

MATERIAL NUMBER 1.0912 · CLASS 1.0

# ML45Mn

Material no. 1.0912

also listed as 46Mn7

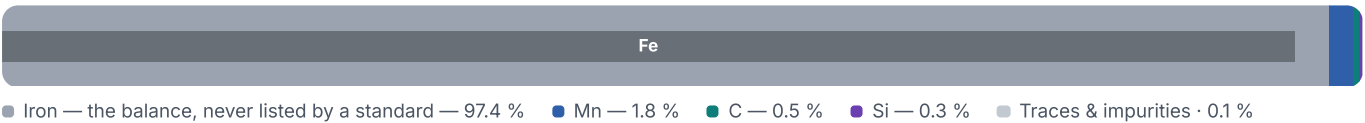
Chemical composition, mechanical and physical property values, and 31 standard designations from 11 regions.

|                                          |                                               |                                      |
|------------------------------------------|-----------------------------------------------|--------------------------------------|
| DENSITY<br><b>7.85</b> g/cm <sup>3</sup> | OTHER DESIGNATIONS<br><b>31</b> in 11 regions | PROPERTY VALUES<br><b>14</b> on file |
|------------------------------------------|-----------------------------------------------|--------------------------------------|

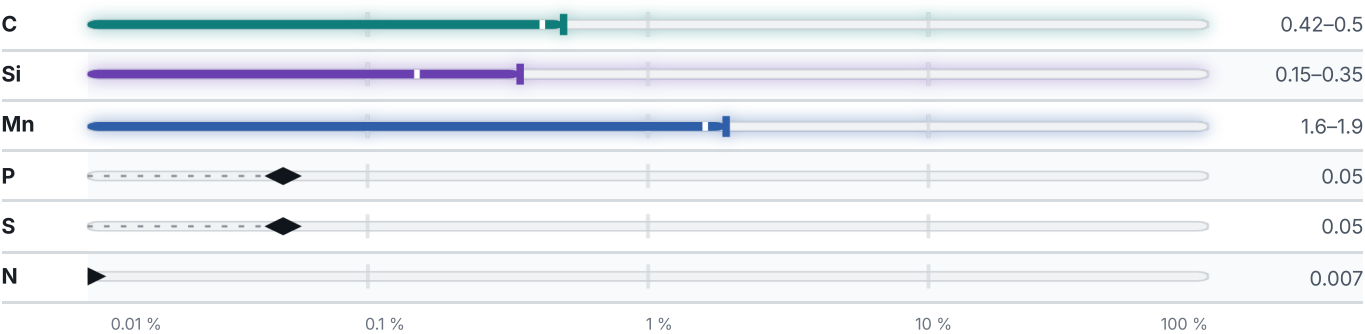
Chemical composition

Mass fraction in %

What this alloy is



Logarithmic scale, 0.01 % to 100 % — every value here compares directly, decade by decade.



The scale is logarithmic, not the element’s raw share of the alloy — the only honest way to fit 0.01 % and 100 % in one picture, and it means every value here can be compared with every other.

## Predicted transformation temperatures

Not enough recorded composition to predict a transformation temperature for this grade — missing: Ni, Cr, Mo.

Mechanical properties

6 values across 2 conditions

| CONDITION · DIMENSION                               | RM<br>N/mm <sup>2</sup> | RE<br>N/mm <sup>2</sup> | A5<br>% | Z<br>% | KCU<br>kJ/m <sup>2</sup> |
|-----------------------------------------------------|-------------------------|-------------------------|---------|--------|--------------------------|
| Bar, GOST 4543-71                                   | 1420                    | 1275                    | 7       | 35     | 390                      |
| CONDITION · DIMENSION                               |                         |                         |         |        | HB                       |
| 45KH2MFA ( 45XH2MΦA )<br>(annealing) , GOST 4543-71 |                         |                         |         |        | 269                      |

Physical properties

8 values

| CONDITION · DIMENSION    | E<br>GPa | ALPHA<br>10 <sup>-6</sup> /K | LAMBDA<br>W/(m·K) | CP<br>J/(kg·K)    | RHO_EL<br>nΩ·m |
|--------------------------|----------|------------------------------|-------------------|-------------------|----------------|
| 20                       | 216      | –                            | 34                | –                 | 300            |
| 100                      | 207      | 11                           | 34                | 480               | 363            |
| 200                      | 197      | 11.6                         | 33                | 500               | 460            |
| 300                      | 188      | 12.1                         | 32                | 520               | 557            |
| 400                      | 176      | 12.7                         | 31                | 540               | 677            |
| 500                      | 168      | 13.3                         | 30                | 555               | 822            |
| 600                      | 152      | 13.7                         | 29                | –                 | 993            |
| 700                      | 136      | 13.9                         | 27                | –                 | 1160           |
| 800                      | 128      | 11.9                         | 26                | –                 | –              |
| PROPERTY                 |          |                              | VALUE             | UNIT              |                |
| Density                  |          |                              | 7.85              | g/cm <sup>3</sup> |                |
| Transformation point Ac1 |          |                              | 735               | °C                |                |
| Transformation point Ac3 |          |                              | 825               | °C                |                |
| Transformation point Ar3 |          |                              | 470               | °C                |                |
| Transformation point Ar1 |          |                              | 370               | °C                |                |

Technological properties

|                    |                   |      |
|--------------------|-------------------|------|
| PROPERTY           | VALUE             | UNIT |
| Weldability        | hard weldability. |      |
| Flake sensitivity  | predisposed       |      |
| Temper brittleness | not predisposed   |      |

## Heat treatment

5 regimes

| STEP                                                  | TEMPERATURE            | MEDIUM |
|-------------------------------------------------------|------------------------|--------|
| Annealing                                             | Temperature not stated | —      |
| source joins the operations with + / procedural order |                        |        |
| Normalizing                                           | Temperature not stated | —      |
| Tempering                                             | Temperature not stated | —      |
| source joins the operations with + / procedural order |                        |        |
| Quenching                                             | Temperature not stated | —      |
| Tempering                                             | Temperature not stated | —      |
| source joins the operations with + / procedural order |                        |        |
| Annealing                                             | Temperature not stated | —      |
| Annealing                                             | Temperature not stated | —      |
| Tempering                                             | Temperature not stated | —      |
| Normalizing                                           | Temperature not stated | —      |
| Tempering                                             | Temperature not stated | —      |
| Spheroidize annealing                                 | Temperature not stated | —      |

## Designations across standards

31 designations · 5 documented as identical

|                                           |          |                                          |        |
|-------------------------------------------|----------|------------------------------------------|--------|
| <b>United States</b>                      | 8        | <b>United Kingdom</b>                    | 3      |
| G13450 <span>This grade's own name</span> | uns      | 080M46                                   | bs     |
| H13450 <span>This grade's own name</span> | uns      | C45                                      | bs     |
| 1040                                      | aisi-sae | C45E                                     | bs     |
| 1045                                      | aisi-sae |                                          |        |
| 1046                                      | aisi-sae | <b>Japan</b>                             | 3      |
| 1345 <span>This grade's own name</span>   | aisi-sae | S45C                                     | jis    |
| 1345H <span>This grade's own name</span>  | aisi-sae | S48C                                     | jis    |
| G10460                                    | aisi-sae | SMn443                                   | jis    |
| <b>Russia / CIS</b>                       | 7        | <b>China</b>                             | 3      |
| 45G                                       | gost     | 45                                       | gb     |
| 45KHn2MFA                                 | gost     | 45Mn2                                    | gb     |
| 45Г2                                      | gost     | ML45Mn                                   | gb     |
| 45XHMΦA                                   | gost     |                                          |        |
| 4KH5V2FS                                  | gost     | <b>Czechia</b>                           | 2      |
| AS45G2                                    | gost     | 13 250 PH                                | csn    |
| ЭИ958                                     | gost     | 13250                                    | csn    |
|                                           |          | <b>Europe</b>                            | 1      |
|                                           |          | 46Mn7 <span>This grade's own name</span> | din-en |

|        |       |          |     |
|--------|-------|----------|-----|
| France | 1     | Poland   | 1   |
| C45E   | afnor | 45G      | pn  |
| Italy  | 1     | Bulgaria | 1   |
| C45E   | uni   | 45G      | bds |

**Note on use.** The data is compiled to the best of our knowledge from publicly available standards and manufacturer documentation. It replaces neither material testing nor an inspection document to EN 10204. Please request a mill certificate to EN 10204 2.1, 3.1 or 3.2 together with your enquiry. The standard in its current valid edition always prevails.

### Enquiry about ML45Mn

Quotation, availability, mill certificate or a technical question — directly on the material page.

[Start an enquiry](#)

|                        |                   |              |              |
|------------------------|-------------------|--------------|--------------|
| DATASHEET ONLINE       | GRADE SEARCH      | MATERIAL NO. | ISSUED       |
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