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Nitinol **actuator wire datasheet**
0.3 mm [0.0118 in] 90°C material

Welcome

In this sheet, you will find specific electrical and actuation characteristics for 0.3 mm [0.0118 in] 90°C actuator wire. If your application requirements fall outside of these performance characteristics, contact our **Engineering team** to discuss possibilities for meeting your material needs.

Material properties

Alloy type	NiTi #5
Chemical composition	Per ASTM F2063
Density	6.45 g/cm^3

Wire dimensions

	Minimum	Typical	Maximum
Diameter	0.292 mm [0.0115 in]	0.300 mm [0.0118 in]	0.308 mm [0.0121 in]

Measured at room temperature under no stress.

Absolute ratings and operating conditions

	Minimum	Typical	Maximum
Environmental temperature	-40°C [-40°F]	20°C [68°F]	60°C [140°F]*
Wire temperature	-40°C [-40°F]	-	150°C [302°F]
Loading force**	1.41 N [0.317 lb]	10.58 N [2.38 lb]**	28.22 N [6.34 lb]
Available stroke	0.5%	4%	5%

**Based on the M_f temperature corresponding to the typical loading force condition. Above this temperature, the material will not be able to cool enough to repeatably transform back to martensite.*

***Typical loading force value is for optimized stroke and fatigue performance. Application loads at the min and max can also be used depending on the design requirements of the actuator.*

If one or more of these typical conditions is exceeded, there is significant risk of damage to the material and performance characteristics listed may no longer apply.

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Electrical characteristics

Approximate resistance (Measured at room temperature under no applied load)	13.39 Ω/m [0.34 Ω/in]
Recommended applied current	1.1 A

Note: Use of constant current to heat the material is highly recommended, but any means (constant voltage, PWM, AC, etc.) may be used so long as appropriate care is taken. Recommended values above are given for wire operating in a quiescent air environment. Other environments may require more or less current.

Performance curves

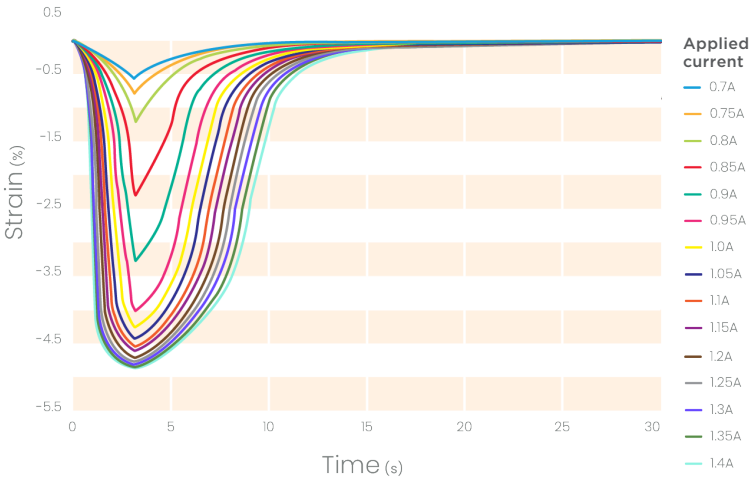
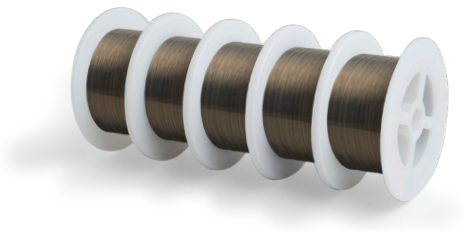


Figure 1. Strain (%) vs. time (s) at multiple applied currents for 0.3 mm [0.0118 in] 90°C actuator wire. Environmental temperature = 20°C [68°F], Load = 10.58 N [2.38 lb], 3 second pulse.



Engineering note

Testing done in quiescent air in controlled-temperature chamber with the wire in the horizontal position. Cooling times do not take into account the last 0.5% strain.

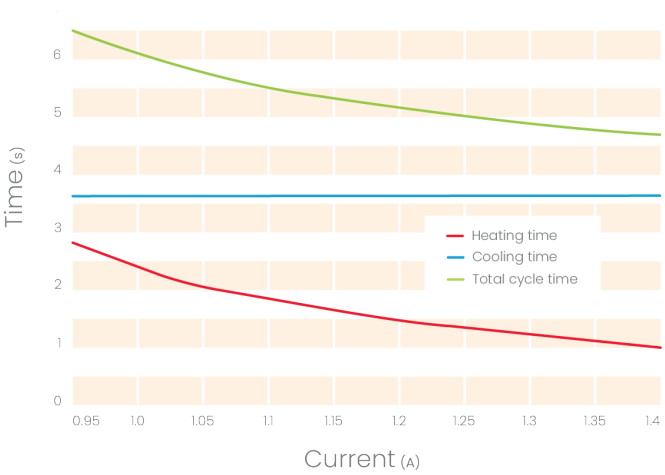


Figure 2. Heating/cooling/total cycle time at multiple currents for 0.3 mm [0.0118 in] 90°C actuator wire. Enviromental temperature = 20°C [68°F], Load = 10.58 N [2.38 lb], 3.5% strain.

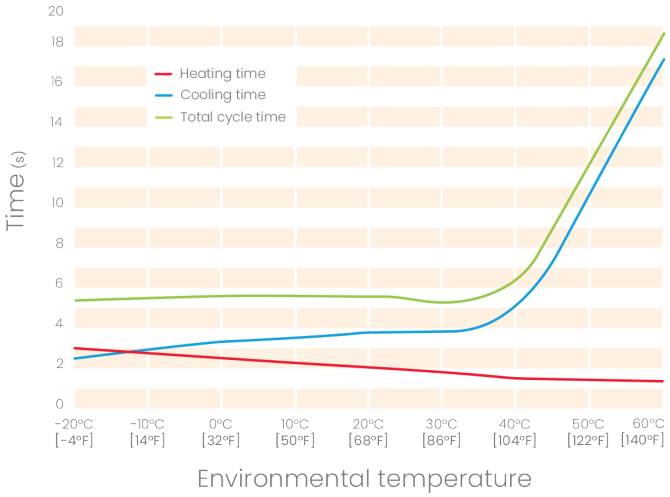


Figure 3. Heating/cooling/total cycle time at multiple environmental temperatures for 0.3 mm [0.0118 in] 90°C actuator wire. Current = 1.1 A, Load = 10.58 N [2.38 lb], 3.5% strain.

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Actuation characteristics

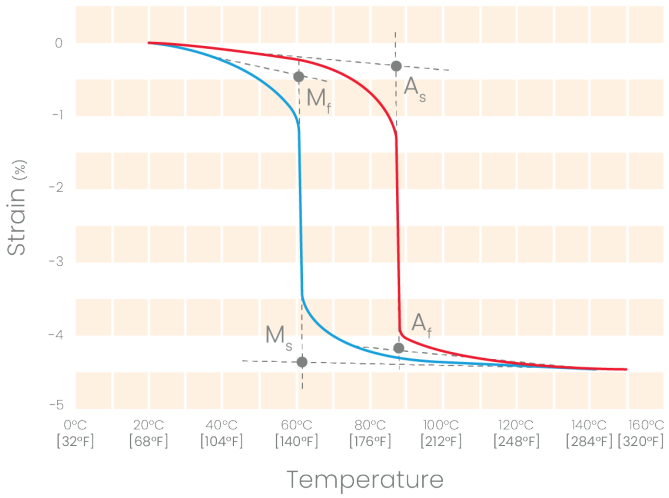

Figure 4. Typical strain vs. temperature curve labeled with typical parameters. Heating curve in red, cooling curve in blue.

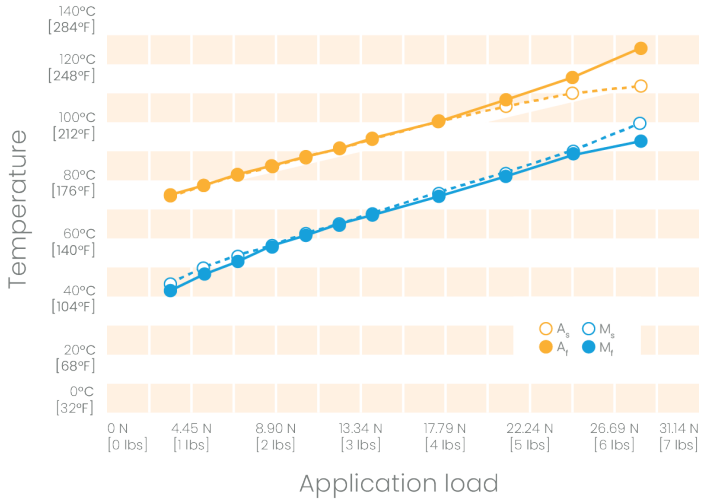

Figure 5. Approximate transformation temperatures under a given load for 0.3 mm [0.0118 in] 90°C actuator wire.

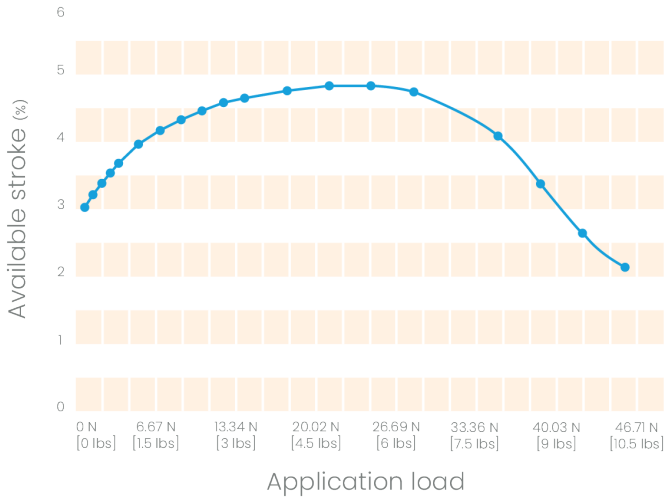

Figure 6. Approximate stroke under a given load for 0.3 mm [0.0118 in] 90°C actuator wire.

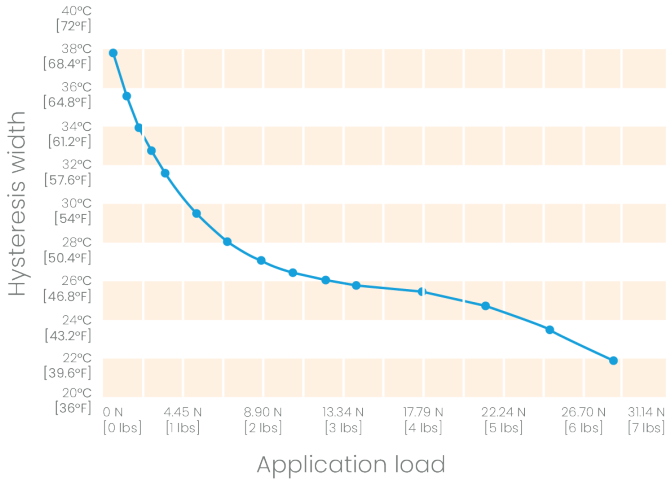

Figure 7. Approximate hysteresis width under a given load for 0.3 mm [0.0118 in] 90°C actuator wire.

We can help

Occasionally, applications have requirements that exceed the characteristics listed here. Our Engineers are happy to discuss with you what possibilities exist for supplying material to enable your application. Properties of the wire may change after repeated cycling.