

Special Steels





We accelerate to evolve with the automotive industry

A result of strong investments focused on the global evolution of the automotive industry, special steels from Sidenor are present in a large number of vehicles produced in Europe.

Our constant quest for technological improvement ensures that we can meet the most stringent requirements of our customers for efficiency and quality.

This is Sidenor, the biggest special steels producer in Spain and one of the largest in Europe.

About Sidenor

Sidenor is a steel company, leader in the European steel industry for the production of special steel long products and one of the main producers of forged and cast pieces. It is also an important supplier of cold finished products in the European market.

The company has production plants in Spain (in the Basque Country, Cantabria and Catalonia).

Our steel production capacity is around one million tonnes per year, destined mainly to the manufacture of components for the automotive, machines and capital equipment, shipbuilding, civil engineering, defence, energy, mining and petrochemical sectors.

In addition, Sidenor has one of the largest R & D centres in the steel industry in Europe; it undertakes technological developments to optimize processes and products in our facilities as well as in those of our customers.



Environment

Environmental Management System

A big area of concern for Sidenor is its performance in the environment area. This concern is reflected in the way we work with the different stakeholders, integrating the environmental variable in all the process monitoring, from design to final product delivery.

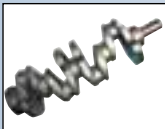
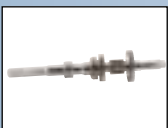
Following these principles, all the Company's plants adopt an Environmental Management System (EMS), prepared in accordance with ISO14.001, develop R&D projects and monitor the environmental footprint of our products.

Sidenor: awarded with the European Prize for Environment - Nationwide and Basque Country sections.



Applications

Automotive

Group	Parts					
Transmission		Wheel hubs		Nut		CVJs
		Drive shafts				
Engine		Conrods		Crankshafts		Camshafts
		Common rail				
Suspension		Coil springs		Leaf springs		Stabilizer bars
		Shock absorbers				
Gear box		Axle		Gears		Planet gears
		Crown				
Steering		Steering rack		Steering pinion		Bolt
Others		Bearings		Fasteners		Brake spindle

Other sectors

Sectors	Applications					
Energy (Wind, Oil & Gas)		Mooring chains for off-shore rigs		Flanges for wind power generation towers		Fasteners for wind power equipment
		Off-shore accessories				
Agricultural machinery		Tractors components				
Machinery for civil engineering		Mesh		Drive shaft		
Others		Hand tools		Shafts for electric motors		Railway axles
		Railway springs				

Sidenor is your ally in **INNOVATION**



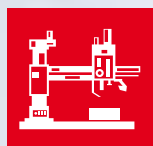
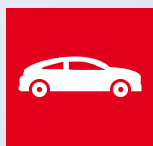
We are focused on understanding the needs of our customers to provide solutions that give answers to the challenges that the market demands.

Environmental regulations lead us to achieve increasingly efficient components of less weight. Our steels allow designs and solutions hitherto unthinkable.

We also seek maximum efficiencies at our customers, adapting our products to their processes and so reducing the resources needed to complete them.

We adapt our production to meet all the service challenges that the market demands.

We have integrated our factories in Industry 4.0 to achieve optimal processes that give high reliability to the components made with our steel.



Sidenor R&D

The activities of SIDENOR R&D are centred on increasing competitiveness through improvements and innovations in Quality, Costs, Productivity and Development of Products with our customers.

Sidenor focuses on the needs of the customer:

- Creating collaborative environments
- Becoming the main technological metallurgical and steelmaking reference
- Giving solutions to current and future demands
- Offering R&D facilities as a tool for cooperation
- Solving your short term technical problems

PRINCIPAL ACTIVITIES

Process Area

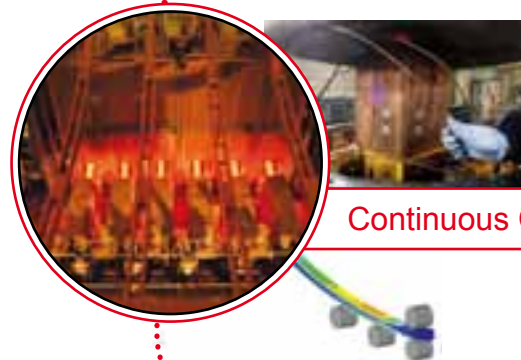
- Optimization and strenghtening of current processes
- Implementation of new processes and requirements
- Introduction of new technologies

Product Area

- Design of new steel grades/qualities
- Adaptation of existing steel grades/qualities to new processes and technologies
- Identification of new applications and markets for existing steel grades/qualities
- Metallurgical advice to our customers in products and processes



Steelmaking



Continuous Casting



Metalworking

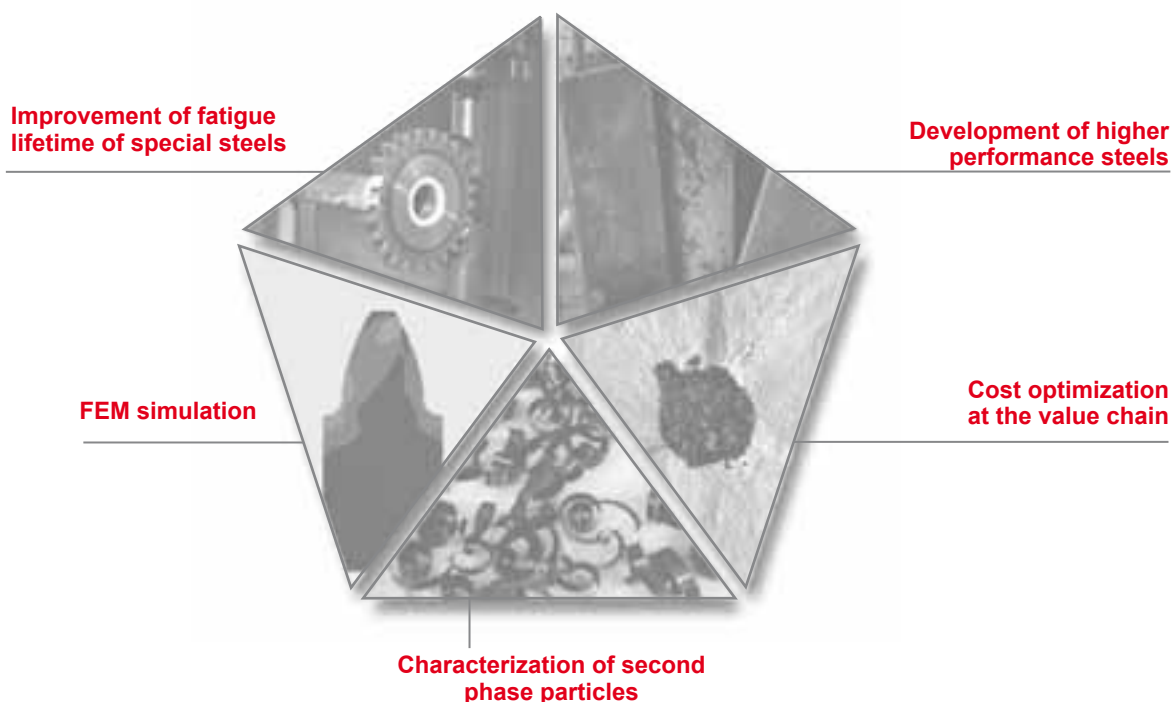


Product



Products and Developments

- SPRING STEELS:** *HIGH STRENGTH AND WEIGHT REDUCTION*
HELICOIDAL SUSPENSION SPRINGS Inclusion engineering and longer lifetime in lighter suspension springs
PREMIUM QUALITY LEAF SPRINGS High strength leaf springs with longer fatigue life
- BEARING STEELS:** *INCLUSION CLEANLINESS*
SUPERCLEAN Superclean steels devoted to 1st, 2nd and 3rd generation bearings manufacturing
- CASE HARDENING STEELS:** *FINAL COMPONENTS' QUALITY*
ISOCEM® High hardenability with reduced cost for conventional and gas quenching processes
NANOCEM Case hardening steels that guarantee a fine grained structure at high temperature
- PISTON STEELS:** *HIGHER EFFICIENCY ENGINES*
MGC3 Quenched and tempered (Q&T) steel with high temperature oxidation resistance
- DROP FORGING STEELS:** *CHARACTERISTICS ASSURANCE*
HARDMAX High yield strength and good compromise strength-toughness
FORMAX Direct quenching of hot forging parts
MICROALLOYED Steels with high mechanical properties after forging
MICRO 1100 Microalloyed steel with high yield strength and fatigue performance after forging
- FASTENER STEELS:** *MECHANICAL PROPERTIES GUARANTEED*
EXTREME FASTENERS 10.9 and 12.9 quenched and tempered (Q&T) steel grades with high mechanical properties for wind fasteners at extreme conditions
DUCTIL Low carbon ductile martensitic structure on 8.8 and 10.9 grades for cold heading
- MOORING CHAIN STEELS:** *DEEPER WATERS – HIGHER LATITUDE*
R4 - R5 - R6 Steels with high tensile strength and high toughness at low temperature
- TOOL STEELS:** *STEELS FOR PLASTIC INJECTION MOULDS*
EBRO2738 SUPERIOR Higher structural homogeneity and thermal conductivity
- ENHANCED MACHINABILITY:** *WITH SIMILAR MECHANICAL PROPERTIES*
MECAMAX®AV Improved machinability steels for high cutting speeds
MECAMAX®PLUS Improved machinability steels for all the cutting speed range
MECAMAX®MB "Green" technology for complex machinability operations



Product Data Sheets



The product data sheets contain technical information of New Products developed in Sidenor R&D.

PRODUCT DATA SHEETS

- Applications
- Advantages
- Applied Technology
- Grade
- Chemical composition
- Production process/supply condition
- Mechanical properties
- Other technical data



Steel Grades

ENGINEERING STEELS

Carbon steels

Engineering steels with carbon contents between 0.10 and 0.60%, tensile strengths between 350 to 750 N/mm² normalised and 650 to 850 N/mm² quenched and tempered. In general, low hardenability.

Applications:

• Low carbon:
Low tensile strength pieces. Piston Pins, chains, nuts and bolts.

• Medium carbon:
Quenching upto 50-60 HRc. Shock and wear resistant parts. Gears, axles, differentials.

• High Carbon:
Parts subject to high loads, generally quenched in oil for hardnesses above 57HRc. Hammers, agricultural tools, transmissions.

Standard equivalents					Chemical composition (average values in %)		
SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si
C15					0,15	0,55	0,25
C25	2C25E	CK25	1.1158	XC25	0,25	0,55	0,25
C30	2C30E	CK30	1.1178	XC32	0,30	0,65	0,25
C35	2C35E	CK35	1.1181	XC38H1	0,35	0,65	0,25
C40	2C40E	CK40	1.1186	XC42H1	0,40	0,65	0,25
C45	2C45E	CK45	1.1191	XC48H1	0,45	0,65	0,25
C50	2C50E	CK50	1.1206		0,50	0,75	0,25
C55	2C55E	CK55	1.1203	XC55H1	0,55	0,75	0,25
C60	2C60E	CK60	1.1221		0,60	0,75	0,25



Alloy steels for quench and temper

Steels with one or more alloying elements, with good physical or mechanical properties after specific heat treatment and varying tensile strengths between 700 and 1.300 N/mm².

Applications:

• Low alloy:
Superficial hardness, after quench and temper by induction, between 40 and 50 HRc. Tensile strengths between 500 and 800 N/mm². Axles, Conrods, camshafts, crankshafts, gears.

• Medium alloy:
Surface hardness above 45 -55 HRc. Tensile strengths between 700 - 900 N/mm². Axles, conrods, crankshafts, transmiion shafts, gears.

• High Alloy:
Superficial hardness, after quench and temper by induction, between 55 and 60 HRc. High toughness and fatigue resistance. Tensile strengths between 800 and 1.300 N/mm².

Standard equivalents					Chemical composition (average values in %)						
SIDENOR	EUROPE	GERMANY		FRANCE	C	Mn	Si	Cr	Ni	Mo	V
	EN	DIN	Stand	AFNOR							
34Cr4	34Cr4	34Cr4	1.7033	32C4	0,34	0,75	0,25	1,05			
41Cr4	41Cr4	41Cr4	1.7035	42C4	0,41	0,75	0,25	1,05			
25CrMo4	25CrMo4	25CrMo4	1.7218	25CD4	0,25	0,75	0,25	1,05			
30CrMo4				30CD4	0,30	0,75	0,25	1,05		0,20	
34CrMo4	34CrMo4	34CrMo4	1.7220	34CD4	0,34	0,75	0,25	1,05		0,20	
42CrMo4	42CrMo4	42CrMo4	1.7225	42CD4	0,42	0,75	0,25	1,05		0,20	
34CrNiMo6	34CrNiMo6	34CrNiMo6	1.6582		0,34	0,65	0,25	1,50	1,50	0,20	
36CrNiMo16	36CrNiMo16			35NCD16	0,36	0,45	0,25	1,80	3,85	0,35	
30CrNiMo8	30CrNiMo8	30CrNiMo8	1.6580		0,30	0,45	0,25	2,00	2,00	0,40	
51CrV4	51CrV4	50CrV4	1.8159		0,51	0,90	0,25	1,05			0,15



Case hardening steels

Steels with C content normally below 0.30%; the surface of the parts being susceptible to hot carburization due to the interaction of a gas that yields its carbon to the steel.

Applications:

• C, CrMn, CrMo, CrNi, CrNiMo steels:

For parts that need to be case hardened where the tensile strengths vary in the centre between 500 and 1500 MPa. Gears, pinions, constant velocity joints, spindle, wheels/crowns, cams.

Standard equivalents					Chemical composition (average values in %)					
SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si	Cr	Ni	Mo
20Mn6		20Mn5	1.1133	20M5	0,20	1,45	0,25			
16MnCr5	16MnCr5	16MnCr5	1.7131	16MC5	0,16	1,15	0,25	1,00		
20MnCr5	20MnCr5	20MnCr5	1.7147	20MC5	0,20	1,25	0,25	1,15		
20NiCrMo2	20NiCrMo2-2			20NCM2	0,20	0,75	0,25	0,50	0,55	0,20
14NiCrMo13					0,14	0,45	0,25	0,95	3,25	0,25



Nitriding steels

Steels that need maximum surface hardness and high wear resistance.

Applications:

- Steels with highest hardness are the CrAl and those with maximum depth CrNiV steels. These are generally used in the pretreated condition with tensile strengths between 900 and 1500 N/mm². Journals, barrels, barrel sleeves.

Standard equivalents				Chemical composition (average values in %)								
SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si	Ni	Cr	Mo	V	Al
15MoCrV10		15MoCrV5 9	1.8521		0,15	0,95	0,25		1,35	0,95	0,25	
25CrMo12					0,25	0,55	0,25		3,25	0,55		
31CrMo12	31CrMo12	31CrMo12	1.8515	30CD12	0,31	0,55	0,25		3,05	0,40		
30CrMoV9	31CrMoV9	31CrMoV9	1.8519		0,30	0,55	0,25		2,50	0,20	0,15	
34CrAlMo5	34CrAlMo5-10	34CrAlMo5	1.8507		0,34	0,65	0,25		1,15	0,20		1,00
34CrAlNiMo7	34CrAlMo7-10	34CrAlNi7	1.8550		0,34	0,55	0,25	1,00	1,65	0,20		1,00
41CrAlMo7	41CrAlMo7-10	41CrAlMo7	1.8509	40CAD6.12	0,41	0,65	0,25		1,65	0,30		1,00



Spring steels

Steels that require high yield strength, fatigue resistance to torsion and flexion, tolerate shear resistance slightly higher than its yield point in the quenched and tempered condition. Normally oil quenched.

Applications:

- MnSi and CrV steels: Tensile strengths from 870 to 1.250 N/mm². Leaf springs for vehicles, helicoidal springs, agricultural tools.
- CrNi Steels: Tensile strengths between 1000 and 1400 N/mm². Coiled springs, torsion bars, hand tools.

Standard equivalents				Chemical composition (average values in %)						
SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si	Cr	Mo	V
46Si7	46Si7	46Si7	1.5024	46S7	0,46	0,65	1,65			
51Si7	50Si7	51Si7	1.5025	51S7	0,51	0,65	1,65			
55Si7	56Si7	55Si7	1.5026	55S7	0,55	0,85	1,65			
60Si7	60Si7	60Si7	1.5027	60S7	0,60	0,85	1,65			
60SiCr7	61SiCr7	60SiCr7	1.7108	61SC7	0,60	0,85	1,65	0,30		
55Cr3	55Cr3	55Cr3	1.7176	55C3	0,55	0,90	0,37	0,85		
50CrV4	51CrV4	50CrV4	1.8159	50CV4	0,50	0,90	0,27	1,05		0,17
51CrMoV4	52CrMoV4	51CrMoV4	1.7701	51CDV4	0,51	0,90	0,27	1,05	0,20	0,12



Free cutting steels

Steels where good machinability is essential.

Applications:

- Carbon and leaded steels: The best characteristics for good machinability are achieved in the drawn condition with tensiles of 550 to 600 N/mm². High volume parts that can be machined in automatic lathes, studs, bolts, caps.
- Medium carbon steels: Parts with medium tensile strengths that need to be turned in automatic lathes, can be supplied with the addition of Pb. Quenched and tempered parts with tensile between 700 and 980 N/mm².

Standard equivalents				Chemical composition (average values in %)					
SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si	S	Pb
9SMn28	11SMn30	9SMn28	1.0715	S250	0,09	1,10	0,01	0,28	
9SMnPb28	11SMnPb30	9SMnPb28	1.0718	S250Pb	0,09	1,10	0,01	0,28	0,25
9SMn36	11SMn37	9SMn36	1.0736	S300Pb	0,09	1,30	0,01	0,36	
9SMnPb36	11SMnPb37	9SMnPb36	1.0737		0,09	1,30	0,01	0,36	0,25
10SPb20	10SPb20	10SPb20	1.0722		0,10	0,85	0,20	0,20	0,25
35SMnPb11				35MF6Pb	0,35	1,50	0,20	0,11	0,25
45S20	46S20	45S20	1.0727	45MF4	0,45	0,85	0,20	0,20	
45SMn28	44SMn28			45MF6.3	0,45	1,50	0,20	0,28	



Steels for cold deformation

These steels do not differ in chemical composition with carbon and alloy steels but require certain specific conditions.

Application:

- Different ranges of alloying (C, Mn, Cr-Mo, CrNiMo, B) with different levels of strength from 450 to 1300 MPa. Studs, bolts and parts for cold heading.

Standard equivalents					Chemical composition (average values in %)						
SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si	Cr	Ni	Mo	B
DF8				XC6FF	0,08	0,35	0,03				
DF35	C35KD	Cq35	1.1172	XC32	0,35	0,65	0,20				
DF45	C45KD	Cq45	1.1192	XC42H1	0,45	0,65	0,20				
DF20B	C22BKD	22B2	1.5508	21B3	0,20	0,80	0,10				0,003
DF34Cr4	34Cr4KD	34Cr4	1.7033	32C4	0,34	0,75	0,15	1,05			
DF25CrMo4	25CrMo4KD	25CrMo4	1.7218	25CD4	0,25	0,75	0,15	1,05		0,20	
DF34CrMo4	34CrMo4KD	34CrMo4	1.7220	34CD4	0,34	0,75	0,15	1,05		0,20	
DF34CrNiMo6	34CrNiMo6KD	34CrNiMo6	1.6582		0,34	0,55	0,20	1,55	1,55	0,20	



Microalloyed steels

The mechanical properties of the pieces or bars are achieved by the combined effect of different mechanisms without the need for heat treatment.

Application:

- All kind of parts but generally, crankshafts, conrods, pistons, parts for suspension systems, wheel rims, constant velocity joints. The tensile strengths achieved on the parts are between 650 and 1150 N/mm² depending on the type of steel used.

Standard equivalents					Chemical composition (average values in %)						
SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si	S	Al	V	Ti
MICRO800	30MnVS6	27MnSIVS6	1.5232		0,28	1,45	0,60	0,04	0,03	0,10	0,01
MICRO850	46MnVS6	49MnVS3	1.1199		0,47	0,80	0,40	0,06	0,03	0,10	0,01
MICRO900	38MnVS6	38MnSIVS5	1.5231		0,38	1,35	0,60	0,06	0,03	0,10	0,01
MICRO1000	46MnVS6	44MnSIVS6	1.5233		0,43	1,45	0,60	0,03	0,03	0,10	0,01



Heat resistant steels

Steels whose main characteristics are the resistance to plasticity under strong pressures, in hot conditions.

Application:

- Mo and CrMo steels:
These steels are used for parts in contact with vapour, valves, flanges, high pressure cylinders, boilers, axle shafts and turbine rotors, vapour collectors, installations for cracking in the oil and gas industries. Can be used at temperatures of 500 °C.

Standard equivalents					Chemical composition (average values in %)						
EEUU ASTM	SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si	Cr	Mo	V
	16Mo3		15Mo3	1.5415		0,16	0,55	0,25		0,30	
	16Mo5		16Mo5	1.5423		0,16	0,55	0,25		0,55	
	15MoCr5				15CD2.05	0,15	0,55	0,25	0,65	0,55	
	14MoCr5	13CrMo4-5	13CrMo4.4	1.7335	15CD4.05	0,14	0,55	0,25	1,00	0,55	
	12CrMo9	10CrMo9-10	10CrMo9.10	1.7380	12CD9.10	0,12	0,55	0,25	2,25	1,00	
	10CrMo20		12CrMo19.5	1.7362	Z15CD5.05	0,10	0,45	0,25	5,00	0,55	
	14MoCrV6	14Mo6-3	14MoV6.3	1.7715		0,14	0,55	0,25	0,45	0,60	0,25
A182F5	10CrMo9	X12CrMo5	12CrMo19-5	1.7362	Z15CD5 05	0,10	0,45	0,25	5,00	0,55	
A182F9	X12CrMo9	X11CrMo9-1	X11CrMo9-1	1.7386	X11CrMo9-1	0,12	0,45	0,30	9,00	1,00	
A182F91	X10CrMoVNb9	X10CrMoVNb9-1	X10CrMoVNb9-1	1.4903	X10CrMoVNb9-1	0,10	0,45	0,35	9,00	1,00	0,20
A182F11	13MoCr5	10CrMo5-5	10CrMo5-5	1.7338	10CrMo5-5	0,12	0,45	0,55	1,00	0,55	
A182F22	11MoCr10	10CrMo9.10	10CrMo9.10	1.7380	12CD9.10	0,12	0,55	0,25	2,25	1,00	



Bearing steels

High hardness and high strength steels.

Applications:

- Carbon, Cr (100Cr6) and CrMo steels:
- Applications where wear resistance and good strength is required.
- Crushing equipment, mills, bearings, turning tips, abrasive materials.

Standard equivalents					Chemical composition (average values in %)				
SIDENOR	EUROPE EN	GERMANY		FRANCE AFNOR	C	Mn	Si	Cr	Mo
		DIN	Stand						
100Cr6	100Cr6	100Cr6	1.3505	100Cr6	1,00	0,35	0,25	1,50	
100CrMn6	100CrMnSi6-4	100CrMn6	1.3520	100CrMn6	1,00	1,10	0,60	1,50	
100CrMo7	100CrMo7	100CrMo7	1.3537	100CrMo7.2	1,00	0,35	0,25	1,80	0,20
100CrMo7.3	100CrMo7-3	100CrMo7.3	1.3536	100CrMo8.3	1,00	0,70	0,25	1,80	0,30
C55	C55	Ck55	1.1203	XC55H	0,55	0,85	0,25	-	-
C70	C70	Ck70			0,70	0,85	0,25	-	-



Steels for chains

Steels with high strength and high toughness at low temperatures.

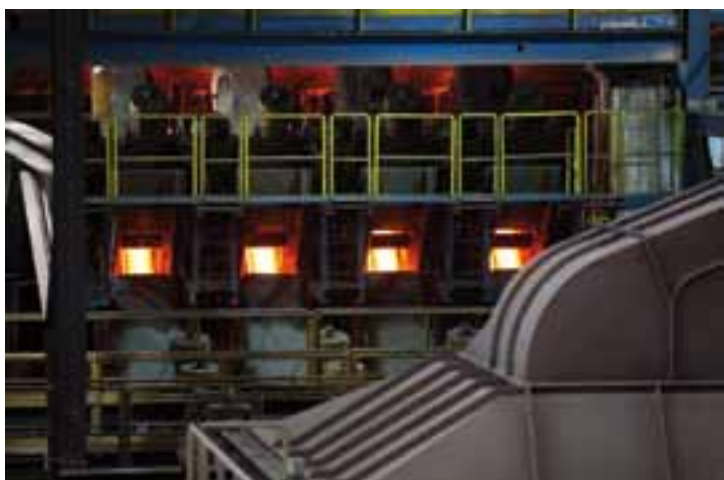
Applications:

- Steels for chains and off-shore accessories.

Medium and high tensile strength	Grade R4	Rm=> 900 N/mm ²
	Grade R5	Rm=> 1000 N/mm ²
	Grade R6	Rm=> 1200 N/mm ²
High toughness at low temperature	KV => 60 J a - 20 °C	

Applied technology:

- Low carbon steels for quenched and tempering.
- Medium alloyed steels to increase impact resistance at low temperature.
- Stable steels with very special melting processes (secondary melting/refining and vacuum degassing).
- Very stable steels with controlled rolling and cooling processes.
- Stringent Process control of materials in the presence of official organizations/agencies.



TOOL STEELS

Steels with resistance to wear, toughness and thermal shocks. We can highlight 3 steel families: steels for cold working, steels for hot working and steels for the production of plastic moulds.

Applications:

- Steels used in the production of gauges, dies, drills, moulds for thermoplastic materials.



Cold and hot working

Standard equivalents					Chemical composition (average values in %)								
SIDENOR	EUROPE	GERMANY		FRANCE	C	Mn	Si	Cr	V	W	Ni	Mo	V
	EN	DIN	Stand	AFNOR									
MAGNO	95MnWCr5	95MnCrW8	1.2510	90MnWCrV5	0,95	1,10	0,25	0,50	0,10	0,50			
ATOR14	55NiCrMoV7	56NiCrMoV7	1.2714	55NiCrMoV7	0,55	0,70	0,25	1,00			1,70	0,50	0,10
FINORV	X40CrMoV5.1	X40CrMoV5.1	1.2344	X40CrMoV5	0,39	0,40	1,00	5,00				1,40	1,00

Steels for moulds of plastic materials

Standard equivalents					Chemical composition (average values in %)								
SIDENOR	EUROPE EN	GERMANY DIN	Stand	FRANCE AFNOR	C	Mn	Si	Cr	Ni	Mo	V	S	Cr+Ni+Mo
EBRO-C45	C45W	C45W	1.1730		0,45	0,65	0,30					0,010 max	0,45 max
EBRO-2311	40CrMnMo7	40CrMnMo7	1.2311	40CMD8	0,38	1,10	0,30	1,70		0,20	0,10	0,010 max	
EBRO-P20	35CrMo8			35CrMo8	0,34	0,80	0,35	1,85		0,42	0,10	0,010 max	
EBRO-2312	40CrMnMoS8.6	40CrMnMoS8.6	1.2312		0,40	1,50	0,35	1,85		0,20	0,10	0,06	
EBRO-2738	40CrMnNiMo8.6.4	40CrMnNiMo8.6.4	1.2738	40CMND8	0,39	1,40	0,30	1,85	1,00	0,20	0,12	0,005 max	
PLASTINOX	XC40Cr14	X42Cr13	1.2083	X40Cr14	0,40	0,50	0,80	13,50			0,20	0,005 max	

STAINLESS STEELS

Steels whose main characteristics are resistance to oxidation and chemical corrosion.

Applications:

- Ferritic steels: Good ductility, excellent resistance to corrosion and relatively economic price. Turbines, food industry, healthcare industry.
- Martensitic steels: Used generally quenched and tempered. Suitable for high mechanical properties and moderate resistance to corrosion. Cutlery, household goods, surgical equipment, distillation towers with temperature working at less than 650 °C.
- Austenitic steels: Excellent corrosion resistance but low tensile strength and yield stress. Accessories and decorative elements, chemical industry, liquid oxygen tanks, cutlery, food, and textile industries.

Standard equivalents				Chemical composition (average values in %)					
EUROPE EN	GERMANY DIN	USA ASTM	FRANCE AFNOR	C	S	Cr	Ni	Mo	Ti
X8CrNiS 18-9	1.4305	AISI 303	Z8CNF 18-09	≤0,1	0,25	18,00	9,00		
X5CrNi18-10	1.4301	AISI 304	Z7CN 18-09	≤0,07		18,50	9,20		
X2CrNi18-9	1.4307	AISI 304L	Z3CN 18-10	≤0,03		18,50	9,00		
X5CrNiMo 17-12-2	1.4401	AISI 316	Z7CND 17-11-02	≤0,07		17,50	11,50	2,25	
X2CrNiMo 17-12-2	1.4404	AISI 316L	Z2CND 18-12-02	≤0,03		17,50	11,50	2,25	
X6CrNiTi 18-10	1.4541	AISI 321	Z6CNT 18-10	≤0,08		18,00	10,50		≤0,7
X6CrNiMoTi 17-12-2	1.4571	AISI 316 Ti	Z6CNDT 17-12	≤0,08		17,50	11,50	2,25	≤0,7



Processes

STEELPLANT

Production process from liquid steel starting from the melting of scrap and alloys. Once molten, the steel solidifies in the form of billets blooms or ingots.

HOT ROLLING

A thermo mechanical process by which the billets and/or blooms are transformed into steel bars, round, square, flat or coils.

FORGE

Process of transforming ingots into round or square bars.

COLD FINISHING

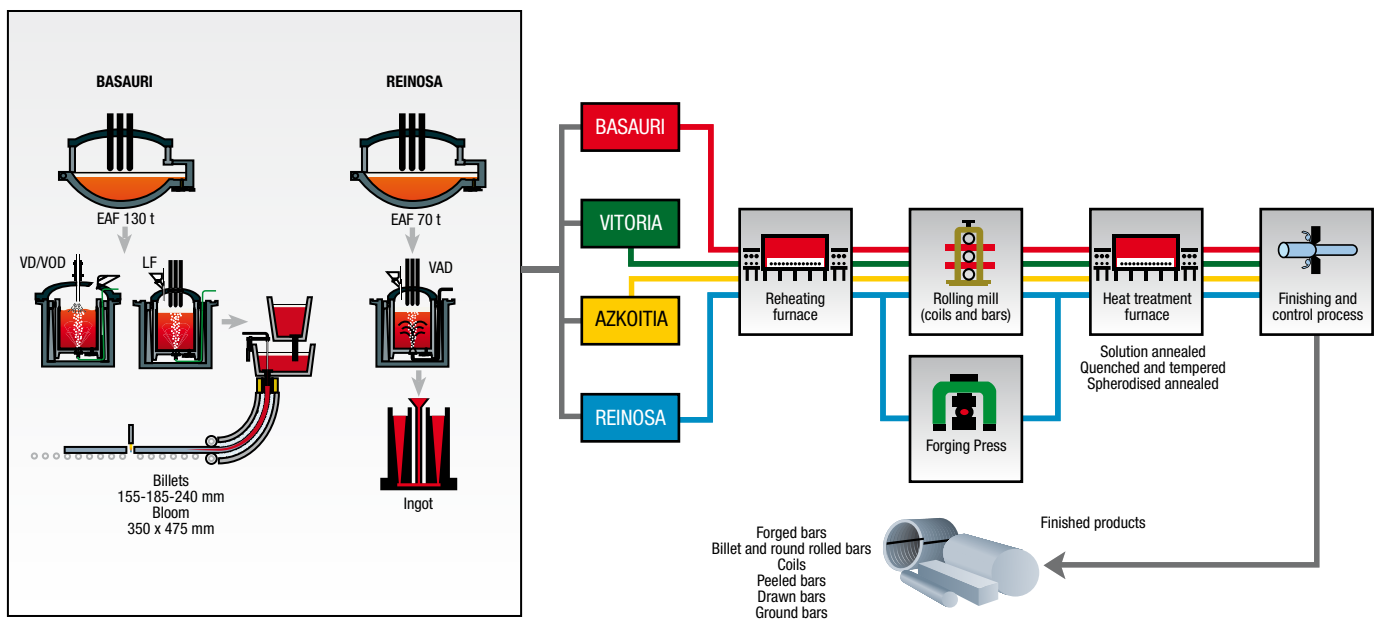
Mechanical processes that provide the superficial finish, dimensional tolerances and mechanical properties according to customer specifications.

HEAT TREATMENTS

Transformation processes to modify the mechanical and metallurgical properties of rolled and/or forged products, through the control of heating and cooling.

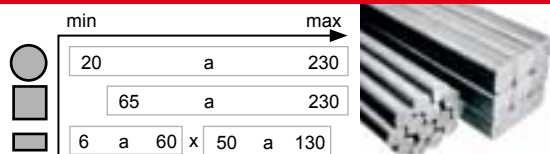
INSPECTION LINES

Set of equipment used to inspect the products and guarantee their quality.

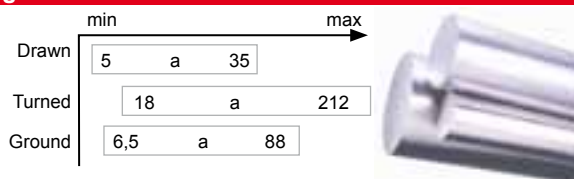


Size Range

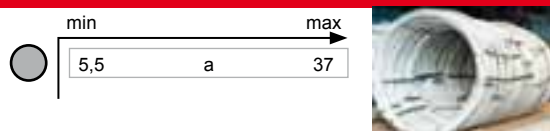
Rolled Bar



Bright Bar



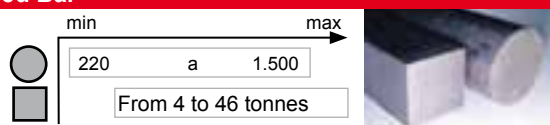
Wire Rod



Ingots

Up to 140 Tonnes

Forged Bar



Continuous Casting

Billet: 240x240 mm, 185x185 mm, 155x155 mm
Bloom: 350x475 mm

Heat Treatments

- Normalising
- Annealing (subcritical, isothermal, spheroidised, softening)
- Quench and Temper in gas furnaces; quench in water or oil
- Quench and Temper in induction furnaces; quench in water
- Stress Relief

Other Services

- **Special product options:**
 - Possibility to cut to lengths (short billets/lopins)
 - Possibility to chamfer and face end of bars
- **In line system controls**
 - Control of superficial defects
 - Black rolled bars: depending on size by dispersion of magnetic flux or magnetic particles
 - Turned or drawn bars: by Eddy currents
 - Control of surface defects: by ultrasound
 - Dimensional control: with laser equipment
 - Control Antimix: Spectrotest or X rays
- **Identification and Packaging:** According to specifications or customer requirement
- **Test Certificates with the specific information requested by the customer:** In Spanish, English, French and German
- **Other facilities and equipment:**
 - Chemical laboratory: Control of chemical composition
 - Metallurgical laboratory: mechanical tests (tensile, hardness, fracture, etc) and metallurgical analysis (cleanliness, micro and macro structure, etc)
 - Quality Control Dept.: unitary control of each production lot
 - Product and Process Engineering Department
 - Technical Assistance to customers
 - SAP: total traceability and rapid access to information



Sidenor Bright Steels

Sidenor Bright Steels is the result of the global strategy of growth of Sidenor Aceros Especiales in the world of steel. The acquisition in 2008 of the 3 major Spanish bright bar producers has resulted in the creation of the principal national bright bar group in the sector.

Bright Bars

Processes: Drawing / Turning / Grinding / Cut to length

Other Shapes	Operation	MALTZAGA	POLINYÀ
●	Drawing Ø	5 - 35 mm	5 - 50 mm
	Drawing from bar to bar Ø	30 - 75 mm	
	Turning Ø	10 - 125 mm	12 - 80 mm
	Grinding Ø	-	7 - 65 mm
⬡	Drawing Ø	6 - 32 mm	5 - 41 mm
	Drawing from bar to bar Ø	22 - 65 mm	-
■	Drawing Ø	11 - 25 mm	8 - 40 mm
	Drawing from bar to bar Ø	20 - 40 mm	
●	Sheared		
	Cut to length Ø	10 - 25 mm	8 - 30 mm
	Length	150 - 1.000 mm	180 - 550 mm
	Sawed		
	Cut to length Ø	-	10 - 100 mm
	Length	-	100 - 3.000 mm
	Chamfered / Centered	-	D10/35 mm - L100/800 mm



Tolerances:

- Drawn h9 / h10
- Turned h9 / h10
- Ground h6 / h8
- Other Shapes h11

Other supply conditions:

- Length 2.800mm to 7.000mm
- Straightness up to 0,5mm/m
- Chamfered both sides (0,5mm to 8mm)
- Bundles 1.000Kg to 1.500Kg
- Technical conditions EN 10277-1

Steel grades:

- Alloys: 42CrMo4, 39NiCrMo3Pb...
- Free Cutting: 11SMnPb30, 44SMn28, 46S20...
- Steel for shock absorbers
- Carbon: C35, C35Pb, C45, C45Pb...

In line system controls

- Control of superficial defects by Eddy current in the entire dimensional range
- Control of internal defects: by ultrasound from 10mm diameter
- Dimensional control: with laser equipment
- Control Antimix: Spectrotest or X rays



Drawn Wire

Processes: Simple: K (Euronorm +U+C)
 Reduced: GKZ+K (Euronorm +AC+U+C)
 Complete: K+GKZ+K (Euronorm +U+C+AC+LC)
 Alloys: GKZ+K+GKZ+K (Euronorm +AC+U+C+AC+LC)

	Ø wire (mm)	Ø (mm)		coil weight (Kg)
		internal	external	
Coil	5 - 10 mm	500 mm	950 mm	750/1.500
	10 - 38 mm	800 mm	1.250 mm	750/1.500
Frame	1,5 - 3 mm	520 mm	950 mm	300/500
	3 - 9 mm	520 mm	950 mm	500/750
	9 - 11,70 mm	520 mm	950 mm	500/750
		750 mm	1.100 mm	750/1.500
	11,70 -15 mm	750 mm	1.100 mm	750/1.500



Surface condition:

- Pickled
- Phosphate
- Reactive Soaped

Steel grades:

- Alloys 41Cr4, 41CrS4, 42CrMoS4...
- Boron: 20MnB4, 23B2, 36MnB4, 35B2...
- Carbon: C4C, C10C, C15C, C20C...
- Bearings: 100Cr6



Certifications



Automotive Industry Certificate
UNE-ISO/TS 16949:2009

Quality Certificate
PECAL/AQAP 2120

Quality Certificate
UNE-EN ISO 9001:2008

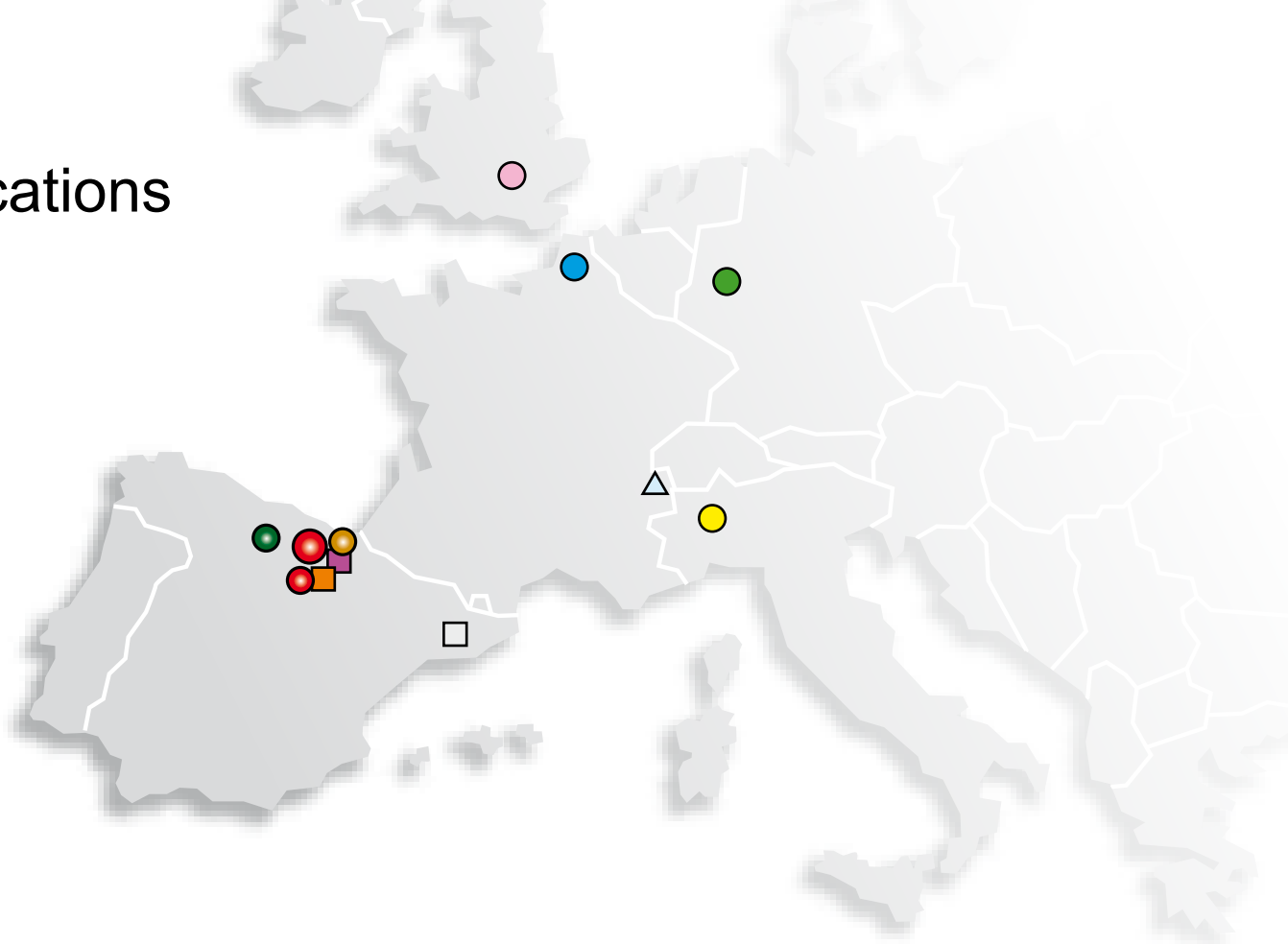
Quality Certificate
IQNet ISO 9001:2008

Environmental Certificate
ISO 14001:2004

Health and Safety Certificate
OHSAS 18001:2007



Locations



Factory

-  **Basauri factory**
Barrio Ugarte s/n
48970 Basauri (Vizcaya) España
Tel: +34 (94) 4871500
Fax: +34 (94) 4871595
-  **Reinosola factory**
Paseo Alejandro Calonge s/n
39200 Reinosola (Cantabria) España
Tel: +34 (942) 775000
Fax: +34 (942) 775283
-  **Vitoria factory**
Portal de Gamarra 22
01013 Vitoria (Álava) España
Tel: +34 (945) 164600
Fax: +34 (945) 164750
-  **Azkoitia factory**
Ctra. Zumárraga s/n
20720 Azkoitia (Guipúzcoa) España
Tel: +34 (943) 025200
Fax: +34 (943) 025299

Drawn Wire

-  **Legutiano factory**
Polígono Industrial Gojain,
Avda. San Blas nº 6
01170 Legutiano (Álava) España
Tel: +34 (945) 466032
Fax: +34 (945) 465490

Bright Bars

-  **Polinyà factory**
Polígono Industrial Can Humet
P. Joan Miró nº3
08213 Polinyà (Barcelona) España
Tel: +34 (937) 135858
Fax: +34 (937) 133628
-  **Malzaga factory**
Barrio Malzaga S/n
Apto. 183,
20600 Eibar (Guipúzcoa) España
Tel: +34 (943) 820040
Fax: +34 (943) 820240

Distribution

-  **Sidenor France**
"Dépôt Haute Savoie"
524, Avenue des Jourdiés - BP 70305
74800 St Pierre en Faucigny
Tel: +33 (0) 4 50 97 97 97
Fax: +33 (0) 4 50 97 97 90
sidenor-france@sidenor.com

Commercial Structure

-  **Sidenor Deutschland**
Heinrich-Heine-Allee 1
D-40213 Düsseldorf
Deutschland
Tel: +49 (211) 630-61-12
Fax: +49 (211) 630-61-27
sidenor-deutschland@sidenor.com
-  **Sidenor France**
"Le Recueil"
100, rue de Lannoy
59650 Villeneuve d'Ascq
France
Tel: +33 (0) 3 20 34 33 30
Fax: +33 (0) 3 20 84 21 53
sidenor-france@sidenor.com
-  **Sidenor Italia**
Viale Berengario, 9
20149 Milano
Italia
Tel: +39 (02) 48007511
Fax: +39 (02) 43510278
sidenor-italia@sidenor.com
-  **Sidenor UK**
Northside House, Mount Pleasant,
Cockfosters, Herts, EN4 9EB
United Kingdom
Tel: +44 (0) 20 84471444
Fax: +44 (0) 20 84471555
sidenor-uk@sidenor.com

Sidenor.
Present in the world
present in your life



Sidenor is one of the main suppliers of special steels in Europe.

Our facilities are highly specialised and are able to provide suitable solutions to all industries that demand high performance steels in response to demanding work conditions.

In addition, our production process makes the company a great recycler transforming hundreds of thousands of tonnes of scrap into steel each year.

For Sidenor, the importance of growing and participating in major projects is as important as forming part of peoples' lives and that of our customers.

