

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 15ps (15nc).

Grade :	15ps (15nc)
Substitute:	10кп, 20кп
Classification :	High quality structural carbon steel
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Chemical composition in % for grade 15ps (15nc)

C	Si	Mn	Ni	S	P	Cr	Cu	As
0.12 - 0.19	0.05 - 0.17	0.35 - 0.65	max 0.3	max 0.04	max 0.035	max 0.25	max 0.3	max 0.08

Temperature of critical points for grade 15ps (15nc).

$Ac_1 = 735$, $Ac_3(Ac_m) = 863$, $Ar_3(Arc_m) = 840$, $Ar_1 = 685$

Mechanical properties under T=20°C for grade 15ps (15nc)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Sheet heat-treatment, GOST 4041-71	4 - 14		320-440		30			
Band annealed , GOST 2284-79			310-490		20			
Band cold-worked , GOST 2284-79			440-780					
Steel cold-drawn , GOST 10702-78			392		8	50		
Strip, GOST 1577-93	6 - 60		350	205	29	55		Normalizing

Brinell hardness for 15ps (15nc) , Sheet GOST 4041-71	HB 10 ⁻¹ = 121 MPa
Brinell hardness for 15ps (15nc) , Bar GOST 10702-78	HB 10 ⁻¹ = 125 MPa
Brinell hardness for 15ps (15nc) , Sheet trick GOST 1577-93	HB 10 ⁻¹ = 143 MPa

Technological properties for grade 15ps (15nc)

Weldability:	without limitations.
Flakes :	not predisposed
Temper brittleness:	not predisposed

Physical properties for grade 15ps (15nc)

T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹
Grade	MPa	1/Grade	Watt/(m·Grade)	kg/m ³	J/(kg·Grade)	Ohm·m
20	2.01			7850		
100	1.92	12.4	53	7827	465	233
200	1.85	13.2	53	7794	486	296
300	1.72	13.9	49	7759	515	387
400	1.56	14.4	46	7724	532	487
500		14.8	43	7687	565	607
600		15.1	39	7648	586	753
700		15.3	36	7611	620	904
800			32	7599	691	1092
900			30	7584	708	1140
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade 15ps (15nc)

Warning! Indicated both exact and nearest equivalents.

USA	Japan	France	Italy	China	Bulgaria	Poland	Czechia
-	JIS	AFNOR	UNI	GB	BDS	PN	CSN
1015 1017 G10150 G10170 M1015 M1017	SWRCH15A SWRCH15R SWRCH16R SWRCH17R	FB18 FR15 FR18 XC18	CB15	ML15	15ps	15Y	12020

Specification :**Mechanical properties :**

- σ_B - Tensile strength , [MPa]
 σ_T - Yield stress , [MPa]
 δ_5 - Specific elongation at fracture , [%]
 ψ - Reduction of area , [%]
KCU - Impact strength , [kJ / m²]
HB - Brinell hardness , [MPa]

Physical properties :

- T** - Test temperature , [Grade]
E - Young modulus , [MPa]
 α - Coefficient of linear expansion (range 20° - T) , [1/Grade]
 λ - Thermal (heat) condition coefficient , [Watt/(m·Grade)]
 ρ - Density , [kg/m³]
C - Specific heat (range 20° - T) , [J/(kg·Grade)]
R - Electrical resistance , [Ohm·m]

Weldability :

without limitations - welding is done without heating and subsequent heat treating

limited weldability - welding is possible under heating up to 100-120 grade and subsequent heat treating

hard weldability - obtaining the quality welding needs the additional operations: heating up to 200-300 grade; the heat treating ia annealing

Database of steels and alloys (Marochnik) contains information about chemical composition and properties more then 2500 steels and alloys (stainless steel, alloy steel, carbone steel, structural steel, tool steel, cast iron, aluminum alloy, titanium alloy, copper alloy, nickel alloy, magnesium alloy and others).
Helpfull for specialists in grade technology, structural engineer, mechanical engineer, metallurgy and metal trader

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