

PENTHOR 811

Oil tempered silicon/chromium alloyed spring wire

External standard :

The material conforms with FDSiCr acc. 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 :

0.40 to 7.00 mm Ø

Chemical composition (heat analysis):

C %	Si %	Mn %	P max. %	S max. %	Cu max. %	Cr %
0.50 - 0.60	1.20 - 1.60	0.50 - 0.90	0.030	0.025	0.12	0.50 - 0.80

Raw material :

Wire rod according to in-house specifications.

Mechanical properties: Penthor 811 - Edition 04/2016 (replaces edition 01/2012)

Wire diameter mm	Tolerance mm	Tensile strength MPa	Minimum reduction area %	Permissible depth of surf. defects ¹⁾	Permissible part. decarburization depth ¹⁾
0.40 to 0.60	± 0,010	2100 to 2300	-	max. 0.009 mm	
> 0.60 to 0.80		2100 to 2300			
> 0.80 to 1.00		2100 to 2300			
> 1.00 to 1.30	± 0.020	2070 to 2260	45	max. 1.5% of wire diameter	
> 1.30 to 1.40		2060 to 2250			
> 1.40 to 1.60		2040 to 2220			
> 1.60 to 2.00	± 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	42		
> 3.00 to 3.20		1910 to 2080			
> 3.20 to 3.50		1900 to 2060			
> 3.50 to 4.00	± 0.035	1870 to 2030	40		
> 4.00 to 4.20		1860 to 2020			
> 4.20 to 4.50		1850 to 2000			
> 4.50 to 4.70		1840 to 1990			
> 4.70 to 5.00	± 0.040	1830 to 1980	38		
> 5.00 to 5.60		1800 to 1950			
> 5.60 to 6.00		1780 to 1930			
> 6.00 to 6.50	± 0.040	1760 to 1910	35		
> 6.50 to 7.00		1740 to 1890			

- 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 }
- e) Torsion tests are carried out according to EN 10218 - 1
- ¹⁾ End samples

Heat treatment:

After coiling, the springs should be stress relieved as soon as possible.

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