

EUROFLEX[®]

WE CREATE SOLUTIONS



www.euroflex.de

INNOVATIVE SOLUTIONS



HIGH-PRECISION SEMI-FINISHED PRODUCTS AND COMPONENTS FOR THE MEDICAL INDUSTRY

EUROFLEX  is a globally leading manufacturer of high-precision semi-finished products and components for medical applications. The company was founded in 1993 and is a full subsidiary of G.RAU GmbH & Co. KG , which produces high-precision tubes, wires, sheet and components.

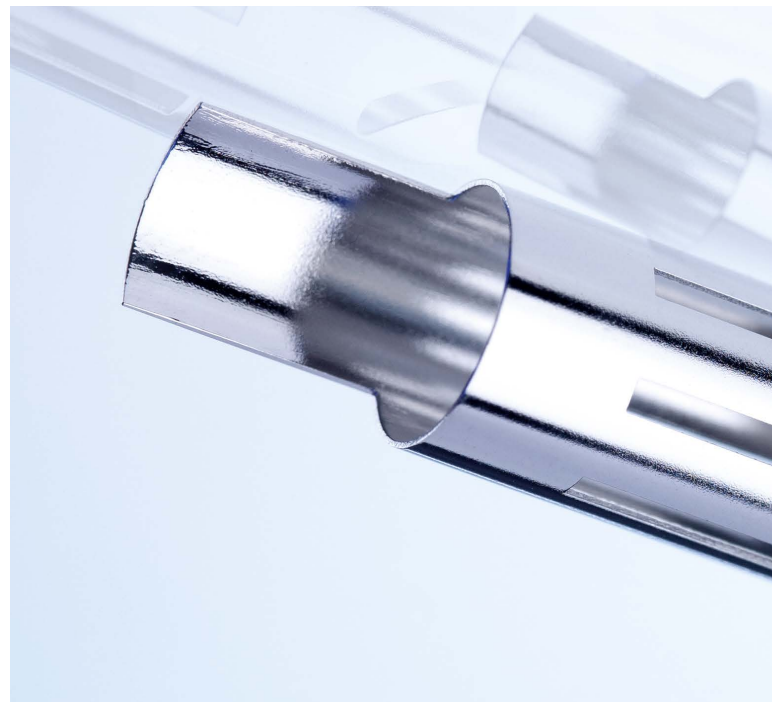
As a leading specialist for solutions made of NITINOL, Cobalt-based Alloys, Stainless steels and many other innovative materials, EUROFLEX is the competent partner for many companies in the field of medical technology. Certified in accordance with EN ISO 13485, our management system ensures a consistently high level of product quality.

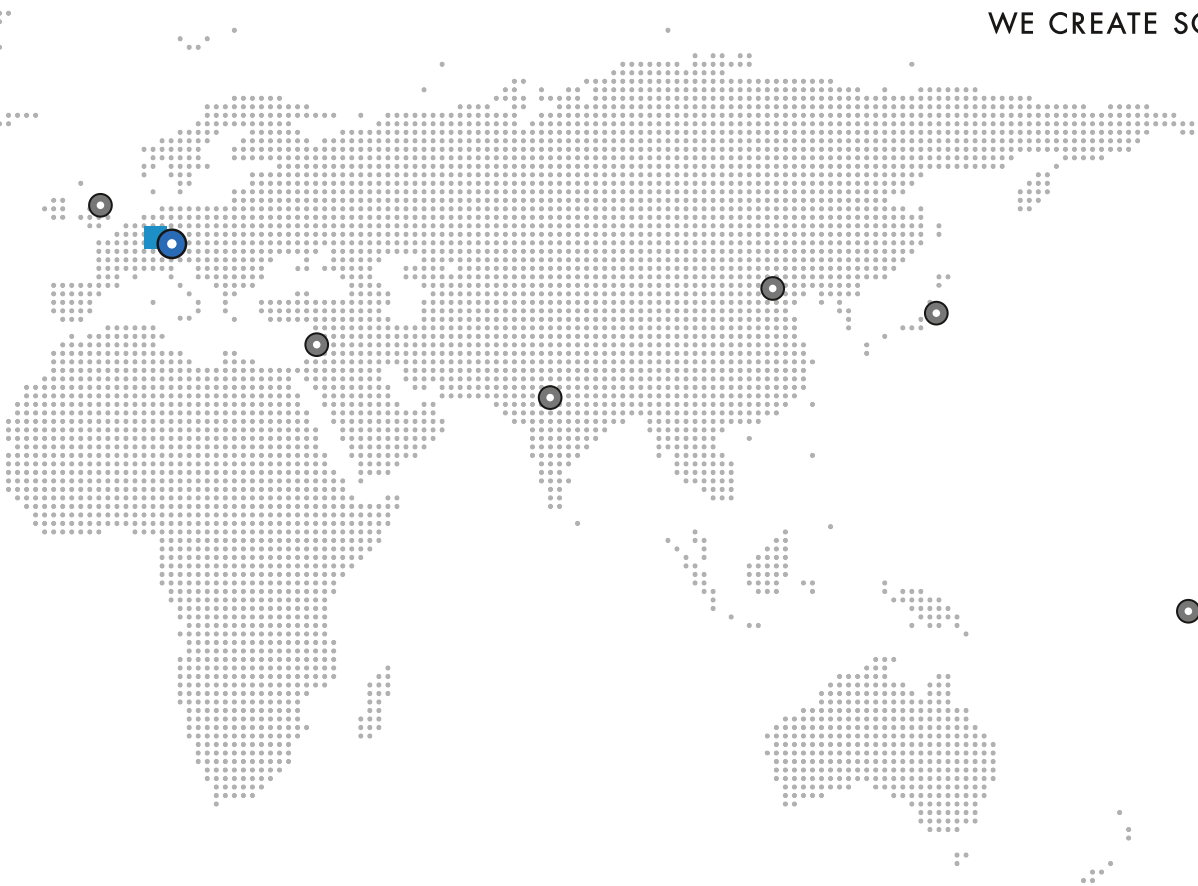
The varied applications and requirements of our customers demand highly suitable production materials as a pre-condition of the quality of the final product. Therefore, our semi-finished products and components are not simply a production material but a vital part of the ultimate success of a stent, implant or an instrument. We are very conscious of our important role and therefore guarantee that all of our products meet the highest standards.



„WE ARE THE STRATEGIC PARTNER FOR YOUR ADVANCED MEDICAL SOLUTION“

// Dr. Axel Pfrommer, President & CEO





● Locations of the representatives of EUROFLEX

PROTOTYPING AND STOCK MATERIAL



Thanks to our Prototyping department we offer optimal solutions for customized requirements.

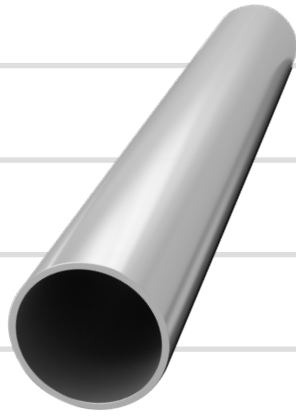
Our customers appreciate the possibility to purchase small quantities of material e.g. for R&D purposes. Especially for very short lead-times, we offer material from our stock list. The stock list range includes several 100 positions of tubes, strips and wires which are available off-the-shelf. Our stock list is ideal if you are looking to purchase small quantities for R&D trials or very urgently needed sample material. Additionally a credit card payment option is available for stock material.

With a long history and a deep understanding of metals, we can support you with your R&D projects as your unique development partner. Our R&D department can help you with the development of new alloys thanks to our expertise and in-house metallurgical test capacities.

PRODUCTS

NITINOL TUBES

	Quality Stent / Heart valve XS	Quality Catheter CQ
Typically generation:	1, 2 or 3 (depending on the requirements)	Typically generation 1 Alloy
Outside Surface:	Ground	Ground
Inner surface:	Various options	Slurry-cleaned
Tolerances:	Tight tolerances for OD, WT and concentricity	Tolerances for OD and ID
Properties:	Defined areas for mechanical and physical properties	Superelastic stand. properties Af-temp. max. 15°C
Outer diameter:	0,06 mm - 25,00 mm (0.0024" - 0.984")	0,20 mm - 1,50 mm (0.008" - 0.059")
Wall thickness/Inner diameter:	0,02 mm - 1,20mm (0.0008" - 0.047")	0,10 mm - 1,30 mm (0.004" - 0.051")
Advantage:	OD to wall ratios of up to 100 can be offered!	Cost advantage - mostly used for cost critical applications



NITINOL MATERIAL OPTIONS

Generation 1	Generation 2	Generation 3
Ingots from two manufacturers available	Ingots from two manufacturers available	In-house development HCF SE
Ingot inclusion area max. 2,8%	Ingot inclusion area max. 1,2%	Ingot inclusion area max. 0,7%
ASTM F2063 compliant	ASTM F2063 compliant	ASTM F2063 compliant
Ingot inclusion size max. 39 μm	Ingot inclusion size max. 20 μm	Ingot inclusion size max. 10 μm

Improved lifetime / fatigue properties

PRODUCTS

NITINOL TUBES & WIRES

Generation 3: HCF-SE (High Cycle Fatigue)

- Improved fatigue compared to first and second generation materials
- More options for new designs
- Higher yields
- HCF refining process
- Higher surface quality
- ASTM F2063 compliant
- Inclusion size max. $10\mu\text{m}$, area percentage max. 0.7%
- Particle Void-Assembly (PVA) $<0.01\%$

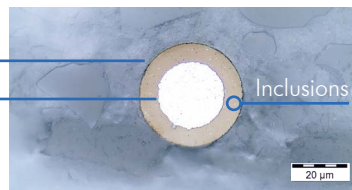
NITINOL HCF ENHANCED WIRES (HFC-E)

- \varnothing 0,025 mm up to 3,00 mm (0.001" up to 0.118")
- Surface oxidized or e-polished
- HCF-layer min. 10% from \varnothing

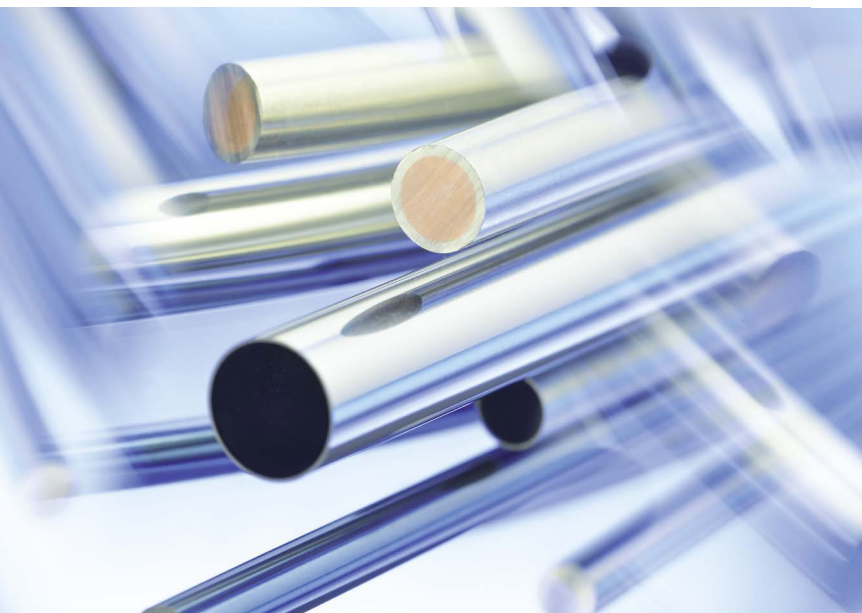
Maximum surface quality through reel-to-reel electro-polishing:

HCF COMPOUNDS

- Customized ratio of OD to core
- Core material customized
- Core materials:
Pt, PtW8, PtIr, Au, Ag, Ta



- High corrosion resistance
- High biocompatibility
- High fatigue properties
- Extremely smooth surface



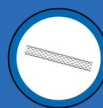
APPLICATIONS



Neuro Applications



Orthopedic Instruments



Braided stents



Stents for Aortic Aneurysms

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PRODUCTS

HIGH-PRECISION ROUND WIRES & MICRO-PROFILES INCLUDING REEL TO REEL ELECTROPOLISHING

Round wires: Ø min. 0,025 mm (0.001")

Micro-profiles: thickness min. 0,020 mm (0.0008")
width up to 1,50 mm (0.059")

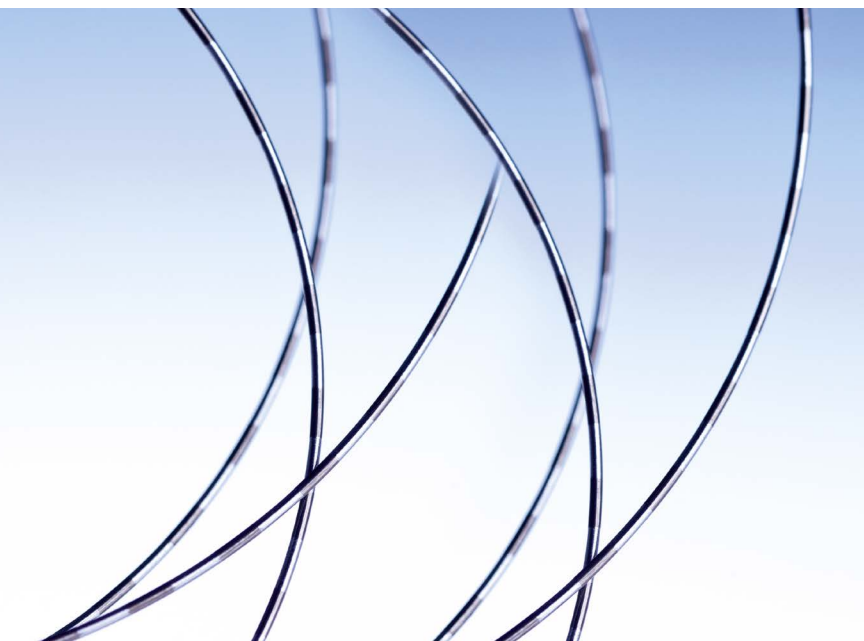
(Other dimensions on request)

Available materials:

- Nitinol
- Pt-alloys
- Absorbable alloys (Mg, Zn)
- Compound materials

(Other materials on request)

- **In-Line process controls and automatic adjustment of parameters for maximum uniformity**
- **Improved surface quality through electro-polishing with a reel-to-reel electro-polishing system designed in-house**



APPLICATIONS



Neuro Applications



Orthopedic Instruments



Braided stents



Stents for Aortic Aneurysms

... ..

PRODUCTS

NITINOL FLAT WIRES AND CONTINUOUS FLAT-ROLLED SHEET

thickness 0,15 mm up to 1,20 mm (0.006" up to 0.047")
width up to 30,00 mm (1.181")

(Other dimensions and materials on request)

natural edges

straight edges

- **ASTM F2063 compliant**
- **Superelastic or shape memory**
- **Endless process -> consistent properties**
- **Sandblasted or light oxide surface**
- **On coils or in lengths**
- **Natural or straight edges**
- **Cost savings on coils**

APPLICATIONS



Orthopedic Instruments



**Cardiovascular stents,
heart valves**



Medical instruments

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PRODUCTS

SEAMLESS TUBES - COBALT-BASED ALLOYS

OD 0,200 mm up to 30,00 mm (0,008" up to 1,181")
WT 0,025 mm up to 1,20 mm (0,001" up to 0,047")

Available materials:

- L605
- MP35N

- **small grain size**
- **high density**
- **high modulus of elasticity**

SEAMLESS TUBES - STAINLESS STEELS

OD 0,200 mm up to 30,00 mm (0,008" up to 1,181")
WT 0,025 mm up to 1,20 mm (0,001" up to 0,047")

Available materials:

Stainless steels for surgical implants:

- 316LVM
- Ni-free stainless steel e.g. Biodur

Stainless steels for surgical instruments:

- 304
- 304L
- 321
- 17-7 PH
- 316Ti
- 316L

- **medical stainless steels**
- **excellent biocompatibility**
- **high elongation**
- **small grain and inclusion size**
- **good strength properties**



APPLICATIONS



Orthopedic Instruments



**Cardiovascular stents,
heart valves**



Medical instruments

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PRODUCTS

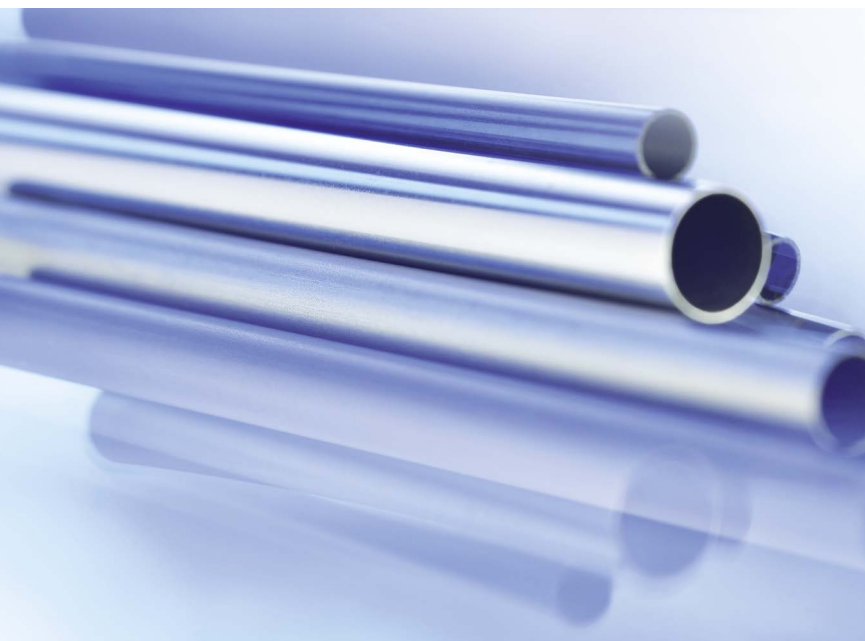
SEAMLESS TUBES - VARIOUS METAL ALLOYS

OD 0,200 mm up to 10,00 mm (0,008" up to 0,394")

WT 0,025 mm up to 1,20 mm (0,001" up to 0,047")

Available materials:

- Titanium-based alloys
- Titanium grade 2, β -Titanium
- Tantalum
- Platinum alloys - Pt, PtIr10, PtIr20, PtW8, PtW5
- Resorbable alloys



APPLICATIONS



X-ray markers



Pacemakers



Electrodes



Aneurysm implants

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PRODUCTS

MEDICAL COMPONENTS

EUROFLEX offers customers our expanded line of medical components and new, custom designed solutions beyond our semi-finished product selection of wire, tubing and profile (shaped) tubing. EUROFLEX offers a wide range of manufacturing processes and surface treatment options to create unique components with features including shape-forming, turned and milled parts, and laser-processed parts. Our manufacturing processes can also be tailored to customer needs. Quality and high precision are always our top priority.

Available materials:

- Nitinol
- Cobalt-based alloys (L605, MP35N)
- Stainless steel (316LVM, 316Ti, 316L, 304, 304L, 321, 17-7 PH)
- Ni-free alloys
- Titanium-based alloys, Titan-grade 2
- Tantalum
- Platinum-alloys, PtIr10, PtIr20, PtW8, PtW5
- Resorbable alloys
- Material composites



APPLICATIONS



Orthopedic Instruments



**Cardiovascular stents,
heart valves**

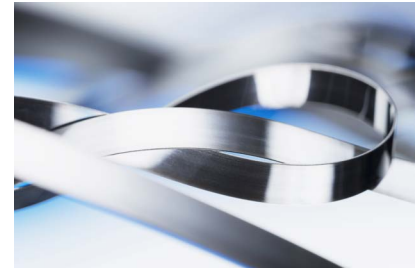
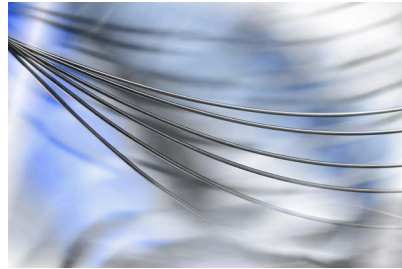


Medical instruments



Pacemakers

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SEMI-FINISHED PRODUCTS

MANUFACTURING METHODS

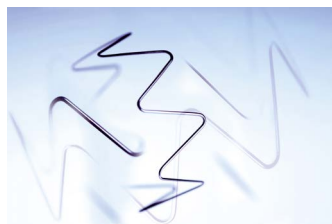
- 3D forming (CNC-controlled)
- Nitinol Shape-Setting
- EDM, abrasive cutting, grinding
- Laser machining (welding, cutting, marking)
- Turned and milled parts (CNC-controlled)
- Punching, deep-drawing, crimping and joining
- Profiled (non-round) tubes and wires

(Other manufacturing methods upon request)

SURFACE TREATMENTS

- Mechanical removal methods
(abrasive blasting, vibratory finishing, tumbling)
- Ultrasonic cleaning, electrolytic degreasing, etching, electro-polishing
- Laser structuring
- Galvanic surface finishing (upon request)

COMPONENTS



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