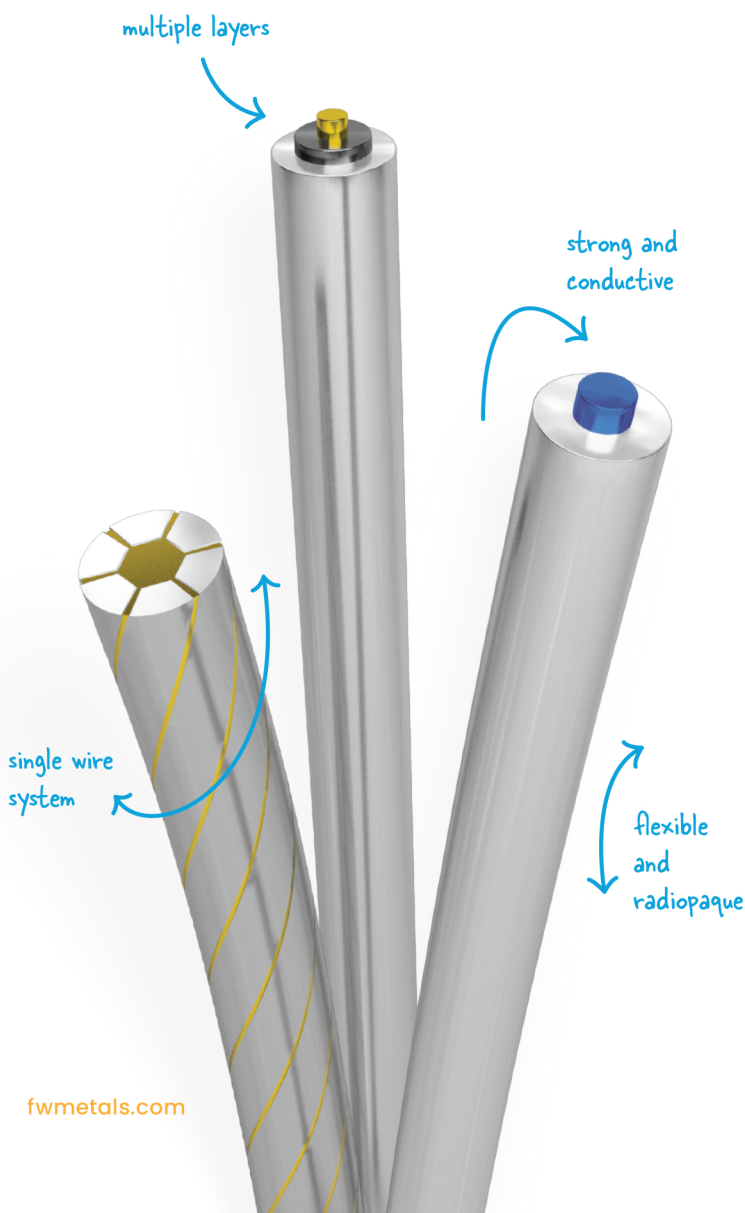




Composite wire

Integrated materials
for optimized performance



Exploring composite wire

Composite wires combine the properties of dissimilar materials into a single construction. DFT® wire offers a core material fully enclosed in a sheath, while DBS® wire strands the sheath material around a core. By leveraging the desirable properties of two materials, and choosing between two distinct composite wire options, you can create the best solution for your application.

DBS® wire

DBS® wire is made by stranding wires of one alloy around a core of a different material. The outer stranded wire provides strength while the core material typically offers greater flexibility and conductivity. When we draw DBS® wire, the pressure causes the core material to integrate with the stranded outer wire, meaning parts of the core material will be exposed. Coated DBS® wires can be used to provide insulation for good biocompatibility.

Sizes from 0.025 mm to 3.175 mm [0.001 in to 0.125 in]

SHEATH MATERIALS

- › **316LVM:** uniform chemistry, improved microcleanliness, and can be processed to improve ductility or corrosion resistance
- › **35N LT™ alloy:** enhanced fatigue life, strength, and corrosion resistance
- › **Stainless steel:** strength and corrosion resistance

CORE MATERIALS

- › **Platinum:** radiopacity, other imaging contrast, moderate electrical conductivity
- › **Silver:** electrical conductivity

DBS® wire – typical end uses

- › Applications requiring solderability
- › Applications requiring strength and conductivity
- › Conductors subject to cyclic bending
- › Electrocautery conductors
- › High fatigue conductor applications
- › High frequency conductors
- › Pacemaker leads

Product forms and capabilities

You can further customize your composite wire by taking advantage of our additional processing capabilities.

COATINGS to provide electrical insulation or chemical separation

FLAT WIRE wire with a rectangular cross section

MECHANICAL ASSEMBLY of crimps, fittings, and specialized parts

NDR® WIRE greater fatigue life without altering the physical properties of a material

**Shape setting applies to DFT® wire only.*

DFT® wire

This type of wire combines the properties of dissimilar materials in a single wire system. The outer sheath provides properties such as good biocompatibility, strength, superelasticity, or another desirable property, while protecting the core material, that provides properties such as conductivity or radiopacity. An enormous amount of force is imparted during processing, which forms a mechanical bond between the two materials. This means that the material is metallurgically sound — two materials become one.

SPECIFICATIONS

- › Sizes from 0.017 mm to 0.320 mm [0.0007 in to 0.126 in] or smaller depending on the constituents
- › Standard core material between 10% and 41%, depending on material, custom fill ratios considered upon request

SHEATH MATERIALS

- › **35N LT™:** enhanced fatigue life, strength, and corrosion resistance
- › **FWM™ 1058:** high strength and corrosion resistance
- › **MP35N®:** high fatigue life, strength, and corrosion resistance
- › **Nitinol:** superelastic and shape memory
- › **Platinum:** oxidation-corrosion resistance and bonding to platinum pins for assembly
- › **Platinum alloys:** oxidation-corrosion resistance and bonding to platinum pins for assembly
- › **Titanium:** high strength, high corrosion resistance, and good biocompatibility

CORE MATERIALS

- › **Gold:** electrical conductivity, radiopacity
- › **Nitinol:** guidewire tip flexibility and steerability
- › **Platinum:** radiopacity, other imaging contrast, moderate electrical conductivity
- › **Silver:** electrical conductivity
- › **Tantalum:** radiopacity, moderate electrical conductivity
- › **Titanium-Beta:** guidewire tip flexibility

DFT® wire – typical end uses

- › Aneurysm coils
- › LVAD driveline cables
- › Neurovascular stents
- › Pacing leads
- › Retrieval baskets
- › Shock coils
- › Vascular stents

Understanding naming conventions

The naming convention for composite wire follows this logic: you'll see the tube material listed first, followed by the DFT® wire or DBS® wire designation, and lastly the fill ratio and core material, for example, 35N LT™-DFT®-28%Pt. The fill ratio refers to the amount of core material in a construction. A fill ratio of 28%Pt means that the DFT® wire is 72% 35N LT™ alloy sheath material and the platinum core makes up the remaining 28% of the construction's cross-sectional area.

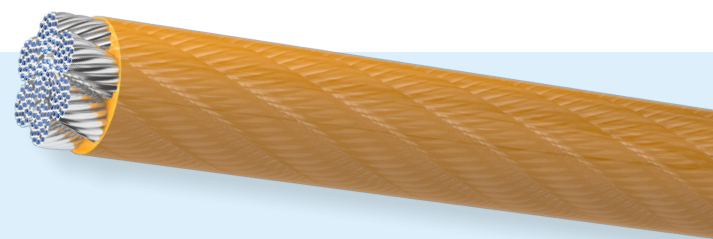
Better visibility for Nitinol

While Nitinol's superelastic properties offer versatility in many applications, it can be hard to see under X-ray. Nitinol DFT® wire can be designed to increase radiopacity by customizing the fill ratio of a denser core material. You can speak with our Engineering team to discuss how the fill ratio of DFT® wire impacts other mechanical properties.

STANDARD FILL RATIOS

- › NiTi#1-DFT®-10%Pt*
- › NiTi#1-DFT®-20%Pt*
- › NiTi#1-DFT®-30%Pt*
- › NiTi#1-DFT®-10%Ta
- › NiTi#1-DFT®-30%Ta
- › NiTi #1-ELI-DFT®-10%Pt
- › NiTi #1-ELI-DFT®-20%Pt
- › NiTi #1-ELI-DFT®-30%Pt
- › NiTi #2-DFT®-10%Pt
- › NiTi #2-DFT®-20%Pt
- › NiTi #2-DFT®-30%Pt

** Included grade/fill ratios for Nitinol DFT® flat wire.*



ROUND WIRE wire with a circular cross section

SHAPE SETTING* custom Nitinol wire constructions that can deform and return to a set shape

SLT® WIRE straightness, grindability, and torque transmission to help streamline production

STRANDS AND CABLES in complex constructions for advanced applications

Understanding the differences

The illustrations below showcase the differences between DBS® wire and DFT® wire. These two product forms can be customized to fit a variety of needs, allowing you to design the right composite wire for your application.



DBS® wire consists of wires stranded around an alternate material core and drawn together to become a metallurgically sound single-wire system.



DFT® wire is made of a core wire fully enclosed in a tubular sheath of a different material and drawn together into a metallurgically sound single-wire system.

Nitinol DFT® flat wire

The more clearly healthcare professionals can see a device in an X-ray, the better equipped they are to provide medical care. Medical providers have long dealt with limited visibility of devices in X-ray imaging. Nitinol wire, while offering shape memory and superelasticity, often requires radiopaque markers to be visible. Nitinol DFT® wire enables the entire length of the material to be seen in an X-ray, helping medical providers to better detect and treat medical issues. In flat wire form, the material increases radiopacity while retaining equivalent thickness.





Scan to visit our website for additional information on this topic and more.

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