

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 50G (50Г).

Grade :	50G (50Г)
Substitute:	40Г, 50
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 50G (50Г)

C	Si	Mn	Ni	S	P	Cr	Cu
0.48 - 0.56	0.17 - 0.37	0.7 - 1	max 0.3	max 0.035	max 0.035	max 0.3	max 0.3

Temperature of critical points for grade 50G (50Г).

$A_{c1} = 723$, $A_{c3}(A_{cm}) = 760$, $A_{r3}(A_{rcm}) = 740$, $A_{r1} = 680$, $M_n = 320$

Mechanical properties under T=20°C for grade 50G (50Г)

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		650	390	13	40	390	Guenching and drawing
Band annealed , GOST 2283-79			640-740		10-15			
Band cold-worked , GOST 2283-79			740-1180					

Brinell hardness for 50G (50Г) (annealing), GOST 4543-71	$HB\ 10^{-1} = 229\ MPa$
Brinell hardness for 50G (50Г) (normalize), Sheet trick GOST 1577-93	$HB\ 10^{-1} = 255\ MPa$
Brinell hardness for 50G (50Г) (annealing), Sheet trick GOST 1577-93	$HB\ 10^{-1} = 217\ MPa$

Technological properties for grade 50G (50Г)

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

Physical properties for grade 50G (50Г)

T	$E\ 10^{-5}$	$\alpha\ 10^6$	λ	ρ	C	$R\ 10^9$
Grade	MPa	1/Grade	Watt/(m·Grade)	kg/m ³	J/(kg·Grade)	Ohm·m

20	2.16		43	7810		
100	2.13	11.8	42		487	
200	2.08	12.5	41		500	
300	1.99	13.2	38		517	
400	1.85	13.8	36		533	
500	1.74	14.3	34		559	
600	1.6	14.8	31		584	
700	1.42	15.1	29		609	
800	1.3	12.3	28		676	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 50G (50Г)

Warning! Indicated both exact and nearest equivalents.

USA	Japan	England	Bulgaria	Poland
-	JIS	BS	BDS	PN
1050 1053 G10500 G10530	STH67	080M50 C50E	50G	50G

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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