

# Exera<sup>®</sup> cored medical wire

## Wire

## Datasheet

Exera<sup>®</sup> cored medical wire (SBCW) is a composite wire consisting of Exera<sup>®</sup> F562 medical wire CoCrMo alloy shell and a secondary alloy as the core material. The core material is typically pure silver (Ag) to promote increased conductivity relative to solid Exera<sup>®</sup> F562. However, other core materials such as platinum (Pt), gold (Au) and tantalum (Ta) can be selected in order to increase the radiopacity or provide other unique combinations of properties to the composite wire. The standard core dimension is 25% by area, however other core sizes can be considered.

The outer component is characterized by:

- Excellent corrosion resistance
- Excellent fatigue properties
- High strength combined with good ductility

The inner silver core provides:

- High electrical efficiency
- Electrical conductivity
- Low electrical resistance.

Exera<sup>®</sup> cored medical wire can be used for cochlear implants, pacemaker, defibrillator leads and varicose vein surgery devices.

Exera<sup>®</sup> F562 medical wire is in accordance with the following standards:  
ASTM F562-02

## Applications

Exera® cored medical wire is the preferred grade for composite wire for medical applications because of the highly favorable combination of excellent corrosion resistance, high strength and moderate conductivity.

Typical applications are lead wires for medical devices such as pacemakers, defibrillators and cochlear implants.

## Chemical composition (nominal) %

C	Si	Mn	P	S	Cr	Ni	Mo	Fe	Ti	B	Co
≤0.025	0.15	0.15	≤0.015	≤0.010	19.0-21.0	33.0-37.0	9.0-10.5	1.0	1.0	≤0.015	Bal

NB :The chemical composition in the table applies to the shell material only.  
Purity of core material to be specified by customer (Ag purity typically > 99.99%)

## Mechanical properties

The mechanical properties of Exera® cored medical wire will depend on the chemical composition of the core material, the cross sectional area of the core material and the temper (annealed, cold worked or cold worked and aged).

Standard tensile strength values in MPa for silver filled Exera® F562 as a function of cold worked and % cross sectional area (CSA) silver are given in the following table.

Note : A cold work percentage greater than 65% is not recommended for this material.

### Tensile Strength $R_m$ MPa

Silver CSA	0 % CW	20 % CW	30 % CW	40 % CW	50 % CW	60 % CW
25	1080	1380	1495	1570	1635	1695
30	1010	1320	1405	1485	1560	1615
35	940	1215	1300	1380	1450	1500
40	870	1130	1205	1275	1335	1385
45	800	1055	1130	1185	1225	1260

## Physical properties

The electrical resistance of Exera® cored medical wire depends on the selection of core alloy, cross sectional area of the core, temper and final size.

The nominal electrical resistance of 0.100 mm silver filled cored wire in the annealed and cold worked condition is given in the following table.

## Electrical resistance at 20°C – 0.100 mm silver filled SBCW ( $\Omega$ /meter)

% silver (Ag)	25	30	35	40	45
<b>Annealed</b>	7.52	6.32	5.45	4.80	4.28
<b>Cold worked</b>	7.88	6.64	5.73	5.04	4.50

The table below shows electrical resistivity (unit : ohm/m) of solid Exera® F562 versus Exera® cored medical wire at different common sizes as a function of silver content:

% silver (Ag)*	Diameter, mm					
	0.100	0.125	0.150	0.175	0.250	
0 - solid Exera® F562	2037.0	127.3	81.5	56.6	41.6	20.4
25	120.3	7.5	4.8	3.3	2.4	1.2
30	101.2	6.3	4.0	2.8	2.1	1.0
35	87.4	5.4	3.5	2.4	1.8	0.9
40	76.9	4.8	3.1	2.1	1.6	0.8
45	68.6	4.3	2.7	1.9	1.4	0.7

\* 25 % silver means 25% Ag filled Sandvik F562 version

## Forms of supply

The wire can be supplied in annealed, cold worked or cold worked and aged condition.

A smooth diamond drawn finish is provided at all size ranges and round wire or ribbon can be coated with an advanced polymer coating.

SCMW is typically supplied on plastic spools but other packaging methods are also available.

## Size range

Exera® cored medical wire (SCMW) is available in sizes ranging from 0.025 mm to 3 mm. Smaller and larger diameters can be supplied on request.

## Tolerances

The standard outside diameter tolerances for SCMW are given as a function of size range in the following list. Special tolerances are available on request.

OD range, mm	Tolerance, mm
0.0250-0.1780	$\pm 0.0025$

0.178-0.381	± 0.005
0.381-0.813	± 0.013
0.813-3.000	± 0.025

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