

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 12KHN2 (12XH2).

Grade :	12KHN2 (12XH2)
Substitute:	20XHP, 20XГHP, 12XH3A, 18XГT, 20XГP
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 12KHN2 (12XH2)

C	Si	Mn	Ni	S	P	Cr	Cu
0.09 - 0.16	0.17 - 0.37	0.3 - 0.6	1.5 - 1.9	max 0.035	max 0.035	0.6 - 0.9	max 0.3

Temperature of critical points for grade 12KHN2 (12XH2).

$Ac_1 = 715$, $Ac_3(Ac_m) = 773$, $Ar_3(Arc_m) = 726$, $Ar_1 = 659$, $Mn = 405$

Mechanical properties under T=20°C for grade 12KHN2 (12XH2)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Pipe, GOST 8731-87			539	392	14			
Bar, GOST 4543-71	Ø 15		780	590	12	50	880	Guenching and drawing

Brinell hardness for 12KHN2 (12XH2) (annealing) , GOST 4543-71	HB 10 ⁻¹ = 207 MPa
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Technological properties for grade 12KHN2 (12XH2)

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

Physical properties for grade 12KHN2 (12XH2)

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	2.11		38	7880		330
100	2.03	10.5	38		494	360

200	1.96	11.5	37		507	430
300	1.9	11.9	35		523	520
400	1.76	12.4	33		536	590
500	1.72	12.9	31		565	670
600	1.54	13.6	30		586	
700	1.41	13.9	29		624	
800	1.3	11.7	29		703	1050
900						1120
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 12KHN2 (12XH2)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	France	England	European	Italy	China	Sweden	Poland	Czechia
-	DIN, WNr	AFNOR	BS	EN	UNI	GB	SS	PN	CSN
Gr.4320	1.5713 15CrNi4 15CrNi6	16NC6	815M17	15NiCr6	16CrNi4	12CrNi2	2511 2512	15HN	16220

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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