

MATERIAL NUMBER 1.7380 · CLASS 1.7

# A 335 Grade P22

## Material no. 1.7380

also listed as 10CrMo9-10

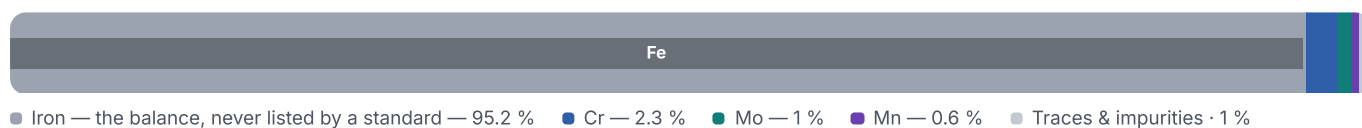
Chemical composition, mechanical and physical property values, and 82 standard designations from 19 regions.

**DENSITY****7.85** g/cm<sup>3</sup>**OTHER DESIGNATIONS****82** in 19 regions**PROPERTY VALUES****10** on file

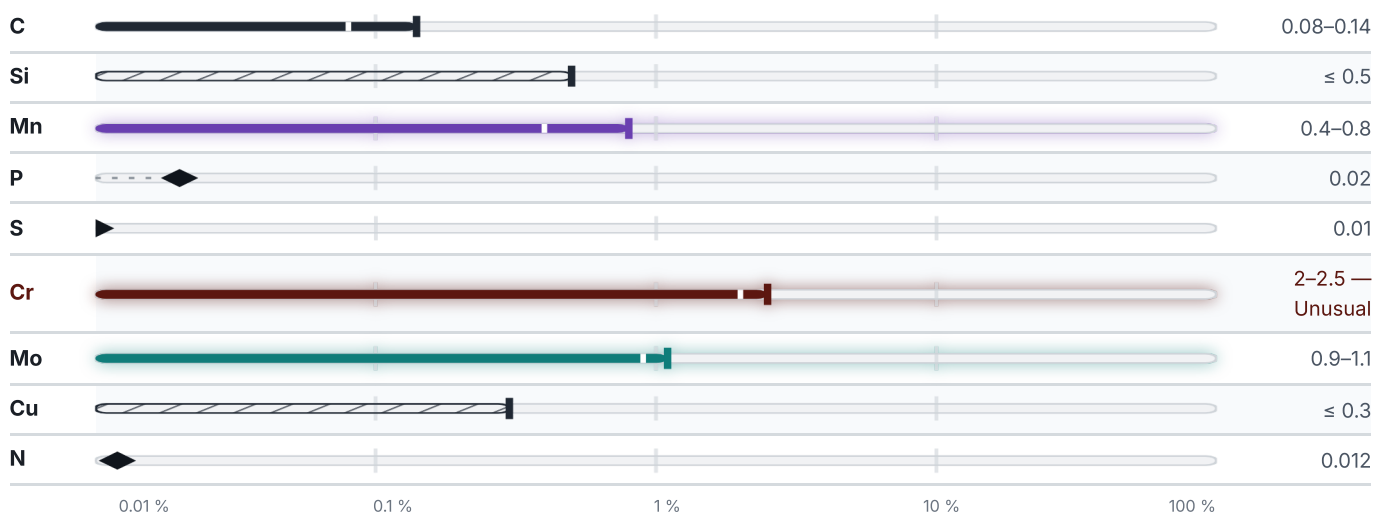
### Chemical composition

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.

Mechanical properties

14 values across 2 conditions

| CONDITION · DIMENSION | REH<br>N/mm <sup>2</sup> | RM<br>N/mm <sup>2</sup> |
|-----------------------|--------------------------|-------------------------|
| ≤ 16                  | 310                      | —                       |
| 16 – 40               | 300                      | —                       |
| 40 – 60               | 290                      | —                       |
| ≤ 60                  | —                        | 480–630                 |
| 60 – 100              | 280                      | 470–620                 |
| 100 – 150             | 260                      | 460–610                 |
| 150 – 250             | 250                      | 450–600                 |

| CONDITION · DIMENSION | RM<br>N/mm <sup>2</sup> | RE<br>N/mm <sup>2</sup> | A5<br>% | KCU<br>kJ/m <sup>2</sup> |
|-----------------------|-------------------------|-------------------------|---------|--------------------------|
| Sheet, GOST 5520-79   | 390–590                 | 295                     | 20      | 980                      |

Physical properties

1 values

| PROPERTY | VALUE | UNIT              |
|----------|-------|-------------------|
| Density  | 7.85  | g/cm <sup>3</sup> |

Heat treatment

1 regimes

| STEP                                                  | TEMPERATURE            | MEDIUM |
|-------------------------------------------------------|------------------------|--------|
| source joins the operations with + / procedural order |                        |        |
| Isothermal annealing                                  | Temperature not stated | —      |
| Normalizing                                           | Temperature not stated | —      |
| Tempering                                             | 675 °C                 | —      |

## Designations across standards

82 designations · 4 documented as identical

| Russia / CIS | 28   | United States                           | 19       |
|--------------|------|-----------------------------------------|----------|
| 10Ch2M       | gost | 2.25Cr1Mo                               | uns      |
| 10G2A        | gost | A182 F22                                | uns      |
| 10G2FB       | gost | A182 T22                                | uns      |
| 10G2FByu     | gost | K21390 This grade's own name            | uns      |
| 10G2SB       | gost | K21590 This grade's own name            | uns      |
| 10G2SFB      | gost | A182                                    | aisi-sae |
| 10GN2MFA     | gost | A387Gr.22                               | aisi-sae |
| 10GN2MFA-Sh  | gost | ASTM A182                               | aisi-sae |
| 10Kh2GNM     | gost | ASTM A182 F.22                          | aisi-sae |
| 10KH2M       | gost | F22                                     | aisi-sae |
| 10ГН2МФА-ВД  | gost | Gr.P22                                  | aisi-sae |
| 10X2M        | gost | 2.25Cr1Mo                               | astm     |
| 10X2M-ВД     | gost | A 182 F 22 Class1 This grade's own name | astm     |
| 12X2M        | gost | A 182 Grade F22                         | astm     |
| 1Ch2M        | gost | A 234 Grade WP22                        | astm     |
| 1Kh2M        | gost | A 335 Grade P22                         | astm     |
| PK10D2F      | gost | A182 F22                                | astm     |
| PK10N2M      | gost | A182 T22                                | astm     |
| Sv-10G2      | gost | K21590                                  | astm     |
| Sv-10G2SMA   | gost |                                         |          |
| Sv-10KhG2SMA | gost | United Kingdom                          | 6        |
| Sv-10KhN2GMT | gost | 1501-622                                | bs       |
| ПК10Д2Ф-6.0  | gost | 1501-622 Gr31                           | bs       |
| ПК10Н2М-6.8  | gost | 622                                     | bs       |
| ПК10Н2М-7.2  | gost | 622-490                                 | bs       |
| ПК10Н2М-7.6  | gost | 622Gr.31                                | bs       |
| ст.12Х2М     | gost | Gr31                                    | bs       |
| ЭИ-984       | gost |                                         |          |
|              |      | France                                  | 5        |
|              |      | 10CD9-10                                | afnor    |
|              |      | 11CrMo9-10                              | afnor    |
|              |      | 12CD10                                  | afnor    |
|              |      | 12CD9                                   | afnor    |
|              |      | 12CD9-10                                | afnor    |
|              |      | Italy                                   | 4        |
|              |      | 10CrMo9-10                              | uni      |
|              |      | 12CrMo10                                | uni      |
|              |      | 12CrMo9                                 | uni      |
|              |      | 12CrMo9-10                              | uni      |
|              |      | Europe                                  | 3        |
|              |      | 1.7380                                  | din-en   |
|              |      | 10CrMo9-10 This grade's own name        | din-en   |
|              |      | Gr.P22                                  | din-en   |

|                      |      |                     |       |
|----------------------|------|---------------------|-------|
| <b>International</b> | 3    | <b>Czechia</b>      | 1     |
| <b>F34</b>           | iso  | <b>15313</b>        | csn   |
| <b>P34</b>           | iso  |                     |       |
| <b>TS34</b>          | iso  | <b>Poland</b>       | 1     |
|                      |      | <b>10H2M</b>        | pn    |
| <b>Japan</b>         | 2    | <b>Slovakia</b>     | 1     |
| <b>SCMV4</b>         | jis  | <b>15 313</b>       | stn   |
| <b>SFVAF22A</b>      | jis  |                     |       |
| <b>Romania</b>       | 2    | <b>Serbia</b>       | 1     |
| <b>10CrMo10</b>      | stas | <b>Č.7401</b>       | srps  |
| <b>12MoCr22</b>      | stas |                     |       |
| <b>Spain</b>         | 1    | <b>Hungary</b>      | 1     |
| <b>TU.H</b>          | une  | <b>2Cr10Mo45.47</b> | msz   |
| <b>China</b>         | 1    | <b>Bulgaria</b>     | 1     |
| <b>12CrMo</b>        | gb   | <b>12Ch2M</b>       | bds   |
| <b>Sweden</b>        | 1    | <b>Austria</b>      | 1     |
| <b>2218</b>          | ss   | <b>10CrMo9-10KW</b> | onorm |

**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.

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#### ISSUED

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