Range of Products

Materials

- Low Temperature Superconductors
- High Temperature Superconductors
- Cuponal™
- Metal Composites
- Customized Wire Products

Devices

- Superconducting Magnets & Devices
- Normal and Superconducting Accelerator Cavities
- Linear Accelerators and Particle Sources
- Circular Accelerators and Beamlines
- Synchroton Instrumentation & X-ray Optics

Low-Tc Superconductor wires

- NbTi and NbSn

Bruker Energy & Supercon Technologies

info@bruker-est.com
www.bruker-est.com

Low Temperature Superconductors (LTS)

We manufacture and deliver several ten-thousand miles of LTS wire annually.

NbTi Superconductors

NbTi superconductors are high performance superconductors and the workhorse of the world's superconductor industry. Their major market is clinical MRI, with well over 1,000,000 km of NbTi wire produced to date. Other large markets include Nuclear Magnetic Resonance (NMR) Spectroscopy and particle accelerators for high energy physics research.

Nb3Sn Superconductors

Nb3Sn superconductors are high performance superconductors and the gold standard of the world's superconductor industry. Their distinguishing characteristic among LTS conductors is the extraordinary performance ultra high magnetic fields.
They are indispensable for the high field magnets in Nuclear Magnetic Resonance (NMR) and Mass Spectroscopy (FTMS), which today routinely exceed 20 Tesla. Large fusion projects also rely on Nb3Sn for magnets exceeding magnetic flux densities of 13 Tesla, paving the way to a future with clean and abundant energy.

Customized Superconductors

Our customized products include superconductors with highly specialized performance characteristics. We have delivered specially alloyed or reinforced conductors and condutors with ultra thin filaments to some of the most demanding customers world wide. Between 2000 and 2005 we had delivered over 40,000 km of thin filament NbTi conductors to the LHC particle accelerator project at CERN. By 2007, we delivered over 60 km of aluminum clad NbTi cables with a total of 15,000 kilometers of NbTi wire to the Euratom 7-X Wendelstein 7-AS fusion project. For the ITER fusion project we are producing nearly 8.000 km of NbSn wire.

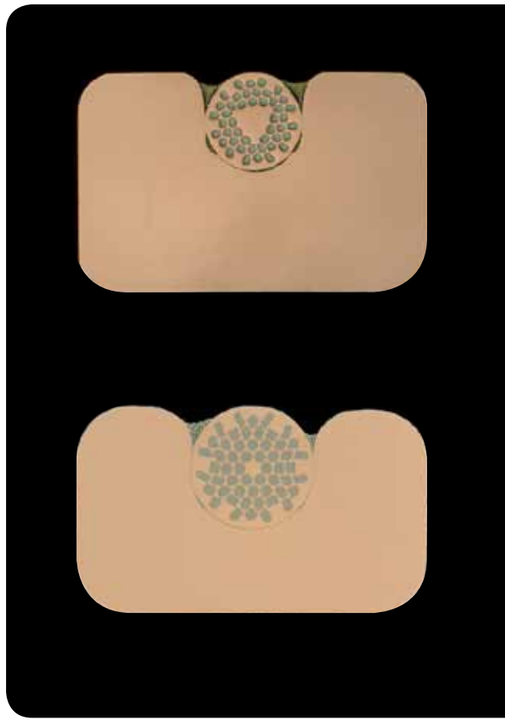
Our LTS products are used in a wide range of applications, including clinical MRI and ultra high field NMR as well as energy storage, high energy physics and fusion research, addressing the world's energy needs.

NbTi for MRI application

High-Cu fraction wires

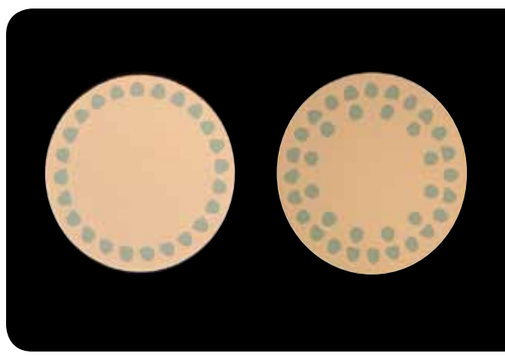
Wire in Channel

a x b = 1.10 x 1.70 mm² to 2.15 x 4.25 mm²
Cu : NbTi = 20



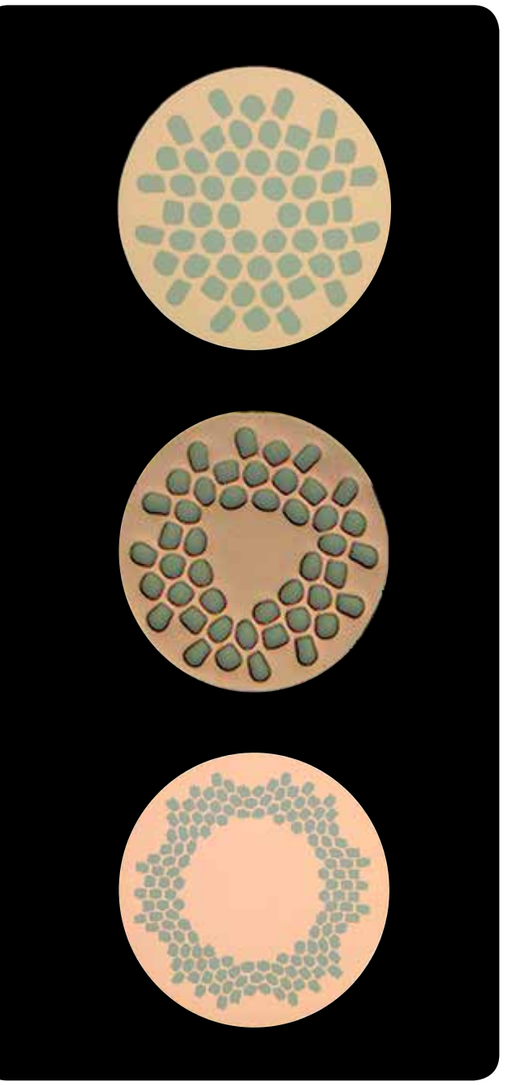
Monolith wires

Number of filaments 17 to 36
Cu : NbTi = 4 to 10



NbTi for NMR and other applications

Low-Cu fraction wires



Monolith wires

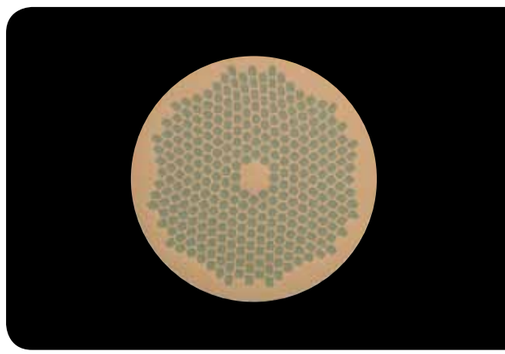
- Number of filaments = 45 to 150
- Cu : NbTi = 1.3 to 2.6

NbTi for High Energy Physics application

Special wires

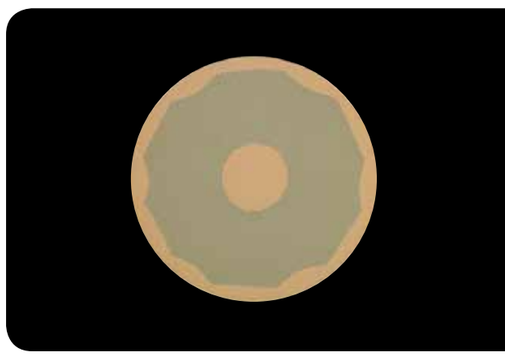
ATLAS strand

- F306 Ø 1.30 mm
- Cu : NbTi = 1.15
- Filament diameter ≈ 50 µm
- Ic = 1700 A @ 5 T; 4.2 K



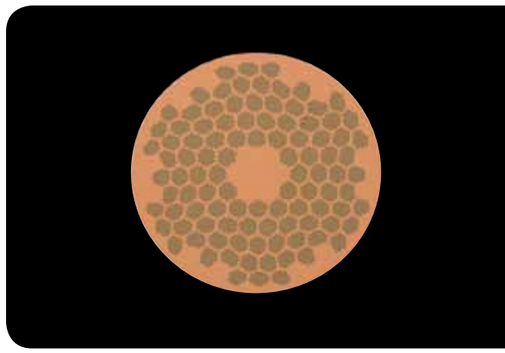
LHC MQY quadrupole strand

- F6360 Ø 0.735 mm
- Cu : NbTi = 1.25
- Filament diameter ≈ 6 µm
- Ic = 550 A @ 5 T; 4.2 K



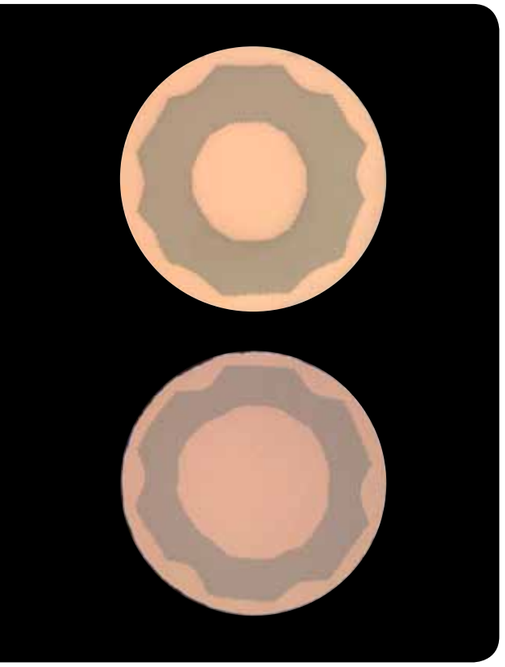
LHC dipole strand

- F8670 Ø 1.065 mm
- Cu : NbTi = 1.65
- Filament diameter ≈ 7 µm
- Ic = 540 A @ 7 T; 4.2 K



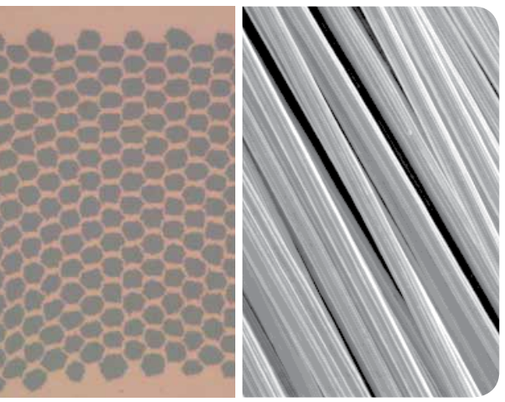
NbTi for Fusion application

Fine filaments PF wires



Wire type 1

- Cu : NbTi ≈ 1.65
- Number of filaments = 4185
- wire diameter = 0.73 mm
- Filament diameter ≈ 8 µm



Wire type 2

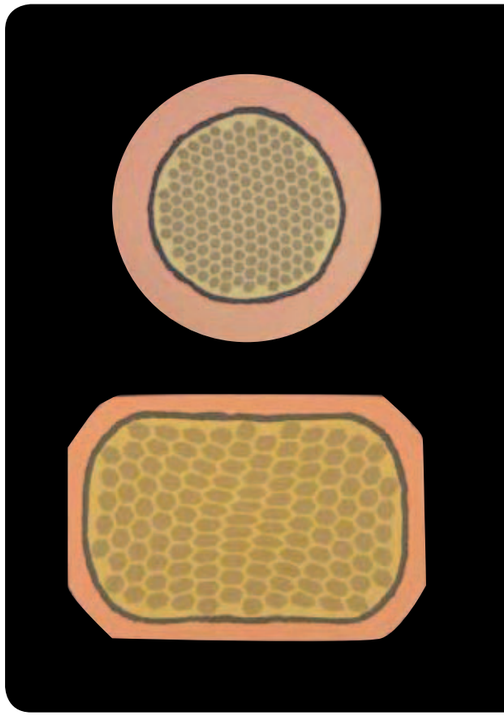
- Cu : NbTi ≈ 2.35
- Number of filaments = 3282
- wire diameter = 0.73 mm
- Filament diameter ≈ 8 µm
- Jc NbTi ≈ 3100 A/mm^2 @ 5T, 4.2K

NbSn wires for High Magnetic Field application

Bronze process wires and Powder-in-Tube process wires

Bronze

- Round and rectangular wires 0.8 mm² to 7 mm²
- Number of filaments 4000 to > 100000
- Cu fraction 20 % to 60 %
- Nb or Ta barrier fraction 6 % to 18 %
- Recommended magnetic field range 12 T to 23.5 T



PIT (Powder-in-Tube) wire

- Round wires Ø 0.6 mm to 1.7 mm
- Number of filaments 54 to 288
- Cu fraction ≈ 50%
- Recommended magnetic field range 12 T to > 20 T