# Penthor 811

# Oil tempered silicon/chromium alloyed spring wire

External Standard:

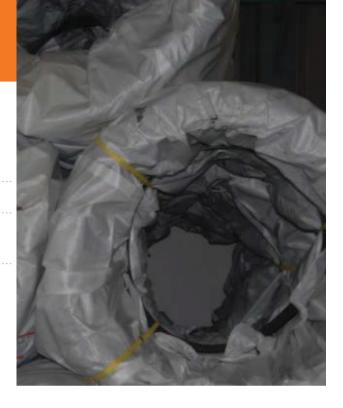
The materials conforms with FDSiCr according to EN 10270-2 : 2011

Further equivalent standards: ASTM A401/A401M JIS 3560 SWOSC- B

#### 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 13.00 mm Ø



### Chemical composition (heat analysis):

С	Si	Mn	P	S	CU	<b>Cr</b>
%	%	%	Max %	Max %	Max %	%
0.50-0.60	1.20-1.60	0.50-0.90	0.030	0.025	0.12	

#### Raw material:

Wire rod according to in-house specifications.

## Mechanical Properties: Penthor 811

Wire diameter	Tolerance	Tensile strength	Minimum reduction area	Permissible depth of surf. defects <sup>1)</sup>	Permissible part decarburization depth <sup>1)</sup>	
mm	mm	MPa	%	acreets	acptil	
1.30 to 1.40	<u>+</u> 0.020	2070 to 2250	45			
>1.40 to 1.60		2040 to 2220				
>1.60 to 2.00	<u>+</u> 0.025	2000 to 2180				
>2.00 to 2.50		1970 to 2140				
>2.50 to 2.70		1950 to 2120				
>2.70 to 3.00	- - ± 0.030	1930 to 2100				
>3.00 to 3.20		1910 to 2080				
>3.20 to 3.50		1900 to 2060	- 42			
>3.50 to 4.00		1870 to 2030		max. 1.5% of wire diameter		
>4.00 to 4.20	± 0.035	1860 to 2020	40			
>4.20 to 4.50		1850 to 2000				
>4.50 to 4.70		1840 to 1990				
>4.70 to 5.00		1830 to1980				
>5.00 to 5.60		1800 to1950	- 38			
>5.60 to 6.00	± 0.040	1780 to 1930				
>6.00 to 6.50		1760 to 1910	35			
>6.50 to 7.00		1740 to 1890				
>7.00 to 8.00	± 0.045	1710 to 1860				
>8.00 to 8.50		1700 to 1850	- 32			
>8.50 to 10.00	<u>+</u> 0.050	1660 to 1810				
>10.00 to 12.00	<u>+</u> 0.070	1620 to 1770	30			
>12.00 to 13.00	<u>+</u> 0.080	1580 to 1730	50			

#### 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.

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