

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 40KH10S2M (40X10C2M).

Grade :	40KH10S2M (40X10C2M)(4X10C2M 9M107)
Classification :	High alloy high-temperature steel
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Chemical composition in % for grade 40KH10S2M (40X10C2M)

C	Si	Mn	Ni	S	P	Cr	Mo	Ti	Cu
0.35 - 0.45	1.9 - 2.6	max 0.8	max 0.6	max 0.025	max 0.03	9 - 10.5	0.7 - 0.9	max 0.2	max 0.3

Temperature of critical points for grade 40KH10S2M (40X10C2M).

$Ac_1 = 810$, $Ac_3(Ac_m) = 950$, $Ar_3(Arc_m) = 845$, $Ar_1 = 700$
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Mechanical properties under T=20°C for grade 40KH10S2M (40X10C2M)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar, GOST 5949-75	Ø 60		930	735	10	35	200	Guenching 1010 - 1050°C, air, Drawing 720 - 780°C, oil,

Brinell hardness for 40KH10S2M (40X10C2M) (annealing), Bar GOST 5949-75	HB 10 ⁻¹ = 197 - 269 MPa
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Technological properties for grade 40KH10S2M (40X10C2M)

Weldability:	hard weldability.
Flakes :	not predisposed
Temper brittleness:	not predisposed

Physical properties for grade 40KH10S2M (40X10C2M)

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	2.14		17	7620		
100	2.11	10	18	7610		906
200	2.05	11	20			958
300	2.02	11	22			1010
400	1.96	11	22		532	1062
500	1.87		24		561	1114
600	1.72		25		586	1166
700	1.51		26			1216
800	1.29	11		7430		
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade 40KH10S2M (40X10C2M)

Warning! Indicated both exact and nearest equivalents.

Germany	Japan	France	England	European	Italy	Spain	China	Bulgaria	Hungary	Poland	South Korea
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DIN,WNr	JIS	AFNOR	BS	EN	UNI	UNE	GB	BDS	MSZ	PN	KS
1.4731 X40CrSiMo10-2	SUH3	Z40CSD10	0/4 X40CrSiMo10-2	X40CrSiMo10	VM12D	F.3221 X40CrSiMo10-02	1Cr18Mn8Ni5N 4Cr10Si2Mo	4Ch10S2M X40CrSiMo10-2	SZ4	H10S2M	STR3

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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