

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 45G (45Г).

Grade :	45G (45Г)
Substitute:	40Г, 50Г
Classification :	Alloy structural steel
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Chemical composition in % for grade 45G (45Г)

C	Si	Mn	Ni	S	P	Cr	Cu
0.42 - 0.5	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 45G (45Г).

$A_{c1} = 715$, $A_{c3}(A_{cm}) = 735$, $A_{r3}(A_{rcm}) = 710$, $A_{r1} = 635$

Mechanical properties under T=20°C for grade 45G (45Г)

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		620	370	15	40	490	Guenching 850°C, oil, Drawing 600°C, air,

Brinell hardness for 45G (45Г) (annealing), GOST 4543-71

HB 10⁻¹ = 229 MPa

Technological properties for grade 45G (45Г)

Weldability:	hard weldability.
Temper brittleness:	weakly predisposed

Equivalent steels for grade 45G (45Г)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	France	England	Italy	China	Bulgaria	Poland
-	DIN, WNr	JIS	AFNOR	BS	UNI	GB	BDS	PN
1040	1.0912	S45C	C45E	080M46	C45E	45	45G	45G
1045	46Mn7	S48C		C45		ML45Mn		
1046	C45E			C45E				
G10460								

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

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