FORÉCREU
Building Critical Partnerships

ORTHOPEDIC SOLUTIONS

BUILDING CRITICAL **PARTNERSHIPS**

For decades now we have been making our name as the go-to supplier of semi-finished products aimed at medical, tooling and industrial operators.

Beyond our offering of products that are unique in the marketplace, we strive to understand the needs and limitations of our partners who have developed their businesses in demanding fields that are in constant evolution. We are forming strategic partnerships which are essential for the development of the materials used in the latest technologies.

This relationship of trust is essential as it limits each player's risk and provides bespoke solutions for the delivery of ambitious projects. Each day, our teams are working to solve critical issues with professionalism, agility and energy.

Our slogan «Building Critical Partnerships*» perfectly sums up the value that we can bring to our clients. We are much more than simply a supplier.

François ORY
CEO

FORÉCREU
Building Critical Partnerships

OUR **VOCATION**

We manufacture cannulated and multiple hole bars from steel and titanium alloys. We also supply solid bars made from special steel materials.

In the medical field, Forécreu's mission is to supply cannulated bar solutions for use in the production of implants and surgical instruments. We also specialize in injection-molding of bio-resorbable orthopedic implants using PEEK and PMMA.

Approved by all main OEMs (Original Equipment Manufacturers) and CMs (Contract Manufacturers) in the industry, FORÉCREU has over the years become a household name in the orthopedic, trauma and sports medicine fields.

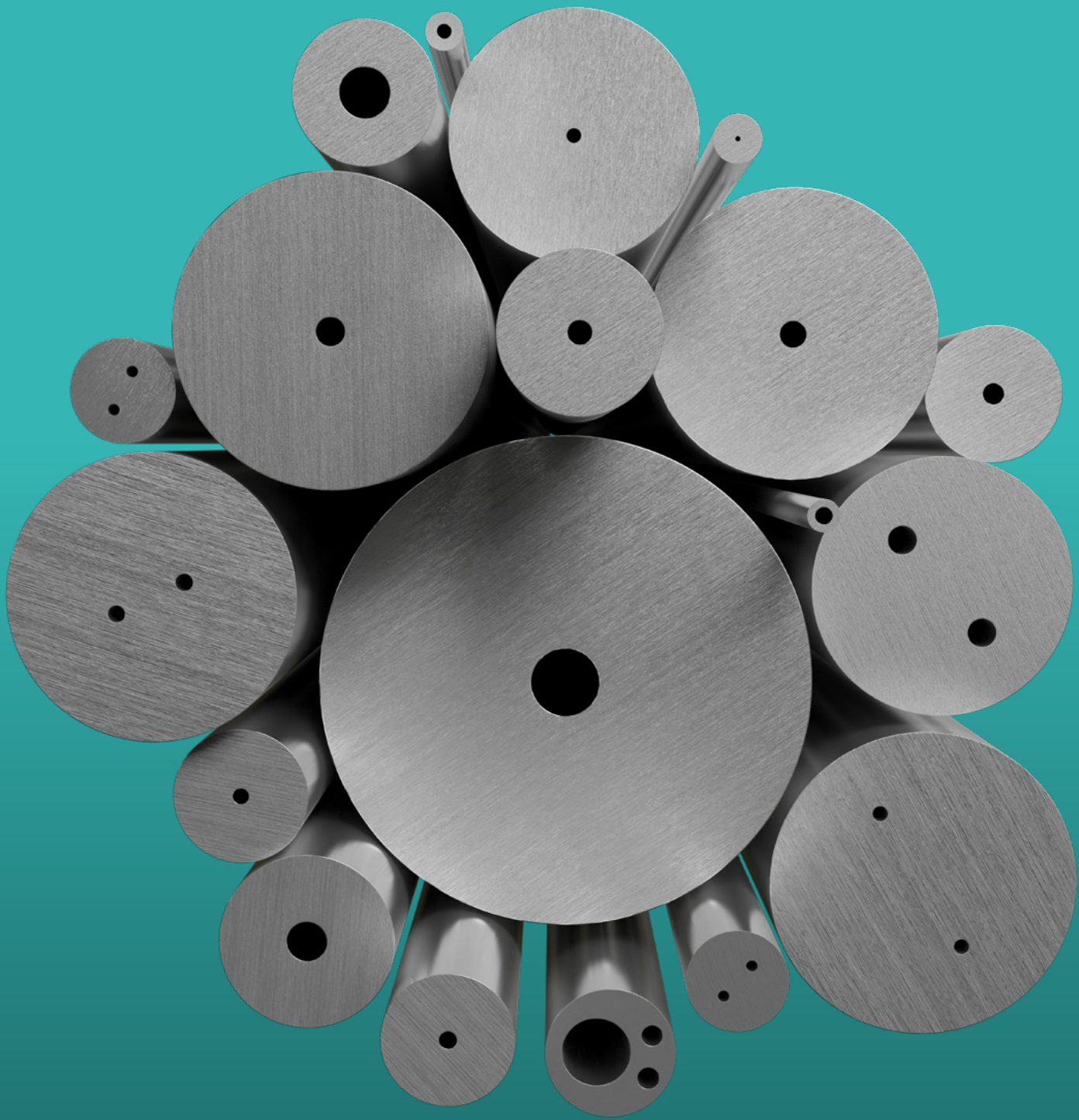
+71
YEARS OF EXPERTISE AND KNOW-HOW

2
MANUFACTURING HUBS BASED IN FRANCE

4
SUBSIDIARIES: USA, CHINA, GERMANY AND JAPAN

+400
MORE THAN 400 CUSTOMERS HAVE PLACED THEIR TRUST IN US.

FORÉCREU
Building Critical Partnerships



FORÉCREU
Building Critical Partnerships

OUR **MARKETS**

We respond to our customers' needs with innovative solutions aimed at the future.

MEDICAL

- Cannulated bar solutions in stainless steel or titanium alloys for implants or surgical instruments.
- Pre-hardened solid bars solutions in stainless steel (AISI 420B) for the production of surgical or dental instruments.
- Stainless steel tube solutions (AISI 304L & 316L) for the production of surgical instruments.
- Bio-resorbable and non-resorbable orthopedic implant solutions (PEEK/PMMA) for use in trauma and sport medicine.

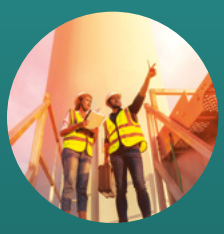
TOOLING

- Oil hole bar solutions made of high-speed steel (HSS) or tool steels for the production of coolant fed drills, taps and tool bodies.

INDUSTRY

- Hollow bar and multi-hole solutions in stainless steel, structural steels, special steels and specialty alloys for applications use in the agri-food, energy sectors, etc.
- Solid bar solutions made of specialty steel and alloys for use in the nuclear, energy sectors, etc.



FORÉCREU
Building Critical Partnerships

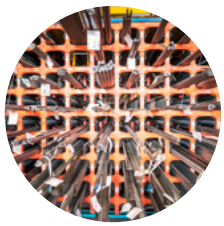

FORÉCREU
Building Critical Partnerships

OUR **STRENGTHS**

- We created a unique industrial process over **70 years ago**.
- **We are the world leader** in the cannulated and multiple hole bar marketplace.
- **Long-term relationships** built with our customers and quality suppliers.
- **Compliance with customer technical specifications.**
- **Technical and sales support** to assist you throughout the life of your project.
- Fast delivery thanks to high availability of **standard stock items, worldwide,** with online updated inventories.
- **Our subsidiaries in the USA, China and Germany** provide you with service which is near to you wherever you are in the world.
- **Quality control testing** carried out in our laboratory: tensile strength and metallurgy testing.
- **Technical expertise** provided by our metallurgy experts.
- **Two dedicated production and product development sites:** design, testing, extrusion, rolling, drawing, thermal treatment, twisting, grinding, etc.
- Our organization and products are certified **ISO9001, ISO14001 & ISO13485.**

At FORÉCREU, you will find a range of bar products which meet market requirements and a team of specialists who will assist you in the successful delivery of your projects.






FORÉCREU
Building Critical Partnerships


FORÉCREU
Building Critical Partnerships

CANNULATED BAR SOLUTIONS FOR **MEDICAL DEVICES**

With our experience in the medical field, we understand the issues faced by our customers and their requirements in an industry in constant evolution.

Advantages of Forécreu cannulated bar solutions

- **Proven technology** based on an industrial process which is unique in the world.

- **Optimized production costs:** our cannulated bar products are delivered ready for machining. By eliminating the drilling stage, you will optimize your per-item production costs. You can therefore focus directly on your core business objectives and gain in efficiency and time to market.

- **Rationalized timescales and throughput:** you will better be able to control risks and increase your organization's performance by simplifying your industrial process. You will gain in agility.

We are proud to serve the surgical field by simplifying the lives of medical device manufacturers and guaranteeing patient safety.

Forécreu cannulated bar solutions

- For the manufacture of **instruments and tools** : drills, end mills, reamers, drill guides, screwdrivers, etc.
- For the manufacture of implants : screws and nails.




FORÉCREU
Building Critical Partnerships

CANNULATED BARS FOR **MEDICAL INSTRUMENTS**

Long cannulated bar solutions for your medical instrument projects:
- outside diameter of 0.157" - 1.378" (4–35 mm) and hole diameter of 0.031" - 0.394" (0.8–10 mm) in stainless steel
- outside diameter of 0.157" - 0.708" (4–18 mm) and hole diameter of 0.031" - 0.265" (0.8–6.75 mm) in titanium alloy.

- Long cannulated bars : up to 12ft (3.65 meters).
- Thick walls.
- Black or ground finished bars, depending on your requirements.

Stainless steels
- 0.137" (3.5mm) < OD < 1.377" (35mm)*
- 0.031" (0.8mm) < ID < 0.394" (10mm)

Titanium alloys
- 0.157" (4mm) < OD < 0.709" (18mm)
- 0.031" (0.8mm) < ID < 0.266" (6.75mm)

Technical specifications of our product range

		Characteristic		Stainless Steels	Titanium Alloys
OD	Black finished	Outside diameter	0.157" < Ø < 0.551"	+0.012/-0.004"	+0.012/-0.004"
			0.551" < Ø < 0.709"	+0.020/-0.006"	+0.020/-0.006"
			0.709" < Ø < 1.378"	+0.024/-0.008"	-
	Ground finished	Outside diameter (OD)		ISO h9 ou h8	
		Roughness		Ra 1.6µm	
ID		Inside diameter		ID ≤ 0.065" : +/-0.002" ID > 0.065" : +/-3% ID	
e		Eccentricity		≤ 1% OD	
		Ground bars (Straightness)		< 0.039" /m	

Available grades

- Martensitic stainless steel: 420B / 431 / 440A / 420MOD
- PH martensitic stainless steel: 630 / 455 / S465
- Austenitic stainless steel: 304L / 316L
- Titanium Alloys: Ti 6Al 4V eli

FORÉCREU
Building Critical Partnerships

*OD maximum not applicable to some grades. Please contact us to study the feasibility.

CANNULATED BARS FOR **MEDICAL IMPLANTS**

Long cannulated bar solutions for your medical implant projects:
- outside diameter of 0.157" - 1.378" (4–35 mm) and hole diameter of 0.031" - 0.394" (0.8–10 mm) in stainless steel
- outside diameter of 0.157" - 0.708" (4–18 mm) and hole diameter of 0.031" - 0.265" (0.8–6.75 mm) in titanium alloy.

- Long cannulated bars : up to 12ft (3.65 meters).
- Thick walls.
- Ground finished bars.

Implantable austenitic
- 0.118" (3mm) < OD < 0.827" (21mm)
- 0.031" (0.8mm) < ID < 0.394" (10mm)

Titanium alloys
- 0.157" (4mm) < OD < 0.709" (18mm)
- 0.031" (0.8mm) < ID < 0.266 (6.75mm)

Technical specifications of our product range

		Characteristic		Stainless Steels	Titanium Alloys
OD	Black finished	Outside diameter	0.157"*< Ø <0.551"	+0.012/-0.004"	+0.012/-0.004"
			0.551" < Ø < 0.709"	+0.020/-0.006"	+0.020/-0.006"
			0.709" * < Ø < 0.827"*	+0.024/-0.008"	-
	Ground finished	Outside diameter (OD)		ISO h9	
		Roughness		Ra 1.6µm	
ID		Inside diameter		ID ≤ 0.039" : +/-0.002" ID > 0.039" : +/- 5% ID	
e		Eccentricity		≤ 1.6%OD	
		Ground bars (Straightness)		< 0.039" /m	

Available grades

- Austenitic stainless steels : 316L implant / Rex 734 (1.4472)
- Titanium Alloys : Ti 6Al 4V eli / Ti 6Al 7Nb

Contact us and we will help you analyze the feasibility of your project: **contact@forecreuamerica.com**

SOLID BARS FOR **MEDICAL INSTRUMENTS**

Round Bars

Instrument Grade according to ASTM F 899.
Implant Grade according to ASTM F 136 and ASTM F 138.

- Drawn, ground, polished, tolerance h8 or better.

Class	Grade	OD (inches) range	OD (mm) range
Solid	455C	.125 to 1.250	3.175 to 31.75
	465C	.125 to 1.250	3.175 to 31.75
	17-4	.187 to .750	4.75 to 19
	316L implant	.0767 to .630	1.95 to 16
	Ti 6Al 4V eli	.187 to .551	4.75 to 14

K-Wire

Implant Grade according to ASTM F 138 and ISO 5832-1 (newest revision).

- Drawn, ground, polished, tolerance h7 or h8 / -0,0003”-0,0005”
- Tensile strength up to min 1400 MPa / min. 203 ksi
- In bar lenghts of 3000-3100 mm / 9,84-10,17 feet
- Test certificate according to EN 10204/3.1

Class	Grade	OD (inches)	OD (mm)
K-Wire	316L implant	.039	1.0
		.043	1.1
		.045	1.15
		.0472	1.2
		.055	1.4
		.063	1.6
		.067	1.7
		.0787	2.0

TUBES FOR MEDICAL INSTRUMENTS

Tube solutions (thin walls) with a diameter of .0112" - 1.102" (.3–28 mm) and wall thickness of .002" - .118" (.05–3 mm).

- Surface finish : Ra ≤ .40µm
- Thickness tolerance : +/- 5%
- Tube length: Ø < .079" (2mm) = 118.11" (3000 mm) max.
  Ø > ou = .079" (2mm) = 236.22" (6000 mm) max.

		Wall thickness (inches)															
		.002	.004	.006	.008	.010	.020	.030	.039	.049	.059	.069	.079	.089	.098	.108	.118
		Wall thickness (mm)															
Outside Ø (inches)	Outside Ø (mm)	.05	.10	.15	.20	.25	.50	.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
.012	0.30																
.020	0.50																
.039	1.00																
.059	1.50																
.079	2.00																
.118	3.00																
.157	4.00																
.197	5.00																
.236	6.00																
.276	7.00																
.315	8.00																
.354	9.00																
.394	10.00																
.433	11.00																
.472	12.00																
.512	13.00																
.551	14.00																
.591	15.00																
.630	16.00																
.669	17.00																
.709	18.00																
.748	19.00																
.787	20.00																
.827	21.00																
.866	22.00																
.906	23.00																
.945	24.00																
.984	25.00																
1.024	26.00																
1.063	27.00																
1.102	28.00																

Feasibility area

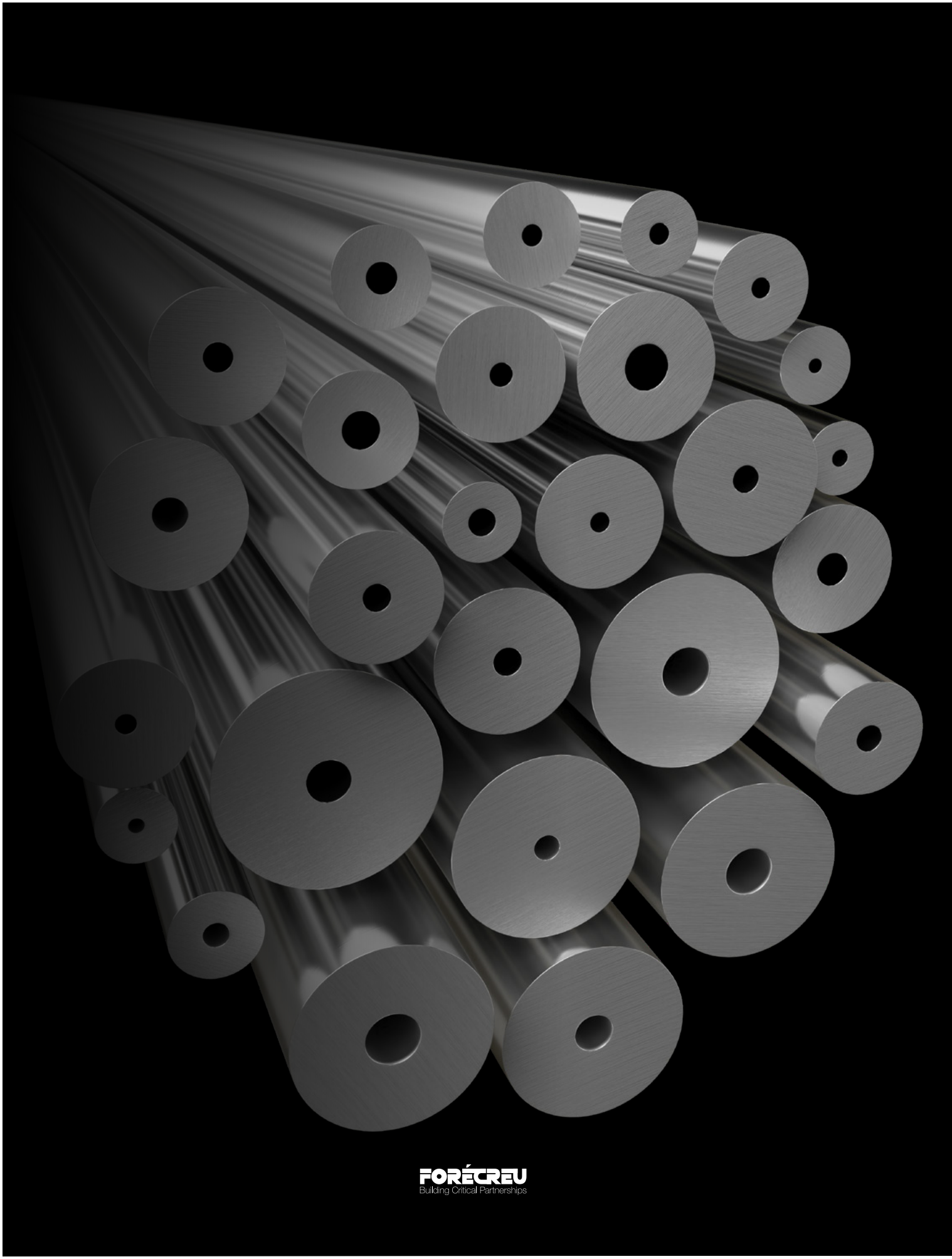
Available grades

- Austenitic stainless steels : 304L / 316L

GRADE SELECTION GUIDE

Type of grades		Reference	Canulated bars range	Solid bars range	Tubing range	Werkstoff	ASTM	ISO	EN 10027	Hardness	Corrosion performance
Stainless Steels	Martensitic	**420B**	■	■	-	1.4028	F899	7153-1-C	X30Cr13	■■■■	■
		431	■	-	-	1.4057	F899	-	X17CrNi16-2	■■■	■■
		440A	■	-	-	1.4109	F899	-	X65CrMo17	■■■■	■
		4112 (near 440B)				1.4112		7153-1-R	X90CrMoV18	■■■■■	■
		420MOD	■	-	-	1.4123	F899	-	X40CrMoVN16-2	■■■■■	■■■
	PH Martensitic	**630**	■	-	-	1.4542	F899/A564	10088-3	X5CrNiCuNb16-4-4	■■■	■■■
		S465	■	-	-	1.4614	F899/A564	-	X2CrNiTi12-11-2	■■■■	■■■■
		455	■	-	-	1.4543	F899/A564	-	X3CrNiCuTi12-9-2	■■■	■■■
	Austénitic	**304L**	■	-	■	1.4307	F899 chemical composition	7153-1-M	X3CrNi18-10	■	■■■■
		316L	■	-	■	1.4404	F899 chemical composition	7153-1-P	X3CrNiMo17-11-2	■	■■■■■
		316L implant	■	-	-	1.4441	F138	5832-1	X3CrNiMo17-11-2	■	■■■■■
		Rex 734	■	-	-	1.4472	F1586	5832-9	X4CrNiMnMo 21-9-4	■■	■■■■■
Titanium alloys	Titanium	**Ti 6Al 4V eli**	■	-	-	3.7165	F136	5832-3	-	■■	■■■■■
		Ti 6Al 7Nb	■	-	-	3.9367	F1295	5832-11	-	■■	■■■■■

	Delivery conditions	Medical tools and instruments	Medical implants	Market segments / products
	Annealed (cannulated bars) Pre-hardened (solid bars)	Yes	No	Instruments for extremities, sport medicine, trauma, spine and dental. E.g. : drill, end mills, tap, screwdriver, drill cutting guide, reamer, etc.
	Annealed	Yes	No	
	Annealed	Yes	No	
	Annealed	Yes	No	
	Annealed	Yes	No	
	Solution annealed	Yes	No	Instruments for extremities, sport medicine, trauma, spine and dental. E.g. : drill, end mills, tap, screwdriver, drill cutting guide, reamer, etc.
	Solution annealed	Yes	No	
	Solution annealed	Yes	No	
	Softened or cold worked	Yes	No	Instruments for sport medicine and spine. E.g. : Screwdriver ans instruments for spine.
	Softened or cold worked	Yes	No	
	Annealed, cold worked or highly cold worked	No	Yes	Implants for trauma. E.g. : Compression and ostheosynthesis screws, intramedullary nail.
	Softened or cold worked	No	Yes	
	Annealed	Yes	Yes	Implants and instruments for trauma, spine and neurology. E.g. : Compression screw, pedicle screw, guiding screw, intramedullary nail and sonotrode.
	Annealed	No	Yes	Implants for trauma and spine. E.g. : Compression screw, pedicle screw for spine.


FORÉCREU
Building Critical Partnerships

OUR STANDARD GROUND **FINISHED ITEMS**

FORÉCREU offers a wide range of available items. Our current stock levels can be viewed at www.forecreu.com.

Technical specifications :

- **O.D. range from : 3/16" to 3/4"**
- **I.D. range from .031" to .169"**

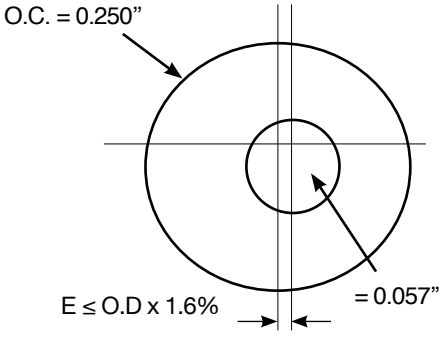
Instrument grades

- Bar lengths: 10-12ft
- T.I.R. - 2X Concentricity
- Straightness - .0043" / FT
- I.D. Tolerance: +/- 3%
- Concentricity - .125" to .625" < 1% of O.D.
- ASTM F899
- Available grades : 17-4 PH (AISI 630), 455, 465, 420 MOD, 440C,

Implant grades

- Bar lengths: 6-12ft
- T.I.R. - 2X Concentricity
- Straightness - .0043" / FT
- I.D. Tolerance: Implant Grade +/- 5%
- Concentricity - .125" to .625" < 1.6% of O.D.
- ASTM F136 / ASTM F138
- Available grades : Ti 6Al 4V eli , 316 L

Concentricity Diagram :



T.I.R = 2 E
E ≤ 0.250" x 1.6% = 0.004"
T.I.R ≤ 0.008"
This value is function of O.D not I.D

Implant Grade:
Concentricity - .125" to .625" < 1.6% of O.D.
Instrument Grade:
Concentricity - .125" to .625" < 1% of O.D.


FORÉCREU
Building Critical Partnerships

POLYMER SOLUTIONS FOR ORTHOPEDIC AND SPORT MEDICINE

The FORÉCREU Polymer Division specializes in the manufacture of polymer implants using injection-molding. From the selection of implantable polymers through to the manufacture of your implants via mold design, FORÉCREU will help you with the production of ligament screws, anchors, cages and centering tools for hip prostheses.

Resorbable materials

The term «bio-resorbable polymers» covers several groups of polymers, including polyactides and polyglycolides which are the most commonly used in surgery. Under normal physiological conditions, these polymers hydrolyze into non-toxic biodegradable products (lactic acid and/or glycolic acid) which are easily metabolized and removed by the human body in the form of CO2 and H2O.

Physiological compatibility - All of these polymers are easily tolerated and are non-toxic. Numerous tests and clinical trials have shown this using polyesters made from lactic acid and glycolic acid.

ßTCP compound - Beta tricalcium phosphate (βTCP) compounds are osteo-conductor materials which encourage the formation of bone tissue when they come into contact with the bone.

Natural PEEK/carbon-fiber-reinforced (CFR) PEEK

PEEK is an **aromatic semi-crystalline polymer which is bio-compatible and designed for permanent implantation.** It can be reinforced with carbon fiber to improve its mechanical strength. Its main advantages are:

- Excellent mechanical performance.
- Highly resistant to wear.
- Can be repeatedly sterilized using all current techniques without affecting performance.
- Full or partial radio-transparency.
- Bio-compatible.
- Elastic module similar to that of bone.

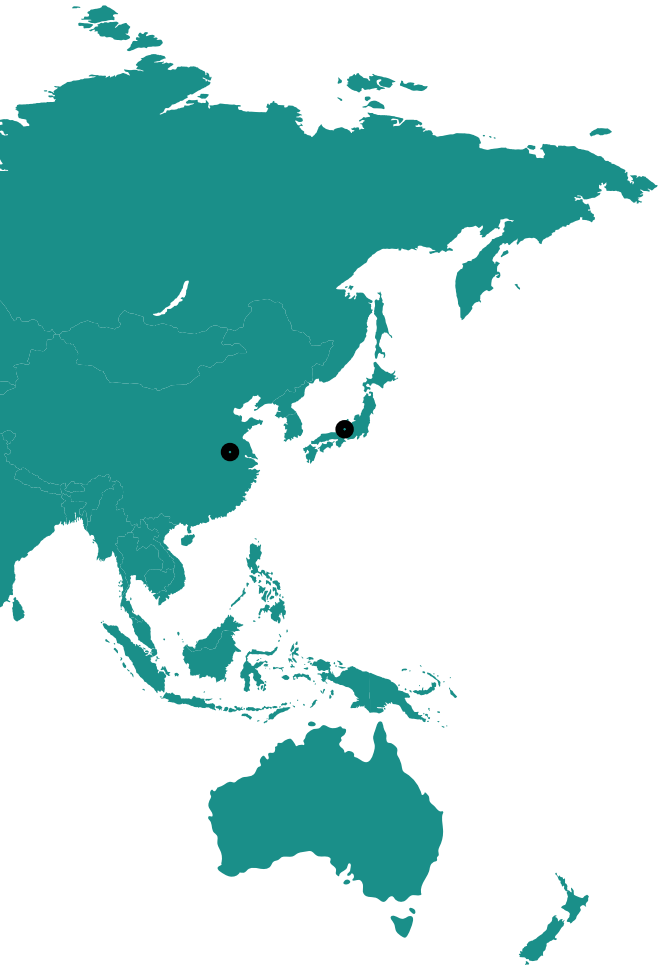
PMMA

Poly(methyl methacrylate) is mainly used to manufacture centering tools or spacers for cemented hip prostheses.

OUR **LOCATIONS**

A geographical coverage in 5 countries to serve our customers all over the world.

FORÉCREU
Building Critical Partnerships



France - Head Office

FORÉCREU SAS
ZI de la Brande,
6 chemin de Saint-Amand,
03600 Malicorne,
FRANCE
Mail. : contact@forecreu.com
Tel. : +33(0)4 70 64 43 37

USA

FORÉCREU America Inc.
2518W.
Maypole Avenue,
Chicago, IL 60612,
USA
Mail. : contact@forecreuamerica.com
Tel. : +1 (773) 539-8501

Germany

FORÉCREU Deutschland GmbH
Lebacher Straße 4
D-66113 Saarbrücken
DEUTSCHLAND
Mail. : mnaumann@forecreu.com
Tel. : +49(0)174 19 03 014

China

FORÉCREU Materials Co., Ltd.
B406/B407, 16B, N8 Xihu Road,
Wujin District,
Changzhou City, Jiangsu,
CHINA
Mail. : china@forecreu.com.cn
Tel. : +86(0) 519 86225260

Japan

FORÉCREU Japan KK
Nihombashi Honcho YS Building 2F,
2-2-2 Nihombashi Honcho,
Chuo-ku, 103-0023 Tokyo, JAPAN
c/o CCI France Japon
Mail. : japan@forecreu.com
Tél. : +81(0) 90 3140 4096

FORÉCREU
Building Critical Partnerships

NOTES

NOTES

FORÉCREU SAS
ZI de la Brande,
6 chemin de Saint-Amand,
03600 Malicorne,
FRANCE
Tel +33 (0)4 70 64 43 37
contact@forecreu.com

Discover our solutions at
www.forecreu.com

FORÉCREU
Building Critical Partnerships