

Database of Steel and Alloy (Marochnik)

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[Home](#) [European steel grades](#) [Steel and Alloy](#) [Search](#) [Equivalent grades](#) [Grading](#) [GOST Standard](#) [Contacts](#)

YOU HERE: [Steel and Alloy](#) -> [Structural steel](#)

Characteristics for grade 20kp (20кп).

Grade :	20kp (20кп)
Substitute:	15кп
Classification :	High quality structural carbon steel
Equivalent grades:	Go here

Chemical composition in % for grade 20kp (20кп)

C	Si	Mn	Ni	S	P	Cr	Cu	As
0.17 - 0.24	max 0.07	0.25 - 0.5	max 0.3	max 0.04	max 0.035	max 0.25	max 0.3	max 0.08

Temperature of critical points for grade 20kp (20кп).

$Ac_1 = 735$, $Ac_3(Ac_m) = 850$, $Ar_3(Arc_m) = 835$, $Ar_1 = 680$

Mechanical properties under T=20°C for grade 20kp (20кп)

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		340-490		28			
Pipe, GOST 10705-80			372	225	22			
Steel cold-drawn, GOST 10702-78			490		7	45		
Strip, GOST 1577-93	6 - 60		380	225	27	55		Normalizing

Brinell hardness for 20kp (20кп) , Sheet GOST 4041-71	HB 10 ⁻¹ = 127 MPa
Brinell hardness for 20kp (20кп) , Sheet trick GOST 1577-93	HB 10 ⁻¹ = 156 MPa

Technological properties for grade 20kp (20кп)

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

Physical properties for grade 20kp (20кп)

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	2.12					
100	2.08	12.3	51	7834	486	219
200	2.03	13.1	49	7803	498	292
300	1.97	13.8	44	7770	514	381
400	1.89	14.3	43	7736	533	487
500	1.77	14.8	39	7699	555	601
600	1.63	15.1	36	7659	584	758
700	1.4	15.2	32	7617	636	925
800			26	7624	703	1094
900			26	7600	703	1135
1000					695	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 20kp (20кп)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	European
-	DIN, WNr	EN
1020 1023 G10200 G10230 M1020 M1023	Cq22	1.1152 C20E2C

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

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

[Top](#)

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