

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 20KH12VNMF (20X12BHMΦ).

Grade :	20KH12VNMF (20X12BHMΦ)(2X12BHMΦ ЭП428)
Classification :	High alloy high-temperature steel
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Chemical composition in % for grade 20KH12VNMF (20X12BHMΦ)

C	Si	Mn	Ni	S	P	Cr	Mo	W	V
0.17 - 0.23	max 0.6	0.5 - 0.9	0.5 - 0.9	max 0.025	max 0.03	10.5 - 12.5	0.5 - 0.7	0.7 - 1.1	0.15 - 0.3

Temperature of critical points for grade 20KH12VNMF (20X12BHMΦ).

$Ac_1 = 800$, $Ac_3(Ac_m) = 860$

Mechanical properties under T=20°C for grade 20KH12VNMF (20X12BHMΦ)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar, GOST 5949-75			740	590	15	50	590	Guenching 1010 - 1060°C, oil, Drawing 660 - 670°C, air,
Bar, GOST 18968-73			740	590-755	15	50	590	Normalizing and drawing

Brinell hardness for 20KH12VNMF (20X12BHMΦ) (annealing), Bar GOST 5949-75	HB 10 ⁻¹ = 229 MPa
Brinell hardness for 20KH12VNMF (20X12BHMΦ) (normalize, tempering), Bar GOST 18968-73	HB 10 ⁻¹ = 229 - 269 MPa

Technological properties for grade 20KH12VNMF (20X12BHMΦ)

Weldability:	hard weldability.
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Physical properties for grade 20KH12VNMF (20X12BHMΦ)

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			7850		
100	2.07	10.6	25	7830		
200	2.02	10.9	25	7800		
300	1.96	11.2	26	7780		
400	1.9	11.4	26	7760		
500	1.81	11.7	27	7730		
600	1.67	11.9	27	7700		
700		12		7670		

800		12.1				
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade 20KH12VNMF (20X12BHMΦ)

Warning! Indicated both exact and nearest equivalents.

USA	Japan
-	JIS
616	SUH616

Specification :**Mechanical properties :**

- σ_B** - Tensile strength , [MPa]
σ_T - Yield stress , [MPa]
δ₅ - 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 is annealing

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

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