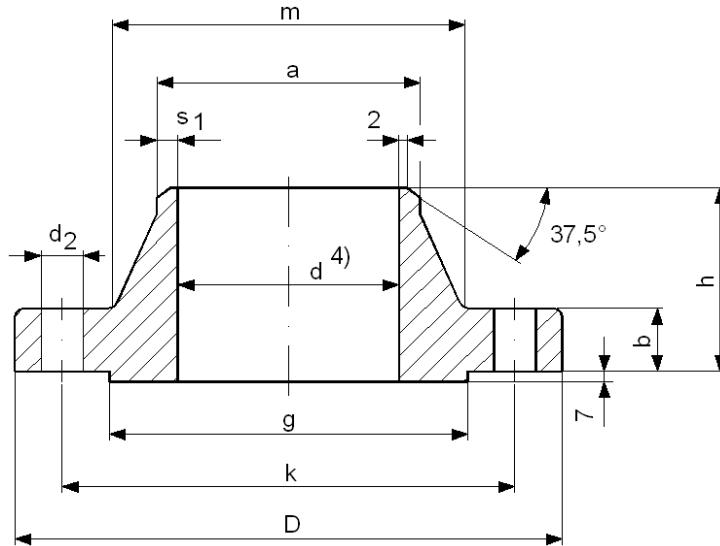
Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Num- ber	Bolts		Weight kg/piece
			b min.	h	k	a	m			Thread	d2	
1/2"	95	15,8	12,7	51	66,7	21,3	38	34,9	4	1/2"	15,9	0,8
3/4"	115	20,8	14,3	56	82,6	26,7	48	42,9	4	5/8"	19	1,3
1"	125	26,6	15,9	60	88,9	33,4	54	50,8	4	5/8"	19	1,7
1 1/4"	135	35,1	17,5	64	98,4	42,2	64	63,5	4	5/8"	19	2,2
1 1/2"	155	40,9	19,1	67	114,3	48,3	70	73	4	3/4"	22,2	3,2
2"	165	52,5	20,7	68	127	60,3	84	92,1	8	5/8"	19	3,6
2 1/2"	190	62,7	23,9	75	149,2	73,2	100	104,8	8	3/4"	22,2	5,4
3"	210	77,9	27,0	78	168,3	88,9	117	127	8	3/4"	22,2	7,4
(3 1/2")	230	90,1	28,6	79	184,2	101,6	133	139,7	8	3/4"	22,2	8,9
4"	255	102,3	30,2	84	200	114,3	146	157,2	8	3/4"	22,2	11,9
5"	280	128,2	33,4	97	235	141,3	178	185,7	8	3/4"	22,2	16
6"	320	154,1	35,0	97	269,9	168,3	206	215,9	12	3/4"	22,2	20,2
8"	380	202,7	39,7	110	330,2	219,1	260	269,9	12	7/8"	25,4	31
10"	445	254,6	46,1	116	387,4	273,0	321	323,8	16	1"	28,6	44,3
12"	520	304,8	49,3	129	450,8	323,8	375	381	16	1 1/8"	31,7	64
14"	585	*)	52,4	141	514,4	355,6	425	412,8	20	1 1/8"	31,7	88
16"	650		55,6	144	571,5	406,4	483	469,9	20	1 1/4"	34,9	113
18"	710		58,8	157	628,6	457,0	533	533,4	24	1 1/4"	34,9	134
20"	775		62,0	160	685,8	508	587	584,2	24	1 1/4"	34,9	171
24"	915		68,3	167	812,8	610	702	692,2	24	1 1/2"	41,1	238

Bracketed nominal diameters shall be avoided.

\*) To be specified by purchaser.

Further footnotes see page 3.

**Welding Neck Flange Class 400 / ASME B16.5**



Welding bevel for s1 acc. to ASME B16.5

- Possible facings: 2)  
 Form RF            Form LT  
 Form LG            Form RTJ  
 Form LM            Form LF

Dimensions in mm

Nominal diameter DN	Flange					Neck		Facing g	Number	Bolts		Weight kg/piece
	D	d 4)	b min.	h	k	a	m			Thread	d2	
1/2" up to (3 1/2")	Use Class 600 dimensions for these sizes											
4"	255	*)	35,0	89	200	114,3	146	157,2	8	7/8"	25,4	14
5"	280		38,1	102	235	141,3	178	185,7	8	7/8"	25,4	19
6"	320		41,3	103	269,9	168,3	206	215,9	12	7/8"	25,4	25,5
8"	380		47,7	117	330,2	219,1	260	269,9	12	1"	28,6	39,5
10"	445		54	124	387,3	273	321	323,8	16	1 1/8"	31,7	54
12"	520		57,2	137	450,8	323,8	375	381	16	1 1/4"	34,9	78
14"	585		60,4	149	514,3	355,6	425	412,8	20	1 1/4"	34,9	105
16"	650		63,5	152	571,5	406,4	483	469,9	20	1 3/8"	38,1	131
18"	710		66,7	165	628,6	457	533	533,4	24	1 3/8"	38,1	159
20"	775		69,9	168	685,8	508	587	584,2	24	1 1/2"	41,3	190
24"	915	76,2	175	812,8	610	702	692,2	24	1 3/4"	47,7	275	

Bracketed nominal diameters shall be avoided.

\*) To be specified by purchaser.

Further footnotes see page 3.

## Welding Neck Flange Class 600 / ASME B16.5

Drawing and possible facings see page 6

Dimensions in mm

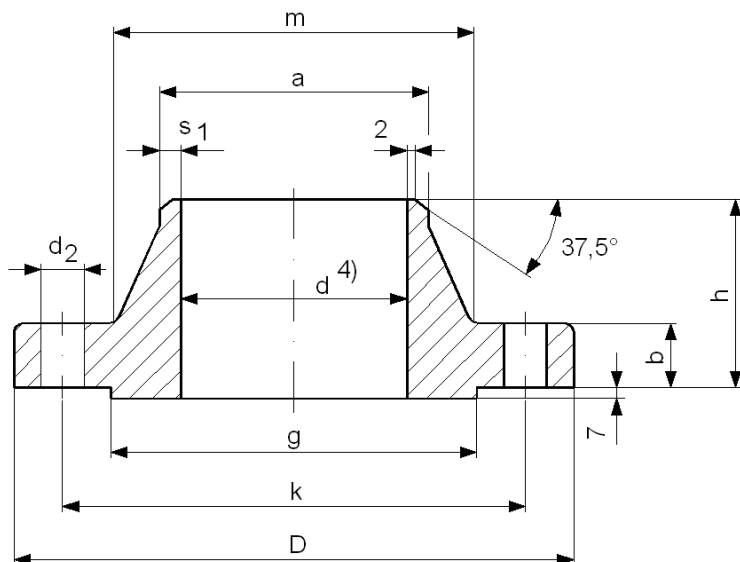
Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Bolts			Weight kg/piece
			b min.	h	k	a	m		Num- ber	Thread	d2	
1/2"	95	*)	14,3	52	66,7	21,3	38	34,9	4	1/2"	15,9	0,9
3/4"	115		15,9	57	82,6	26,7	48	42,9	4	5/8"	19	1,5
1"	125		17,5	62	88,9	33,4	54	50,8	4	5/8"	19	1,9
1 1/4"	135		20,7	67	98,4	42,2	64	63,5	4	5/8"	19	2,6
1 1/2"	155		22,3	70	114,3	48,3	70	73	4	3/4"	22,2	3,3
2"	165		25,4	73	127	60,3	84	92,1	8	5/8"	19	4,7
2 1/2"	190		28,6	79	149,2	73,0	100	104,8	8	3/4"	22,2	6,5
3"	210		31,8	83	168,3	88,9	117	127	8	3/4"	22,2	8,7
(3 1/2")	230		35	86	184,2	101,6	133	139,7	8	7/8"	25,4	11,2
4"	275		38,1	102	215,9	114,3	152	157,2	8	7/8"	25,4	18,1
5"	330		44,5	114	266,7	141,3	189	185,7	8	1"	28,6	30,5
6"	355		47,7	117	292,1	168,3	222	215,9	12	1"	28,6	36,2
8"	420		55,6	133	349,2	219,1	273	269,9	12	1 1/8"	31,7	49,5
10"	510		63,5	152	431,8	273	343	323,8	16	1 1/4"	34,9	89
12"	560		66,7	156	489	323,8	400	381	20	1 1/4"	34,9	110
14"	605		69,9	165	527	355,6	432	412,8	20	1 3/8"	38,1	150
16"	685		76,2	178	603,2	406,4	495	469,9	20	1 1/2"	41,3	190
18"	745		82,6	184	654	457	546	533,4	20	1 5/8"	44,4	240
20"	815		88,9	190	723,9	508	610	584,2	24	1 5/8"	44,4	295
24"	940		101,6	203	838,2	610	718	692,2	24	1 7/8"	50,8	363

Bracketed nominal diameters shall be avoided.

\*) To be specified by purchaser.

Further footnotes see page 3.

**Welding Neck Flange Class 900 / ASME B16.5**



Welding bevel for s1 acc. to ASME B16.5

Possible facings: 2)

- Form RF            Form LT
- Form LG           Form RTJ
- Form LM           Form LF

Dimensions in mm

Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Num- ber	Bolts		Weight kg/piece
			b min.	h	k	a	m			Thread	d2	
1/2" up to 2 1/2"	Use Class 1500 dimensions for these sizes											
3"	240	*)	38,1	102	190,5	88,9	127	127	8	7/8"	25,4	14
4"	290		44,5	114	235	114,3	159	157,2	8	1 1/8"	31,7	23,2
5"	350		50,8	127	279,4	141,3	190	185,7	8	1 1/4"	34,9	37,1
6"	380		55,6	140	317,5	168,3	235	215,9	12	1 1/8"	31,7	49,3
8"	470		63,5	162	393,7	219,1	298	269,9	12	1 3/8"	38,1	84
10"	545		69,9	184	469,9	273	368	323,8	16	1 3/8"	38,1	123
12"	610		79,4	200	533,4	323,8	419	381	20	1 3/8"	38,1	163
14"	640		85,8	213	558,8	355,6	451	412,8	20	1 1/2"	41,3	186
16"	705		88,9	216	616	406,4	508	469,9	20	1 5/8"	44,4	224
18"	785		101,6	229	685,8	457	565	533,4	20	1 7/8"	50,8	300
20"	855		108	248	749,3	508	622	584,2	20	2"	54	373
24"	1040		139,7	292	901,7	610	749	692,2	20	2 1/2"	66,7	680

\*) To be specified by purchaser.

Further footnotes see page 3.

## Welding Neck Flange Class 1500 and Class 2500 / ASME B16.5

Drawing and possible facings see page 8

Dimensions in mm for **Class 1500**

Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Num- ber	Bolts		Weight kg/piece
			b min.	h	k	a	m			Thread	d2	
1/2"	120	*)	22,3	60	82,6	21,3	38	34,9	4	3/4"	22,2	1,9
3/4"	130		25,4	70	88,9	26,7	44	42,9	4	3/4"	22,2	2,6
1"	150		28,6	73	101,6	33,4	52	50,8	4	7/8"	25,4	3,8
1 1/4"	160		28,6	73	111,1	42,2	64	63,5	4	7/8"	25,4	4,4
1 1/2"	180		31,8	83	123,8	48,3	70	73	4	1"	28,6	6,1
2"	215		38,1	102	165,1	60,4	105	92,1	8	7/8"	25,4	11,1
2 1/2"	245		41,3	105	190,5	73,1	124	104,8	8	1"	28,6	15,5
3"	265		47,7	117	203,2	88,9	133	127	8	1 1/8"	31,7	20,4
4"	310		54,0	124	241,3	114,3	162	157,2	8	1 1/4"	34,9	30,5
5"	375		73,1	156	292,1	141,2	197	185,7	8	1 1/2"	41,3	58
6"	395		82,6	171	317,5	168,4	229	215,9	12	1 3/8"	38,1	70
8"	485		92,1	213	393,7	219,2	292	269,9	12	1 5/8"	44,4	119
10"	585		108	254	482,6	273,0	368	323,8	12	1 7/8"	50,8	204
12"	675		123,7	283	571,5	323,8	451	381	16	2"	54,0	303
14"	750		133,4	298	635,0	355,6	495	412,8	16	2 1/4"	60,3	400
16"	825		146,1	311	704,8	406,4	552	469,9	16	2 1/2"	66,7	510
18"	915		162	327	774,7	457,2	597	533,4	16	2 3/4"	73,0	737
20"	985	177,8	356	831,8	508	641	584,2	16	3"	79,4	930	
24"	1170	203,2	406	990,6	609,6	762	692,2	16	3 1/2"	92,1	1510	

Dimensions in mm for **Class 2500**

Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Num- ber	Bolts		Weight kg/piece
			b min.	h	k	a	m			Thread	d2	
1/2"	135	*)	30,2	73	88,9	21,3	43	34,9	4	3/4"	22,2	3,6
3/4"	140		31,8	79	95,2	26,7	51	42,9	4	3/4"	22,2	4
1"	160		35	89	108	33,4	57	50,8	4	7/8"	25,4	6
1 1/4"	185		38,1	95	130,2	42,2	73	63,5	4	1"	28,6	9
1 1/2"	205		44,5	111	146,0	48,3	79	73	4	1 1/8"	31,7	13
2"	235		50,9	127	171,4	60,3	95	92,1	8	1"	28,6	19
2 1/2"	265		57,2	143	196,8	73,0	114	104,8	8	1 1/8"	31,7	24
3"	305		66,7	168	228,6	88,9	133	127	8	1 1/4"	34,9	43
4"	355		76,2	190	273	114,3	165	157,2	8	1 1/2"	41,3	66
5"	420		92,1	229	323,8	141,3	203	185,7	8	1 3/4"	47,6	111
6"	485		108	273	368,3	168,3	235	215,9	8	2"	54	172
8"	550		127	318	438,2	219,1	305	269,9	12	2"	54	261
10"	675		165,1	419	539,8	273,0	375	323,8	12	2 1/2"	66,7	485
12"	760	184,2	464	619,1	323,8	441	381	12	2 3/4"	73,0	730	

\*) To be specified by purchaser.

Further footnotes see page 3.

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# Welding Neck Flanges

**H 400**

Class 150 - 900 / ASME B16.47 Series A (MSS SP-44)

Page 10

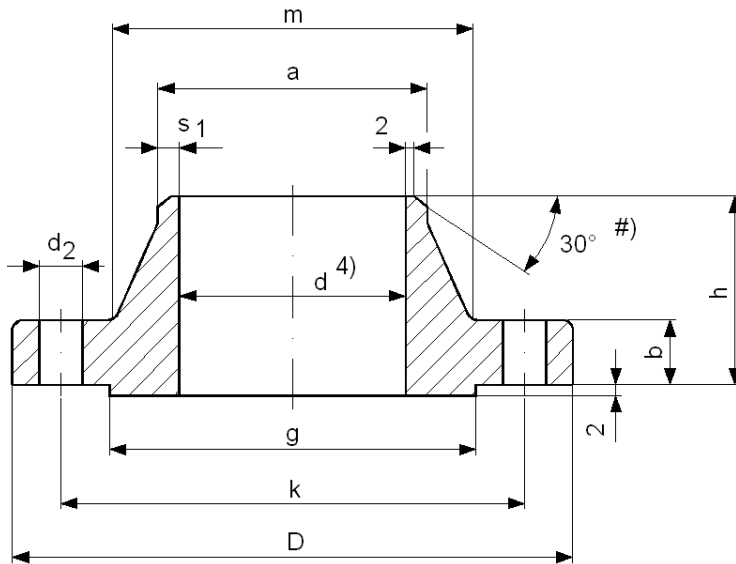
Example of Designation: Designation of a welding neck flange with flange facing RF (roughness 125 RMS), nominal diameter 26", class 300 and mating pipe wall thickness s1 = Schedule 80, material: Gr. F36

Part number **4129E95S2**      **26 (INCH)/711x15.88(MM)**      **WN-FLANGE/RF RA125**      **MSS SP-44 Gr.F36**  
**CLASS 300 SCHED.80 H400/ASME B16.47 SERIES A**

Part numbering Code											
Position of Part No.											
1. - 2.		3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part	Cd.	Class	5) Cd.	Flange Facing	2) Cd.	ASTM-material	1) Cd.	Wall thickness		10) Certificate	
								* 3)	S 8)	ASME/	2
Welding Neck Flange	41	150	1	Flat Face (FF)	6)	0	A105	5B			ASME/
		300	2	Raised Face (RF)		1	A181 Cl.70	5D			MSS
		400	3	Ring Type Joint (RTJ)		4	A182 Gr.F1	5E			11)
		600	4	Raised Face (RF)		9	A182 Gr.F5	5F			ASME/
		900	5	125 RMS	7)		A182 Gr.F11	5J			MSS
							A182 Gr.F12	5K			
							A182 Gr.F22	5L			
							A182 Gr.F304	5M			
							A182 Gr.F316	5P			
							A182 Gr.F321	5Q			
							MSS SP-44 / Gr.F36	E9			
							A182 Gr.F304L	F4			
							A182 Gr.F316H	F5			
							A182 Gr.F316L	F6			
							A182 Gr.F321H	F7			
						A182 Gr.F51 (S31803)	T1				
						A182 Gr.F91	T2				

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Flange facings and roughness according to ASME B16.47 (MSS SP-44).
- 3) Wall thickness code according to Std. H0011.  
Mating wall thicknesses s1 see corresponding piping specifications.
- 4) Dimension "d" is given by inside diameter of mating pipe.
- 5) Code for class.
- 6) This standard permits flat face flanges in all classes.
- 7) Raised face - Flanges with roughness 125 RMS are only available if class ≥ 300.
- 8) Flanges according to ASME B16.47 Series A correspond with flanges according to MSS SP-44, suit to flanges according to BS 3293 and ASME B16.1 and are standardized with ratings according to ASME B16.5. These flanges are designated by code "S" at position 8 of part number.
- 9) Reference values due to flanges according to BS 3293.
- 10) Standard certificate according to corresponding ASTM- / ASME- / MSS-standards (i.e. no test report).
- 11) For flanges with end coding H a "certified test report" according to ASTM A530 shall be provided.

**Welding Neck Flange Class 150 / ASME B16.47 Series A  
(MSS SP-44)**



#) Welding bevel for s1 acc. to ASME B16.47  
Possible facings: 2)  
Form FF      Form RF  
Form RTJ

Dimensions in mm

Nominal diameter DN	Flange					Neck		Facing g	Bolts			Weight kg/piece
	D	d 4)	b min.	h	k	a	m		Num- ber	Thread	d2	
(22")	750	*)	44,5	148	692,1	558,8	610	641,4	20	1 1/4"	35	99,0
26"	870		66,7	119	806,4	660,4	676	749	24	1 1/4"	35	142
28"	925		69,9	124	863,6	711,2	727	800	28	1 1/4"	35	161
30"	985		73,1	135	914,4	762	781	857	28	1 1/4"	35	190
32"	1060		79,4	143	977,9	812,8	832	914	28	1 1/2"	41,1	237
34"	1110		81,0	148	1028,8	863,8	883	965	32	1 1/2"	41,1	253
36"	1170		88,9	156	1085,8	914,4	933	1022	32	1 1/2"	41,1	304
38"	1240		85,8	156	1149,4	965,2	991	1073	32	1 1/2"	41,1	337
40"	1290		88,9	162	1200,2	1016	1041	1124	36	1 1/2"	41,1	363
42"	1345		95,3	170	1257,3	1066,8	1092	1194	36	1 1/2"	41,1	414
44"	1405		100,1	176	1314,4	1117,6	1043	1245	40	1 1/2"	41,1	466
46"	1455		101,6	184	1365,2	1168,4	1197	1295	40	1 1/2"	41,1	497
48"	1510		106,4	191	1422,4	1219,2	1248	1359	44	1 1/2"	41,1	546
50"	1570		109,6	202	1479,6	1270	1302	1410	44	1 3/4"	47,8	592
52"	1625		114,3	208	1536,7	1320,8	1353	1461	44	1 3/4"	47,8	650
54"	1685		119,1	214	1593,8	1371,6	1403	1511	44	1 3/4"	47,8	724
56"	1745		122,3	227	1651	1422,4	1457	1575	48	1 3/4"	47,8	796
58"	1805		127,0	233	1708,2	1473,2	1508	1626	48	1 3/4"	47,8	881
60"	1855		130,2	238	1759,0	1524	1559	1676	52	1 3/4"	47,8	922

Bracketed nominal diameters shall be avoided (dimensions according to MSS SP-44).

\*) To be specified by purchaser.

Further footnotes see page 10.

### Welding Neck Flange Class 300 / ASME B16.47 Series A (MSS SP-44)

Drawing and possible facings see page 10

Dimensions in mm

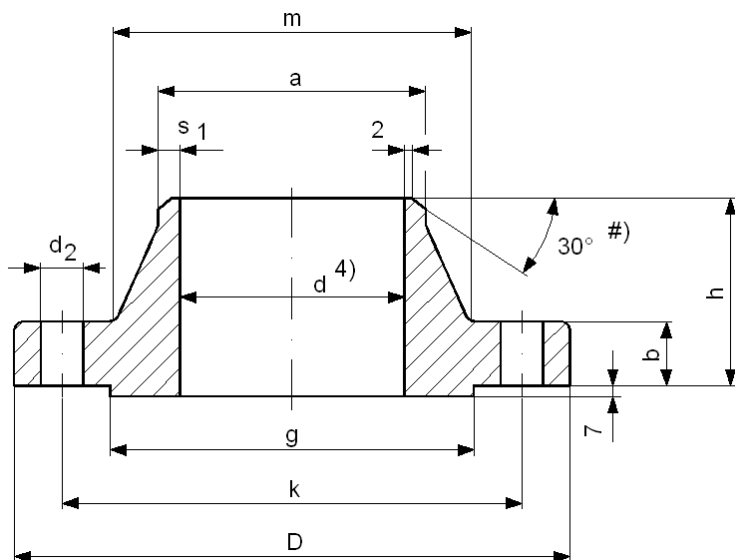
Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Num- ber	Bolts		Weight kg/piece
			b min.	h	k	a	m			Thread	d2	
(22")	840		65,1	164	743	558,8	641	641,5	24	1 1/2"	41,1	196
26"	970		77,8	183	876,3	660,4	721	749	28	1 5/8"	44,4	277
28"	1035		84,2	195	939,8	711,2	775	800	28	1 5/8"	44,4	337
30"	1090		90,5	208	997	762	827	857	28	1 3/4"	47,8	386
32"	1150		96,9	221	1054,1	812,8	881	914	28	1 7/8"	50,8	447
34"	1205		100,1	230	1104,9	863,6	937	965	28	1 7/8"	50,8	501
36"	1270		103,2	240	1168,4	914,4	991	1022	32	2"	53,8	560
38"	1170		106,4	179	1092,2	965,2	994	1029	32	1 1/2"	41,1	316
40"	1240		112,8	192	1155,7	1016	1048	1086	32	1 5/8"	44,4	382
42"	1290	*)	117,5	198	1206,5	1066,8	1099	1137	32	1 5/8"	44,4	416
44"	1355		122,3	205	1263,6	1117,6	1149	1194	32	1 3/4"	47,8	475
46"	1415		127,0	214	1320,8	1168,4	1203	1245	28	1 7/8"	50,8	539
48"	1465		131,8	222	1371,6	1219,2	1254	1302	32	1 7/8"	50,8	575
50"	1530		138,2	230	1428,8	1270	1305	1359	32	2"	53,8	655
52"	1580		142,9	237	1479,6	1320,8	1356	1410	32	2"	53,8	703
54"	1660		150,9	251	1549,4	1371,6	1410	1467	28	2 1/4"	60,5	855
56"	1710		152,4	259	1600,2	1422,4	1464	1518	28	2 1/4"	60,5	901
58"	1760		157,2	265	1651,0	1473,2	1514	1575	32	2 1/4"	60,5	944
60"	1810		162,0	271	1701,8	1524	1565	1626	32	2 1/4"	60,5	1003

Bracketed nominal diameters shall be avoided (dimensions according to MSS SP-44).

\*) To be specified by purchaser.

Further footnotes see page 10.

**Welding Neck Flange Class 400 / ASME B16.47 Series A  
(MSS SP-44)**



#) Welding bevel for s1 acc. to ASME B16.47  
Possible facings: 2)  
Form FF            Form RF  
Form RTJ

Dimensions in mm

Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Bolts			Weight kg/piece 9)
			b min.	h	k	a	m		Number	Thread	d2	
(22")	840	*)	73,1	171	743	558,8	641	641,5	24	1 5/8"	44,4	211
26"	970		88,9	194	876,3	660,4	727	749	28	1 3/4"	47,8	340
28"	1035		95,3	206	939,8	711,2	783	800	28	1 7/8"	50,8	400
30"	1090		101,6	219	997	762	837	857	28	2"	53,8	454
32"	1150		108	232	1054,1	812,8	889	914	28	2"	53,8	522
34"	1205		111,2	241	1104,9	863,6	945	965	28	2"	53,8	590
36"	1270		114,3	251	1168,4	914,4	1000	1022	32	2"	53,8	669
38"	1205		123,9	206	1117,6	965,2	1003	1035	32	1 3/4"	47,8	
40"	1270		130,2	216	1174,8	1016	1054	1092	32	1 7/8"	50,8	
42"	1320		133,4	224	1225,6	1066,8	1108	1143	32	1 7/8"	50,8	853
44"	1385		139,7	233	1282,7	1117,6	1159	1200	32	2"	53,8	
46"	1440		146,1	244	1339,8	1168,4	1213	1257	36	2"	53,8	
48"	1510		152,4	257	1403,4	1219,2	1267	1308	28	2 1/4"	60,5	
50"	1570		157,2	268	1460,5	1270	1321	1362	32	2 1/4"	60,5	
52"	1620		162	276	1511,3	1320,8	1372	1413	32	2 1/4"	60,5	
54"	1700		169,9	289	1581,2	1371,6	1426	1470	28	2 1/2"	66,5	
56"	1755		174,7	298	1632,0	1422,4	1480	1527	32	2 1/2"	66,5	
58"	1805		177,8	306	1682,8	1473,2	1530	1578	32	2 1/2"	66,5	
60"	1885		185,8	319	1752,6	1524	1584	1635	32	2 3/4"	73,2	

Bracketed nominal diameters shall be avoided (dimensions according to MSS SP-44).

\*) To be specified by purchaser.

Further footnotes see page 10.

## Welding Neck Flange Class 600 / ASME B16.47 Series A (MSS SP-44)

Drawing and possible facings see page 13

Dimensions in mm

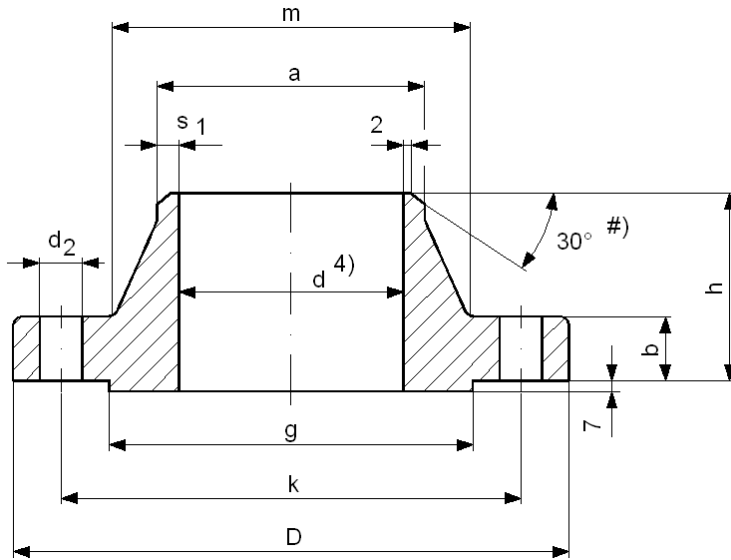
Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Num- ber	Bolts		Weight kg/piece 9)
			b min.	h	k	a	m			Thread	d2	
(22")	870		95,3	197	777,8	558,8	667	641,4	24	1 3/4"	47,7	281
26"	1015		108	222	914,4	660,4	748	749	28	1 7/8"	50,8	404
28"	1175		111,2	235	965,2	711,2	803	800	28	2"	53,8	480
30"	1130		114,3	248	1022,4	762	862	857	28	2"	53,8	560
32"	1195		117,5	260	1079,5	812,8	918	914	28	2 1/4"	60,4	681
34"	1245		120,7	270	1130,3	863,6	973	965	28	2 1/4"	60,4	749
36"	1315		123,9	283	1193,8	914,4	1032	1022	28	2 1/2"	66,5	795
38"	1270		152,4	254	1162,0	965,2	1022	1054	28	2 1/4"	60,4	
40"	1320		158,8	264	1212,8	1016	1073	1111	32	2 1/4"	60,4	
42"	1405	*)	168,3	279	1282,7	1066,8	1127	1168	28	2 1/2"	66,5	1096
44"	1455		173,1	289	1333,5	1117,6	1181	1226	32	2 1/2"	66,5	
46"	1510		179,4	300	1390,6	1168,4	1235	1276	32	2 1/2"	66,5	
48"	1595		189,0	316	1460,5	1219,2	1289	1334	32	2 3/4"	73,2	
50"	1670		196,9	329	1524,0	1270	1343	1384	28	3"	79,2	
52"	1720		203,2	337	1574,8	1320,8	1394	1435	32	3"	79,2	
54"	1780		209,6	349	1632,0	1371,6	1448	1492	32	3"	79,2	
56"	1855		217,4	362	1695,4	1422,4	1502	1543	32	3 1/4"	85,9	
58"	1905		222,3	370	1746,2	1473,2	1553	1600	32	3 1/4"	85,9	
60"	1995		233,4	389	1822,4	1524	1610	1657	28	3 1/2"	91,9	

Bracketed nominal diameters shall be avoided (dimensions according to MSS SP-44).

\*) To be specified by purchaser.

Further footnotes see page 10.

**Welding Neck Flange Class 900 / ASME B16.47 Series A**



#) Welding bevel for s1 acc. to ASME B16.47  
 Possible facings: 2)  
 Form FF            Form RF  
 Form RTJ

Dimensions in mm

Nominal diameter DN	D	d 4)	Flange			Neck		Facing g	Bolts			Weight kg/piece
			b min	h	k	a	m		Num- ber	Thread	d2	
26"	1085	*)	139,7	286	952,5	660,4	775	749	20	2 3/4"	73,2	
28"	1170		142,9	298	1022,4	711,2	832	800	20	3"	79,2	
30"	1230		149,3	311	1085,8	762	889	857	20	3"	79,2	
32"	1315		158,8	330	1155,7	812,8	946	914	20	3 1/4"	85,9	
34"	1395		165,1	349	1225,6	863,6	1006	965	20	3 1/2"	91,9	
36"	1460		171,5	362	1289,0	914,4	1064	1022	20	3 1/2"	91,9	
38"	1460		190,5	352	1289,0	965,2	1073	1099	20	3 1/2"	91,9	
40"	1510		196,9	364	1339,8	1016	1127	1162	24	3 1/2"	91,9	
42"	1560		206,4	371	1390,6	1066,8	1176	1213	24	3 1/2"	91,9	
44"	1650		214,4	391	1463,7	1117,6	1235	1270	24	3 3/4"	98,6	
46"	1735		225,5	411	1536,7	1168,4	1292	1334	24	4"	104,6	
48"	1785		233,4	419	1587,5	1219,2	1343	1384	24	4"	104,6	

\*) To be specified by purchaser.

Further footnotes see page 10.

# Lap Joint Flanges

Class 150 - 2500 / ASME B16.5

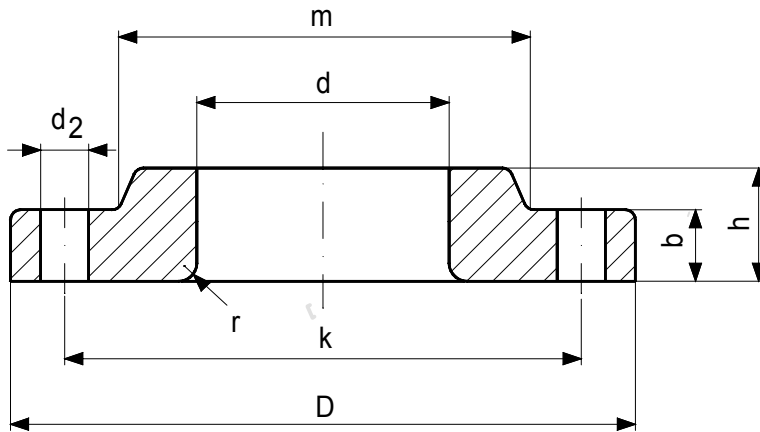
Example of Designation: Designation of a lap joint flange, nominal diameter 10", class 600, material: A 105

Part number **42485B002**      **10 (INCH) LAP JOINT FLANGE CLASS 600 ASTM A105 H400/ASME B16.5**

Part numbering Code												
Position of Part No.												
1. - 2.		3.		4.		5. - 6.		7.- 8.		9.		
Kind of Part		Class 2)		Type		ASTM-material 1)				Certificate 3)		
	Cd.		Cd.		Cd.		Cd.	Cd.	Cd.		Cd.	
Lap Joint Flange	42	150	1	Lap Joint Flange	8	A105 galvanized	5A	0	0	ASME	2	
		300	2			A105	5B			4)	H	
		400	3			A181 Cl.70	5D			ASME		
		600	4			A182 Gr.F1	5E					
		900	5			A182 Gr.F5	5F					
		1500	6			A182 Gr.F11	5J					
		2500	7			A182 Gr.F12	5K					
					A182 Gr.F304	5M						
					A182 Gr.F316	5P						
					A182 Gr.F321	5Q						
					A182 Gr.F304L	F4						
					A182 Gr.F316L	F6						

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Code for class.
- 3) Standard certificate according to corresponding ASTM- / ASME-standards (i.e. no test report).
- 4) For flanges with end coding H a "certified test report" according to ASTM A530 shall be provided.

Lap Joint Flange Class 150 / ASME B16.5



Dimensions in mm

Nominal diameter DN	Flange						Neck m	Bolts			Weight kg/piece
	D	d min.	b min.	h	k	r		Number	Thread	d2	
1/2"	90	22,9	11,2	16	60,3	3	30	4	1/2"	15,9	0,5
3/4"	100	28,2	12,7	16	69,9	3	38	4	1/2"	15,9	0,9
1"	110	34,9	14,3	17	79,4	3	49	4	1/2"	15,9	0,9
1 1/4"	115	43,7	15,9	21	88,9	5	59	4	1/2"	15,9	1,4
1 1/2"	125	50	17,5	22	98,4	6	65	4	1/2"	15,9	1,4
2"	150	62,5	19,1	25	120,7	8	78	4	5/8"	19	2,3
2 1/2"	180	75,4	22,3	29	139,7	8	90	4	5/8"	19	3,2
3"	190	91,4	23,9	30	152,4	10	108	4	5/8"	19	3,6
(3 1/2")	215	104,1	23,9	32	177,8	10	122	8	5/8"	19	5
4"	230	116,8	23,9	33	190,5	11	135	8	5/8"	19	5,9
5"	255	144,4	23,9	36	215,9	11	164	8	3/4"	22,2	6,8
6"	280	171,4	25,4	40	241,3	13	192	8	3/4"	22,2	8,6
8"	345	222,2	28,6	44	298,5	13	246	8	3/4"	22,2	13,6
10"	405	277,4	30,2	49	362	13	305	12	7/8"	25,4	19,5
12"	485	328,2	31,8	56	431,8	13	365	12	7/8"	25,4	29
14"	535	360,2	35	79	476,3	13	400	12	1"	28,6	47,6
16"	595	411,2	36,6	87	539,8	13	457	16	1"	28,6	63,5
18"	635	462,3	39,7	97	577,9	13	505	16	1 1/8"	31,7	72,6
20"	700	514,4	42,9	103	635	13	559	20	1 1/8"	31,7	88,5
24"	815	616	47,7	111	749,3	13	663	20	1 1/4"	34,9	125

Bracketed nominal diameters shall be avoided.

## Lap Joint Flange Class 300 and Class 400 / ASME B16.5

Drawing see page 17

Dimensions in mm for **Class 300**

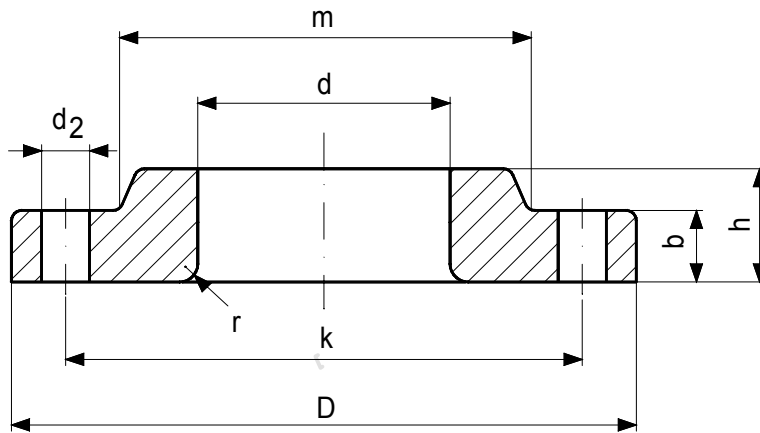
Nominal diameter DN	Flange						Neck m	Num- ber	Bolts		Weight kg/piece
	D	d min.	b min.	h	k	r			Thread	d2	
1/2"	95	22,9	14,3	22	66,7	3	38	4	1/2"	15,9	0,9
3/4"	115	28,2	15,9	25	82,6	3	48	4	5/8"	19	1,4
1"	125	34,9	17,5	27	88,9	3	54	4	5/8"	19	1,4
1 1/4"	135	43,7	19,1	27	98,4	5	64	4	5/8"	19	1,8
1 1/2"	155	50	20,7	30	114,3	6	70	4	3/4"	22,2	2,7
2"	165	62,5	22,3	33	127	8	84	8	5/8"	19	3,2
2 1/2"	190	75,4	25,4	38	149,2	8	100	8	3/4"	22,2	4,5
3"	210	91,4	28,6	43	168,3	10	117	8	3/4"	22,2	5,9
(3 1/2")	230	104,1	30,2	44	184,2	10	133	8	3/4"	22,2	7,7
4"	255	116,8	31,8	48	200	11	146	8	3/4"	22,2	10
5"	280	144,4	35	51	235	11	178	8	3/4"	22,2	12,7
6"	320	171,4	36,6	52	269,9	13	206	12	3/4"	22,2	17,7
8"	380	222,2	41,3	62	330,2	13	260	12	7/8"	25,4	26,3
10"	445	277,4	47,7	95	387,4	13	321	16	1"	28,6	41,3
12"	520	328,2	50,8	102	450,8	13	375	16	1 1/8"	31,7	63,5
14"	585	360,2	54	111	514,4	13	425	20	1 1/8"	31,7	86,2
16"	650	411,2	57,2	121	571,5	13	483	20	1 1/4"	34,9	113
18"	710	462,3	60,4	130	628,6	13	533	24	1 1/4"	34,9	134
20"	775	514,4	63,5	140	685,8	13	587	24	1 1/4"	34,9	168
24"	915	616	69,9	152	812,8	13	702	24	1 1/2"	41,3	249

Dimensions in mm for **Class 400**

Nominal diameter DN	Flange						Neck m	Num- ber	Bolts		Weight kg/piece
	D	d min.	b min.	h	k	r			Thread	d2	
1/2" up to (3 1/2")	Use Class 600 dimensions for these sizes										
4"	255	116,8	35	51	200	11	146	8	7/8"	25,4	11,3
5"	280	144,5	38,1	54	235	11	178	8	7/8"	25,4	13,2
6"	320	171,4	41,3	57	269,9	13	206	12	7/8"	25,4	19,1
8"	380	222,2	47,7	68	330	13	260	12	1"	28,6	29
10"	445	277,4	54	102	387,4	13	321	16	1 1/8"	31,7	49,9
12"	520	328,2	57,2	18	450,8	13	375	16	1 1/4"	34,9	68
14"	585	360,2	60,4	117	514,4	13	425	20	1 1/4"	34,9	93
16"	650	411,2	63,5	127	571,5	13	483	20	1 3/8"	38,1	118
18"	710	462,3	66,7	137	628,6	13	533	24	1 3/8"	38,1	143
20"	775	514,4	69,9	146	685,8	13	587	24	1 1/2"	41,3	175
24"	915	616	76,2	159	812,8	13	702	24	1 3/4"	47,6	259

Bracketed nominal diameters shall be avoided.

Lap Joint Flange Class 600 / ASME B16.5



Dimensions in mm

Nominal diameter DN	D	Flange					Neck m	Bolts			Weight kg/piece
		d min.	b min.	h	k	r		Num- ber	Thread	d2	
1/2"	95	22,9	14,3	22	66,7	3	38	4	1/2"	15,9	0,9
3/4"	120	28,2	15,9	25	82,6	3	48	4	5/8"	19	1,4
1"	125	34,9	17,5	27	88,9	3	54	4	5/8"	19	1,8
1 1/4"	135	43,7	20,7	29	98,4	5	64	4	5/8"	19	2,3
1 1/2"	155	50	22,3	32	114,3	6	70	4	3/4"	22,2	3,2
2"	165	62,5	25,4	37	127	8	84	8	5/8"	19	4,1
2 1/2"	190	75,4	28,6	41	149,2	8	100	8	3/4"	22,2	5,4
3"	210	91,4	31,8	46	168,3	10	117	8	3/4"	22,2	6,8
(3 1/2")	230	104,1	35	49	184,2	10	133	8	7/8"	25,4	9,1
4"	275	116,8	38,1	54	215,9	11	152	8	7/8"	25,4	16,3
5"	330	144,4	44,5	60	266,7	11	189	8	1"	28,6	27,7
6"	355	171,4	47,7	67	292,1	13	222	12	1"	28,6	35,4
8"	420	222,2	55,6	76	349,2	13	273	12	1 1/8"	31,7	49,9
10"	510	277,4	63,5	111	431,8	13	343	16	1 1/4"	34,9	77,1
12"	560	328,2	66,7	117	489	13	400	20	1 1/4"	34,9	90,7
14"	605	360,2	69,9	127	527	13	432	20	1 3/8"	38,1	113
16"	685	411,2	76,2	140	603,2	13	495	20	1 1/2"	41,3	166
18"	745	462,3	82,6	152	654	13	546	20	1 5/8"	44,4	197
20"	815	514,4	88,9	165	723,9	13	610	24	1 5/8"	44,4	259
24"	940	616	101,6	184	838,2	13	718	24	1 7/8"	50,8	367

Bracketed nominal diameters shall be avoided.

## Lap Joint Flange Class 900 and Class 1500 / ASME B16.5

Drawing see page 19

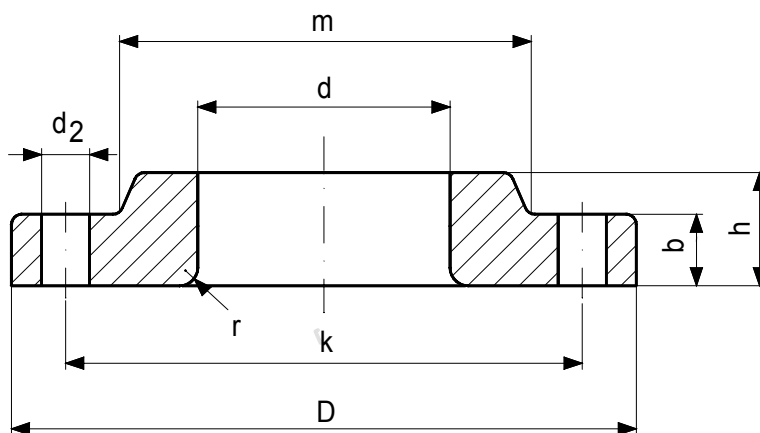
### Dimensions in mm for **Class 900**

Nominal diameter DN	Flange						Neck m	Number	Bolts		Weight kg/piece
	D	d min.	b min.	h	k	r			Thread	d2	
1/2" up to 2 1/2"	Use Class 1500 dimensions for these sizes										
3"	240	91,4	38,1	54	190,5	10	127	8	7/8"	25,4	11,3
4"	290	116,8	44,5	70	235	11	159	8	1 1/8"	31,7	23,1
5"	350	144,4	50,8	79	279,4	11	190	8	1 1/4"	34,9	36,7
6"	38	171,4	55,6	86	317,5	13	235	12	1 1/8"	31,7	47,6
8"	470	222,2	63,5	114	393,7	13	298	12	1 3/8"	38,1	86,2
10"	545	277,4	69,9	127	469,9	13	368	16	1 3/8"	38,1	125
12"	610	328,2	79,4	143	533,4	13	419	20	1 3/8"	38,1	168
14"	640	360,2	85,8	156	558,8	13	451	20	1 1/2"	41,3	188
16"	705	411,2	88,9	165	616	13	508	20	1 5/8"	44,4	211
18"	785	462,3	101,6	190	685,8	13	565	20	1 7/8"	50,8	295
20"	855	514,4	108	210	749,3	13	622	20	2"	54	367
24"	1040	616	139,7	267	901,7	13	749	20	2 1/2"	66,7	703

### Dimensions in mm for **Class 1500**

Nominal diameter DN	Flange						Neck m	Number	Bolts		Weight kg/piece
	D	d min.	b min.	h	k	r			Thread	d 2	
1/2"	120	22,9	22,3	32	82,6	3	38	4	3/4"	22,2	1,8
3/4"	130	28,2	25,4	35	88,9	3	44	4	3/4"	22,2	2,3
1"	150	34,9	28,6	41	101,6	3	52	4	7/8"	25,4	3,6
1 1/4"	160	43,7	28,6	41	111,1	5	64	4	7/8"	25,4	4,1
1 1/2"	180	50	31,8	44	123,8	6	70	4	1"	28,6	5,4
2"	215	62,5	38,1	57	165,1	8	105	8	7/8"	25,4	11,3
2 1/2"	245	75,4	41,3	64	190,5	8	124	8	1"	28,6	16
3"	265	91,4	47,7	73	203,2	10	133	8	1 1/8"	31,7	21,3
4"	310	116,8	54	90	241,3	11	162	8	1 1/4"	34,9	34
5"	375	144,4	73,1	105	292,1	11	197	8	1 1/2"	41,3	63,5
6"	395	171,4	82,6	119	317,5	13	229	12	1 3/8"	38,1	77,1
8"	485	222,2	92,1	143	393,7	13	292	12	1 5/8"	44,4	129
10"	585	277,4	108	178	482,6	13	368	12	1 7/8"	50,8	220
12"	675	328,2	123,9	219	571,5	13	451	16	2"	54	286
14"	750	360,2	133,4	241	635	13	495	16	2 1/4"	60,3	404
16"	825	411,2	146,1	260	704,8	13	552	16	2 1/2"	66,7	522
18"	915	462,3	162	276	774,7	13	597	16	2 3/4"	73	669
20"	985	514,4	177,8	292	831,8	13	641	16	3"	79,4	805
24"	1170	616	203,2	330	990,6	13	762	16	3 1/2"	92,1	1326

Lap Joint Flange Class 2500 / ASME B16.5



Dimensions in mm

Nominal diameter DN	D	Flange					Neck m	Bolts			Weight kg/piece
		d min.	b min.	h	k	r		Num- ber	Thread	d2	
1/2"	135	22,9	30,2	40	88,9	3	43	4	3/4"	22,2	3,2
3/4"	140	28,2	31,8	43	95,2	3	51	4	3/4"	22,2	3,6
1"	160	34,9	35	48	108	3	57	4	7/8"	25,4	5
1 1/4"	185	43,7	38,1	52	130,2	5	73	4	1"	28,6	7,3
1 1/2"	205	50	44,5	60	146	6	79	4	1 1/8"	31,7	10
2"	235	62,5	50,9	70	171,4	8	95	8	1"	28,6	16,8
2 1/2"	265	75,4	57,2	79	196,8	8	114	8	1 1/8"	31,7	24
3"	305	91,4	66,7	92	228,6	10	133	8	1 1/4"	34,9	36,3
4"	355	116,8	76,2	108	273	11	165	8	1 1/2"	41,3	54,4
5"	420	144,4	92,1	130	323,8	11	203	8	1 3/4"	47,6	93
6"	485	171,4	108	152	368,3	13	235	8	2"	54	143
8"	550	222,2	127	178	438,2	13	305	12	2"	54	213
10"	675	277,4	165,1	229	539,7	13	375	12	2 1/2"	66,7	408
12"	760	328,2	184,2	254	619,1	13	441	12	2 3/4"	73	499

# Threaded Flanges

Class 150 - 2500 / ASME B16.5

**H 400**

Page 22

Example of Designation: Designation of a threaded flange with flange facing FF, nominal diameter 3", class 150, material: A182 Gr.F304

Part number  
**43105M002      3 (INCH)    THREADED FLANGE/FF CLASS 150    ASTM A182 GR.F304  
 H400/ASME B16.5**

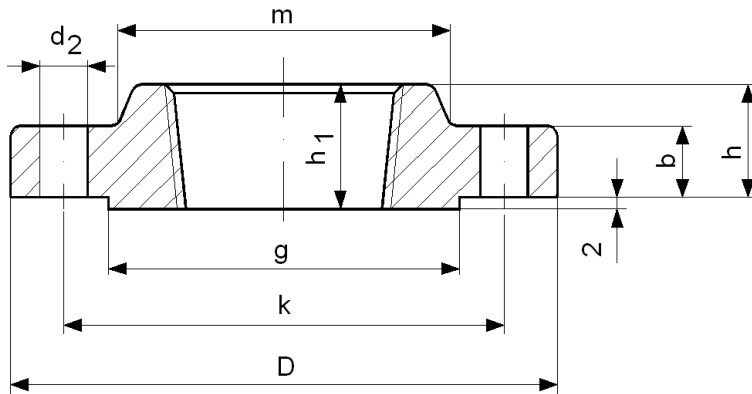
Part numbering Code													
Position of Part No.													
1. - 2.		3.		4.			5. - 6.		7.- 8.		9.		
Kind of Part		Class 3)		Flange facing 2)			ASTM-material 1)				Certificate 6)		
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.		
Threaded Flange	43	150	1	Flat Face (FF) 4)		0	A105 galvanized		5A	0	0	ASME	2
		300	2	Raised Face (RF)		1	A105		5B			7)	H
		400	3	Large Tongue (LT)		2	A181 Cl.70		5D				
		600	4	Large Groove (LG)		3	A182 Gr.F304		5M				
		900	5	Ring Type Joint (RTJ)		4	A182 Gr.F316		5P				
		1500	6	Large Male (LM)		5	A182 Gr.F321		5Q				
		2500	7	Large Female (LF)		6	A182 Gr.F304L		F4				
						Raised Face (RF) 125 RMS 5)		9	A182 Gr.F316L		F6		

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Flange facings and roughness according to ASME B16.5.
- 3) Code for class.
- 4) Class 150 - Steel flanges may also be ordered with flat face (FF).
- 5) Raised face (RF) - Flanges with roughness 125 RMS are only available if class  $\geq$  300.
- 6) Standard certificate according .to corresponding ASTM- / ASME-standards (i.e. no test report).
- 7) For flanges with end coding H a "certified test report" according to ASTM A530 shall be provided.

**General:**

Thread for threaded flanges shall conform with ASME B1.20.1 (NPT-thread) with the same size as the nominal diameter.

**Threaded Flange Class 150 / ASME B16.5**



Possible facings: 2)  
 Form FF            Form LT  
 Form RF            Form RTJ  
 Form LG            Form LF  
 Form LM

Dimensions in mm

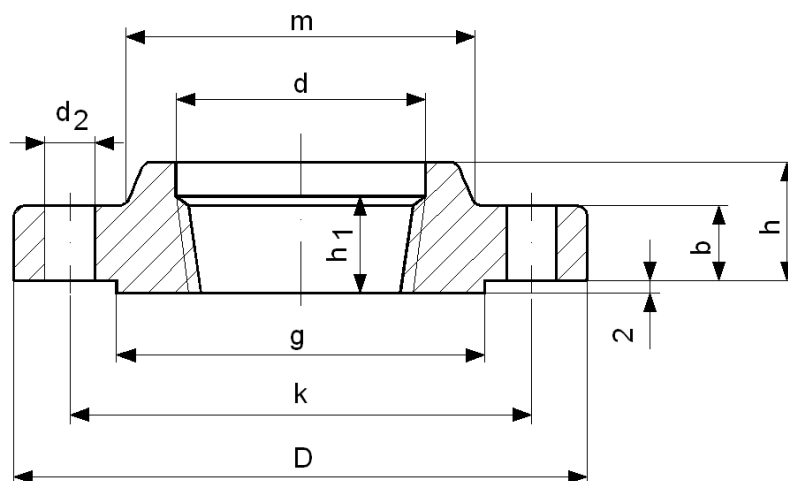
Nominal diameter DN	D	b min.	Flange			Neck m	Facing g	Bolts			Weight kg/piece
			h	h1	k			Number	Thread	d2	
1/2"	90	11,2	14	16	60,3	30	34,9	4	1/2"	15,9	0,5
3/4"	100	12,7	14	16	69,9	38	42,9	4	1/2"	15,9	0,9
1"	110	14,3	16	17	79,4	49	50,8	4	1/2"	15,9	0,9
1 1/4"	115	15,9	19	21	88,9	59	63,5	4	1/2"	15,9	1,4
1 1/2"	125	17,5	21	22	98,4	65	73	4	1/2"	15,9	1,4
2"	150	19,1	24	25	120,7	78	92,1	4	5/8"	19	2,3
2 1/2"	180	22,3	27	29	139,7	90	104,8	4	5/8"	19	3,2
3"	190	23,9	29	30	152,4	108	127	4	5/8"	19	3,6
(3 1/2")	215	23,9	30	32	177,8	122	139,7	8	5/8"	19	5
4"	230	23,9	32	33	190,5	135	157,2	8	5/8"	19	5,9
5"	255	23,9	35	36	215,9	164	185,7	8	3/4"	22,2	6,8
6"	280	25,4	38	40	241,3	192	215,9	8	3/4"	22,2	8,6
8"	345	28,6	43	44	298,5	246	269,9	8	3/4"	22,2	13,6
10"	405	30,2	48	49	362	305	323,8	12	7/8"	25,4	19,5
12"	485	31,8	54	56	431,8	365	381	12	7/8"	25,4	29
14"	535	35	56	57	476,3	400	412,8	12	1"	28,6	40,8
16"	595	36,6	62	64	539,8	457	469,9	16	1"	28,6	44,5
18"	635	39,7	67	68	577,9	505	533,4	16	1 1/8"	31,7	59
20"	700	42,9	71	73	635	559	584,2	20	1 1/8"	31,7	74,8
24"	815	47,7	81	83	749,3	663	692,2	20	1 1/4"	34,9	99,8

Bracketed nominal diameters shall be avoided.

No counter bore required on Class 150 threaded flanges.

Further footnotes see page 22.

## Threaded Flange Class 300 / ASME B16.5



Possible facings: 2)  
 Form RF      Form LT  
 Form LG      Form RTJ  
 Form LM      Form LF

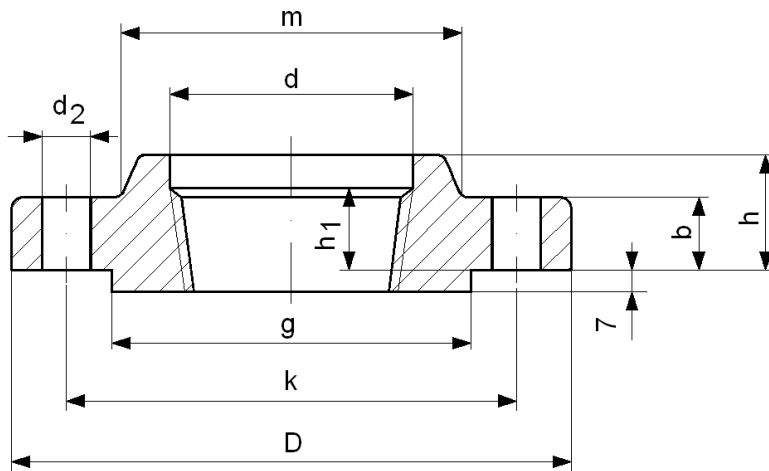
Dimensions in mm

Nominal diameter DN	Flange						Neck m	Facing g	Bolts			Weight kg/piece
	D	d 6)	b min.	h	h1	k			Num- ber	Thread	d2	
1/2"	95	23,6	12,7	21	16	66,7	38	34,9	4	1/2"	15,9	0,9
3/4"	115	29	14,3	24	16	82,6	48	42,9	4	5/8"	19	1,4
1"	125	35,8	15,9	25	18	88,9	54	50,8	4	5/8"	19	1,4
1 1/4"	135	44,4	17,5	25	21	98,4	64	63,5	4	5/8"	19	1,8
1 1/2"	155	50,3	19,1	29	23	114,3	70	73	4	3/4"	22,2	2,7
2"	165	63,5	20,7	32	29	127	84	92,1	8	5/8"	19	3,2
2 1/2"	190	76,2	23,9	37	32	149,2	100	104,8	8	3/4"	22,2	4,5
3"	210	92,2	27	41	32	168,3	117	127	8	3/4"	22,2	5,9
(3 1/2")	230	104,9	28,6	43	37	184,2	133	139,7	8	3/4"	22,2	7,7
4"	255	117,6	30,2	46	37	200	146	157,2	8	3/4"	22,2	10
5"	280	144,4	33,4	49	43	234,9	178	185,7	8	3/4"	22,2	12,7
6"	320	171,4	35	51	47	269,9	206	215,9	12	3/4"	22,2	17,7
8"	380	222,2	39,7	60	51	330,2	260	269,9	12	7/8"	25,4	26,3
10"	445	276,2	46,1	65	56	387,4	321	323,8	16	1"	28,6	36,7
12"	520	328,6	49,3	71	61	450,8	375	381	16	1 1/8"	31,7	52,2
14"	585	360,4	52,4	75	64	514,4	425	412,8	20	1 1/8"	31,7	74,8
16"	650	411,2	55,6	81	69	571,5	483	469,9	20	1 1/4"	34,9	86,2
18"	710	462	58,8	87	70	628,6	533	533,4	24	1 1/4"	34,9	113
20"	775	512,8	62	94	74	685,8	587	584,2	24	1 1/4"	34,9	143
24"	915	614,4	68,3	105	83	812,8	702	692,2	24	1 1/2"	41,3	215

Bracketed nominal diameters shall be avoided.

Further footnotes see page 22.

**Threaded Flange Class 400 / ASME B16.5**



Possible facings: 2)  
 Form RF      Form LT  
 Form LG      Form RTJ  
 Form LM      Form LF

Dimensions in mm

Nominal diameter DN	Flange						Neck m	Facing g	Bolts			Weight kg/piece
	D	d 6)	b min.	h	h1	k			Num- ber	Thread	d2	
1/2" up to (3 1/2")	Use Class 600 dimensions for these sizes											
4"	255	117,6	35	51	37	200	146	157,2	8	7/8"	25,4	11,8
5"	280	144,4	38,1	54	43	235	178	185,7	8	7/8"	25,4	14,1
6"	320	171,4	41,3	57	46	269,9	206	215,9	12	7/8"	25,4	20
8"	380	222,2	47,7	68	51	330	260	269,9	12	1"	28,6	30,4
10"	445	276,2	54	73	56	387,4	321	323,8	16	1 1/8"	31,7	41,3
12"	520	328,6	57,2	79	61	450,8	375	381	16	1 1/4"	34,9	59
14"	585	360,4	60,4	84	64	514,4	425	412,8	20	1 1/4"	34,9	81,6
16"	650	411,2	63,5	94	69	571,5	483	469,9	20	1 3/8"	38,1	107
18"	710	462	66,7	98	70	628,6	533	533,4	24	1 3/8"	38,1	129
20"	775	512,8	69,9	102	74	685,8	587	584,2	24	1 1/2"	41,3	156
24"	915	614,4	76,2	114	83	812,8	702	692,2	24	1 3/4"	47,6	231

Bracketed nominal diameters shall be avoided.

Further footnotes see page 22.

## Threaded Flange Class 600 and Class 900 / ASME B16.5

Drawing and possible facings see page 25

### Dimensions in mm for **Class 600**

Nominal diameter DN	Flange						Neck m	Facing g	Bolts			Weight kg/piece
	D	d 6)	b min.	h	h1	k			Num- ber	Thread	d2	
1/2"	95	23,6	14,3	22	16	66,7	39	34,9	4	1/2"	15,9	0,9
3/4"	115	29	15,9	25	16	82,6	48	42,9	4	5/8"	19	1,4
1"	125	35,8	17,5	27	18	88,9	54	50,8	4	5/8"	19	1,8
1 1/4"	135	44,4	20,7	29	21	98,4	64	63,5	4	5/8"	19	2,3
1 1/2"	155	50,6	22,3	32	23	114,3	70	73	4	3/4"	22,2	3,2
2"	165	63,5	25,4	37	29	127	84	92,1	8	5/8"	19	4,1
2 1/2"	190	76,2	28,6	41	32	149,2	100	104,8	8	3/4"	22,2	5,9
3"	210	92,2	31,8	46	35	168,3	117	127	8	3/4"	22,2	7,3
(3 1/2")	230	104,9	35	49	40	184,2	133	139,7	8	7/8"	25,4	9,5
4"	275	117,6	38,1	54	42	215,9	152	157,2	8	7/8"	25,4	16,8
5"	330	144,4	44,5	60	48	266,7	189	185,7	8	1"	28,6	28,6
6"	355	171,4	47,7	67	51	292,1	222	215,9	12	1"	28,6	36,3
8"	420	222,2	55,6	76	58	349,2	273	269,9	12	1 1/8"	31,7	52,2
10"	510	276,2	63,5	86	66	431,8	343	323,8	16	1 1/4"	34,9	77,1
12"	560	328,6	66,7	92	70	489	400	381	20	1 1/4"	34,9	90,7
14"	605	360,4	69,9	94	74	527	432	412,8	20	1 3/8"	38,1	104
16"	685	411,2	76,2	106	78	603,2	495	469,9	20	1 1/2"	41,3	150
18"	745	462	82,6	117	80	654	546	533,4	20	1 5/8"	44,4	181
20"	815	512,8	88,9	127	83	723,9	610	584,2	24	1 5/8"	44,4	231
24"	940	614,4	101,6	140	93	838,2	718	692,2	24	1 7/8"	50,8	331

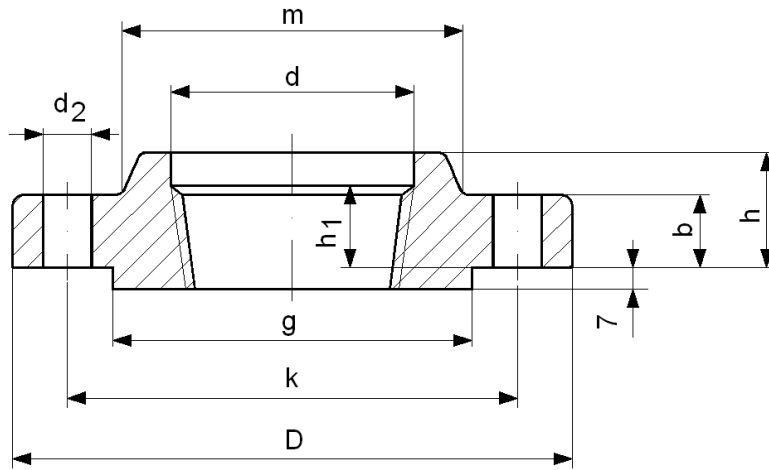
### Dimensions in mm for **Class 900**

Nominal diameter DN	Flange						Neck m	Facing g	Bolts			Weight kg/piece
	D	d 6)	b min.	h	h1	k			Num- ber	Thread	d2	
1/2" up to 2 1/2"	Use Class 1500 dimensions for these sizes											
3"	240	92,2	38,1	54	42	190,5	127	127	8	7/8"	25,4	11,8
4"	290	117,6	44,5	70	48	235	159	157,2	8	1 1/8"	31,7	24
5"	350	144,4	50,8	79	54	279,4	190	185,7	8	1 1/4"	34,9	37,6
6"	380	171,4	55,6	86	58	317,5	235	215,9	12	1 1/8"	31,7	49,9
8"	470	222,2	63,5	102	64	393,7	298	269,9	12	1 3/8"	38,1	77,1
10"	545	276,2	69,9	108	72	469,9	368	323,8	16	1 3/8"	38,1	111
12"	610	328,6	79,4	117	77	533,4	419	381	20	1 3/8"	38,1	147
14"	640	360,4	85,8	130	83	558,8	451	412,8	20	1 1/2"	41,3	181
16"	705	411,2	88,9	133	86	616	508	469,9	20	1 5/8"	44,4	193
18"	785	462	101,6	152	89	685,8	565	533,4	20	1 7/8"	50,8	272
20"	855	512,8	108	159	93	749,3	622	584,2	20	2"	54	331
24"	1040	614,4	139,7	203	102	901,7	749	692,2	20	2 1/2"	66,7	635

Bracketed nominal diameters shall be avoided.

Further footnotes see page 22.

**Threaded Flange Class 1500 and Class 2500 / ASME B16.5**



Possible facings: 2)  
 Form RF      Form LT  
 Form LG      Form RTJ  
 Form LM      Form LF

Dimensions in mm for **Class 1500**

Nominal diameter DN	Flange						Neck m	Facing g	Bolts			Weight kg/piece
	D	d 6)	b min.	h	h1	k			Num- ber	Thread	d2	
1/2"	120	23,6	22,2	32	23	82,6	38	34,9	4	3/4"	22,2	1,8
3/4"	130	29	25,4	35	26	88,9	44	42,9	4	3/4"	22,2	2,3
1"	150	35,8	28,6	41	29	101,6	52	50,8	4	7/8"	25,4	3,6
1 1/4"	160	44,4	28,6	41	31	111,1	64	63,5	4	7/8"	25,4	4,1
1 1/2"	180	50,6	31,7	44	32	123,8	70	73	4	1"	28,6	5,4
2"	215	63,5	38,1	57	39	165,1	105	92,1	8	7/8"	25,4	11,3
2 1/2"	245	76,2	41,3	64	48	190,5	124	104,8	8	1"	28,6	16,3

Dimensions in mm for **Class 2500**

Nominal diameter DN	Flange						Neck m	Facing g	Bolts			Weight kg/piece
	D	d 6)	b min.	h	h1	k			Num- ber	Thread	d2	
1/2"	135	23,6	30,2	40	29	88,9	43	34,9	4	3/4"	22,2	3,2
3/4"	140	29	31,8	43	32	95,2	51	42,9	4	3/4"	22,2	3,6
1"	160	35,8	35	48	35	108	57	50,8	4	7/8"	25,4	5
1 1/4"	185	44,4	38,1	52	39	130,2	73	63,5	4	1"	28,6	7,3
1 1/2"	205	50,6	44,5	60	45	146	79	73	4	1 1/8"	31,7	10
2"	235	63,5	50,9	70	51	171,4	95	92,1	8	1"	28,6	17,2
2 1/2"	265	76,2	57,2	79	58	196,8	114	104,8	8	1 1/8"	31,7	24,9

Further footnotes see page 22.

# Blind Flanges

Class 150 – Class 2500 / ASME B16.5

**H 400**

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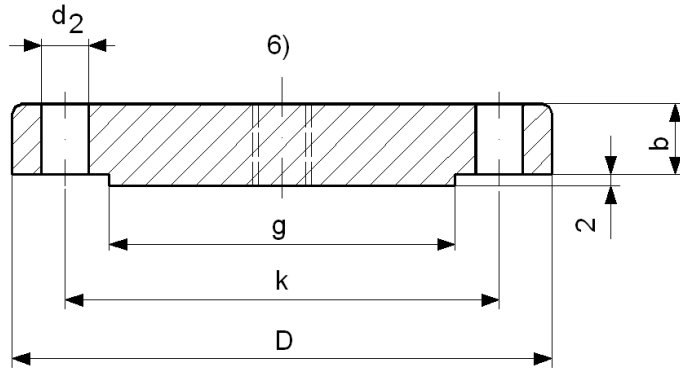
Example of Designation: Designation of a blind flange with flange facing RTJ, nominal diameter 4", class 1500, material: A182 Gr.F11

Part number  
**44645J002      4 (INCH)    BLIND FLANGE/RTJ CLASS 1500    ASTM A182 GR.F11**  
**H400/ASME B16.5**

Part numbering Code														
Position of Part No.														
1. - 2.		3.		4.			5. - 6.		7. - 8.		9.			
Kind of Part	Cd.	Class	3) Cd.	Flange Facing 2)			1) ASTM-material 1)		6) Cd.		7) Certificate 7)			
							Cd.	Cd.					Cd.	Cd.
Blind Flange	44	150	1	Flat Face (FF) 4)			0	A105	5B	0	0	ASME	2	
		300	2	Raised Face (RF)			1	A181 Cl.70	5D		N	8)		
		400	3	Large Tongue (LT)			2	A182 Gr.F1	5E		R	ASME	H	
		600	4	Large Groove (LG)			3	A182 Gr.F5	5F					
		900	5	Ring Type Joint (RTJ)			4	A182 Gr.F11	5J					
		1500	6	Large Male (LM)			5	A182 Gr.F12	5K					
		2500	7	Large Female (LF)			6	A182 Gr.F22	5L					
						Raised Face (RF)			9	A182 Gr.F304	5M			
						125 RMS 5)				A182 Gr.F316	5P			
									A182 Gr.F321	5Q				
									A182 Gr.F304L	F4				
									A182 Gr.F316H	F5				
									A182 Gr.F316L	F6				
									A182 Gr.F321H	F7				
									A182 Gr.F51 (S31803)	T1				
									A182 Gr.F91	T2				

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Flange facings and roughness according to ASME B16.5.
- 3) Code for class.
- 4) Class 150 - Steel flanges may also be ordered with flat face (FF).
- 5) Raised face (RF) - Flanges with roughness 125 RMS are only available if class  $\geq$  300.
- 6) With thread hole NPT 1/2": Code N  
Rp 1/2" (Whitworth): Code R
- 7) Standard certificate according .to corresponding ASTM- / ASME-standards (i.e. no test report).
- 8) For flanges with end coding H a "certified test report" according to ASTM A530 shall be provided.

**Blind Flange Class 150 / ASME B16.5**



Possible facings: 2)  
 Form FF            Form LT  
 Form RF            Form RTJ  
 Form LG            Form LF  
 Form LM

Dimensions in mm

Nominal diameter DN	Flange			Facing g	Bolts			Weight kg/piece
	D	b min.	k		Number	Thread	d2	
1/2"	90	9,6	60,3	34,9	4	1/2"	15,9	0,4
3/4"	100	11,2	69,9	42,9	4	1/2"	15,9	0,7
1"	110	12,7	79,4	50,8	4	1/2"	15,9	0,9
1 1/4"	115	14,3	88,9	63,5	4	1/2"	15,9	1,3
1 1/2"	125	15,9	98,4	73	4	1/2"	15,9	1,6
2"	150	17,5	120,7	92,1	4	5/8"	19	2,6
2 1/2"	180	20,7	139,7	104,8	4	5/8"	19	4,1
3"	190	22,3	152,4	127	4	5/8"	19	5
(3 1/2")	215	22,3	177,8	139,7	8	5/8"	19	6,4
4"	230	22,3	190,5	157,2	8	5/8"	19	7,1
5"	255	22,3	215,9	185,7	8	3/4"	22,2	9
6"	280	23,9	241,3	215,9	8	3/4"	22,2	11,8
8"	345	27,0	298,5	269,9	8	3/4"	22,2	21
10"	405	28,6	362	323,8	12	7/8"	25,4	30
12"	485	30,2	431,8	381	12	7/8"	25,4	45
14"	535	33,4	476,3	412,8	12	1"	28,6	59
16"	595	35,0	539,8	469,9	16	1"	28,6	79
18"	635	38,1	577,9	533,4	16	1 1/8"	31,7	97
20"	700	41,3	635	584,2	20	1 1/8"	31,7	124
24"	815	46,1	749,3	692,2	20	1 1/4"	35	188

Bracketed nominal diameters shall be avoided.

Further footnotes see page 28.

## Blind Flange Class 300 / ASME B16.5

Drawing and possible facings see page 29

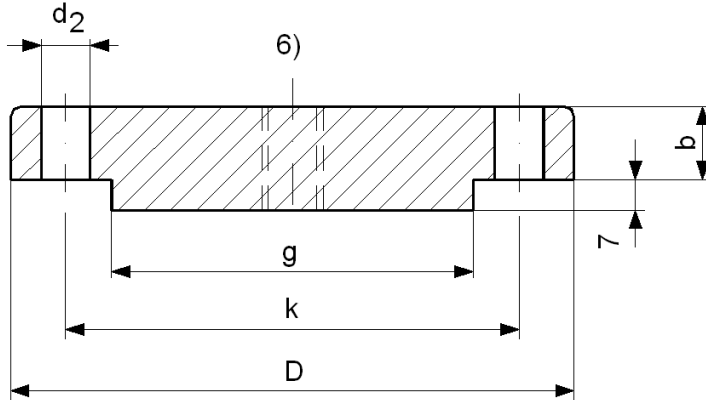
Dimensions in mm

Nominal diameter DN	Flange			Facing g	Bolts			Weight kg/piece
	D	b min.	k		Number	Thread	d2	
1/2"	95	12,7	66,7	34,9	4	1/2"	15,9	0,7
3/4"	115	14,3	82,6	42,9	4	5/8"	19	1,2
1"	125	15,9	88,9	50,8	4	5/8"	19	1,5
1 1/4"	135	17,5	98,4	63,5	4	5/8"	19	2
1 1/2"	155	19,1	114,3	73	4	3/4"	22,2	2,9
2"	165	20,7	127	92,1	8	5/8"	19	3,4
2 1/2"	190	23,9	149,2	104,8	8	3/4"	22,2	5,1
3"	210	27	168,3	127	8	3/4"	22,2	7
(3 1/2")	230	28,6	184,2	139,7	8	3/4"	22,2	8,9
4"	255	30,2	200	157,2	8	3/4"	22,2	11,8
5"	280	33,4	235	185,7	8	3/4"	22,2	15,5
6"	320	35	269,9	215,9	12	3/4"	22,2	21,3
8"	380	39,7	330,2	269,9	12	7/8"	25,4	35,2
10"	445	46,1	387,4	323,8	16	1"	28,6	57
12"	520	49,3	450,8	381	16	1 1/8"	31,7	82
14"	585	52,4	514,4	412,8	20	1 1/8"	31,7	106
16"	650	55,6	571,5	469,9	20	1 1/4"	34,9	140
18"	710	58,8	628,6	533,4	24	1 1/4"	34,9	178
20"	775	62,0	685,8	584,2	24	1 1/4"	34,9	223
24"	915	68,3	812,8	692,2	24	1 1/2"	41,1	345

Bracketed nominal diameters shall be avoided.

Further footnotes see page 28.

**Blind Flange Class 400 / ASME B16.5**



Possible facings: 2)  
 Form RF            Form LT  
 Form LG            Form RTJ  
 Form LM            Form LF

Dimensions in mm

Nominal diameter DN	D	Flange b min.	k	Facing g	Number	Bolts Thread	d2	Weight kg/piece
1/2" up to (3 1/2")	Use Class 600 dimensions for these sizes							
4"	255	35	200	157,2	8	7/8"	25,4	14
5"	280	38,1	235	185,7	8	7/8"	25,4	19
6"	320	41,3	269,9	215,9	12	7/8"	25,4	26
8"	380	47,7	330	269,9	12	1"	28,6	43
10"	445	54	387,4	323,8	16	1 1/8"	31,7	65
12"	520	57,2	450,8	381	16	1 1/4"	34,9	95
14"	585	60,4	514,4	412,8	20	1 1/4"	34,9	126
16"	650	63,5	571,5	469,9	20	1 3/8"	38,1	163
18"	710	66,7	628,6	533,4	24	1 3/8"	38,1	206
20"	775	69,9	685,8	584,2	24	1 1/2"	41,3	256
24"	915	76,2	812,8	692,2	24	1 3/4"	47,7	387

Bracketed nominal diameters shall be avoided.

Further footnotes see page 28.

### Blind Flange Class 600 / ASME B16.5

Drawing and possible facings see page 31

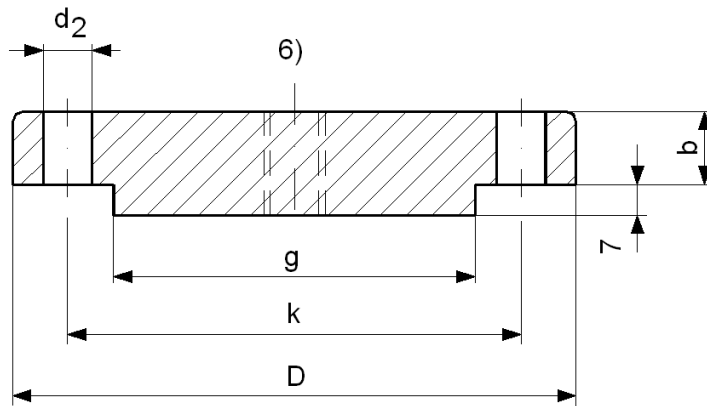
Dimensions in mm

Nominal diameter DN	Flange			Facing g	Bolts			Weight kg/piece
	D	b min.	k		Number	Thread	d2	
1/2"	95	14,3	66,7	34,9	4	1/2"	15,9	0,7
3/4"	115	15,9	82,6	42,9	4	5/8"	19	1,2
1"	125	17,5	88,9	50,8	4	5/8"	19	1,5
1 1/4"	135	20,7	98,4	63,5	4	5/8"	19	2
1 1/2"	155	22,3	114,3	73	4	3/4"	22,2	3,2
2"	165	25,4	127	92,1	8	5/8"	19	4,3
2 1/2"	190	28,6	149,2	104,8	8	3/4"	22,2	6
3"	210	31,8	168,3	127	8	3/4"	22,2	8
(3 1/2")	230	35	184,2	139,7	8	7/8"	25,4	10,5
4"	275	38,1	215,9	157,2	8	7/8"	25,4	18
5"	330	44,5	266,7	185,7	8	1"	28,6	28,5
6"	355	47,7	292,1	215,9	12	1"	28,6	35,5
8"	420	55,6	349,2	269,9	12	1 1/8"	31,7	58
10"	510	63,5	431,8	323,8	16	1 1/4"	34,9	95
12"	560	66,7	489	381	20	1 1/4"	34,9	125
14"	605	69,9	527	412,8	20	1 3/8"	38,1	151
16"	685	76,2	603,2	469,9	20	1 1/2"	41,3	215
18"	745	82,6	654	533,4	20	1 5/8"	44,4	275
20"	815	88,9	723,9	584,2	24	1 5/8"	44,4	350
24"	940	101,6	838,2	692,2	24	1 7/8"	50,8	532

Bracketed nominal diameters shall be avoided.

Further footnotes see page 28.

**Blind Flange Class 900 / ASME B16.5**



Possible facings: 2)  
 Form RF      Form LT  
 Form LG      Form RTJ  
 Form LM      Form LF

Dimensions in mm

Nominal diameter DN	Flange			Facing	Number	Bolts Thread	d2	Weight kg/piece
	D	b min.	k	g				
1/2" up to 2 1/2"	Use Class 600 dimensions for these sizes							
3"	240	38,1	190,5	127	8	7/8"	25,4	13,1
4"	290	44,5	235	157,2	8	1 1/8"	31,7	22,1
5"	350	50,8	279,4	185,7	8	1 1/4"	34,9	36,5
6"	380	55,6	317,5	215,9	12	1 1/8"	31,7	47,4
8"	470	63,5	393,7	269,9	12	1 3/8"	38,1	82,5
10"	545	69,9	459,9	323,8	16	1 3/8"	38,1	123
12"	610	79,4	533,4	381	20	1 3/8"	38,1	174
14"	640	85,8	558,8	412,8	20	1 1/2"	41,3	206
16"	705	88,9	616	469,9	20	1 5/8"	44,4	259
18"	785	101,6	685,8	533,4	20	1 7/8"	50,8	367
20"	855	108	749,3	584,2	20	2"	54	463
24"	1040	139,7	901,7	692,2	20	2 1/2"	66,7	875

Further footnotes see page 28.

## Blind Flange Class 1500 and Class 2500 / ASME B16.5

Drawing and possible facings see page 33

Dimensions in mm for **Class 1500**

Nominal diameter DN	Flange			Facing g	Bolts			Weight kg/piece
	D	b min.	k		Number	Thread	d2	
1/2"	120	22,3	82,6	34,9	4	3/4"	22,2	1,8
3/4"	130	25,4	88,9	42,9	4	3/4"	22,2	2,4
1"	150	28,6	101,6	50,8	4	7/8"	25,4	3,6
1 1/4"	160	28,6	111,1	63,5	4	7/8"	25,4	4,1
1 1/2"	180	31,8	123,8	73	4	1"	28,6	5,8
2"	215	38,1	165,1	92,1	8	7/8"	25,4	10,1
2 1/2"	245	41,3	190,5	104,8	8	1"	28,6	14,0
3"	265	47,7	203,2	127	8	1 1/8"	31,7	19,0
4"	310	54,0	241,3	157,2	8	1 1/4"	34,9	30,0
5"	375	73,1	292,1	185,7	8	1 1/2"	41,3	58,0
6"	395	82,6	317,5	215,9	12	1 3/8"	38,1	72,0
8"	485	92,1	393,7	269,9	12	1 5/8"	44,4	122
10"	585	108	482,6	323,8	12	1 7/8"	50,8	210
12"	675	123,9	571,5	381	16	2"	54,0	315
14"	750	133,4	635,0	412,8	16	2 1/4"	60,3	461
16"	825	146,1	704,8	469,9	16	2 1/2"	66,7	613
18"	915	162	774,7	533,4	16	2 3/4"	73,0	835
20"	985	177,8	831,8	584,2	16	3"	79,4	1062
24"	1170	203,2	990,6	692,2	16	3 1/2"	92,1	1712

Dimensions in mm for **Class 2500**

Nominal diameter DN	Flange			Facing g	Bolts			Weight kg/piece
	D	b min.	k		Number	Thread	d2	
1/2"	135	30,2	88,9	34,9	4	3/4"	22,2	3
3/4"	140	31,8	95,2	42,9	4	3/4"	22,2	4,5
1"	160	35	108	50,8	4	7/8"	25,4	5
1 1/4"	185	38,1	130,2	63,5	4	1"	28,6	8
1 1/2"	205	44,5	146	73	4	1 1/8"	31,7	11
2"	235	50,9	171,4	92,1	8	1"	28,6	17
2 1/2"	265	57,2	196,8	104,8	8	1 1/8"	31,7	25
3"	305	66,7	228,6	127	8	1 1/4"	34,9	39
4"	355	76,2	273	157,2	8	1 1/2"	41,3	60
5"	420	92,1	323,8	185,7	8	1 3/4"	47,6	101
6"	485	108	368,3	215,9	8	2"	54	156
8"	550	127	438,2	269,9	12	2"	54	242
10"	675	165,1	539,8	323,8	12	2 1/2"	66,7	465
12"	760	184,2	619,1	381	12	2 3/4"	73,0	665

Further footnotes see page 28.

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# Blind Flanges

Class 150 – Class 900 / ASME B16.47 Series A (MSS SP-44)

**H 400**

Page 35

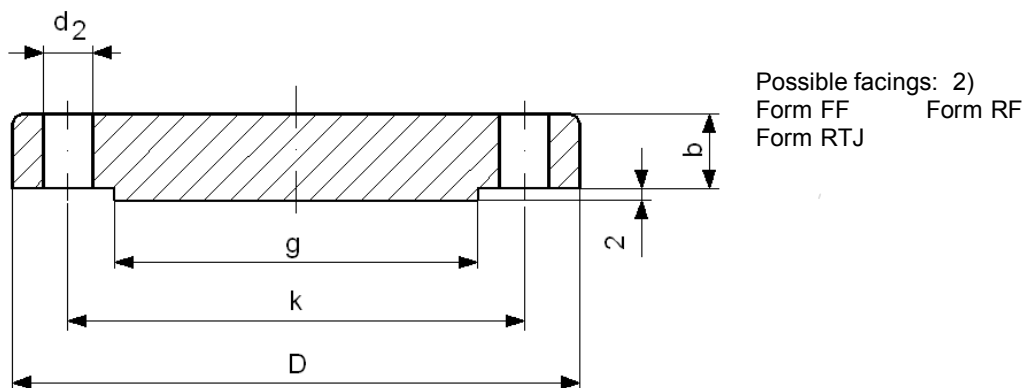
Example of Designation: Designation of a blind flange with flange facing RTJ, nominal diameter 28", class 900, material: A182 Gr.F304

Part number  
**44545M0S2      28 (INCH) BLIND FLANGE/RTJ CLASS 900 ASTM A182 GR.F304 H400/ASME B16.47**

Part numbering Code														
Position of Part No.														
1. - 2.		3.		4.		5. - 6.		7.- 8.		9.				
Kind of Part		Class 3)		Flange Facing 2)		ASTM-material 1)				Certificate 7)				
Cd.		Cd.		Cd.		Cd.		Cd.		Cd.				
Blind Flange	44	150	1	Flat Face (FF) 4)	0	A105	5B	0	S 6)	ASME/ MSS	2			
		300	2	Raised Face (RF)	1	A181 Cl.70	5D							
		400	3	Ring Type Joint (RTJ)	4	A182 Gr.F1	5E							
			600	4	Raised Face (RF)	9	A182 Gr.F5			5F			ASME/ MSS	H
			900	5	125 RMS 5)		A182 Gr.F11			5J				
							A182 Gr.F12			5K				
							A182 Gr.F22			5L				
							A182 Gr.F304			5M				
							A182 Gr.F316			5P				
							A182 Gr.F321			5Q				
							MSS SP-44 /Gr.F36			E9				
							A182 Gr.F304L			F4				
							A182 Gr.F316H			F5				
							A182 Gr.F316L			F6				
							A182 Gr.F321H			F7				
						A182 Gr.F51 (S31803)	T1							
						A182 Gr.F91	T2							

- 1) Materials:  
All materials correspond with specified ASTM- / MSS-standards.
- 2) Flange facings and roughness according to ASME B16.47 (MSS SP-44).
- 3) Code for class.
- 4) This standard permits flat face flanges in all classes.
- 5) Raised face (RF) - Flanges with roughness 125 RMS are only available if class  $\geq$  300.
- 6) Flanges according to ASME B16.47 Series A correspond with flanges according to MSS SP-44, suit to flanges according to BS 3293 and ASME B16.1 and are standardized with ratings according to ASME B16.5. These flanges are designated by code "S" at position 8 of part number.
- 7) Standard certificate according .to corresponding ASTM- / ASME- / MSS-standards (i.e. no test report).
- 8) For flanges with end coding H a "certified test report" according to ASTM A530 shall be provided.

**Blind Flange Class 150 / ASME B16.47 Series A (MSS SP-44)**



Dimensions in mm

Nominal diameter DN	D	Flange		Facing g	Number	Bolts		Weight kg/piece
		b min.	k			Thread	d2	
(22")	750	44,5	692,2	641,4	20	1 1/4"	35	152
26"	870	66,7	806,4	749	24	1 1/4"	35	305
28"	925	69,9	863,6	800	28	1 1/4"	35	361
30"	985	73,1	914,4	857	28	1 1/4"	35	430
32"	1060	79,4	977,9	914	28	1 1/2"	41,1	536
34"	1110	81	1028,7	965	32	1 1/2"	41,1	598
36"	1170	88,9	1085,8	1022	32	1 1/2"	41,1	731
38"	1240	85,8	1149,4	1073	32	1 1/2"	41,1	797
40"	1290	88,9	1200,2	1124	36	1 1/2"	41,1	892
42"	1345	95,3	1257,3	1194	36	1 1/2"	41,1	1042
44"	1405	100,1	1314,4	1245	36	1 1/2"	41,1	1197
46"	1455	101,6	1365,2	1295	40	1 1/2"	41,1	1301
48"	1510	106,4	1422,4	1359	44	1 1/2"	41,1	1466
50"	1570	109,6	1479,6	1410	44	1 3/4"	47,6	1619
52"	1625	114,3	1536,7	1461	44	1 3/4"	47,6	1813
54"	1685	119,1	1593,8	1511	44	1 3/4"	47,6	2035
56"	1745	122,3	1651	1575	48	1 3/4"	47,6	2240
58"	1805	127	1708,2	1626	48	1 3/4"	47,6	2493
60"	1855	130,2	1759	1676	52	1 3/4"	47,6	2696

Bracketed nominal diameters shall be avoided (dimensions according to MSS SP-44).

Further footnotes see page 35.

### Blind Flange Class 300 /ASME B16.47 Series A (MSS-SP-44)

Drawing and possible facings see page 36

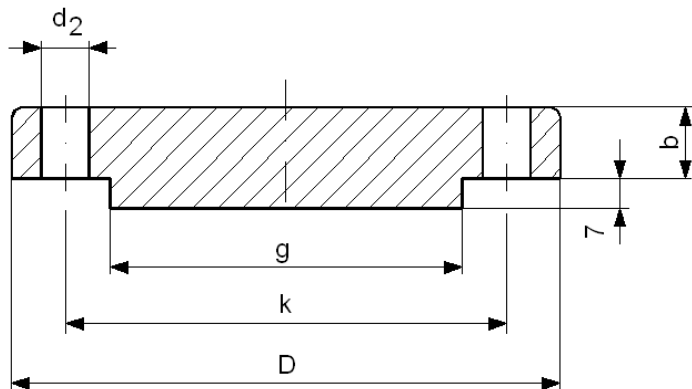
Dimensions in mm

Nominal diameter DN	Flange			Facing g	Bolts			Weight kg/piece
	D	b min.	k		Number	Thread	d2	
(22")	840	65,1	743	641,5	24	1 1/2"	41,1	271
26"	970	82,6	876,3	749	28	1 5/8"	44,4	457
28"	1035	88,9	939,8	800	28	1 5/8"	44,4	564
30"	1090	93,7	997	857	28	1 3/4"	47,6	657
32"	1150	98,5	1054,1	914	28	1 7/8"	50,8	768
34"	1205	103,2	1104,9	965	28	1 7/8"	50,8	887
36"	1270	109,6	1168,4	1022	32	2"	53,8	1038
38"	1170	106,4	1092,2	1029	32	1 1/2"	41,1	874
40"	1240	112,8	1155,7	1086	32	1 5/8"	44,4	1038
42"	1290	117,5	1206,5	1137	32	1 5/8"	44,4	1173
44"	1355	122,3	1263,6	1194	32	1 3/4"	47,8	1344
46"	1415	127	1320,8	1245	28	1 7/8"	50,8	1527
48"	1465	131,8	1371,6	1302	32	1 7/8"	50,8	1694
50"	1530	138,2	1428,8	1359	32	2"	53,8	1934
52"	1580	142,9	1479,6	1410	32	2"	53,8	2138
54"	1660	150,9	1549,4	1467	28	2 1/4"	60,5	2489
56"	1710	152,4	1600,2	1518	28	2 1/4"	60,5	2674
58"	1760	157,2	1651	1575	32	2 1/4"	60,5	2913
60"	1810	162	1701,8	1626	32	2 1/4"	60,5	3181

Bracketed nominal diameters shall be avoided (dimensions according to MSS SP-44).

Further footnotes see page 35.

**Blind Flange Class 400 / ASME B16.47 Series A (MSS SP-44)**



Possible facings: 2)  
 Form FF                      Form RF  
 Form RTJ

Dimensions in mm

Nominal diameter DN	D	Flange b min.	k	Facing g	Bolts			Weight kg/piece
					Number	Thread	d2	
(22")	840	73,1	743	641,5	24	1 5/8"	44,4	314
26"	970	98,5	876,3	749	28	1 3/4"	47,6	556
28"	1035	104,8	939,8	800	28	1 7/8"	50,8	672
30"	1090	111,2	997	857	28	2"	53,8	789
32"	1150	115,9	1054,1	914	28	2"	53,8	921
34"	1205	122,3	1104,9	965	28	2"	53,8	1072
36"	1270	128,6	1168,4	1022	32	2"	53,8	1248
38"	1205	123,9	1117,6	1035	32	1 3/4"	47,8	1097
40"	1270	130,2	1174,8	1092	32	1 7/8"	50,8	1277
42"	1320	133,4	1225,6	1143	32	1 7/8"	50,8	1418
44"	1385	139,7	1282,7	1200	32	2"	53,8	1631
46"	1440	146,1	1339,8	1257	36	2"	53,8	1838
48"	1510	152,4	1403,4	1308	28	2 1/4"	60,5	2115
50"	1570	158,8	1460,5	1362	32	2 1/4"	60,5	2374
52"	1620	163,6	1511,3	1413	32	2 1/4"	60,5	2609
54"	1700	171,5	1581,2	1470	28	2 1/2"	66,5	3012
56"	1755	176,3	1632,0	1527	32	2 1/2"	66,5	3288
58"	1805	181	1682,8	1578	32	2 1/2"	66,5	3578
60"	1885	189,0	1752,6	1635	32	2 3/4"	73,2	4047

Bracketed nominal diameters shall be avoided (dimensions according to MSS SP-44).

Further footnotes see page 35.

### Blind Flange Class 600 / ASME B16.47 Series A (MSS SP-44)

Drawing and possible facings see page 38

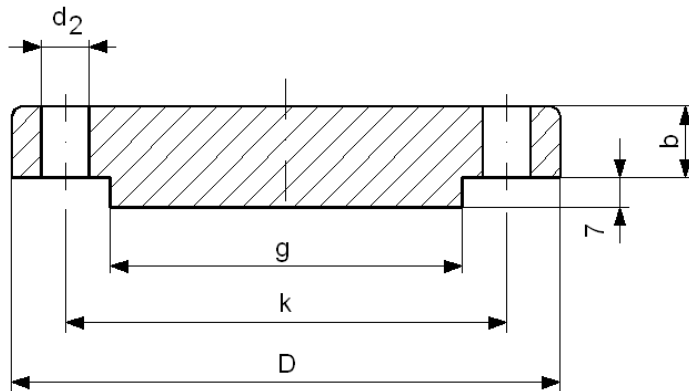
Dimensions in mm

Nominal diameter DN	Flange			Facing g	Bolts			Weight kg/piece
	D	b min.	k		Number	Thread	d2	
(22")	870	95,3	777,8	641,4	24	1 3/4"	47,6	430
26"	1015	125,5	914,4	749	28	1 7/8"	50,8	764
28"	1175	131,8	965,2	800	28	2"	53,8	1081
30"	1130	139,7	1022,4	857	28	2"	53,8	1059
32"	1195	147,7	1079,5	914	28	2 1/4"	60,4	1241
34"	1245	154	1130,3	965	28	2 1/4"	60,4	1412
36"	1315	162	1193,8	1022	28	2 1/2"	66,5	1645
38"	1270	155	1162	1054	28	2 1/4"	60,4	1488
40"	1320	162	1212,8	1111	32	2 1/4"	60,4	1673
42"	1405	171,5	1282,7	1168	28	2 1/2"	66,5	2011
44"	1455	177,8	1333,5	1226	32	2 1/2"	66,5	2226
46"	1511	185	1390,6	1276	32	2 1/2"	66,5	2508
48"	1595	195,3	1460,5	1334	32	2 3/4"	73,2	2927
50"	1670	203,2	1524,0	1384	28	3"	79,2	3349
52"	1720	209,6	1574,8	1435	32	3"	79,2	3645
54"	1780	217,5	1632,0	1492	32	3"	79,2	4067
56"	1855	225,5	1695,4	1543	32	3 1/4"	85,9	4549
58"	1905	231,8	1746,2	1600	32	3 1/4"	85,9	4949
60"	1995	242,9	1822,4	1657	28	3 1/2"	91,9	5712

Bracketed nominal diameters shall be avoided (dimensions according to MSS SP-44).

Further footnotes see page 35.

**Blind Flange Class 900 / ASME B16.47 Series A**



Possible facings: 2)  
 Form FF                      Form RF  
 Form RTJ

Dimensions in mm

Nominal diameter DN	D	Flange		Facing g	Bolts		Weight kg/piece
		b min.	k		Number	Thread	
26"	1085	160,4	952,5	749	20	2 3/4"	1080
28"	1170	171,5	1022,4	800	20	3"	1339
30"	1230	182,6	1085,9	857	20	3"	1590
32"	1315	193,7	1155,7	914	20	3 1/4"	1921
34"	1395	204,8	1225,6	965	20	3 1/2"	2279
36"	1460	214,4	1289	1022	20	3 1/2"	2634
38"	1460	215,9	1289	1099	20	3 1/2"	2659
40"	1510	223,9	1339,8	1162	24	3 1/2"	2920
42"	1560	231,8	1390,6	1213	24	3 1/2"	3245
44"	1650	242,9	1463,7	1270	24	3 3/4"	3789
46"	1735	255,6	1536,7	1334	24	4"	4397
48"	1785	263,6	1587,5	1384	24	4"	4824

Further footnotes see page 35.

# Slip-on Flanges

Class 150 – Class 1500 / ASME B16.5

**H 400**

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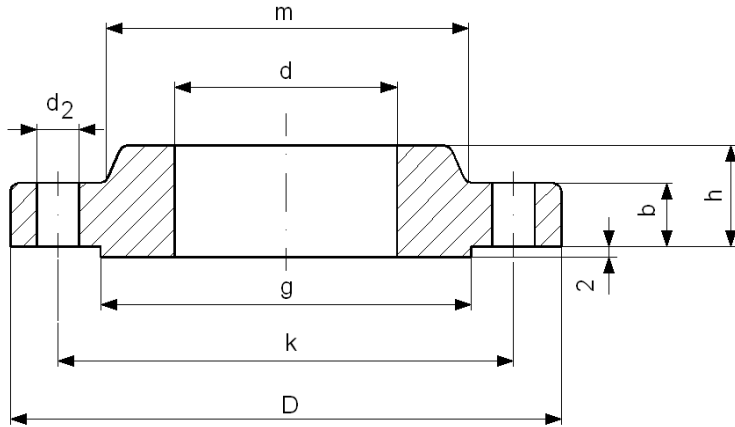
Example of Designation: Designation of a slip-on flange with flange facing RF, nominal diameter 6", class 300, material: A105

Part number  
**45215B002      6 (INCH) SLIP-ON FLANGE/RF CLASS 300    ASTM A105**  
**H400/ASME B16.5**

Part numbering Code											
Position of Part No.											
1. - 2.		3.		4.		5. - 6.		7.- 8.		9.	
Kind of Part		Class 3)		Flange Facing 2)		ASTM-material 1)		Wall thickness		Certificate 6)	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.
Slip-on flange	45	150	1	Flat Face (FF) 4)	0	A105	5B	0	0	ASME	2
		300	2	Raised Face (RF)	1	A181 Cl.70	5D			7)	H
		400	3	Large Tongue (LT)	2	A182 Gr.F1	5E			ASME	
		600	4	Large Groove (LG)	3	A182 Gr.F5	5F				
		900	5	Ring Type Joint (RTJ)	4	A182 Gr.F11	5J				
		1500	6	Large Male (LM)	5	A182 Gr.F12	5K				
				Large Female (LF)	6	A182 Gr.F22	5L				
				Raised Face (RF)	9	A182 Gr.F304	5M				
				125 RMS 5)		A182 Gr.F316	5P				
						A182 Gr.F321	5Q				
						A285 Gr.C	5U				
						A182 Gr.F304L	F4				
						A182 Gr.F316L	F6				

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Flange facings and roughness according to ASME B16.5.
- 3) Code for class.
- 4) Class 150 - Steel flanges may also be ordered with flat face (FF).
- 5) Raised face (RF) - Flanges with roughness 125 RMS are only available if class  $\geq$  300.
- 6) Standard certificate according .to corresponding ASTM- / ASME-standards (i.e. no test report).
- 7) For flanges with end coding H a "certified test report" according to ASTM A530 shall be provided.

**Slip-On Flange Class 150 / ASME B16.5**



Possible facings: 2)  
 Form FF            Form RF  
 Form LT            Form LG  
 Form RTJ           Form LM  
 Form LF

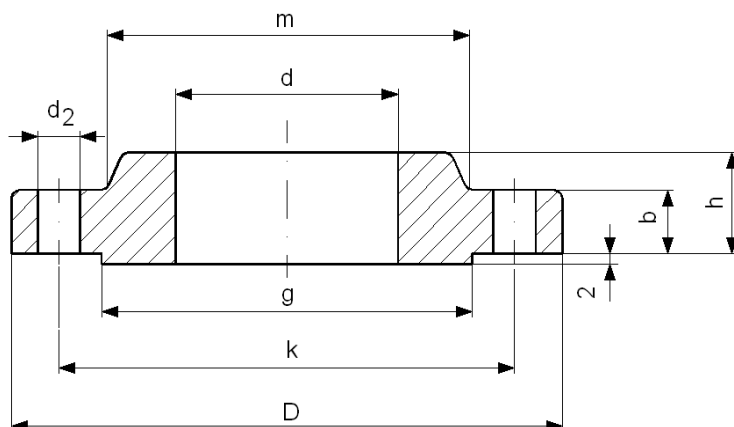
Dimensions in mm

Nominal diameter DN	D	d min.	Flange			Neck m	Facing g	Bolts			Weight kg/piece
			b	h	k			Num- ber	Thread	d2	
1/2"	90	22,2	9,6	14	60,3	30	34,9	4	1/2"	15,9	0,4
3/4"	100	27,7	11,2	14	69,9	38	42,9	4	1/2"	15,9	0,7
1"	110	34,5	12,7	16	79,4	49	50,8	4	1/2"	15,9	0,8
1 1/4"	115	43,2	14,3	19	88,9	59	63,5	4	1/2"	15,9	1,1
1 1/2"	125	49,5	15,9	21	98,4	65	73,0	4	1/2"	15,9	1,4
2"	150	61,9	17,5	24	120,7	78	92,1	4	5/8"	19	2,2
2 1/2"	180	74,6	20,7	27	139,7	90	104,8	4	5/8"	19	3,6
3"	190	90,7	22,3	29	152,4	108	127,0	4	5/8"	19	4,1
(3 1/2")	215	103,4	22,3	30	177,8	122	139,7	8	5/8"	19	5,2
4"	230	116,1	22,3	32	190,5	135	157,2	8	5/8"	19	5,6
5"	255	143,8	22,3	35	215,9	164	185,7	8	3/4"	22,2	6,3
6"	280	170,7	23,9	38	241,3	192	215,9	8	3/4"	22,2	7,5
8"	345	221,5	27,0	43	298,5	246	269,9	8	3/4"	22,2	12,6
10"	405	276,2	28,6	48	362	305	323,8	12	7/8"	25,4	18,5
12"	485	327	30,2	54	431,8	365	381,0	12	7/8"	25,4	28
14"	535	359,2	33,4	56	476,3	400	412,8	12	1"	28,6	36
16"	595	410,5	35,0	62	539,8	457	469,9	16	1"	28,6	46
18"	635	461,8	38,1	67	577,9	505	533,4	16	1 1/8"	31,7	50
20"	700	513,1	41,3	71	635	559	584,2	20	1 1/8"	31,7	64
24"	815	616	46,1	81	749,3	663	692,2	20	1 1/4"	34,9	89

Bracketed nominal diameters shall be avoided.

Further footnotes see page 41.

## Slip-On Flange Class 300 / ASME B16.5



Possible facings: 2)

Form RF            Form LT

Form LG           Form RTJ

Form LM           Form LF

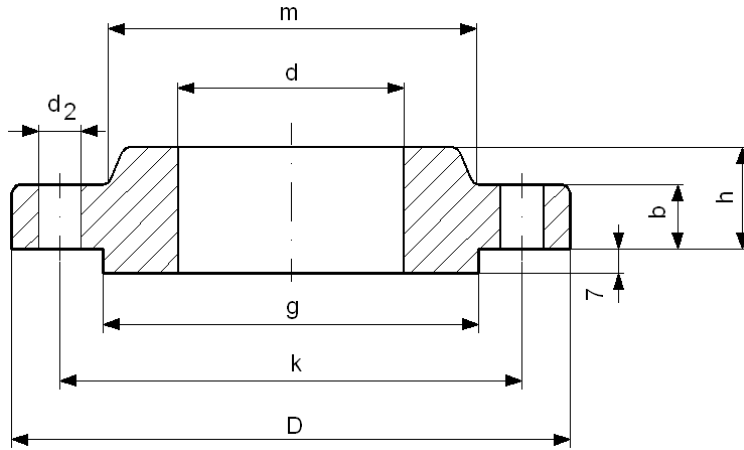
Dimensions in mm

Nominal diameter DN	D	Flange				Neck m	Facing g	Bolts			Weight kg/piece
		d min.	b	h	k			Number	Thread	d2	
1/2"	95	22,2	12,7	21	66,7	38	34,9	4	1/2"	15,9	0,7
3/4"	115	27,7	14,3	24	82,6	48	42,9	4	5/8"	19	1,1
1"	125	34,5	15,9	25	88,9	54	50,8	4	5/8"	19	1,4
1 1/4"	135	43,2	17,5	25	98,4	64	63,5	4	5/8"	19	1,8
1 1/2"	155	49,5	19,1	29	114,3	70	73,0	4	3/4"	22,2	2,6
2"	165	61,9	20,7	32	127	84	92,1	8	5/8"	19	3,4
2 1/2"	190	74,7	23,9	37	149,2	100	104,8	8	3/4"	22,2	4,4
3"	210	90,7	27,0	41	168,3	117	127,0	8	3/4"	22,2	6,1
(3 1/2")	230	103,4	28,6	43	184,2	133	139,7	8	3/4"	22,2	7,5
4"	255	116,1	30,2	46	200	146	157,2	8	3/4"	22,2	10,1
5"	280	143,8	33,4	49	235	178	185,7	8	3/4"	22,2	12,5
6"	320	170,7	35	51	269,9	206	215,9	12	3/4"	22,2	14,1
8"	380	221,5	39,7	60	330,2	260	269,9	12	7/8"	25,4	24,8
10"	445	276,2	46,1	65	387,4	321	323,8	16	1"	28,6	37,1
12"	520	327	49,3	71	450,8	375	381,0	16	1 1/8"	31,7	50
14"	585	359,2	52,4	75	514,4	425	412,8	20	1 1/8"	31,7	70
16"	650	410,5	55,6	81	571,5	483	469,9	20	1 1/4"	34,9	97
18"	710	461,8	58,8	87	628,6	533	533,4	24	1 1/4"	34,9	123
20"	775	513,1	62,0	94	685,8	587	584,2	24	1 1/4"	34,9	133
24"	915	616	68,3	105	812,8	702	692,2	24	1 1/2"	41,3	208

Bracketed nominal diameters shall be avoided.

Further footnotes see page 41.

**Slip-On Flange Class 400 / ASME B16.5**



Possible facings: 2)  
 Form RF            Form LT  
 Form LG            Form RTJ  
 Form LM            Form LF

Dimensions in mm

Nominal diameter DN	Flange					Neck m	Facing g	Bolts			Weight kg/piece
	D	d min.	b min.	h	k			Num- ber	Thread	d2	
1/2" up to (3 1/2")	Use Class 600 dimensions for these sizes										
4"	255	116,1	35	51	200	146	157,2	8	7/8"	25,4	11,5
5"	280	143,8	38,1	54	235	178	185,7	8	7/8"	25,4	14,5
6"	320	170,7	41,3	57	269,9	206	215,9	12	7/8"	25,4	19,0
8"	380	221,5	47,7	68	330	260	269,9	12	1"	28,6	29,0
10"	445	276,2	54	73	387,4	321	323,8	16	1 1/8"	31,7	39,5
12"	520	327	57,2	79	450,8	375	381,0	16	1 1/4"	34,9	58
14"	585	369,2	60,4	84	514,4	425	412,8	20	1 1/4"	34,9	82
16"	650	410,5	63,5	94	571,5	483	469,9	20	1 3/8"	38,1	105
18"	710	461,8	66,7	98	628,6	533	533,4	24	1 3/8"	38,1	126
20"	775	513,1	69,9	102	685,8	587	584,2	24	1 1/2"	41,3	152
24"	915	616	76,2	114	812,8	702	692,2	24	1 3/4"	47,6	218

Bracketed nominal diameters shall be avoided.

Further footnotes see page 41.

**Slip-On Flange Class 600 / ASME B16.5**

Drawing and possible facings see page 44

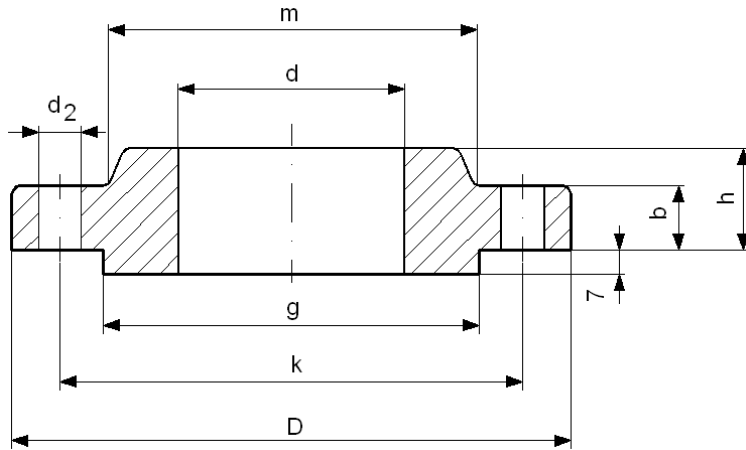
Dimensions in mm

Nominal diameter DN	D	d min.	Flange			Neck m	Facing g	Num- ber	Bolts		Weight kg/piece
			b min.	h	k				Thread	d2	
1/2"	95	22,2	14,3	22	66,7	38	34,9	4	1/2"	15,9	0,8
3/4"	115	27,7	15,9	25	82,6	48	42,9	4	5/8"	19	1,4
1"	125	34,5	17,5	27	88,9	54	50,8	4	5/8"	19	1,6
1 1/4"	135	43,2	20,7	29	98,4	64	63,5	4	5/8"	19	2,1
1 1/2"	155	49,5	22,3	32	114,3	70	73,0	4	3/4"	22,2	3,1
2"	165	62,0	25,4	37	127	84	92,1	8	5/8"	19	3,7
2 1/2"	190	74,6	28,6	41	149,2	100	104,8	8	3/4"	22,2	5,4
3"	210	90,7	31,8	46	168,3	117	127,0	8	3/4"	22,2	7,3
(3 1/2")	230	103,4	35	49	184,2	133	139,7	8	7/8"	25,4	8,9
4"	275	116,1	38,1	54	215,9	152	157,2	8	7/8"	25,4	15,8
5"	330	143,8	44,5	60	266,7	189	185,7	8	1"	28,6	24,5
6"	355	170,7	47,7	67	292,1	222	215,9	12	1"	28,6	29,5
8"	420	221,5	55,6	76	349,2	273	269,9	12	1 1/8"	31,7	43
10"	510	276,2	63,5	86	431,8	343	323,8	16	1 1/4"	34,9	70
12"	560	327	66,7	92	489	400	381,0	20	1 1/4"	34,9	86
14"	605	359,2	69,9	94	527	432	412,8	20	1 3/8"	38,1	100
16"	685	410,5	76,2	106	603,2	495	469,9	20	1 1/2"	41,3	142
18"	745	461,8	82,6	117	654,0	546	533,4	20	1 5/8"	44,4	175
20"	815	513,1	88,9	127	723,9	610	584,2	24	1 5/8"	44,4	221
24"	940	616	101,6	140	838,2	718	692,2	24	1 7/8"	50,8	315

Bracketed nominal diameters shall be avoided.

Further footnotes see page 41.

**Slip-On Flange Class 900 and Class 1500 / ASME B16.5**



Possible facings: 2)  
 Form RF            Form LT  
 Form LG            Form RTJ  
 Form LM            Form LF

Dimensions in mm for **Class 900**

Nominal diameter DN	Flange					Neck m	Facing g	Bolts		Weight kg/piece	
	D	d min.	b min.	h	k			Num- ber	Thread		d2
1/2" up to 2 1/2"	Use Class 1500 dimensions for these sizes										
3"	241,3	90,7	38,1	54	190,5	127	127	8	7/8"	25,4	11,6
4"	292,1	116,1	44,5	70	235	159	157,2	8	1 1/8"	31,7	19,8
5"	349,2	143,8	50,8	79	279,4	190	185,7	8	1 1/4"	34,9	32
6"	381	170,7	55,6	86	317,5	235	215,9	12	1 1/8"	31,7	41,2
8"	469,9	221,5	63,5	102	393,7	298	269,9	12	1 3/8"	38,1	71,0
10"	546,1	276,2	69,9	108	469,9	368	323,8	16	1 3/8"	38,1	100
12"	609,6	327	79,4	117	533,4	419	381	20	1 3/8"	38,1	133
14"	641,3	369,2	85,8	130	558,8	451	412,8	20	1 1/2"	41,3	152
16"	704,8	410,5	88,9	133	616	508	469,9	20	1 5/8"	44,4	184
18"	787,4	461,8	101,6	152	685,8	565	533,4	20	1 7/8"	50,8	258
20"	857,2	513,1	108	159	749,3	622	584,2	20	2"	54	317
24"	1041,4	616	139,7	203	901,7	749	692,2	20	2 1/2"	66,7	608

Dimensions in mm for **Class 1500**

Nominal diameter DN	Flange					Neck m	Facing g	Bolts		Weight kg/piece	
	D	d min.	b min.	h	k			Num- ber	Thread		d2
1/2"	120	22,2	22,3	32	82,5	38	34,9	4	3/4"	22,2	1,7
3/4"	130	27,7	25,4	35	88,9	44	42,9	4	3/4"	22,2	2,3
1"	150	34,5	28,6	41	101,6	52	50,8	4	7/8"	25,4	3,4
1 1/4"	160	43,2	28,6	41	111,1	64	63,5	4	7/8"	25,4	3,9
1 1/2"	180	49,5	31,8	44	123,8	70	73	4	1"	28,6	5,4
2"	215	62	38,1	57	165,1	105	92,1	8	7/8"	25,4	9,8
2 1/2"	245	74,6	41,3	64	190,5	124	104,8	8	1"	28,6	13,7

Further footnotes see page 41.

# Hub Flanges

## Class D and E / AWWA C207

**H 400**

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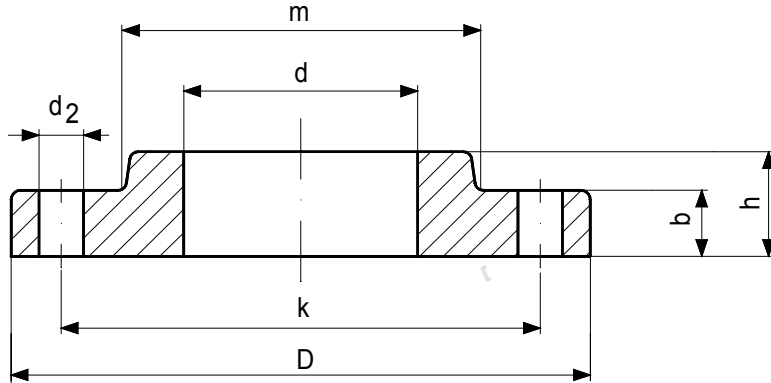
Example of Designation: Designation of a hub flange with flange facing FF, nominal diameter 40", Class E, material: A285 Gr.C

Part number  
**45H05U0A2      40 (INCH)      HUB FLANGE/FF CLASS E      ASTM A285 Gr.C**  
**275PSI H400/AWWA C207**

Part numbering Code												
Position of Part No.												
1. - 2		3.		4.		5. - 6.		7.- 8.		9.		
Kind of Part		Class 3) 5)		Flange Facing 2)		ASTM-material 1)				Certificate 8)		
	Cd.	D	D	Flat Face (FF) 4)	Cd.		Cd.	Cd.	Cd.	Cd.		
Hub Flange	45	D	D	Flat Face (FF) 4)	0	A105	5B	0	A 7)	ASME/	2	
		E	H	Raised Face (RF)	1	A181 Cl.70	5D			AWWA		
							A182 Gr.F1	5E				
							A182 Gr.F304	5M				
							A182 Gr.F316	5P				
							A182 Gr.F321	5Q				
							A285 Gr.C	5U				
							A182 Gr.F304L	F4				
					A182 Gr.F316L	F6						

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Flange facings according to AWWA C207.
- 3) Code for class.
- 4) AWWA C207 flanges have a standard facing Flat Face (FF).
- 5) Connecting dimensions for AWWA C207 / Class D and Class E correspond with ASME B16.1 / Class 125.
- 6) For larger sizes than 96" steel-ring flanges shall be used (special part).
- 7) AWWA-flanges are designated by code "A" at position 8 of part number.
- 8) Certificate according to ASME- / AWWA- / ASTM-standards.

**Hub Flange Class D / AWWA C207**  
(175 - 150 psi) +)



Possible facings:  
Form FF,RF

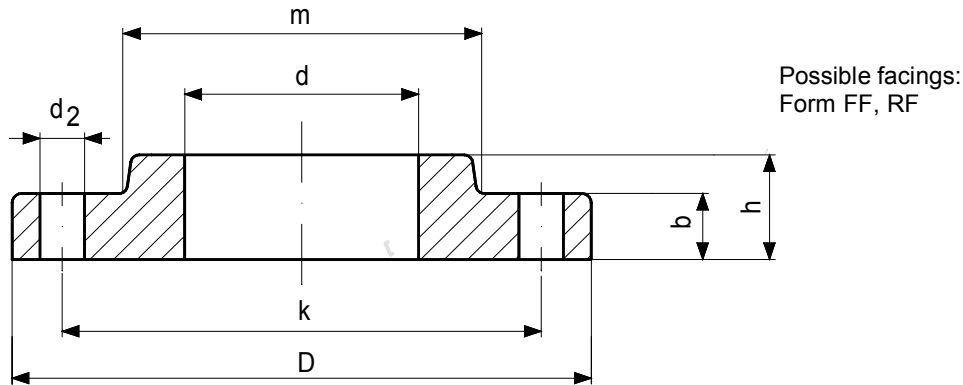
Dimensions in mm

Nominal diameter DN	Flange					Neck m	Bolts			Weight kg/piece
	D	d	b	h	k		Num- ber	Thread	d2	
26"	869,9	665,2	25,4	44,5	806,5	723,9	24	1 1/4"	35	54,1
28"	927,1	716,0	25,4	44,5	863,6	774,7	28	1 1/4"	35	59,1
30"	984,3	766,8	25,4	44,5	914,4	825,5	28	1 1/4"	35	65,1
32"	1060,5	817,6	28,6	44,5	977,9	882,6	28	1 1/2"	41,3	82,5
34"	1111,3	868,4	28,6	44,5	1028,7	933,5	32	1 1/2"	41,3	86,5
36"	1168,4	919,2	28,6	44,5	1085,8	984,3	32	1 1/2"	41,3	94,1
38"	1238,3	970,0	28,6	44,5	1149,4	1035,1	32	1 1/2"	41,3	107
40"	1289,1	1020,8	28,6	44,5	1200,2	1092,2	36	1 1/2"	41,3	113
42"	1346,2	1071,6	31,8	44,5	1257,3	1143	36	1 1/2"	41,3	130
44"	1403,4	1122,4	31,8	57,2	1314,5	1193,8	40	1 1/2"	41,3	151
46"	1454,2	1173,2	31,8	57,2	1365,3	1244,6	40	1 1/2"	41,3	158
48"	1511,3	1224,0	35,0	63,5	1422,4	1295,4	44	1 1/2"	41,3	185
50"	1568,5	1274,8	35,0	63,5	1479,6	1346,2	44	1 3/4"	47,6	191
52"	1625,6	1325,6	35,0	63,5	1536,7	1397	44	1 3/4"	47,6	203
54"	1682,8	1376,4	35,0	63,5	1593,9	1447,8	44	1 3/4"	47,6	216
60"	1854	1528,8	38,1	69,9	1759,0	1600,2	52	1 3/4"	47,6	274
66"	2032	1681,2	38,1	69,9	1931	1753	52	1 3/4"	47,6	326
72"	2197	1833,6	38,1	69,9	2096	1905	60	1 3/4"	47,6	364
78"	2363	1986,0	44,5	76,2	2261	2064	64	2"	54	459
84"	2534	2138,4	44,5	76,2	2426	2223	64	2"	54	527
90"	2705	2290,8	50,8	82,6	2591	2381	68	2 1/4"	60,3	652
96" 6)	2877	2443,2	50,8	82,6	2756	2540	68	2 1/4"	60,3	738

+ ) Pressure rating at atmospheric temperature is 150 psi for sizes larger than 12".  
These flanges have the same diameter and drilling as class 125 cast-iron flanges (ASME B16.1).

Further footnotes see page 47.

**Hub Flange Class E / AWWA C207**  
(275 psi) ++)



Dimensions in mm

Nominal diameter DN	Flange					Neck m	Bolts			Weight kg/piece
	D	d	b	h	k		Num- ber	Thread	d2	
26"	869,9	665,2	50,8	85,7	806,5	723,9	24	1 1/4"	35	107
28"	927,1	716,0	52,4	87,3	863,6	781,1	28	1 1/4"	35	122
30"	984,3	766,8	54,0	88,9	914,4	831,9	28	1 1/4"	35	138
32"	1060,5	817,6	57,2	92,1	977,9	889	28	1 1/2"	41,3	170
34"	1111,3	868,4	58,8	93,7	1028,7	939,8	32	1 1/2"	41,3	182
36"	1168,4	919,2	60,3	95,3	1085,8	997,0	32	1 1/2"	41,3	205
38"	1238,3	970,0	60,3	95,3	1149,4	1060,5	32	1 1/2"	41,3	239
40"	1289,1	1020,8	63,5	98,4	1200,2	1111,3	36	1 1/2"	41,3	260
42"	1346,2	1071,6	66,7	101,6	1257,3	1168,4	36	1 1/2"	41,3	294
44"	1403,4	1122,4	66,7	101,6	1314,5	1219,2	40	1 1/2"	41,3	312
46"	1454,2	1173,2	68,3	103,2	1365,3	1270	40	1 1/2"	41,3	332
48"	1511,3	1224,0	69,9	104,8	1422,4	1327,2	44	1 1/2"	41,3	362
50"	1568,5	1274,8	69,9	104,8	1479,6	1378,0	44	1 3/4"	47,6	375
52"	1625,6	1325,6	73,0	108,0	1536,7	1435,1	44	1 3/4"	47,6	418
54"	1682,8	1376,4	76,2	111,2	1593,9	1492,3	44	1 3/4"	47,6	464
60"	1854	1528,8	79,4	114,3	1759,0	1657	52	1 3/4"	47,6	568
66"	2032	1681,2	85,7	123,8	1931	1816	52	1 3/4"	47,6	735
72"	2197	1833,6	88,9	127	2096	1994	60	1 3/4"	47,6	871
78"	2363	1986,0	98,4	136,5	2261	2146	64	2"	54	1035
84"	2534	2138,4	98,4	136,5	2426	2299	64	2"	54	1173
90"	2705	2290,8	107,9	146,1	2591	2457	68	2 1/4"	60,3	1395
96" 6)	2877	2443,2	107,9	146,1	2756	2610	68	2 1/4"	60,3	1566

++) Pressure rating at atmospheric temperature is 275 psi.

These flanges have the same diameter and drilling as class 125 cast-iron flanges (ASME B16.1).

Further footnotes see page 47.

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# Socket-Welding Flanges

## Class 150 – Class 1500 / ASME B16.5

**H 400**

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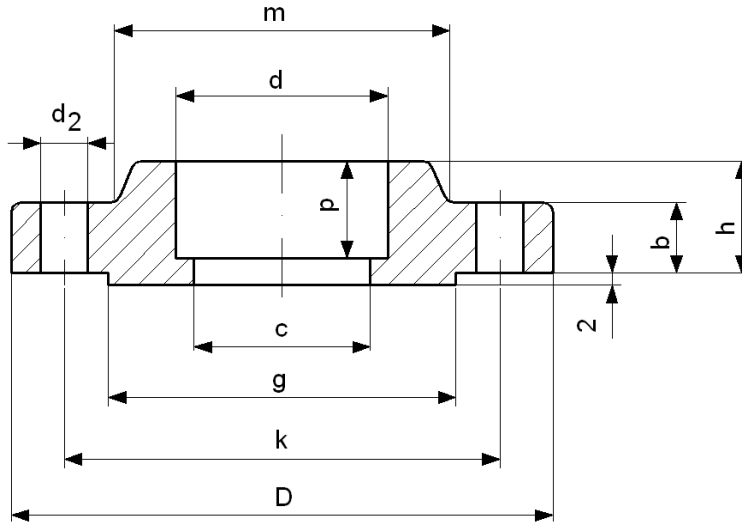
Example of Designation: Designation of a socket-welding flange with flange facing RF, nominal diameter 2", class 600, mating pipe wall thickness Schedule 80, material: A105

Part number  
**46415B502      2 (INCH)      SW-FLANGE/RF CLASS 600      ASTM A105**  
**SCHED.80 H400/ASME B16.5**

Part numbering Code											
Position of Part No.											
1. - 2.		3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part	Cd.	Class 3)		Flange Facing 2)		ASTM-material 1)		Wall thickness		Certificate 9)	
		Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	
Socket-Welding Flange 8)	46	150	1	Flat Face (FF) 6)	0	A105	5B	* 4)	0	ASME	2
		300	2	Raised Face (RF)	1	A181 Cl.70	5D			10)	H
		600	4	Large Tongue (LT)	2	A182 Gr.F304	5M			ASME	
		1500	6	Large Groove (LG)	3	A182 Gr.F316	5P				
				Large Male (LM)	5	A182 Gr.F321	5Q				
				Large Female (LF)	6	A182 Gr.F304L	F4				
				Raised Face (RF) 125 RMS 7)	9	A182 Gr.F316L	F6				

- 1) Materials:  
All materials correspond with specified ASTM-standards.
- 2) Flange facings and roughness according to ASME B16.5.
- 3) Code for class.
- 4) Wall thickness code according to Standard H0011.  
Mating wall thickness see corresponding piping specifications.
- 5) Dimension "c" is given by inside diameter of mating pipe.  
Dimension "c" from table class 150 and 300 correspond to a mating pipe wall thickness "Standard wall".
- 6) Class 150 - Steel flanges may also be ordered with flat face (FF).
- 7) Raised face - Flanges with roughness 125 RMS are only available if class  $\geq$  300.
- 8) Socket-welding flanges are not recommended for services above 260°C.
- 9) Standard certificate according .to corresponding ASTM- / ASME-standards (i.e. no test report).
- 10) For flanges with end coding H a "certified test report" according to ASTM A530 shall be provided.

**Socket Welding Flange Class 150 and Class 300 / ASME B16.5**



Possible facings: 2)  
 Form FF      Form RF  
 Form LT      Form LG  
 Form LF      Form LM

Dimensions in mm for **Class 150**

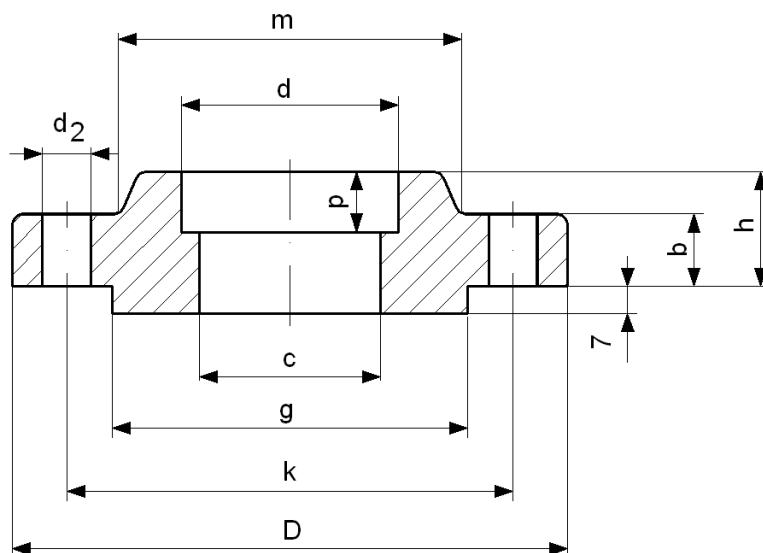
Nominal diameter DN	Outside diameter of pipe	Flange							Neck m	Facing g	Bolts			Weight kg/piece
		D	d min.	b min.	c 5)	p	h	k			Num- ber	Thread	d2	
1/2"	21,3	90	22,2	9,6	15,8	10	14	60,3	30	34,9	4	1/2"	15,9	0,5
3/4"	26,7	100	27,7	11,2	20,9	11	14	69,9	38	42,9	4	1/2"	15,9	0,9
1"	33,4	110	34,5	12,7	26,6	13	16	79,4	49	50,8	4	1/2"	15,9	0,9
1 1/4"	42,2	115	43,2	14,3	35,1	14	19	88,9	59	63,5	4	1/2"	15,9	1,4
1 1/2"	48,3	125	49,5	15,9	40,9	16	21	98,4	65	73	4	1/2"	15,9	1,4
2"	60,3	150	61,9	17,5	52,5	17	24	120,7	78	92,1	4	5/8"	19	2,3
2 1/2"	73	180	74,6	20,7	62,7	19	27	139,7	90	104,8	4	5/8"	19	3,2
3"	88,9	190	90,7	22,3	77,9	21	29	152,4	108	127	4	5/8"	19	3,6

Dimensions in mm for **Class 300**

Nominal diameter DN	Outside diameter of pipe	Flange							Neck m	Facing g	Bolts			Weight kg/piece
		D	d min.	b min.	c 5)	p	h	k			Num- ber	Thread	d2	
1/2"	21,3	95	22,2	12,7	15,8	10	21	66,7	38	34,9	4	1/2"	15,9	0,9
3/4"	26,7	115	27,7	14,3	20,9	11	24	82,6	48	42,9	4	5/8"	19	1,4
1"	33,4	125	34,5	15,9	26,6	13	25	88,9	54	50,8	4	5/8"	19	1,4
1 1/4"	42,2	135	43,2	17,5	35,1	14	25	98,4	64	63,5	4	5/8"	19	1,8
1 1/2"	48,3	155	49,5	19,1	40,9	16	29	114,3	70	73	4	3/4"	22,2	2,7
2"	60,3	165	61,9	20,7	52,5	17	32	127	84	92,1	8	5/8"	19	3,2
2 1/2"	73	190	74,6	23,9	62,7	19	37	149,2	100	104,8	8	3/4"	22,2	4,5
3"	88,9	210	90,7	27	77,9	21	41	168,3	117	127	8	3/4"	22,2	5,9

Footnotes see page 50.

### Socket Welding Flange Class 600 and Class 1500 / ASME B16.5



Possible facings: 2)  
 Form RF      Form LT  
 Form LG      Form LF  
 Form LM

#### Dimensions in mm for Class 600

Nominal diameter DN	Outside diameter of pipe	Flange							Neck m	Facing g	Bolts			Weight kg/piece
		D	d min.	b min.	c 5)	p	h	k			Num- ber	Thread	d2	
1/2"	21,3	95	22,2	14,3	*)	10	22	66,7	38	34,9	4	1/2"	15,9	0,9
3/4"	26,7	115	27,7	15,9		11	25	82,6	48	42,9	4	5/8"	19	1,4
1"	33,4	125	34,5	17,5		13	27	88,9	54	50,8	4	5/8"	19	1,8
1 1/4"	42,2	135	43,2	20,7		14	29	98,4	64	63,5	4	5/8"	19	2,3
1 1/2"	48,3	155	49,5	22,3		16	32	114,3	70	73	4	3/4"	22,2	3,2
2"	60,3	165	61,9	25,4		17	37	127	84	92,1	8	5/8"	19	4,1
2 1/2"	73	190	74,6	28,6		19	41	149,2	100	104,8	8	3/4"	22,2	5,9
3"	88,9	210	90,7	31,8		21	46	168,3	117	127	8	3/4"	22,2	7,3

#### Dimensions in mm for Class 1500

Nominal diameter DN	Outside diameter of pipe	Flange							Neck m	Facing g	Bolts			Weight kg/piece
		D	d min.	b min.	c 5)	p	h	k			Num- ber	Thread	d2	
1/2"	21,3	120	22,2	22,3	*)	10	32	82,6	38	34,9	4	3/4"	22,2	1,8
3/4"	26,7	130	27,7	25,4		11	35	88,9	44	42,9	4	3/4"	22,2	2,3
1"	33,4	150	34,5	28,6		13	41	101,6	52	50,8	4	7/8"	25,4	3,6
1 1/4"	42,2	160	43,2	28,6		14	41	111,1	64	63,5	4	7/8"	25,4	4,1
1 1/2"	48,3	180	49,5	31,8		16	44	123,8	70	73	4	1"	28,6	5,4
2"	60,3	215	61,9	38,1		17	57	165,1	105	92,1	8	7/8"	25,4	11,3
2 1/2"	73	245	74,6	41,3		19	64	190,5	124	104,8	8	1"	28,6	16,3

\*) To be specified by purchaser.

Further footnotes see page 50.

# SAE - Flanges

acc. to SAE J518 for ASME-application

## H 488 A

Page 1 of 10

Example of Designation: Designation of a SAE-flange class 6000, for equipment connection Type SA2, welding nozzle outside diameter 48,3 mm, mating wall thickness 7,14 mm, with inspection certificate, material: nozzle Gr. 316L, flange A 182 Gr. 316L , NBR - O-ring

Part number

**488PF690H****1 1/2"/48,3 \* 7,14**

**EQUIPM. CONNECTION TYPE SA2**  
**CLASS 6000/SCHED.160 H488A/SAE J518**


**Gr.316L/NBR****W.CERT**

Part numbering Code											
Position of Part No.											
1. - 2.		3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Class <sup>3)</sup>		Type <sup>2) 5)</sup>		Material <sup>1)</sup>		Wall thicken. series		Certificate <sup>9)</sup>	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.
Special Flanges SAE-Flanges	48	Standard-pressure series (Class 3000)	7	Types and codes see supply schedule on page 3 Type codes are also indicated by  along with the appropriate sketch	Cd.	A182 Gr.F304 / NBR	5M	0	0	ASME/ SAE	2
						A182 Gr.F316 / NBR	5P	* 4)	0		
		A182 Gr.F321 / NBR	5Q			ASME/ SAE	H				
		Steel ReH $\geq$ 415 MPa / A106 Gr.B / NBR	6)					5V			
		Steel nickel plated ReH $\geq$ 415 MPa / Gr.F304 / NBR	6)					8S			
		Steel nickel plated ReH $\geq$ 330 MPa / Gr.F304 / NBR	7)					8T			
		Steel nickel plated ReH $\geq$ 415 MPa/Gr.F316L / FKM	6)					F1			
		Steel nickel plated ReH $\geq$ 330 MPa/Gr.F316L / FKM	7)					F2			
		Steel nickel plated ReH $\geq$ 330 MPa/Gr.F316 / FKM	7)					F3			
		A182 Gr.F304L / NBR	F4								
		A182 Gr.F316L / NBR	F6								
		Steel nickel plated ReH $\geq$ 330 MPa/Gr.F316 / NBR	7)					F8			
		Steel ReH $\geq$ 330 MPa/ A106 Gr.B / NBR	7)					F9			
		A182 Gr.F304L / FKM	V1								
A182 Gr.F316L / FKM	V2										
Steel ReH $\geq$ 415 MPa / A106 Gr.B / FKM	6)	V3									
Steel ReH $\geq$ 330 MPa / A106 Gr.B / FKM	7)	V4									

- 1) Materials acc. to ASTM-Standard (Materials also see material table on page 2)  
**Welding nozzle:**  
 ASTM A105 / ASTM A106 / ASTM A182  
**Flanges:**  
 ASTM A182  
 Steel ReH $\geq$ 415 MPa or ReH $\geq$ 330 MPa acc. to SAE J518  
 Nickel plating $\geq$ 12  $\mu$ m acc. to manufacturer's standard  
**Bolts:**  
 SAE Gr.5 acc. to SAE J429  
 Nickel plating acc. to manufacturer's standard

- 2) Code for type (also see supply schedule on page 3)  
 3) Code for class  
 4) Code only necessary for welding nozzle flanges. For welding nozzle wall thicknesses the wall thickness codes shall be derived from Standard H011.  
 5) Appropriate gasket see Standard H699  
 6) Preferably for SAE-Flanges Class 3000  
 7) Preferably for SAE-Flanges Class 6000  
 8) Bolts for SAE-flanges for ASME-applications are delivered with UNC- thread.  
 9) Certificate acc. to ASTM-specification  
 For components with end coding "H" a "certified test report" shall be provided.

**Materials:** For flanges or flange connections without O-ring use the same material codes. In this case O-rings will be omitted.

Flange connection without O-ring applies for following flange type codes :  
1, 2, 3, E, F, H, J, S, T, U

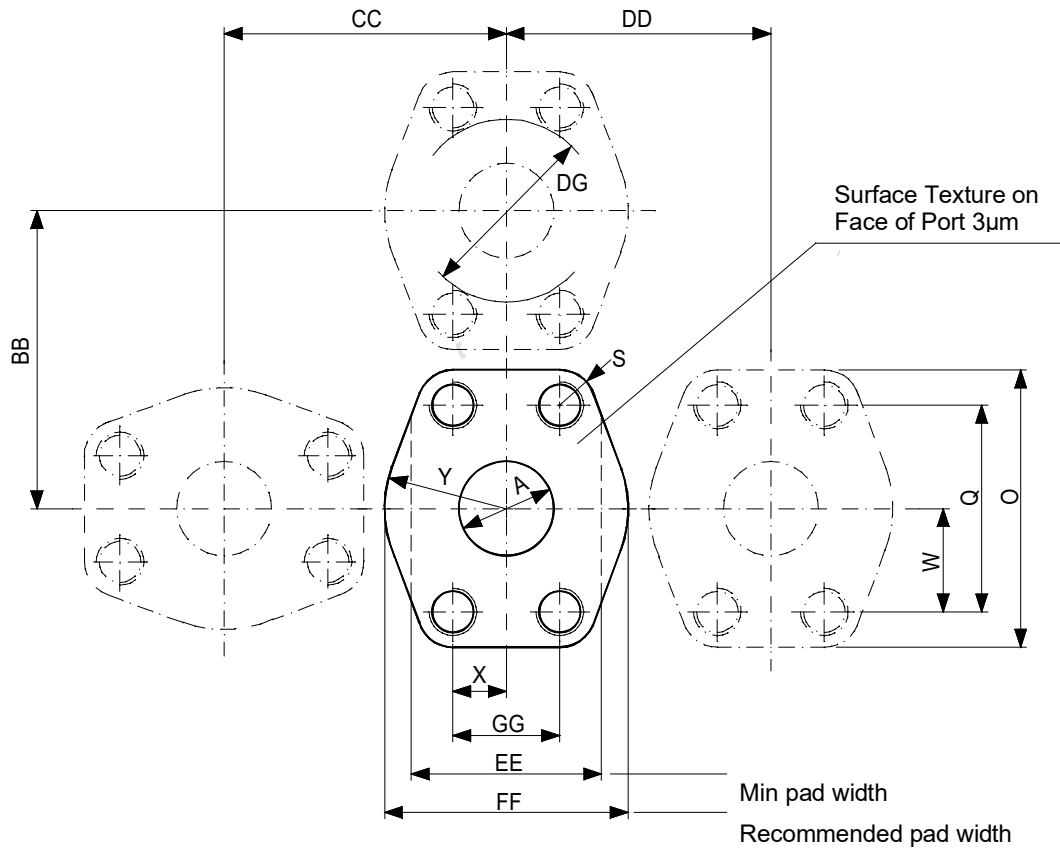
Code	Flange	Welding nozzle (or SW-Flange)	Hexagonal/ Hex. recess bolts and hexagonal nuts	O-Ring
5V	Steel $Re_H \geq 415$ MPa 6) for Class 3000	A106 Gr.B	SAE Gr.5	NBR
F9	Steel $Re_H \geq 330$ MPa 7) for Class 6000	A106 Gr.B	SAE Gr.5	NBR
8S	Steel nickel-plated $Re_H \geq 415$ MPa 6) for Class 3000	Gr.F304	SAE Gr.5 - nickel-plated	NBR
8T	Steel nickel-plated $Re_H \geq 330$ MPa 7) for Class 6000	Gr.F304	SAE Gr.5 - nickel-plated	NBR
F8	Steel nickel-plated $Re_H \geq 330$ MPa 7) for Class 6000	Gr.F316	SAE Gr.5 - nickel-plated	NBR
F4	A182 Gr.F304L	Gr.F304L	SAE Gr.5 nickel-plated	NBR
5M	A182 Gr.F304	Gr.F304	SAE Gr.5 nickel-plated	NBR
5P	A182 Gr.F316	Gr.F316	SAE Gr.5 nickel-plated	NBR
F6	A182 Gr.F316L	Gr.F316L	SAE Gr.5 - nickel-plated	NBR
5Q	A182 Gr.F321	Gr.F321	SAE Gr.5 - nickel-plated	NBR
F1	Steel nickel-plated $Re_H \geq 415$ MPa 6) for Class 3000	Gr.F316L	SAE Gr.5 - nickel-plated	FKM
F2	Steel nickel plated $Re_H \geq 330$ Mpa 7) for Class 6000	Gr.F316L	SAE Gr.5 - nickel-plated	FKM
F3	Steel nickel plated $Re_H \geq 330$ MPa 7) for Class 6000	Gr.F316	SAE Gr.5 - nickel-plated	FKM
V1	A182 Gr.F304L	Gr.F304L	SAE Gr.5 nickel-plated	FKM
V2	A182 Gr.F316L	Gr.F316L	SAE Gr.5 nickel-plated	FKM
V3	Steel $Re_H \geq 415$ MPa 6) for Class 3000	A106 Gr.B	SAE Gr.5	FKM
V4	Steel $Re_H \geq 330$ MPa 7) for Class 6000	A106 Gr.B	SAE Gr.5	FKM

Further footnotes see page 1

**Supply schedule for various flange types:**

Flange types =Position 4 of part number	Cd.	Flange (piece)			Welding nozzle piece	Hex. thru bolt with nut set	Hex. bolt for thread hole set	Hex. Recess bolts for thrd. hole set	O-Ring seal piece	Lock washer set	Sketch on page
		Split piece	Mono bloc or flat piece	Mono bloc with groove piece							
<b>Split flange clamp half</b>	1	1 pair								5	
<b>Equipment split flange connection</b>	2	1 pair					1		1	5	
<b>Flange with welding nozzle flat, type SA1</b>	3		1		1					7	
<b>Threaded flange with groove</b>	9			1				1		10	
<b>Threaded flange equipment connection</b>	A			1			1	1		10	
<b>Socket-weld flange equipment connection</b>	B			1			1	1		9	
<b>Threaded flange connection complete with thread holes</b>	C		1	1			1	1		10	
<b>Socket-weld flange connection complete with thread holes</b>	D		1	1			1	1		9	
<b>Socket-weld flange flat with thread holes</b>	E		1							9	
<b>Socket-weld flange flat with thread holes &amp; split flange</b>	F	1 pair	1				1		1	9	
<b>Blind flange with groove</b>	G			1				1		8	
<b>Threaded flange flat with thread holes</b>	H		1							10	
<b>Welding nozzle flat, type SA1</b>	J				1					7	
<b>Welding nozzle with groove, type SA2</b>	K				1			1		7	
<b>Socket-weld flange with groove</b>	L			1				1		9	
<b>Equipment connection with welding nozzle, type SA2</b>	P		1		1		1	1		7	
<b>Flange connection complete with welding nozzles, type SA1 / SA2</b>	Q		2		2	1		1		7	
<b>Flange connection with welding nozzle flat, type SA1 &amp; hexagon thru bolts with nuts</b>	S		1		1	1				8	
<b>Blind flange flat</b>	T		1							8	
<b>Flange connection, type SF3 with thread holes with welding nozzle flat, type SA1 and split flange with hexagon bolts</b>	U	1 pair	1		1		1		1	8	

**Port Dimensions for Hydraulic Flanged Tube, Pipe and Hose Connections**  
4 - Bolt Split Flange Type



**Class 3000** (Standard pressure series) Dimensions in [mm]

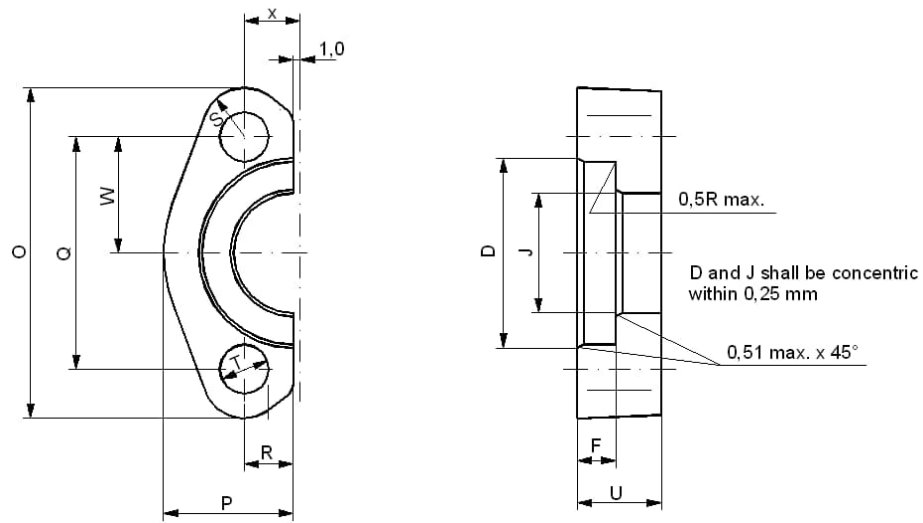
Nom. diam. DN	Flange Dash Size	A +0,0 -1,5	O Nom. dim.	FF	Q ± 0,25	GG ± 0,25	S Rad.	W	X	Y Rad.	BB min.	CC min.	DD min.	EE min.	DG
1/2"	-8	12,7	54	46	38,10	17,48	8	19	9	23	56	52	49	33	33,18
3/4"	-12	19,1	65	52	47,63	22,23	9	24	11	26	68	61	55	41	42,25
1"	-16	25,4	70	59	52,37	26,19	9	26	13	29	72	67	61	48	48,24
1 1/4"	-20	31,8	79	73	58,72	30,18	10	29	15	37	82	78	75	54	54,11
1 1/2"	-24	38,1	94	83	69,85	35,71	12	35	18	41	96	90	85	64	64,96
2"	-32	50,8	102	97	77,77	42,88	12	39	21	49	104	102	99	76	75,31
2 1/2"	-40	63,5	114	109	88,90	50,80	13	44	25	54	117	114	111	89	88,90
3"	-48	76,2	135	131	106,38	61,93	14	53	31	66	137	136	133	106	106,43
(3 1/2")	-56	88,9	152	140	120,65	69,85	16	60	35	70	155	148	142	119	-
4"	-64	101,6	162	152	130,18	77,77	16	65	39	76	164	160	155	132	134,98
5"	-80	127,0	184	181	152,40	92,08	16	76	46	90	186	185	183	151	161,40

Bracketed nominal diameters shall be avoided.

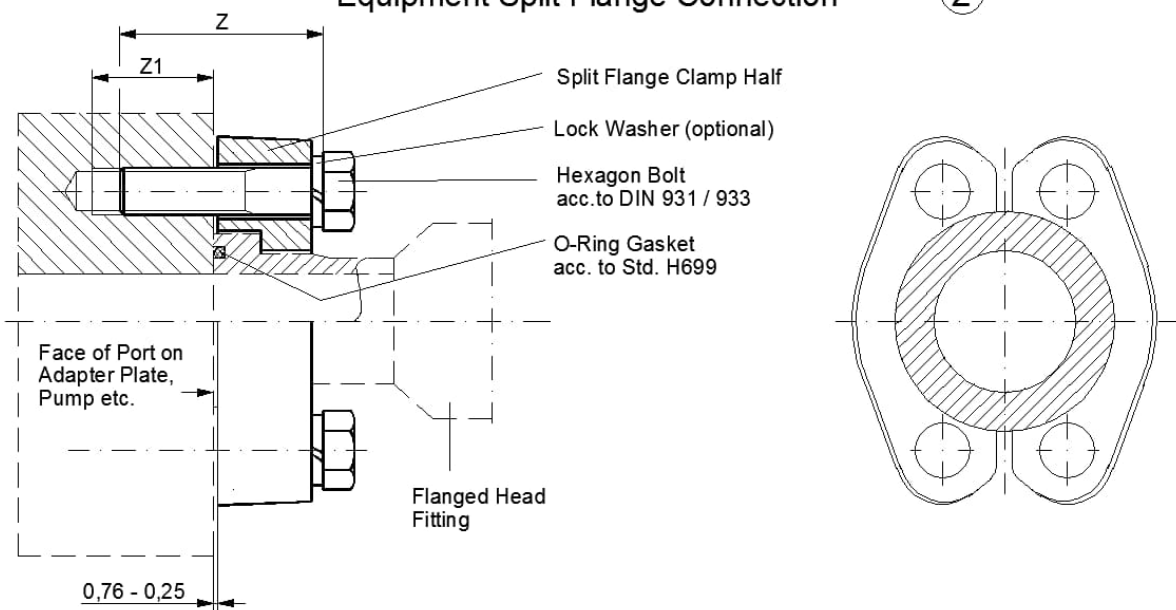
**Class 6000** (High pressure series) Dimensions in [mm]

Nom. diam. DN	Flange Dash Size	A +0,0 -1,5	O Nom. dim.	FF	Q ± 0,25	GG ± 0,25	S Rad.	W	X	Y Rad.	BB min.	CC min.	DD min.	EE min.
1/2"	-8	12,7	56	48	40,49	18,24	8	20	9	24	59	56	53	38
3/4"	-12	19,1	71	60	50,80	23,80	10	25	12	30	75	70	66	48
1"	-16	25,4	81	70	57,15	27,76	12	28	14	35	84	80	75	54
1 1/4"	-20	31,8	95	78	66,68	31,75	14	33	16	39	99	90	83	60
1 1/2"	-24	38,1	113	95	79,38	36,50	17	40	18	48	116	108	101	70
2"	-32	50,8	133	114	96,82	44,45	18	49	22	57	137	128	120	86

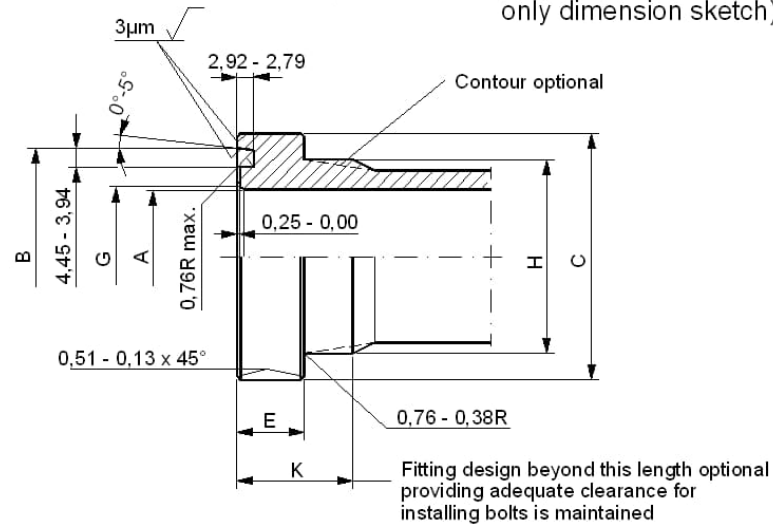
Split Flange Clamp Half 2 pieces (1)



Equipment Split Flange Connection (2)



Flanged Head (no separate item; only dimension sketch)



## Class 3000 (Standard pressure series) Dimensions in [mm]

Nom. diam. DN	Diam. A max.	Diameter B	Diam. C ± 0,25	Diam. D ± 0,25	E ± 0,13	F ± 0,13	Diam. G max.	Diam. H max.	Diam. J ± 0,25	K Refer. value	O
1/2"	13	25,53 - 25,40	30,18	30,96	6,73	6,22	14	24	24,26	13	54,9 - 53,1
3/4"	19	31,88 - 31,75	38,10	38,89	6,79	6,22	21	32	32,13	14	65,8 - 64,3
1"	25	39,75 - 39,62	44,45	45,24	8,00	7,49	27	38	38,48	14	70,6 - 69,1
1 1/4"	32	44,58 - 44,45	50,80	51,59	8,00	7,49	33	43	43,69	14	80,3 - 78,5
1 1/2"	38	53,98 - 53,72	60,33	61,09	8,00	7,49	40	50	50,80	16	94,5 - 93,0
2"	51	63,50 - 63,25	71,42	72,24	9,53	9,02	52	62	62,74	16	103,1 - 100,1
2 1/2"	64	76,33 - 76,07	84,12	84,94	9,53	9,02	65	74	74,93	18	115,8 - 112,8
3"	76	92,08 - 91,82	101,60	102,39	9,53	9,02	78	90	90,93	19	136,7 - 133,4
(3 1/2")	89	104,52 - 104,01	114,30	115,09	11,23	10,72	90	102	102,36	22	153,9 - 150,9
4"	102	117,22 - 116,71	127,00	127,79	11,23	10,72	103	114	115,06	25	163,6 - 160,3
5"	127	142,62 - 142,11	152,40	153,19	11,23	10,72	129	140	140,46	28	158,7 - 182,6

Nom. diam. DN	P ± 0,8	R	Diam. T *) ± 0,25	U	Bolt dimensions 8)			Maximum Recommend. work. press.		Recommend. Bolt Torque [Nm] <sup>+10%</sup> <sub>-0</sub>	Split Flange Weight [kg/1 half]
					UNC-thread x length Z	pitch / [inch]	Z1	[psi]	[MPa]		
1/2"	21,8	8	8,74	13	5/16 x 1 1/4"	18	24	5000	34,5	32	0,06
3/4"	24,9	10	10,31	14	3/8 x 1 1/4"	16	24	5000	34,5	60	0,07
1"	28,2	12	10,31	16	3/8 x 1 1/4"	16	22	4600	32	60	0,10
1 1/4"	35,3	14	11,91	14	7/16 x 1 1/2"	14	28	4000	27,6	92	0,15
1 1/2"	40,1	17	13,49	16	1/2 x 1 1/2"	13	27	3000	20,7	150	0,18
2"	47,2	21	13,49	16	1/2 x 1 1/2"	13	27	3000	20,7	150	0,22
2 1/2"	53,1	24	13,49	19	1/2 x 1 3/4"	13	30	2500	17,2	150	0,37
3"	64,3	30	16,66	22	5/8 x 1 3/4"	11	30	2000	13,8	295	0,65
(3 1/2")	68,3	34	16,66	22	5/8 x 2"	11	33	500	3,4	295	0,75
4"	74,9	38	16,66	25	5/8 x 2"	11	30	500	3,4	295	0,84
5"	89,4	45	16,66	28	5/8 x 2 1/4"	11	36	500	3,4	295	1,25

Bracketed nominal diameters shall be avoided.

## Class 6000 (High pressure series) Dimensions in [mm]

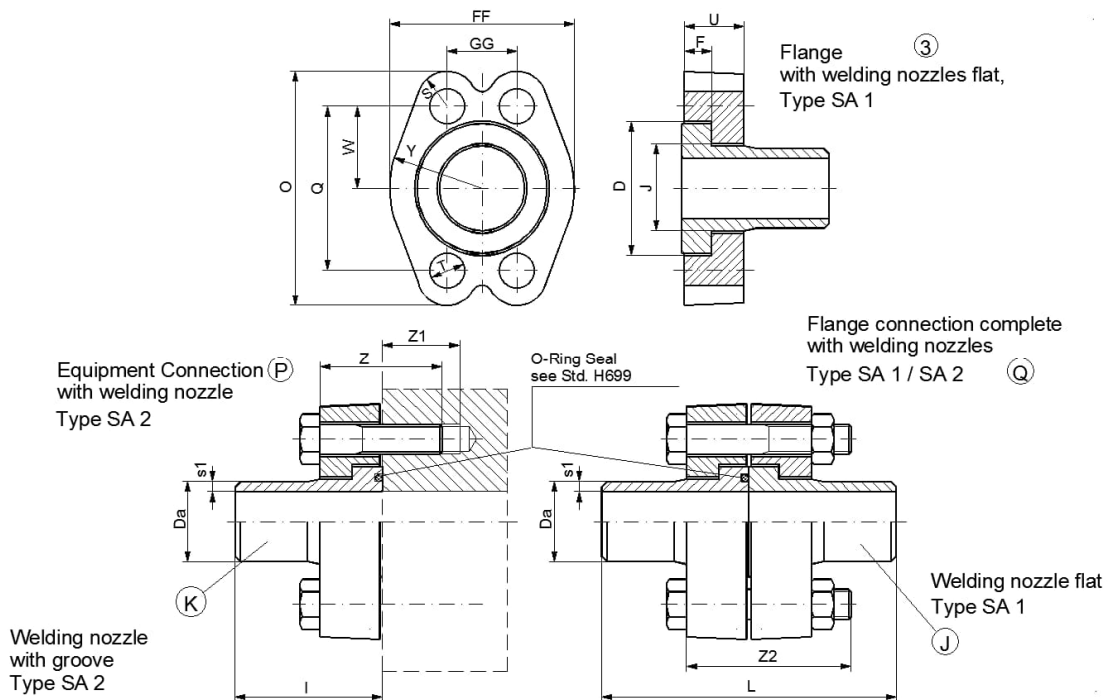
Nom. diam. DN	Diam. A max.	Diameter B	Diam. C ± 0,25	Diam. D ± 0,25	E ± 0,13	F ± 0,13	Diam. G max.	Diam. H max.	Diam. J ± 0,25	K Refer. value	O
1/2"	13	25,53 - 25,40	31,75	32,54	7,75	7,24	14	24	24,64	14	57,2 - 55,6
3/4"	19	31,88 - 31,75	41,28	42,06	8,76	8,26	21	32	32,51	18	72,1 - 70,6
1"	25	39,75 - 39,62	47,63	48,41	9,53	9,02	27	38	38,86	21	81,8 - 80,3
1 1/4"	32	44,58 - 44,45	53,98	54,76	10,29	9,78	33	44	44,45	25	96,0 - 94,5
1 1/2"	38	53,98 - 53,72	63,50	64,29	12,57	12,07	40	51	51,56	30	114,3 - 111,3
2"	51	63,50 - 63,25	79,38	80,16	12,57	12,07	52	67	67,56	38	134,9 - 131,8

Nom. diam. DN	P ± 0,8	R	Diam. T *) ± 0,25	U	Bolt dimensions 8)			Maximum Recommend. work. press		Recommend. Bolt Torque [Nm] <sup>+10%</sup> <sub>-0</sub>	Split Flange Weight [kg/1 half]
					UNC-thread x length Z	pitch / [inch]	Z1	[psi]	[MPa]		
1/2"	22,6	8	8,74	16	5/16 x 1 1/4"	18	21	6000	41,1	32	0,08
3/4"	29,0	11	10,31	19	3/8 x 1 1/2"	16	24	6000	41,1	60	0,16
1"	33,8	13	11,91	24	7/16 x 1 3/4"	14	27	6000	41,1	92	0,25
1 1/4"	37,6	15	13,49	27	1/2 x 1 3/4"	13	25	6000	41,1	150	0,34
1 1/2"	46,5	17	16,66	30	5/8 x 2 1/4"	11	35	6000	41,1	295	0,55
2"	55,9	21	19,84	37	3/4 x 2 3/4"	10	38	6000	41,1	450	1,02

\*) Specified bolt hole diameter "T" corresponds with SAE J518.

However bolt hole diameters of manufacturers are drilled for use of metric or UNC-bolts.

Further footnotes see page 1.



**Class 3000:** (Standard pressure series) Dimensions in [mm]

Nom. diam. DN	Length		Pipe		Bolt dimensions 8)		Weight [kg/set] (Part. No.)			
	I	L	da	S1	UNC-thread x length Z2	Drilling $\varnothing$ T $\pm 0,25$	Mono-Bloc Flange	Equipm. connect.	Flange connect. compl.	Weld. nozzle
1/2"	40	80	21,3	4)	5/16 x 1,57"	8,74	0,15	0,238	0,464	0,08
3/4"	50	100	26,7		3/8 x 1,57"	10,31	0,17	0,405	0,664	0,16
1"	55	110	33,4		3/8 x 1,77"	10,31	0,22	0,500	0,979	0,23
1 1/4"	65	130	42,2		7/16 x 1,77"	11,91	0,30	0,750	1,445	0,30
1 1/2"	68	136	48,3		1/2 x 1,97"	13,49	0,45	1,048	2,044	0,40
2"	80	160	60,3		1/2 x 1,97"	13,49	0,50	1,435	2,822	0,50
2 1/2"	70	140	73		1/2 x 2,17"	13,49	0,74	1,900	3,750	0,80
3"	80	160	88,9		5/8 x 2,56"	16,66	1,30	3,000	5,900	1,10
(3 1/2")	95	190	101,6		5/8 x 2,56"	16,66	1,50	3,600	7,375	1,40
4"	110	220	114,3		5/8 x 2,76"	16,66	1,65	4,260	8,475	1,75
5"	120	240	141,3		5/8 x 2,95"	16,66	2,50	4,855	9,615	2,62

Bracketed nominal diameters shall be avoided.

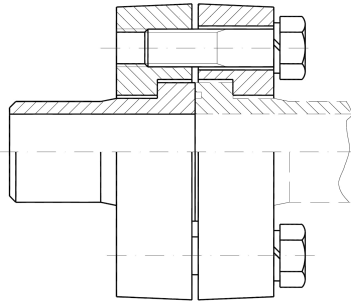
**Class 6000:** (High pressure series) Dimensions in [mm]

Nom. diam. DN	Length		Pipe		Bolt dimensions 8)		Weight [kg/set] (Part. No.)			
	I	L	da	S1	UNC-thread x length Z2	Drilling $\varnothing$ T $\pm 0,25$	Mono-Bloc Flange	Equipm. connect.	Flange connect. compl.	Weld. nozzle
1/2"	40	80	21,3	4)	5/16 x 1,77"	8,74	0,16	0,345	0,671	0,08
3/4"	50	100	26,7		3/8 x 1,97"	10,31	0,35	0,646	1,246	0,17
1"	55	110	33,4		7/16 x 2,56"	11,91	0,53	1,051	2,076	0,25
1 1/4"	65	130	42,2		1/2 x 2,76"	13,49	0,80	1,530	3,000	0,30
1 1/2"	68	136	48,3		5/8 x 3,15"	16,66	1,35	2,465	4,830	0,53
2"	80	160	60,3		3/4 x 3,74"	19,84	2,10	4,193	8,274	0,90

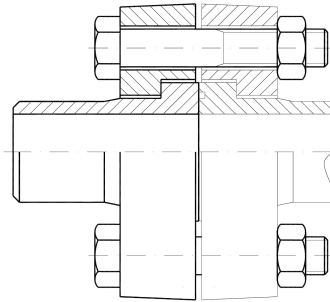
Dimensions Q, W, FF, GG, S and Y see page 4  
Further footnotes see page 1

// Dimensions O, D, J, F, U, Z and Z1 see page 6

Flange connection type SF3 with thread holes with welding nozzle flat (type SA1) and split flange with hexagon bolts

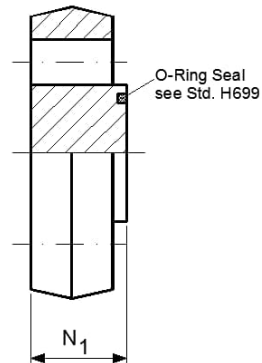


Flange connection with welding nozzle flat type SA1 with hexagon thru bolts with nuts

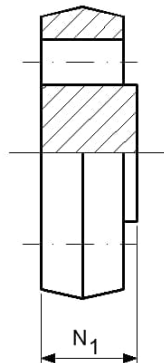


Dimensions see tables on page 4, 6, 7

Blind flange with groove



Blind flange flat



Dimensions in [mm]

**Class 3000** (Standard pressure series)

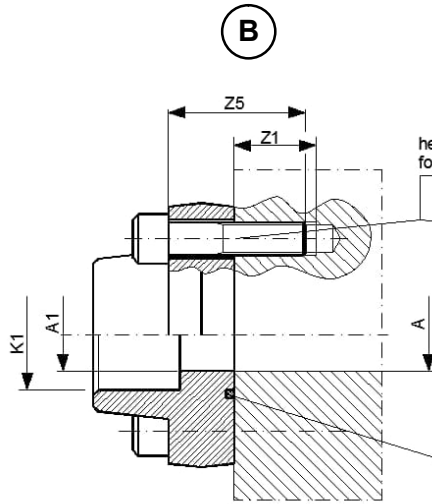
Nominal diameter DN	N1	Weight [kg/piece]
1/2"		0,20
3/4"	19,1	0,30
1"	22,1	0,37
1 1/4"	23,9	0,54
1 1/2"	30,2	0,90
2"	34,8	1,00
2 1/2"	44,5	2,35
3"	53,9	2,90
(3 1/2")	36,6	2,90
4"	38,1	3,90
5"	44,5	4,00

**Class 6000** (High pressure series)

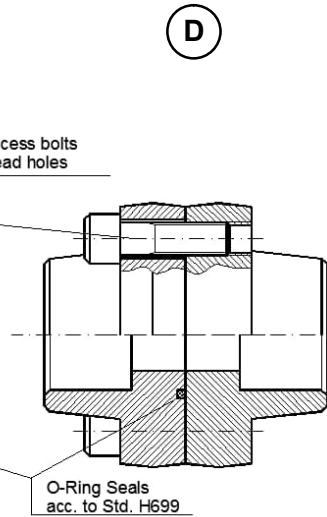
Nominal diameter DN	N1	Weight [kg/piece]
1/2"		0,20
3/4"	22,1	0,48
1"	25,4	0,77
1 1/4"	31,8	0,85
1 1/2"	38,1	1,80
2"	44,5	2,00

Bracketed nominal diameters shall be avoided.

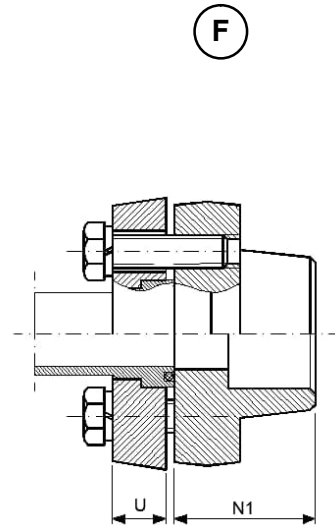
**Socket-weld flange equipment connection**



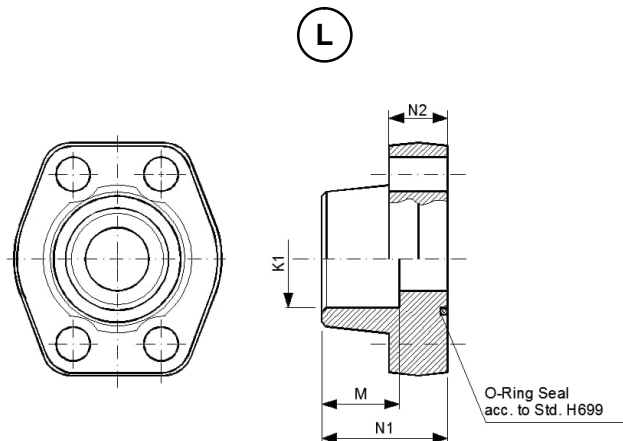
**Socket-weld flange connection complete with thread holes**



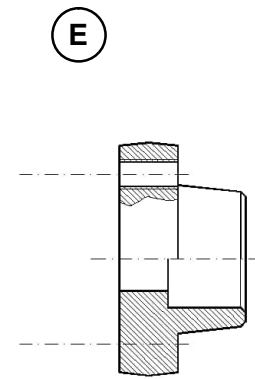
**Socket-weld flange flat with thread holes and split flange**



**Socket-weld flange with groove**



**Socket-weld flange flat with thread holes**



Dimensions in mm

Nomin. diam. DN	Nominal pressure class 3000									Nominal pressure class 6000									
	K1	N1	N2	M	U	Bolt Dimensions			Max. press. *)	Weight kg/pc **)	N1	N2	M	U	Bolt Dimensions			Max. press. *)	Weight kg/pc **)
		**)	**)	**)		UNC- Thrd. inch	Z5 **) inch	Z1	psi	**)	**)	**)	**)		UNC- Thrd. inch	Z5 **) inch	Z1	psi	**)
3/4"	27,1	36	18	18	14	3/8	1 1/2	23	3000	0,39	36	19	20	19	3/8	1 1/2	22	6000	0,50
1"	33,8	38	18	18	16	3/8	1 1/2	23	3000	0,46	44	24	22	24	7/16	1 1/2	17	6000	0,76
1 1/4"	42,5	41	21	20	14	7/16	1 1/2	23	3000	0,66	44	27	22	27	1/2	1 3/4	20	6000	1,20
1 1/2"	48,8	44	25	22	16	1/2	1 3/4	23	3000	1,05	51	30	24	30	5/8	2 1/4	31	6000	1,65
2"	61,1	45	25	24	16	1/2	1 3/4	23	3000	1,19	70	37	25	37	3/4	2 3/4	37	6000	2,45
2 1/2"	73,8	50	25	28	19	1/2	1 3/4	23	2500	1,40									
3"	90,1	50	27	28	22	5/8	2 1/4	34	2000	2,15									
(3 1/2")	102,8	50	27	28	22	5/8	2 1/4	34	500	2,40									
4"	116,3	50	27	28	25	5/8	2 1/4	34	500	2,85									
5"	147,2	50	28	28	28	5/8	2 1/4	34	500	3,25									

Bracketed nominal diameters shall be avoided.

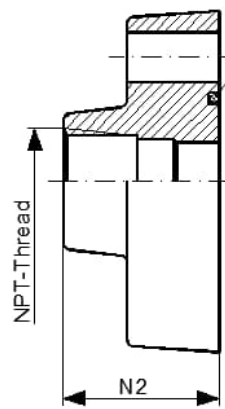
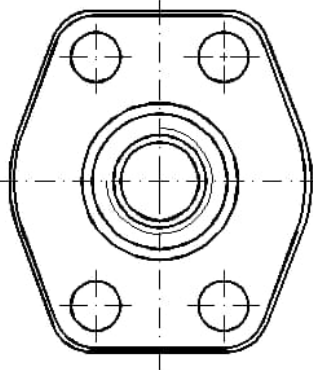
\*) for SW-connections only

\*\*\*) Values from manufacturer Ermeto/Parker Part PAFS-S, PGFS-S

Dimensions of socket take pattern from ASME B16.11.

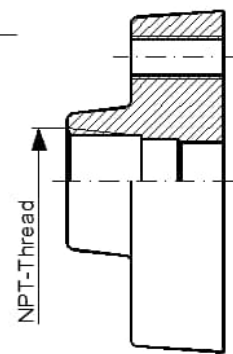
**Threaded flange with groove**

9



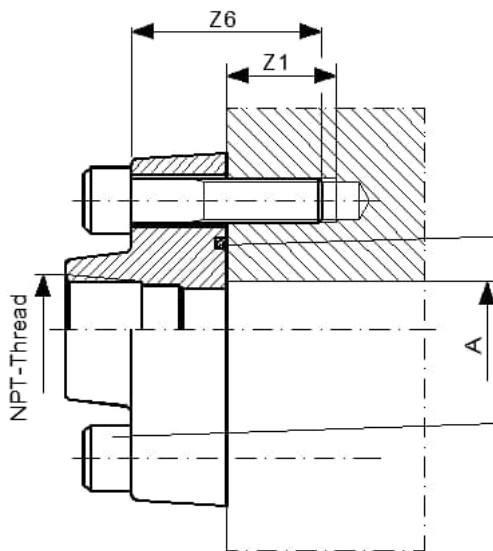
**Threaded flange flat with thread holes**

H



**Threaded flange equipment connection**

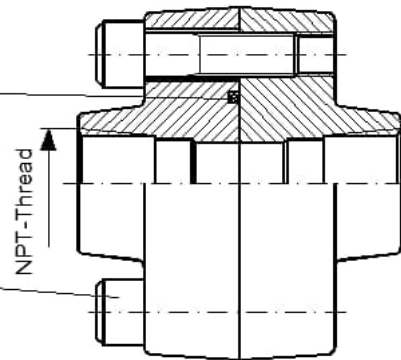
A



**Threaded flange connection complete with thread holes**

C

O-Ring Seals acc. to Std. H699



Hex. recess bolts for thread holes

Dimensions in mm

Nomin. diam. DN	N2	Nominal pressure class 3000				(Nominal pressure class 6000)					
		Thread UNC inch	Z6 inch	Z1 mm	*) Max. pressure psi	Weight kg/piece	Thread UNC inch	Z6	Z1 mm	*) Max. pressure psi	Weight kg/piece
3/4"	31,75	3/8	1 1/2	24	3000		3/8		24	6000	
1"	34,8	3/8	1 3/4	22	3000		7/16		27	6000	
1 1/4"	38,1	7/16	1 3/4	28	3000		1/2		25	6000	
1 1/2"	41,15	1/2	2	27	3000		5/8		35	6000	
2"	41,15	1/2	2	27	3000		3/4		38	6000	
2 1/2"	50,8	1/2	2 1/2	30	3000						
3"	50,8	5/8	2 3/4	30	3000						
(3 1/2")		5/8		33	500						
4"		5/8		30	500						
5"		5/8		36							

Bracketed nominal diameters shall be avoided.

\*) for threaded flange connections only

NPT-Thread acc. to ASME B1.20.1

**Heavy Hex Bolts, Stud Bolts  
and Heavy Hex Nuts  
with thread according to ASME B1.1**

Standard

**H 500**

Page 1 of 11

<b>1.) Contents</b>	<b>Page</b>
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<b>Heavy Hex Nuts according to ASME B18.2.2</b>	
Part numbering Code	10
Dimension Tables	11

**2.) Tolerances**

**2.1 Heavy Hex Bolts according to ASME B18.2.1 and Stud Bolts according to page 6**

All dimensions given in Table on page 3 to 5 and 7 to 9 are nominal dimensions unless values are designated as a maximum value.

For length tolerances etc. see appropriate dimensional tables of ASME B18.2.1, for thread tolerances see ASME B1.1, Class 2A.

**2.2 Heavy Hex Nuts according to ASME B18.2.2**

For tolerances see associated dimension tables from ASME B18.2.2, for thread tolerances see ASME B1.1, Class 2B

**Heavy Hex Bolts according to ASME B18.2.1,  
Heavy Hex Nut according to ASME B18.2.2  
with thread according to ASME B1.1**

Example of Designation: Designation of a heavy hex bolt with heavy hex nut 1 1/4" with UNC-thread, length 8 inch, material: bolt A307 Gr.B / nut A307 Gr.B

Part number **5114H3002**    **1 1/4 \* 8 (INCH)**    **HEAVY HEX BOLT WITH NUT**    **ASTM A307 GR.B**  
**UNC-THREAD H500/ASME B18.2.1 / B18.2.2**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		Type of Thread		Material <sup>1)</sup>		4)		Certificate <sup>6)</sup>	
	Cd.		Cd.		Cd.	Cd.	Cd.		Cd.
Heavy Hex Bolt, Heavy Hex Nut	511	UNC-Thread <sup>2)</sup>	4	A307 Gr.A	H2	0	0	ASME	2
		8UN-Thread <sup>2)</sup>	5	A307 Gr.B	H3	B		ASME <sup>5)</sup>	H
				A307 Gr.B / A563 Gr.B	H4				
				A307 Gr.B / A563 Gr.A	H5				
				A307 Gr.B galvanized	U3				
				A307 Gr.B nickel plated	U4				
				A307 Gr.B / A563 Gr.B galvanized	U5				
				A193 Gr.B7 / A194 Gr.2H	7H				
				A193 Gr.B16 / A194 Gr.16	7K				
				A193 Gr.B8 / A194 Gr.8	7L				
				A193 Gr.B8M / A194 Gr.8M	7N				

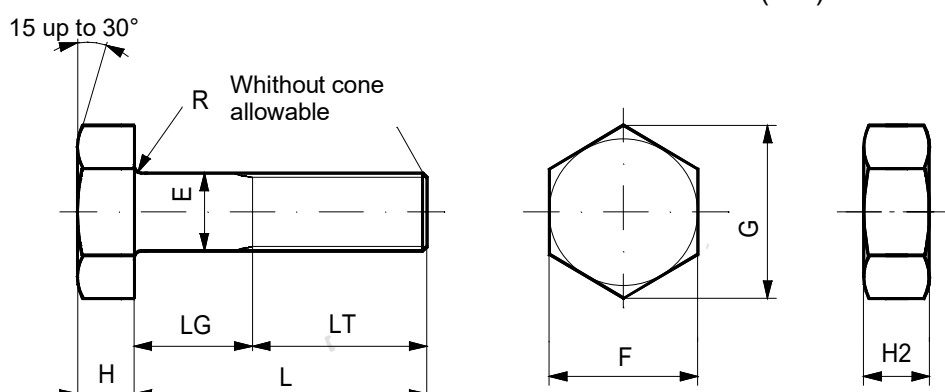
- 1) Materials:  
 All materials correspond with specified ASTM-standards  
 Galvanizing according to ASTM A307  
 Nickel plating according to manufacturer's standard, thickness ca. 8 µm

Appropriate bolt/nut material combination

	Bolt: AISI-Type	ASTM-Grade	Nut: ASTM-Grade	Material-Code
		A307 Gr.A	A307 Gr.A	H2
		A307 Gr.B	A307 Gr.B	H3
		A307 Gr.B	A563 Gr.B	H4
		A307 Gr.B	A563 Gr.A	H5
4140		A193 Gr.B7	A194 Gr.2H	7H
		A193 Gr.B16	A194 Gr.16	7K
304		A193 Gr.B8	A194 Gr.8	7L
316		A193 Gr.B8M	A194 Gr.8M	7N

- 2) Code for type of thread  
 Selection and classification for type of thread according to diameters see table page 3
- 3) In printouts dimensions are basically given in inch  
 For material take off-inputs with part number use metric lengths  
 Translation of metric lengths to imperial units are rounded to the nearest step of 1/4 inch
- 4) Code "0" for heavy hex bolt with heavy hex nut  
 Code "B" for heavy hex bolt
- 5) With certified test report according to ASTM-Standards
- 6) Certificate according to ASME- / ASTM-Standards

**Heavy Hex Bolts according to ASME B18.2.1 with Heavy Hex Nuts according to ASME B18.2.2**  
 Thread according to ASME B1.1: Class 2A (Bolt)  
 Class 2B (Nut)



Dimensions in mm

for MTO	14	16	20	24	27	30	33	36	39	42	45
Thread	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"
L	see following 2 pages										
LT L ≤ 150 mm	31,8	38,1	44,5	50,8	57,2	63,5	69,9	76,2	82,6	88,9	95,3
LT L > 150 mm	38,1	44,5	50,8	57,2	63,5	69,9	76,2	82,6	88,9	95,3	101,6
LG											
E max.	13,1	16,3	19,5	22,7	26	29,2	32,4	35,7	38,9	42,1	45,3
F max.	22,2	27	31,7	36,5	41,3	46	50,8	55,6	60,3	65,1	69,8
G max.	25,6	31,2	36,6	42,2	47,6	53,2	58,6	64,2	69,6	75,1	80,6
H	8,7	10,7	12,7	14,7	17,1	19,1	21,4	23	25,4	27,4	29,4
H2	12,3	15,5	18,6	21,8	25	28,2	30,9	34,1	37,3	40,5	43,6
R max.	0,76	1,52	1,52	1,52	2,29	2,29	2,29	2,29	2,29	3,05	3,05
pitch /	UNC	13	11	10	9	8	7	7	6	6	-
inch	8UN	-	-	-	-	-	8	8	8	8	8

for MTO	52	56	65	70	80	85	90	95	100
Thread	2"	2 1/4"	2 1/2"	2 3/4"	3"	3 1/4"	3 1/2"	3 3/4"	4"
L	see following 2 pages								
LT L ≤ 150 mm	108	120,7	133,4	146,1	158,8	171,5	184,2	196,9	209,6
LT L > 150 mm	114,3	127	139,7	152,4	165,1	177,8	190,5	203,2	215,9
LG									
E max.	51,8	58,6	65	71,8	78,3	84,7	91,2	98,0	104,4
F max.	79,4	88,9	98,4	107,9	117,5	123,8	133,4	142,9	152,4
G max.	91,6	102,6	113,6	124,6	135,6	143,0	154,0	164,0	176,0
H	34,1	38,1	42,1	46	50,8	57,2	60,5	65,3	70,2
H2	50	55,9	62,3	68,6	75	81,0	87,3	93,7	100,0
R max.	3,05	4,83	4,83	4,83	4,83	4,83	4,83	4,83	4,83
pitch /	UNC	4,5	4,5	4	4	4	4	4	4
inch	8UN	8	8	8	8	8	8	8	8

Footnotes see page 2

## Heavy Hex Bolts according to ASME B18.2.1 with Heavy Hex Nuts according to ASME B18.2.2

Weight for bolts with nuts kg/1000 pieces

Length 3)		1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"
mm	L inch											
40	1 1/2	92										
45	1 3/4	96	167									
50	2	100	174									
55	2 1/4	104	181									
60	2 7/16	108	187									
65	2 1/2	112	184									
70	2 3/4	116	200	315	432							
75	2 7/8	120	207	324	445							
80	3	124	214	334	458							
85	3 1/4	128	220	343	471							
90	3 1/2	132	227	353	484							
95	3 3/4	136	233	362	497							
100	4	140	240	372	510	700	980					
105	4 1/8	144	247	381	523	717	1002					
110	4 1/4	148	254	391	536	734	1024					
115	4 1/2	152	261	400	549	751	1046					
120	4 3/4	156	268	410	562	768	1068	1420				
125	5	160	275	419	575	785	1090	1445				
130	5 1/8	164	282	429	588	802	1112	1470				
135	5 1/4	168	289	438	601	819	1134	1495				
140	5 1/2	172	296	448	614	836	1156	1520				
145	5 3/4	176	303	457	627	853	1178	1545				
150	6	180	310	467	640	870	1200	1570	1950			
155	6 1/8		317	476	653	887	1222	1595	1974			
160	6 1/4		324	486	666	904	1244	1620	1998			
165	6 1/2		331	495	679	921	1266	1645	2022			
170	6 3/4		338	505	692	938	1288	1670	2046	2720		
175	7		345	514	705	955	1310	1695	2070	2750		
180	7 1/4		352	524	718	972	1332	1720	2094	2780		
185	7 1/2			533	731	989	1354	1745	2118	2810		
190	7 3/4			543	744	1006	1376	1770	2142	2840		
195	7 7/8			552	757	1023	1398	1795	2166	2870		
200	8			562	770	1040	1420	1820	2190	2900	3420	4100
210	8 1/4				796	1074	1464	1870	2228	2960	3520	4210
220	8 3/4				822	1108	1508	1920	2286	3020	3620	4320
> 220 mm graduation steps of 10mm		Weight increasing of each 10 mm			26	34	44	50	48	60	100	110
Nuts kg/1000 pcs.		30	54	88	135	193	269	357	463	595	736	937

Footnotes see page 2

### Heavy Hex Bolts according to ASME B18.2.1 with Heavy Hex Nuts according to ASME B18.2.2

Weight for bolts with nuts kg/1000 pieces

Length 3)		2"	2 1/4"	2 1/2"	2 3/4"	3"	3 1/4"	3 1/2"	3 3/4"	4"
L mm	inch									
40	1 1/2									
45	1 3/4									
50	2									
55	2 1/4									
60	2 7/16									
65	2 1/2									
70	2 3/4									
75	2 7/8									
80	3									
85	3 1/4									
90	3 1/2									
95	3 3/4									
100	4									
105	4 1/8									
110	4 1/4									
115	4 1/2									
120	4 3/4									
125	5									
130	5 1/8									
135	5 1/4									
140	5 1/2									
145	5 3/4									
150	6									
155	6 1/8									
160	6 1/4									
165	6 1/2									
170	6 3/4									
175	7									
180	7 1/4									
185	7 1/2									
190	7 3/4									
195	7 7/8									
200	8	5890	7733	9938	12450	15534				
210	8 1/4	6030	7945	10198	12768	15912				
220	8 3/4	6170	8157	10458	13086	16290				
> 220 mm graduation steps of 10mm	Weight increasing of each 10 mm									
	140	212	260	318	378					
Nuts kg/1000 pcs.	1358	1903	2561	3244	4165					

Footnotes see page 2

**Stud Bolts**  
**with 2 Heavy Hex Nuts according to ASME B18.2.2**  
 with thread according to ASME B1.1

Example of Designation: Designation of a stud bolt 1 1/2" with 2 heavy hex nuts, UNC-Thread along entire length, length 6 1/2 inch, material: stud bolt A193 Gr.B7, nuts A194 Gr.2H

Part number  
**52347H002 1 1/2 \* 6 1/2 (INCH) STUD BOLT & 2 NUTS ASTM A193-B7/A194-2H ENTIRELY UNC-THREAD H500/ASME B18.2.2**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
3) Kind of Part		Type of Thread		1) Material		5) Cd.		7) Certificate	
Code			Code		Cd.	Code	Code		Code
Stud Bolts	521	UNC-Thread 2)	4	A193 Gr.B7 / A194 Gr.2H	U2	0	0	ASME	2
		8UN-Thread 2)	5	galvanized		B			H 6) 7 6)
Stud Bolts with thread along entire length	523			A193 Gr.B6 / A194 Gr.6	7G				
				A193 Gr.B7 / A194 Gr.2H	7H				
				A193 Gr.B14 / A194 Gr.14	7J				
				A193 Gr.B16 / A194 Gr.16	7K				
				A193 Gr.B8 / A194 Gr.8	7L				
				A193 Gr.B8C / A194 Gr.8C	7M				
				A193 Gr.B8M / A194 Gr.8M	7N				
		A193 Gr.B8T / A194 Gr.8T	7P						

1) Materials:

All materials correspond with specified ASTM-standards  
 Galvanizing according to ASTM A307

Appropriate bolt-/nut material combination:

Bolt:	ASTM-Grade	Nut:	ASTM-Grade	Material-Code
AISI-Type				
410	A193 Gr.B6	A194 Gr.6		7G
4140	A193 Gr.B7	A194 Gr.2H		7H
	A193 Gr.B14	A194 Gr.14		7J
	A193 Gr.B16	A194 Gr.16		7K
304	A193 Gr.B8	A194 Gr.8		7L
347	A193 Gr.B8C	A194 Gr.8C		7M
316	A193 Gr.B8M	A194 Gr.8M		7N
321	A193 Gr.B8T	A194 Gr.8T		7P

2) Code for type of thread

Selection and classification for type of thread according to diameters see table page 7

3) Code for kind of part

4) In printouts dimensions are basically given in inch

For material take off-inputs with part number use metric lengths  
 Translation of metric lengths to imperial units are rounded to the nearest step of 1/4 inch

5) Code "0" for stud bolts with 2 heavy hex nuts

Code "B" for stud bolts

6) Code "H": With certified test report according to ASTM-Standards

Code "7": UL listed and FM approved

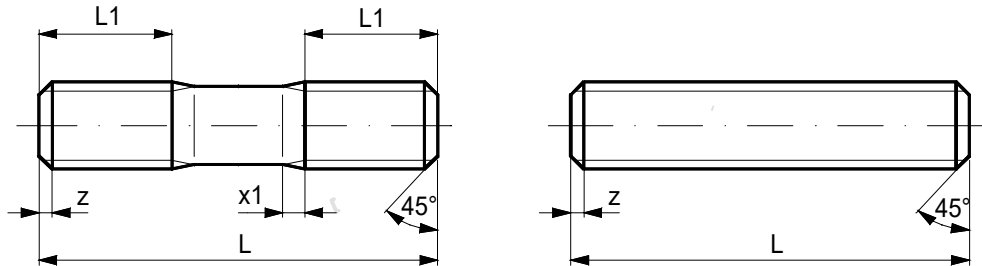
7) Certificate according to ASME- / ASTM-Standards

**Stud Bolts with 2 Heavy Hex Nuts according to ASME B18.2.2**

Thread according to ASME B1.1: Class 2A (Bolt)

Class 2B (Nut)

Suitable nut see page 10



Dimensions in mm

for MTO	14	16	20	24	27	30	33	36	39	42	45	48
Thread	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"
L1	20	25	30	35	40	45	50	55	60	65	70	75
x1	4	5	6	7	7	8	8	10	10	11	11	12
z	2,5	3	3,5	4,5	4,5	5	5	6	6	6,5	6,5	7,5
pitch per	UNC	13	11	10	9	8	7	7	6	6	-	5
inch	8UN	-	-	-	-	-	8	8	8	8	8	8

for MTO	52	56	65	70	80	85	90	95	100
Thread	2"	2 1/4"	2 1/2"	2 3/4"	3"	3 1/4"	3 1/2"	3 3/4"	4"
L1	80	85	90	95	100	105	110	115	120
x1	12	13	13	14	14	16	16	18	20
z	7,5	8,5	8,5	10	10	12	12	14	14
pitch per	UNC	4,5	4,5	4	4	4	4	4	4
inch	8UN	8	8	8	8	8	8	8	8

**Stud Bolts with 2 Heavy Hex Nuts according to ASME B18.2.2**

suitable nut see page 10

Weight without nuts kg/1000 pieces

Length 4)		1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"	
mm	L inch													
60	2 7/16	48												
65	2 1/2	52												
70	2 3/4	56	89,4											
75	2 7/8	60,1	95,8											
80	3	64,1	102	149										
85	3 1/4	68,1	108	159										
90	3 1/2	72,1	115	168										
95	3 3/4	76,1	121	177										
100	4	80,1	127	187	256									
105	4 1/8	84,1	134	196	269									
110	4 1/4	88,1	140	205	282									
115	4 1/2		146	214	295	385								
120	4 3/4		153	224	308	402								
125	5		159	233	320	418								
130	5 1/8		166	243	334	434	550							
135	5 1/4		172	252	346	451	571							
140	5 1/2			261	359	468	592							
145	5 3/4			271	372	485	613							
150	6			280	384	502	635							
155	6 1/8			289	397	519	656							
160	6 1/4			299	410	535	677	852						
165	6 1/2			308	423	552	698	879						
170	6 3/4				436	568	719	906						
175	7				449	585	740	932						
180	7 1/4				462	602	762	959						
185	7 1/2					619	783	985						
190	7 3/4					636	804	1012	1214					
195	7 7/8					652	825	1039	1246					
200	8					669	846	1065	1278	1536				
210	8 1/4					702	888	1118	1342	1612				
220	8 3/4					736	931	1172	1406	1689				
230	9						973	1225	1469	1766	2068	2394		
240	9 1/2						1015	1278	1533	1843	2158	2498		
250	10						1057	1332	1597	1920	2248	2602		
260	10 1/4							1385	1661	1996	2338	2706		
270	10 3/4							1438	1725	2073	2428	2810		
280	11							1491	1789	2150	2518	2915	3355	
290	11 1/2								1853	2227	2608	3019	3475	
300	12								1917	2304	2698	3123	3595	
310	12 1/4								1981	2380	2788	3227	3715	
320	12 3/4									2457	2877	3331	3835	
> 320 mm graduation steps of 10mm		Weight increasing of each 10 mm									77	90	104	120
Nuts kg/1000 pcs.		30	54	88	135	193	269	357	463	595	736	927	1095	

Footnotes see page 2

**Stud Bolts with 2 Heavy Hex Nuts according to ASME B18.2.2**  
suitable nut see page 10

Weight without nuts kg/1000 pieces

Length 4)		2"	2 1/4"	2 1/2"	2 3/4"	3"	3 1/4"	3 1/2"	3 3/4"	4"
mm	L									
	inch									
60	2 7/16									
65	2 1/2									
70	2 3/4									
75	2 7/8									
80	3									
85	3 1/4									
90	3 1/2									
95	3 3/4									
100	4									
105	4 1/8									
110	4 1/4									
115	4 1/2									
120	4 3/4									
125	5									
130	5 1/8									
135	5 1/4									
140	5 1/2									
145	5 3/4									
150	6									
155	6 1/8									
160	6 1/4									
165	6 1/2									
170	6 3/4									
175	7									
180	7 1/4									
185	7 1/2									
190	7 3/4									
195	7 7/8									
200	8									
210	8 1/4									
220	8 3/4									
230	9									
240	9 1/2									
250	10									
260	10 1/4									
270	10 3/4									
280	11									
290	11 1/2									
300	12									
310	12 1/4	4238								
320	12 3/4	4374								
> 320 mm graduation steps of 10mm	Weight increasing of each 10 mm									
		137	176	217	266	320	379	443		
Nuts kg/1000 pcs.		1358	1903	2561	3244	4165	5226	6468		

Footnotes see page 2

**Heavy Hex Nuts**

according to ASME B18.2.2  
with thread according to ASME B1.1

Example of  
Designation:

Designation of a heavy hex nut 1 1/4" with 8UN-Thread,  
material: A194 Gr.2H

Part number  
**55157S002**

**1 1/4 (INCH) HEAVY HEX NUT W. 8UN- ASTM A194 GR.2H  
THREAD H500/ASME B18.2.2 / ASME B1.1**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part		2) Type of Thread		1) Material		Wall thickness		4) Certificate	
Code			Code		Cd.	Code	Code		Code
Heavy Hex Nuts	551	UNC-Thread	4	A307 Gr.A	H2	0	0	ASME	2
		8UN-Thread	5	A307 Gr.B	H3			ASME 3)	H
					A563 Gr.B	H4			
					A563 Gr.A	H5			
					A307 Gr. B galvanized	U3			
					A307 Gr. B nickel plated	U4			
					A194 Gr.8T	7P			
					A194 Gr.8C	7Q			
					A194 Gr.2	7R			
					A194 Gr.2H	7S			
					A194 Gr.16	7T			
					A194 Gr.4	7U			
					A194 Gr.6	7V			
					A194 Gr.8	7W			
					A194 Gr.8H	7X			
				A194 Gr.8F	7Y				
				A194 Gr.8M	7Z				

1) Materials:

All materials correspond with specified ASTM-standards  
Galvanizing according to ASTM A307  
Nickel plating according to manufacturer's standard, thickness ca. 8 µm  
Appropriate bolt-/nut material combination see page 2 and 6

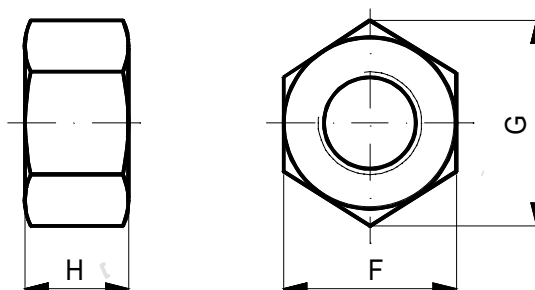
2) Code for type of thread

Nuts with no standardized UNC-Thread (1 5/8" and 1 7/8") are furnished with 8UN-Thread

3) With certified test report according to ASTM-Standards

4) Certificate according to ASME- / ASTM-Standards

**Heavy Hex Nuts according to ASME B18.2.2**  
Thread according to ASME B1.1, Class 2B



Dimensions in mm

for MTO	Thread	G max.	F max.	H	Pitch / inch		Weight kg/1000 pcs.
					UNC	8UN	
14	1/2"	25,6	22,2	12,3	13	-	30
16	5/8"	31,2	27	15,5	11	-	54
20	3/4"	36,6	31,7	18,6	10	-	88
24	7/8"	42,2	36,5	21,8	9	-	135
27	1"	47,2	41,3	25,0	8	-	193
30	1 1/8"	53,2	46	28,2	7	8	269
33	1 1/4"	58,6	50,8	30,9	7	8	357
36	1 3/8"	64,2	55,6	34,1	6	8	463
39	1 1/2"	69,6	60,3	37,3	6	8	595
42	1 5/8"	75,1	65,1	40,5	-	8	736
45	1 3/4"	80,6	69,8	43,6	5	8	927
48	1 7/8"	86,1	74,6	46,8	-	8	1095
52	2"	91,6	79,4	50,0	4,5	8	1358
56	2 1/4"	102,6	88,9	55,9	4,5	8	1903
65	2 1/2"	113,6	98,4	62,3	4	8	2561
70	2 3/4"	124,6	107,9	68,6	4	8	3244
80	3"	135,6	117,5	75,0	4	8	4165
85	3 1/4"	146,6	127	81,0	4	8	5226
90	3 1/2"	157,6	136,5	87,3	4	8	6468
95	3 3/4"	168,7	146,1	93,7	4	8	8219
100	4"	179,7	155,6	100,0	4	8	9888

**Washers**

according to ASME B18.22.1

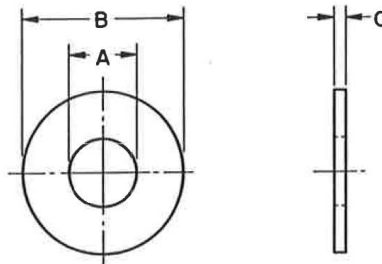
Example of Designation: Designation of a plain washer type A, narrow, for thread diameter 1", material: steel ASTM F844, galvanized

Part number **5811S9002**    **1 INCH**    **WASHER PLAIN TYPE A, NARROW**    **STEEL ASTM F844 GALVANIZED**  
**H581A/ASME B18.22.1**

Part numbering Code									
Position of Part No.									
1. - 3.		4.		5. - 6.		7. - 8.		9.	
Kind of part	Cd.	Type 2)		Material 1)		Cd.	Cd.	Certificate 4)	
			Cd.		Cd.				Cd.
Washer acc. to ASME B18.22.1	581	plain, Type A, narrow	1	Steel ASTM F844	S7	0	0	ASME	2
		plain, Type A, wide	2	Steel ASTM F844	S9				
		plain, Type A 3)	3	galvanized					
		plain, Type B, narrow	4	Brass	8Y				
		plain, Type B, regular	5	Gr.304	0A				
		plain, Type B, wide	6	Gr.316	0B				

- 1) Materials:  
Steel according to ASTM F844  
Stainless steel according to ASTM A240  
Brass according to manufacturer's standard  
Zinc coatings according to ASTM A153, Class C or B695, Class 50.
- 2) Code for type  
Dimensions and tolerances according to ASME B18.22.1.  
Screw and washer assemblies see ASME B18.13.
- 3) This type code is used for washer sizes > 1 1/2" which do not have a distinction between "narrow" and "wide".
- 4) Requirements and certificate according to ASTM/ASME-Standards

Plain Washers Type A



Dimensions of Preferred Sizes of Type A Plain Washers \*\* in [inch]

Nominal Washer Size ***	Nominal Washer Size ***			Inside Diameter (A)			Outside Diameter (B)			Thickness (C)			Weight [kg/100pc]
	[inch]	#		Tolerance	Tolerance	Tolerance	max.	min.					
				[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	
1/4	0.25	8	Narrow	0.281	0.015	0.005	0.625	0.015	0.005	0.065	0.08	0.051	0.25
1/4	0.25	8	Wide	0.312	0.015	0.005	0.734 *	0.015	0.007	0.065	0.08	0.051	0.36
5/16	0.312	9	Narrow	0.344	0.015	0.005	0.688	0.015	0.007	0.065	0.08	0.051	0.29
5/16	0.312	9	Wide	0.375	0.015	0.005	0.875	0.03	0.007	0.083	0.104	0.064	0.66
3/8	0.375	10	Narrow	0.406	0.015	0.005	0.812	0.015	0.007	0.065	0.08	0.051	0.4
3/8	0.375	10	Wide	0.438	0.015	0.005	1	0.03	0.007	0.083	0.104	0.064	0.85
7/16	0.438	11	Narrow	0.469	0.015	0.005	0.922	0.015	0.007	0.065	0.08	0.056	0.51
7/16	0.438	11	Wide	0.5	0.015	0.005	1.25	0.03	0.007	0.083	0.104	0.064	1.38
1/2	0.5	12	Narrow	0.531	0.015	0.005	1.062	0.03	0.007	0.095	0.121	0.074	1.03
1/2	0.5	12	Wide	0.562	0.015	0.005	1.375	0.03	0.007	0.109	0.132	0.086	2.1
9/16	0.562	13	Narrow	0.594	0.015	0.005	1.156 *	0.03	0.007	0.095	0.121	0.074	1.2
9/16	0.562	13	Wide	0.625	0.015	0.005	1.469 *	0.03	0.007	0.109	0.132	0.086	2.36
5/8	0.625	16	Narrow	0.656	0.03	0.007	1.312	0.03	0.007	0.095	0.121	0.074	1.58
5/8	0.625	16	Wide	0.688	0.03	0.007	1.75	0.03	0.007	0.134	0.16	0.108	4.19
3/4	0.75	20	Narrow	0.812	0.03	0.007	1.469	0.03	0.007	0.134	0.16	0.108	2.42
3/4	0.75	20	Wide	0.812	0.03	0.007	2	0.03	0.007	0.148	0.177	0.122	5.97
7/8	0.875	24	Narrow	0.938	0.03	0.007	1.75	0.03	0.007	0.134	0.16	0.108	3.53
7/8	0.875	24	Wide	0.938	0.03	0.007	2.25	0.03	0.007	0.165	0.192	0.136	8.11
1	1.000	27	Narrow	1.062	0.03	0.007	2	0.03	0.007	0.134	0.16	0.108	4.64
1	1.000	27	Wide	1.062	0.03	0.007	2.5	0.03	0.007	0.165	0.192	0.136	9.94
1 1/8	1.125	30	Narrow	1.25	0.03	0.007	2.25	0.03	0.007	0.134	0.16	0.108	5.66
1 1/8	1.125	30	Wide	1.25	0.03	0.007	2.75	0.03	0.007	0.165	0.192	0.136	11.64
1 1/4	1.25	33	Narrow	1.375	0.03	0.007	2.5	0.03	0.007	0.165	0.192	0.136	8.46
1 1/4	1.25	33	Wide	1.375	0.03	0.007	3	0.03	0.007	0.165	0.192	0.136	13.79
1 3/8	1.375	36	Narrow	1.5	0.03	0.007	2.75	0.03	0.007	0.165	0.192	0.136	10.31
1 3/8	1.375	36	Wide	1.5	0.03	0.01	3.25	0.03	0.01	0.18	0.213	0.153	17.89
1 1/2	1.5	39	Narrow	1.625	0.03	0.007	3	0.03	0.007	0.165	0.192	0.136	12.34
1 1/2	1.5	39	Wide	1.625	0.045	0.01	3.5	0.045	0.01	0.18	0.213	0.153	20.68
1 5/8	1.625	42	-	1.78	0.045	0.01	3.75	0.045	0.01	0.18	0.213	0.153	23.44
1 3/4	1.75	45	-	1.875	0.045	0.01	4	0.045	0.01	0.18	0.213	0.153	26.87
1 7/8	1.875	48	-	2	0.045	0.01	4.25	0.045	0.01	0.18	0.213	0.153	30.26
2	2	52	-	2.125	0.045	0.01	4.5	0.045	0.01	0.18	0.213	0.153	33.86
2 1/4	2.25	56	-	2.375	0.045	0.01	4.75	0.045	0.01	0.22	0.248	0.193	42.4
2 1/2	2.5	65	-	2.625	0.045	0.01	5	0.045	0.01	0.238	0.28	0.21	51.23
2 3/4	2.7	70	-	2.875	0.065	0.01	5.25	0.065	0.01	0.259	0.31	0.228	60.44
3	3	80	-	3.125	0.065	0.01	5.5	0.065	0.01	0.284	0.327	0.249	67.68

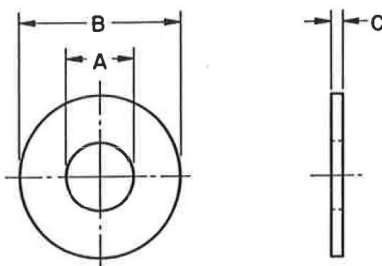
#) For input in material take off (MTO) this column shall be used.

\* The 0.734 inch, 1.156 inch and 1.469 inch outside diameters avoid washers which could be used in coin operated devices.

\*\* Preferred sizes are for the most part from series previously designated "Standard Plate" and "SAE". Where common sizes existed in the two series, the SAE size is designated "Narrow" and the Standard Plate "Wide".

\*\*\* Nominal washer sizes are intended for use with comparable nominal screw or bolt sizes.

## Plain Washers Type A



Dimensions of Preferred Sizes of Type A Plain Washers \*\* in [mm]

Nominal Washer Size ***	[mm]	#		Inside Diameter (A)			Outside Diameter (B)			Thickness (C)			Weight [kg/100pc]
				[mm]	Tolerance + [mm]	Tolerance - [mm]	[mm]	Tolerance + [mm]	Tolerance - [mm]	[mm]	max. [mm]	min. [mm]	
1/4	6.4	8	Narrow	7.14	0.38	0.13	15.88	0.38	0.13	1.65	2.03	1.3	0.25
1/4	6.4	8	Wide	7.92	0.38	0.13	18.64 *	0.38	0.18	1.65	2.03	1.3	0.36
5/16	7.9	9	Narrow	8.74	0.38	0.13	17.48	0.38	0.18	1.65	2.03	1.3	0.29
5/16	7.9	9	Wide	9.53	0.38	0.13	22.23	0.76	0.18	2.11	2.64	1.63	0.66
3/8	9.5	10	Narrow	10.31	0.38	0.13	20.62	0.38	0.18	1.65	2.03	1.3	0.4
3/8	9.5	10	Wide	11.13	0.38	0.13	25.40	0.76	0.18	2.11	2.64	1.63	0.85
7/16	11.1	11	Narrow	11.91	0.38	0.13	23.42	0.38	0.18	1.65	2.03	1.42	0.51
7/16	11.1	11	Wide	12.70	0.38	0.13	31.75	0.76	0.18	2.11	2.64	1.63	1.38
1/2	12.7	12	Narrow	13.49	0.38	0.13	26.97	0.76	0.18	2.41	3.07	1.88	1.03
1/2	12.7	12	Wide	14.27	0.38	0.13	34.93	0.76	0.18	2.77	3.35	2.18	2.1
9/16	14.3	13	Narrow	15.09	0.38	0.13	29.36 *	0.76	0.18	2.41	3.07	1.88	1.20
9/16	14.3	13	Wide	15.88	0.38	0.13	37.31 *	0.76	0.18	2.77	3.35	2.18	2.36
5/8	15.9	16	Narrow	16.66	0.76	0.18	33.32	0.76	0.18	2.41	3.07	1.88	1.58
5/8	15.9	16	Wide	17.48	0.76	0.18	44.45	0.76	0.18	3.4	4.06	2.74	4.19
3/4	19.1	20	Narrow	20.62	0.76	0.18	37.31	0.76	0.18	3.4	4.06	2.74	2.42
3/4	19.1	20	Wide	20.62	0.76	0.18	50.8	0.76	0.18	3.76	4.50	3.1	5.97
7/8	22.2	24	Narrow	23.83	0.76	0.18	44.45	0.76	0.18	3.4	4.06	2.74	3.53
7/8	22.2	24	Wide	23.83	0.76	0.18	57.15	0.76	0.18	4.19	4.88	3.45	8.11
1	25.4	27	Narrow	26.97	0.76	0.18	50.8	0.76	0.18	3.4	4.06	2.74	4.64
1	25.4	27	Wide	26.97	0.76	0.18	63.5	0.76	0.18	4.19	4.88	3.45	9.94
1 1/8	28.6	30	Narrow	31.75	0.76	0.18	57.15	0.76	0.18	3.40	4.06	2.74	5.66
1 1/8	28.6	30	Wide	31.75	0.76	0.18	69.85	0.76	0.18	4.19	4.88	3.45	11.64
1 1/4	31.8	33	Narrow	34.93	0.76	0.18	63.5	0.76	0.18	4.19	4.88	3.45	8.46
1 1/4	31.8	33	Wide	34.93	0.76	0.18	76.2	0.76	0.18	4.19	4.88	3.45	13.79
1 3/8	34.9	36	Narrow	38.1	0.76	0.18	69.85	0.76	0.18	4.19	4.88	3.45	10.31
1 3/8	34.9	36	Wide	38.1	0.76	0.25	82.55	0.76	0.25	4.57	5.41	3.89	17.89
1 1/2	38.1	39	Narrow	41.28	0.76	0.18	76.2	0.76	0.18	4.19	4.88	3.45	12.34
1 1/2	38.1	39	Wide	41.28	1.14	0.25	88.9	1.14	0.25	4.57	5.41	3.89	20.68
1 5/8	41.3	42	-	45.21	1.14	0.25	95.25	1.14	0.25	4.57	5.41	3.89	23.44
1 3/4	44.5	45	-	47.63	1.14	0.25	101.6	1.14	0.25	4.57	5.41	3.89	26.87
1 7/8	47.6	48	-	50.8	1.14	0.25	107.95	1.14	0.25	4.57	5.41	3.89	30.26
2	50.8	52	-	53.98	1.14	0.25	114.3	1.14	0.25	4.57	5.41	3.89	33.86
2 1/4	50.8	56	-	60.33	1.14	0.25	120.65	1.14	0.25	5.59	6.3	4.9	42.40
2 1/2	63.5	65	-	66.68	1.14	0.25	127	1.14	0.25	6.05	7.11	5.33	51.23
2 3/4	69.9	70	-	73.03	1.65	0.25	133.35	1.65	0.25	6.58	7.87	5.79	60.44
3	76.2	80	-	79.38	1.65	0.25	139.7	1.65	0.25	7.21	8.31	6.32	67.68

#) For input in material take off (MTO) this column shall be used.

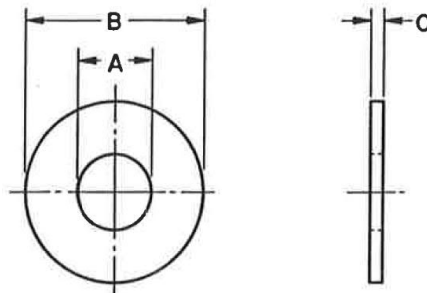
\* The 18.64 mm, 29.36 mm and 37.31 mm outside diameters avoid washers which could be used in coin operated devices.

\*\* Preferred sizes are for the most part from series previously designated "Standard Plate" and "SAE". Where common sizes existed in the two series, the SAE size is designated "Narrow" and the Standard Plate "Wide".

\*\*\* Nominal washer sizes are intended for use with comparable nominal screw or bolt sizes.

Measurements in [mm] are only for information.

Plain Washers Type B



Dimensions of Type B Washers in [inch] Part 1 of 2

Nominal Washer Size **	[inch]	#	Series	Inside Diameter (A)			Outside Diameter (B)			Thickness (C)			Weight [kg/100pc]
				[inch]	Tolerance		[inch]	Tolerance		[inch]	Tolerance		
				[inch]	+	-	[inch]	+	-	[inch]	max.	min.	
1/4	0.25	8	Narrow	0.281	0.015	0.005	0.5	0.015	0.005	0.063	0.071	0.056	0.12
			Regular	0.281	0.015	0.005	0.734 *	0.015	0.007	0.063	0.071	0.056	0.33
			Wide	0.281	0.015	0.005	1	0.015	0.007	0.063	0.071	0.056	0.66
5/16	0.312	9	Narrow	0.344	0.015	0.005	0.625	0.015	0.005	0.063	0.071	0.056	0.2
			Regular	0.344	0.015	0.005	0.875	0.015	0.007	0.063	0.071	0.056	0.46
			Wide	0.344	0.015	0.005	1.125	0.015	0.007	0.063	0.071	0.056	0.82
3/8	0.375	10	Narrow	0.406	0.015	0.005	0.734 *	0.015	0.007	0.063	0.071	0.056	0.27
			Regular	0.406	0.015	0.005	1	0.015	0.007	0.063	0.071	0.056	0.6
			Wide	0.406	0.015	0.005	1.25	0.03	0.007	0.1	0.112	0.09	1.58
7/16	0.438	11	Narrow	0.469	0.015	0.005	0.875	0.015	0.007	0.063	0.071	0.056	0.39
			Regular	0.469	0.015	0.005	1.125	0.015	0.007	0.063	0.071	0.09	0.75
			Wide	0.469	0.015	0.005	1.469 *	0.03	0.007	0.1	0.112	0.09	2.19
1/2	0.5	12	Narrow	0.531	0.015	0.005	1	0.015	0.007	0.063	0.071	0.056	0.52
			Regular	0.531	0.015	0.005	1.25	0.03	0.007	0.1	0.112	0.09	1.45
			Wide	0.531	0.015	0.005	1.75	0.03	0.007	0.1	0.112	0.09	3.15
9/16	0.562	13	Narrow	0.594	0.015	0.005	1.125	0.015	0.007	0.063	0.071	0.056	0.65
			Regular	0.594	0.015	0.005	1.469 *	0.03	0.007	0.1	0.112	0.09	2.04
			Wide	0.594	0.015	0.005	2	0.03	0.007	0.1	0.112	0.09	4.13
5/8	0.625	16	Narrow	0.656	0.03	0.007	1.25	0.03	0.007	0.1	0.112	0.09	1.28
			Regular	0.656	0.03	0.007	1.75	0.03	0.007	0.1	0.112	0.09	2.98
			Wide	0.656	0.03	0.007	2.25	0.03	0.007	0.16	0.174	0.146	8.14
3/4	0.75	20	Narrow	0.812	0.03	0.007	1.375	0.03	0.007	0.1	0.112	0.09	1.39
			Regular	0.812	0.03	0.007	2	0.03	0.007	0.1	0.174	0.09	5.87
			Wide	0.812	0.03	0.007	2.5	0.03	0.007	0.16	0.174	0.146	9.83
7/8	0.875	24	Narrow	0.938	0.03	0.007	1.469 *	0.03	0.007	0.1	0.112	0.09	1.45
			Regular	0.938	0.03	0.007	2.25	0.03	0.007	0.16	0.174	0.146	7.35
			Wide	0.938	0.03	0.007	2.75	0.03	0.007	0.16	0.174	0.146	11.75
1	1	27	Narrow	1.062	0.03	0.007	1.75	0.03	0.007	0.1	0.112	0.09	2.19
			Regular	1.062	0.03	0.007	2.5	0.03	0.007	0.16	0.174	0.146	9
			Wide	1.062	0.03	0.007	3	0.03	0.007	0.16	0.174	0.146	13.84
1 1/8	1.125	30	Narrow	1.188	0.03	0.007	2	0.03	0.007	0.1	0.112	0.09	2.93
			Regular	1.188	0.03	0.007	2.75	0.03	0.007	0.16	0.174	0.146	10.81
			Wide	1.188	0.03	0.007	3.25	0.03	0.007	0.16	0.174	0.146	16.09

#) For input in material take off (MTO) this column shall be used.

\* The 0.734 inch and 1.469 inch outside diameter avoids washers which could be used in coin operated devices.

\*\* Nominal washer sizes are intended for use with comparable screw- or bolt sizes.

Inside and outside diameters shall be concentric within at least the inside diameter tolerance.

Washers shall be flat within 0.005 inch for basic outside diameters up to and including 0.875 inch and within 0.01 inch for larger outside diameters.

**Plain Washers Type B**



Dimensions of Type 2 Washers in [inch] Part 2 of 2

Nominal Washer Size *			Series	Inside Diameter (A)			Outside Diameter (B)			Thickness (C)		Weight [kg/100pc]	
[inch]	#			[inch]	Tolerance + [inch]	Tolerance - [inch]	[inch]	Tolerance + [inch]	Tolerance - [inch]	[inch]	max. [inch]		min. [inch]
1 1/4	1.25	33	Narrow	1.312	0.03	0.007	2.25	0.03	0.007	0.16	0.174	0.146	5.87
			Regular	1.312	0.03	0.007	3	0.03	0.007	0.16	0.174	0.146	12.80
			Wide	1.312	0.045	0.01	3.5	0.045	0.01	0.25	0.266	0.234	28.30
1 3/8	1.375	36	Narrow	1.438	0.03	0.007	2.5	0.03	0.07	0.16	0.174	0.146	7.35
			Regular	1.438	0.03	0.007	3.25	0.03	0.07	0.16	0.174	0.146	14.93
			Wide	1.438	0.045	0.01	3.75	0.045	0.01	0.25	0.266	0.234	32.24
1 1/2	1.5	39	Narrow	1.562	0.03	0.007	2.75	0.03	0.07	0.16	0.174	0.146	9.01
			Regular	1.562	0.045	0.01	3.5	0.045	0.01	0.25	0.266	0.234	26.36
			Wide	1.562	0.045	0.01	4	0.045	0.01	0.25	0.266	0.234	36.44
1 5/8	1.625	42	Narrow	1.75	0.03	0.007	3	0.03	0.07	0.16	0.174	0.146	10.44
			Regular	1.75	0.045	0.01	3.75	0.045	0.01	0.25	0.266	0.234	29.56
			Wide	1.75	0.045	0.01	4.25	0.045	0.01	0.25	0.266	0.234	40.31
1 3/4	1.75	45	Narrow	1.875	0.03	0.007	3.25	0.03	0.07	0.16	0.174	0.146	12.39
			Regular	1.875	0.045	0.01	4.25	0.045	0.01	0.25	0.266	0.234	39.09
			Wide	1.875	0.045	0.01	4.75	0.045	0.01	0.25	0.266	0.234	51.19
1 7/8	1.875	48	Narrow	2	0.045	0.01	3.5	0.045	0.01	0.25	0.266	0.234	22.17
			Regular	2	0.045	0.01	4.25	0.045	0.01	0.25	0.266	0.234	37.79
			Wide	2	0.045	0.01	4.75	0.045	0.01	0.25	0.266	0.234	49.89
2	2	52	Narrow	2.125	0.045	0.01	3.75	0.045	0.01	0.25	0.266	0.234	25.66
			Regular	2.125	0.045	0.01	4.5	0.045	0.01	0.25	0.266	0.234	42.29
			Wide	2.125	0.045	0.01	5	0.045	0.01	0.25	0.266	0.234	55.05
2 1/4	2.25	56	Narrow	2.375	0.045	0.01	4	0.045	0.01	0.25	0.266	0.234	27.84
			Regular	2.375	0.045	0.01	5	0.045	0.01	0.25	0.266	0.234	52.03
			Wide	2.375	0.065	0.01	5.5	0.065	0.01	0.375	0.393	0.357	97.71
2 1/2	2.5	65	Narrow	2.625	0.045	0.01	4.5	0.045	0.01	0.25	0.266	0.234	35.90
			Regular	2.625	0.065	0.01	5.5	0.065	0.01	0.375	0.393	0.357	92.75
			Wide	2.625	0.065	0.01	6	0.065	0.01	0.375	0.393	0.357	115.58
2 3/4	2.75	70	Narrow	2.875	0.045	0.01	5	0.045	0.01	0.25	0.266	0.234	44.97
			Regular	2.875	0.065	0.01	6	0.065	0.01	0.375	0.393	0.357	110.12
			Wide	2.875	0.065	0.01	6.5	0.065	0.01	0.375	0.393	0.357	134.94
3	3	80	Narrow	3.125	0.065	0.01	5.5	0.065	0.01	0.375	0.393	0.357	81.33
			Regular	3.125	0.065	0.01	6.5	0.065	0.01	0.375	0.393	0.357	128.98
			Wide	3.125	0.065	0.01	7	0.065	0.01	0.375	0.393	0.357	155.78

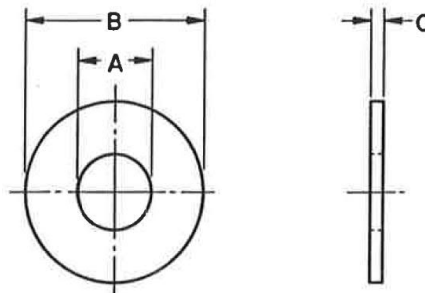
#) For input in material take off (MTO) this column shall be used.

\* Nominal washer sizes are intended for use with comparable nominal screw- or bolt sizes.

Inside and outside diameters shall be concentric within at least the inside diameter tolerance.

Washers of sizes shown above shall be flat within 0.01 inch.

Plain Washers Type B



Dimensions of Type B Washers in [mm] Part 1 of 2

Nominal Washer Size **	[mm]	#	Series	Inside Diameter (A)			Outside Diameter (B)			Thickness (C)			Weight [kg/100pc]
				[mm]	Tolerance + [mm]	Tolerance - [mm]	[mm]	Tolerance + [mm]	Tolerance - [mm]	[mm]	max. [mm]	min. [mm]	
1/4	6.35	8	Narrow	7.14	0.38	0.13	12.7	0.38	0.13	1.6	1.8	1.42	0.12
			Regular	7.14	0.38	0.13	18.64 *	0.38	0.18	1.6	1.8	1.42	0.33
			Wide	7.14	0.38	0.13	25.4	0.38	0.18	1.6	1.8	1.42	0.66
5/16	7.92	9	Narrow	8.74	0.38	0.13	15.88	0.38	0.13	1.6	1.8	1.42	0.2
			Regular	8.74	0.38	0.13	22.23	0.38	0.18	1.6	1.8	1.42	0.46
			Wide	8.74	0.38	0.13	28.58	0.38	0.18	1.6	1.8	1.42	0.82
3/8	9.53	10	Narrow	10.31	0.38	0.13	18.64 *	0.38	0.18	1.6	1.8	1.42	0.27
			Regular	10.31	0.38	0.13	25.4	0.38	0.18	1.6	1.8	1.42	0.6
			Wide	10.31	0.38	0.13	31.75	0.76	0.18	2.54	2.84	2.29	1.58
7/16	11.13	11	Narrow	11.91	0.38	0.13	22.23	0.38	0.18	1.6	1.8	1.42	0.39
			Regular	11.91	0.38	0.13	28.58	0.38	0.18	1.6	1.8	2.29	0.75
			Wide	11.91	0.38	0.13	37.31 *	0.76	0.18	2.54	2.84	2.29	2.19
1/2	12.7	12	Narrow	13.49	0.38	0.13	25.4	0.38	0.18	1.6	1.8	1.42	0.52
			Regular	13.49	0.38	0.13	31.75	0.76	0.18	2.54	2.84	2.29	1.45
			Wide	13.49	0.38	0.13	44.45	0.76	0.18	2.54	2.84	2.29	3.15
9/16	14.27	13	Narrow	15.09	0.38	0.13	28.58	0.38	0.18	1.6	1.8	1.42	0.65
			Regular	15.09	0.38	0.13	37.31 *	0.76	0.18	2.54	2.84	2.29	2.04
			Wide	15.09	0.38	0.13	50.8	0.76	0.18	2.54	2.84	2.29	4.13
5/8	15.88	16	Narrow	16.66	0.76	0.18	31.75	0.76	0.18	2.54	2.84	2.29	1.28
			Regular	16.66	0.76	0.18	44.45	0.76	0.18	2.54	2.84	2.29	2.98
			Wide	16.66	0.76	0.18	57.15	0.76	0.18	4.06	4.42	3.71	8.14
3/4	19.05	20	Narrow	20.62	0.76	0.18	34.93	0.76	0.18	2.54	2.84	2.29	1.39
			Regular	20.62	0.76	0.18	50.8	0.76	0.18	2.54	4.42	2.29	5.87
			Wide	20.62	0.76	0.18	63.5	0.76	0.18	4.06	4.42	3.71	9.83
7/8	22.23	24	Narrow	23.83	0.76	0.18	37.31 *	0.76	0.18	2.54	2.84	2.29	1.45
			Regular	23.83	0.76	0.18	57.15	0.76	0.18	4.06	4.42	3.71	7.35
			Wide	23.83	0.76	0.18	69.85	0.76	0.18	4.06	4.42	3.71	11.75
1	25.4	27	Narrow	26.97	0.76	0.18	44.45	0.76	0.18	2.54	2.84	2.29	2.19
			Regular	26.97	0.76	0.18	63.5	0.76	0.18	4.06	4.42	3.71	9
			Wide	26.97	0.76	0.18	76.2	0.76	0.18	4.06	4.42	3.71	13.84
1 1/8	28.58	30	Narrow	30.18	0.76	0.18	50.8	0.76	0.18	2.54	2.84	2.29	2.93
			Regular	30.18	0.76	0.18	69.85	0.76	0.18	4.06	4.42	3.71	10.81
			Wide	30.18	0.76	0.18	82.55	0.76	0.18	4.06	4.42	3.71	16.09

#) For input in material take off (MTO) this column shall be used.

\* The 18.64 mm. and 37.31 mm outside diameter avoids washers which could be used in coin operated devices.

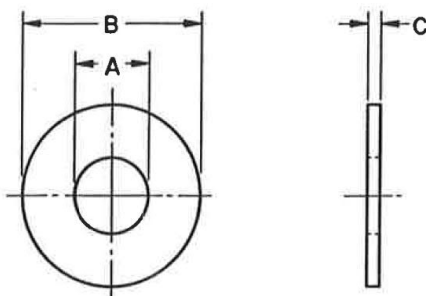
\*\* Nominal washer sizes are intended for use with comparable screw- or bolt sizes.

Inside and outside diameters shall be concentric within at least the inside diameter tolerance.

Washers shall be flat within 0.005 inch for basic outside diameters up to and including 22.23 mm. and within 0.254 mm for larger outside diameters.

Measurements in [mm] are only for information.

## Plain Washers Type B



Dimensions of Type B Washers in [mm] Part 2 of 2

Nominal Washer Size *			Series	Inside Diameter (A)			Outside Diameter (B)			Thickness (C)			Weight [kg/100pc]
[mm]	#)			[mm]	Tolerance + [mm]	Tolerance - [mm]	[mm]	Tolerance + [mm]	Tolerance - [mm]	[mm]	max. [mm]	min. [mm]	
1 1/4	31.75	33	Narrow	33.32	0.76	0.18	57.15	0.76	0.18	4.06	4.42	3.71	5.87
			Regular	33.32	0.76	0.18	76.2	0.76	0.18	4.06	4.42	3.71	12.8
			Wide	33.32	1.14	0.25	88.9	1.14	0.25	6.35	6.76	5.94	28.3
1 3/8	34.93	36	Narrow	36.53	0.76	0.18	63.5	0.76	1.78	4.06	4.42	3.71	7.35
			Regular	36.53	0.76	0.18	82.55	0.76	1.78	4.06	4.42	3.71	14.93
			Wide	36.53	1.14	0.25	95.25	1.14	0.25	6.35	6.76	5.94	32.24
1 1/2	38.10	39	Narrow	39.67	0.76	0.18	69.85	0.76	1.78	4.06	4.42	3.71	9.01
			Regular	39.67	1.14	0.25	88.9	1.14	0.25	6.35	6.76	5.94	26.36
			Wide	39.67	1.14	0.25	101.6	1.14	0.25	6.35	6.76	5.94	36.44
1 5/8	41.28	42	Narrow	44.45	0.76	0.18	76.2	0.76	1.78	4.06	4.42	3.71	10.44
			Regular	44.45	1.14	0.25	95.25	1.14	0.25	6.35	6.76	5.94	29.56
			Wide	44.45	1.14	0.25	107.95	1.14	0.25	6.35	6.76	5.94	40.31
1 3/4	44.45	45	Narrow	47.63	0.76	0.18	82.55	0.76	1.78	4.06	4.42	3.71	12.39
			Regular	47.63	1.14	0.25	107.95	1.14	0.25	6.35	6.76	5.94	39.09
			Wide	47.63	1.14	0.25	120.65	1.14	0.25	6.35	6.76	5.94	51.19
1 7/8	47.63	48	Narrow	50.8	1.14	0.25	88.9	1.14	0.25	6.35	6.76	5.94	22.17
			Regular	50.8	1.14	0.25	107.95	1.14	0.25	6.35	6.76	5.94	37.79
			Wide	50.8	1.14	0.25	120.65	1.14	0.25	6.35	6.76	5.94	49.89
2	50.8	52	Narrow	53.98	1.14	0.25	95.25	1.14	0.25	6.35	6.76	5.94	25.66
			Regular	53.98	1.14	0.25	114.3	1.14	0.25	6.35	6.76	5.94	42.29
			Wide	53.98	1.14	0.25	127	1.14	0.25	6.35	6.76	5.94	55.05
2 1/4	57.15	56	Narrow	60.33	1.14	0.25	101.6	1.14	0.25	6.35	6.76	5.94	27.84
			Regular	60.33	1.14	0.25	127	1.14	0.25	6.35	6.76	5.94	52.03
			Wide	60.33	1.65	0.25	139.7	1.65	0.25	9.53	9.98	9.07	97.71
2 1/2	63.5	65	Narrow	66.68	1.14	0.25	114.3	1.14	0.25	6.35	6.76	5.94	35.9
			Regular	66.68	1.65	0.25	139.7	1.65	0.25	9.53	9.98	9.07	92.75
			Wide	66.68	1.65	0.25	152.4	1.65	0.25	9.53	9.98	9.07	115.58
2 3/4	69.85	70	Narrow	73.03	1.14	0.25	127	1.14	0.25	6.35	6.76	5.94	44.97
			Regular	73.03	1.65	0.25	152.4	1.65	0.25	9.53	9.98	9.07	110.12
			Wide	73.03	1.65	0.25	165.1	1.65	0.25	9.53	9.98	9.07	134.94
3	76.2	80	Narrow	79.38	1.65	0.25	139.7	1.65	0.25	9.53	9.98	9.07	81.33
			Regular	79.38	1.65	0.25	165.1	1.65	0.25	9.53	9.98	9.07	128.98
			Wide	79.38	1.65	0.25	177.8	1.65	0.25	9.53	9.98	9.07	155.78

#) For input in material take off (MTO) this row shall be used.

\* Nominal washer sizes are intended for use with comparable nominal screw or bolt sizes.

Inside and outside diameters shall be concentric within at least the inside diameter tolerance.

Washers of sizes shown above shall be flat within 0.254 mm.

Measurements in [mm] are only for information.

**Gaskets**

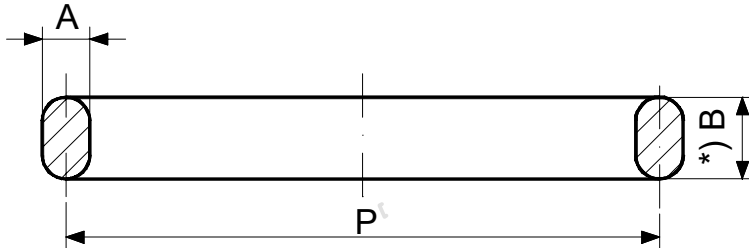
acc. to ASME B16.21 and B16.20

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**Tolerances acc. to ASME B16.20**

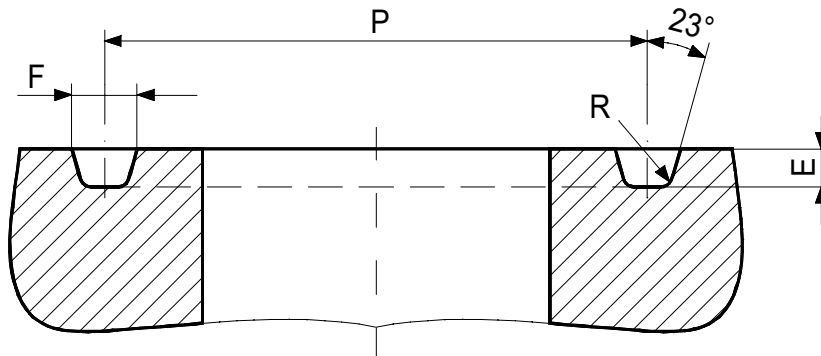
Oval Ring



**Ring tolerances**

- P = ± 0,4 mm
- A = ± 0,2 mm
- B = + 1,2 mm  
- 0,4 mm

\*) Variation in height throughout the entire circumference of any given ring shall not exceed 0,5 mm within these tolerances.



**Groove tolerances**

- E = + 0,4 mm  
- 0,0 mm
- F = ± 0,2 mm
- P = ± 0,13 mm
- R = min. dimension
- 23° = ± 1/2°

**Tolerances acc. to ASME B16.21**

Gaskets for large male and female and large tongue and groove should cover the bottom of the recess having minimum width, considering the tolerances of ± 0,5 mm specified by the respective standards for these facings.

**Full Face Flat Gaskets**  
for Flange Facing FF (Flat Face)  
ASME B16.21 / MSS SP44 / AWWA C207

**H 600**

Page 3

Example of Designation: Designation of a plain full face flat gasket for nominal diameter 6", Class 150 material: natural rubber

Part number **60119B002**      **6 (INCH)\*2 MM**      **FULL FACE FLAT GASKET/FF**      **(NR) NATURAL RUBBER**  
**CLASS 150 H600/ASME B16.21**

Part numbering Code											
Position of Part No.											
1. - 2.		3.		4.		5. - 6.		7.- 8.		9.	
Kind of Part	Cd.	2) Class		Type	Cd.	1) Material		3) Special type		5) Certificate	
		Cd.	Cd.			Cd.	Cd.	Cd.	Cd.	Cd.	Cd.
Full Face Flat Gaskets	60	150	1	plain	1	NR (Natural rubber)	9B	0	0	ASME	2
		D	D			Rubber with 2 plies of fabric	9F	0	A		
		E	H			ItÖ 4)	9G				
						It400 4)	9K				
						SBR-Rubber red, premium grade	9R				
<b>Garlock Qualities</b>							Application limits				
							p (bar)	T (°C)	max. pxT		
BLUE-GARD Style 3000							K4	70	200	12000	
BLUE-GARD Style 3300							K5	80	200	12000	
BLUE-GARD Style 3400							K6	80	200	12000	
BLUE-GARD Style 3200							K7	80	200	12000	
BLUE-GARD Style 3700							K8	80	200	12000	
Gylon Style 3510 White							K9	55	260	12000	
Gylon Style 3501E Standard							P9	83	260	12000	

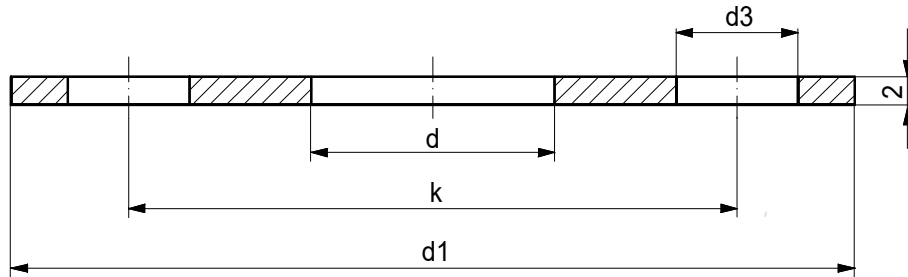
- 1) Materials:  
It-Materials acc. to DIN3754 - only for expiring projects  
Garlock Qualities: BLUE-GARD Style 3000: Aramid fiber with nitrile binder (Water, aliphatic hydrocarbon, oil, gasoline)  
BLUE-GARD Style 3200: Aramid fiber with SBR binder (Water, inert gas)  
BLUE-GARD Style 3300: Aramid fiber with neoprene binder (Water, refrigerant, oil, fuel)  
BLUE-GARD Style 3400: Aramid fiber with SBR binder (Water, inert gas)  
BLUE-GARD Style 3700: Aramid fiber with EPDM binder (Water, inert gas)  
GYLON Style 3501E: PTFE with silica for chemical industry and petro chemistry application (strong acid (except hydrofluoric), solvents, hydrocarbon, water, steam, chlorine, cryogenic)  
GYLON Style 3510: PTFE with barium sulfate (strong caustic, moderate acid, chlorine, gas, water, steam, hydrocarbon, cryogenic und aluminum fluoride)

All other qualities acc. to manufacturer´s standard

- 2) Code for Class  
Class-designation acc. to ASME B16.21 or AWWA C207
- 3) Code for special type  
00 = Requirements and dimensions acc. to ASME B16.21 for flanges acc. to ASME B16.5  
0A = Requirements and dimensions acc. to AWWA C207 for flanges acc. to AWWA C207  
0S = Requirements and dimensions acc. to MSS-SP44 for flanges acc. to MSS-SP44 (ASME B16.47 Series A)
- 4) Only for expiring projects
- 5) Certificate corresponds with ASTM- / ASME- / MSS- / AWWA-Standards

**Full Face Flat Gaskets** for flange facing FF (Flat Face) acc. to ASME B16.21  
for **Flanges Class 150 acc. to ASME B16.5**

Required flange roughness  $R_a = 125 - 500 \mu\text{inch}$

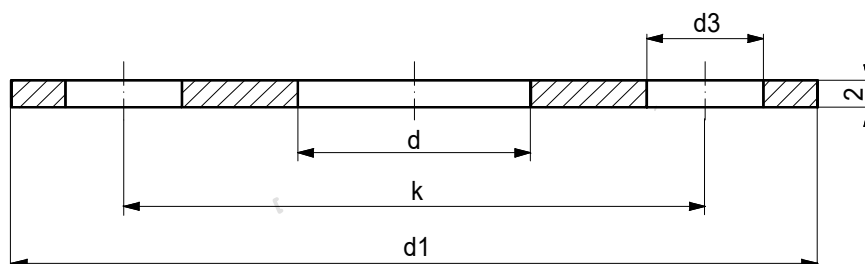


Dimensions in mm

Nominal diameter		Inside diameter $d$	Outside diameter $d_1$	Diameter of Bolt circle $k$	Diameter of holes $d_3$		Weight kg/100 pieces
inch	mm					number	
1/2	15	22	88	60,3	16	4	
3/4	20	27	98	69,8	16	4	
1	25	33	107	79,4	16	4	
1 1/4	32	42	117	88,9	16	4	
1 1/2	40	48	127	98,4	16	4	
2	50	60	152	120,6	19	4	
2 1/2	65	73	177	139,7	19	4	
3	80	89	190	152,4	19	4	
4	100	114	228	190,5	19	8	
5	125	141	254	215,9	22	8	
6	150	168	279	241,3	22	8	
8	200	219	342	298,4	22	8	
10	250	273	406	361,9	25	12	
12	300	324	482	431,8	25	12	
14	350	356	533	476,2	29	12	
16	400	406	596	539,7	29	16	
18	450	457	635	577,8	32	16	
20	500	508	698	635,0	32	20	
24	600	610	812	749,3	35	20	

**Full Face Flat Gaskets** for flange facing FF (Flat Face)  
for Flanges Class 150 acc. to **MSS-SP44 (ASME B16.47 Series A)**

Required flange roughness  $R_a = 125 - 500 \mu\text{inch}$



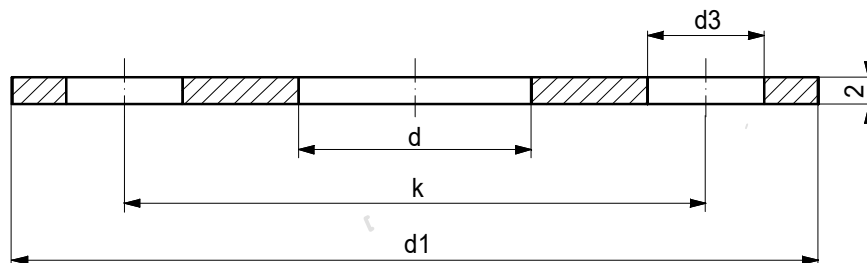
Dimensions in mm

Nominal diameter		Inside diameter $d$	Outside diameter $d_1$	Diameter of Bolt circle $k$	Diameter of holes		Weight kg/100 pieces
inch	mm				$d_3$	number	
(22)	550	559	749	692,1	35	20	
26	650	661	869	806,4	35	24	
28	700	712	927	863,6	35	28	
30	750	763	984	914,4	35	28	
32	800	814	1060	977,9	42	28	
34	850	865	1111	1028,7	42	32	
36	900	916	1168	1085,8	42	32	
38	950	967	1238	1149,4	42	32	
40	1000	1017	1289	1200,2	42	36	
42	1050	1068	1346	1257,3	42	36	
44	1100	1119	1403	1314,5	42	40	
46	1150	1170	1454	1365,3	42	40	
48	1200	1221	1511	1422,4	42	44	
50	1250	1271	1569	1479,6	48	44	
52	1300	1322	1625	1536,7	48	44	
54	1350	1373	1682	1593,9	48	44	
56	1400	1424	1746	1651,0	48	48	
58	1450	1475	1803	1708,2	48	48	
60	1500	1525	1854	1759,0	48	52	

Bracketed sizes shall be avoided.

**Full Face Flat Gaskets for flange facing FF (Flat Face)  
for Flanges Class D and E acc. to AWWA C207**

Required flange roughness Ra = 125 - 500 µinch



Dimensions in mm

Nominal diameter		Inside diameter d	Outside diameter d1	Diameter of Bolt circle k	Diameter of holes		Weight kg/100 pieces
inch	mm				d3	number	
26	650	661	870	806,5	35	24	
28	700	712	927	863,6	35	28	
30	750	763	984	914,4	35	28	
32	800	814	1060	977,9	42	28	
34	850	865	1111	1028,7	42	32	
36	900	916	1168	1085,8	42	32	
38	950	967	1238	1149,4	42	32	
40	1000	1017	1289	1200,2	42	36	
42	1050	1068	1346	1257,3	42	36	
44	1100	1119	1403	1314,5	42	40	
46	1150	1170	1454	1365,3	42	40	
48	1200	1221	1511	1422,4	42	44	
50	1250	1271	1568	1479,6	48	44	
52	1300	1322	1625	1536,7	48	44	
54	1350	1373	1682	1593,9	48	44	
60	1500	1525	1854	1759,0	48	52	
66	1650	1678	2032	1931,0	48	52	
72	1800	1830	2197	2096,0	48	60	
78	1950	1983	2363	2261,0	54	64	
84	2100	2135	2534	2426,0	54	64	
90	2250	2287	2705	2591,0	62	68	
96	2400	2440	2877	2756,0	62	68	

**Flat Ring Gaskets**  
for flange facing RF (Raised Face)  
ASME B16.21 / MSS-SP44 / AWWA C207

**H 600**

Page 7

Example of Designation: Designation of a self centering flat ring gasket for flanges ASME B16.5, class 300, nominal diameter 16", material: graphite with stainless steel insert

Part number  
**61219S002      16(INCH)\*2 (MM)      FLAT RING GASKET/RF      GRAPHITE/SS-INSERT**  
**CLASS 300 H600/ASME B16.21**

Part numbering Code												
Position of Part No.												
1. - 2		3.		4.		5. - 6.			7.- 8.		9.	
Kind of Part		Class 2)		Type		Material 1)			Special type 3)		Certificate 5)	
Cd.		Cd.		Cd.		Cd.			Cd.		Cd.	
Flat Ring Gasket for flange facing Raised Face	61	150	1	flat (self centering)	1	Acryl / Neoprene +)	9A	0	0	ASME	2	
		300	2			NR (Natural rubber) +)	9B	0	F			
		400	3			It200 4)	9C	0	G			
		600	4			ItÖ-Cold 4)	9D	0	A			
		900	5			PTFE *)	9E	0	S			
		D	D			Rubber with 2 plies of fabric +)	9F					
		E	H			ItÖ 4)	9G					
						ItC 4)	9H					
						CR (Neoprene) with steel insert +)	9J					
						It400 4)	9K					

\*) Requirements and tests acc. to ASTM F104  
+) Tests acc. to ASTM D2000

1) Materials:  
It-Material acc. to DIN3754-only for expiring projects  
Garlock-Qualities see page 3  
All other materials acc. to manufacturer's standard

2) Code for Class  
Class-designation acc. to ASME B16.21 or AWWA C207

3) Code for special type

- 00 = Requirements and dimensions acc. to ASME B16.21 for flanges acc. to ASME B16.5
- 0F = "free of oil and grease", packed, certified and marked for "oxygen service"  
Requirements and dimensions acc. to ASME B16.21 for flanges acc. to ASME B16.5
- 0G = "free of oil and grease", packed, certified and marked for "oxygen service"  
Requirements and dimensions acc. to ASME B16.21 for flanges acc. to MSS-SP44 (ASME B16.47 Series A)
- 0A = Requirements and dimensions acc. to AWWA C207 for flanges acc. to AWWA C207
- 0S = Requirements and dimensions acc. to ASME B16.21 for flanges acc. to MSS-SP44 (ASME B16.47 Series A)

4) Only for expiring projects

5) Certificate corresponds with ASTM- / ASME- / MSS- / AWWA-Standards

Garlock-Qualities			Application limits		
			p (bar)	T (°C)	max. pxT
Garfite N (~ItÖ) *)	K1		138	400	25000
Garfite S (~It400) *)	K2		138	400	25000
Garfite TI (Graphite) *)	K3		138	470	25000
BLUE-GARD Style 300 *)	K4		70	200	12000
BLUE-GARD Style 3300 *)	K5		80	200	12000
BLUE-GARD Style 3400 *)	K6		80	200	12000
BLUE-GARD Style 3200 *)	K7		80	200	12000
BLUE-GARD Style 3700 *)	K8		80	200	12000
Gylon Style 3510 White *)	K9		55	260	12000
Gylon Style 3505 *)	P1		55	260	12000
Gylon Style 3501E Standard *)	P9		83	260	12000

Leerseite

**Flat Ring Gaskets**  
for flange facing RF (Raised Face)  
Class 150 - 900 / ASME B16.21 / MSS-SP44

**H 600**

Page 9

Example of Designation: Designation of an inside jacketed flat ring gasket for flanges MSS-SP-44, class 300, nominal diameter 28", material: Garlock Blue Gard Style 3300 with jacket of Gr.304

Partnumber **6122K50S2**      **28" FLAT RING GASKET/RF INS. STYLE 3300/GR.304**  
**JACKETED CLASS 300 H600/MSS-SP44/GARLOCK**

Part numbering Code												
Position of Part No.												
1. - 2.		3.		4.		5. - 6.		7. - 8.		9.		
Kind of Part		Class 2)		Type		Material 1)		Special type 3)		Certificate 5)		
Kz.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	
Flat Ring Gasket for flange facing Raised Face	61	150	1	Inside jacketed (self centering)	2	SBR-Rubber / PTFE		9E	0	0	ASME	2
		300	2			ItÖ / 1.4541 4)		9G	0	F		
		400	3			ItC / 1.4404 4)		9H	0	G		
		600	4			It400 / 1.4571 4)		9K	0	S		
		900	5			Graphite with stainless steel insert		9S				
<b>Garlock Qualities</b>						Application limits						
								p (bar)	T (°C)	max. pxT		
Style 3000 / Gr.304						K4	70	200	12000			
Style 3300 / Gr.304						K5	80	200	12000			
Style 3400 / Gr.316						K6	80	200	12000			
Style 3300 / Gr.304						K7	80	200	12000			
Style 3700 / Gr.304						K8	80	200	12000			
Gylon Style 3510 White / Gr.S31803						K9	55	260	12000			
Gylon Style 3501E Standard/ Gr.316						P9	83	260	12000			

- 1) Materials:  
It-Materials acc. to DIN3754 - only for expiring projects  
Inside jacket of stainless steel Gr.304, Gr.316 acc. to ASTM A167; Gr.S31803 acc. to ASTM A240  
Garlock-Qualities see page 3  
All other materials acc. to manufacturer's standard

2) Code for Class

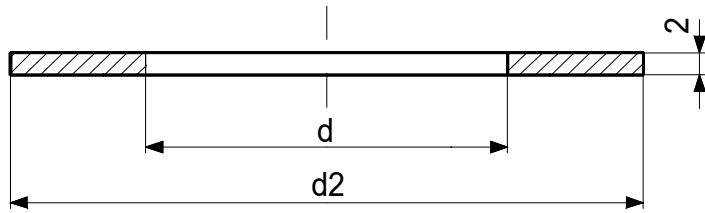
3) Code for special type

- 00 = Requirements and dimensions acc. to ASME B16.21 for flanges acc. to ASME B16.5
- 0F = "free of oil and grease", packed, certified and marked for "oxygen service"  
Requirements and dimensions acc. to ASME B16.21 for flanges acc. to ASME B16.5
- 0G = "free of oil and grease", packed, certified and marked for "oxygen service"  
Requirements and dimensions acc. to ASME B16.21 for flanges acc. to MSS-SP44 (ASME B16.47 Series A)
- 0S = Requirements and dimensions acc. to ASME B16.21 for flanges acc. to MSS-SP44 (ASME B16.47 Series A)

4) Only for expiring projects

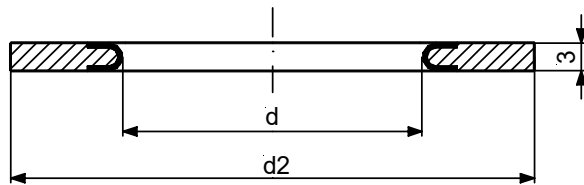
5) Certificate corresponds with ASTM- / ASME- / MSS-Standards

**Flat Ring Gasket flat (self centering) acc. to ASME B16.21  
for Flanges acc. to ASME B16.5, Class 150 - 900**



Required flange facing  
RF (Raised Face)  
(Ra = 250 - 500 μinch)

**Flat Ring Gasket inside jacketed (self centering ) acc. to ASME B16.21  
for Flanges acc. to ASME B16.5, Class 150 - 900**

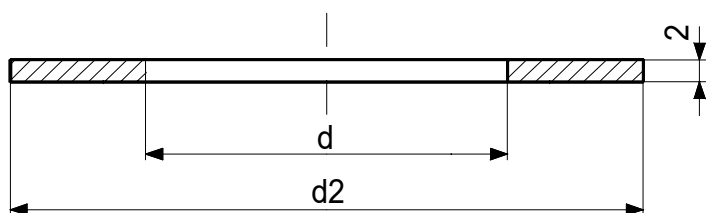


Required flange facing  
RF (Raised Face)  
(Ra = 125 - 500 μinch)

Dimensions in mm

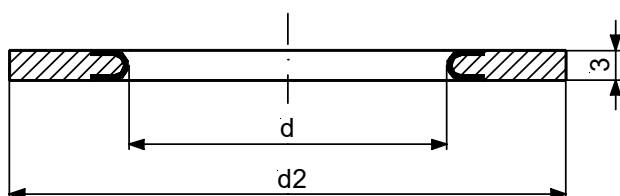
Nominal diameter		Inside diameter d	Outside diameter d2 for Class					Weight (flat) kg/100 pieces					
inch	mm		150	300	400	600	900	150	300	400	600	900	
1/2	15	21	47	53	see Class 600	53	see Class 1500						
3/4	20	27	57	66		66							
1	25	33	66	73		73							
1 1/4	32	42	76	82		82							
1 1/2	40	48	85	95		95							
2	50	60	104	111		111							
2 1/2	65	73	123	130		130							
3	80	89	136	149	149	168							
4	100	114	174	180	177	193	206						
5	125	141	196	215	212	241	247						
6	150	168	222	250	247	266	288						
8	200	219	279	307	304	320	358						
10	250	273	339	361	358	400	434						
12	300	324	409	422	419	457	498						
14	350	356	450	485	482	492	520						
16	400	406	514	539	536	565	574						
18	450	457	549	597	594	613	638						
20	500	508	606	654	647	682	698						
24	600	610	717	774	768	790	838						

**Flat Ring Gasket flat** (self centering) acc. to ASME B16.21  
for Flanges acc. to **MSS-SP-44, Class 150 - 900** (ASME B16.47 Series A)



Required flange facing  
RF (Raised Face)  
(Ra = 250 - 500 μinch)

**Flat Ring Gasket inside jacketed** (self centering) acc. to ASME B16.21  
for Flanges acc. to **MSS-SP-44, Class 150 - 900** (ASME B16.47 Series A)



Required flange facing  
RF (Raised Face)  
(Ra = 125 - 500 μinch)

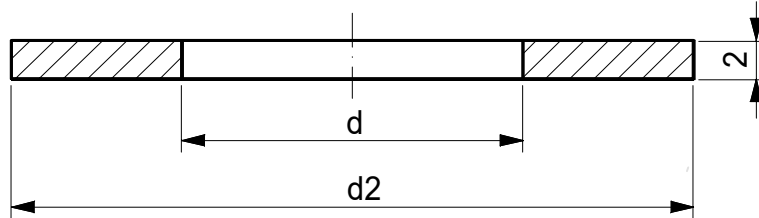
Dimensions in mm

Nominal diameter		Inside diameter d	Outside diameter d2 for Class					Weight (flat) kg/100 pieces				
inch	mm		150	300	400	600	900	150	300	400	600	900
(22)	550	559	659	703	700	732	-					
26	650	661	774	834	830	865	881					
28	700	712	830	897	891	913	945					
30	750	763	882	951	945	970	1008					
32	800	814	938	1005	1002	1021	1072					
34	850	865	990	1056	1053	1072	1135					
36	900	916	1047	1116	1116	1129	1199					
38	950	967	1110	1053	1072	1103	1199					
40	1000	1017	1161	1113	1131	1154	1249					
42	1050	1068	1218	1164	1177	1218	1300					
44	1100	1119	1275	1218	1230	1269	1367					
46	1150	1170	1326	1272	1288	1326	1434					
48	1200	1221	1383	1322	1345	1389	1484					
50	1250	1271	1434	1376	1402	1446	-					
52	1300	1322	1491	1427	1453	1497	-					
54	1350	1373	1548	1491	1516	1554	-					
56	1400	1424	1605	1542	1567	1611	-					
58	1450	1475	1162	1592	1618	1662	-					
60	1500	1525	1713	1643	1681	1719	-					

Bracketed sizes shall be avoided.

**Flat Ring Gasket flat** (self centering) acc. to AWWA C207  
for Flanges **Class D and E acc. to AWWA C207 \***)

Required flange roughness Ra = 125 - 500 µinch



Dimensions in mm

Nominal diameter		Inside diameter	Outside diameter	Weight kg/100 pieces
inch	mm	d	d2	
26	650	666	774	
28	700	716	830	
30	750	767	882	
32	800	818	938	
34	850	869	990	
36	900	920	1047	
38	950	970	1110	
40	1000	1021	1161	
42	1050	1072	1218	
44	1100	1123	1275	
46	1150	1174	1326	
48	1200	1224	1383	
50	1250	1275	1434	
52	1300	1326	1491	
54	1350	1377	1548	
60	1500	1529	1713	
66	1650	1682	1885	
72	1800	1834	2050	
78	1950	1986	2208	
84	2100	2139	2373	
90	2250	2291	2532	
96	2400	2444	2697	

\*) Flanges acc. to AWWA C207, Class D or E suit to flanges Class 125 acc. to ASME B16.1  
resp. Class 150 acc. to ASME B16.5.

## Flat Ring Gaskets double jacketed

for flange facing RF (Raised Face)  
Class 150 - 900 / ASME B16.20

**H 600**

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Example of Designation: Designation of a double jacketed flat ring gasket, class 600 for nominal diameter 10", material: jacket Gr. 304, filler graphite

Part number  
**61440C002**

**10(INCH)\*3 (MM)**

**FLAT RING GASKET DOUBLE GR.304/GRAPHITE  
JACKETED CLASS 600 H600/ASME B16.20**

Part numbering Code											
Position of Part No.											
1. - 2.		3.		4.		5. - 6.		7.- 8.		9.	
Kind of Part		Class <sup>2)</sup>		Type		Material <sup>1)</sup>		Special type <sup>3)</sup>		Certificate <sup>5)</sup>	
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.
Flat Ring Gasket for flange facing Raised Face	61	150	1	Double jacketed	4	Gr.304 / Graphite	0C	0	0	ASME	2
		300	2			Gr.316 / Graphite	0Z	0	F		
		400	3								
		600	4								
		900	5								
					Soft iron / Asbestos <sup>4)</sup>	0M					
					Al / Asbestos <sup>4)</sup>	0N					
				Gr.321 / Asbestos <sup>4)</sup>	0P						
				PTFE / It400 <sup>4)</sup>	9E						

**1) Materials**

**Jacket:**

Al, soft iron and PTFE acc. to manufacturer's standard.  
Stainless steel acc. to ASTM A167

**Filler:**

Asbestos acc. to DIN 3752 <sup>4)</sup>  
It-Materials acc. to DIN 3754 <sup>4)</sup>  
all other materials acc. to manufacturer's standard

**2) Code for Class**

**3) Code for special type**

00 = Requirements and dimensions acc. to ASME B16.20 for flanges acc. to ASME B16.5

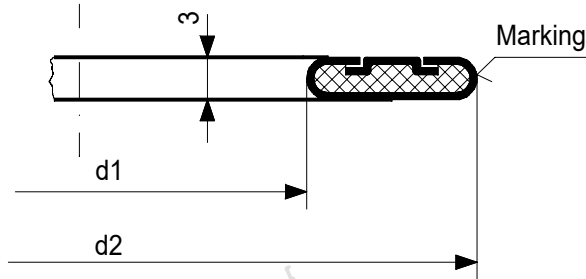
0F = "free of oil and grease", packed, certified and marked for "oxygen service";  
requirements and dimensions acc. to ASME B16.20 for flanges acc. to ASME B16.5

**4) Only for expiring projects**

**5) Certificate corresponds with ASTM- / ASME-Standards.**

**Double Jacketed Flat Ring Gasket for flange facing RF (Raised Face) Class 150 - 900**

Required flange roughness Ra max. = 125 µinch



Dimensions in mm

Nominal diameter		d1	d2					Weight kg/100 pcs.
inch	mm		Class 150	Class 300	Class 400	Class 600	Class 900	
1/2	15	22,4	44,5	50,8	Use Class 600	50,8	Use Class 1500	
3/4	20	28,7	54,1	63,5		63,5		
1	25	38,1	63,5	69,9		69,9		
1 1/4	32	47,8	73,2	79,5		79,5		
1 1/2	40	54,1	82,6	92,2		92,2		
2	50	73,2	101,6	108,0		108,0		
2 1/2	65	88,9	120,7	127,0		127,0		
3	80	108,0	133,4	146,1	146,1	165,1		
4	100	131,8	171,5	177,8	174,8	190,5	203,2	
5	125	152,4	193,8	212,9	209,6	238,3	244,6	
6	150	190,5	219,2	247,7	244,6	263,7	285,8	
8	200	238,3	276,4	304,8	301,8	317,5	355,6	
10	250	285,8	336,6	358,9	355,6	397,0	431,8	
12	300	342,9	406,4	419,1	416,1	454,2	495,3	
14	350	374,7	447,8	182,6	479,6	489,0	517,7	
16	400	425,5	511,3	536,7	533,4	562,1	571,5	
18	450	489,0	546,1	593,9	590,6	609,6	635	
20	500	533,4	603,3	651,0	644,7	679,5	695,5	
24	600	641,4	714,5	771,7	765,3	787,4	835,2	

**Spiral wound gasket**  
for flange facing RF (Raised Face)  
Class 150 - 2500 / ASME B16.20 \*)

**H 600**

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Example of Designation: Designation of a spiral wound gasket with centering ring and internal ring, class 1500 for nominal diameter 10", material: spiral Gr.304 with graphite filler, internal ring Gr.304, centering ring C-steel

Part number **61650USR2**      **10 (INCH)\*5 (MM)**      **SPIRAL WOUND GASKET CL.1500 GR.304/GRAPHITE/C-STEEL W.CENTERING-&INTERNAL RING H600/ASME B16.20**

Part numbering Code													
Position of Part No.													
1. - 2.		3.		4.		5. - 6.			7. - 8.		9.		
Kind of Part		Class 2)		Type		Material 1)			Special type 3)		Certificate 5)		
Cd.		Cd.	Cd.	Cd.		Cd.			Cd.	Cd.	Cd.		
Flat Ring Gasket for flange facing Raised Face	61	150	1	Spiral wound gasket	5	Gr.304/Asbestos with filler 4)			0A	0	0	ASME	2
		300	2			Gr.304/Graphite/Gr.304			0C	0	F		
		400	3			Gr.321/Graphite/Gr.321			0D	S	R		
		600	4			Gr.316/Graphite/Gr.316			0E	S	F		
		900	5			1.4541/It200 4)			0P	S	S		
		1500	6			1.4571/It400 4)			0Q	S	X		
		2500	7			1.4306/ItC 4)			0R				
			1.4301/PTFE-Asbestos 4)			0S							
			1.4541/Graphite / Asbestos 4)			0T							
			Gr.304/Graphite/C-Steel			0U							
			Gr.304/PTFE/C-Steel §)			0V							
			Gr.316/PTFE/C-Steel §)			0W							
			Gr.321/Graphite/C-Steel			0Y							
			Gr.316/Graphite/C-Steel			0Z							

1) Materials

**Spiral:**

Stainless steel acc. to ASTM A167 or DIN17440

**Filler:**

It-Materials acc. to DIN3754 / Asbestos acc. to DIN3752 - for expiring projects

Graphite, PTFE acc. to manufacturer's standard

**Internal- / Centering ring:**

acc. to ASTM A167 or DIN17440, ASTM A285 / A570

2) Code for Class

3) Code for special type

00 = With centering ring;

Requirements and dimensions acc. to ASME B16.20 for flanges acc. to ASME B16.5

0F = With centering ring;

"free of oil and grease", packed, certified and marked for "oxygen service"

Requirements and dimensions acc. to ASME B16.20 for flanges acc. to ASME B16.5

SR = With centering ring and internal ring;

Requirements and dimensions acc. to ASME B16.20 for flanges acc. to ASME B16.5

SF = With centering ring and internal ring;

"free of oil and grease", packed, certified and marked for "oxygen service"

Requirements and dimensions acc. to ASME B16.20 for flanges acc. to ASME B16.5

SS = With centering ring and internal ring;

Requirements and dimensions acc. to ASME B16.20 for flanges acc. to MSS-SP44 (ASME B16.47 Series A)

SX = With centering ring and internal ring;

"free of oil and grease", packed, certified and marked for "oxygen service"

Requirements and dimensions acc. to ASME B16.20 for flanges acc. to MSS-SP44 (ASME B16.47 Series A)

4) Only for expiring projects

5) Certificate corresponds with ASTM- / ASME- Standards.

§) An internal ring is mandatory for a spiral wound gasket with PTFE-filler.

Further requirements see ASME B16.20

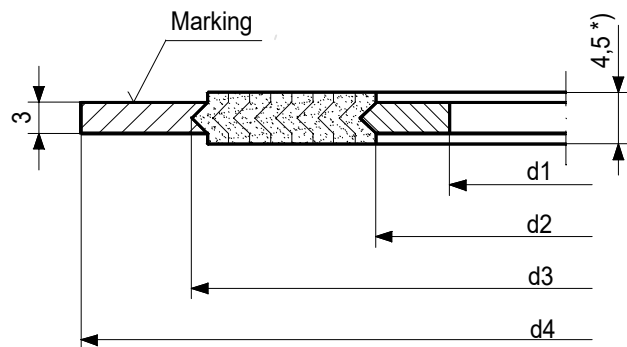
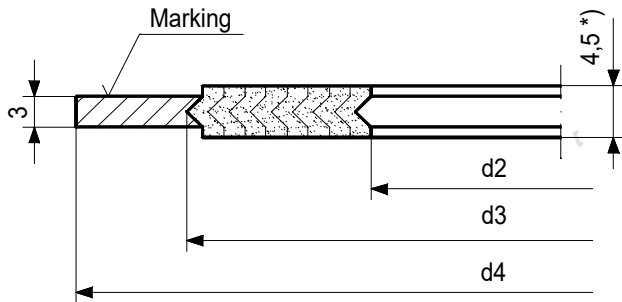
\*) Spiral wound gaskets acc. to ASME B16.20 recently standardized by API 601.

**Spiral wound gasket Class 150-600**  
with centering ring acc. to ASME B16.20  
for **Flanges acc. to ASME B16.5**  
with flange facing Raised Face (RF)

Special type-Code: **00**  
**OF**

**Spiral wound gasket Class 150-600**  
with centering ring and internal ring  
acc. to ASME B16.20  
for **Flanges acc. to ASME B16.5**  
with flange facing Raised Face (RF)

Special type-Code: **SR**  
**SF**



Required flange roughness Ra max. = 250 µinch

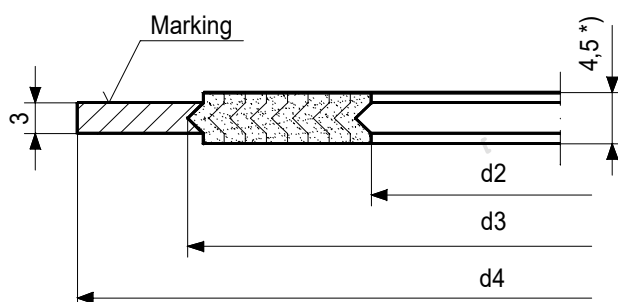
Dimensions in mm

Nominal diameter		d1 Class		d2 Class		d3 Class	d4 Class			
inch	mm	150-300	400-600	150-300	400-600	150-600	150	300	400	600
1/2	15	14,2		19,1		31,8	47,8	54,1		
3/4	20	20,6		25,4		39,6	57,2	66,8		
1	25	26,9		31,8		47,8	66,8	73,2		
1 1/4	32	38,1		47,8		60,5	76,2	82,6		
1 1/2	40	44,5		54,1		69,9	85,9	95,3		
2	50	55,6		69,9		85,9	104,9	111,3		
2 1/2	65	66,5		82,6		98,6	124,0	130,3		
3	80	81,0		101,6		120,7	136,7	149,4		
4	100	106,4	102,6	127,0	120,7	149,4	174,8	181,1	177,8	193,8
5	125	131,8	128,3	155,7	147,6	177,8	196,9	215,9	212,9	241,3
6	150	157,2	154,9	182,6	174,8	209,6	222,3	251,0	247,7	266,7
8	200	215,9	205,7	233,4	225,5	263,7	279,4	308,1	304,8	320,8
10	250	268,2	255,3	287,3	274,6	317,5	339,9	362,0	358,9	400,1
12	300	317,5	307,3	339,9	327,2	374,7	409,7	422,4	419,1	457,2
14	350	349,3	342,9	371,6	362,0	406,4	450,9	485,9	482,6	492,3
16	400	400,1	389,9	422,4	412,8	463,6	514,4	539,8	536,7	565,2
18	450	449,3	438,3	474,7	469,9	527,1	549,4	596,9	593,9	612,9
20	500	500,1	489,0	525,5	520,7	577,9	606,6	654,1	647,7	682,8
24	600	603,3	590,6	628,7	628,7	685,8	717,6	774,7	768,4	790,7

\*) On computer printouts the thickness is indicated as 5 mm.

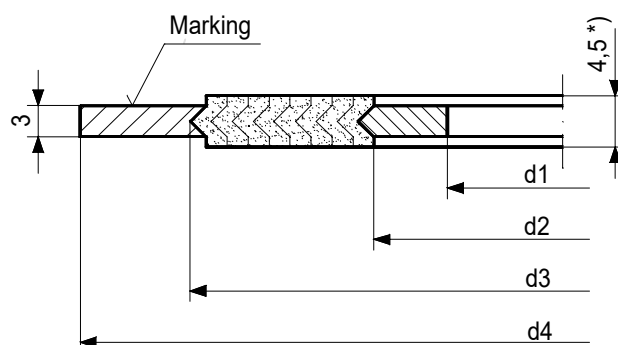
**Spiral wound gasket Class 900-2500**  
with centering ring acc. to ASME B16.20  
for **Flanges acc. to ASME B16.5**  
with flange facing Raised Face (RF)

Special type-Code:**00**  
**OF**



**Spiral wound gasket Class 900-2500**  
with centering ring and internal ring  
acc. to ASME B16.20  
for **Flanges acc. to ASME B16.5**  
with flange facing Raised Face (RF)

Special type-Code:**SR**  
**SF**



Required flange roughness Ra max. = 250 µinch

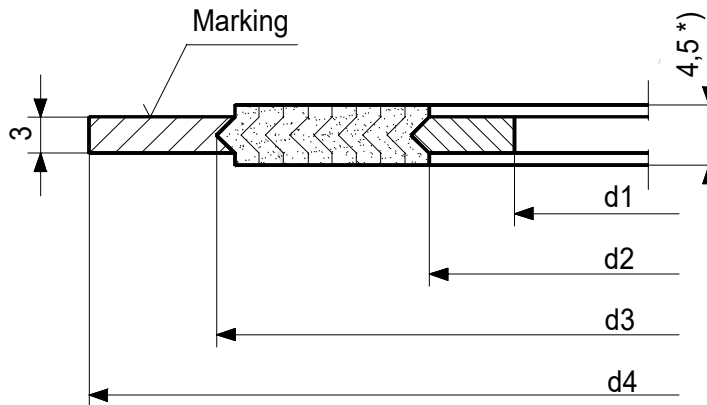
Dimensions in mm

Nominal diameter		d1 Class			d2 Class			d3 Class	d4 Class		
inch	mm	900	1500	2500	900	1500	2500	900 - 2500	900	1500	2500
1/2	15	14,2			19,1			31,8	63,5	69,9	
3/4	20	20,6			25,4			39,6	69,9	76,2	
1	25	26,9			31,8			47,8	79,5	85,9	
1 1/4	32	33,3			39,6			60,5	88,9	104,9	
1 1/2	40	41,4			47,8			69,9	98,6	117,6	
2	50	52,3			58,7			85,9	143,0	146,1	
2 1/2	65	63,5			69,9			98,6	165,1		168,4
3	80	78,7			95,3	92,2	92,2	120,7	168,4	174,8	196,9
4	100	102,9	97,8	97,8	120,7	117,6	117,6	149,4	206,5	209,6	235,0
5	125	128,3	124,5	124,5	147,6	143,0	143,0	177,8	247,7	254,0	279,4
6	150	154,9	147,3	147,3	174,8	171,5	171,5	209,6	289,1	282,7	317,5
8	200	196,9	196,9	196,9	222,3	215,9	215,9	263,7	358,9	352,6	387,4
10	250	246,1	246,1	246,1	276,4	266,7	270,0	317,5	435,1	435,1	476,3
12	300	292,1	292,1	292,1	323,9	323,9	317,5	374,7	498,6	520,7	549,4
14	350	320,8	320,8		355,6	362,0		406,4	520,7	577,9	
16	400	374,7	368,3		412,8	406,4		463,6	574,8	641,4	
18	450	425,5	425,5		463,6	463,6		527,1	638,3	704,9	
20	500	482,6	476,3		520,7	514,4		577,9	698,5	755,7	
24	600	590,6	577,9		628,7	616,0		685,8	838,2	901,7	

\*) On computer printouts the thickness is indicated as 5 mm.

**Spiral wound gasket Class 150-400**  
 with centering ring and internal ring acc. to ASME B16.20  
 for Flanges acc. to MSS-SP44 (ASME B16.47 Series A)  
 with flange facing Raised Face (RF)

Special type-Code: **SS**  
**SX**



Required flange roughness Ra max. = 250 µinch

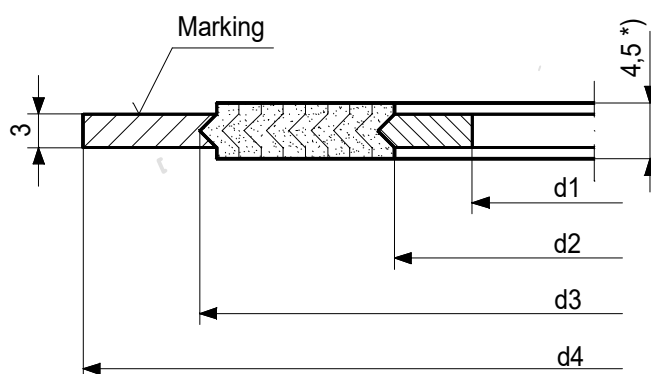
Dimensions in mm

Nominal diameter		d1 Class			d2 Class			d3 Class			d4 Class		
inch	mm	150	300	400	150	300	400	150	300	400	150	300	400
26	650	654,1		660,4	673,1		685,8	704,9		736,6	774,7	835,2	831,9
28	700	704,9		711,2	723,9		736,6	755,7		787,4	831,9	898,7	892,3
30	750	755,7		755,6	774,7		793,7	806,5		844,6	882,7	952,5	946,2
32	800	806,5		812,8	825,5		850,9	860,6		901,7	939,8	1006,6	1003,3
34	850	857,3		863,6	876,3		901,7	911,4		952,5	990,6	1057,4	1054,1
36	900	908,1		917,7	927,1		955,8	968,5		1006,6	1047,8	1117,6	1117,6
38	950	958,9	952,5	952,5	977,9	977,9	971,6	1019,3	1016,0	1022,4	1111,3	1054,1	1073,2
40	1000	1009,7	1003,3	1000,3	1028,7	1022,3	1025,7	1070,1	1070,1	1076,5	1162,1	1114,6	1127,7
42	1050	1060,5	1054,1	1051,1	1079,5	1073,1	1076,5	1124,0	1120,9	1127,3	1219,2	1165,4	1178,1
44	1100	1111,3	1104,9	1104,9	1130,3	1130,3	1130,3	1178,1	1181,1	1181,1	1276,4	1219,2	1231,9
46	1150	1162,1	1152,7	1168,4	1181,1	1178,1	1193,8	1228,9	1228,9	1244,6	1327,2	1273,3	1289,1
48	1200	1212,9	1209,8	1206,5	1231,9	1235,2	1244,6	1279,7	1286,0	1295,4	1384,3	1324,1	1346,2
50	1250	1263,7	1244,6	1257,3	1282,7	1295,4	1295,4	1333,5	1346,2	1346,2	1435,1	1378,0	1403,4
52	1300	1314,5	1320,8	1308,1	1333,5	1346,2	1346,2	1384,3	1397,0	1397,0	1492,3	1428,8	1454,2
54	1350	1358,9	1352,6	1352,6	1384,3	1403,4	1403,4	1435,1	1454,2	1454,2	1549,4	1492,3	1517,7
56	1400	1409,7	1403,4	1403,4	1435,1	1454,2	1454,2	1485,9	1505,0	1505,0	1606,6	1543,1	1568,5
58	1450	1460,5	1447,8	1454,2	1485,9	1511,3	1505,0	1536,7	1562,1	1555,8	1663,7	1593,9	1619,3
60	1500	1511,3	1524,0	1517,7	1536,7	1562,1	1568,5	1587,5	1612,9	1619,3	1714,5	1644,7	1682,8

\*) On computer printouts the thickness is indicated as 5 mm.

**Spiral wound gasket Class 600-900**  
 with centering ring and internal ring acc. to ASME B16.20  
 for **Flanges acc. to MSS-SP44 (ASME B16.47 Series A)**  
 with flange facing Raised Face (RF)

Special type-Code: **SS**  
**SX**



Required flange roughness Ra max. = 250 µinch

Dimensions in mm

Nominal diameter		d1 Class		d2 Class		d3 Class		d4 Class	
inch	mm	600	900	600	900	600	900	600	900
26	650	647,7	660,4	685,8		736,6		866,9	882,7
28	700	698,5	711,2	736,6		787,4		914,4	946,2
30	750	755,7	768,4	793,7		844,6		971,6	1009,7
32	800	812,8	812,8	850,9		901,7		1022,4	1073,2
34	850	863,6	863,6	901,7		952,5		1073,2	1136,7
36	900	917,7	920,8	955,8	958,9	1006,6	1009,7	1130,3	1200,2
38	950	952,5	1009,7	990,6	1035,1	1041,4	1085,9	1104,9	1200,2
40	1000	1009,7	1060,5	1047,8	1098,6	1098,6	1149,4	1155,7	1251,0
42	1050	1066,8	1111,3	1104,9	1149,4	1155,7	1200,2	1219,2	1301,8
44	1100	1111,3	1155,7	1162,1	1206,5	1212,9	1257,3	1270,0	1368,6
46	1150	1162,1	1219,2	1212,9	1270,0	1263,7	1320,8	1327,2	1435,1
48	1200	1219,2	1270,0	1270,0	1320,8	1320,8	1371,6	1390,7	1485,9
50	1250	1270,0		1320,8		1371,6		1447,8	
52	1300	1320,8		1371,6		1422,4		1498,6	
54	1350	1378,0		1428,8		1479,6		1555,8	
56	1400	1428,8		1479,5		1530,4		1612,9	
58	1450	1473,2		1536,7		1587,5		1663,7	
60	1500	1530,4		1593,9		1644,7		1733,6	

\*) On computer printouts the thickness is indicated as 5 mm.

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**Flat Gaskets**  
for flange facing Large Tongue / Large Groove  
Class 150 - 1500 / ASME B16.21

Example of Designation: Designation of a flat gasket for nominal diameter 10", material: SBR-rubber red, premium grade

Part number **62619R002**      **10 (INCH)\*2 (MM)**      **FLAT GASKET LT/LG**      **SBR-RUBBER RED PREMIUM GRADE**  
**H600/ASME B16.21/B16.5**

Part numbering Code													
Position of Part No.													
1. - 2.		3.		4.		5. - 6.		7. - 8.		9.			
Kind of Part		Class		Type 2)		Material 1)		Special type 4)		Certificate 5)			
Cd.		Cd.		Cd.		Cd.		Cd.		Cd.			
Flat Gasket for Large Tongue / Large Groove (LT / LG)	62	150 - 1500	6	flat	1	<b>Flat Gasket:</b>		0	0	ASME	2		
				double jacketed	4	ItÖ-K 3)	9D						
								ItÖ 3)	9G				
								ItC 3)	9H				
								It400 3)	9K				
								ist 3)	9L				
								SBR-Rubber red, premium grade	9R				
								PTFE-reinforced	9X				
								Graphite with stainless steel insert	9S				
								<b>Double jacketed Gasket:</b>					
								1.4541 / Asbestos 3)	0P				
								PTFE / It400 3)	9E				

1) Materials:

**a) Flat Gaskets**

It-Materials acc. to DIN3754 - for expiring projects  
All other materials acc. to manufacturer's standard

**b) Double Jacketed Gaskets:**

**Jacket of:**

1.4541 acc. to DIN17440 (or comparable ASTM-Material)  
PTFE acc. to manufacturer's standard

**Filler of:**

Asbestos acc. to DIN3752 3)  
It-Material acc. to DIN3754 3)  
All other materials acc. to manufacturer's standard

2) Code for type

3) Only for expiring projects

4) Code 00 = Requirements acc. to ASME B16.21,  
Dimensions for flanges acc. to ASME B16.5

5) Certificate corresponds with ASTM- / ASME-Standards

**Gaskets acc. to ASME B16.21**

Class 150 - 1500

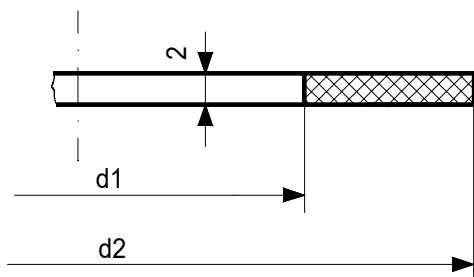
Flange facing:

LT: Large Tongue

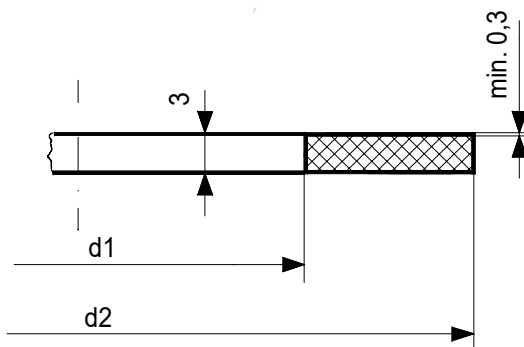
LG: Large Groove

Required flange roughness Ra max. = 250 µinch

**Flat Gasket**



**Double Jacketed Flat Gasket with PTFE-Jacket**



Dimensions in mm

Nominal diameter		d1	d2	Weight kg/100 pcs.
inch	mm			
1/2	15	25	35	
3/4	20	33	43	
1	25	38	51	
1 1/4	32	47	64	
1 1/2	40	54	73	
2	50	73	92	
2 1/2	65	86	105	
3	80	108	127	
4	100	132	157	
5	125	160	186	
6	150	190	216	
8	200	238	270	
10	250	286	324	
12	300	343	381	
14	350	374	413	
16	400	425	470	
18	450	489	533	
20	500	533	584	
24	600	641	692	

**Flat Gaskets**  
for flange facing Large Male / Large Female  
Class 150 - 1500 / ASME B16.21

Example of Designation: Designation of a flat gasket for nominal diameter 4", material: Graphite with SS-insert

Part number **63619S002**      **4 (INCH)\*2 (MM)**      **FLAT GASKET LM/LF**      **GRAPHITE/SS**  
**H600/ASME B16.21/B16.5**

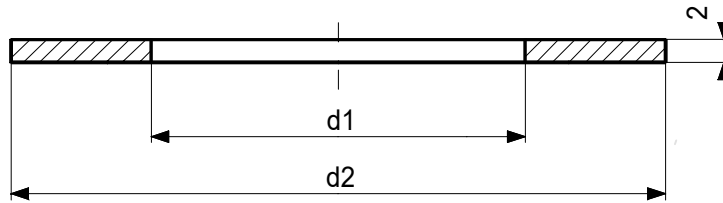
Part numbering Code											
Position of Part No.											
1. - 2.		3.		4.		5. - 6.		7. - 8.		9.	
Kind of Part	Cd.	Class		Type 2)	Cd.	Material 1)		Special type 4)		Certificate 5)	
								Cd.	Cd.		
Flat Gasket for Large Male / Large Female (LM / LF)	63	150 - 1500	6	flat	1	ItÖ-K 3)	9D	0	0	ASME	2
						Rubber with 2 plies of fabric	9F				
						ItÖ 3)	9G				
						ItC 3)	9H				
						It400 3)	9K				
						ist 3)	9L				
						Graphite	9S				

Garlock-Qualities		Application limits		
		p (bar)	T (°C)	max. pxT
Garfite N (~ItÖ)	K1	138	400	25000
Garfite S (~It400)	K2	138	400	25000
Garfite TI (Graphite)	K3	138	470	25000
Style 3000	K4	70	200	12000
Style 3300	K5	80	200	12000
Style 3400	K6	80	200	12000
Style 3200	K7	80	200	12000
Style 3700	K8	80	200	12000
Gylon Style 3510 White	K9	55	260	12000
Gylon Style 3501E Standard	P9	83	260	12000

- 1) Materials:  
It-Materials acc. to DIN3754 3)  
Rubber with 2 plies of fabric, graphite with SS-insert and all other materials acc. to manufacturer's standard.  
Garlock-Qualities see page 3
- 2) Code for type
- 3) Only for expiring projects
- 4) Code 00 = Requirements acc. to ASME B16.21,  
Dimensions for flanges acc. to ASME B16.5
- 5) Certificate corresponds with ASTM- / ASME-Standards

**Flat Gasket** for flange facing Large Male (LM) / Large Female (LF)  
 Class 150 - 1500 acc. to ASME B16.21

Required flange roughness Ra = 125 - 500 µinch



Dimensions in m

Nominal diameter		Inside diameter	Outside diameter	Weight kg/100 pcs.
inch	mm	d1	d2	
1/2	15	21	35	
3/4	20	27	43	
1	25	33	51	
1 1/4	32	42	64	
1 1/2	40	48	73	
2	50	60	92	
2 1/2	65	73	105	
3	80	89	127	
4	100	114	157	
5	125	141	186	
6	150	168	216	
8	200	219	270	
10	250	273	324	
12	300	324	381	
14	350	356	413	
16	400	406	470	
18	450	457	533	
20	500	508	584	
24	600	610	692	

**Ring-Joint-Gaskets**  
Class 150 - 2500 / ASME B16.20

Example of Designation: Designation of an oval Ring-Joint-Gasket for nominal diameter 10" and Class 600, material: ASTM A182 Gr.F5 soft annealed

Part number **68475F002**      **10 (INCH)**      **RING-JOINT-GASKET OVAL CLASS600**      **A182 GR.F5 SOFT ANNEALED**  
**H600/ASME B16.20/B16.5**

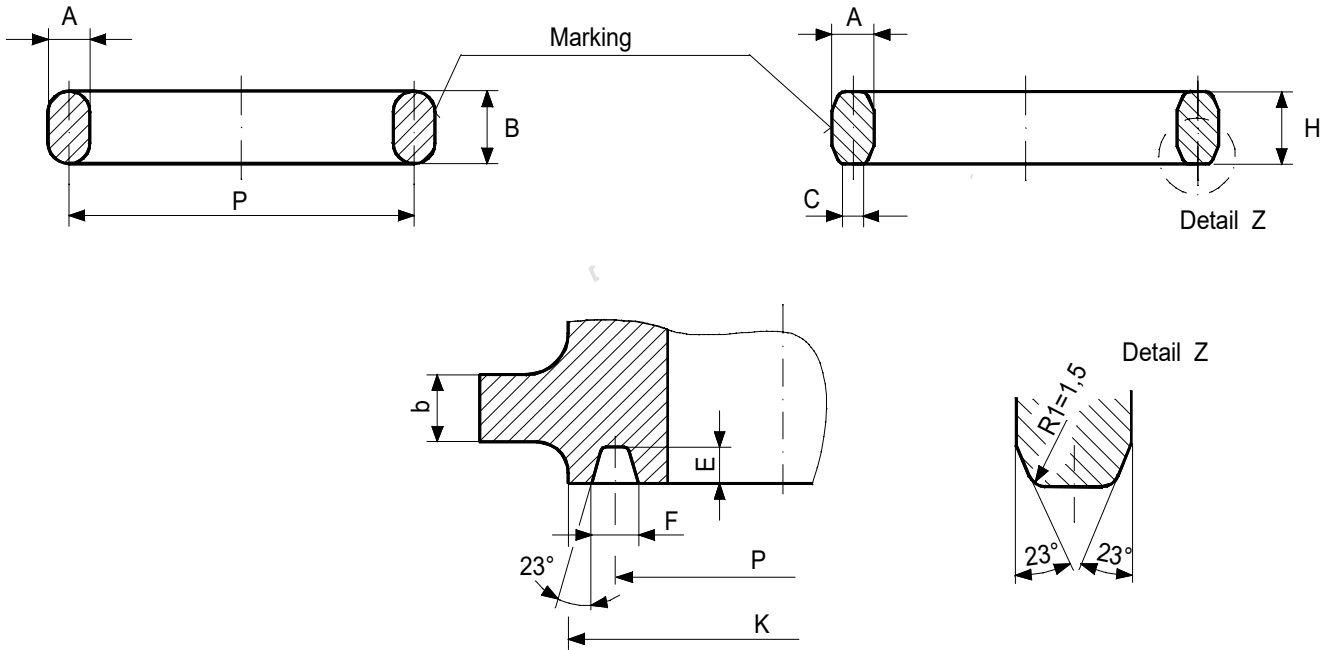
Part numbering Code											
Position of Part No.											
1. - 2		3.		4.		5. - 6.		7.- 8.		9.	
Kind of Part	Cd.	2)		3) 4)		1)		Code for Ring No.	7)		
		Class	Cd.	Type	Cd.	Material	Cd.		Certificate	Cd.	
Ring-Joint-Gasket	68	150	1	octagonal	6	A182 Gr.F5 soft annealed	5F	00 5)	ASME	2	
		300	2	Ring Type		A182 Gr.F304/max. HB130	5M				0S 5)
		400	3	oval	7	A182 Gr.F316/max. HB130	5P	11 6)			
		600	4	Ring Type		A182 Gr.F321/max. HB130	5Q				
		900	5			A182 Gr.F347/max. HB130	5R				
		1500	6			Armco-Iron	J1				
		2500	7								

- 1) Materials:  
Materials acc. to ASTM-Standards  
Armco-Iron acc. to manufacturer's standard.
- 2) Code for Class  
Ring-Joint-Gaskets for flanges acc. to ASME B16.47 Series A (MSS-SP44) are only adopted for Class 300 to 900.
- 3) Code for type:  
Tolerances acc. to ASME B16.20  
There are no Ring-Joint-Gaskets assigned for nominal size 38" and larger.
- 4) For flanges acc. to ASME B16.47 Series A (MSS-SP44) there are only octagonal rings standardized.
- 5) Code for ring no.  
**00** = no direct coding of ring number  
In this case Ring number results from nominal diameter and flange class acc. to ASME B16.5.  
**0S** = no direct coding of ring number.  
In this case Ring number results from nominal diameter and flange class acc. to ASME B16.47 Series A (MSS-SP44).
- 6) **Direct coding for ring number:**  
**11** = Ring No. R11  
:  
:  
**99** = Ring No. R99  
**A0** = Ring No. R100  
:  
:  
**A5** = Ring No. R105
- 7) Certificate corresponds with ASTM- / ASME-Standards

**Ring-Joint-Gasket** acc. to ASME B16.20  
for flanges acc. to **ASME B16.5, Class 150**

**Oval Ring**

**Octagonal Ring**

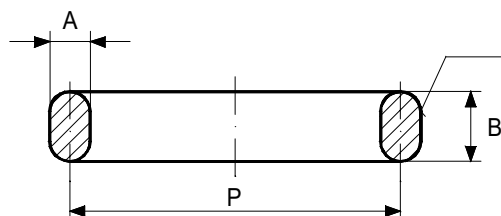


Dimensions in mm

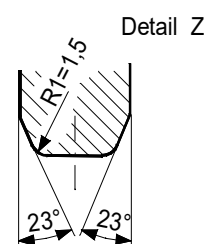
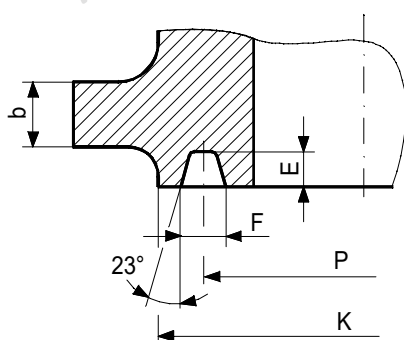
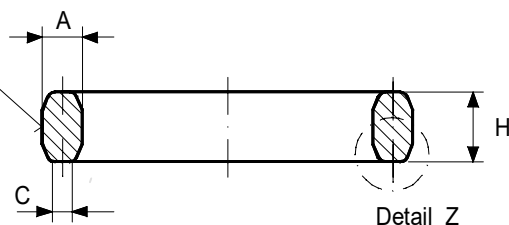
Ring No.	Nominal diameter	Raised face K	Pitch diameter of groove P	Depth of groove E	Width of groove F	Width of ring A	Width of flattening C	Height of ring		Weight kg/100 pcs.
	DN							B	H	
R15	1"	63,5	47,62	6,35	8,7	7,9	5,23	14,3	12,7	
R17	1 1/4"	73,0	57,15							
R19	1 1/2"	82,6	65,09							
R22	2"	101,6	82,55							
R25	2 1/2"	120,7	101,60							
R29	3"	133,4	114,30							
R33	3 1/2"	154,0	131,76							
R36	4"	171,5	149,22							
R40	5"	193,7	171,45							
R43	6"	219,1	193,68							
R48	8"	273,1	247,65							
R52	10"	330,2	304,80							
R56	12"	406,4	381,00							
R59	14"	425,5	396,88							
R64	16"	482,6	454,02							
R68	18"	546,1	517,52							
R72	20"	596,9	558,80							
R76	24"	711,2	673,10							

**Ring-Joint-Gasket** acc. to ASME B16.20  
for flanges acc. to **ASME B16.5, Class 300 / 400 / 600**

**Oval Ring**



**Octagonal Ring**



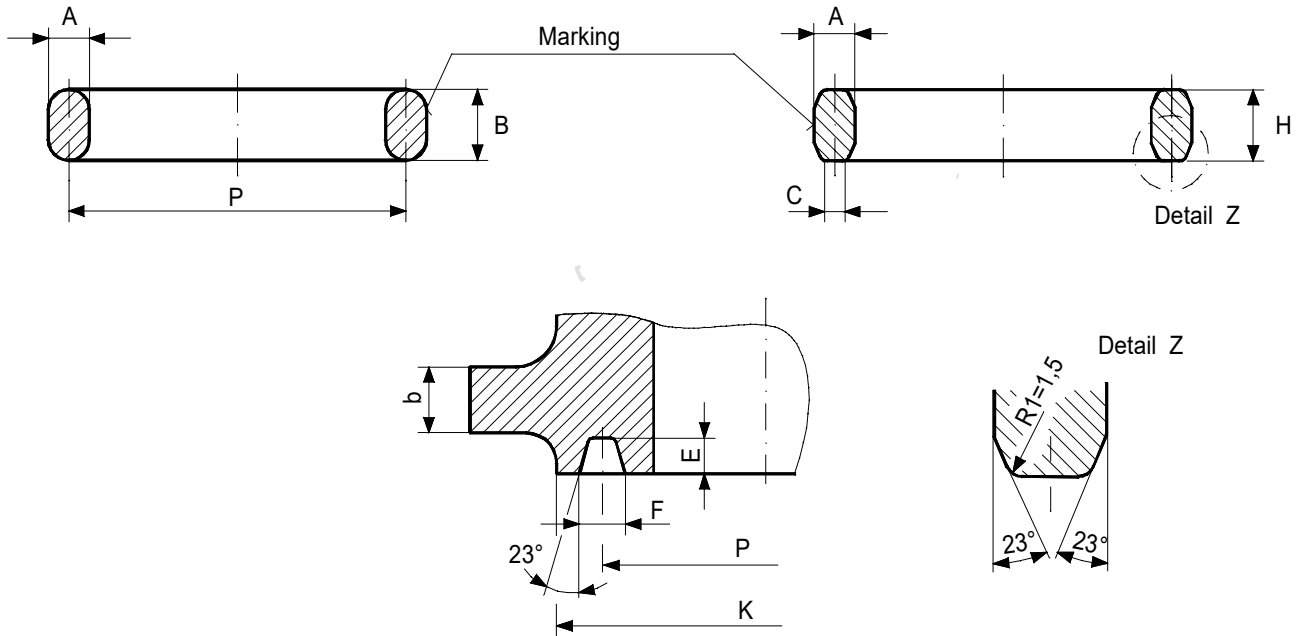
Dimensions in mm

Ring No.	Nominal diameter	Raised face K	Pitch diameter of groove P	Depth of groove E	Width of groove F	Width of ring A	Width of flattening C	Height of ring		Weight kg/100 pcs.
	DN							B	H	
R11	1/2"	50,8	34,13	5,55	7,1	6,35	4,32	11,1	9,6	
R13	3/4"	63,5	42,86	6,35	8,7	7,9	5,23	14,3	12,7	
R16	1"	69,9	50,80							
R18	1 1/4"	79,4	60,32							
R20	1 1/2"	90,5	68,26							
R23	2"	107,9	82,55	7,9	11,9	11,1	7,75	17,5	16,0	
R26	2 1/2"	127,0	101,60							
R31	3"	146,1	123,82							
R34	3 1/2"	158,8	131,76							
R37	4"	174,6	149,22							
R41	5"	209,6	180,98							
R45	6"	241,3	211,14							
R49	8"	301,6	269,88							
R53	10"	355,6	323,85							
R57	12"	412,8	381,00							
R61	14"	457,2	419,10							
R65	16"	508,0	469,90							
R69	18"	574,7	533,40							
R73	20"	635,0	584,2	9,53	13,5	12,7	8,66	19,1	17,5	
R77	24"	749,3	692,2	11,13	16,7	15,9	10,49	22,4	20,6	

**Ring-Joint-Gasket** acc. to ASME B16.20  
for flanges acc. to **ASME B16.5, Class 900**

**Oval Ring**

**Octagonal Ring**

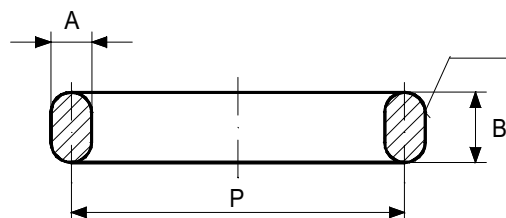


Dimensions in mm

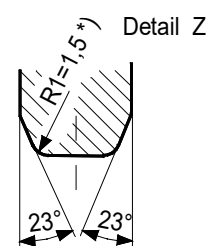
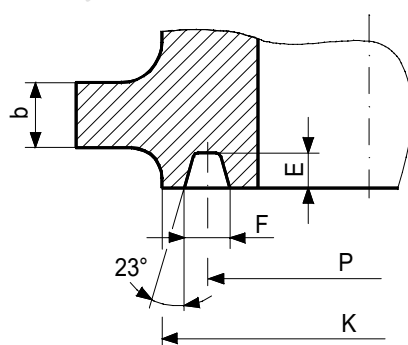
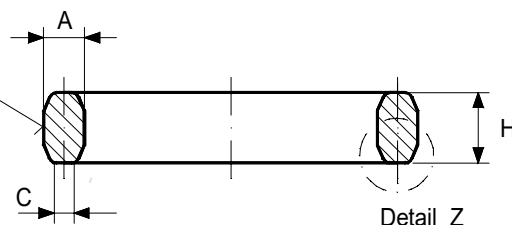
Ring No.	Nominal diameter	Raised face K	Pitch diameter of groove P	Depth of groove E	Width of groove F	Width of ring A	Width of flattening C	Height of ring		Weight kg/100 pcs.
	DN							B	H	
R12	1/2"	60,3	39,69	6,35	8,7	7,9	5,23	14,3	12,7	
R14	3/4"	66,7	44,45							
R16	1"	71,4	50,80							
R18	1 1/4"	81,0	60,32							
R20	1 1/2"	92,1	68,26							
R24	2"	123,8	95,25	7,9	11,9	11,1	7,75	17,5	16,0	
R27	2 1/2"	136,5	107,95							
R31	3"	155,6	123,82							
R37	4"	181,0	149,22							
R41	5"	215,9	180,98							
R45	6"	241,3	211,14							
R49	8"	308,0	269,88							
R53	10"	361,9	323,85							
R57	12"	419,1	381,00							
R62	14"	466,7	419,10							11,1
R66	16"	523,9	469,90							
R70	18"	593,7	533,40							
R74	20"	647,7	584,20	12,7	19,8	19,0	12,32	25,4	23,9	
R78	24"	771,7	692,15	15,9	27,0	25,4	17,30	33,3	31,8	

**Ring-Joint-Gasket acc. to ASME B16.20**  
**for flanges acc. to ASME B16.5, Class 1500**

**Oval Ring**



**Octagonal Ring**



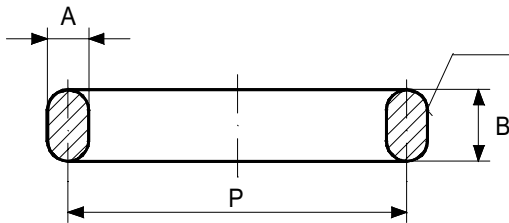
Dimensions in mm

Ring No.	Nominal diameter	Raised face K	Pitch diameter of groove P	Depth of groove E	Width of groove F	Width of ring A	Width of flattening C	Height of ring		Weight kg/100 pcs.
	DN							B	H	
R12	1/2"	60,3	39,69	6,35	8,7	7,9	5,23	14,3	12,7	
R14	3/4"	66,7	44,45							
R16	1"	71,4	50,80							
R18	1 1/4"	81,0	60,32							
R20	1 1/2"	92,1	68,26							
R24	2"	123,8	95,25	7,9	11,9	11,1	7,75	17,5	16,0	
R27	2 1/2"	136,5	107,95							
R35	3"	168,3	136,52							
R39	4"	193,7	161,92							
R44	5"	228,6	193,68							
R46	6"	247,6	211,14	9,5	13,5	12,7	8,66	19,0	17,5	
R50	8"	317,5	269,88	11,1	16,7	15,9	10,5	22,4	20,6	
R54	10"	371,5	323,85							
R58	12"	438,1	381,00							
R63	14"	488,9	419,10	15,9	27,0	25,4	17,30	33,3	31,8	
R67	16"	546,1	469,90	17,5	30,2	28,6	19,81	36,5	35,1	
R71	18"	612,8	533,40							
R75	20"	673,1	584,20							
R79	24"	793,8	692,20	20,6	36,5	34,9	24,82	44,5	41,4	

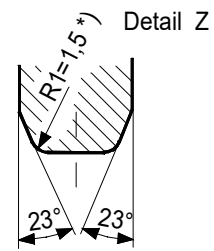
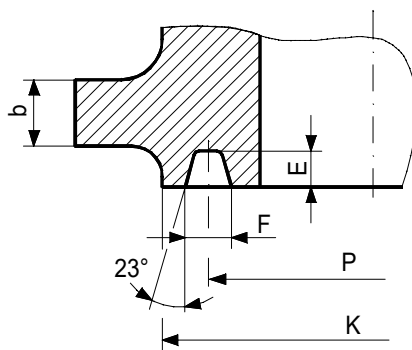
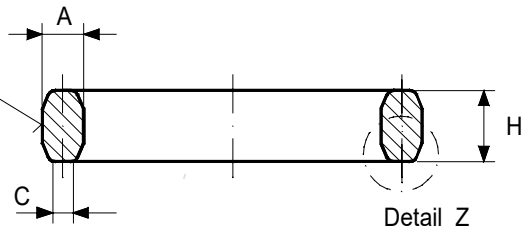
\*) Up from DN14": R1=2,3 mm

**Ring-Joint-Gasket** acc. to ASME B16.20  
for flanges acc. to **ASME B16.5, Class 2500**

**Oval Ring**



**Octagonal Ring**

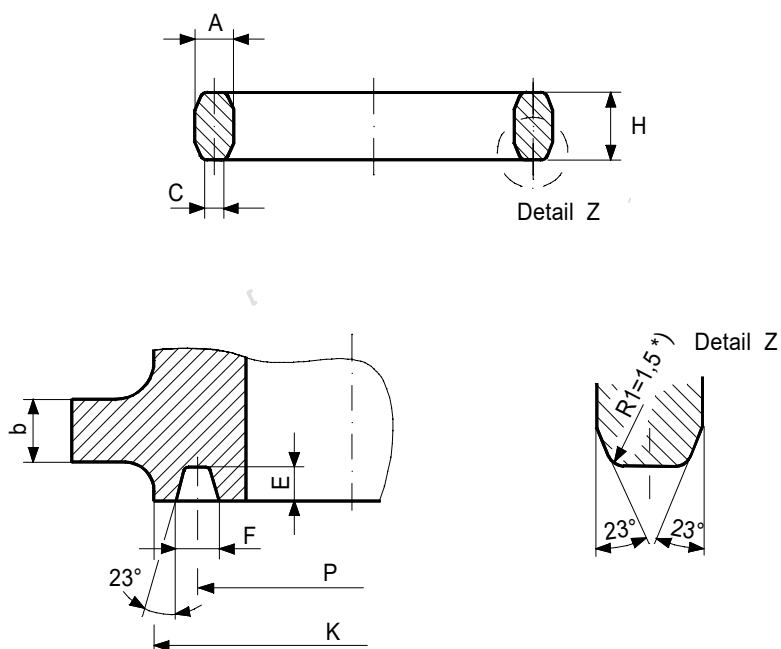


Dimensions in mm

Ring No.	Nominal diameter	Raised face K	Pitch diameter of groove P	Depth of groove E	Width of groove F	Width of ring A	Width of flattening C	Height of ring		Weight kg/100 pcs.
	DN							B	H	
R13	1/2"	65,1	42,9	6,35	8,7	7,9	5,23	14,3	12,7	
R16	3/4"	73,0	50,8							
R18	1"	82,5	60,3							
R21	1 1/4"	101,6	72,2	7,9	11,9	11,1	7,75	17,5	16,0	
R23	1 1/2"	114,3	82,5							
R26	2"	133,3	101,6							
R28	2 1/2"	149,2	111,1	9,5	13,5	12,7	8,66	19,0	17,5	
R32	3"	168,3	127,0							
R38	4"	203,2	157,2							11,1
R42	5"	241,3	190,5	12,7	19,8	19,0	12,32	25,4	23,9	
R47	6"	279,4	228,6							
R51	8"	339,7	279,4	14,3	23,0	22,2	14,81	28,7	26,9	
R55	10"	425,4	342,9	17,5	30,2	28,6	19,81	36,6	35,1	
R60	12"	469,3	406,4	17,5	33,3	31,7	22,33	39,7	38,1	

\*) Up from DN10" : R1 = 2,3 mm

**Ring-Joint-Gasket** acc. to ASME B16.20  
for flanges acc. to **ASME B16.47 Series A (MSS-SP44)** \*\*)



For these flanges there are only octagonal rings standardized.

Dimensions in mm

Ring No.	Raised face K	Pitch diameter of groove P	Depth of groove E	Width of groove F	Width of ring A	Width of flattening C	Height of ring H	Applied for Class		Weight kg/100 pcs.	
								300 - 600	900		
R93	809,8	749,3	12,7	19,84	19,1	12,3	23,9	26"			
R94	860,6	800,1						28"			
R95	917,4	857,3						30"			
R96	984,3	914,4	14,27	23,01	22,2	14,81	26,9	32"			
R97	1035,1	965,2						34"			
R98	1092,2	1022,4						36"			
R100	831,9	749,3	17,48	30,18	28,6	19,81	35,1		26"		
R101	889,0	800,1							28"		
R102	946,2	857,3			33,32	31,8	22,33	38,1		30"	
R103	1003,3	914,4								32"	
R104	1066,8	965,2	20,62	36,53	34,9	24,82	41,4		34"		
R105	1124,0	1022,35									

\*) Up from ring number  $\geq$  R100: R1 = 2,3 mm

\*\*) There are no Ring-Joint-Gaskets assigned for nominal diameter 38" and larger.  
Ring number 80 not adopted for single nominal diameter 22" / Class 150.

# Supports for Hydraulics

for ASME - Application

Standard

**H780A**

Page 1 of 8

Example of Designation: Designation of a U-bolt Type 24 with 4 hexagon nuts, for nominal pipe size 2", material: Steel A576 Gr.1020 galvanized

Part Number **780LRNU12**    **2" U-BOLT WITH 4 NUTS**    **A576 GR.1020 GALVAN.**  
**H780A/MSS SP-58 TYPE 24**

Part Numbering Code												
Position of Part No.												
1. - 3.		4.		5.		6.		7. - 8.		9.		
Kind of Part		Series		Clamp Type		Type of pipe		Material 2)		Certificate		
Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.		
Supports for Hydraulic Lines	780	Light Series	L	Type of Clamp 1)		Pipes	N	Material 2)		ASME/ MSS	2	
				single sided 6)				Stainless steel A240 Gr.304				1N
				-----				Stainless steel A240 Gr.316				1Q
		Heavy Series	S	for 1 tube		Tubes	P	Steel A285 Gr.B galvanized		2G		
				-----				Steel A285 Gr.B		5T		
				2 tubes				-----		Steel A576 Gr.1020		7C
				-----				Aluminium		J3		
				3 tubes				-----		Aluminium / Stainless steel		J6
				-----				Aluminium / Stainless steel		J7		
				4 tubes				-----		with hexagon bolts		P2
				-----				Polypropylene		P3		
				5 tubes				-----		Polypropylene /		U1
				-----				Stainless steel		-----		
				6 tubes				-----		Steel A576 Gr.1020		-----
				-----				galvanized		-----		
-----		Stacking Clamp		-----		-----						
-----		Combi Clamp		-----		-----						
-----		Normal Clamp		-----		-----						
-----		U-Bolt		-----		-----						
-----		MSS SP-58 Type 24		-----		-----						
-----		with 4 nuts		-----		-----						
-----		U-Bolt		-----		-----						
-----		MSS SP-58 Type 24		-----		-----						
-----		without nuts		-----		-----						

- 1) Code for type of clamp; also see corresponding dimension tables.
- 2) Materials:  
 Nuts according to ASTM A194 Gr.2H  
 Stainless steel bolts according to ASTM A193 Gr.B8  
 U-bolts according to ASTM A576 Gr.1020  
 Steel according to ASTM A285 Gr.B  
 Austenitic stainless steel according to ASTM A240 Gr.304 or ASTM A240 Gr.316  
 Polypropylene and Aluminium according to manufacturer's standard
- 3) Requirements and certificates according to ASTM / ASME / MSS
- 4) When using stacking clamps for steel pipes it is to verify that the selected flange connection does not collide with the next pipe
- 5) Dimensions are reference values, deviations to the present type (e.g. using C-shapes, welding on plates) must be specified particularly
- 6) Clamps have to be delivered with self-tapping screws.  
 Material: Steel galvanized
  - a) M6 x 16 / DIN7513, Form A / Standard H568E
  - or optional b) 1/4" -20 x 5/8" long / SAE J78 / Type CSD / Hex Washer Head

**Tube clamps 6)  
single sided**

Material: Steel ASTM A285 Gr.B Material Code: 5T  
 Steel ASTM A285 Gr.B galvanized Material Code: 2G  
 Austenitic stainless steel ASTM A240 Gr. 304 Material Code: 1N  
 Austenitic stainless steel ASTM A240 Gr. 316 Material Code: 1Q

Figure 1

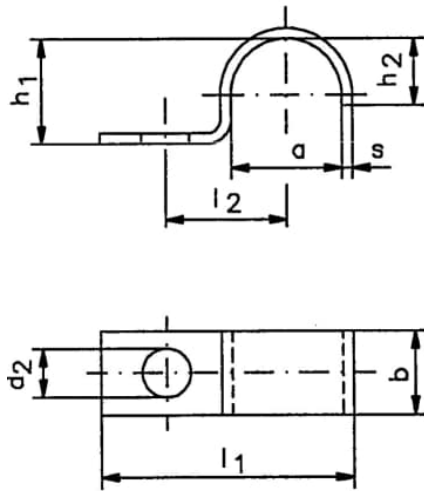
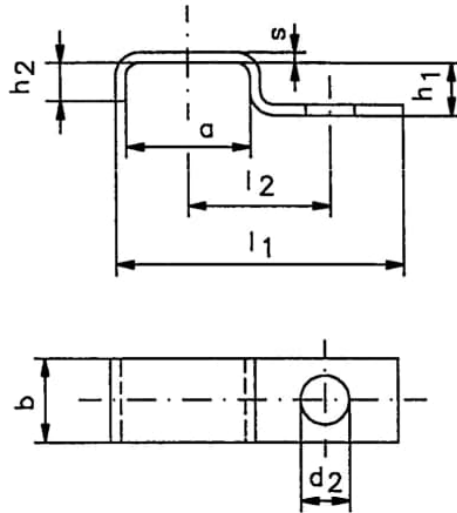


Figure 2



Dimensions in mm

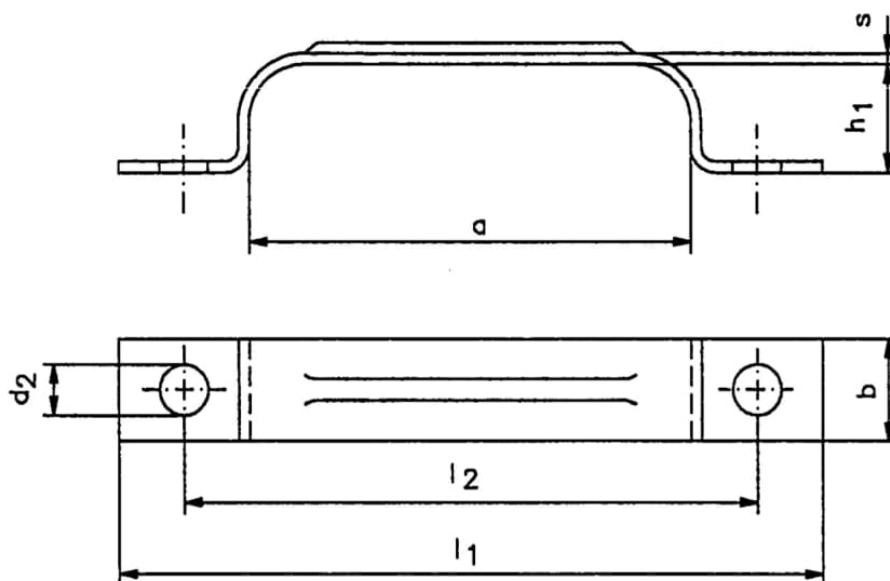
1) Type-Code	No. of	*) Dash size	Tube		a +1 0	b ±0,2	d2 +0,2 0	h1 ±0,2	h2 ±0,2	l1 ±0,3	l2 ±0,2	s ±0,1	Weight kg/1000 pieces
			outside diameter inch	mm									
LSP	1	-3	3/16	4,8	4,8	12,7	7,2	4,3	4	27,0	13,9	1	1,60
		-4	1/4	6,4	6,4			6,0	5	28,5	14,3		1,90
		-6	3/8	9,5	9,5			9,0	7	32,0	15,9		2,50
		-8	1/2	12,7	12,7			12,0	8	32,0	15,9		6,50
		-10	5/8	15,9	15,9			15,2	10	36,5	17,5		7,10
LTP	2	-3	3/16	4,8	10,0	12,7	7,2	4,3	4	32,0	15,9	1,5	1,70
		-4	1/4	6,4	13,2			6,0	5	35,0	17,5		2,40
		-6	3/8	9,5	19,5			9,0	7	41,3	20,6		3,10
LUP	3	-3	3/16	4,8	15,0	12,7	7,2	4,3	4	36,5	18,3	2	1,90
		-4	1/4	6,4	19,8			6,0	5	41,3	20,6		3,00

Footnotes see page 1.

\*) For material take off(MTO) use values from this column.

Tube clamps 6)  
double sided

Material: Steel ASTM A285 Gr.B Material Code: 5T  
 Steel ASTM A285 Gr.B galvanized Material Code: 2G  
 Austenitic stainless steel ASTM A240 Gr. 304 Material Code: 1N  
 Austenitic stainless steel ASTM A240 Gr. 316 Material Code: 1Q



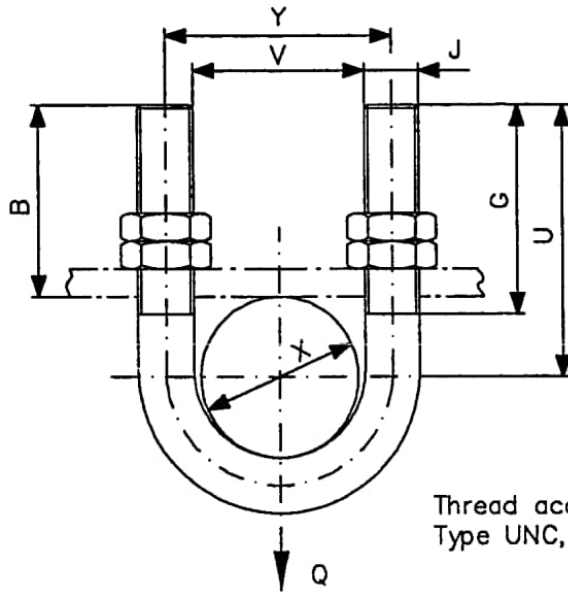
Dimensions in mm

1) Type-Code	No. of	*) Dash size	Tube		a +1 0	b ±0,2	d2 +0,2 0	h1 ±0,2	l1 ±0,3	l2 ±0,2	s ±0,1	Weight kg/1000 pieces
			outside diameter inch	mm								
L2P	2	-8	1/2	12,7	25,7	12,7	7,2	12,0	68,3	49,2	1,5	14,2
		-10	5/8	15,9	32,3			15,2	74,6	55,6		14,0
L3P	3	-6	3/8	9,5	29,0	12,7	7,2	9,0	71,5	52,4	1,0	7,3
L4P	4	-3	3/16	4,8	20,2	12,7	7,2	4,3	62,0	42,9	1,0	4,8
		-4	1/4	6,4	26,6			5,9	68,3	49,2		5,5
		-6	3/8	9,5	39,0			9,0	81,0	61,9		10,0
L5P	5	-3	3/16	4,8	25,0	12,7	7,2	4,3	66,7	47,6	1,0	5,1
L6P	6	-3	3/16	4,8	30,0	12,7	7,2	4,3	71,5	52,4	1,0	6,0
		-4	1/4	6,4	40,0			5,9	81,0	61,9		6,8
		-6	3/8	9,5	58,0			9,0	100,0	81,0		11,0

Footnotes see page 1.

\*) For material take off (MTO) use values from this column.

**U - Bolt**  
according to MSS SP-58 / Type 24



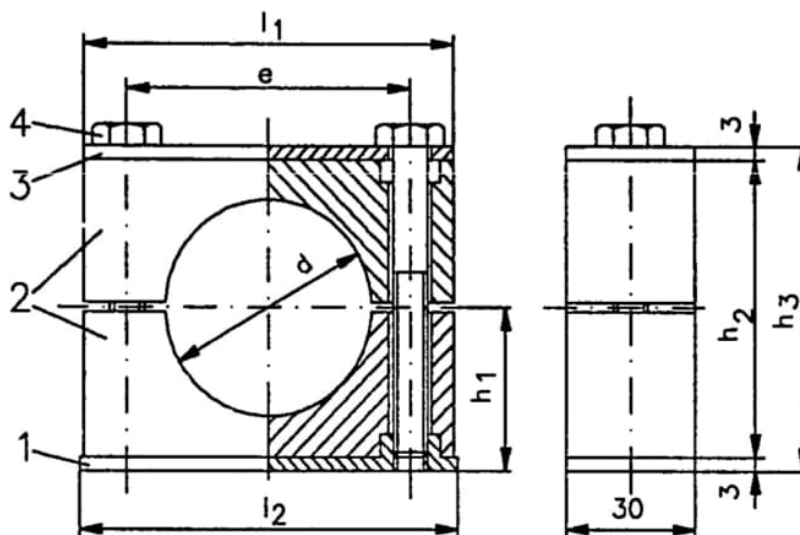
1)										
Type-Code	Size inch	X mm	J inch	B mm	G mm	U mm	V mm	Y mm	Q (Kg) 350°C	Weight kg/1000 pieces
LRN	1/2	21,5	1/4	59	60	70	24	30	250	0,07
	3/4	27		56			28	34		0,08
	1	34		53			36	42		0,08
	1 1/4	43	3/8	51	63	73	44	54	550	0,17
	1 1/2	49		52			50	60		0,18
	2	61		82			62	72		0,19
	2 1/2	75	1/2	59	76	96	76	88	1050	0,45
	3	90		102			90	102		0,48
	3 1/2	102		57			108	104		116
	4	115	5/8	56	95	127	143	155	1650	0,58
	5	142		71			170	186		1,12
	6	169		181			222	238		1,28
	8	220	3/4	75	102	212	276	296	2500	2,59
	10	274		245			326	348		3,64
	12	325		261			358	380		4,32
	14	356	7/8	83	108	287	410	432	3450	4,70
	16	408		321			460	484		6,87
	18	458		347			512	536		7,37
	20	510	1	92	120	397	614	638	4500	8,43
	24	610								

Material: Rod: ASTM A576 Gr.1020, Nuts: ASTM A194 Gr.2H (inclusive)  
 Rod and Nuts as above, but galvanized  
 Rod and Nuts austenitic stainless steel ASTM A240 Gr.304  
 Rod and Nuts austenitic stainless steel ASTM A240 Gr.316

Material code: 7C  
 Material code: U1  
 Material code: 1N  
 Material code: 1Q

Normal Clamp – Light Series

Material: Polypropylene Material Code: P2 or P3  
 Aluminium Material Code: J3, J6, J7



Dimensions in mm

1) Type-Code	Size= outside diameter inch	*) Dash size	Outside diameter d	Clamp size	e	h1	h2	h3	l1	l2	Hex. bolt ASME B18.2.1	Weight kg/ piece	
LNP for Tubes	1/4	-4	6,4	1a	20	16	26	32	34	35	1/4" x 30	0,09	
	5/16	-5	7,9										
	3/8	-6	9,5										
	LNP for Tubes	1/2	-8	12,7	2	26	19,5	33	39	40	42	1/4" x 35	0,11
		5/8	-10	16,0	3	33	20,5	35	41	48	49	1/4" x 40	0,12
	3/4	-12	19,0										
	LNP for Tubes	1	-16	25,4	5	52	32	58	64	70	70	1/4" x 60	0,17
		1 1/4	-20	31,8									
1 1/2		-24	38,1										
2		-32	50,9	6									

1) Type-Code	Nominal diameter (inch)   (mm) *)		Outside diameter d	Clamp size	e	h1	h2	h3	l1	l2	Hex. bolt ASME B18.2.1	Weight kg/ piece									
LNN for Pipes	1/8	6	10,3	1a	20	16	26	32	34	35	1/4" x 30	0,09									
	1/4	8	13,7	2	26	19,5	33	39	40	42	1/4" x 35	0,11									
	3/8	10	17,1																		
	LNN for Pipes	1/2	15	21,3	3	33	20,5	35	41	48	49	1/4" x 40	0,12								
		3/4	20	26,7	4	40	24	42	48	57	60	1/4" x 45	0,14								
	LNN for Pipes	1	25	33,4	5	52	32	58	64	70	70	1/4" x 60	0,17								
		1 1/4	32	42,2																	
		1 1/2	40	48,3										6	66	36	66	72	86	88	1/4" x 70
2		50,9																			

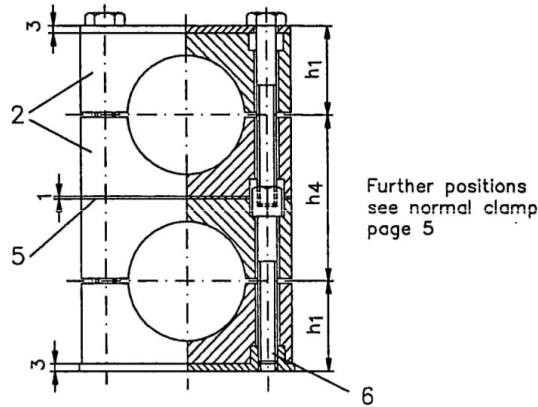
\*) For material take off (MTO) use values from this column.

Part list see page 6.

Further footnotes see page 1.

## Stacking Clamp / Combi Clamp – Light Series 4)

Material: Polypropylene    Material Code: P2 or P3  
 Aluminium                    Material Code: J3, J6, J7



**Table for Tubes:**  
Dimensions in mm

1) Type-Code	Size= outside diameter (inch)	Dash size	Outside diam.	Clamp size	h4	h1
Stacking Clamp LAP	1/4	-4	6,4	1a	27	16
	5/16	-5	7,9			
	3/8	-6	9,5			
	1/2	-8	12,7			
	5/8	-10	16,0			
Combi Clamp LKP	3/4	-12	19,0	2	34	19,5
	1	-16	25,4	3	36	20,5
	1 1/4	-20	31,8	5	59	32
	1 1/2	-24	38,1	6	67	36
	2	-32	50,9	6	67	36

**Table for pipes**  
Dimensions in mm

1) Type-Code	Nom. Diam.		Outside diam.	Clamp size	h4	h1
	(inch)	(mm) *)				
Stacking Clamp LAN	1/8	6	10,3	1a	27	16
	1/4	8	13,7	2	34	19,5
	3/8	10	17,1			
	1/2	15	21,3	3	36	20,5
	3/4	20	26,7	4	43	24
Combi Clamp LKN	1	25	33,4	5	59	32
	1 1/4	32	42,2			
	1 1/2	40	48,3			

**Part List: for Normal-, Stacking and Combi Clamps**

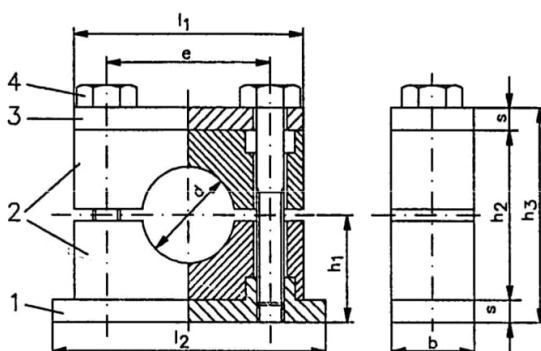
Pos.	Designation	Material for Code					Number of pcs. for type		
		P2	J3	P3	J6	J7	LNP LNN	LAP LAN	LKP LKN
1	Basic plate	Steel weldable		Austenitic stainless steel			1	-	1
2	Clamp shell	Polypropylene	Aluminium	Polypropylene	Aluminium		2	2	4
3	Cover plate	Steel	-	Austenitic stainless steel	-	Austenitic stainless steel	1	-	1
4	Hexagon bolt	A307 Gr.B	-	A193 Gr.B8	-	A193 Gr.B8	2	-	2
	Hexagon recess bolt	-	A307 Gr.B	-	A193 Gr.B8	-	2	-	2
5	Safety locking plate	Steel		Austenitic stainless steel			-	1	1
6	Stacking bolt and washer	A307 Gr.B		A193 Gr.B8			-	2	2

\*) For material take off (MTO) use values from this column.

For footnotes see page 1

Normal Clamp – Heavy Series

Material: Polypropylene    Material Code: P2 or P3  
 Aluminium                    Material Code: J3, J6, J7



Dimensions in mm

1) Type-Code	Size= outside diameter inch	*) Dash size	Outside diameter d	Clamp size	b	e	h1	h2	h3	l1	l2	s	Hex. bolt ASME B18.2.1	Weight kg/ piece
SNP for Tubes	1/4	-4	6,4	3S	30	33	24	32	48	55	73	8	3/8" x 45	0,3
	3/8	-6	9,5											
	1/2	-8	12,7											
	5/8	-10	16,0											
	3/4	-12	19,0	4S	30	45	32	48	64	70	85	8	3/8" x 60	0,4
	7/8	-14	22,2											
	1	-16	25,4	5S	30	60	38	60	76	84	100	8	3/8" x 70	0,5
	1 1/4	-20	31,8											
1 1/2	-24	38,1												
2	-32	50,9	6S	45	90,5	55	90	110	115	140	10	1/2" x 100	1,8	

1) Type-Code	Nominal diameter (inch)   (mm) *)		Outside diameter d	Clamp size	b	e	h1	h2	h3	l1	l2	s	Hex. bolt ASME B18.2.1	Weight kg/ piece
SNN for Pipes	1/8	6	10,3	3S	30	33	24	32	48	55	73	8	3/8" x 45	0,3
	1/4	8	13,7											
	3/8	10	17,1											
	1/2	15	21,3	4S	30	45	32	48	64	70	85	8	3/8" x 60	0,4
	3/4	20	26,7											
	1	25	33,4	5S	30	60	38	60	76	84	100	8	3/8" x 70	0,5
	1 1/4	32	42,2											
	1 1/2	40	48,3	6S	45	90,5	55	90	110	115	140	10	1/2" x 100	1,8
	2	50	60,3											
	2 1/2	65	73,0	7S	60	122	70	120	140	152	180	10	5/8" x 130	3,5
	3	80	88,9											
	4	100	114,3	8S	60	168	100	170	200	205	225	15	3/4" x 190	8,0
	5	125	141,3	9S	90	205	115	200	230	250	270	15	7/8" x 220	11,0
	6	150	168,3	10S	120	265	160	270	320	320	340	25	1 1/8"x300	24,0
	8	200	219,1											
	10	250	273,0											
12	300	323,9	11S	160	398	235	410	470	466	520	30	1 1/8"x450	60,0	

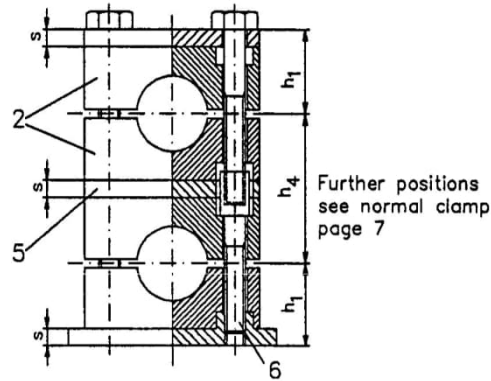
\*) For material take off (MTO) use values from this column.

Part list see page 8

Further footnotes see page 1

## Stacking Clamp / Combi Clamp – Heavy Series 4)

Material: Polypropylene    Material Code: P2 or P3  
 Aluminium                    Material Code: J3, J6, J7



**Table for Tubes:**  
Dimensions in mm

1) Type-Code	Size= outside diameter (inch)	Dash size	Outside diam.	Clamp size	h4	h1
Stacking Clamp <b>SAP</b>	1/4	-4	6,4	3S	40	24
	3/8	-6	9,5			
	1/2	-8	12,7			
	5/8	-10	16,0			
	3/4	-12	19,0			
Combi Clamp <b>SKP</b>	7/8	-14	22,2	4S	56	32
	1	-16	25,4			
	1 1/4	-20	31,8			
	1 1/2	-24	38,1			
	2	-32	50,9			
				6S	100	55

**Table for pipes**  
Dimensions in mm

1) Type-Code	Nom. Diam.		Outside diam.	Clamp size	h4	h1			
	(inch)	(mm) *)							
Stacking Clamp <b>SAN</b>	1/8	6	10,3	3S	40	24			
	1/4	8	13,7						
	3/8	10	17,1						
	1/2	15	21,3						
	3/4	20	26,7						
Combi Clamp <b>SKN</b>	1	25	33,4	4S	56	32			
	1 1/4	32	42,2						
	1 1/2	40	48,3						
	2	50	60,3						
	2 1/2	65	73,0						
	3	80	88,9				5S	68	38
	4	100	114,3						
	5	125	141,3						
	6	150	168,3						
	8	200	219,1						
	10	250	273,0	6S	100	55			
	12	300	323,9						
							7S	130	70
			8S	185	100				
						9S	215	115	
			10S	295	160				
						11S	440	235	

**Part List: for Normal-, Stacking and Combi Clamps**

Pos.	Designation	Material for Code					Number of pcs. for type		
		P2	J3	P3	J6	J7	SNN	SAN	SKN
1	Basic plate	Steel weldable		Austenitic stainless steel			1	-	1
2	Clamp shell	Polypropylene	Aluminium	Polypropylene	Aluminium		2	2	4
3	Cover plate	Steel	-	Austenitic stainless steel	-	Austenitic stainless steel	1	-	1
4	Hexagon bolt	A307 Gr.B	-	A193 Gr.B8	-	A193 Gr.B8	2	-	2
	Hexagon recess bolt	-	A307 Gr.B	-	A193 Gr.B8	-	2	-	2
5	Safety locking plate	Steel		Austenitic stainless steel			-	1	1
6	Stacking bolt and washer	A307 Gr.B		A193 Gr.B8			-	2	2

\*) For material take off (MTO) use values from this column.  
 For footnotes see page 1

## Spectacle Blinds

for ASME B16.5 - Flanges Class 150 - 1500

Part No.

8	1	2)	3)	1)	0	0	2
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Standard

H800A

Page 1 of 9

Example of Designation: Designation of a spectacle blind Class 1500, for flange facing RTJ, nominal diameter 10", material: ASTM A387 Gr.11

Partnumber  
**81642T002 10" Spectacle Blind RTJ Class 1500  
H800A A387 Gr.11**

Partnumbering Code												
Position of Part No.												
1. - 2.		3.		4.		5. - 6.		7. - 8.		9.		
Kind of Part	Cd.	2) Class		3) Flange facing		1) ASTM - Material		Wallthick- nesss		5) Certificate		
		Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.	Cd.		
Spectacle Blind	81	150	1	Raised Face	1	A516 Gr.60	A2	0	0	ASME / ANSI	2	
		300	2			A283 Gr.C	A7					
		400	3	Ring Type	4	A662 Gr.A	2L					
		600	4	Joint RTJ		A387 Gr.5	2Q					
		900	5	Raised Face	9	A387 Gr.11	2T					
		1500	6	Ra 125 4)		A387 Gr.22	2V					
						A204 Gr.A	2W					
						A285 Gr.C	5U					
		<b>Stainless steels</b>										
				A240 Type 304	1N							
				A240 Type 304L	1P							
				A240 Type 316	1Q							
		A240 Type 316L	1R									

1) Material code acc.to Std. H0005

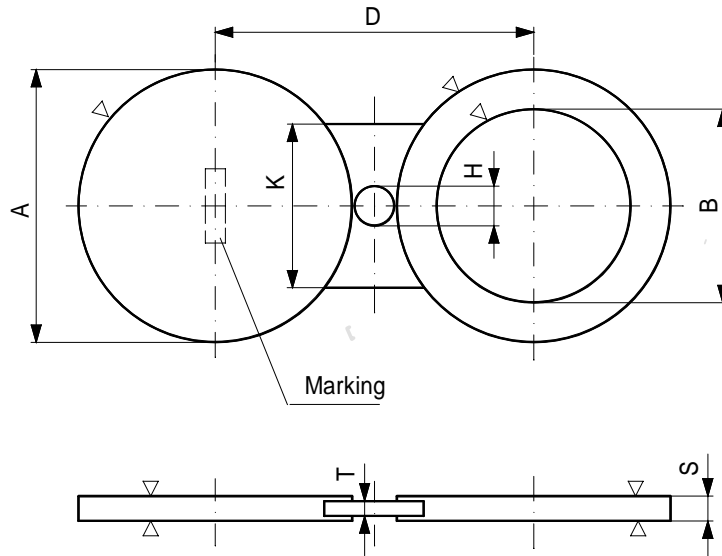
2) Code for Class

3) Code for flange facing  
Flange facing acc.to ASME B16.5.  
Dimensions for RTJ - Rings acc.to ASME B16.20.

4) Roughness Ra 125 (µinch) may also be furnished in the range of Ra 125 (µinch) to Ra 250 (µinch).

5) Certificate acc.to ASME - / ASTM - Standards  
Code for requirements and certificate acc.to Std. H0009.

**Spectacle blind for flange facing RF**



Dimensions in mm for **Class 150**

Nominal diameter		A	B	D	H	K	S	T	Weight kg / 100 pieces
inch	mm								
1/2	15	44	18	71	-	20	10	8	
3/4	20	54	23	81	-	20	10	8	
1	25	63	29	90	-	25	10	8	
1 1/4	32	73	38	100	-	30	10	8	
1 1/2	40	83	43	110	-	35	10	8	
2	50	102	54	132	-	35	10	8	
2 1/2	65	121	65	154	-	35	10	8	
3	80	133	80	167	-	35	10	8	
4	100	171	104	205	-	35	10	8	
5	125	194	130	229	-	40	10	8	
6	150	219	156	254	35	130	10	8	
8	200	276	207	315	39	130	10	8	
10	250	337	260	377	40	130	10	8	
12	300	406	309	449	43	130	10	8	
14	350	446	339	494	48	130	15	10	
16	400	511	389	559	48	130	15	10	
18	450	-	-	-	-	-	-	-	
20	500	603	491	656	53	130	20	15	
24	600	714	593	768	54	160	20	15	

Dimensions in mm for **Class 300**

Nominal diameter		A	B	D	H	K	S	T	Weight kg / 100 pieces
inch	mm								
1/2	15	51	18	78	-	20	10	8	
3/4	20	64	23	96	-	25	10	8	
1	25	70	29	102	-	25	10	8	
1 1/4	32	79	38	111	-	25	10	8	
1 1/2	40	92	43	129	-	25	10	8	
2	50	108	54	142	-	25	10	8	
2 1/2	65	127	65	164	-	25	10	8	
3	80	146	80	183	-	30	10	8	
4	100	178	104	221	-	35	10	8	
5	125	213	130	251	-	40	10	8	
6	150	248	156	288	40	90	10	8	
8	200	305	207	348	43	90	15	10	
10	250	359	260	407	48	90	20	15	
12	300	419	309	475	56	90	20	15	
14	350	482	339	538	56	90	25	20	
16	400	536	389	596	60	90	30	20	
18	450	-	-	-	-	-	-	-	
20	500	651	491	718	67	100	35	25	
24	600	771	593	848	77	160	40	30	

Dimensions in mm for **Class 400**

Nominal diameter		A	B	D	H	K	S	T	Weight kg / 100 pieces
inch	mm								
1/2	15	51	18	78	-	20	10	8	
3/4	20	64	23	96	-	25	10	8	
1	25	70	29	102	-	25	10	8	
1 1/4	32	79	38	111	-	25	10	8	
1 1/2	40	92	43	129	-	25	10	8	
2	50	108	54	142	-	25	10	8	
2 1/2	65	127	65	164	-	25	10	8	
3	80	146	80	183	-	30	10	8	
4	100	175	104	220	-	35	10	8	
5	125	210	130	250	-	40	15	10	
6	150	245	156	286	41	85	15	10	
8	200	302	207	347	45	85	15	10	
10	250	355	260	405	50	85	20	15	
12	300	416	309	473	57	85	25	20	
14	350	479	339	537	58	85	30	20	
16	400	534	389	592	58	85	35	25	
18	450	-	-	-	-	-	-	-	
20	500	644	491	714	70	95	40	30	
24	600	765	593	840	75	110	50	35	

Dimensions in mm for **Class 600**

Nominal diameter		A	B	D	H	K	S	T	Weight kg / 100 pieces
inch	mm								
1/2	15	51	18	78	-	20	10	8	
3/4	20	64	23	96	-	25	10	8	
1	25	70	29	102	-	25	10	8	
1 1/4	32	79	38	111	-	25	10	8	
1 1/2	40	92	43	129	-	25	10	8	
2	50	108	54	142	-	25	10	8	
2 1/2	65	127	65	164	-	25	10	8	
3	80	146	80	183	-	30	10	8	
4	100	190	104	237	-	40	10	8	
5	125	238	130	289	-	50	15	10	
6	150	264	156	315	51	80	15	10	
8	200	317	207	373	56	80	20	15	
10	250	397	260	458	61	90	25	20	
12	300	454	309	511	57	80	30	20	
14	350	489	339	551	62	85	35	25	
16	400	562	389	629	67	100	40	30	
18	450	-	-	-	-	-	-	-	
20	500	679	491	746	67	100	50	35	
24	600	787	593	868	81	105	60	45	

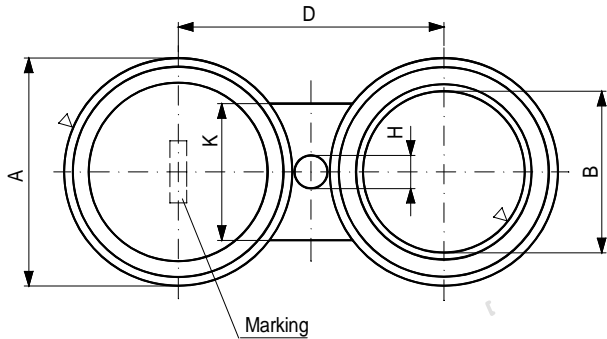
Dimensions in mm for **Class 900**

Nominal diameter		A	B	D	H	K	S	T	Weight kg / 100 pieces
inch	mm								
1/2	15	60	18	95	-	25	10	8	
3/4	20	66	23	103	-	30	10	8	
1	25	76	29	118	-	30	10	8	
1 1/4	32	86	38	127	-	30	10	8	
1 1/2	40	95	43	141	-	30	10	8	
2	50	140	54	183	-	30	10	8	
2 1/2	65	162	65	208	-	35	10	8	
3	80	165	80	208	-	35	10	8	
4	100	203	104	253	-	40	15	10	
5	125	244	130	302	-	50	15	10	
6	150	286	156	339	53	100	20	15	
8	200	356	207	418	62	100	25	20	
10	250	432	260	494	62	100	30	20	
12	300	495	309	557	62	85	35	25	
14	350	517	339	584	67	90	45	30	
16	400	572	389	643	71	100	50	35	
18	450	-	-	-	-	-	-	-	
20	500	695	491	781	86	120	60	45	
24	600	835	593	943	108	145	70	50	

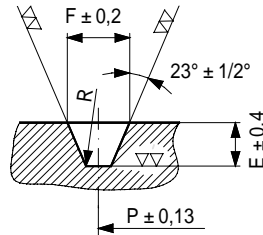
Dimensions in mm for **Class 1500**

Nominal diameter		A	B	D	H	K	S	T	Weight kg / 100 pieces
inch	mm								
1/2	15	60	18	95	-	25	10	8	
3/4	20	66	23	103	-	30	10	8	
1	25	76	29	118	-	30	10	8	
1 1/4	32	86	38	127	-	30	10	8	
1 1/2	40	95	43	141	-	30	10	8	
2	50	140	54	183	-	30	10	8	
2 1/2	65	161	65	208	-	35	15	10	
3	80	171	80	224	-	35	15	10	
4	100	205	104	264	-	40	15	10	
5	125	251	130	318	-	50	25	20	
6	150	280	156	342	62	85	25	20	
8	200	349	207	421	72	100	35	25	
10	250	432	260	513	81	100	40	30	
12	300	518	309	601	83	110	50	35	
14	350	575	339	667	92	120	55	40	
16	400	638	389	737	99	140	70	50	
18	450	-	-	-	-	-	-	-	
20	500	752	491	837	121	160	80	60	
24	600	898	593	1038	140	200	100	80	

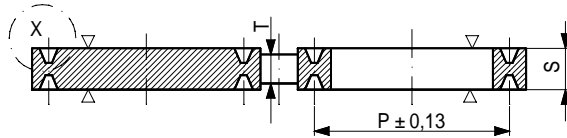
**Spectacle blind for flange facing RTJ**



Detail X



Radius R = 0,8 mm for  $F \leq 11,9$  mm  
 Radius R = 1,5 mm for  $F > 11,9$  but  $\leq 23$  mm  
 Radius R = 2,4 mm for  $F > 23$  mm



Dimensions in mm for **Class 150**

Nominal diameter	A		B	D	H	K	S	T	P	F	E	Weight kg / 100 pieces
	inch	mm										
1	1/8	25	63	29	90	-	25	15	10	47,6	8,7	6,35
1 1/4	1/4	32	73	38	100	-	30	15	10	57,2	8,7	6,35
1 1/2	3/8	40	83	43	110	-	35	15	10	65,1	8,7	6,35
2	1/2	50	102	54	132	-	35	20	15	82,6	8,7	6,35
2 1/2	5/8	65	121	65	154	-	35	20	15	101,6	8,7	6,35
3	3/4	80	133	80	167	-	35	20	15	114,3	8,7	6,35
4	1	100	171	104	205	-	35	20	15	149,2	8,7	6,35
5	1 1/8	125	194	130	229	-	40	20	15	171,5	8,7	6,35
6	1 1/4	150	219	156	254	35	130	20	15	193,7	8,7	6,35
8	1 3/4	200	276	207	315	39	130	25	20	247,7	8,7	6,35
10	2	250	337	260	377	40	130	25	20	304,8	8,7	6,35
12	2 1/4	300	406	309	449	43	130	25	20	381	8,7	6,35
14	2 3/4	350	446	339	494	48	130	30	20	396,9	8,7	6,35
16	3	400	511	389	559	48	130	30	20	454	8,7	6,35
18	3 1/4	450	546	437	596	50	130	30	20	517,5	8,7	6,35
20	3 1/2	500	603	491	656	53	130	35	25	558,8	8,7	6,35
24	4 1/4	600	714	593	768	54	160	35	25	673,1	8,7	6,35

Dimensions in mm for **Class 300**

Nominal diameter		A	B	D	H	K	S	T	P	F	E	Weight kg / 100 pieces
inch	mm											
1	25	70	29	102	-	25	20	15	50,8	8,7	6,35	
1 1/4	32	79	38	111	-	25	20	15	60,3	8,7	6,35	
1 1/2	40	92	43	129	-	25	20	15	68,3	8,7	6,35	
2	50	108	54	142	-	25	25	20	82,6	11,9	7,9	
2 1/2	65	127	65	164	-	25	25	20	101,6	11,9	7,9	
3	80	146	80	183	-	30	25	20	123,8	11,9	7,9	
4	100	178	104	221	-	35	25	20	149,2	11,9	7,9	
5	125	213	130	251	-	40	30	20	181	11,9	7,9	
6	150	248	156	288	40	90	30	20	211,1	11,9	7,9	
8	200	305	207	348	43	90	35	25	269,9	11,9	7,9	
10	250	359	260	407	48	90	40	30	323,9	11,9	7,9	
12	300	419	309	475	56	90	45	30	381	11,9	7,9	
14	350	482	339	538	56	90	45	30	419,1	11,9	7,9	
16	400	536	389	596	60	90	50	35	469,9	11,9	7,9	
18	450	594	437	658	64	90	55	40	533,4	11,9	7,9	
20	500	651	491	718	67	100	60	45	584,4	13,5	9,5	
24	600	771	593	848	77	160	70	50	692,2	16,7	11,1	

Dimensions in mm for **Class 400**

Nominal diameter		A	B	D	H	K	S	T	P	F	E	Weight kg / 100 pieces
inch	mm											
1	25	70	29	102	-	25	20	15	50,8	8,7	6,35	
1 1/4	32	79	38	111	-	25	20	15	60,3	8,7	6,35	
1 1/2	40	92	43	129	-	25	20	15	68,3	8,7	6,35	
2	50	108	54	142	-	25	25	20	82,6	11,9	7,9	
2 1/2	65	127	65	164	-	25	25	20	101,6	11,9	7,9	
3	80	146	80	183	-	30	25	20	123,8	11,9	7,9	
4	100	175	104	220	-	35	30	20	149,2	11,9	7,9	
5	125	210	130	250	-	40	35	25	181	11,9	7,9	
6	150	245	156	286	41	85	35	25	211,1	11,9	7,9	
8	200	302	207	347	45	85	40	30	269,9	11,9	7,9	
10	250	355	260	405	50	85	40	30	323,9	11,9	7,9	
12	300	416	309	473	57	85	45	30	381	11,9	7,9	
14	350	479	339	537	58	85	50	35	419,1	11,9	7,9	
16	400	534	389	592	58	85	55	40	469,9	11,9	7,9	
18	450	591	437	653	62	85	60	45	533,4	11,9	7,9	
20	500	644	491	714	70	95	70	50	584,2	13,5	9,5	
24	600	765	593	840	75	110	80	60	692,2	16,7	11,1	

Dimensions in mm for **Class 600**

Nominal diameter		A	B	D	H	K	S	T	P	F	E	Weight kg / 100 pieces
inch	mm											
1	25	70	29	102	-	25	20	15	50,8	8,7	6,35	
1 1/4	32	79	38	111	-	25	20	15	60,3	8,7	6,35	
1 1/2	40	92	43	129	-	25	20	15	68,3	8,7	6,35	
2	50	108	54	142	-	25	25	20	82,6	11,9	7,9	
2 1/2	65	127	65	164	-	25	30	20	101,6	11,9	7,9	
3	80	146	80	183	-	30	30	20	123,8	11,9	7,9	
4	100	190	104	237	-	40	30	20	149,2	11,9	7,9	
5	125	238	130	289	-	50	35	25	181	11,9	7,9	
6	150	264	156	315	51	80	35	25	211,1	11,9	7,9	
8	200	317	207	373	56	80	40	30	269,9	11,9	7,9	
10	250	397	260	458	61	90	50	35	323,9	11,9	7,9	
12	300	454	309	511	57	80	55	40	381	11,9	7,9	
14	350	489	339	551	62	85	60	45	419,1	11,9	7,9	
16	400	562	389	629	67	100	60	45	469,9	11,9	7,9	
18	450	610	437	681	71	110	70	50	533,4	11,9	7,9	
20	500	679	491	746	67	100	80	60	584,2	13,5	9,5	
24	600	787	593	868	81	105	90	60	692,2	16,7	11,1	

Dimensions in mm for **Class 900**

Nominal diameter		A	B	D	H	K	S	T	P	F	E	Weight kg / 100 pieces
inch	mm											
1	25	76	29	118	-	30	20	15	50,8	8,7	6,35	
1 1/4	32	86	38	127	-	30	20	15	60,3	8,7	6,35	
1 1/2	40	95	43	141	-	30	20	15	68,3	8,7	6,35	
2	50	140	54	183	-	30	30	20	95,3	11,9	7,9	
2 1/2	65	162	65	208	-	35	30	20	108	11,9	7,9	
3	80	165	80	208	-	35	30	20	123,8	11,9	7,9	
4	100	203	104	253	-	40	35	25	149,2	11,9	7,9	
5	125	244	130	302	-	50	40	30	181	11,9	7,9	
6	150	286	156	339	53	100	40	30	211,1	11,9	7,9	
8	200	356	207	418	62	100	50	35	269,9	11,9	7,9	
10	250	432	260	494	62	100	55	40	323,9	11,9	7,9	
12	300	495	309	557	62	85	60	45	381	11,9	7,9	
14	350	517	339	584	67	90	70	50	419,1	16,7	11,1	
16	400	572	389	643	71	100	80	60	469,9	16,7	11,1	
18	450	635	437	716	81	100	90	60	533,4	19,8	12,7	
20	500	695	491	781	86	120	100	80	584,2	19,8	12,7	
24	600	835	593	943	108	145	120	80	692,2	27	15,9	

Dimensions in mm for **Class 1500**

Nominal diameter		A	B	D	H	K	S	T	P	F	E	Weight kg / 100 pieces
inch	mm											
1	25	76	29	118	-	30	20	15	50,8	8,7	6,35	
1 1/4	32	86	38	127	-	30	25	20	60,3	8,7	6,35	
1 1/2	40	95	43	141	-	30	25	20	68,3	8,7	6,35	
2	50	140	54	183	-	30	30	20	95,3	11,9	7,9	
2 1/2	65	161	65	208	-	35	35	25	108	11,9	7,9	
3	80	171	80	224	-	35	35	25	136,5	11,9	7,9	
4	100	205	104	264	-	40	40	30	161,9	11,9	7,9	
5	125	251	130	318	-	50	50	35	193,7	11,9	7,9	
6	150	280	156	342	62	85	50	35	211,1	13,5	9,5	
8	200	349	207	421	72	100	70	50	269,9	16,7	11,1	
10	250	432	260	513	81	100	70	50	323,9	16,7	11,1	
12	300	518	309	601	83	110	90	60	381	23	14,3	
14	350	575	339	667	92	120	100	80	419,1	27	15,9	
16	400	638	389	737	99	140	110	80	469,9	30,2	17,5	
18	450	701	437	813	112	150	120	80	533,4	30,2	17,5	
20	500	752	491	873	121	160	130	80	584,2	33,3	17,5	
24	600	898	593	1038	140	200	150	100	692,2	36,5	20,6	

	<b>SPECIAL PART SPECIFICATION</b> <b>ASME</b> <b>PRESSURE MEASUREMENT</b>	Special-Part-No. <b>9++AMP011 - 023</b> Page: 1 of 1 Revision: 1 Date: 04.07.2011 Name:
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**DESCRIPTION:** Capsule Pressure Gauge, Liquid filled (EN837-3)

**FLUID**

Water, Air, Gas

**SERVICE LIMITS**

Pressure range: see sketch  
 Design temperature: -20 / +60°C  
 Accuracy class: 1  
 Protection rating: IP44  
 Safety design code: S1

**MATERIALS**

Casing of gauge: Steel-enameled or Stainless Steel 304  
 Wetted Parts: Brass, Bronze  
 Globe Valve: Bronze B 62  
 Nuts / Studs: Steel

**TESTS & CERTIFICATION**

Quality conditions:  
 Acceptance certificate for material: acc. to ASTM standard  
 Acceptance certificate for final test: acc. to ASME standard  
 Marking with part number and order regulations.

**TECHNICAL CHARACTERISTICS**

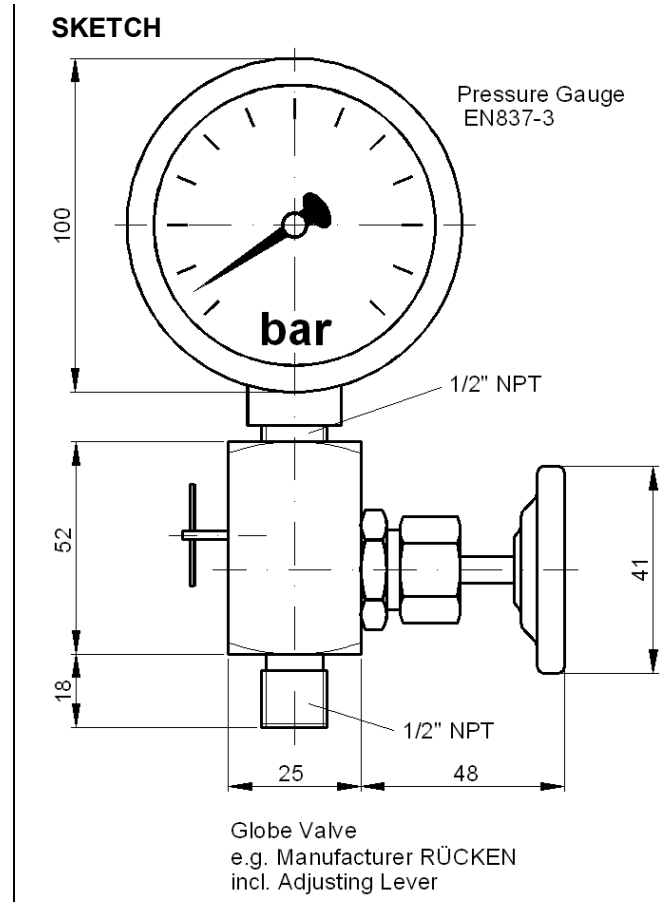
**Scope:**

- 1 pc. Capsule pressure gauge acc. to EN837-3  
Liquid filled (Glycerin)
- 1 pc. Globe valve with male/female 1/2" NPT-thread  
acc. sketch and manufacturer standard

**Nominal Size:** 100

**Threads:** NPT 1/2" acc. to ASME B 1.20.1

**Weight (approx.):** 1.5 kg per set



Dimensions in mm

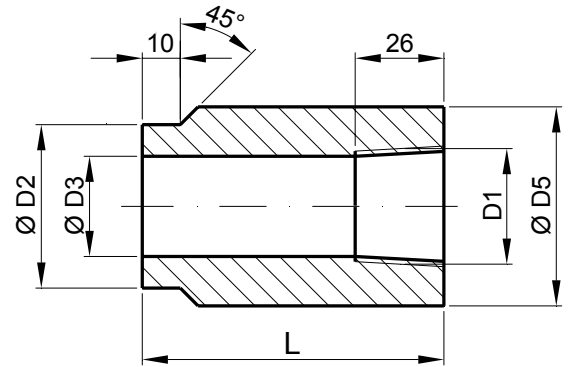
Pressure Range	Special Part No.
0 to 100 mbar	9++AMP011
0 to 250 mbar	9++AMP012
0 to 400 mbar	9++AMP013
-1 to 3 bar	9++AMP014
0 to 1 bar	9++AMP015
0 to 2,5 bar	9++AMP016
0 to 4 bar	9++AMP017
0 to 6 bar	9++AMP018
0 to 10 bar	9++AMP019
0 to 16 bar	9++AMP020
0 to 25 bar	9++AMP021

	<b>SPECIAL PART SPECIFICATION</b> <b>ASME</b> <b>TEMPERATURE MEASUREMENT</b> <b>CLASS 300</b>	Special-Part-No. <b>9++AMT001</b> Page: 1 of 1 Revision: 1 Date: 10.01.2012 Name:
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**DESCRIPTION:** Welding Nipple for Thermometer

<b>FLUID</b>	
Water, Air, Gas	
<b>SERVICE LIMITS</b>	
Design pressure:	40 bar / 600 PSI
<b>MATERIALS</b>	
Welding Nipple:	Carbon Steel
<b>TESTS &amp; CERTIFICATION</b>	
Quality conditions: Acceptance certificate for material: acc. ASTM standard Marking with part number and order regulations.	
<b>TECHNICAL CHARACTERISTICS</b>	
Connection:	Female NPT-thread connection according to ASME B 1.20.1

**SKETCH**



Dimensions in mm

DN1	D1	D2	D3	D5	Weight [kg/m]
15	1/2"	27	18,7	38	6,7
20	3/4"	32	24,1	38	5,3
25	1"	38	30,5	46	7,3

<b>L (DN2)</b>	50, 60, 70, 80, 90, 100, 120, 150, 200
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**REVISION 1** : Service Limits (PSI) added.

**Rodiks Material Take Off (MTO) :**

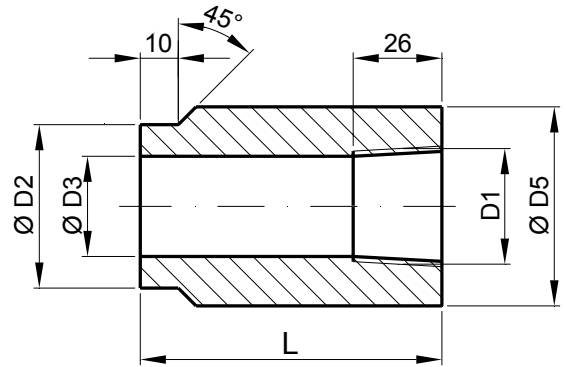
- "SHCD" = XT
- "DN1" = DN1 in mm
- "DN2" = L in mm

	<b>SPECIAL PART SPECIFICATION</b> <b>ASME</b> <b>TEMPERATURE MEASUREMENT</b> <b>CLASS 300</b>	Special-Part-No. <b>9++AMT002</b> Page: 1 of 1 Revision: 1 Date: 10.01.2012 Name:
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**DESCRIPTION:** Welding Nipple for Thermometer

<b>FLUID</b>	
Water, Air, Gas	
<b>SERVICE LIMITS</b>	
Design pressure:	40 bar / 600 PSI
<b>MATERIALS</b>	
Welding Nipple:	Stainless Steel
<b>TESTS &amp; CERTIFICATION</b>	
Quality conditions:	
Acceptance certificate for material: acc. ASTM standard	
Marking with part number and order regulations.	
<b>TECHNICAL CHARACTERISTICS</b>	
Connection:	Female NPT-thread connection according to ASME B 1.20.1

**SKETCH**



Dimensions in mm

DN1	D1	D2	D3	D5	Weight [kg/m]
15	1/2"	27	18,7	38	6,7
20	3/4"	32	24,1	38	5,3
25	1"	38	30,5	46	7,3

<b>L (DN2)</b>	50, 60, 70, 80, 90, 100, 120, 150, 200
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**Rodiks Material Take Off (MTO) :**

- "SHCD" = XT
- "DN1" = DN1 in mm
- "DN2" = L in mm

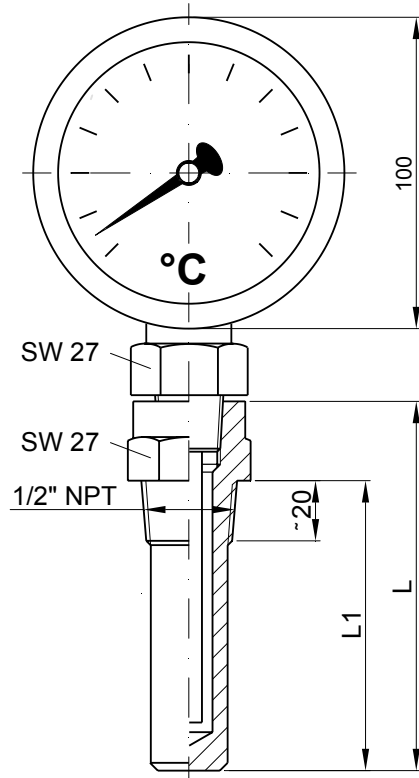
	<b>SPECIAL PART SPECIFICATION</b> <b>ASME</b> <b>TEMPERATURE MEASUREMENT</b>	Special-Part-No. <b>9++AMT011 - 024</b> Page: 1 of 1 Revision: 1 Date: 03.10.2007 Name:
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**DESCRIPTION:** Bimetallic Thermometer

<b>FLUID</b>	
Water, Air, Gas	
<b>SERVICE LIMITS</b>	
Temperature range:	see sketch
Accuracy:	+ / - 1 %
Protection rating:	IP45 (min.)
<b>MATERIALS</b>	
Casing:	Steel with anti-corrosion coating or Stainless Steel
Immersion tubing:	Steel or Stainless Steel
Protection tube:	Stainless Steel 316
<b>TESTS &amp; CERTIFICATION</b>	
Quality conditions:	
Acceptance certificate for material: acc. to ASTM standard	
Acceptance certificate for final test: acc. to ASME standard	
Marking with part number and order regulations.	

<b>TECHNICAL CHARACTERISTICS</b>	
<b>Scope:</b>	
- Bimetallic thermometer (BM) acc. to EN13190 position of connection: lower (form 1) type of connection: fixed, tapered thread (form 7)	
- Protection Tube acc. to DIN43772 straight shaft, tapered thread (form 7)	
<b>Nominal Size:</b>	100
<b>Connection threads:</b>	
Thermometer:	1/2" NPT acc. to ASME B 1.20.1
Protection tube:	1/2" NPT acc. to ASME B 1.20.1
<b>Weight (approx.):</b>	0,7 kg per set

**SKETCH**



Dimensions in mm

Temperature Range	L	L1	Special Part No.
0 to 60 °C	110	82	9++AMT011
0 to 80 °C			9++AMT012
0 to 100 °C			9++AMT013
0 to 120 °C			9++AMT014
0 to 160 °C			9++AMT015
0 to 200 °C			9++AMT016
0 to 250 °C			9++AMT017
0 to 60 °C	170	142	9++AMT018
0 to 80 °C			9++AMT019
0 to 100 °C			9++AMT020
0 to 120 °C			9++AMT021
0 to 160 °C			9++AMT022
0 to 200 °C			9++AMT023
0 to 250 °C			9++AMT024

**Revision 1** : Connection thread of protection tube from NPT 3/4" to NPT 1/2".

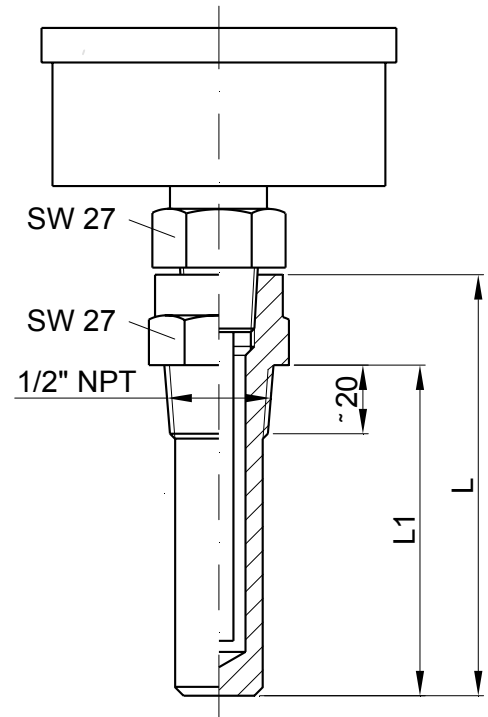
	<b>SPECIAL PART SPECIFICATION</b> <b>ASME</b> <b>TEMPERATURE MEASUREMENT</b>	Special-Part-No. <b>9++AMT031 - 044</b> Page: 1 of 1 Revision: 1 Date: 03.10.2007 Name:
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**DESCRIPTION:** Bimetallic Thermometer

<b>FLUID</b>	
Water, Air, Gas	
<b>SERVICE LIMITS</b>	
Temperature range:	see sketch
Accuracy:	+ / - 1 %
Protection rating:	IP45 (min.)
<b>MATERIALS</b>	
Casing:	Steel with anti-corrosion coating or Stainless Steel
Immersion tubing:	Steel or Stainless Steel
Protection tube:	Stainless Steel 316
<b>TESTS &amp; CERTIFICATION</b>	
Quality conditions:	
Acceptance certificate for material: acc. to ASTM standard	
Acceptance certificate for final test: acc. to ASME standard	
Marking with part number and order regulations.	

<b>TECHNICAL CHARACTERISTICS</b>	
<b>Scope:</b>	
- Bimetallic thermometer (BM) acc. to EN13190 position of connection: centric, backside (form 3) type of connection: fixed, tapered thread (form 7)	
- Protection Tube acc. to DIN43772 straight shaft, tapered thread (form 7)	
<b>Nominal Size:</b>	100
<b>Connection threads:</b>	
Thermometer:	1/2" NPT acc. to ASME B 1.20.1
Protection tube:	1/2" NPT acc. to ASME B 1.20.1
<b>Weight (approx.):</b>	0,7 kg per set

**SKETCH**



Dimensions in mm

Temperature Range	L	L1	Special Part No.
0 to 60 °C	110	82	9++AMT031
0 to 80 °C			9++AMT032
0 to 100 °C			9++AMT033
0 to 120 °C			9++AMT034
0 to 160 °C			9++AMT035
0 to 200 °C			9++AMT036
0 to 250 °C			9++AMT037
0 to 60 °C	170	142	9++AMT038
0 to 80 °C			9++AMT039
0 to 100 °C			9++AMT040
0 to 120 °C			9++AMT041
0 to 160 °C			9++AMT042
0 to 200 °C			9++AMT043
0 to 250 °C			9++AMT044

**Revision 1** : Connection thread of protection tube from NPT 3/4" to NPT 1/2".

	<b>SPECIAL PART SPECIFICATION</b> <b>ASME</b> <b>EXPANSION JOINTS</b> <b>CLASS 150</b>	Special-Part-No. <b>9++ASJ006</b> Page: 1 of 1 Revision: 0 Date: 02.08.2007 Name:
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**DESCRIPTION:** Rubber Expansion Joint with Bracing Class 150

**FLUID**

Water, Cooling Water, Waste Water, ...  
Compressed Air, gaseous

**SERVICE LIMITS**

Design pressure: 16 bar  
Design temperature: 70 °C

**MATERIALS**

Soul: NBR  
Layer: Nylon S  
Cover: CR  
Flanges: ASTM A105, galvanised

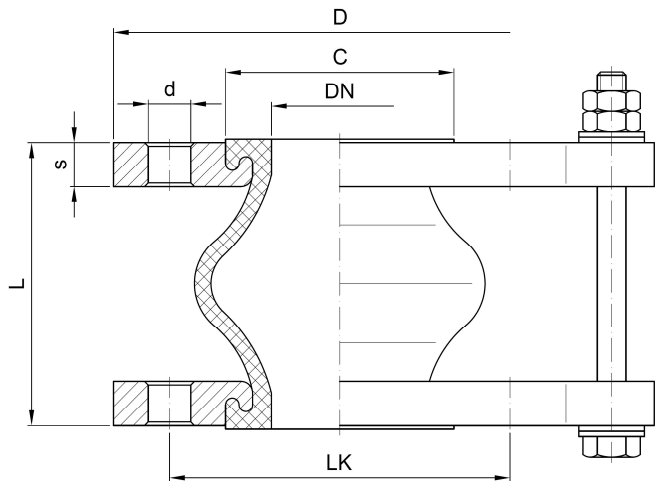
**TESTS & CERTIFICATION**

Quality conditions:  
Acceptance certificate for material:  
according to ASTM standard  
Acceptance certificate for final test:  
according to ASME standard  
Test pressure = 1,5 x nominal pressure.  
Marking with part number and  
order regulations.

**TECHNICAL CHARACTERISTICS**

Rotary flanges with through holes.  
Self-sealing through rubber bellow.  
Flange connection: Class 150  
acc. to ASME B16.5

**SKETCH**



Dimensions in mm

DN	DN	L	Ø D	Ø LK	z x Ø d	Ø C*	s	Weight* [kg]
32	1 ¼"	130	117,5	88,9	4 x 15,9	64	16	2,8
40	1 ½"	130	127,0	98,4	4 x 15,9	69	16	3,0
50	2"	130	152,4	120,6	4 x 19,0	87	16	4,0
65	2 ½"	130	177,8	139,7	4 x 19,0	109	16	4,8
80	3"	130	190,5	152,4	4 x 19,0	118	19	6,1
100	4"	130	228,6	190,5	8 x 19,0	147	19	8,1
125	5"	130	254,0	215,9	8 x 22,2	177	19	8,7
150	6"	130	279,4	241,3	8 x 22,2	202	19	9,9
200	8"	130	342,9	298,4	8 x 22,2	263	19	12,5
250	10"	130	406,4	361,9	12 x 25,4	323	22	19,0
300	12"	130	482,6	431,8	12 x 25,4	372	25	32,0
350	14"	200	533,4	476,2	12 x 28,6	422	32	46,0
400	16"	200	596,9	539,7	16 x 28,6	479	32	54,0
500	20"	200	698,5	635,0	20 x 31,8	576	32	67,0

**REMARKS:** \* Approximate values which may vary due to the vendor

	<b>SPECIAL PART SPECIFICATION</b> <b>ASME</b> <b>CHECK VALVES</b> <b>CLASS 150</b>	Special-Part-No. <b>9++AVD001-009</b> Page: 1 of 1 Revision: 0 Date: 23.05.2011 Name:
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**DESCRIPTION:** Swing Check Valve (E11W36J12) with hydraulic damping device (low backpressure)

**FLUID**

According Valve Specification E11W36J12

**SERVICE LIMITS**

According Valve Specification E11W36J12

Maximum backpressure see table below

**MATERIALS**

According Valve Specification E11W36J12

**TESTS & CERTIFICATION, CE-MARKING**

According Valve Specification E11W36J12

**Tag - Marking** with Special-Part-No. (according to order regulations)

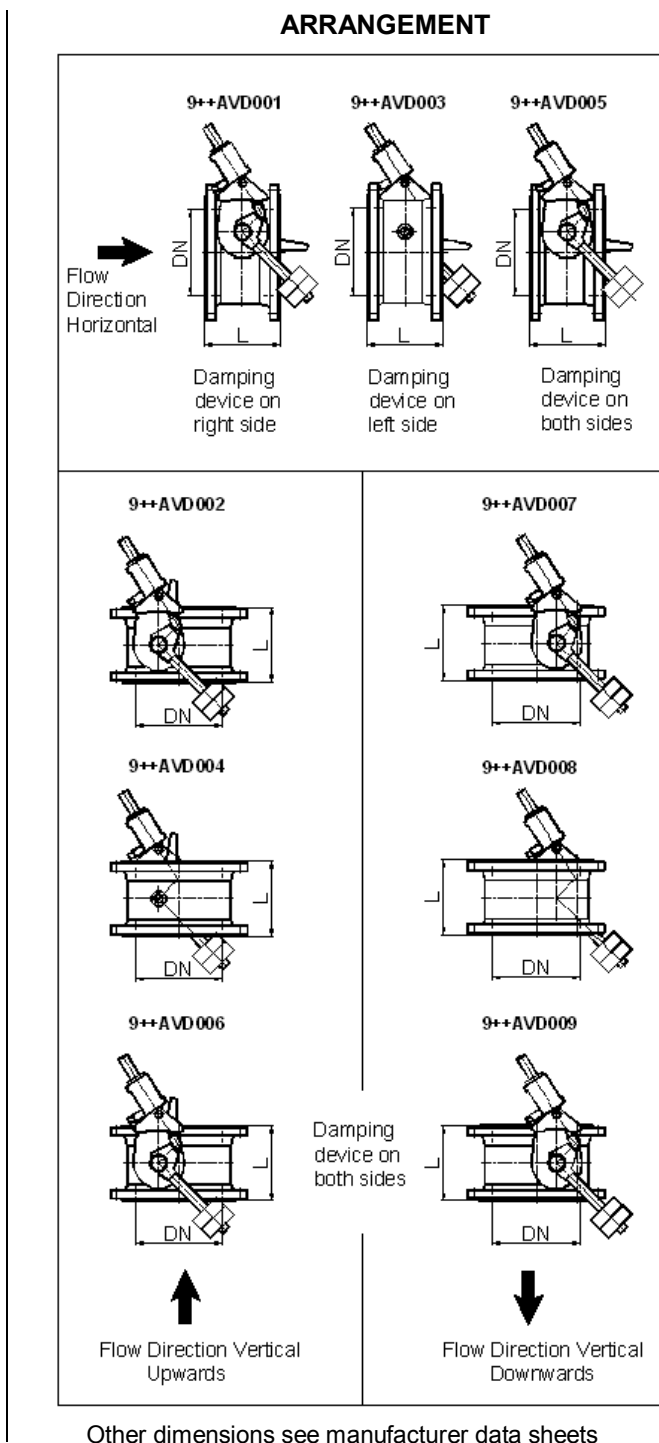
**TECHNICAL CHARACTERISTICS**

Swing Check Valve acc. Specification **E11W36J12** (weight-loaded lever and hydraulic damping device). The damping device is working during closing and opening action

**TABLE**

DN	L 1) [mm]	Maximum backpressure	Weight * [kg]
150	210	10,0 bar	38,0
200	230	10,0 bar	55,0
250	250	7,0 bar	80,0
300	270	7,0 bar	105,0
350	290	5,0 bar	140,0
400	310	3,5 bar	170,0
500	350	3,0 bar	270,0
600	390	3,0 bar	380,0

1) L= Length acc. to manufacturer's standard  
 Valve shaft and damping device must be sized to withstand the maximum backpressure.



**REMARKS:**

Maximum backpressure is valid during closing action of check valve (backward flow). In closed position the valve must withstand a backpressure equal to nominal pressure.