Material Data Sheet

Superelastic Nitinol Alloys*

	SE508ELI	SE508	SE506	SE510
PHYSICAL PROPERTIES				
Melting Point:	1310°C	1310°C	1310°C	1310°C
Density:	6.5 g/cm^3	6.5 g/cm^3	6.5 g/cm^3	6.5 g/cm^3
Electrical Resistivity:	82 µohm-cm	82 µohm-cm	82 µohm-cm	82 µohm-cm
Modulus of Elasticity:	41 - 75 GPa	41 - 75 GPa	41 - 75 GPa	41 - 75 GPa
Coefficient of Thermal Expansion:	11 X 10^{-6}/ °C	11 X 10^{-6}/ °C	11 X 10^{-6}/ °C	11 X 10^{-6}/ °C
MECHANICAL PROPERTIES				
Ultimate Tensile Strength:	≥ 1070 MPa	≥ 1070 MPa	≥ 1070 MPa	≥ 1070 MPa
Total Elongation (min):	≥ 10%	≥ 10%	≥ 10%	≥ 10%
SUPERELASTIC PROPERTIES				
Loading Plateau Stress @ 3%	≥ 380 MPa	≥ 380 MPa	~25% lower than SE508	~25% higher than SE508
Permanent Set (after 6% strain)	≤0.3%	≤0.3%	≤0.3%	≤0.3%
TRANSFORMATION TEMPERATURE				
Ingot Austenite Finish (A_f)	-25 to 5°C	-25 to 5°C	5°C to 25°C	-65 to -25°C
Finished Product (A_f)	-25 to 30°C	-25 to 30°C	10°C to 45°C	-65 to 10°C
COMPOSITION (Meets ASTM F2063 requirements)				
Nickel (nominal):	55.8 wt.%	55.8 wt.%	55.6 wt.%	56.0 wt.%
Titanium:	Balance	Balance	Balance	Balance
Oxygen:	≤ 0.01 wt.%	≤ 0.04 wt.%	≤ 0.04 wt.%	≤ 0.04 wt.%
Carbon:	≤ 0.005 wt.%	≤ 0.02 wt.%	≤ 0.02 wt.%	≤ 0.02 wt.%
Inclusion Area Fraction:	≤ 1.0%	≤ 2.8%	≤ 2.8%	≤ 2.8%
APPLICATIONS	SE508ELI is our ultrapure material for your most safety-critical applications. ELI has the fewest and smallest inclusions of any commercial Nitinol material.	SE508 is our flagship material with over two decades of proven success as the world's most implanted Nitinol material.	SE506 has a higher transformation temperature that results in a softer feel compared to SE508. Typical application is orthodontic archwires for a mild chronic force.	SE510 has a lower transformation temperature that results in a stiffer feel compared to SE508. Typical application is guidewires with ehnaced kink resistance.

* These values should only be used as guidelines for developing material specifications. Properties of Nitinol Alloys are strongly dependent on processing history and ambient temperature. The mechanical and superelastic properties shown here are typical for standard superelastic straight Nitinol at room temperature tested in uniaxial tension. Bending properties differ, and depend on specific geometries and applications. Modulus is dependent on temperature and strain. Certain shapes or product configurations may require custom specifications. Materials are also available in the cold-worked or annealed conditions.

CONFLUENT

Confluent Medical Technologies • 47533 Westinghouse Drive • Fremont, California 94539
(510)683-2000 • Fax:(510)683-2001 • sales@confluentmedical.com • confluentmedical.com

Material Data Sheet

Nitinol SE508 Wire*

PHYSICAL PROPERTIES

Melting Point:	2390°F	1310°C
Density:	0.234 lb/in^3	6.5 g/cm^3
Electrical Resistivity:	32 µohm-cm	82 µohm-cm
Modulus of Elasticity:	6-11 x 10^6 psi	41-75 x 10^3 MPa
Coefficient of Thermal Expansion:	6.1 X 10^{-6}/ °F	11 X 10^{-6}/ °C

MECHANICAL PROPERTIES

Ultimate Tensile Strength (UTS):	160-200 x 10^3 psi	1100-1150 MPa
Total Elongation:	10%	10%

SUPERELASTIC PROPERTIES

Loading Plateau Stress @ 3% strain (min):	65x10^{3}psi	450 MPa
Permanent Set (after 6% strain) (max):	0.2%	0.2%
Transformation Temperature (A_f):	41 to 64°F	5 to 18°C

COMPOSITION

(Meets ASTM F2063 requirements)

Nickel (nominal):	55.8 wt.%
Titanium:	Balance
Oxygen (max):	0.04 wt.%
Carbon (max):	≤ 0.02 wt.%

* These values should only be used as guidelines for developing material specifications. Properties of Nitinol Alloys are strongly dependent on processing history and ambient temperature. The mechanical and superelastic properties shown here are typical for standard superelastic straight Nitinol at room temperature tested in uniaxial tension. Bending properties differ, and depend on specific geometries and applications. Modulus is dependent on temperature and strain. Certain shapes or product configurations may require custom specifications. Materials are also available in the cold-worked or annealed conditions.

*All values are typical, at room temperature. SE508 is a binary alloy suitable for superelastic applications at room and/or body temperature.

CONFLUENT

Confluent Medical Technologies • 47533 Westinghouse Drive • Fremont, California 94539
(510)683-2000 • Fax:(510)683-2001 • sales@confluentmedical.com • confluentmedical.com

Material Data Sheet

Nitinol SE508 Tubing*

PHYSICAL PROPERTIES		
Melting Point:	2390°F	1310°C
Density:	0.234 lb/in^3	6.5 g/cm^3
Electrical Resistivity:	32 µohm-cm	82 µohm-cm
Modulus of Elasticity:	6-11 x 10^6 psi	41-75 x 10^3 MPa
Coefficient of Thermal Expansion:	6.1 X 10^{-6}/ °F	11 X 10^{-6}/ °C
MECHANICAL PROPERTIES		
Ultimate Tensile Strength (UTS):	155 x 10^3 psi	1070 MPa
Total Elongation:	10%	10%
SUPERELASTIC PROPERTIES		
Loading Plateau Stress @ 3% strain (min):	55x10^{3}psi	380 MPa
Permanent Set (after 6% strain) (max):	0.3%	0.3%
Transformation Temperature (A_f):	<59°F	5 to 18°C
COMPOSITION		
(Meets ASTM F2063 requirements)		
Nickel (nominal):	55.8 wt.%	
Titanium:	Balance	
Oxygen (max):	0.04 wt.%	
Carbon (max):	≤ 0.02 wt.%	

* These values should only be used as guidelines for developing material specifications. Properties of Nitinol Alloys are strongly dependent on processing history and ambient temperature. The mechanical and superelastic properties shown here are typical for standard superelastic straight Nitinol at room temperature tested in uniaxial tension. Bending properties differ, and depend on specific geometries and applications. Modulus is dependent on temperature and strain. Certain shapes or product configurations may require custom specifications. Materials are also available in the cold-worked or annealed conditions.

*All values are typical, at room temperature. SE508 is a binary alloy suitable for superelastic applications at room and/or body temperature.

CONFLUENT

Confluent Medical Technologies • 47533 Westinghouse Drive • Fremont, California 94539
(510)683-2000 • Fax:(510)683-2001 • sales@confluentmedical.com • confluentmedical.com

Material Data Sheet

Nitinol SE495 Wire*

PHYSICAL PROPERTIES

Melting Point:	2390°F	1310°C
Density:	0.234 lb/in^3	6.5 g/cm^3
Electrical Resistivity:	30 µohm-in	76 µohm-cm
Modulus of Elasticity:	4-6 x 10^6 psi	28-41 x 10^3 MPa
Coefficient of Thermal Expansion:	3.7 X 10^{-6}/ °F	6.6 X 10^{-6}/ °C

MECHANICAL PROPERTIES

Ultimate Tensile Strength (UTS):	160 x 10^3 psi	1100 MPa
Total Elongation:	10%	10%

SUPERELASTIC PROPERTIES

Loading Plateau Stress @ 3% strain (min):	15 x 10^{3}psi	100 MPa
Permanent Set (max):	8.0%	8.0%
Transformation Temperature (A_f):	140°F	60°C

COMPOSITION

(Meets ASTM F2063 requirements)

Nickel (nominal):	54.5 wt.%
Titanium:	Balance
Oxygen (max):	0.05 wt.%
Carbon (max):	0.02 wt.%

* These values should only be used as guidelines for developing material specifications. Properties of Nitinol Alloys are strongly dependent on processing history and ambient temperature. The mechanical and superelastic properties shown here are typical for standard superelastic straight Nitinol at room temperature tested in uniaxial tension. Bending properties differ, and depend on specific geometries and applications. Modulus is dependent on temperature and strain. Certain shapes or product configurations may require custom specifications. Materials are also available in the cold-worked or annealed conditions.

*All values are typical, at room temperature. SM495 is a binary alloy suitable for shape memory applications with transformation requirements greater than 60°C.

CONFLUENT

Confluent Medical Technologies • 47533 Westinghouse Drive • Fremont, California 94539
(510)683-2000 • Fax:(510)683-2001 • sales@confluentmedical.com • confluentmedical.com