



Actuator wire

Leverage the power of shape memory for reliable performance

Small, light,
and quiet



Consistent,
repeatable results



... cameras

... support)

Nitinol actuators

Imagine a wire able to perform work – such as opening a valve, lifting an object, or pulling a load. Now visualize that same wire repeating the same work over and over again – quietly and in a small space. That is the power behind Nitinol actuator technology.

We've applied our more than 30 years of Nitinol processing experience toward developing this next-generation material. It can help advance the material performance of conventional or emerging applications across automotive, industrial, aerospace markets.

Understanding the benefits

Nitinol's unique properties allow our actuator wire to achieve a high power-to-weight ratio, meaning it has the ability to move relatively substantial loads in relation to its small footprint. When compared to more traditional actuator technologies, actuator wire is smaller, lighter, quieter, and can be longer-lasting. Actuator wire is also very reliable: if used under the recommended parameters, it can sustain millions of actuation cycles. Additionally, you can choose to have your actuator wire arrive on a spool for easier processing or have custom crimps and components added.

Design specifications

There are many variables to consider when using actuator wire in your applications. Your Sales Representative can help get you in touch with a member of our Engineering team to discuss your desired material specifications.

Product forms and capabilities

In addition to actuator wire, you can take advantage of our additional processing and testing capabilities to further enhance the performance of your application. Reach out to your Sales Representative for more information.

MECHANICAL ASSEMBLY consisting of crimps, fittings, and specialized parts.

THERMO-MECHANICAL TESTING

- › **ASTM E3097** compliant thermal characterization under stress
- › **Variable load** with spring simulation thermal characterization
- › **Material electrical response** in various environmental temperatures

How it works

Leveraging Nitinol's shape memory ability to cycle between two different material phases, we expertly apply our advanced processing capabilities to "train" the wire, ultimately providing consistency and reliability in your application. When actuator wire is heated or an electrical current is applied, it contracts, reverting back to its original, unstretched shape. This contraction of the wire causes it to perform a task, such as pulling a load. When the wire cools, it elongates again, enabling the cycle to be repeated time and time again.

Size ranges and operating parameters

Actuator wire is available on a spool, in various size ranges and actuation temperatures. Use our actuator calculator found at fwmetals.com/resources and the chart below to explore possibilities.

Product	Size range	A _s	Recommended application stress	Hysteresis width
Actuator wire on a spool	0.0762 mm - 0.5842 mm [0.003 in - 0.023 in]	70 °C - 90 °C [158 °F - 194 °F]	100 MPa - 150 MPa [14.5 ksi - 21.75 ksi]	30 ± 5 °C [54 ± 9 °F]

A_s, hysteresis width, and stroke based on 150 MPa application stress. Recommended application stress values are for maximized stroke performance and fatigue life. Application stresses outside of this range can also be used depending on the design requirements of the actuator wire.

While we provide standard size ranges and operating parameters as a starting point, we're continuously looking for new ways to innovate. If you are interested in something outside what is listed, please contact your Sales Representative to discuss possibilities.

Typical end uses

Actuator wire is often used in industries with small spaces and where lightweight devices are required, such as:

- › Locking/latching systems
- › Vents/valves
- › Insulin pumps
- › Optical image stabilization in smartphone cameras
- › Safety relief valve for fire protection
- › Interior comfort systems (lumbar support)



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LOCATIONS AROUND THE WORLD

Global Headquarters
Fort Wayne, Indiana, U.S.A.

European Headquarters
Castlebar, Co. Mayo, Ireland

Advanced Materials Development
Columbia City, Indiana, U.S.A.

International Sales Support
Shanghai, China
Augsburg, Germany
Potheri Chennai, India
Savyon, Israel
Kobe, Japan
Seoul, Korea

U.S.A. Sales Support
San Mateo, California
Ridgefield, Connecticut
Chanhassen, Minnesota

Find your Sales Representative
at fwmetals.com/find-your-rep



FORT WAYNE METALS

Turning knowledge into solutions.®

9609 Ardmore Avenue
Fort Wayne, Indiana 46809

PHN 260.747.4154

FAX 260.747.0398

EMAIL info@fwmetals.com