

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 20KHGNR (20XГHP).

Grade :	20KHGNR (20XГHP)
Substitute:	20XH3A, 12XH2, 12XH3A
Classification :	Alloy structural steel
Equivalent grades:	Is absent

Chemical composition in % for grade 20KHGNR (20XГHP)

C	Si	Mn	Ni	S	P	Cr	Ti	Cu	B
0.16 - 0.23	0.17 - 0.37	0.7 - 1	0.8 - 1.1	max 0.035	max 0.035	0.7 - 1.1	max 0.06	max 0.3	0.001 - 0.005

Temperature of critical points for grade 20KHGNR (20XГHP).

$Ac_1 = 740$, $Ac_3(Ac_m) = 830$, $Ar_3(Arc_m) = 725$, $Ar_1 = 650$, $Mn = 365$

Mechanical properties under T=20°C for grade 20KHGNR (20XГHP)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar	Ø 25		1420	1370	14	60	1080	Normalizing 930°C, air, Guenching 840°C, oil, Drawing 200°C, air,
Bar	Ø 50		1200	1110	12	62	1470	Normalizing 930°C, air, Guenching 840°C, oil, Drawing 200°C, air,
Bar, GOST 4543-71	Ø 15		1270	1080	10	50	880	Guenching and drawing

Brinell hardness for 20KHGNR (20XГHP) (annealing), GOST 4543-71

HB 10 ⁻¹ = 197 MPa

Technological properties for grade 20KHGNR (20XГHP)

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

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 / m ²]
HB	- Brinell hardness , [MPa]

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

[Top](#)

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