

MATERIAL NUMBER 1.4306 · CLASS 1.4

# 304F10

Material no. 1.4306

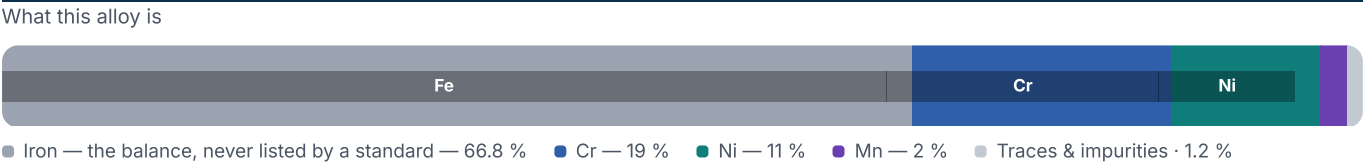
also listed as X2CrNi19-11

Chemical composition, mechanical and physical property values, and 137 standard designations from 17 regions.

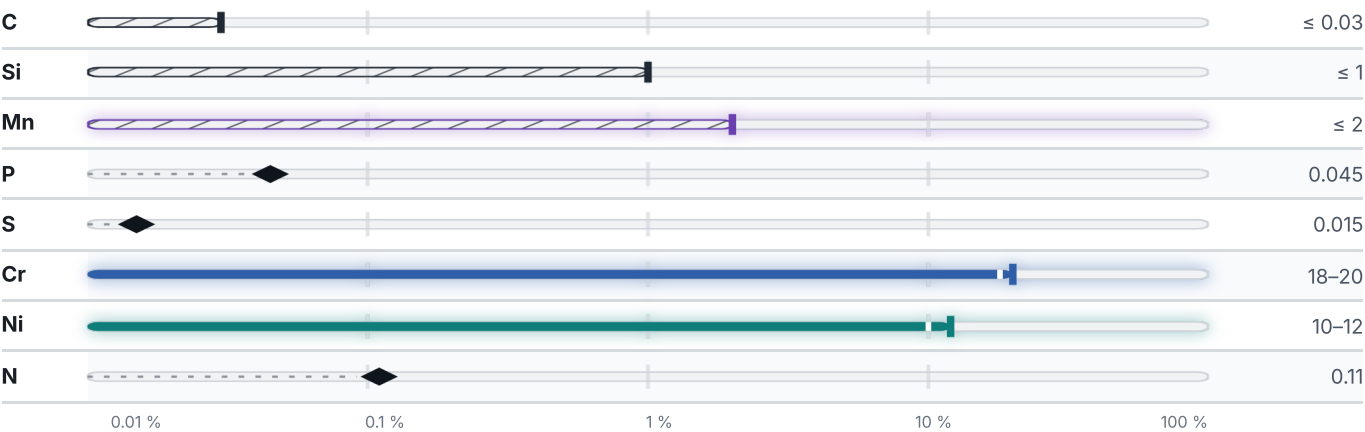
|                             |                                                |                                      |
|-----------------------------|------------------------------------------------|--------------------------------------|
| DENSITY<br><b>7.9</b> g/cm³ | OTHER DESIGNATIONS<br><b>137</b> in 17 regions | PROPERTY VALUES<br><b>13</b> on file |
|-----------------------------|------------------------------------------------|--------------------------------------|

Chemical composition

Mass fraction in %



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: Mo.

## Mechanical properties

21 values across 7 conditions

| CONDITION · DIMENSION                             | RM<br>N/mm <sup>2</sup> | RE<br>N/mm <sup>2</sup> | A<br>%  | HB     |     |
|---------------------------------------------------|-------------------------|-------------------------|---------|--------|-----|
| Casting                                           | 390                     | 185                     | 33      | –      |     |
| Solution heat treatment                           | –                       | –                       | –       | 183    |     |
| CONDITION · DIMENSION                             | RM<br>N/mm <sup>2</sup> | RE<br>N/mm <sup>2</sup> | A5<br>% | Z<br>% | HB  |
| Forging, GOST 25054-81                            | 441                     | 176                     | 40      | 45–55  | –   |
| 03KH18N11 ( 03X18H11 ) , Forging<br>GOST 25054-81 | –                       | –                       | –       | –      | 179 |
| SOFT ANNEALED                                     |                         |                         |         |        | HB  |
| Soft annealed                                     |                         |                         |         |        | 215 |
| QUENCHING 1020 - 1100°C,COOLING<br>AIR            | RM<br>N/mm <sup>2</sup> | RE<br>N/mm <sup>2</sup> | A5<br>% | Z<br>% |     |
| to Ø 60                                           | 440                     | 155                     | 40      |        | 55  |
| SOLUTION ANNEALED                                 |                         |                         |         |        | HB  |
| Solution annealed                                 |                         |                         |         |        | 200 |
| CONDITION · DIMENSION                             | RM<br>N/mm <sup>2</sup> | RE<br>N/mm <sup>2</sup> | A5<br>% |        |     |
| Sheet trick, GOST 7350-77                         | 490                     |                         | 196     | 40     |     |
| CONDITION · DIMENSION                             | RM<br>N/mm <sup>2</sup> | RE<br>N/mm <sup>2</sup> | A5<br>% |        |     |
| Sheet thin, GOST 5582-75                          | 490                     |                         | 196     | 40     |     |

## Physical properties

5 values

| PROPERTY                      | VALUE | UNIT                |
|-------------------------------|-------|---------------------|
| Density                       | 7.9   | g/cm <sup>3</sup>   |
| Thermal expansion coefficient | 16.8  | 10 <sup>-6</sup> /K |
| Thermal conductivity          | 15    | W/(m·K)             |
| Specific heat capacity        | 500   | J/(kg·K)            |
| Electrical resistivity        | 730   | nΩ·m                |

Heat treatment

3 regimes

| STEP                                  | TEMPERATURE            | MEDIUM |
|---------------------------------------|------------------------|--------|
| Solution annealing                    | Temperature not stated | —      |
| source joins the operations with (or) |                        |        |
| Quenching                             | Temperature not stated | —      |
| Solution annealing                    | 1050–1100 °C           | Water  |
| source joins the operations with (or) |                        |        |
| Quenching                             | Temperature not stated | —      |
| Solution annealing                    | Temperature not stated | —      |

## Designations across standards

137 designations · 4 documented as identical

| United States                             | 61       | A924                             | astm |
|-------------------------------------------|----------|----------------------------------|------|
| S30300                                    | uns      | A943                             | astm |
| S30400                                    | uns      | A965                             | astm |
| S30403 <span>This grade's own name</span> | uns      | A988                             | astm |
| S30453                                    | uns      | F2281                            | astm |
| S30500                                    | uns      | F593                             | astm |
| 303                                       | aisi-sae | F594                             | astm |
| 30304L                                    | aisi-sae | F738                             | astm |
| 304                                       | aisi-sae | F836                             | astm |
| 304L <span>This grade's own name</span>   | aisi-sae | F837                             | astm |
| 304LN                                     | aisi-sae | F879                             | astm |
| 305                                       | aisi-sae | F880                             | astm |
| S30403                                    | aisi-sae | TP304                            | astm |
| A 182 Grade F304L                         | astm     | TP304L                           | astm |
| A 276                                     | astm     | <b>United States / Aerospace</b> |      |
| A 312 Grade TP304L                        | astm     |                                  | 16   |
| A 403 Grade WP304L                        | astm     | 5370                             | ams  |
| A 479                                     | astm     | 5371                             | ams  |
| A 484                                     | astm     | 5501                             | ams  |
| A1022                                     | astm     | 5511                             | ams  |
| A1040                                     | astm     | 5513                             | ams  |
| A182                                      | astm     | 5560                             | ams  |
| A213                                      | astm     | 5563                             | ams  |
| A240                                      | astm     | 5564                             | ams  |
| A249                                      | astm     | 5565                             | ams  |
| A269                                      | astm     | 5566                             | ams  |
| A270                                      | astm     | 5567                             | ams  |
| A312                                      | astm     | 5569                             | ams  |
| A314                                      | astm     | 5575                             | ams  |
| A358                                      | astm     | 5584                             | ams  |
| A368                                      | astm     | 5639                             | ams  |
| A403                                      | astm     | 5647                             | ams  |
| A409                                      | astm     | <b>United Kingdom</b>            |      |
| A473                                      | astm     |                                  | 12   |
| A478                                      | astm     | 304C12                           | bs   |
| A493                                      | astm     | 304S11                           | bs   |
| A511                                      | astm     | 304S12                           | bs   |
| A554                                      | astm     | 304S62                           | bs   |
| A580                                      | astm     | 305 S 11                         | bs   |
| A632                                      | astm     | C12                              | bs   |
| A666                                      | astm     | LW 14                            | bs   |
| A688                                      | astm     | LW20                             | bs   |
| A774                                      | astm     | LWCF 14                          | bs   |
| A778                                      | astm     | LWCF20                           | bs   |
| A793                                      | astm     | S.536                            | bs   |
| A813                                      | astm     | T.74                             | bs   |
| A814                                      | astm     |                                  |      |
| A851                                      | astm     |                                  |      |

|                     |       |                                                |        |
|---------------------|-------|------------------------------------------------|--------|
| <b>France</b>       | 11    | <b>Europe</b>                                  | 3      |
| 304F10              | afnor | 1.4306                                         | din-en |
| Z1CN18-12           | afnor | X2CrNi189                                      | din-en |
| Z1CN18-19           | afnor | X2CrNi19-11 <span>This grade's own name</span> | din-en |
| Z2CN18.09           | afnor |                                                |        |
| Z2CN18.10           | afnor | <b>China</b>                                   | 3      |
| Z2CrNi1810          | afnor | 00Cr19Ni10                                     | gb     |
| Z3CN18-10           | afnor | 00Cr19Ni11                                     | gb     |
| Z3CN18-11           | afnor | OCr19Ni10                                      | gb     |
| Z3CN19-10M          | afnor |                                                |        |
| Z3CN19-11           | afnor | <b>Sweden</b>                                  | 3      |
| Z3CN19.10           | afnor | 2333                                           | ss     |
|                     |       | 2352                                           | ss     |
| <b>Japan</b>        | 8     | SIS 2352 <span>This grade's own name</span>    | ss     |
| SCS19               | jis   |                                                |        |
| SUS 304L            | jis   | <b>Italy</b>                                   | 2      |
| SUS 304LFB          | jis   | X2CrNi18.11                                    | uni    |
| SUS 304LTB          | jis   | X3CrNi18-11                                    | uni    |
| SUS 304LTBS         | jis   |                                                |        |
| SUS 304LTP          | jis   | <b>Poland</b>                                  | 2      |
| SUS F 304L          | jis   | 00H18N10                                       | pn     |
| SUS304              | jis   | 0H18N9                                         | pn     |
|                     |       |                                                |        |
| <b>Russia / CIS</b> | 7     | <b>Czechia</b>                                 | 1      |
| 000X18H11           | gost  | 17249                                          | csn    |
| 03Ch18N11           | gost  |                                                |        |
| 03Ch19N11           | gost  | <b>Slovakia</b>                                | 1      |
| 03KH18N11           | gost  | 17 249                                         | stn    |
| 03X18H11            | gost  |                                                |        |
| 03X18H11            | gost  | <b>Brazil</b>                                  | 1      |
| 04Ch18N10           | gost  | 304 L                                          | abnt   |
|                     |       |                                                |        |
| <b>Spain</b>        | 4     | <b>Austria</b>                                 | 1      |
| F.310.G             | une   | X2CrNi19-11KKW                                 | onorm  |
| F.3503              | une   |                                                |        |
| F.3503-X2CrNi19-10  | une   | <b>Finland</b>                                 | 1      |
| X2CrNi1810          | une   | 720                                            | sfs    |

**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 304F10

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#### MATERIAL NO.

1.4306

#### ISSUED

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