

Database of Steel and Alloy (Marochnik)

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Characteristics for grade VT14 (BT14).

Grade :	VT14 (BT14)
Classification :	Titanium wrought alloy
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Chemical composition in % for grade VT14 (BT14)

Fe	C	Si	Mo	V	N	Ti	Al	Zr	O	H	Impurity
max 0.25	max 0.1	max 0.15	2.5 - 3.8	0.9 - 1.9	max 0.05	86.85 - 92.8	3.5 - 6.3	max 0.3	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 VT14 (BT14)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Sheet, GOST 22178-76			1080- 1180		4-6			Quenching and artificial aging
Sheet, GOST 22178-76			835-885		8			Annealing
Bar, GOST 26492-85			1080		4	8	200	Hardening and ageing
Bar, GOST 26492-85			865-1080		8-10	25- 35	450- 500	Annealing
Bar, GOST 26492-85			865-1080		8-10	25- 35	450- 500	Annealing
Bar, GOST 26492-85			1080		4-6	8-12	200- 250	Hardening and ageing
Die			850-900		10- 15			Annealing
Die			1250- 1300		6-15	20- 40	500	Hardening and ageing
Plate annealed , GOST 23755- 79	11 - 100		835-1030		6-7	14- 20		

Brinell hardness for VT14 (BT14) (annealing) , Die	HB 10 ⁻¹ = 255 - 341 MPa
Brinell hardness for VT14 (BT14) (quenching, ageing) , Die	HB 10 ⁻¹ = 302 - 388 MPa

Technological properties for grade VT14 (BT14)

Weldability:	without limitations.
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Physical properties for grade VT14 (BT14)

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	1.1		8.37	4520		
100		8	9.21			
200		8.2	10.47		0.544	
300		8.5	11.72		0.586	
400		8.8	12.92		0.628	
500		8.9	13.82		0.67	
600		8.7			0.712	
T	E 10 ⁻⁵	α 10 ⁶	λ	ρ	C	R 10 ⁹

Equivalent steels for grade VT14 (BT14)

Warning! Indicated both exact and nearest equivalents.

USA	France
-	AFNOR
4Al-3Mo-1V	T-A4D3V

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 - Termal (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 treeting
limited weldability - welding is possible under heating up to 100-120 grade and subsequent heat treeting
hard weldability - obtaining the quality welding needs the additional operations: heating up to 200-300 grade; the heat treeting ia annealing

(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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