

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 20KH (20X).

Grade :	20KH (20X)
Substitute:	15X, 20XH, 12XH2, 18XГТ
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 20KH (20X)

C	Si	Mn	Ni	S	P	Cr	Cu
0.17 - 0.23	0.17 - 0.37	0.5 - 0.8	max 0.3	max 0.035	max 0.035	0.7 - 1	max 0.3

Temperature of critical points for grade 20KH (20X).

$Ac_1 = 750$, $Ac_3(Ac_m) = 825$, $Ar_3(Arc_m) = 755$, $Ar_1 = 665$, $Mn = 390$

Mechanical properties under T=20°C for grade 20KH (20X)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Pipe, GOST 8731-87			431		16			
Bar, GOST 4543-71	Ø 15		780	635	11	40	590	Guenching and drawing

Brinell hardness for 20KH (20X) (annealing) , GOST 4543-71	HB 10 ⁻¹ = 179 MPa
Brinell hardness for 20KH (20X) (cold-worked) , GOST 4543-71	HB 10 ⁻¹ = 229 MPa
Brinell hardness for 20KH (20X) , Bar GOST 10702-78	HB 10 ⁻¹ = 163 MPa

Technological properties for grade 20KH (20X)

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

Physical properties for grade 20KH (20X)

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	2.16		42	7830		

100	2.13	10.5	42	7810	496	
200	1.98	11.6	41	7780	508	
300	1.93	12.4	40		525	
400	1.81	13.1	38	7710	537	
500	1.71	13.6	36		567	
600	1.65	14	33	7640	588	
700	1.43		32		626	
800	1.33		31		706	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 20KH (20X)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	England	European	Bulgaria	Hungary	Poland
-	DIN, WNr	JIS	BS	EN	BDS	MSZ	PN
5117 5120 5120H G51170 G51200 H51200	20Cr4 20CrS4	SCr420 SCr420H	207	20Cr4	20Ch	BC2	20H

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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