

# Database of Steel and Alloy (Marochnik)

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## Characteristics for grade TsA4M3 ( ЦА4М3 ).

|                           |                     |
|---------------------------|---------------------|
| <b>Grade :</b>            | TsA4M3 ( ЦА4М3 )    |
| <b>Classification :</b>   | Zinc casting alloys |
| <b>Equivalent grades:</b> | Is absent           |

## Chemical composition in % for grade TsA4M3 ( ЦА4М3 )

| Fe       | Si        | Al        | Cu        | Pb       | Mg          | Zn            | Sn        | Cd        |
|----------|-----------|-----------|-----------|----------|-------------|---------------|-----------|-----------|
| max 0.07 | max 0.015 | 3.5 - 4.5 | 2.5 - 3.7 | max 0.01 | 0.02 - 0.06 | 91.64 - 93.98 | max 0.002 | max 0.005 |

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

## Mechanical properties under T=20°C for grade TsA4M3 ( ЦА4М3 )

| Assortment                 | Dimension | Direct. | $\sigma_B$ | $\sigma_T$ | $\delta_5$ | $\psi$ | KCU                 | Heat treatment |
|----------------------------|-----------|---------|------------|------------|------------|--------|---------------------|----------------|
| -                          | mm        | -       | MPa        | MPa        | %          | %      | kJ / m <sup>2</sup> | -              |
| die casting, GOST 25140-93 |           |         | 290        |            | 1.5        |        |                     |                |

|                                                                   |                              |
|-------------------------------------------------------------------|------------------------------|
| Brinell hardness for TsA4M3 ( ЦА4М3 ) , die casting GOST 25140-93 | HB 10 <sup>-1</sup> = 90 MPa |
|-------------------------------------------------------------------|------------------------------|

## Technological properties of the material TsA4M3 ( ЦА4М3 ) .

|                       |              |
|-----------------------|--------------|
| Melting temperature : | 379 - 389 °C |
|-----------------------|--------------|

## Physical properties for grade TsA4M3 ( ЦА4М3 )

| 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    |                    | 29.5                     | 105            | 6800              | 427          |                   |

## Specification :

### Mechanical properties :

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

**Physical properties :**

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

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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