

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 15KH5M (15X5M).

Grade :	15KH5M (15X5M) (X5M)
Classification :	Low alloy high-temperature steel
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Chemical composition in % for grade 15KH5M (15X5M)

C	Si	Mn	Ni	S	P	Cr	Mo	W	V	Ti	Cu
max 0.15	max 0.5	max 0.5	max 0.6	max 0.025	max 0.03	4.5 - 6	0.45 - 0.6	max 0.3	max 0.05	max 0.03	max 0.2

Temperature of critical points for grade 15KH5M (15X5M).

$Ac_1 = 815$, $Ac_3(Ac_m) = 848$, $Ar_3(Arc_m) = 775$, $Ar_1 = 718$

Mechanical properties under T=20°C for grade 15KH5M (15X5M)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Pipe hot strain, GOST 550-75			392	216	22	50	1180	
Bar, GOST 20072-74	Ø 90		390	215	22	50	1180	Annealing 840 - 860°C, Cooling oven,
Sheet trick, GOST 7350-77			470	235	18			Annealing 840 - 870°C, Cooling air,

Brinell hardness for 15KH5M (15X5M) (hot-rolled, annealing) , GOST 20072-74	HB 10 ⁻¹ = 217 MPa
Brinell hardness for 15KH5M (15X5M) , Pipe GOST 550-75	HB 10 ⁻¹ = 170 MPa

Technological properties for grade 15KH5M (15X5M)

Weldability:	hard weldability.
Flakes :	predisposed
Temper brittleness:	not predisposed

Physical properties for grade 15KH5M (15X5M)

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	2.11			7750		430
100		11.3	37	7730	483	
200		11.6	36	7700		
300		11.9	35	7670		
400	1.78	12.2	34	7640		

500	1.45	12.3	33	7610		
600	1.02	12.5		7580		
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 15KH5M (15X5M)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	France	European	Italy	China	Hungary	Poland	Romania	Czechia
-	DIN, WNr	JIS	AFNOR	EN	UNI	GB	MSZ	PN	STAS	CSN
501 502 K41545 S50100 S50200 T12005 T51605	1.7362 12CrMo19-5 T5 X12CrMo5	SFVAB5A STBA25 STC48 STFA25 STPA25	710CD5-05 Z15CD5-05 Z20CD5	1.7362 5CrMo16 X12CrMo5	A16CrMo25-5KG A16CrMo25-5KW	10MoCr50	12CrMo20-5	H5M	10MoCr50	17102

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, carbene 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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