



Welcome

In this sheet, you will find specific electrical and actuation characteristics for 0.25 mm [0.0098 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	0.242 mm [0.0095 in]	0.250 mm [0.0098 in]	0.258 mm [0.0101 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**	0.97 N [0.22 lb]	7.30 N [1.64 lb]**	19.47 N [4.38 lb]
Available stroke	0.5%	4%	5%

**Based on the M_s temperature corresponding to the typical loading force condition. Above this temperature, the material will not be able to cool enough to repeatedly 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.



Electrical characteristics

Approximate resistance

(Measured at room temperature under no applied load)

19.7 Ω/m [0.50 Ω/in]

Recommended applied current

0.85 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

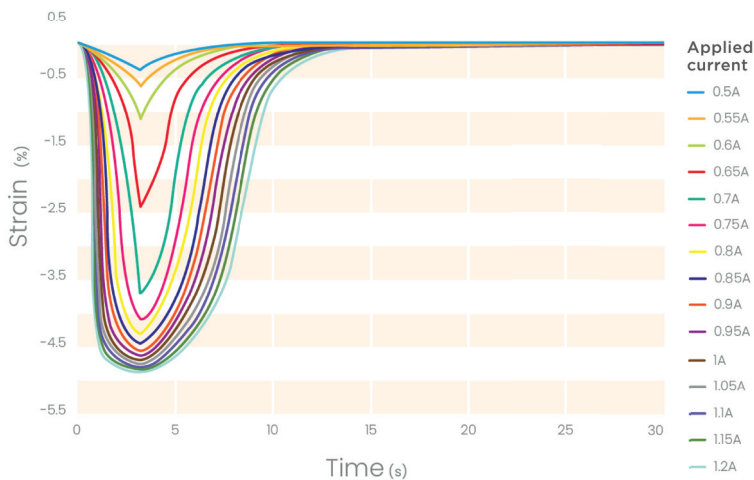
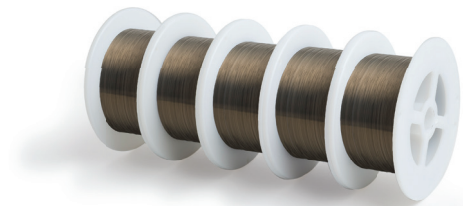


Figure 1. Strain (%) vs. time (s) at multiple applied currents for 0.25 mm [0.0098 in] 90°C actuator wire. Environmental temperature = 20°C [68°F], Load = 7.30 N [1.64 lb], 3 second pulse.



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.

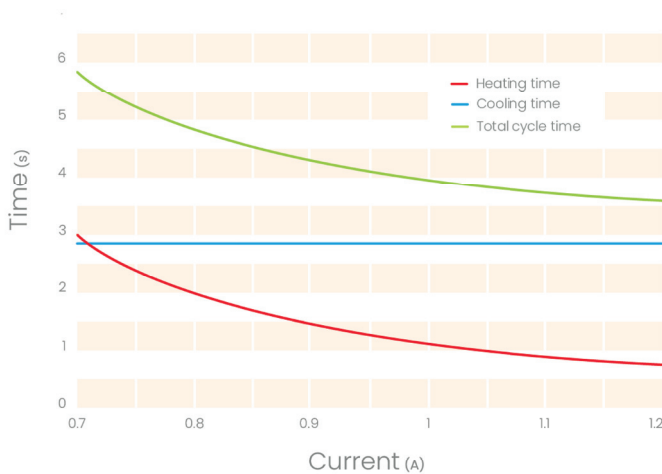


Figure 2. Heating/cooling/total cycle time at multiple currents for 0.25 mm [0.0098 in] 90°C actuator wire. Environmental temperature = 20°C [68°F], Load = 7.30 N [1.64 lb], 3.5% strain.

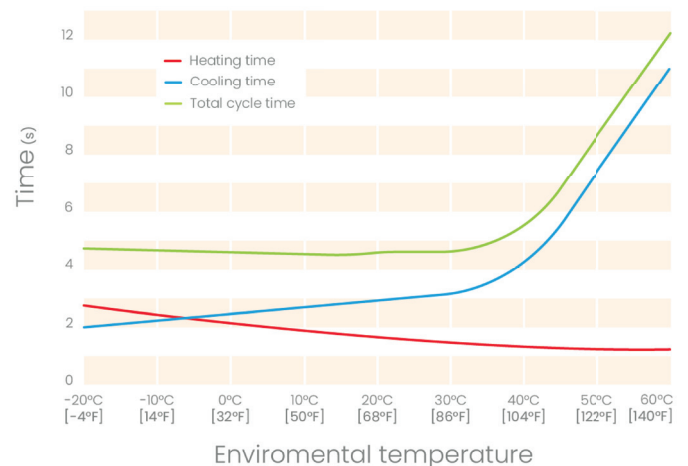


Figure 3. Heating/cooling/total cycle time at multiple environmental temperatures for 0.25 mm [0.0098 in] 90°C actuator wire. Current = 0.85 A, Load = 7.30 N [1.64 lb], 3.5% strain.



Actuation characteristics

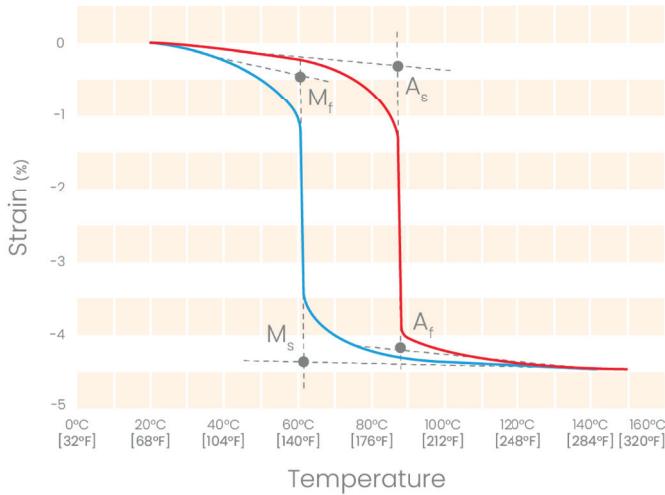


Figure 4. Typical strain vs. temperature curve for 90°C actuator wire. Heating curve in red, cooling curve in blue.

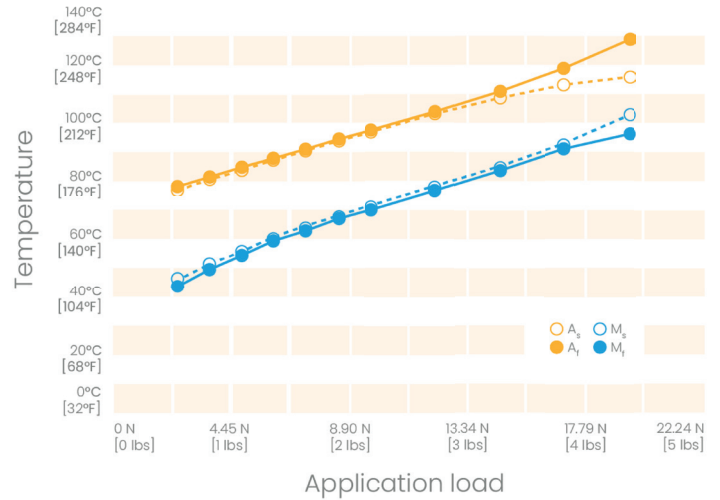


Figure 5. Approximate transformation temperatures under a given load for 0.25 mm [0.0098 in] 90°C actuator wire.

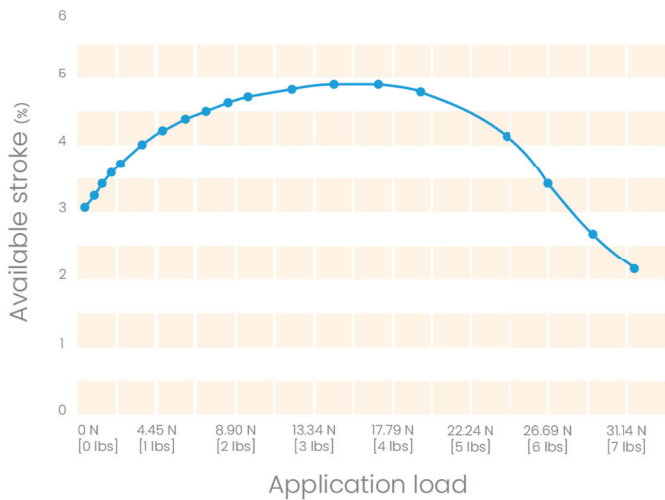


Figure 6. Approximate stroke under a given load for 0.25 mm [0.0098 in] 90°C actuator wire.

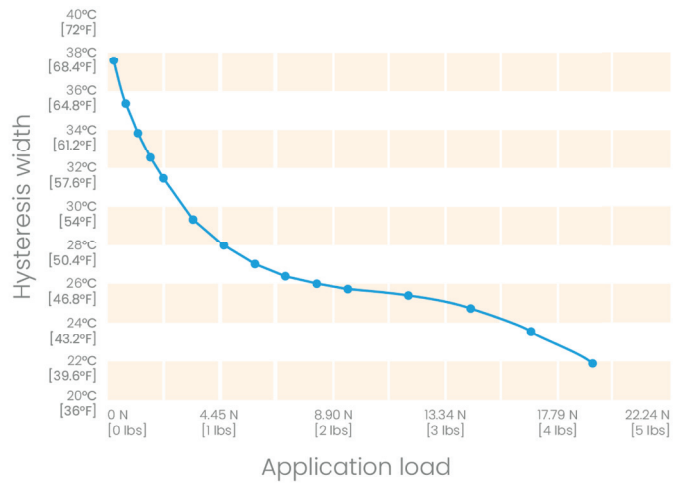


Figure 7. Approximate hysteresis width under a given load for 0.25 mm [0.0098 in] 90°C actuator wire.

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.

© 2024 Fort Wayne Metals Research Products, LLC - All rights reserved.

Fort Wayne Metals makes no warranty as to design, suitability, merchantability, fitness for any particular purpose, or effectiveness.

As a custom manufacturer, we require that our customers specify their preferred products. As such, any uses and applications given above should not be considered Fort Wayne Metals' recommendations.

THIS DATASHEET IS FOR INFORMATIONAL PURPOSES ONLY, PROVIDED 'AS-IS' AND WITH ALL FAULTS, AND FORT WAYNE METALS DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS. YOU ARE SOLELY RESPONSIBLE FOR SELECTING THE APPROPRIATE PRODUCTS FOR YOUR END APPLICATION. FORT WAYNE METALS DISCLAIMS RESPONSIBILITY FOR, AND YOU WILL INDEMNIFY FORT WAYNE METALS AND ITS REPRESENTATIVES AGAINST, ANY CLAIMS, DAMAGES, COSTS, LOSSES, AND LIABILITIES ARISING OUT OF YOUR USE OF THESE RESOURCES.