

MATERIAL NUMBER 1.7034 · CLASS 1.7

# Gr.5135

Material no. 1.7034

also listed as 37Cr4

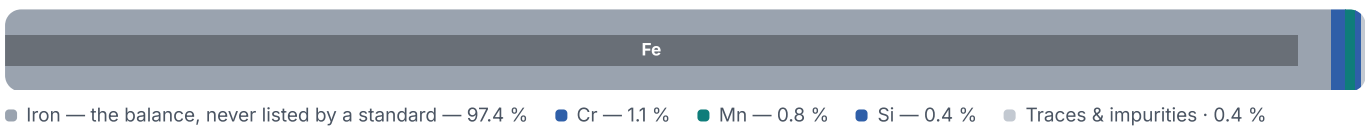
Chemical composition, mechanical and physical property values, and 104 standard designations from 23 regions.

|                                          |                                                |                                      |
|------------------------------------------|------------------------------------------------|--------------------------------------|
| DENSITY<br><b>7.85</b> g/cm <sup>3</sup> | OTHER DESIGNATIONS<br><b>104</b> in 23 regions | PROPERTY VALUES<br><b>14</b> on file |
|------------------------------------------|------------------------------------------------|--------------------------------------|

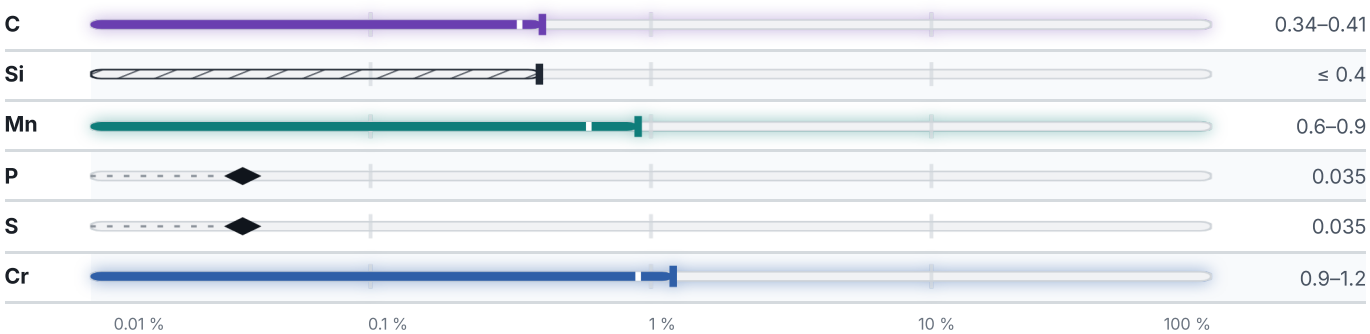
## Chemical composition

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, Mo.

## Mechanical properties

18 values across 5 conditions

| CONDITION · DIMENSION                      | RM<br>N/mm <sup>2</sup> | A5<br>%                 | HB                     |        |                          |
|--------------------------------------------|-------------------------|-------------------------|------------------------|--------|--------------------------|
| Pipe, GOST 8731-87                         | 657                     | 9                       | –                      |        |                          |
| Pipe cooling strain, GOST 8733-74          | 618                     | 14                      | –                      |        |                          |
| (annealing) , GOST 4543-71                 | –                       | –                       | 217                    |        |                          |
| Pipe GOST 8731-87                          | –                       | –                       | 269                    |        |                          |
| Pipe GOST 8733-74                          | –                       | –                       | 217                    |        |                          |
| Bar GOST 10702-78                          | –                       | –                       | 179                    |        |                          |
| QUENCHED AND TEMPERED · ROUND PRODUCTS     |                         |                         | A<br>% · Lo = 5,65 √So |        |                          |
| ≤ 16                                       |                         |                         | 11                     |        |                          |
| 16 – 40                                    |                         |                         | 13                     |        |                          |
| 40 – 100                                   |                         |                         | 14                     |        |                          |
| TREATED TO IMPROVE SHEARABILITY            |                         |                         | HB                     |        |                          |
| Treated to improve shearability            |                         |                         | 255                    |        |                          |
| SOFT ANNEALED                              |                         |                         | HB                     |        |                          |
| Soft annealed                              |                         |                         | 235                    |        |                          |
| QUENCHING 860°C, OIL, DRAWING 500°C, WATER | 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> |
| Ø 25                                       | 980                     | 785                     | 10                     | 45     | 590                      |

## Physical properties

8 values

| CONDITION · DIMENSION | RHO<br>g/cm <sup>3</sup> | 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                    | 7.82                     | 214      | –                            | –                 | –              | 210            |
| 100                   | 7.8                      | 211      | 11.9                         | 46                | 466            | 285            |
| 200                   | 7.77                     | 206      | 12.5                         | 42.7              | 508            | 346            |
| 300                   | 7.74                     | 203      | 13.2                         | 42.3              | 529            | 425            |
| 400                   | 7.7                      | 185      | 13.8                         | 38.5              | 563            | 528            |
| 500                   | 7.67                     | 176      | 14.1                         | 35.6              | 592            | 642            |
| 600                   | 7.63                     | 164      | 14.4                         | 31.9              | 622            | 780            |
| 700                   | 7.59                     | 143      | 14.6                         | 28.8              | 634            | 936            |

| CONDITION · DIMENSION    | RHO<br>g/cm³ | 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 |
|--------------------------|--------------|----------|------------------------------|-------------------|----------------|----------------|
| 800                      | 7.61         | 132      | –                            | 26                | 664            | 1100           |
| 900                      | 7.56         | –        | –                            | 26.7              | –              | 1140           |
| 1000                     | 7.51         | –        | –                            | 28                | –              | 1170           |
| 1100                     | 7.47         | –        | –                            | 28.8              | –              | 120            |
| 1200                     | 7.43         | –        | –                            | –                 | –              | 1230           |
| PROPERTY                 |              |          |                              | VALUE             | UNIT           |                |
| Density                  |              |          |                              | 7.85              | g/cm³          |                |
| Transformation point Ac1 |              |          |                              | 743               | °C             |                |
| Transformation point Ac3 |              |          |                              | 782               | °C             |                |
| Transformation point Ar3 |              |          |                              | 730               | °C             |                |
| Transformation point Ar1 |              |          |                              | 693               | °C             |                |

Technological properties

| PROPERTY           | VALUE             | UNIT |
|--------------------|-------------------|------|
| Weldability        | hard weldability. |      |
| Flake sensitivity  | predisposed       |      |
| Temper brittleness | predisposed       |      |

Heat treatment

6 regimes

| STEP                                                  | TEMPERATURE            | MEDIUM |
|-------------------------------------------------------|------------------------|--------|
| source joins the operations with (or)                 |                        |        |
| Annealing                                             | Temperature not stated | —      |
| Tempering                                             | Temperature not stated | —      |
| Annealing                                             | Temperature not stated | —      |
| source joins the operations with + / procedural order |                        |        |
| Quenching                                             | 820–860 °C             | —      |
| Tempering                                             | 540–680 °C             | —      |
| Annealing                                             | Temperature not stated | —      |
| source joins the operations with + / procedural order |                        |        |
| Quenching                                             | 820–860 °C             | —      |
| Tempering                                             | 540–680 °C             | —      |

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

## Designations across standards

104 designations · 5 documented as identical

|                      |          |                       |       |
|----------------------|----------|-----------------------|-------|
| <b>United States</b> | 12       | <b>United Kingdom</b> | 8     |
| G51350               | uns      | 37Cr4                 | bs    |
| H51350               | uns      | 41Cr4                 | bs    |
| 5135                 | aisi-sae | 530A36                | bs    |
| 5135H                | aisi-sae | 530A40                | bs    |
| 5140                 | aisi-sae | 530H36                | bs    |
| 5140H                | aisi-sae | 530H40                | bs    |
| 5140RH               | aisi-sae | 530M36                | bs    |
| G51350               | aisi-sae | 530M40                | bs    |
| G51400               | aisi-sae |                       |       |
| Gr.5135              | aisi-sae | <b>Japan</b>          | 8     |
| H51350               | aisi-sae | SCr 3 H               | jis   |
| H51400               | aisi-sae | SCr3                  | jis   |
|                      |          | SCr35H                | jis   |
|                      |          | SCr4                  | jis   |
|                      |          | SCr435                | jis   |
|                      |          | SCr435H               | jis   |
|                      |          | SCr440                | jis   |
|                      |          | SCr440H               | jis   |
| <b>Spain</b>         | 11       | <b>Italy</b>          | 8     |
| 37Cr4                | une      | 36CrMn4               | uni   |
| 38Cr4                | une      | 36CrMn5               | uni   |
| 38Cr4DF              | une      | 37Cr4                 | uni   |
| 41Cr4                | une      | 38Cr4                 | uni   |
| 41Cr4DF              | une      | 38Cr4KB               | uni   |
| 42Cr4                | une      | 38CrMn4KB             | uni   |
| F.1201 -38 Cr 4      | une      | 41Cr4                 | uni   |
| F.1202               | une      | 41Cr4KB               | uni   |
| F.1210               | une      |                       |       |
| F.1211               | une      | <b>France</b>         | 6     |
| F1201                | une      | 37Cr4                 | afnor |
|                      |          | 38C4                  | afnor |
|                      |          | 38C4FF                | afnor |
|                      |          | 41Cr4                 | afnor |
|                      |          | 42C4                  | afnor |
|                      |          | 42C4TS                | afnor |
| <b>China</b>         | 9        |                       |       |
| 35Cr                 | gb       |                       |       |
| 38CrA                | gb       |                       |       |
| 40Cr                 | gb       |                       |       |
| 40CrA                | gb       |                       |       |
| 40CrH                | gb       |                       |       |
| 45Cr                 | gb       |                       |       |
| 45CrH                | gb       |                       |       |
| ML38CrA              | gb       |                       |       |
| ML40Cr               | gb       |                       |       |

|                      |      |                                |                              |
|----------------------|------|--------------------------------|------------------------------|
| <b>Russia / CIS</b>  | 6    | <b>Romania</b>                 | 3                            |
| 38ChA                | gost | 40Cr10                         | stas                         |
| 38KHA                | gost | 40Cr10q                        | stas                         |
| 38KHA                | gost | 40Cr10X                        | stas                         |
| 38XA                 | gost |                                |                              |
| 40KH                 | gost | <b>Belgium</b>                 | 3                            |
| 40X                  | gost | 37Cr4                          | nbn                          |
|                      |      | 41Cr4                          | nbn                          |
|                      |      | 45C4                           | nbn                          |
| <b>International</b> | 5    |                                |                              |
| 34Cr4                | iso  | <b>Europe</b>                  | 2                            |
| 34CrS4               | iso  |                                |                              |
| 37Cr4                | iso  | 37Cr4                          | This grade's own name din-en |
| 37CrS4               | iso  | 46Cr2                          | din-en                       |
| 46Cr2                | iso  |                                |                              |
| <b>Hungary</b>       | 4    | <b>Australia / New Zealand</b> | 2                            |
| 37Cr4                | msz  | 5132H                          | as-nzs                       |
| 41Cr4                | msz  | 5140                           | as-nzs                       |
| Cr2Z                 | msz  |                                |                              |
| Cr3Z                 | msz  | <b>Sweden</b>                  | 1                            |
|                      |      | 2245                           | ss                           |
| <b>Bulgaria</b>      | 4    | <b>Czechia</b>                 | 1                            |
| 37Cr4                | bds  | 14140                          | csn                          |
| 38ChA                | bds  |                                |                              |
| 40Ch                 | bds  | <b>Slovakia</b>                | 1                            |
| 41Cr4                | bds  | 14 140                         | stn                          |
| <b>South Korea</b>   | 4    | <b>Latin America</b>           | 1                            |
| SCr435               | ks   | 5135                           | copant                       |
| SCr435H              | ks   |                                |                              |
| SCr440               | ks   | <b>Serbia</b>                  | 1                            |
| SCr440H              | ks   | Č.4134                         | srps                         |
| <b>Poland</b>        | 3    | <b>Austria</b>                 | 1                            |
| 38HA                 | pn   | 41Cr4SP                        | onorm                        |
| 40H                  | pn   |                                |                              |
| 40HA                 | pn   |                                |                              |

**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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#### MATERIAL NO.

1.7034

#### ISSUED

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