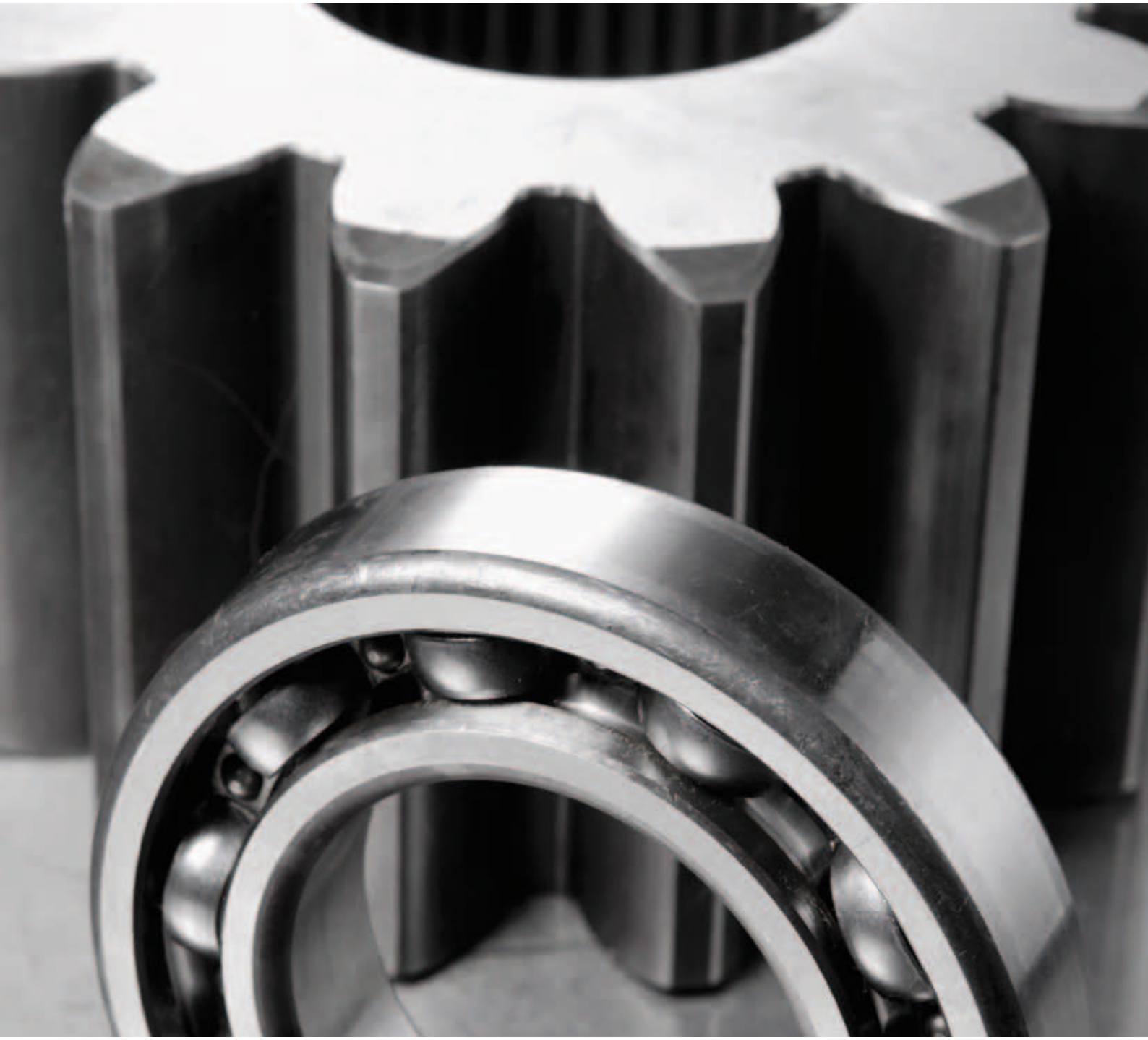
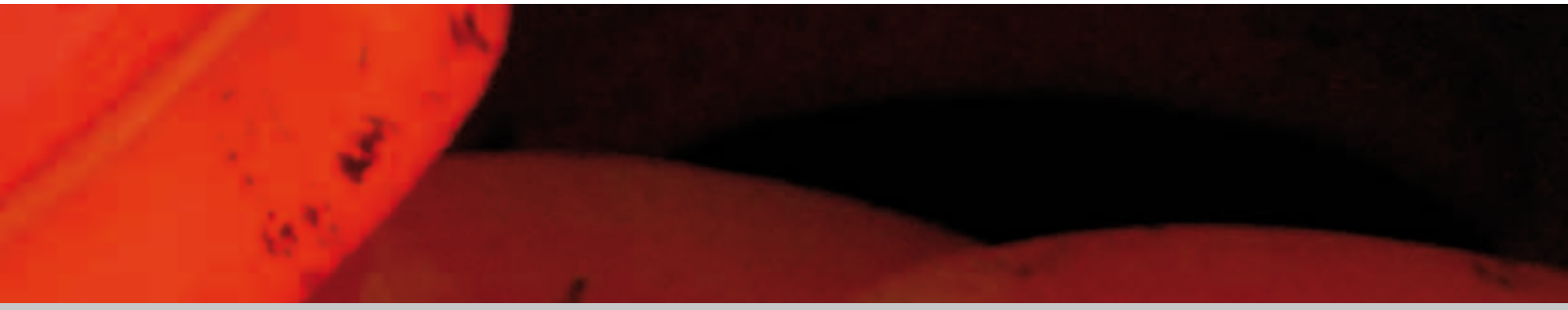
FOMAS GROUP



GEARS, TRANSMISSIONS AND BEARINGS

Since 1956 the reliable partner of equipment manufacturers



GEARS, TRANSMISSIONS AND BEARINGS

FOMAS Group manufactures rings and forgings, in any type of steel and non-ferrous alloys for the **Gears, Transmissions & Bearings** markets.

Our decades of experience in the manufacturing of components for very severe conditions & critical applications, have made us an essential partner to our clients.

We share know-how within the Group, optimizing processes and materials, minimizing cost, and maximizing product quality.

We supply rings for Gears/gearboxes, Speed increasers/reducers, Bearings.

Our added value is to provide **turnkey solutions**, from forging and ring rolling to the finished machined part.

Starting from a thorough analysis of the customer's design, then engineering the production of contour forgings close to net shape up to the finished part.

All the required machining processes such as milling, lathe-machining, drilling, sawing and others can be carried out in our manufacturing units.

- **Cutting-edge technology**
- **Quality**
- **On time delivery**

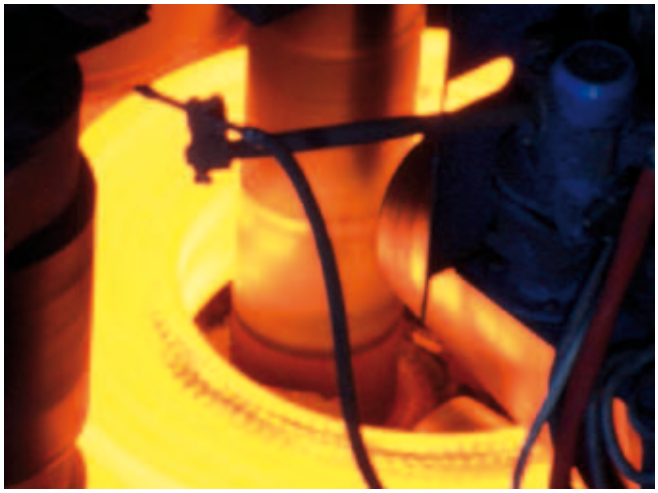
Gears, Transmissions and Bearings

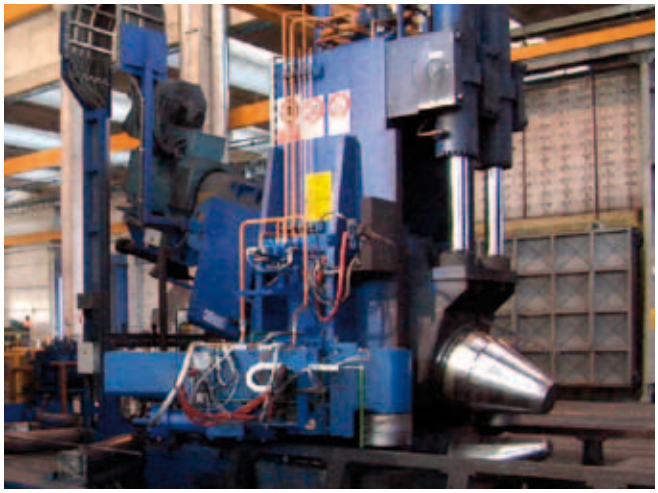
GEARS / GEAR BOXES

- Rings for gears
- Rings for planetary gears
- Hollow shafts
- Rings for sun gears
- Rings for intermediate gears
- Rings for output gears
- Discs
- Shafts

TRANSMISSIONS

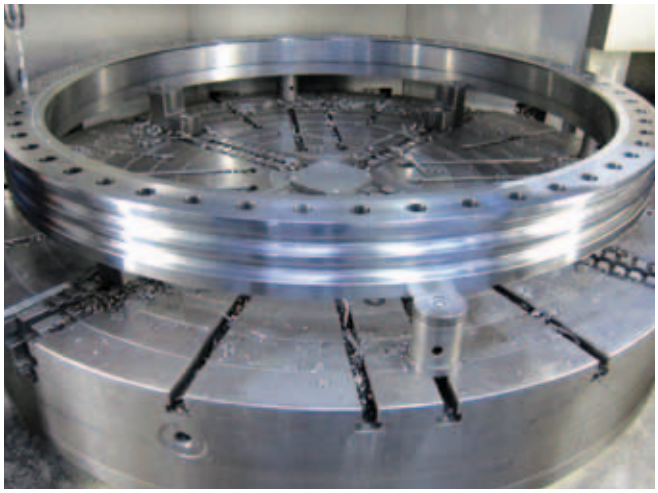
- Rings for gears
- Rings for bevel gears

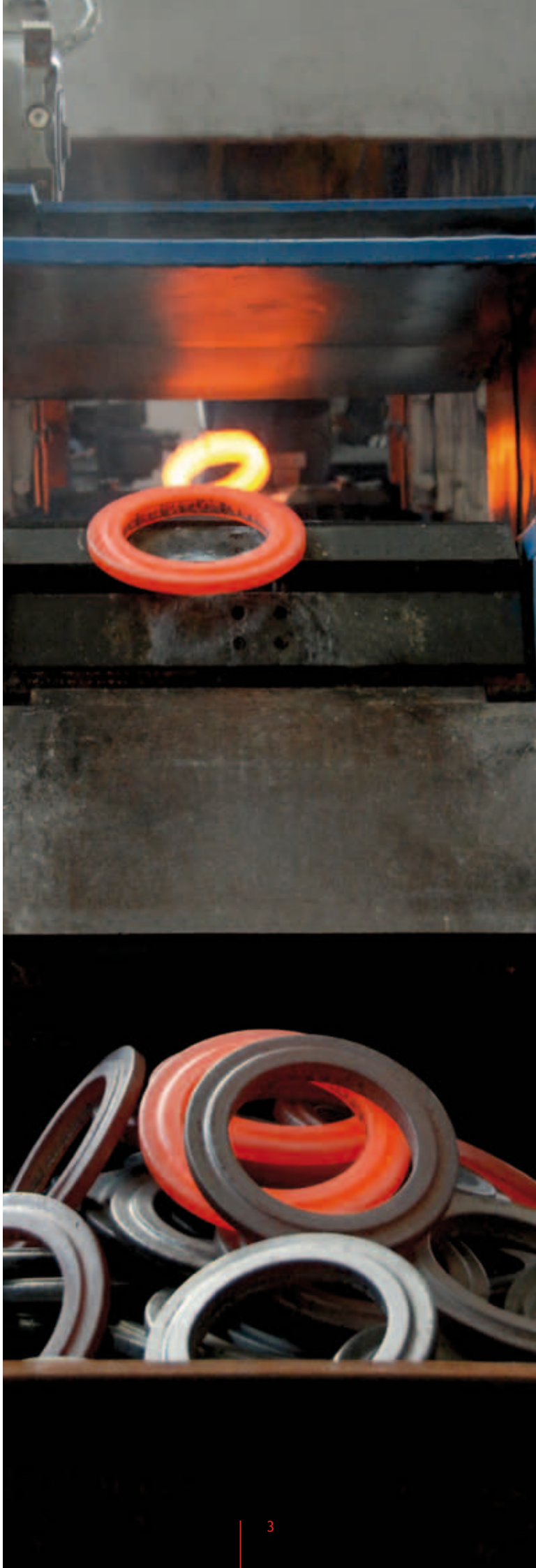




BEARINGS / ULTRA LARGE BEARINGS

- Rings for Cylindrical Roller Bearings (CRB)
- Rings for Spherical Roller Bearings (SRB)
- Rings for Deep Groove Ball Bearings (DGBB)
- Rings for Angular Contact Ball Bearings (ACBB)
- Rings for Barrel Roller Bearings (BRB)
- Rings for Axial Spherical Roller bearings (ASRB)
- Rings for Spherical Roller Thrust bearings (SRTB)
- Rings for Self Aligning Ball Bearings (SABB)
- Ring for Spindel Bearings (SB)



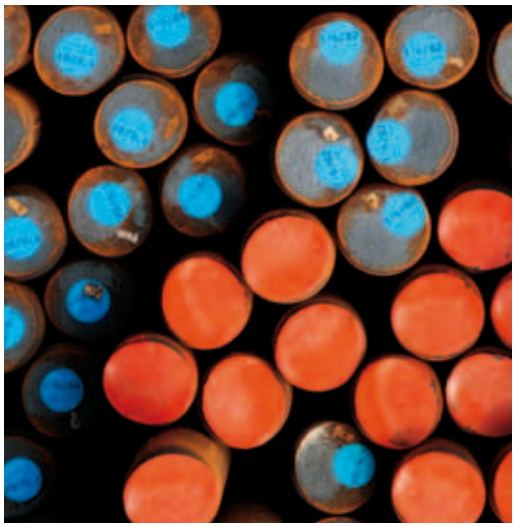


MATERIALS - Special steels, nickel and titanium alloys

Steel	Material Number	Uns-Designation	AISI-SAE	Din identification	Alloy	Application
CARBON AND LOW ALLOYS STEELS	~1.0432				SA 105	GENERAL INDUSTRY
	-				A 266 CL2	
	~1.0570				SA 350 LF2	
	~1.5403; ~1.6310; ~1.6368				SA 508 Grade 3 CL1 /CL2	
	1.0562	-	-	STE355	A48 CP-APR	
	1.1120				20 Mn 5	
	1.6308				16 MnD 5	
	1.6308				18 MnD 5	
	1.6310				20 MnMoNi 55	
	~1.0570				A 694 F52	
	~1.0570				A 694 F60	
	~1.0570				A 694 F65	
	~1.0570				A 694 F70	
					A 707 Grade 3W	
	1.6368				15NiCuMoNb5	
	~1.5637; ~1.5639				SA 350 LF3	
	~1.8902; ~1.8905; ~1.8912; ~1.8915; ~1.8932; ~1.8935				A 350 LF6	
	15.421	K12822		20MnMo3-5	SA 336 F1	
	~1.7362	K41545		X11CrMo5	SA 336 F5	
	-	K11572 K11597		no	SA 336 F11	
	~1.7337	K11564		16CrMo4-4	SA 336 F12	
	no	K31545		no	SA 336 F21	
	1.738	K21590		10CrMo9-10	A 182 F22	
	no	K31835		12CrMoV9-10	A 182 F22V	
	~1.7214	no		30CrMo4	AISI 4130	
	1.7225	no		42CrMo4	AISI 4140	
	1.7218		4125	25CrMo4		
	1.7220	no	4130	34CrMo4	34CrMo4	
	1.8159			50CrV4	50CrV4	
	1.6545	G 86300			AISI8630	
	1.6565	G 43400		40NiCrMo6	40NiCrMo6	
	1.6510				39NiCrMo3	
	-	K23010			A 470 CL8	
	~1.5662				A 522 Type1	
	1.6523			21NiCrMo2	20NiCrMo2-2	
	1.5415				15 Mo 3	
	1.0532 ~		A 105	C21		
	1.0508		A 350 LF2	St52.3N		
	1.1121		1010	Ck10		
	1.1141		1015	Ck15		
	1.1148		1016	Ck15Al		
	1.1151		1020	Ck22		
	1.1178		1030	Ck30		
	1.1181		1034	Ck35		
	1.1186		1040	Ck40		
	1.1193 ~			Cf45		
	1.1191		1045	Ck45		
	1.1198		1049	CK48		
	1.1206		1050	Ck50		
	1.1203		1055	Ck55		
	1.1221		1060	Ck60		

Steel	Material Number	Uns-Designation	AISI-SAE	Din identification	Alloy	Application
CASE HARDENING STEELS	1.7131		G 51150	16MnCr5	16MnCr5	GEARS AND TRANSMISSIONS
	1.7147		5120	20MnCr5	20MnCr5	
	1.5919		3115	17CrNi6.6	17CrNI6.6	
	1.6587	-		18CrNiMo7.6	18CrNiMo7.6	
	1.6566			17NiCrMo6-4		
	1.6523		8620	21NiCrMo2		
	1.5732		3415	14NiCr10		
	1.6782			16NiCrMo12-6		
ALLOYED HEAT TREATABLE STEELS	1.6580	-		30CND8	30CrNiMo8	GEARS AND TRANSMISSIONS
	1.6582			34CND6	34CrNiMo6	
	1.7710			15CrMoV6.9	15CrMoV6	
	1.7707			30CrMoV9	30CrMoV9	
	1.8519			31CrMoV9		
	1.7225		4140	42CrMo4		
	1.7035		5140	41Cr4		
	1.7220		4135	34CrMo4		
	1.6510		9840	39NiCrMo3		
	1.6773			36NiCrMo16		
	1.7228		4150	50CrMo4		
	17.218		4125	25CrMo4		
	16.511		9840	34CrNiMo4		
	1.7034 ~		5135	37Cr4		
	1.7225 ~		4142	41CrMo4		
	1.7228		4150	50CrMo4		
	1.8159		6150	50CrV4		
BEARING STEELS	1.3505		52100	100Cr6		BEARINGS
	1.2067		52100	100Cr6		
	1.3520			100CrMnSi6-4		
	1.3537		485(3)	100CrMo7		
	1.3539		A 485 (B8)	100CrMnMo8		
	1.3536		K19965 ~	100CrMo7-3		
TOOL STEEL	1.2343		H 11	X38CrMoV5-1		
	1.2344		H 13	X40CrMoV5-1		
STAINLESS STEEL	1.4305		303	X10CrNiS18 9		
	1.4567		304Cu	X3CrNiCu18 9		
	1.4401		316	X5CrNiMo18 10		
	1.4404		316L	X2CrNiMo17-13-2		
	1.4541		321	X6CrNiTi8-10		
	1.4006		410	X 10 Cr 13		
	1.4021		420	X20Cr13		
	1.4016		430	X6Cr17		
	1.4057		431	X20 CrNi17 2		
	1.4542		17-4 PH / 630	X5CrNiCuNb16-4		

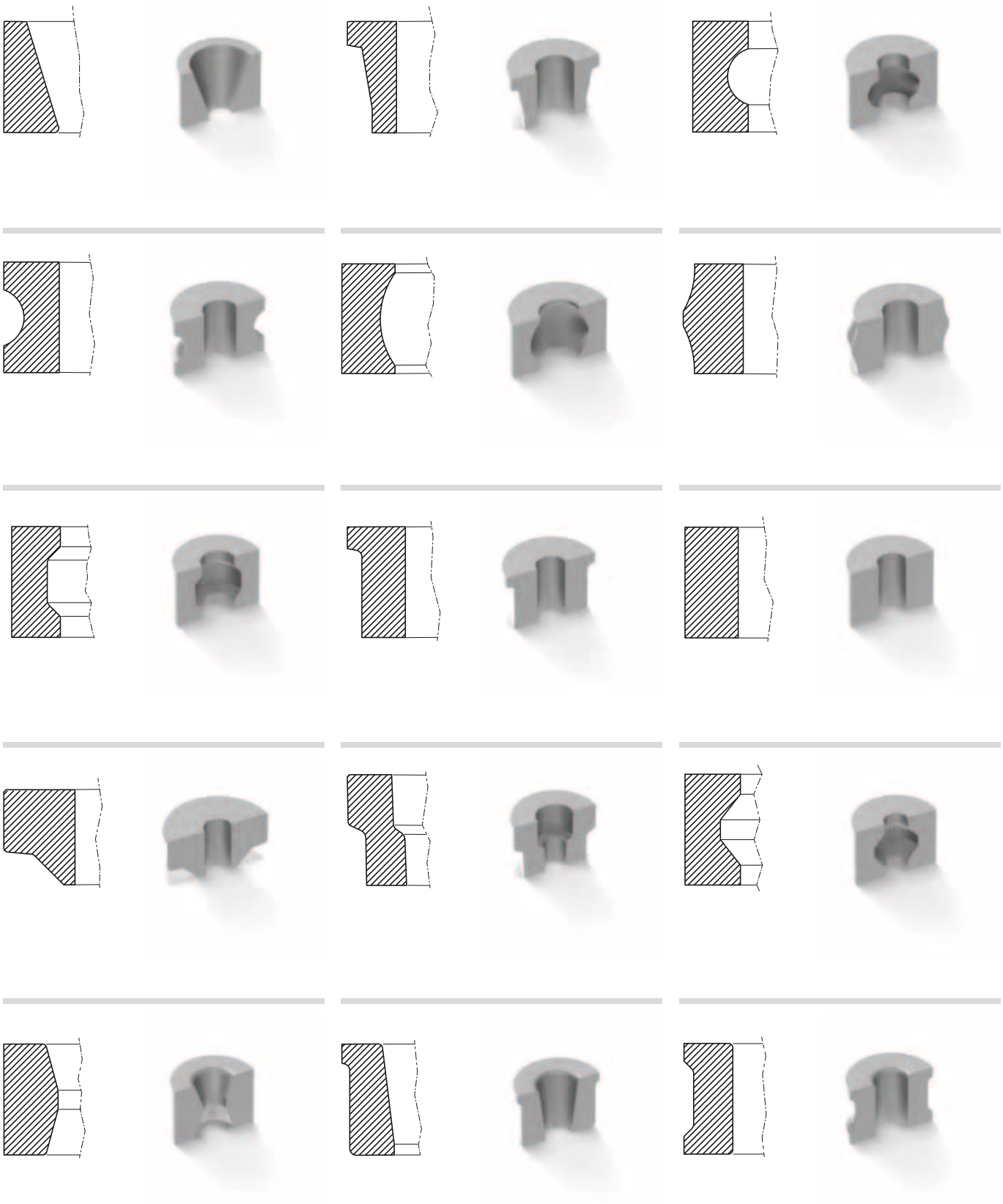
Other materials and alloys are available on request

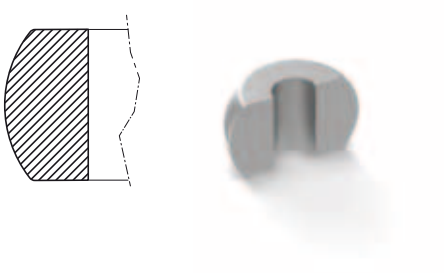
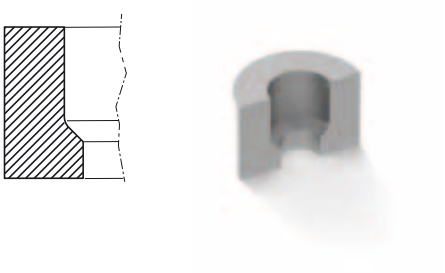
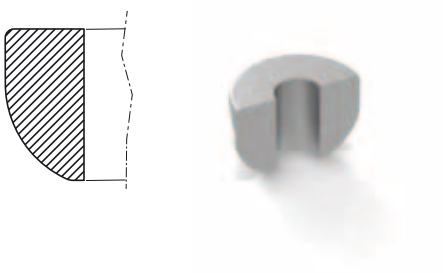
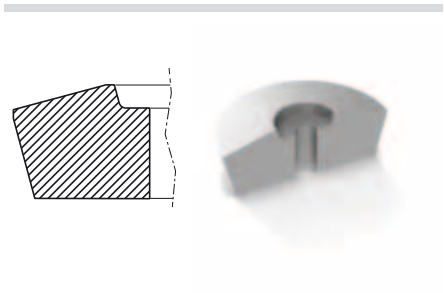
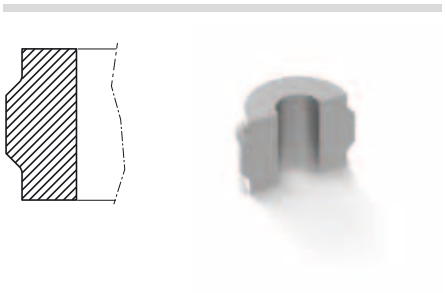
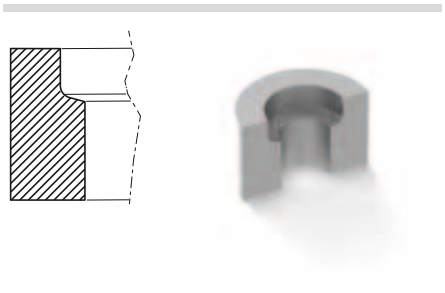
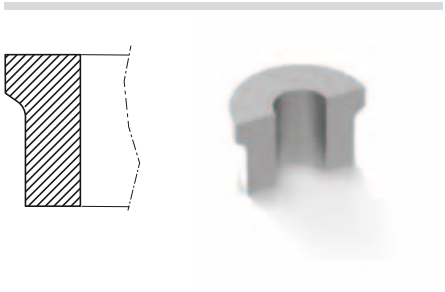
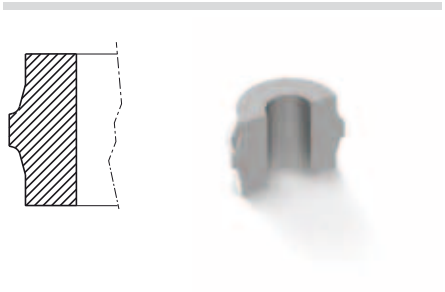
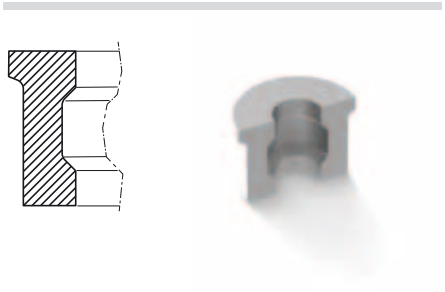
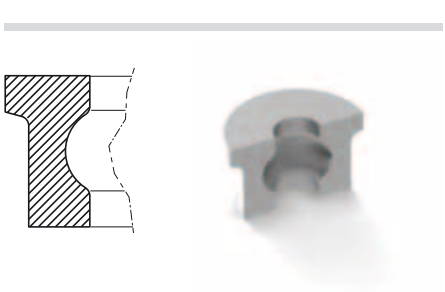
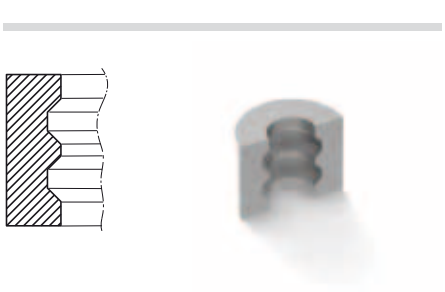
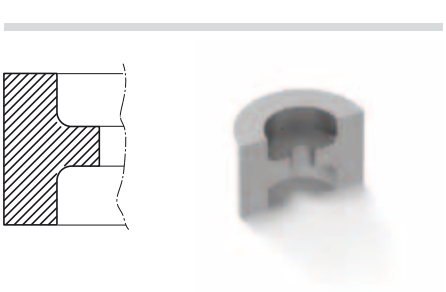
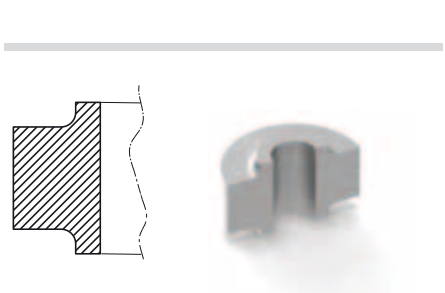
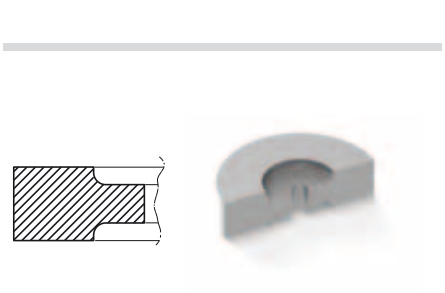
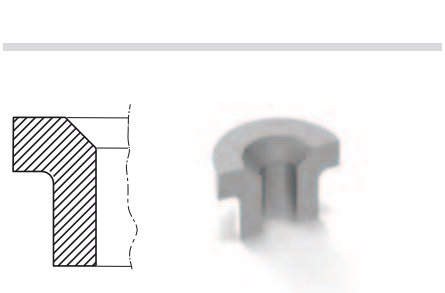


Profiled shapes of rolled rings

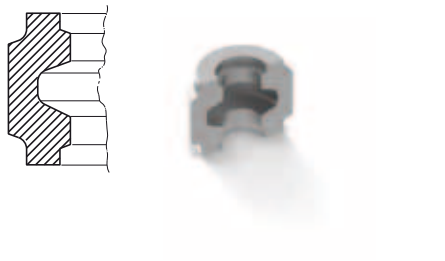
PROFILING ADVANTAGES:

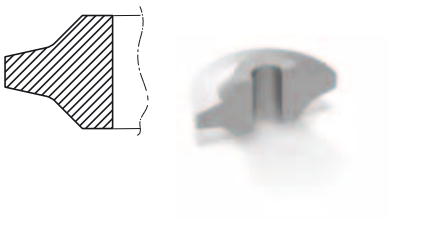
- Reduced raw material consumption
- Reduced machining hours
- Optimized grain flow/Increased product performance

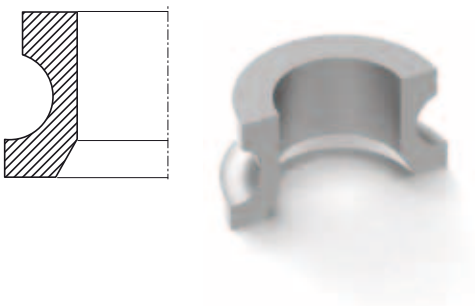


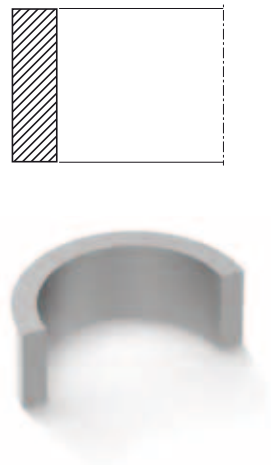
















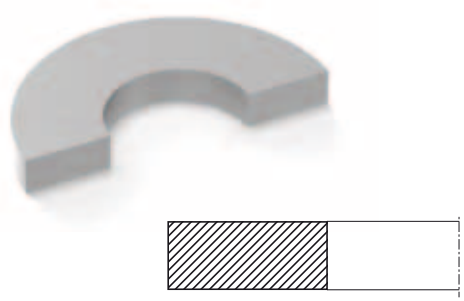
Profiled shapes of rolled rings

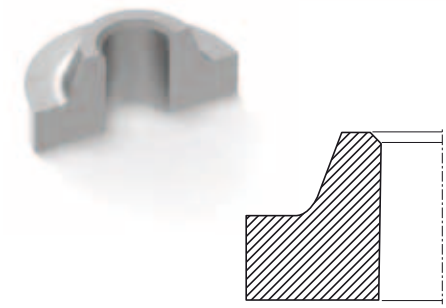


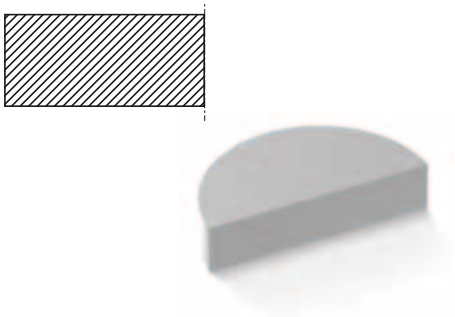


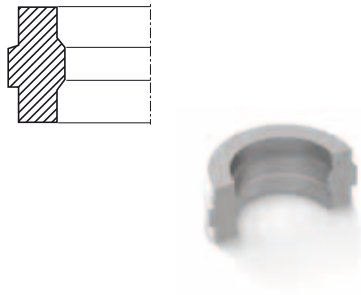


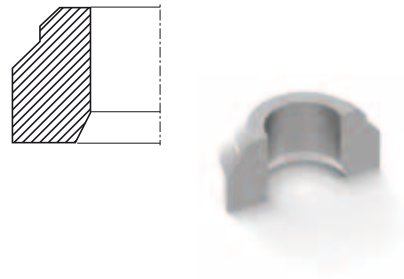


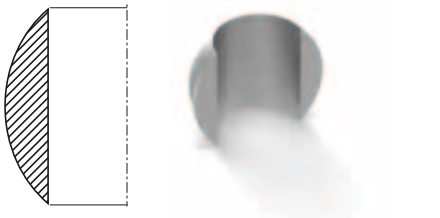


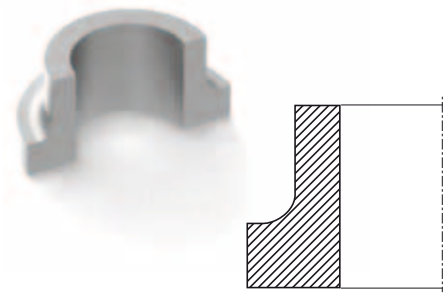


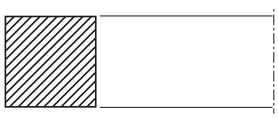


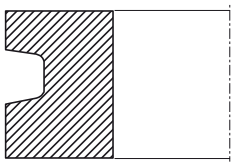


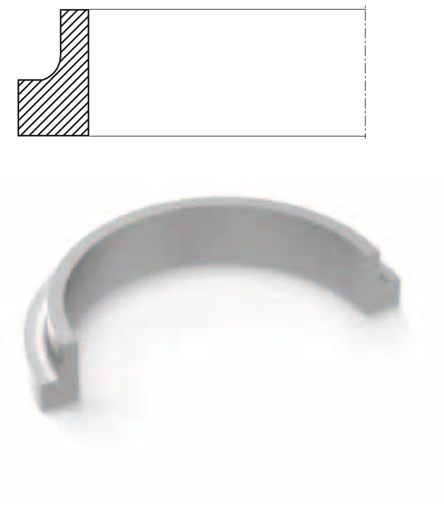


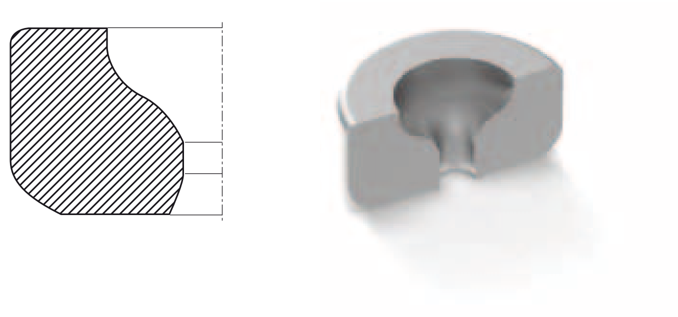


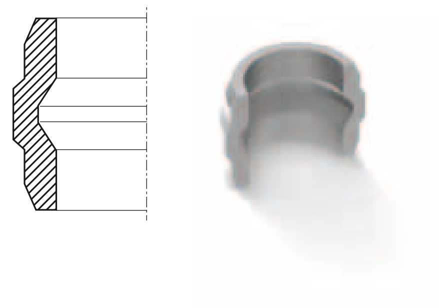


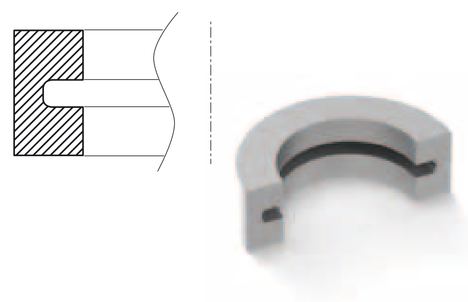


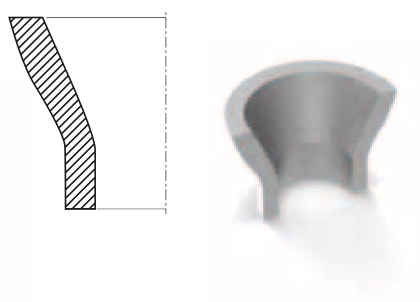


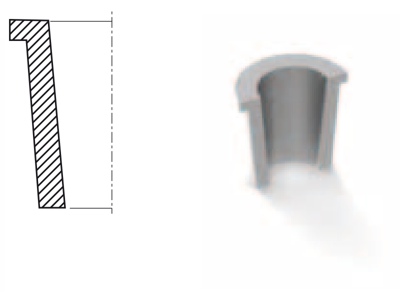


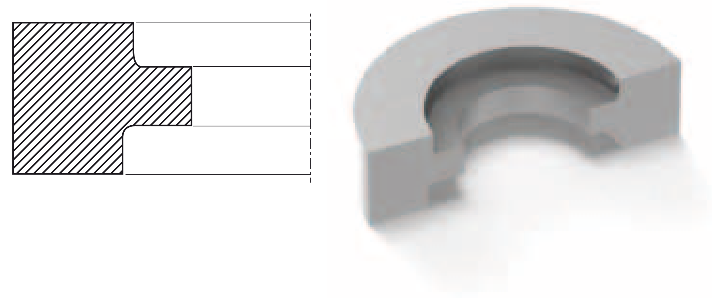


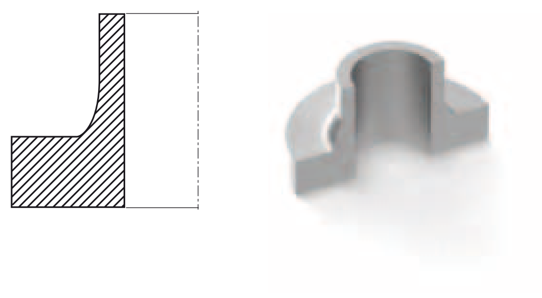












Other profiles are available on request

THE GROUP

Our mission is to fulfil customer requirements with unmatched quality and on time delivery.
Our 50 years experience enable us to provide the highest level of material and process knowledge on critical industrial applications.

The Group has over 1,350 employees all around the world. Working with us signifies entering a team which is focused on continuous evolution, a company that measures its success in the achievement of excellence at each and every step of function and process.

The Group is organised in two main business units, Forgings and Rings and its factories are located in Italy, France, India and China.

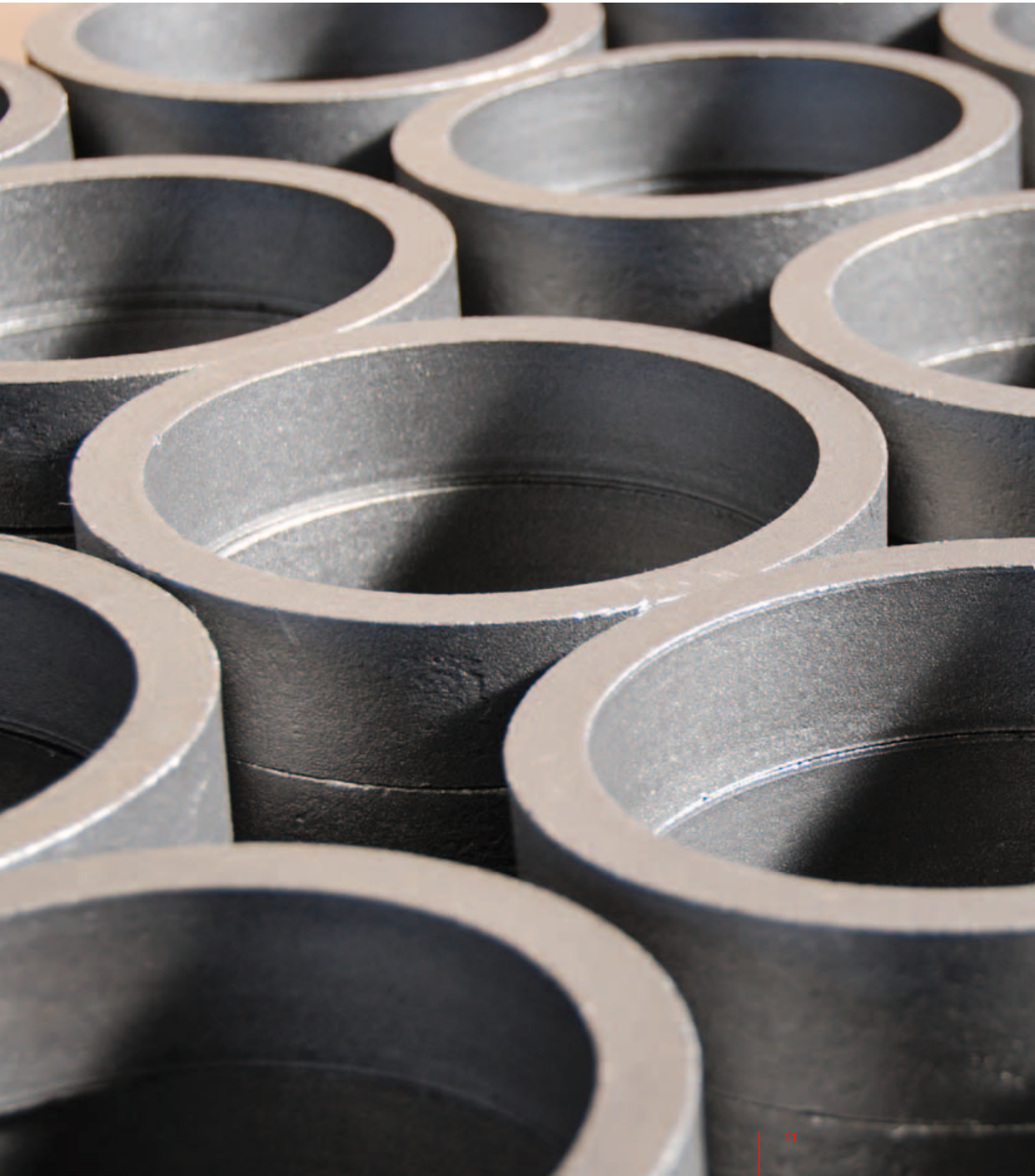
OUR GROWTH PATH

In order to comply with the most demanding customer requests, in 2007 the Group initiated an extensive **250 million euro investment** in new facilities, technology, and machinery and human capital around the world.

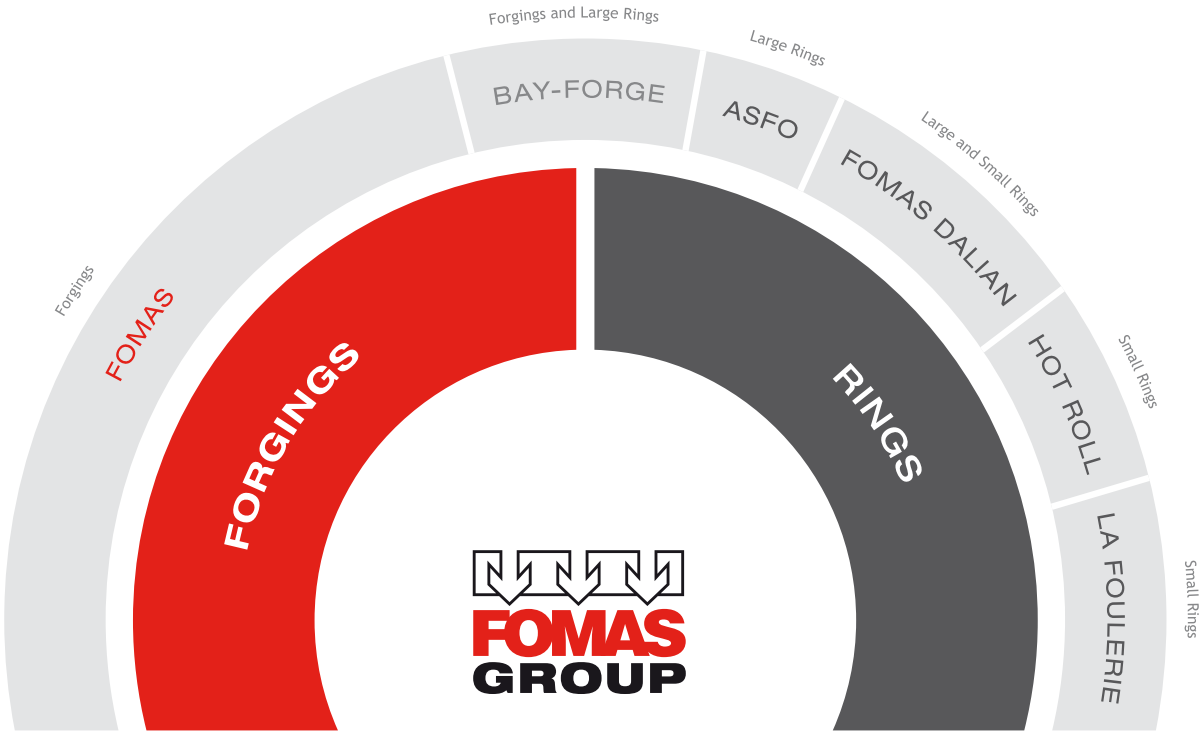
The "FOMAS 2012" project was launched to significantly increase the Group's manufacturing capabilities and capacity.

While the world's financial crisis hit, FOMAS continued to move forward with investments as planned: this major investment project was completed more than a year ahead of schedule.
And we are still forging ahead with more upcoming investments.

1,350
employees



FOMAS GROUP STRUCTURE



average

180,000 tons

raw material purchased 2012

POWER GENERATION

Steam
Gas
Hydro
Geothermal
Nuclear
Wind

OIL and GAS

Upstream
Downstream
Process Equipment

MOBILITY/TRANSPORTATION

Automotive
Industrial Vehicles
Aerospace
Railway
Ship Industry

CONSTRUCTION EQUIPMENT

Construction
Mining
Tunnelling

GENERAL INDUSTRY

Dies & Rolls
Agriculture
Chemical Process Equipment
Fluid Handling

GEARS, TRANSMISSIONS and BEARINGS

Gears/gearboxes
Speed increasers/reducers
Bearings

SPECIAL STEELS and ALLOYS

GROUP'S CAPACITY HIGHLIGHTS

Process optimization and control

- High material recovery & yield
- Fit to design ingot weight (100% material optimization)
- High process automation and reproducibility (no human factor)
- Fully recorded and digitized real time process control

RINGS

- **max. ring diameter: 7,000 mm**
- **max ring height: 1,200 mm**
- **max ring weight: 20 ton**
- **max ingot weight: 40 ton**

17 Rolling Mills

12 for small rings

5 for large rings

Providing our customers assurance of supply from different manufacturing facilities.

plant	line	weight (kg)	D ext (mm)	H (mm)	
HOT ROLL	2	1-10	120-270	30-110	Small rings
HOT ROLL	4	5-40	150-450	30-170	
HOT ROLL	5	1-6	140-220	25-40	
HOT ROLL	6	15-80	200-900	30-200	
HOT ROLL	7	8-40	150-600	30-165	
LA FOULERIE	8/9	1-6	100-400	30-85	
LA FOULERIE	12	8-25	160-480	30-130	
LA FOULERIE	14	3-15	160-450	30-130	
LA FOULERIE	15	10-50	200-500	65-200	
LA FOULERIE	18	5-20	150-400	30-160	
DALIAN	RM1	2-20	180-500	30-160	
DALIAN	RM2	6-80	300-1150	30-200	
DALIAN	bridging	80-2000	300-2000	40-700	Large rings
ASFO	1	80-15000	2500	500	
ASFO	2	80-15000	4500	1100	
ASFO	3	80-15000	7000	1250	
BAY-FORGE	1	20000	5500	1000	

Aluminium electric-drop furnace which guarantees full immersion of batch charge within 5 seconds.

State of the art in-house heat treatment plants, with an automated mobile conveyor for loading/unloading operations.
This means quick, consistent and optimized transfer time from furnace to tank.

CERTIFICATIONS

All the Group's Companies are certified with:

- ISO 9001
  Det Norske Veritas (DNV)
- ISO 14001
  Environmental Management (DNV)
- BS OHSAS 18001
  Occupational Health and Safety (DNV)

Moreover each company is certified by the most prestigious institutes in specific sectors.
In particular for small rings we are certified ISO TS 16949.

FOMAS Group's central research and development department aims to respond to customer needs. We often provide, on request co-design solutions. Our approach is to focus on safety, cost reduction, minimize end waste. Moreover we strive to sustain profitability providing the highest level of quality and safety throughout the entire manufacturing cycle and at the same time ensuring the least possible impact on the environment.


ABB
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studiochiesa

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