

MATERIAL NUMBER 1.0116 · CLASS 1.0

# Gr 40D

Material no. 1.0116

also listed as S235J2G3

Chemical composition, mechanical and physical property values, and 66 standard designations from 11 regions.

|                                          |                                               |                                      |
|------------------------------------------|-----------------------------------------------|--------------------------------------|
| DENSITY<br><b>7.85</b> g/cm <sup>3</sup> | OTHER DESIGNATIONS<br><b>66</b> in 11 regions | PROPERTY VALUES<br><b>12</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: Si, Ni, Cr, Mo.

Mechanical properties

26 values across 3 conditions

| FLAT AND LONG PRODUCTS | REH<br>N/mm <sup>2</sup> | RM<br>N/mm <sup>2</sup> |
|------------------------|--------------------------|-------------------------|
| ≤ 3                    | —                        | 360–510                 |

| FLAT AND LONG PRODUCTS | REH<br>N/mm <sup>2</sup> | RM<br>N/mm <sup>2</sup> |         |
|------------------------|--------------------------|-------------------------|---------|
| 3 – 100                | –                        | 360–510                 |         |
| ≤ 16                   | 235                      | –                       |         |
| 16 – 40                | 225                      | –                       |         |
| 40 – 63                | 215                      | –                       |         |
| 63 – 80                | 215                      | –                       |         |
| 80 – 100               | 215                      | –                       |         |
| 100 – 150              | 195                      | 350–500                 |         |
| 150 – 250              | –                        | 340–490                 |         |
| 150 – 200              | 185                      | –                       |         |
| 200 – 250              | 175                      | –                       |         |
| 250 – 400              | –                        | 330–480                 |         |
| CONDITION · DIMENSION  | A80<br>% · Lo = 80 mm    | A<br>% · Lo = 5,65 √So  |         |
| ≤ 1                    | 17                       | –                       |         |
| 1– 1.5                 | 18                       | –                       |         |
| 1.5 – 2                | 19                       | –                       |         |
| 2 – 2.5                | 20                       | –                       |         |
| 2.5 – 3                | 21                       | –                       |         |
| 3 – 40                 | –                        | 26                      |         |
| 40 – 63                | –                        | 25                      |         |
| 63 – 100               | –                        | 24                      |         |
| 100 – 150              | –                        | 22                      |         |
| 150 – 250              | –                        | 21                      |         |
| CONDITION · DIMENSION  | RM<br>N/mm <sup>2</sup>  | RE<br>N/mm <sup>2</sup> | A5<br>% |
| to 20                  | 360–460                  | 235                     | 27      |

## Physical properties

8 values

| CONDITION · DIMENSION | RHO<br>g/cm <sup>3</sup> | E<br>GPa |
|-----------------------|--------------------------|----------|
| 20                    | 7.85                     | 213      |
| 100                   | –                        | 208      |

| CONDITION · DIMENSION | RHO<br>g/cm <sup>3</sup> | E<br>GPa |
|-----------------------|--------------------------|----------|
| 200                   | –                        | 202      |
| 300                   | –                        | 195      |
| 400                   | –                        | 187      |
| 500                   | –                        | 176      |
| 600                   | –                        | 167      |
| 700                   | –                        | 153      |

| PROPERTY                 | VALUE | UNIT              |
|--------------------------|-------|-------------------|
| Density                  | 7.85  | g/cm <sup>3</sup> |
| Transformation point Ac1 | 735   | °C                |
| Transformation point Ac3 | 850   | °C                |
| Transformation point Ar3 | 835   | °C                |
| Transformation point Ar1 | 680   | °C                |

## Technological properties

| PROPERTY           | VALUE                | UNIT |
|--------------------|----------------------|------|
| Weldability        | without limitations. |      |
| Flake sensitivity  | not predisposed      |      |
| Temper brittleness | not predisposed      |      |

## Designations across standards

66 designations · 5 documented as identical

| Russia / CIS |      | 39 | United States  |                       | 11       |
|--------------|------|----|----------------|-----------------------|----------|
| 08Kh14N5M2DL | gost |    | K01702         | This grade's own name | uns      |
| 08X14H5M2ДЛ  | gost |    | K02001         | This grade's own name | uns      |
| 0Kh18N5G12AB | gost |    | K02601         | This grade's own name | uns      |
| 0Kh20N4AG10  | gost |    | K02701         |                       | uns      |
| 0X18H5Г12АБ  | gost |    | A284           |                       | aisi-sae |
| 0X20H4AГ10   | gost |    | A573           |                       | aisi-sae |
| 34KhM        | gost |    | A611           |                       | aisi-sae |
| 34XMA        | gost |    | C A611 Gr. C   |                       | aisi-sae |
| A3           | gost |    | A284           |                       | astm     |
| CHKH3        | gost |    | A573           |                       | astm     |
| CHKH3T       | gost |    | A611           |                       | astm     |
| CHN3KHMSH    | gost |    |                |                       |          |
| L3           | gost |    | United Kingdom |                       | 4        |
| LR3          | gost |    | 4360-40C       |                       | bs       |
| PA-ZhGr3     | gost |    | D-1449-37C     |                       | bs       |
| PA-ZhGr3M    | gost |    | Gr 40D         |                       | bs       |
| PA-ZhGr3TSs  | gost |    | HS 37          |                       | bs       |
| PA-ZhNGr3M   | gost |    |                |                       |          |
| PF3          | gost |    | France         |                       | 3        |
| PVK3         | gost |    | E24-3          |                       | afnor    |
| PZhR3        | gost |    | E24-4          |                       | afnor    |
| PZhV3        | gost |    | S235J2G3       |                       | afnor    |
| S245         | gost |    |                |                       |          |
| VSt3Gps      | gost |    | Europe         |                       | 2        |
| VSt3kp       | gost |    | S235J2G3       | This grade's own name | din-en   |
| VSt3ps       | gost |    | St 37-3 N      | This grade's own name | din-en   |
| VSt3sp       | gost |    |                |                       |          |
| ACHS-3       | gost |    | Spain          |                       | 2        |
| ВНЛ-3        | gost |    | A360           |                       | une      |
| ЖГр3         | gost |    | A360 C         |                       | une      |
| ЖГр3-20      | gost |    |                |                       |          |
| ЖГр3-5.5     | gost |    | Japan          |                       | 1        |
| ЖГр3M15      | gost |    | SS34           |                       | jis      |
| ЖГр3Цc4      | gost |    |                |                       |          |
| ЖГр3Цc4У     | gost |    | Sweden         |                       | 1        |
| ЖНГр3M15     | gost |    | 1313           |                       | ss       |
| HH3          | gost |    |                |                       |          |
| HH3Б         | gost |    | Czechia        |                       | 1        |
| Ст3cp        | gost |    | 11378          |                       | csn      |
|              |      |    |                |                       |          |
|              |      |    | Poland         |                       | 1        |
|              |      |    | St3W           |                       | pn       |
|              |      |    |                |                       |          |
|              |      |    | South Africa   |                       | 1        |
|              |      |    | 240 WDD        |                       | sans     |

**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 Gr 40D

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

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**ISSUED**  
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