

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 12KH2N4A (12X2H4A).

Grade :	12KH2N4A (12X2H4A)
Substitute:	20ХГНР, 12ХН2, 12ХН3А, 20Х2Н4А, 20ХГР
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 12KH2N4A (12X2H4A)

C	Si	Mn	Ni	S	P	Cr	Cu
0.09 - 0.15	0.17 - 0.37	0.3 - 0.6	3.25 - 3.65	max 0.025	max 0.025	1.25 - 1.65	max 0.3

Temperature of critical points for grade 12KH2N4A (12X2H4A).

$Ac_1 = 745$, $Ac_3(Ac_m) = 800$, $Ar_3(Arc_m) = 675$, $Ar_1 = 625$, $Mn = 438$

Mechanical properties under $T=20^{\circ}C$ for grade 12KH2N4A (12X2H4A)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar, GOST 4543-71	Ø 15		1130	930	10	50	880	Guenching and drawing

Brinell hardness for 12KH2N4A (12X2H4A) (annealing), GOST 4543-71

HB 10 ⁻¹ = 269 MPa

Technological properties for grade 12KH2N4A (12X2H4A)

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

Physical properties for grade 12KH2N4A (12X2H4A)

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			7840		
100		11	25	7820		
200		12				
300		13		7760		

400		14.7	19	7710		
500		15.3				
600		15.6		7630		
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 12KH2N4A (12X2H4A)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	France	England	Bulgaria	Poland	Czechia
-	DIN, WNr	JIS	AFNOR	BS	BDS	PN	CSN
3310H E3310 E3310X G33106	1.5752 14NiCr14 X12Ni5	SNC815	13NiCr14	655H13 655M13	12Ch2N4A	12H2N4A	16420

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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