

# Database of Steel and Alloy (Marochnik)

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## Characteristics for grade KHN60VT ( XH60BT ).

|                    |                                          |
|--------------------|------------------------------------------|
| Grade :            | KHN60VT ( XH60BT )( ЭИ868 )              |
| Classification :   | High-temperature or heat-resistant alloy |
| Equivalent grades: | Is absent                                |

## Chemical composition in % for grade KHN60VT ( XH60BT )

| Fe    | C       | Si      | Mn      | Ni            | S         | P         | Cr          | W       | Ti        | Al      |
|-------|---------|---------|---------|---------------|-----------|-----------|-------------|---------|-----------|---------|
| max 4 | max 0.1 | max 0.8 | max 0.5 | 50.874 - 63.2 | max 0.013 | max 0.013 | 23.5 - 26.5 | 13 - 16 | 0.3 - 0.7 | max 0.5 |

## Mechanical properties under T=20°C for grade KHN60VT ( XH60BT )

| Assortment        | Dimension | Direct.      | $\sigma_B$ | $\sigma_T$ | $\delta_5$ | $\psi$ | KCU                 | Heat treatment                |
|-------------------|-----------|--------------|------------|------------|------------|--------|---------------------|-------------------------------|
| -                 | mm        | -            | MPa        | MPa        | %          | %      | kJ / m <sup>2</sup> | -                             |
| Sheet cold-rolled |           |              | 750        |            | 40         |        |                     | Guenching 1200°C, air,        |
| Bar               |           | longitudinal | 750        | 300        | 45         | 52     |                     |                               |
| Band              |           |              | 700        |            | 30         |        |                     | Guenching 1150 - 1170°C, air, |

## Technological properties for grade KHN60VT ( XH60BT )

|              |                      |
|--------------|----------------------|
| Weldability: | without limitations. |
|--------------|----------------------|

## Physical properties for grade KHN60VT ( XH60BT )

| T     | E 10 <sup>-5</sup> | $\alpha$ 10 <sup>6</sup> | $\lambda$      | $\rho$            | C            | R 10 <sup>9</sup> |
|-------|--------------------|--------------------------|----------------|-------------------|--------------|-------------------|
| Grade | MPa                | 1/Grade                  | Watt/(m·Grade) | kg/m <sup>3</sup> | J/(kg·Grade) | Ohm·m             |
| 20    | 1.9                |                          | 29.6           | 8800              |              |                   |
| 100   |                    | 12.7                     | 10.5           |                   | 440          |                   |
| 200   |                    | 13.2                     | 11.7           |                   | 460          |                   |
| 300   |                    | 13.6                     | 13.8           |                   | 480          |                   |
| 400   |                    | 14.1                     | 16.3           |                   | 500          |                   |
| 500   |                    | 14.5                     | 18.8           |                   | 520          |                   |
| 600   |                    | 15.1                     | 21.3           |                   | 540          |                   |
| 700   | 1.39               | 15.6                     | 23.4           |                   | 540          |                   |
| 800   | 1.12               | 16                       | 25.5           |                   | 570          |                   |
| 900   | 0.81               | 16.2                     | 28             |                   | 590          |                   |
| 1000  | 0.5                | 16.8                     |                |                   |              |                   |
| T     | E 10 <sup>-5</sup> | $\alpha$ 10 <sup>6</sup> | $\lambda$      | $\rho$            | C            | R 10 <sup>9</sup> |

Specification :

**Mechanical properties :**

|            |                                             |
|------------|---------------------------------------------|
| $\sigma_B$ | - Tensile strength , [MPa]                  |
| $\sigma_T$ | - Yield stress , [MPa]                      |
| $\delta_5$ | - Specific elongation at fracture , [ % ]   |
| $\psi$     | - Reduction of area , [ % ]                 |
| <b>KCU</b> | - Impact strength , [ kJ / m <sup>2</sup> ] |
| <b>HB</b>  | - Brinell hardness , [MPa]                  |

**Physical properties :**

|           |                                                                |
|-----------|----------------------------------------------------------------|
| <b>T</b>  | - Test temperature , [Grade]                                   |
| <b>E</b>  | - Young modulus , [MPa]                                        |
| $\alpha$  | - Coefficient of linear expansion (range 20° - T ) , [1/Grade] |
| $\lambda$ | - Thermal (heat) condition coefficient , [Watt/(m·Grade)]      |
| $\rho$    | - Density , [kg/m <sup>3</sup> ]                               |
| <b>C</b>  | - Specific heat ( range 20° - T ) , [J/(kg·Grade)]             |
| <b>R</b>  | - Electrical resistance , [Ohm·m]                              |

**Weldability :**

|                            |                                                                                                                              |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>without limitations</b> | - welding is done without heating and subsequent heat treating                                                               |
| <b>limited weldability</b> | - welding is possible under heating up to 100-120 grade and subsequent heat treating                                         |
| <b>hard weldability</b>    | - 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).  
Helpful for specialists in grade technology, structural engineer, mechanical engineer, metallurgy and metal trader

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