



the **forging** evolution

FORGING TRUE LEADERSHIP WITH GLOBAL REACH

FRISA IS A GLOBAL LEADING MANUFACTURER
OF SEAMLESS ROLLED RINGS
AND OPEN DIE FORGINGS

With more than **40 years of experience**, four facilities in Mexico and one in the US, we figure as a leader in North America serving high volumes, one-piece jobs and providing door-to-door service to the most demanding industries all over the world.

We offer the most competitive forging solutions through an extensive range of carbon, alloy and stainless steels, titanium and superalloys.

Our world-class standards, total commitment to quality and exceptional customer service have positioned us as a strategic and reliable supplier in all the industries we serve:

- Aerospace
- Construction & Mining
- Industrial Machinery
- Oil & Gas
- Power Generation
- Wind Power

HIGH-VALUE FORGING SOLUTIONS

FRISA'S HIGH-VALUE SOLUTIONS AND SERVICES INCLUDE NEEDS ASSESSMENT, FORGING, HEAT TREATING, MACHINING AND NON-DESTRUCTIVE TESTING. SO YOU'RE GETTING NOT ONLY UNMATCHED QUALITY BUT UNRIVALED EXPERTISE AS WELL.



FORGING

Our rolling mills and hydraulic presses cover a very wide range of geometries and sizes. Our layout allows us the flexibility to manufacture from one piece to high volume orders.



HEAT TREATMENT

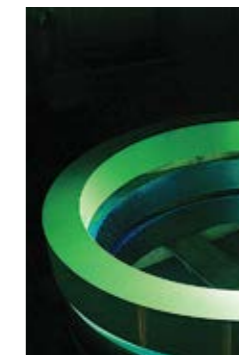
Our fully automated and digitally controlled equipment monitors each part of the process, ensuring adherence to customer specifications. Our processes include the following:

- Normalizing
- Quenching
- Tempering
- Annealing
- Solution annealing
- Spheroidizing
- Aging
- Stress relieving
- Or any other heat treatment required by customer



MACHINING

The latest CNC technology allows us to machine all of our forgings. Our processes include rough machining and semi-finish machining. Our staff works simultaneously with our customers, enabling us to provide an optimal cost-effective solution with the highest quality standards.



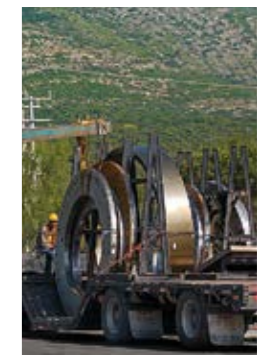
NON-DESTRUCTIVE TESTING

We have 2 in-house labs fully equipped with state-of-the-art technology that perform the following tests:

- Ultrasound
- Magnetic particles (wet and dry)
- Liquid penetrant (visible and fluorescent)

Our technicians are certified by ASNT, and we have the following qualifications:

- SNT-TC-1A (Level II)
- ASNT ACCP (ISO 9712) (Level II)
- ASNT Level III (UT, MT, PT)



DOOR-TO-DOOR SHIPPING

From a single ring to a full container, we handle door-to-door shipments with access to the most competitive rates, including Special Duty Benefits with North American and European Union Free Trade Agreement.

STATE-OF-THE-ART FACILITIES

All of our facilities are equipped with cutting-edge manufacturing equipment and the latest information technology systems that allow us to guarantee the quality of our products and deliver increased customer value with an unsurpassed degree of responsiveness.



SANTA CATARINA PLANT

Specializes in stainless and carbon steel forgings in a wide variety of shapes, geometries, and sizes. Located in the heart of the industrial strip of Monterrey, Mexico; its nearness to the US border places us in an ideal location for the shipping and transportation of our products to the rest of the world.

- ISO 9001
- ISO 14001
- ISO 17025
- C-TPAT
- Pressure Equipment Directive (PED)
- PROFEPA Clean Industry Certificate



SUPERALLOYS PLANT

Offers forgings made of specialized materials such as titanium and nickel-based alloys used for high temperature, low weight and corrosion resistant applications, mainly for the aerospace and power generation industries.

- AS 9100:2009 Rev. C
- ISO 9001
- ISO 14001
- C-TPAT
- NADCAP Heat Treating
- PROFEPA Clean Industry Certificate



GARCÍA PLANT

Specializes in the production of complex shapes in various grades of steel and alloys. Its state-of-the-art technology and its location next to a main railroad, make it an integral solution to your forging needs.

- ISO 9001
- ISO 14001
- ISO 17025
- C-TPAT
- Pressure Equipment Directive (PED)
- PROFEPA Clean Industry Certificate



OPEN DIE PLANT

Represents a leap in our forging solutions portfolio. This manufacturing facility enables us to produce larger, heavier and more complex open forging products in various grades of steel and carbon base alloys.

- ISO 9001

MANUFACTURING CAPABILITIES

INVENTORY STOCKING GRADES

CARBON & LOW ALLOY STEEL		ALLOY STEEL		STAINLESS STEEL		SUPERALLOYS		TITANIUM
1010	ASTM A266	4130	ASTM A182F5	ASTM A286	431	718	Waspaloy	Ti 6-4
1018	ASTM A105	4130M	ASTM A182F11	ASTM A182F51	M152	718 oil	C263	Ti 6-4 Premium
1020	ASTM A350 LF2	4140	ASTM A182F22	17-4 PH	FV 535	718 +	Nimonic 80	Ti 6-2-4-2
1022	ASTM A350 LF6	4145	ASTM A707	304/304L	N60	718 Premium	Inco 600	Ti 21s
1035	ASTM A694 F42/F60	4150	CrMoV	310	420	800H	Inco 617	CP Titanium Grade 2
1042	ASTM A694V	4320	12CrNiMo6	316/316L	X46Cr13	HR-120	Inco 625	
1045/50	ASTM A584B	4330/4330V	12CrNiMo7-6	321	X22CrMoV12-1	H-230	Inco 825	
1080	S355 NL	4340/VAR	34CrNiMo6	347	XCrNiMo13-4	H-242	Inco 901	
1524	EN355B	52100	42CrMo4	405	X11CrMo12-1	Alloy X	Inco 907	
1541M	S355J2G3	8620	16Mo3	410	F6NM/1.4313	Alloy 188	Inco 909	
1552	API 5L X60	8630M	H13	422		PE16	H282	
							Thermo-Span	
							H46	



SEAMLESS ROLLED RINGS

The forging process for the seamless rolled rings circumferentially orients the grain flow, giving our pieces the mechanical properties they require to be more resistant to fatigue and impact, thus giving a better quality product capable of meeting your highest expectations.

CARBON, ALLOY & STAINLESS STEEL*

Maximum Outside Diameter		Maximum Height/Length	
in	mm	in	mm
315	8000	67	1700
Maximum Wall Thickness		Maximum Weight	
in	mm	lb	kg
40	1000	55000	25000

*Stainless up to 7,500 kg.

TITANIUM & SUPERALLOYS

Maximum Outside Diameter		Maximum Height Nickel		Maximum Height Titanium	
in	mm	in	mm	in	mm
		51	1300	67	1700
		Maximum Weight Nickel		Maximum Weight Titanium	
196	4980	lb	kg	lb	kg
		11000	5000	15400	7000

CONTOURED ROLLED RING FORGINGS

Near net shape rings are designed to meet customer drawings
 Machine time savings
 Increase material resistance to fatigue failure
 Reduce excess material

OPEN DIE FORGINGS

This process is performed between flat dies with no precut profiles in the dies.

Among our Open Die products are: Blocks, Discs, Hollows, Bars, Spindles and Step-down Shafts.

ROUND BAR

CARBON & ALLOY STEEL	Max Outside Diameter	45 in	1143 mm
	Min Outside Diameter	4 in	102 mm
	Max Length	287 in	7290 mm
	Max Weight	55000 lb	25000 kg
STAINLESS STEEL	Max Outside Diameter	30 in	762 mm
	Min Outside Diameter	4 in	102 mm
	Max Length	200 in	5080 mm
	Max Weight	33000 lb	15000 kg

HOLLOW FORGINGS / BUSHES

CARBON & ALLOY STEEL	Max Outside Diameter	59 in	1499 mm
	Max Inside Diameter	30 in	762 mm
	Min Inside Diameter	7 in	178 mm
	Max Length	275 in	6985 mm
	Max Weight	55000 lb	25000 kg
STAINLESS STEEL	Min Wall	5 in	127 mm
	Max Outside Diameter	45 in	1143 mm
	Max Inside Diameter	30 in	762 mm
	Min Inside Diameter	7 in	178 mm
	Max Length	200 in	5080 mm
	Max Weight	33000 lb	15000 kg
	Min Wall	6 in	152 mm

SPINDLES, STEPDOWN SHAFTS, FLANGE SHAFTS

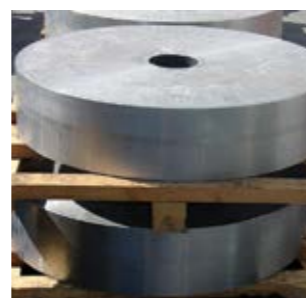
CARBON & ALLOY STEEL	Max Outside Diameter	70 in	1778 mm
	Min Outside Diameter	10 in	254 mm
	Max Length	287 in	7290 mm
	Min I	12 in	305 mm
STAINLESS STEEL	Max Weight	55000 lb	25000 kg
	Max Outside Diameter	50 in	1270 mm
	Min Outside Diameter	10 in	254 mm
	Max Length	200 in	5080 mm
	Min I	12 in	305 mm
	Max Weight	33000 lb	15000 kg

BLOCKS, FLAT BARS, PLATES

CARBON & ALLOY STEEL	Max Length	287 in	7290 mm
	Max Width	79 in	2006 mm
	Max Height	39 in	1000 mm
	Max Weight	55000 lb	25000 kg
STAINLESS STEEL	Max Length	200 in	5080 mm
	Max Width	59 in	1500 mm
	Max Height	39 in	1000 mm
	Max Weight	33000 lb	15000 kg

DISCS

CARBON & ALLOY STEEL	Max Outside Diameter	87 in	2200 mm
	Max Weight	33000 lb	15000 kg
STAINLESS STEEL	Max Outside Diameter	87 in	2200 mm
	Max Weight	17600 lb	8000 kg
SUPERALLOYS	Max Outside Diameter	39 in	1000 mm
	Max Weight	5500 lb	2500 kg



POT DIE FORGINGS

This forging process involves the use of tools to impart more shape to the work piece, resulting in a near net shape end product, which saves time and money and creates a stronger, higher-quality finished piece.



MACHINE SHOP

CAPABILITIES

	Maximum Outside Diameter		Maximum Height/Length		Maximum Weight		Minimum Surface Finish	
	in	mm	in	mm	lb	kg	RMS	µm
Vertical Turning	315	8,000	157	4,000	55,000	25,000	63	1.6
Horizontal Turning	60	1,500	315	8,000	33,000	15,000	63	1.6
Flange Drilling	220	5,600	15	380	22,000	10,000	125	3.2

	Maximum Outside Diameter		Maximum Height/Length		Maximum Width		Maximum Weight		Minimum Surface Finish	
	in	mm	in	mm	in	mm	lb	kg	RMS	µm
Milling	280	7,100	39	990	79	2006	33,000	15,000	125	3.2

If you need a certain material or geometry not currently being manufactured, please do not hesitate to contact us. Our very capable engineering team will gladly work to offer a solution.

DELIVERING EXCELLENCE TO OUR CUSTOMERS

CUSTOMER SERVICE



Our customer-centric structure enables us to interpret our clients' needs and transform them into high-value forging solutions.

A committed sales team visits our customers on a regular basis, thus establishing solid relationships and has the technical knowledge and decision-making abilities to provide answers on the spot. Our technical team can support our customers directly and is fully committed to developing the best solution for any given requirement.

QUALITY



Focus on quality has been the foundation to our success and growth. Through certifications, customer recognitions and audits, our Quality, Safety & Environmental System is continuously working on areas of opportunity as well as working on sharing best practices amongst departments and facilities. At every facility, we have integrated external certifications to ensure that the highest standards are maintained and improved.

TRACEABILITY



Our cutting-edge information systems guarantee effective process control, long-term document preservation and, in some instances, full traceability of our products. Certifications are issued for each step of our processes only after our IT system runs a full procedure validation, thus ensuring that we meet our customers' requirements. In addition, our e-Frista tool allows our customers to view online account statements and status reports among other features.

PRODUCT DEVELOPMENT



Our goal is to provide the best forging for every application. This is why we have experts in metal forming, metallurgy, modeling, machining and manufacturing that work together with our customers' engineers to develop geometries, required properties and specifications for general and very critical parts. Additionally, our manufacturing lines record real time data including forces, temperatures, deformation speed, heating cycle and even images that are key for process control, process improvement and cost reduction.



OUR WORLDWIDE NETWORK

Headquarters

Santa Catarina, Nuevo León, Mexico

Manufacturing Facilities

Santa Catarina, Nuevo León, Mexico

- Santa Catarina Plant
- Superalloys Plant

García, Nuevo León, Mexico

- García Plant
- Open Die Plant

Wayne, MI, United States

- Ringmasters (JV)

Global Sales Offices

Belo Horizonte, MG, Brazil

Long Beach, California, USA

US Toll Free: 1 888 882 0959

Mexico Toll Free: 01 800 253 7472

International: +52 (81) 8153 0321

www.frisa.com

