



Penthor 843/842

Oil tempered silicon/chromium alloyed spring wire

External Standard:

The material conforms with TDSiCr according to EN 10270-2: 2011

Further equivalent standards:

ASTM A-1000 Grade A

Applications:

For coil springs subjected to moderate dynamic stresses such as clutch springs or springs requiring similar moderate fatigue resistance as well as high tensile strength and excellent relaxation properties at elevated temperatures (up to approx. 250°C).

Range of diameters:

1.30 to 8.00 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	0.025	0.020	0.10	0.50-0.80

Raw material:

Wire rod according to in-house specifications.

Cleanliness acc. to DIN 50602, inclusions chart 1:

Max. size 2 for all types of inclusions

Mechanical Properties: Penthor 843/842

Wire diameter mm	Tolerance mm	Tensile strength MPa	Minimum reduction area %	Minimum number of torsions min.	Permissible depth of surf. defects ¹⁾	Permissible part decarburization depth ¹⁾		
1.30 to 1.40	± 0.020	2080 to 2210	50	5	max. 1.3% of wire diameter			
>1.40 to 1.60		2060 to 2210						
>1.60 to 2.00	± 0.025	2010 to 2160						
>2.00 to 2.50		1960 to 2060						
>2.50 to 2.70		1910 to 2010						
>2.70 to 3.00		1910 to 2010						
>3.00 to 3.20	± 0.030	1910 to 2010	45	4				
>3.20 to 3.50		1910 to 2010						
>3.50 to 4.00		1860 to 1960						
>4.00 to 4.20		1860 to 1960						
>4.20 to 4.50	± 0.035	1810 to 1910					40	3
>4.50 to 4.70		1810 to 1910						
>4.70 to 5.00		1810 to 1910						
>5.00 to 5.60		1760 to 1860						
>5.60 to 6.00	± 0.040	1760 to 1860	-					
>6.00 to 6.50		1710 to 1810						
>6.50 to 7.00		1710 to 1810						
>7.00 to 8.00		1710 to 1810						

Surface inspection:

Wires with diameters from 2.5 to 8.00 mm are eddy current surface inspected after oil hardening and tempering using a combination of two methods to detect both transverse and longitudinal defects.

Testing of wires <2.50 mm can be agreed upon separately.

Defect ≥60µm are recorded and marked. **Penthor 842 wire are not subjected to inline surface inspection**

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.

After shot peening, the springs must be stress relieved at approx 240°C for 30 minutes.

Shot peening:

The shot size and blast time must be chosen to ensure complete coverage of the inside of the springs.

Particular attention should be paid to the above in case of springs with small index and pitch.

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

- a) Range of tensile strength within one coil max. 60 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
- ¹⁾ End samples