

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 18KHGT (18XГТ).

Grade :	18KHGT (18XГТ)
Substitute:	30XГТ, 25XГТ, 12XH3A, 12X2H4A, 20XH2M, 14XГCH2MA, 20XГP
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 18KHGT (18XГТ)

C	Si	Mn	Ni	S	P	Cr	Ti	Cu
0.17 - 0.23	0.17 - 0.37	0.8 - 1.1	max 0.3	max 0.035	max 0.035	1 - 1.3	0.03 - 0.09	max 0.3

Temperature of critical points for grade 18KHGT (18XГТ).

$Ac_1 = 740$, $Ac_3(Ac_m) = 825$, $Ar_3(Arc_m) = 730$, $Ar_1 = 650$, $Mn = 360$

Mechanical properties under T=20°C for grade 18KHGT (18XГТ)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar, GOST 4543-71			980	885	9	50	780	Guenching and drawing
Steel	5		1520	1320	12	50	720	Guenching 850°C, oil, Drawing 200°C, air,
Steel	20		980	730	15	55	1130	Guenching 850°C, oil, Drawing 200°C, air,

Brinell hardness for 18KHGT (18XГТ) (annealing) , GOST 4543-71	HB 10 ⁻¹ = 217 MPa
Brinell hardness for 18KHGT (18XГТ) (cold-worked) , GOST 4543-71	HB 10 ⁻¹ = 229 MPa

Technological properties for grade 18KHGT (18XГТ)

Weldability:	without limitations.
Flakes :	not predisposed
Temper brittleness:	weakly predisposed

Physical properties for grade 18KHGT (18XГТ)

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		37	7800		
100	2.05	10	38		495	
200	1.97	11.5	38		508	
300	1.91	12.3	37		525	
400	1.76	12.8	35		537	
500	1.68	13.3	34		567	
600	1.55	13.6	31		588	
700	1.36		30		626	
800	1.29		29		705	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 18KHGT (18XГТ)

Warning! Indicated both exact and nearest equivalents.

Germany	France	China	Bulgaria	Poland	Romania	Czechia
DIN, WNr	AFNOR	GB	BDS	PN	STAS	CSN
20MnCr5G	20MC5	20CrMnTi	18ChGT	18HGT	20TiMnCr12 21TiMnCr12q	14223

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, carbone 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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