

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 15KH12VNMF (15X12BHMΦ).

Grade :	15KH12VNMF (15X12BHMΦ)(1X12BHMΦ 3И802)
Classification :	High alloy high-temperature steel
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Chemical composition in % for grade 15KH12VNMF (15X12BHMΦ)

C	Si	Mn	Ni	S	P	Cr	Mo	W	V	Ti	Cu
0.12 - 0.18	max 0.4	0.5 - 0.9	0.4 - 0.8	max 0.025	max 0.03	11 - 13	0.5 - 0.7	0.7 - 1.1	0.15 - 0.3	max 0.2	max 0.3

Temperature of critical points for grade 15KH12VNMF (15X12BHMΦ).

$Ac_1 = 800 - 810$, $Ac_3(Ac_m) = 860 - 880$

Mechanical properties under T=20°C for grade 15KH12VNMF (15X12BHMΦ)

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	45	590	
Bar, GOST 18968-73			740	590-735	15	50	590	Normalizing and drawing
Bars, GOST 5582-75	60		740	590	15	45	590	Annealing 900 - 950°C, oven, Guenching 1000 - 1020°C, oil, Drawing 600 - 700°C, air,

Brinell hardness for 15KH12VNMF (15X12BHMΦ) (annealing), Bar GOST 5949-75	HB 10 ⁻¹ = 229 MPa
Brinell hardness for 15KH12VNMF (15X12BHMΦ) (normalize, tempering), Bar GOST 18968-73	HB 10 ⁻¹ = 229 - 269 MPa

Technological properties for grade 15KH12VNMF (15X12BHMΦ)

Weldability:	hard weldability.
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Physical properties for grade 15KH12VNMF (15X12BHMΦ)

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			7850		
100		10	24		477	
200		10.5	25.5		498	
300	2	10.7	25.9		545	

400	1.94	11	26.3		625	
500	1.84	11.2	26.8		741	
600	1.66	11.6	27.2		896	
700			27.2			
800			27.6			
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 15KH12VNMF (15X12BHMΦ)

Warning! Indicated both exact and nearest equivalents.

Poland
PN
15H12WMF

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 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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