

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](#) -> [High-temperature or heat-resistant steel and alloy](#)

Characteristics for grade 40KH9S2 (40X9C2).

Grade :	40KH9S2 (40X9C2) (4X9C2)
Classification :	High alloy high-temperature steel
Equivalent grades:	Go here

Chemical composition in % for grade 40KH9S2 (40X9C2)

C	Si	Mn	Ni	S	P	Cr	Ti	Cu
0.35 - 0.45	2 - 3	max 0.8	max 0.6	max 0.025	max 0.03	8 - 10	max 0.2	max 0.3

Temperature of critical points for grade 40KH9S2 (40X9C2).

$Ac_1 = 900$, $Ac_3(Ac_m) = 970$, $Ar_3(Arc_m) = 970$, $Ar_1 = 810$
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Mechanical properties under T=20°C for grade 40KH9S2 (40X9C2)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar, GOST 5949-75			740	440	15	35		Annealing 850 - 870°C, air,

Technological properties for grade 40KH9S2 (40X9C2)

Weldability:	is not used.
Flakes :	not predisposed
Temper brittleness:	predisposed

Physical properties for grade 40KH9S2 (40X9C2)

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				7630		
100		11.1	17	7610		
200		12.7		7580		
300			20			
400		14.3		7510		
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade 40KH9S2 (40X9C2)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	France	England	European	Italy	Spain	China	Bulgaria	Hungary	Poland	Romania	Czechia	South Korea
-	DIN, WNr	JIS	AFNOR	BS	EN	UNI	UNE	GB	BDS	MSZ	PN	STAS	CSN	KS
HN3 HW3 S65007	1.4718 1.4818 G- X45CrSi9-3 X45CrSi9-3	SUH1 SUH2 	X45CrSi9-3 Z45CS9	401S45 X45CrSi9-3	1.4718 X45CrSi8 X45CrSi9-3	X45CrSi8	F.3220 X45CrSi09-03 X45CrSi9-3 X4ScrSi09-03	4Cr9Si2 4Cr9Si8 ZG40Cr9Si2	4Ch9S2 4Ch9S3 X45CrSi9-3	SZ3	H9S2	45SiCr90	17115	STR1

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]

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/m ³]
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

[Top](#)

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