

# Database of Steel and Alloy (Marochnik)

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## Characteristics for grade AD31 ( АД31 ).

|                           |                          |
|---------------------------|--------------------------|
| <b>Grade :</b>            | AD31 ( АД31 ) ( 1310 )   |
| <b>Classification :</b>   | Aluminium wrought alloys |
| <b>Equivalent grades:</b> | <a href="#">Go here</a>  |

## Chemical composition in % for grade AD31 ( АД31 )

| Fe      | Si        | Mn      | Cr      | Ti       | Al            | Cu      | Mg         | Zn      | Impurity                   |
|---------|-----------|---------|---------|----------|---------------|---------|------------|---------|----------------------------|
| max 0.5 | 0.2 - 0.6 | max 0.1 | max 0.1 | max 0.15 | 97.65 - 99.35 | max 0.1 | 0.45 - 0.9 | max 0.2 | other, each 0.05; all 0.15 |

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

## Mechanical properties under T=20°C for grade AD31 ( АД31 )

| Assortment            | Dimension | Direct. | $\sigma_B$ | $\sigma_T$ | $\delta_5$ | $\psi$ | KCU                 | Heat treatment                 |
|-----------------------|-----------|---------|------------|------------|------------|--------|---------------------|--------------------------------|
| -                     | mm        | -       | MPa        | MPa        | %          | %      | kJ / m <sup>2</sup> | -                              |
| Pipe, GOST 18482-79   |           |         | 130        | 60         | 12         |        |                     |                                |
| Pipe, GOST 18482-79   |           |         | 180        | 120        | 10         |        |                     | Quenching and artificial aging |
| Bar, GOST 21488-97    |           |         | 90         | 60         | 15         |        |                     |                                |
| Bar, GOST 21488-97    |           |         | 135-195    | 70-145     | 8-13       |        |                     | Hardening and ageing           |
| Profile, GOST 8617-81 | to 100    |         | 196        | 147        | 10         |        |                     | Quenching and artificial aging |
| Profile, GOST 8617-81 |           |         | 127        | 69         | 13         |        |                     |                                |

|                                                                 |                                    |
|-----------------------------------------------------------------|------------------------------------|
| <b>Brinell hardness for AD31 ( АД31 ) (quenching, ageing) ,</b> | <b>HB 10<sup>-1</sup> = 80 MPa</b> |
|-----------------------------------------------------------------|------------------------------------|

## Physical properties for grade AD31 ( АД31 )

| 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    | 0.71               |                          |                | 2710              |              | 34.4              |
| 100   |                    | 23.4                     | 188            |                   | 921          |                   |

## Equivalent steels for grade AD31 ( АД31 )

Warning! Indicated both exact and nearest equivalents.

| USA    | Germany  | Japan | France | Italy       | Inter |
|--------|----------|-------|--------|-------------|-------|
| -      | DIN, WNr | JIS   | AFNOR  | UNI         | ISO   |
| AA6060 | 3.2316   | 6063  | A-GS   | P-AlSi0.4Mg | 6063  |

|        |                                  |  |  |  |                     |
|--------|----------------------------------|--|--|--|---------------------|
| AA6063 | 3.3206<br>AlMgSi0.5<br>AlMgSi0.8 |  |  |  | AlMg0.7Si<br>AlMgSi |
|--------|----------------------------------|--|--|--|---------------------|

**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]

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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