

## SM / DM

Patented drawn spring wire

**External standard:**

The material conforms with EN 10270 - 1 : 2011

**Further equivalent standards:**

ASTM A227/A227M      JIS G3521

**Scope:**

Round, patented drawn spring wire according to EN 10270 - 1 : 2011

The wire is used for helical or other spring forms subjected to medium static and light dynamic stresses.

The wire can be supplied in a dry drawn or wet drawn finish.

Arrangements as to type of surface (either as above or other possible versions) are made when ordering.

**Range of diameters:**

0.30 to 6.50 mm

**Chemical composition (heat analysis):**

| C<br>%      | Si<br>%     | Mn<br>%     | P<br>max. % | S<br>max. % | Cu<br>max. % |
|-------------|-------------|-------------|-------------|-------------|--------------|
| 0.55 - 0.85 | 0.10 - 0.30 | 0.50 - 1.00 | 0.020       | 0.025       | 0.12         |

**Raw material:**

Wire rod according to in-house specification.

**Mechanical properties:**

See table on opposite side.

The cast and helix of the wire meets the requirements of EN 10270 - 1 : 2011

**Forms of delivery:**

Wires are supplied in the form of coils or on spools.

See the data sheets on forms of delivery.

**Please inquire for special tolerances, tensiles, sections, etc.**

**Mechanical properties: SM / DM - Edition 01/2012** (replaces edition 01/2010)

| Nominal diameter<br>mm | Tolerance <sup>1)</sup><br>mm | Tensile strength <sup>2)</sup><br>MPa | Minimum reduction of area<br>% | Torsion test | Range of tensile strength within the coil<br>MPa |
|------------------------|-------------------------------|---------------------------------------|--------------------------------|--------------|--|
| 0.30                   | ± 0.008                       | 2370 - 2650                           | -                              | -            | max.<br>150                                      |
| 0.32                   |                               | 2350 - 2630                           |                                |              |  |
| 0.34                   |                               | 2330 - 2600                           |                                |              |  |
| 0.36                   |                               | 2310 - 2580                           |                                |              |  |
| 0.38                   |                               | 2290 - 2560                           |                                |              |  |
| 0.40                   |                               | 2270 - 2550                           |                                |              |  |
| 0.43                   |                               | 2250 - 2520                           |                                |              |  |
| 0.45                   |                               | 2240 - 2500                           |                                |              |  |
| 0.48                   |                               | 2220 - 2480                           |                                |              |  |
| 0.50                   |                               | 2200 - 2470                           |                                |              |  |
| 0.53                   |                               | 2180 - 2450                           |                                |              |  |
| 0.56                   |                               | 2170 - 2430                           |                                |              |  |
| 0.60                   |                               | 2140 - 2400                           |                                |              |  |
| 0.63                   |                               | 2130 - 2380                           |                                |              |  |
| 0.65                   | 2120 - 2370                   |                                       |                                |              |  |
| 0.70                   | ± 0.010                       | 2090 - 2350                           | 40                             | 25           | max.<br>100                                      |
| 0.75                   | 2070 - 2320                   |                                       |                                |              |  |
| 0.80                   | ± 0.015                       | 2050 - 2300                           |                                |              |  |
| 0.85                   |                               | 2030 - 2280                           |                                |              |  |
| 0.90                   |                               | 2010 - 2260                           |                                |              |  |
| 0.95                   |                               | 2000 - 2240                           |                                |              |  |
| 1.00                   | ± 0.020                       | 1980 - 2220                           |                                |              |  |
| 1.05                   |                               | 1960 - 2200                           |                                |              |  |
| 1.10                   |                               | 1950 - 2190                           |                                |              |  |
| 1.20                   |                               | 1920 - 2160                           |                                |              |  |
| 1.25                   |                               | 1910 - 2140                           |                                |              |  |
| 1.30                   |                               | 1900 - 2130                           |                                |              |  |
| 1.40                   | ± 0.025                       | 1870 - 2100                           |                                |              |  |
| 1.50                   |                               | 1850 - 2080                           |                                |              |  |
| 1.60                   |                               | 1830 - 2050                           |                                |              |  |
| 1.70                   |                               | 1810 - 2030                           |                                |              |  |
| 1.80                   |                               | 1790 - 2010                           |                                |              |  |
| 1.90                   |                               | 1770 - 1990                           |                                |              |  |
| 2.00                   |                               | 1760 - 1970                           |                                |              |  |
| 2.10                   |                               | 1740 - 1960                           |                                |              |  |
| 2.25                   | ± 0.030                       | 1720 - 1930                           |                                |              |  |
| 2.40                   |                               | 1700 - 1910                           |                                |              |  |
| 2.50                   |                               | 1690 - 1890                           |                                |              |  |
| 2.60                   |                               | 1670 - 1880                           |                                |              |  |
| 2.80                   |                               | 1650 - 1850                           |                                |              |  |
| 3.00                   |                               | 1630 - 1830                           |                                |              |  |
| 3.20                   |                               | 1610 - 1810                           |                                |              |  |
| 3.40                   |                               | 1590 - 1780                           |                                |              |  |
| 3.60                   |                               | 1570 - 1760                           |                                |              |  |
| 3.80                   |                               | 1550 - 1740                           |                                |              |  |
| 4.00                   | ± 0.035                       | 1530 - 1730                           |                                |              |  |
| 4.25                   |                               | 1510 - 1700                           |                                |              |  |
| 4.50                   |                               | 1500 - 1680                           |                                |              |  |
| 4.75                   |                               | 1480 - 1670                           |                                |              |  |
| 5.00                   |                               | 1460 - 1650                           |                                |              |  |
| 5.30                   |                               | 1440 - 1630                           |                                |              |  |
| 5.60                   |                               | 1430 - 1610                           |                                |              |  |
| 6.00                   |                               | 1400 - 1580                           |                                |              |  |
| 6.30                   | ± 0.040                       | 1390 - 1560                           |                                |              |  |
| 6.50                   |                               | 1380 - 1550                           |                                |              |  |
|                        |                               |                                       | 35                             | 16           | max.<br>70                                       |
|                        |                               |                                       |                                | 12           |  |
|                        |                               |                                       |                                | 11           |  |
|                        |                               |                                       |                                | 10           |  |
|                        |                               |                                       |                                | 9            |  |

<sup>1)</sup> Out-of-roundness maximum 50 % of diameter tolerance.

<sup>2)</sup> For intermediate wire diameters, the rating for the following diameters applies.