

SOLUTIONS FOR THE **INDUSTRY**



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.



A handwritten signature in black ink, reading "François ORY". The signature is written in a cursive style and is positioned above a horizontal line.

François ORY
CEO

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
GERMAN & JAPAN

+400

MORE THAN
400 CUSTOMERS HAVE
PLACED THEIR
TRUST IN US.



OUR MARKETS

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

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.

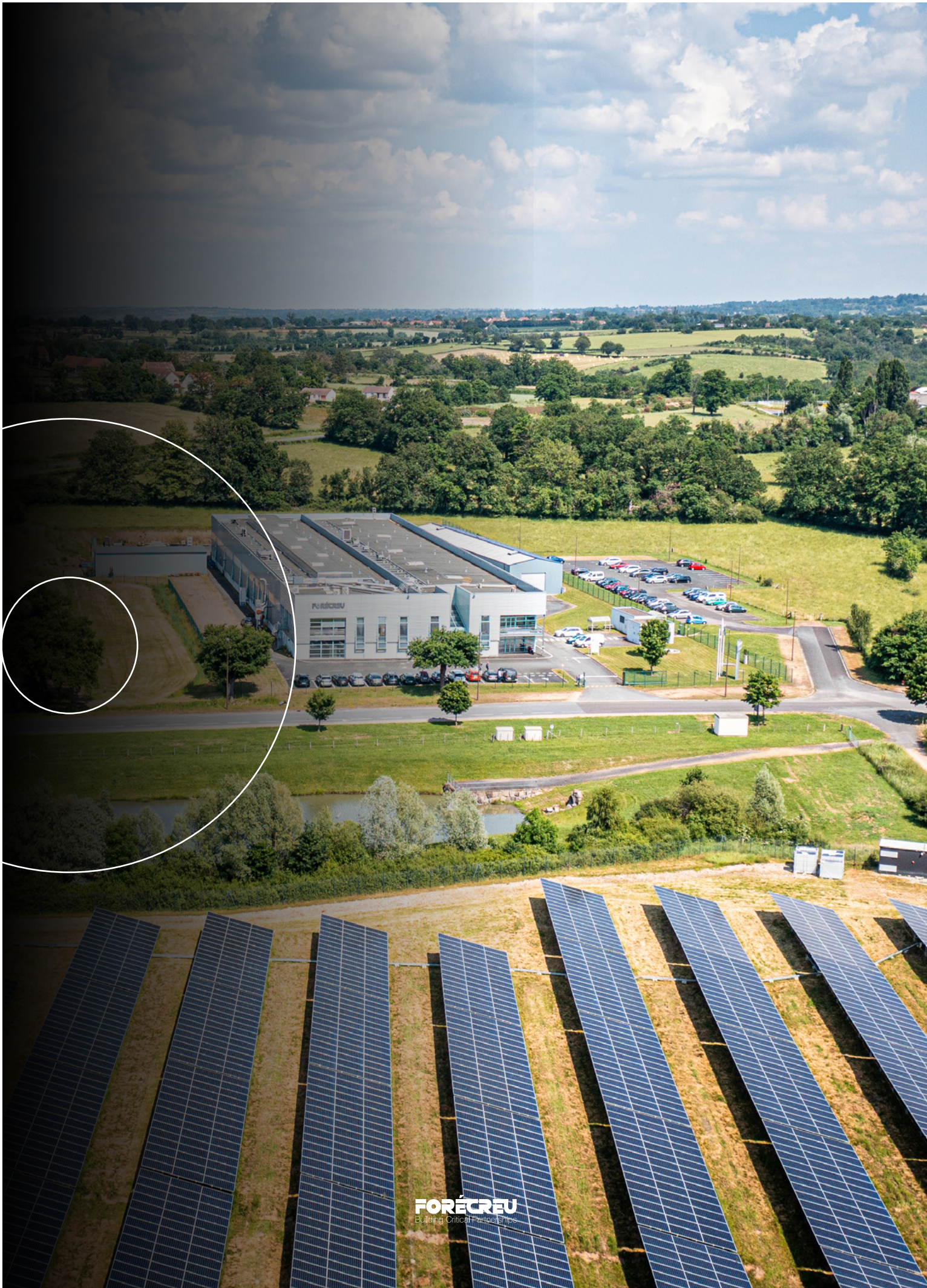
MEDICAL

- 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.



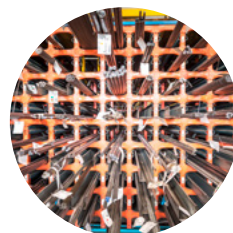


FORÉCREU
Building Critical Partnerships

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, Germany, China & Japan** 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.





HOLLOW BARS SOLUTIONS FOR INDUSTRIAL APPLICATIONS

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

Advantages of Forécreu hollow bar solutions

- **Proven technology** based on an industrial process which is unique in the world.
- **Optimized production costs:** our hollow 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.

Forécreu hollow bar solutions

- **Aeronautics:** fasteners, components, actuators, connecting rods, central lubrication spindles, probes, etc.
- **Chemistry and energy:** transport of corrosive liquids, probes, injectors, nozzles, etc.
- **High pressure:** hydro-forming (dudgeoning), hydraulic, etc.
- **Automotive:** components, injection, hollow shafts, valve stems, etc.
- **Mechanical engineering:** hollow shafts, pins, hollow screws, mechanical components, precision mechanics, etc.
- Plastic molds, injection parts, blower nozzles, cores and spindles, etc.



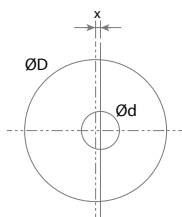
GENERAL SPECIFICATIONS AND TOLERANCES

Surface Condition	Outside Diameter (mm)	Tolerance on outside diameter	Straightness
Ground	3.0 - 50.0	ISO k9 with 2 holes	1 mm/m
		ISO h9 with central hole	
Black from drawing or extrusion rolling	3.7 - 14.0	-0.10 / +0.30	2 mm/m
	14.0 - 18.0	-0.15 / +0.50	
	18.0 - 45.0	-0.20 / +0.60	
	45.0 - 50.0	-0.30 / +0.70	

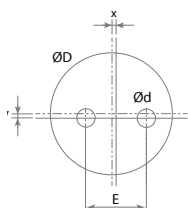
Bar length

Standard specification: delivery in bars from 1.8 to 3.9 meters.

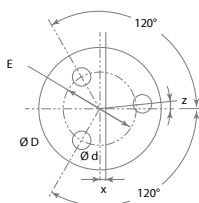
Geometric tolerances



Bars with central hole (fig. 1) :
 D : see table above.
 d : +/- 7 % of nominal.
 Excentration x : 2.5% de D.
 Roundness of hole : within tolerance of d.



Bars with two holes (fig. 2) :
 D : see table above.
 d : +/- 7 % of nominal.
 Center hole distance E : +/- 5% of nominal.
 Excentration x : 5 % of D.
 Excentration y : 3 % of D



Bars with three (or +) holes (fig. 3) :
 D : see table above.
 d : +/- 7 % of nominal.
 Excentration x : 5 % de D
 Circle E : +/- 5% of nominal
 Angular position z : +/- 3% of D

Straight holes Warping limits

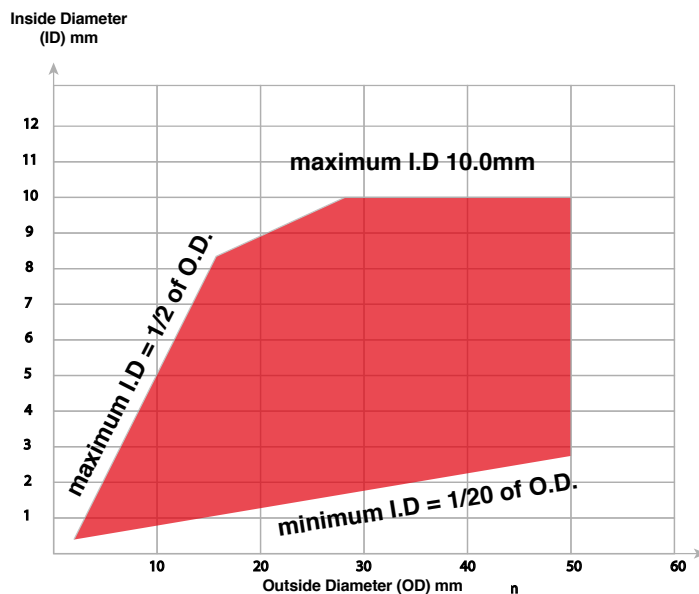
The maximum «warping» allowed on a straight bar is: 15° per meter.

Delivery conditions

Unless mentioned specifically, all our bars are supplied in annealed condition.

MULTI-HOLE HOLLOW BARS

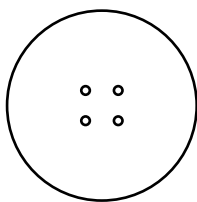
The Forécreu process is capable of producing a wide range of hollow bars to different geometries. As a complement to our standards process, we can investigate any project involving our feasibility area:



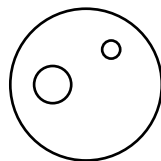
Feasibility thresholds

- Number of holes: 1 to 9
- Total hole surface area: less than half outside diameter section
- Outside diameter: 2 to 65 mm
- Inside diameter: 0,4 to 12 mm
- Bar length: up to 6 meters
- Hole positioning: free (consult us with your drawing).
- Grades: see table
- Tolerances: see table. Our general tolerances can be adapted to your specific needs. Consult us.

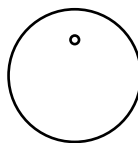
Examples of special geometries already produced



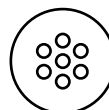
OD 40 mm
ID 2 mm



OD 32 mm
ID 8 and 4 mm



OD 28 mm
ID 2 mm



OD 22 mm
ID 3 mm



OD 12 mm
ID 3 and 1 mm



OD 9 mm
ID 2 and 1 mm

TUBE HOLLOW EXTRUDED / DRAWN

Forécreu proposes conversion services with its newly commissioned press and full extruded drawn products. Extrusion can start from cast/forged alloy with a peeled diameter 120mm, 100mm or 80mm and a length of 300-600mm.

Grades

- Tools Steel (HSS PM, HSS Co, Hot and Cold working...)
- Stainless Steel (Martensitic Steel PH ...)
- Titanium Alloys for the non-ferrous family
- Refractory steels and other steels

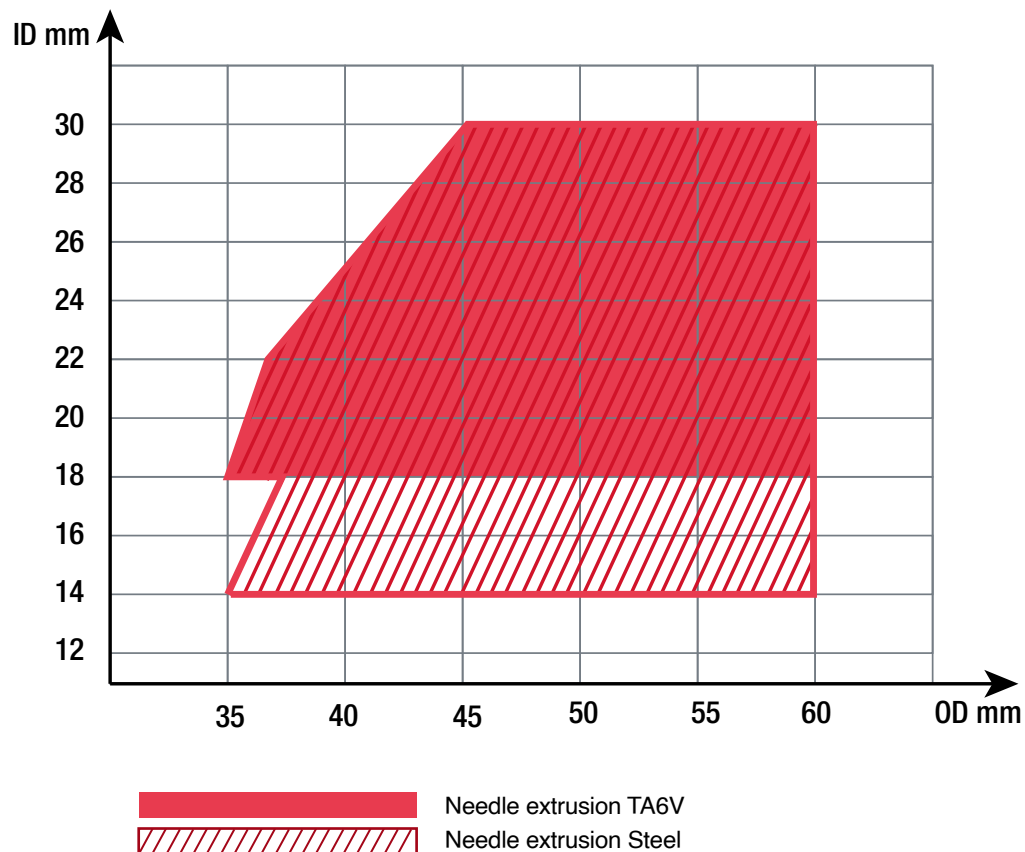
Concentricity

- We guarantee concentricity <12.5% on the wall thickness of our tubular blanks.
- Tighter tolerances will be considered.

Size range

- From 35 to 60mm, depend on starting billet.

For tubular blanks, see the following table.



STANDARD SPECIFICATIONS

			Characteristic	Tolerance		
				Center hole bars	Bars with several holes	
OD	Black Finished	3.7 ≤ Ø ≤ 14mm	Outside diameter (OD)	+ 0.30 / -0.10 mm		
		14 ≤ Ø ≤ 18mm		+ 0.50 / -0.15 mm		
		18 ≤ Ø ≤ 45mm		+ 0.60 / -0.20 mm		
		45 ≤ Ø ≤ 50mm		+ 0.70 / -0.30 mm		
		3.7 ≤ Ø ≤ 14mm	Hole surface defect thickness	< 0.5 mm	Straight holes : <0.5 mm	
		Straight holes : < 1.0 mm				
		14 ≤ Ø ≤ 50mm	Hole surface defect thickness	< 1.0 mm	Straight holes : < 1.0 mm	
					Twisted holes (including roping) : <2.0 mm	
		Ground Finished	3.0 ≤ Ø ≤ 50mm	Outside Diameter (OD)	h9	k9
				Roughness	Ra 1.6 µm	
	Outside hole Ovality			Within tolerance h9	Within tolerance k9	
	Outside hole surface defect			Within tolerance h9	Within tolerance k9	
ID	0.4 < Ø ≤ 10mm		Inside diameter (ID)	ID ≤ 0.7mm : +/-0.05mm ID > 0.7mm : +/-7% ID		
			Hole ovality	≤ 7% ID		
			Hole surface defect	≤ 0.05 mm		
CHD				+/-5% CHD		
e	Eccentricity		≤2.5% OD	On Axle X (of 2 holes) : ≤5% OD On Axle Y (of 2 holes) : ≤3% OD		
Straightness			Black finished Bars	< 2mm/m		
			Ground Bars	< 1mm/m		
Bar length			1m80 - 3m90 and > 1.0m pour 10% of the number of bars			
Lead length			Clockwise except special requirement in order	+/-15° at 5 x lead length (+/-0.8% lead length)		
Acceptable internal twist				<15° / meter		

GRADE SELECTION GUIDE

Reference	AISI	Werkstoff N°	ISO / EN	ISO	EN	Condition	Characterization
42CD4	4140	1.7225	4CrMo4	ISO 683-2	-	Softened	HB < 280
40CAD612	-	1.8509	41CrAlMo7	-	NF-EN 10085	Softened	HB < 280
50CV4	6145	1.8159	51CrV4	ISO 683-2	-	Softened	HB < 280
100C6	L3	1.2067	102Cr6	ISO 4957	-	Softened	HB < 280
35NCD16	-	1.6773	36NiCrMo16	-	NF-EN 10083-3	Softened	HB < 310
60WCS20	S1	1.2550	60WCrV7	ISO 4957	-	Softened	HB < 280
Z38CDV5	H11	1.2343	X37CrMoV5-1	ISO 4957	-	Softened	HB < 249

OUR IMPLANTATIONS

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

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