

Database of Steel and Alloy (Marochnik)

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

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

Characteristics for grade 33KHS (33XC).

Grade :	33KHS (33XC)
Classification :	Alloy structural steel
Equivalent grades:	Is absent

Chemical composition in % for grade 33KHS (33XC)

C	Si	Mn	Ni	S	P	Cr	Cu
0.29 - 0.37	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 33KHS (33XC).

$Ac_1 = 755$, $Ac_3(Ac_m) = 830$, $Ar_1 = 715$
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Mechanical properties under T=20°C for grade 33KHS (33XC)

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		880	690	13	50	780	Guenching 920°C, water, Drawing 630°C, water,

Brinell hardness for 33KHS (33XC) (annealing), GOST 4543-71	HB 10 ⁻¹ = 241 MPa
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Technological properties for grade 33KHS (33XC)

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

Physical properties for grade 33KHS (33XC)

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	2.14		40	7640		
100	2.06	12	38		466	
200	1.96	12.8	37		508	

300	1.86	13.4	37		529	
400	1.76	13.7	35		563	
500	1.68	14.3	33		592	
600	1.57	14.7	31		622	
700	1.37	15	29		634	
800	1.27	12.4	27		664	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

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 in 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).
 Helpfull for specialists in grade technology, structural engineer, mechanical engineer, metallurgy and metal trader

[Top](#)

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