

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 38KHS (38XC).

Grade :	38KHS (38XC)
Substitute:	40XC
Classification :	Alloy structural steel
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Chemical composition in % for grade 38KHS (38XC)

C	Si	Mn	Ni	S	P	Cr	Cu
0.34 - 0.42	1 - 1.4	0.3 - 0.6	max 0.3	max 0.035	max 0.035	1.3 - 1.6	max 0.3

Temperature of critical points for grade 38KHS (38XC).

$A_{c1} = 763$, $A_{c3}(A_{cm}) = 810$, $A_{r3}(A_{rcm}) = 755$, $A_{r1} = 680$, $M_n = 330$

Mechanical properties under $T=20^{\circ}\text{C}$ for grade 38KHS (38XC)

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		930	735	12	50	690	Guenching 900°C, water, Drawing 630°C, water,
Forging	to 100		685	540	15	45	590	Guenching and drawing

Brinell hardness for 38KHS (38XC) (annealing), GOST 4543-71

HB 10⁻¹ = 255 MPa

Technological properties for grade 38KHS (38XC)

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

Physical properties for grade 38KHS (38XC)

T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$
Grade	MPa	1/Grade	Watt/(m·Grade)	kg/m ³	J/(kg·Grade)	Ohm·m
20	2.11		38	7640		284

100	2.03	12.3	38		466	329
200	1.94	13.1	37		508	413
300	1.84	13.6	35		529	563
400	1.74	13.8	34		563	725
500	1.66	14.2	33		592	902
600	1.57	14.5	31		621	1060
700	1.39	14.7	29		634	1280
800	1.27	12.5	28		663	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 38KHS (38XC)

Warning! Indicated both exact and nearest equivalents.

Bulgaria	Poland	Czechia
BDS	PN	CSN
38ChS	37HS	14341

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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