

Shape Memory Nitinol Alloys*

SM495

SM500

PHYSICAL PROPERTIES

Melting Point:	1310°C	1310°C
Density:	6.5 g/cm ³	6.5 g/cm ³
Electrical Resistivity:	76 μohm-cm	76 μohm-cm
Modulus of Elasticity:	28 – 41 GPa	28 – 41 GPa
Coefficient of Thermal Expansion:	6.6 x 10 ⁻⁶ / °C	6.6 x 10 ⁻⁶ / °C

MECHANICAL PROPERTIES

Ultimate Tensile Strength:	≥ 1070 MPa	≥ 1070 MPa
Total Elongation:	≥ 10%	≥ 10%

SHAPE MEMORY PROPERTIES

Loading Plateau Stress @ 3%	≥ 100 MPa	≥ 100 MPa
Shape Memory Strain	≤ 8.0%	≤ 8.0%

TRANSFORMATION TEMPERATURE

Ingot Austenite Finish (A _f)	75 to 110°C	45°C to 80°C
Finished Product A _f	50 to 80°C	30°C to 50°C

COMPOSITION (Meets ASTM F2063 requirements)

Nickel (nominal):	54.5 wt.%	55.0 wt.%
Titanium:	Balance	Balance
Oxygen:	≤ 0.05 wt.%	≤ 0.05 wt.%
Carbon:	≤ 0.02 wt.%	≤ 0.02 wt.%
Inclusion Area Fraction:	≤ 2.8%	≤ 2.8%

APPLICATIONS

SM495 is our standard shape memory wire that is malleable at room temperature and returns to shape in boiling water or autoclave. Typical applications for the material are actuators and surgical tools.

SM500 exhibits shape memory such that it is malleable at room temperature and returns to shape just above body temperature. Typical applications for SM500 are for dental products such as archwires and springs.

* 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 shape memory properties shown here are typical for standard shape memory 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.

