

# Database of Steel and Alloy ( Marochnik )

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## Characteristics for grade 12GS ( 12ГC ).

|                           |                                                  |
|---------------------------|--------------------------------------------------|
| <b>Grade :</b>            | 12GS ( 12ГC )                                    |
| <b>Substitute:</b>        | 12Г2А, 14Г2А, 15ГC                               |
| <b>Classification :</b>   | Low alloy structural steel for welding construct |
| <b>Equivalent grades:</b> | <a href="#">Go here</a>                          |

## Chemical composition in % for grade 12GS ( 12ГC )

| C           | Si        | Mn        | Ni      | S        | P         | Cr      | N         | Cu      | As       |
|-------------|-----------|-----------|---------|----------|-----------|---------|-----------|---------|----------|
| 0.09 - 0.15 | 0.5 - 0.8 | 0.8 - 1.2 | max 0.3 | max 0.04 | max 0.035 | max 0.3 | max 0.008 | max 0.3 | max 0.08 |

## Mechanical properties under T=20°C for grade 12GS ( 12ГC )

| Assortment           | Dimension | Direct. | $\sigma_B$ | $\sigma_T$ | $\delta_5$ | $\psi$ | KCU                 | Heat treatment |
|----------------------|-----------|---------|------------|------------|------------|--------|---------------------|----------------|
| -                    | mm        | -       | MPa        | MPa        | %          | %      | kJ / m <sup>2</sup> | -              |
| Sheet, GOST 19282-73 | 4         |         | 470        | 320        | 26         |        |                     |                |
| Rolled stock         | 4 - 10    |         | 470        |            | 26         |        |                     |                |

## Technological properties for grade 12GS ( 12ГC )

|                            |                      |
|----------------------------|----------------------|
| <b>Weldability:</b>        | without limitations. |
| <b>Flakes :</b>            | not predisposed      |
| <b>Temper brittleness:</b> | not predisposed      |

## Equivalent steels for grade 12GS ( 12ГC )

Warning! Indicated both exact and nearest equivalents.

|         |
|---------|
| Germany |
| DIN,WNr |
| 10MnSi5 |

## 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]                  |

**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 ia annealing

Database of steels and alloys (Marochnik) contains information about chemical composition and properties more then 2500 steels and alloys (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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