

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 20KHN3A (20XH3A).

Grade :	20KHN3A (20XH3A)
Substitute:	20XГHP, 20XHГ, 38XA, 15X2ГH2TA, 20XГP
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 20KHN3A (20XH3A)

C	Si	Mn	Ni	S	P	Cr	Cu
0.17 - 0.24	0.17 - 0.37	0.3 - 0.6	2.75 - 3.15	max 0.025	max 0.025	0.6 - 0.9	max 0.3

Temperature of critical points for grade 20KHN3A (20XH3A).

$Ac_1 = 730$, $Ac_3(Ac_m) = 810$, $Ar_3(Arc_m) = 700$, $Ar_1 = 615$, $Mn = 340$

Mechanical properties under T=20°C for grade 20KHN3A (20XH3A)

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		930	735	12	55	1080	Guenching and drawing

Brinell hardness for 20KHN3A (20XH3A) (annealing), GOST 4543-71

HB 10⁻¹ = 255 MPa

Technological properties for grade 20KHN3A (20XH3A)

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

Physical properties for grade 20KHN3A (20XH3A)

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	2.12		36	7850		270
100	2.04	11.5	35	7830	494	300
200	1.94	11.7	34		507	350
300	1.88	12	33	7760	523	450

400	1.69	12.6	33		536	550
500	1.69	12.8	31		565	650
600	1.53	13.2	31	7660	586	
700	1.38	13.6	30		624	
800	1.32	11.2	28		703	
T	$E 10^{-5}$	$\alpha 10^6$	λ	ρ	C	$R 10^9$

Equivalent steels for grade 20KHN3A (20XH3A)

Warning! Indicated both exact and nearest equivalents.

France	Sweden	Bulgaria	Poland
AFNOR	SS	BDS	PN
20NC11	2515	20ChN3A	20HN3A

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

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