

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 50KH (50X).

Grade :	50KH (50X)
Substitute:	40X, 45X, 50XH, 50XΦA
Classification :	Alloy structural steel
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Chemical composition in % for grade 50KH (50X)

C	Si	Mn	Ni	S	P	Cr	Cu
0.46 - 0.54	0.17 - 0.37	0.5 - 0.8	max 0.3	max 0.035	max 0.035	0.8 - 1.1	max 0.3

Temperature of critical points for grade 50KH (50X).

$A_{c1} = 720$, $A_{c3}(A_{cm}) = 770$, $A_{r3}(A_{rcm}) = 693$, $A_{r1} = 660$, $M_n = 250$

Mechanical properties under T=20°C for grade 50KH (50X)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar, GOST 4543-71	Ø 25		1080	885	9	40	390	Guenching 830°C, oil, Drawing 520°C, water,
Forging	to 100		590	345	18	45	590	Normalizing
Forging	100 - 300		590	345	17	40	540	Normalizing
Forging	300 - 500		590	345	14	38	490	Normalizing
Forging	500 - 800		590	345	12	38	390	Normalizing

Brinell hardness for 50KH (50X) (annealing) , GOST 4543-71

HB 10⁻¹ = 229 MPa

Technological properties for grade 50KH (50X)

Weldability:	hard weldability.
Flakes :	predisposed
Temper brittleness:	predisposed

Physical properties for grade 50KH (50X)

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	2.07			7820		
100		12.8				
200		13				
300		13.8				
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade 50KH (50X)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	France	Bulgaria	Poland
-	DIN,WNr	AFNOR	BDS	PN
5147 5147H 5150 5150H 5152 G51470 G51500 H51470 H51500	50CrMo4	50CrV4 50CrV4RR	50Ch	50H

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

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