

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 45G2 (45Г2).

Grade :	45G2 (45Г2)
Substitute:	50Г2
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 45G2 (45Г2)

C	Si	Mn	Ni	S	P	Cr	Cu
0.41 - 0.49	0.17 - 0.37	1.4 - 1.8	max 0.3	max 0.035	max 0.035	max 0.3	max 0.3

Temperature of critical points for grade 45G2 (45Г2).

$Ac_1 = 711$, $Ac_3(Ac_m) = 765$, $Ar_3(Arc_m) = 704$, $Ar_1 = 626$, $Mn = 245$

Mechanical properties under $T=20^{\circ}C$ for grade 45G2 (45Г2)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar, GOST 4543-71	Ø 25		680	400	11	40		Guenching 850°C, oil, Drawing 650°C, air,

Brinell hardness for 45G2 (45Г2) (annealing), GOST 4543-71

HB 10 ⁻¹ = 229 MPa

Technological properties for grade 45G2 (45Г2)

Weldability:	hard weldability.
Flakes :	weakly predisposed
Temper brittleness:	predisposed

Physical properties for grade 45G2 (45Г2)

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	2.04			7810		
100		11.3				
200		11.9	45		445	

300		12.7	43		428	
400			41			
500		14.7	35			
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 45G2 (45Г2)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	China	Sweden	Bulgaria	Poland	Australia
-	DIN, WNr	JIS	GB	SS	BDS	PN	AS
1144 1345 1345H G13450 H13450	46Mn27	SMn3 SMn433 SMn433H	45Mn2 45Mn2A	2120	45G2	45G2	X1345

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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