

Database of Steel and Alloy (Marochnik)

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Characteristics for grade VT3-1 (BT3-1).

Grade :	VT3-1 (BT3-1)
Classification :	Titanium wrought alloy
Equivalent grades:	Is absent

Chemical composition in % for grade VT3-1 (BT3-1)

Fe	C	Si	Cr	Mo	N	Ti	Al	Zr	O	H	Impurity
0.2 - 0.7	max 0.1	0.15 - 0.4	0.8 - 2	2 - 3	max 0.05	85.95 - 91.05	5.5 - 7	max 0.5	max 0.15	max 0.015	other 0.3

Comment: Ti is a basis; the percentage of Ti is given approximately.

Mechanical properties under T=20°C for grade VT3-1 (BT3-1)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Bar, GOST 26492-85			930		6-8	15-20	250-300	Annealing
Bar, GOST 26492-85			930-1230		8-10	20-30	300	Annealing
Bar, GOST 26492-85			1180		6	16-20	180-200	Hardening and ageing
Die			1040-1118		14-20	45-60	300-400	Annealing
Die			1150-1220		10-12	32-48		Hardening and ageing

Brinell hardness for VT3-1 (BT3-1) (annealing), Die	HB 10 ⁻¹ = 269 - 363 MPa
Brinell hardness for VT3-1 (BT3-1) (quenching, ageing), Die	HB 10 ⁻¹ = 302 - 415 MPa

Technological properties for grade VT3-1 (BT3-1)

Weldability:	limited weldability.
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Physical properties for grade VT3-1 (BT3-1)

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	1.15		8.01	4500		1360
100		8.6	8.79			
200		9.8	10.04		0.502	

300		10.3	11.3		0.544	
400		10.9	12.92		0.628	
500		11.4	14.24		0.67	
600			15.49		0.712	
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 in 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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