

Database of Steel and Alloy (Marochnik)

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Characteristics for grade 90KHF (90XΦ).

Grade :	90KHF (90XΦ)
Substitute:	9X1, 9X2
Classification :	Tool steel for roller
Equivalent grades:	Is absent

Chemical composition in % for grade 90KHF (90XΦ)

C	Si	Mn	Ni	S	P	Cr	V	Cu
0.8 - 0.9	0.15 - 0.35	0.3 - 0.6	max 0.35	max 0.03	max 0.03	0.4 - 0.7	0.15 - 0.3	max 0.3

Temperature of critical points for grade 90KHF (90XΦ).

$A_{c1} = 700$, $Mn = 215$

Mechanical properties under T=20°C for grade 90KHF (90XΦ)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Steel			990	670	19	55	450	Normalizing 870°C, Drawing 650°C,

Brinell hardness for 90KHF (90XΦ) (annealing) , GOST 5950	HB 10 ⁻¹ = 241 MPa
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Technological properties for grade 90KHF (90XΦ)

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

Physical properties for grade 90KHF (90XΦ)

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						
100			44		460	
200			42		500	

300			38		560	
400			36		620	
500			33		670	
600			31		730	
700			29		1320	
800			27		720	
900			27		640	
1000					650	
T	$E \cdot 10^{-5}$	$\alpha \cdot 10^6$	λ	ρ	C	$R \cdot 10^9$

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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