

# Valve Spring Wire Roeslau „R15 VD SC“ SiCr-alloyed oil tempered



roeslau wire

### **Application:**

Valve springs and springs with high dynamic stress. Also for springs that require at operating temperatures up to approx. 250° C high temperature strength low relaxation (loss of tension).

### **Range of diameters:**

The wire is manufactured from **0,85 mm - 6,00 mm** in round section.

### **Chemical composition (%):**

C	Si	Mn	Cr	P max.	S max.	Cu max.
0,50 - 0,60	1,20 - 1,60	0,50 - 0,90	0,50 - 0,80	0,025	0,020	0,060

### **Raw material:**

Super – clean melted, specially treated wire rod acc.to Roeslau prescription.

### **Mechanical properties:**

The deviation of tensile strength within one coil is 50 N/mm<sup>2</sup> max. – The tensile strength is related to the real cross section..

Nominal wire diameter from mm	Limit deviations mm ±	Tensile strength Rm N/mm <sup>2</sup> from	Tensile strength Rm N/mm <sup>2</sup> to	Reduction in area Z %	No. of torsions min. L <sub>0</sub> 300 mm
0,850	0,015	2.080	2.230	0	6
1,001	0,020	2.080	2.230	50	5
1,301	0,020	2.060	2.210	50	5
1,401	0,020	2.060	2.210	50	5
1,601	0,025	2.010	2.160	50	4
2,001	0,025	1.960	2.060	50	4
2,501	0,025	1.910	2.010	50	4
2,701	0,030	1.910	2.010	50	4
3,001	0,030	1.910	2.010	45	4
3,501	0,030	1.860	1.960	45	4
4,001	0,035	1.860	1.960	45	4
4,501	0,035	1.810	1.910	45	3
5,001	0,035	1.810	1.910	40	3
5,601	0,035	1.760	1.860	40	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 plane, shall not exceed 50 % of the range given by the limit deviations.

Modulus of elasticity about 206 kN/mm<sup>2</sup>

Modulus of rigidity about 79,5 kN/mm<sup>2</sup>

**Surface quality:**

The surface condition of „Roeslau R15 VD SC“ 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 % of the wire diameter. Connected carbon-free areas are not permissible.

In the range of sizes 2,00 – 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 mentioned error limits could also not be detected. See also the position paper of the IVSWMA.\*

**Non-metallic inclusions:**

Number of inclusions in the edge zone (measured on end samples of the wire rod).

Inclusion size	5 - 10	>10 - 15	> 15 <sup>1)</sup> µm
Max. Number/1000 mm <sup>2</sup>	50	7	0

1) According to the IVSWMA position paper\*, the occasional occurrence of inclusions larger than 15 µm is thus not excluded.

**Form supplied and condition supplied:**

Valve spring wire „Roeslau R15VD SC“ is usually supplied on carriers.

Coil weights acc.to agreement, however, at present max. 2000 kg.

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 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.

Comparable standards: EN 10270/2

\*IVSWMA: International Valve Spring Wire Manufacturers Association