

MINITUBES

New Technology

Innovative tube manufacturing process
combining cost efficiency and tight tolerances

Many medical devices require high precision small diameter metal tubing. Besides the classic stainless steel hypodermic products, there is a need for affordable specialty tubing from various alloys with customized specifications: Co-Cr for high strength applications, MRI compatible materials, specific surface or tensile properties...

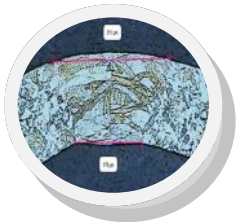
Minitubes has developed a high performance metal tubing process with high performance alloys capability, for specialty medical applications.

Minitubes value proposition at an affordable cost



- **Opening new possibilities for device performance with improved functional properties:** *shape set, column strength, kink, torquability, deflation speed, tip penetration effort...*
- **Through small metal tubing in a wider alloy choice:** *SS, Co-Cr, Inconels, Ni alloys, Ti alloys...*
- **Exploring material full potential within tight specifications:** *dimensional, mechanical properties, microstructure, surface finish, hardness...*

Minitubes recipe



Dedicated product & process development team, from samples to validation & volume ramp up.

Experienced with medical, automotive & aerospace high demands.



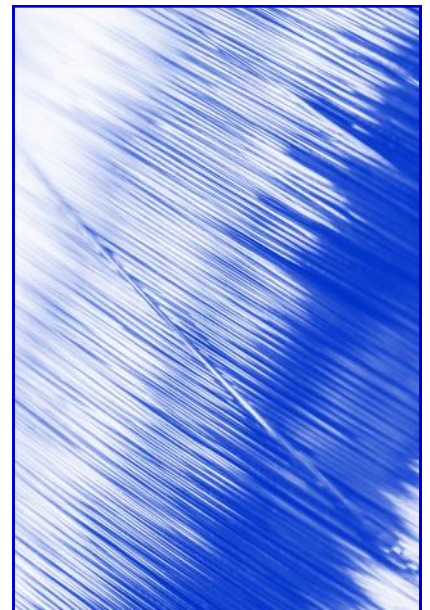
Unique new equipment designed to optimize manufacturing for precise control of the end product.

Minitubes tube drawing & metallurgical expertise on over 100 alloys for stents, aortic valves, endoscopy products...



Reengineer the manufacturing process to jointly resolve technical & economical issues.

Technical performance, control, flexibility, cost.



KEY FIGURES

Export ratio > 75 %
Size : 260 persons
Manufacturing area : 10 000 m²

Agents :
in USA, Italy, China, Israel

Certifications :
ISO 9001
ISO 13485

CONTACT

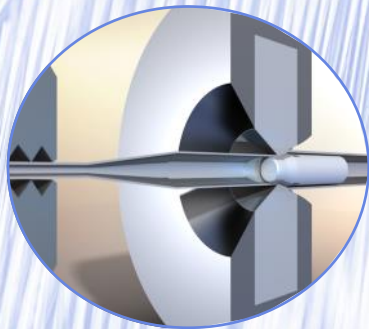
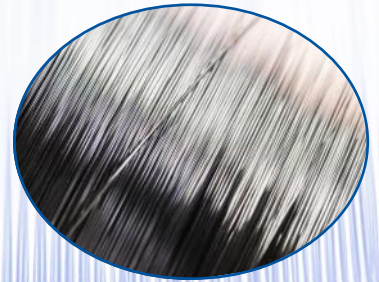
Phone : +33 (0) 456 58 58 00
Fax : +33 (0) 456 58 58 60
info@minitubes.com
www.minitubes-usa.com

This new tubing process is designed to produce a variety of high performance exotic alloys. Minitubes leverages decades of experience in metallurgy and tube processing, including grades such as Cobalt Chromiums, Phynox, Elgiloy, MP35N, 35N LT, L605, Inconel 600, 625, 718...

The new availability of affordable small size tubing in customized specifications and materials opens new possibilities for better catheter hypotubes, MRI compatible needles, endoscopic instruments...

Cost efficiency

- High speed strip forming and welding.
- Welding close to the final tubing size further limits the draw/ clean / anneal cycles to those strictly required to achieve the products specifications.
- Tooling change time kept to a few minutes only, thus allowing to economically run small batches of different materials, diameters and wall thicknesses.



High technical performance

- Ra 0.2 μm
- +/- 7 μm tolerances on OD and wall thickness
- Grain size and tensile properties can be controlled within tight tolerances.

Minitubes Difference

- Long experience with plug drawing stainless steel, CoCr and exotic alloys on stents, heart valves...
- Extensive metallurgical expertise
- Unusually tight tolerances

Degreasing

- A new cleaning process custom-designed to deliver very clean surfaces.
- Removing the ID lubricant for longer lengths on smaller bores.
- Controls of process parameters and solvent circulation & drying

Minitubes Difference

- High Pressure
- Efficient solvent
- Optimized drying



Unconventional annealing technology



Minitubes Difference

- Ability to reduce grain size, improved control over mechanical properties
- Superior OD surface, more « coating friendly »
- Higher throughput & lower operating cost