

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 40KHFA (40XΦA).

Grade :	40KHFA (40XΦA)
Substitute:	40X, 65Г, 50XΦA, 30X3MΦ
Classification :	Alloy structural steel
Equivalent grades:	Go here

Chemical composition in % for grade 40KHFA (40XΦA)

C	Si	Mn	Ni	S	P	Cr	V	Cu
0.37 - 0.44	0.17 - 0.37	0.5 - 0.8	max 0.3	max 0.025	max 0.025	0.8 - 1.1	0.1 - 0.18	max 0.3

Temperature of critical points for grade 40KHFA (40XΦA).

$Ac_1 = 760$, $Ac_3(Ac_m) = 800$, $Ar_3(Arc_m) = 725$, $Ar_1 = 680$, $Mn = 218$

Mechanical properties under $T=20^{\circ}C$ for grade 40KHFA (40XΦA)

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		880	735	10	50	880	Guenching and drawing
Forging	100 - 300		615	395	15	40	540	Guenching and drawing
Forging	300 - 500		615	395	13	35	490	Guenching and drawing

Brinell hardness for 40KHFA (40XΦA) (annealing), GOST 4543-71

HB 10⁻¹ = 241 MPa

Technological properties for grade 40KHFA (40XΦA)

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

Physical properties for grade 40KHFA (40XΦA)

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	2.15		37	7810		

100	2.12	12.1	37		466	
200	2.05	12.6	37		508	
300	1.99	13	36		529	
400	1.82	13.3	33		563	
500	1.73	13.8	31		592	
600	1.66	14.2	31		621	
700	1.44	14.6	30		634	
800	1.35	11.8	28		664	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

Equivalent steels for grade 40KHFA (40XΦA)

Warning! Indicated both exact and nearest equivalents.

USA	Germany	Japan	France	England	European	Italy	Belgium	Spain	Sweden	Bulgaria	Czechia
-	DIN,WNr	JIS	AFNOR	BS	EN	UNI	NBN	UNE	SS	BDS	CSN
4140 4142 6135 G41400	1.7223 41CrMo4	SCM440	42CD4TS	3111-5/1 42CrMo4 708M40	41CrMo	41CrMo4	41CrMo4	40CrMo4 42CrMo4 F.1252 F.8332	2244	40ChFA	15240

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, carbone 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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