

Database of Steel and Alloy (Marochnik)

splat.kharkov.com/en

[Home](#) [European steel grades](#) [Steel and Alloy](#) [Search](#) [Equivalent grades](#) [Grading](#) [GOST Standard](#) [Contacts](#)

YOU HERE: [Steel and Alloy](#) -> [Structural steel](#)

Characteristics for grade 15KH (15X).

Grade :	15KH (15X)
Substitute:	20X
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 15KH (15X)

C	Si	Mn	Ni	S	P	Cr	Cu
0.12 - 0.18	0.17 - 0.37	0.4 - 0.7	max 0.3	max 0.035	max 0.035	0.7 - 1	max 0.3

Temperature of critical points for grade 15KH (15X).

$Ac_1 = 766$, $Ac_3(Ac_m) = 838$, $Ar_3(Arc_m) = 799$, $Ar_1 = 702$

Mechanical properties under T=20°C for grade 15KH (15X)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	$\frac{kJ}{m^2}$	-
Pipe cooling strain, GOST 8733-74			412		19			
Bar, GOST 4543-71	Ø 15		690	490	12	45	690	Guenching 880°C, water, Guenching 770 - 820°C, water, Drawing 180°C, air,
Forging	to 100		390	195	26	55	590	Normalizing
Forging	100 - 300		390	195	23	50	540	Normalizing

Brinell hardness for 15KH (15X) (annealing) , GOST 4543-71	$HB\ 10^{-1} = 179\ MPa$
Brinell hardness for 15KH (15X) (cold-worked) , GOST 4543-71	$HB\ 10^{-1} = 217\ MPa$
Brinell hardness for 15KH (15X) , Pipe GOST 8733-74	$HB\ 10^{-1} = 179\ MPa$
Brinell hardness for 15KH (15X) , Bar GOST 10702-78	$HB\ 10^{-1} = 156\ MPa$

Technological properties for grade 15KH (15X)

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

Physical properties for grade 15KH (15X)

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	2.15		44	7830		
100	2.12	10.2	44	7810	496	
200	1.94	11.5	43	7780	508	
300	1.91	12.4	41		525	
400	1.79	13	39	7710	538	
500	1.7	13.5	36		567	
600	1.62	14	33	7640	588	
700	1.42		32		626	
800	1.32		32		706	
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade 15KH (15X)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	France	England	European	Belgium	Spain	China	Bulgaria	Poland	Romania	Czechia	South Korea
-	DIN, WNr	JIS	AFNOR	BS	EN	NBN	UNE	GB	BDS	PN	STAS	CSN	KS
5015 5115 G50150 G51150 G51170 G61180	1.7015 13Cr2 15Cr3 17Cr3	SCr415 SCr415H	12C3 12C8 15Cr2RR 17Cr3 18C3	17Cr3 523M15	1.7014 1.7016 15Cr2 15Cr2KD 17Cr3 17CrS3	15Cr2	17Cr3	15Cr 15CrA ML15Cr	15Ch	15H	15Cr9q	14120	SCr415 SCr415H

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

[Top](#)

© 2003 - 2013 All rights reserved. [About program.](#)

The entire risk as to use of the Database of Steel and Alloy (Marochnik) content is assumed by you the user

