

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 45KHN (45XH).

Grade :	45KHN (45XH)
Substitute:	40XH
Classification :	Alloy structural steel
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Chemical composition in % for grade 45KHN (45XH)

C	Si	Mn	Ni	S	P	Cr	Cu
0.41 - 0.49	0.17 - 0.37	0.5 - 0.8	1 - 1.4	max 0.035	max 0.035	0.45 - 0.75	max 0.3

Temperature of critical points for grade 45KHN (45XH).

$Ac_1 = 750$, $Ac_3(Ac_m) = 790$, $Mn = 310$

Mechanical properties under $T=20^{\circ}C$ for grade 45KHN (45XH)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ/m^2	-
Bar, GOST 4543-71	$\varnothing 25$		1030	835	10	45	690	Guenching and drawing

Brinell hardness for 45KHN (45XH) (annealing), GOST 4543-71

HB 10⁻¹ = 207 MPa

Technological properties for grade 45KHN (45XH)

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

Physical properties for grade 45KHN (45XH)

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				7820		
100		11.8	45			
200		12.3	43			
300			41			

400		13.4	40			
T	$E 10^{-5}$	$\alpha 10^6$	λ	ρ	C	$R 10^9$

Equivalent steels for grade 45KHN (45XH)

Warning! Indicated both exact and nearest equivalents.

USA	Japan	Bulgaria	Poland
-	JIS	BDS	PN
3145	SNC236	45ChN	45HN

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

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