

# Penthor 911

Oil tempered silicon/  
chromium/vanadium  
alloyed spring wire

### External Standard:

The material conforms to FDSiCrV according to EN 10270 – 2: 2011

### Applications:

For statically stressed springs or springs working in the finite life range, requiring strength at elevated temperatures (up to approx. 250°C).

### Range of diameters:

1.30 to 6.50 mm Ø



### Chemical composition (heat analysis):

C %	Si %	Mn %	P Max %	S Max %	Cu Max %	Cr %	V %
0.50-0.70	1.20-1.65	0.40-0.90	0.030	0.025	0.12	0.50-1.00	0.10-0.25

### Raw material:

Wire rod according to in-house specifications.

### Mechanical Properties: Penthor 911

Wire diameter mm	Tolerance mm	Tensile strength MPa	Minimum reduction area %	Permissible depth of surf.defects <sup>1)</sup>	Permissible part decarburization depth <sup>1)</sup>	
1.30 to 1.40	± 0.020	2280 to 2410	45		max. 1.5% of wire diameter	
>1.40 to 1.60		2260 to 2410				
>1.60 to 2.00	± 0.025	2210 to 2360				
>2.00 to 2.50		2160 to 2310				
>2.50 to 2.70		2110 to 2260				
>2.70 to 3.00		2110 to 2260				
>3.00 to 3.20	± 0.030	2110 to 2260				40
>3.20 to 3.50		2110 to 2260				
>3.50 to 4.00		2060 to 2210				
>4.00 to 4.20	± 0.035	2060 to 2210				
>4.20 to 4.50		2060 to 2210				
>4.50 to 4.70		2010 to 2160				
>4.70 to 5.00		2010 to 2160				
>5.00 to 5.60		2010 to 2160				
>5.60 to 6.00	± 0.040	1960 to 2110	38			
>6.00 to 6.50		1960 to 2110	35			

- a) Range of tensile strength within one coil max. 70 MPa
- b) Ovality: Difference between the largest and smallest diameter of a cross section does not exceed 50% of the diameter tolerance.
- c) Yield point (0.2%limit) at least 90% of the tensile strength
- d) Modulus of elasticity  
E= 206.000 MPa (Standard)  
Shear Modulus  
G = 79.500 MPa (Standard)
- e) Torsion tests are carried out according to EN 10218-1

<sup>1)</sup> End samples

### Heat treatment:

After coiling, the springs should be stress relieved as soon as possible at 380° – 425°C, with a holding time of 30 minutes at temperature.

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