

Valve Spring Wire Roeslau „R20 VD“ SiCrV - alloyed oil tempered



Application:

Oil tempered SiCrV-alloyed Valve spring steel wire for the manufacture of medium to high stressed springs.

Range of diameters:

The wire is manufactured from **2,50 mm – 6,00 mm** in round section.

Chemical composition (%):

| C | Si | Mn | Cr | P max. | S max. | V |
|-------------|-------------|-------------|-------------|--------|--------|-------------|
| 0,50 - 0,70 | 1,20 - 1,65 | 0,40 - 0,90 | 0,50 - 1,00 | 0,020 | 0,020 | 0,10 - 0,25 |

Raw material:

Specially treated wire rod acc. to Roeslau prescription.

Mechanical properties:

The deviation of tensile strength within one coil is 50 N/mm² max. – The tensile strength is related to the real cross section.

| Nominal wire diameter from mm | Limit deviations mm ± | Tensile strength Rm N/mm ² from | Tensile strength Rm N/mm ² to | Reduction in area Z % | Reduction in area min. L ₀ 300 mm |
|-------------------------------|-----------------------|--|--|-----------------------|--|
| 2,500 | 0,025 | 2.100 | 2.250 | 50 | 4 |
| 2,501 | 0,025 | 2.060 | 2.210 | 45 | 4 |
| 2,701 | 0,030 | 2.060 | 2.210 | 45 | 4 |
| 3,201 | 0,030 | 2.010 | 2.160 | 45 | 4 |
| 4,001 | 0,035 | 1.960 | 2.110 | 45 | 3 |
| 4,501 | 0,035 | 1.960 | 2.110 | 40 | 3 |
| 5,001 | 0,035 | 1.910 | 2.060 | 35 | 3 |
| 5,601 | 0,040 | 1.910 | 2.060 | 35 | 3 |

- 1) The surface of fracture of the sample tested on torsion must be perpendicular to the axis. On the fracture or on the surface of the sample not a single crack may be visible.
- 2) The ovality, i.e. the difference between the minimum and maximum wire diameter measured in the same plane, shall not exceed 50 % of the range given by the limit deviations.

Modulus of elasticity about 206 kN/mm²

Modulus of rigidity about 79,5 kN/mm²

Surface quality:

The surface condition of „Roeslau R20 VD“ is tested by means of an inspection of both coil ends. The test pieces are checked for surface defects after deep etching and microscopically for decarburization.

When testing the coil ends the maximum depth of surface defects and decarburization is 1,3 % of the wire diameter. Connected carbon-free areas are not permissible.

In the range of sizes 2,50 – 4,99 mm the oil tempered wire is continuously tested for a permissible depth of defects of 40 µm acc. to two different methods.

Defects > 40 µm are marked in colour.

In the range of sizes 5,00 – 5,99 mm the oil tempered wire is continuously tested for a permissible depth of defects of 50 µm acc. to two different methods.

Defects > 50 µm are marked in colour.

Diameter 6,00 mm is continuously tested for a permissible depth of defects of 60 µm acc. to two different methods. Defects > 60 µm are marked in colour.

Depending on the type and shape, a surface defect deeper than the above defect limits could also not be detected. See also the position paper of the IVSWMA.*

Non-metallic inclusions:

Non-metallic inclusions are determined according to DIN 50602, method K or deviating agreement when ordering.

Form supplied and condition supplied:

This material is usually supplied in catchweight coils or on carriers.

Detailed coil diameters and coil weights are indicated in a separate sheet.

The packing is made according to the customer's request.

Recommendation for processing:

Immediately upon coiling the springs must be tempered at abt. 420° C for 30 minutes at least. After shot peening the springs must be tempered at abt. 250° C for 30 minutes.

In order to achieve an optimal fatigue resistance, the size of the shots and the time of shot peening must be adjusted in such a manner that the inner sides, too, are covered completely. The size of the shots must be adapted to the wire size, the pitch of the spring and the equipment used.

During loading, storing or processing the wire shall be suitably protected against corrosion and mechanical damage.

*IVSWMA: International Valve Spring Wire Manufacturers Association