

Database of Steel and Alloy (Marochnik)

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Characteristics for grade VT20 (BT20).

Grade :	VT20 (BT20)
Classification :	Titanium wrought alloy
Equivalent grades:	Is absent

Chemical composition in % for grade VT20 (BT20)

Fe	C	Si	Mo	V	N	Ti	Al	Zr	O	H	Impurity
max 0.25	max 0.1	max 0.15	0.5 - 2	0.8 - 2.5	max 0.05	85.15 - 91.4	5.5 - 7	1.5 - 2.5	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 VT20 (BT20)

Assortment	Dimension	Direct.	σ_B	σ_T	δ_5	ψ	KCU	Heat treatment
-	mm	-	MPa	MPa	%	%	kJ / m ²	-
Sheet annealed , GOST 22178-76			930-980		6-12			Annealing
Bar, GOST 26492-85			885		7-8	20	250-300	Annealing
Bar, GOST 26492-85			885-1130		8-10	20-25	300-400	Annealing
Plate , GOST 23755-79	11 - 100		880-1130		5-6	10-12	300	Annealing

Brinell hardness for VT20 (BT20) ,	HB 10⁻¹ = 255 - 341 MPa
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Technological properties for grade VT20 (BT20)

Weldability:	without limitations.
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Physical properties for grade VT20 (BT20)

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	1.12		8	4450		1110
100		8.3	8.8			
200		8.3	10.2		0.587	
300		9	10.9		0.628	
400		9.2	12.2		0.67	

500		9.3	13.8		0.712	
600		9.5	15.1			
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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