

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 15KHF (15XΦ).

Grade :	15KHF (15XΦ)
Substitute:	20XΦ
Classification :	Alloy structural steel
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Chemical composition in % for grade 15KHF (15XΦ)

C	Si	Mn	Ni	S	P	Cr	V	Cu
0.12 - 0.18	0.17 - 0.37	0.4 - 0.7	max 0.3	max 0.035	max 0.035	0.8 - 1.1	0.06 - 0.12	max 0.3

Temperature of critical points for grade 15KHF (15XΦ).

$Ac_1 = 741$, $Ac_3(Ac_m) = 843$, $Ar_3(Arc_m) = 788$, $Ar_1 = 704$, $Mn = 435$

Mechanical properties under $T=20^{\circ}C$ for grade 15KHF (15XΦ)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ/m^2	-
Bar, GOST 4543-71	Ø 15		740	540	13	50	780	As-delivered state

Brinell hardness for 15KHF (15XΦ) (annealing), GOST 4543-71	HB 10 ⁻¹ = 187 MPa
Brinell hardness for 15KHF (15XΦ) (cold-worked), GOST 4543-71	HB 10 ⁻¹ = 217 MPa
Brinell hardness for 15KHF (15XΦ) , Bar GOST 10702-78	HB 10 ⁻¹ = 163 MPa

Technological properties for grade 15KHF (15XΦ)

Weldability:	without limitations.
Flakes :	weakly predisposed
Temper brittleness:	weakly predisposed

Physical properties for grade 15KHF (15XΦ)

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	2.06			7760		

100		11.9	43	7730		281
200		12.4	42	7710		345
300		13.1	42	7670		421
400		13.7	40	7640		513
500		14.2	36	7600		606
600		14.5	34	7570		731
700		14.9	30	7530		833
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 15KHF (15XΦ)

Warning! Indicated both exact and nearest equivalents.

USA	Czechia
-	CSN
6117 Gr.6118	15221

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 - Termal (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 treeting
- limited weldability** - welding is possible under heating up to 100-120 grade and subsequent heat treeting
- hard weldability** - obtaining the quality welding needs the additional operations: heating up to 200-300 grade; the heat treeting 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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