

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 40G (40Г).

Grade :	40G (40Г)
Substitute:	45, 40X
Classification :	Alloy structural steel
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Chemical composition in % for grade 40G (40Г)

C	Si	Mn	Ni	S	P	Cr	Cu
0.37 - 0.45	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 40G (40Г).

$A_{c1} = 723$, $A_{c3}(A_{cm}) = 785$, $A_{r3}(A_{rcm}) = 770$, $A_{r1} = 680$

Mechanical properties under T=20°C for grade 40G (40Г)

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		590	350	17	45	590	Guenching 860°C, water, Drawing 600°C, air,

Brinell hardness for 40G (40Г) , Bar GOST 10702-78	HB 10 ⁻¹ = 207 MPa
Brinell hardness for 40G (40Г) (normalize), Sheet trick GOST 1577-93	HB 10 ⁻¹ = 229 MPa
Brinell hardness for 40G (40Г) (annealing), Sheet trick GOST 1577-93	HB 10 ⁻¹ = 207 MPa

Technological properties for grade 40G (40Г)

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

Physical properties for grade 40G (40Г)

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			7810		

100		11.1	60		487	
200		11.7	53		483	
300		12.7				
400			47		491	
500		14.3	24			
600					575	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 40G (40Г)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	France	England	China	Bulgaria	Romania
-	DIN, WNr	AFNOR	BS	GB	BDS	STAS
1035	1.1157	35M5	150M36	40Mn	40G	40Mn10
1039	40Mn4	40M5		ML40Mn		
1040						
1041						
1043						
G10350						
G10390						
G10400						
G10430						

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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