

# Database of Steel and Alloy (Marochnik)

[splat.kharkov.com/en](http://splat.kharkov.com/en)

[Home](#) [European steel grades](#) [Steel and Alloy](#) [Search](#) [Equivalent grades](#) [Grading](#) [GOST Standard](#) [Contacts](#)

YOU HERE: [Steel and Alloy](#) -> [Structural steel](#)

## Characteristics for grade 70S3A ( 70C3A ).

|                    |                         |
|--------------------|-------------------------|
| Grade :            | 70S3A ( 70C3A )         |
| Classification :   | Spring structural steel |
| Equivalent grades: | <a href="#">Go here</a> |

## Chemical composition in % for grade 70S3A ( 70C3A )

| C           | Si        | Mn        | Ni       | S         | P         | Cr      | Cu      |
|-------------|-----------|-----------|----------|-----------|-----------|---------|---------|
| 0.66 - 0.74 | 2.4 - 2.8 | 0.6 - 0.9 | max 0.25 | max 0.025 | max 0.025 | max 0.3 | max 0.2 |

## Temperature of critical points for grade 70S3A ( 70C3A ).

|                                                |
|------------------------------------------------|
| $Ac_1 = 765$ , $Ac_3(Ac_m) = 780$ , $Mn = 270$ |
|------------------------------------------------|

## Mechanical properties under T=20°C for grade 70S3A ( 70C3A )

| Assortment                  | Dimension | Direct. | $\sigma_B$ | $\sigma_T$ | $\delta_5$ | $\psi$ | KCU                 | Heat treatment                       |
|-----------------------------|-----------|---------|------------|------------|------------|--------|---------------------|--------------------------------------|
| -                           | mm        | -       | MPa        | MPa        | %          | %      | kJ / m <sup>2</sup> | -                                    |
| Rolled stock, GOST 14959-79 |           |         | 1670       | 1470       | 6          | 25     |                     | Guenching 850°C, oil, Drawing 470°C, |

|                                                                            |                               |
|----------------------------------------------------------------------------|-------------------------------|
| Brinell hardness for 70S3A ( 70C3A ) (annealing) , GOST 14959-79           | HB 10 <sup>-1</sup> = 269 MPa |
| Brinell hardness for 70S3A ( 70C3A ) (without heat treatment) , GOST 14959 | HB 10 <sup>-1</sup> = 302 MPa |

## Technological properties for grade 70S3A ( 70C3A )

|                     |                    |
|---------------------|--------------------|
| Weldability:        | is not used.       |
| Flakes :            | not predisposed    |
| Temper brittleness: | weakly predisposed |

## Physical properties for grade 70S3A ( 70C3A )

| 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    | 2.14               |                          | 25             |                   |              |                   |
| 100   | 2.08               | 11.4                     | 26             |                   | 480          |                   |
| 200   | 1.98               | 12.3                     | 27             |                   | 510          |                   |

|     |                   |                     |           |        |     |                |
|-----|-------------------|---------------------|-----------|--------|-----|----------------|
| 300 | 1.92              | 12.8                | 28        |        | 520 |                |
| 400 | 1.85              | 13.3                | 29        |        | 535 |                |
| 500 | 1.8               | 13.7                | 29        |        | 565 |                |
| 600 | 1.52              | 14.1                | 29        |        | 585 |                |
| 700 | 1.39              | 14.3                | 28        |        | 620 |                |
| 800 | 1.32              | 12.8                | 27        |        | 700 |                |
| T   | $E \cdot 10^{-5}$ | $\alpha \cdot 10^6$ | $\lambda$ | $\rho$ | C   | $R \cdot 10^9$ |

**Equivalent steels for grade 70S3A ( 70C3A )**

Warning! Indicated both exact and nearest equivalents.

|          |
|----------|
| Bulgaria |
| BDS      |
| 70S3A    |

**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) condition 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]

**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

[Top](#)© 2003 - 2013 All rights reserved. [About program.](#)

The entire risk as to use of the Database of Steel and Alloy (Marochnik) content is assumed by you the user



