

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 **45 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, 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

# INDUSTRIES

Frisa provides forging solutions that meet the highest standards of each industry we participate. We specialize in critical forged components used in aerospace, construction & mining, oil and gas, power generation, wind power and other industries worldwide.



**AEROSPACE**



**CONSTRUCTION AND MINING**



**INDUSTRIAL MACHINERY**



**OIL AND GAS**



**POWER GENERATION**



**WIND POWER**



# 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.

### Certifications:

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.

### Certifications:

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.

#### **Certifications:**

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.

#### **Certifications:**

ISO 9001



### **FRISA STEEL**

Our steel mill integrates best-in-class technologies to deliver top-quality steel ingot stock for forging applications. With an annual capacity of 350,000 tons of liquid steel per year, our top quality steel ingots range in sizes 13" to 70" and up to 100 tons.

#### **Certifications:**

ISO 9001



# HIGH-VALUE FORGING SOLUTIONS

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



## STEEL MAKING

Our steel grades are produced under strict process controls to provide a consistent chemical composition and high cleanliness, conforming to industry standards: ASTM A694, ASTM A707, ASTM A335, ASTM A182, ASTM A668, ASTM A350.



## 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.



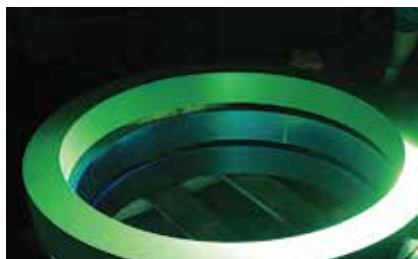
## HEAT TREATMENT

Our processes include the following: normalizing, quenching, tempering, annealing, solution annealing, spheroidizing, aging, stress relieving, or any other heat treatment required by customer.



## MACHINING

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 to perform the following tests: ultrasound, magnetic particles (wet and dry) and 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


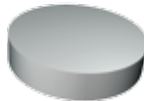
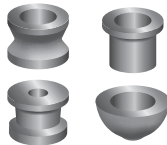
From a single ring to a full container, we handle door-to-door shipments with access to the most competitive rates, including Special Duty Benefits with North American and European Union Free Trade Agreement.

# MATERIAL STOCKING GRADES

Classification	Grade	UNS Number	DIN	Werkstoff Nr
Carbon and Low Alloy Steels	A105	K03504	C22.8	1.0460
	1010	G10100	CK10	1.1121
	1018	G10180	CK15	1.1141
	1020	G10200	CK20	
	1035	G10350	CK35	1.1181
	1045	G10450	CK45	1.1191
	1050	G10500	CK50	
	1080	G10800	CK80	
	1552	G15520		
	A350 Grade LF6			
	A350 Grade LF2	K03011	C22.8	1.0460
	A694			
			E355	1.0580
Alloy Steels	4130	G41300	25CrMo4	1.7218
	4140	G41400	42CrMo2	1.7225
	4145	G41450		
	4320	G4320		
	4330			
	4340	G43400	34CrNiMo6	1.6582
	52100		100Cr6	1.3505
	8620	G86200	21NiCrMo22	1.6543
	8630	G86300		1.6545
	A182 Grade F5	K41545	12CRM0195	1.7362
	A182 Grade F11	K11597	13CrMo4-5	1.7335
	A182 Grade F22	K21590	10CrMo9-10	1.7380
	H 13	T20813	X40CrMoV 5-1	1.2344
	A707 Grade L5			
	A707 Grade 3W			
Stainless Steels	A182 F44	S31254	X1CrNiMoN20-18-7	1.4547
	A182 F51	S31803	X2CrNiMoN22-5-3	1.4462
	A182 F53	S32750	X2CrNiMoN25-7-4	1.4410
	A182 F60	S32205		
	A182 F91	K90901	X10CrMoVNb9-1	1.4903
	15-5 PH	S15500	X5CrNiCuNb15-5	1.4545
	17-4 PH	S17400	X5CrNiCuNb 17-4	1.4542
	304	S30400	X5CrNi18-10	1.4301
	304L	S30403	X5CrNi18-9	1.4306
	310	S31000	X8 CrNi 25-21	1.4845
	316	S31600	X5CrNiMo17 12-2	1.4401
	316L	S31603	X2CrNiMo17 12-2	1.4404
	321	S32100	X6CrNiTi18-10	1.4541
	347	S34700	X6CrNiNb18-10	1.4551
	410	S41000	X12Cr13	1.4006
	420	S42000	X46Cr13	1.4034
	422	S42200		1.4935
	431	S43100	X17CrNi16-2	1.4057
			X22CrNiMoV 12-1	1.4923
			X11CrMo 12-1	
	F6NM	S41500	X3CrNiMo 13-4	1.4313
Superalloys	Alloy 718	N07718	NiCr19Fe19Nb5Mo3	2.4668
	Alloy 718 Plus			
	Waspaloy	N07001	NiCr20Co13Mo4Ti3Al	2.4654
	Alloy 909	N19909	X4NiCo38Nb	
	Alloy 907	N19907	X4NiCo38Nb	
	Alloy 625	N06625	NiCr22Mo9Nb	2.4856
	Alloy 600	N06600	NiCr15Fe8	2.4816
	Alloy 617	N06617	NiCr23Co12Mo	2.4663
	Alloy X	N06002	NiCr22Fe18Mo	2.4665
	Alloy H230	N06230	NiCo29Cr28Si	2.4880
	Alloy 188	R30188	CoCr22NiW	2.4683
	Alloy H242	N10242		
	Alloy HR120	N08120	NiFe33Cr25Co	2.4854
	Nimonic 80	N07080	NiCr20TiAl	2.4952
	Alloy 825	N08825	NiCr 21 Mo	2.4858
	Alloy 800 H	N08800/N08810	X8 NiCrAlTi 32-21	1.4876 / 1.4958
	Alloy C276	N10276	NiMo 16 Cr 15 W	2.4819
	Monel 400	N04400	NiCu 30 Fe	2.4360
	Alloy C263	N07263	NiCo20Cr20Mo6Ti2Al	2.4650
	Alloy 286	S66286	X5 NiCrTi 26-15	1.4980
	Rene 41	N07041	NiCr19Co11MoTi	2.4973
	Thermo Span			
Titanium	Ti-6-4	R56400	TiAl6V4	3.7165
	Ti 6-2-4-2	R54620	TiAl6Sn2Zr4Mo2	3.7145
	Ti 21s	R58210		
	Ti 834			




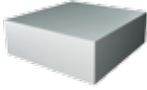
# MANUFACTURING CAPABILITIES

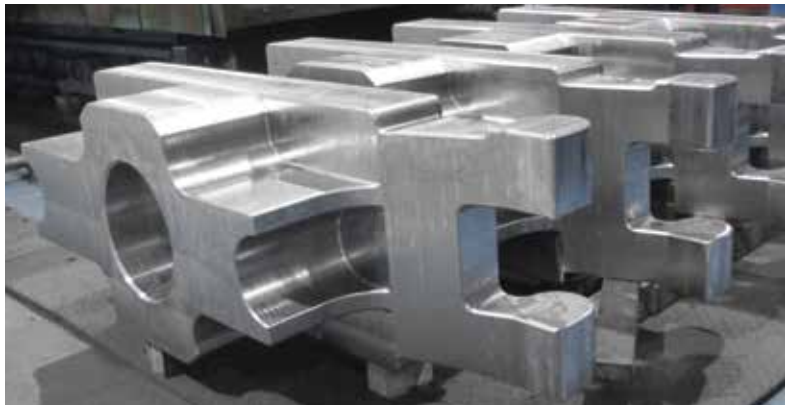
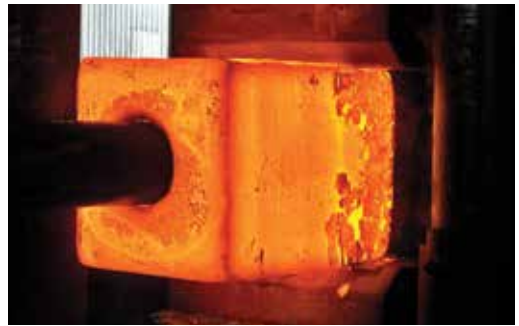
## OUR PRODUCTS

				
	<b>Rolled Rings</b>	<b>Contoured Rings</b>	<b>Discs</b>	<b>Pot-Die Forgings</b>
Range	O.D. up to 315 in.	Near net shape rings forged to customer drawing.	O.D. up to 87 in.	Near net shapes forged to customer drawing with special tools.
	Weight up to 55,000 lb.		Weight up to 55,000 lb.	
Material	Carbon Steel, Alloy Steel, Tool Steel, Stainless Steel, Superalloys, Titanium.			Carbon Steel, Alloy Steel, Stainless Steel.
Heat Treat	Normalizing, Quenching, Tempering, Annealing, Solution Annealing, Spheroidizing, Aging, Stress Relieving.			
Testing	Destructive and Non-Destructive.			
Machining	Available CNC machining capabilities: vertical & horizontal turning, milling, boring, drilling, deep drilling.			





			
<b>Round Bars</b>	<b>Hollows</b>	<b>Step &amp; Flange Shafts</b>	<b>Blocks &amp; Plates</b>
O.D. up to 45 in.	O.D. up to 59 in.	O.D. up to 70 in.	Length up to 287 in.
Length up to 287 in.	I.D. up to 30 in.	Length up to 287 in.	
Weight up to 55,000 lb.	Weight up to 55,000 lb.	Weight up to 55,000 lb.	Weight up to 55,000 lb.
Carbon Steel, Alloy Steel, Tool Steel, Stainless Steel.			
Normalizing, Quenching, Tempering, Annealing, Solution Annealing, Spheroidizing, Aging, Stress Relieving.			
Destructive and Non-Destructive.			
Available CNC machining capabilities: vertical & horizontal turning, milling, boring, drilling, deep drilling.			



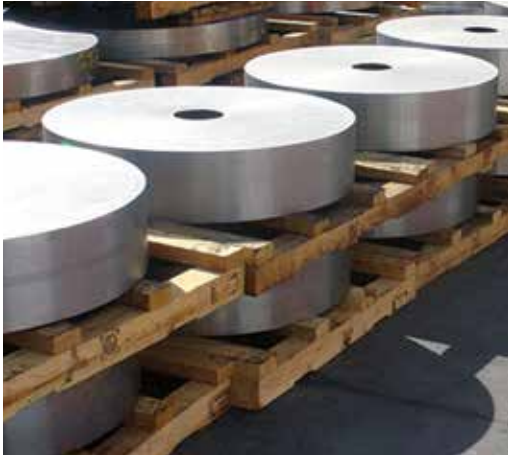
# MACHINE SHOP

## 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	79	2,000	315	8,000	88,000	40,000	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	100	2540	157	4000	48,500	22,000	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-Frisa tool allows our customers to view online account statements and status reports, download MTR's 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, México

### Manufacturing Facilities

Santa Catarina, Nuevo León, México

- Santa Catarina Plant
- Superalloys Plant

García, Nuevo León, México

- García Plant
- Open Die Plant
- Frisa Steel

### Global Sales Offices

Cambridge , Ontario, CAN

Long Beach, California

The Woodlands, Texas, USA

US Toll Free: 1 888 882 0959

Mexico Toll Free: 01 800 253 7472

International: +52 (81) 8153 0300

[www.frisa.com](http://www.frisa.com)

