



**SINOXX**<sup>...</sup>  
STAINLESS STEEL

**sij**<sup>•</sup>

Stainless steel  
**SINOXX**





# sij | group

SIJ is a vertically integrated holding company, the leading steel manufacturer in Slovenia, and one of the largest stainless and special steel manufacturers in Europe. SIJ Group consists of the two largest steel companies in Slovenia (SIJ Acroni and SIJ Metal Ravne), other manufacturing and processing companies (SIJ Ravne Systems, SIJ Elektrode, SIJ SUZ), specialized service and sales centers across Europe and the USA, and companies for scrap steel collection and sales.

[www.sij.si](http://www.sij.si)



#### **INCREASE YOUR PRODUCT'S LIFE SPAN**

The highest steel quality, based on world class production equipment and more than 400 years of experience in steel making.



#### **DECREASE MACHINING COSTS**

Narrow dimensional tolerances, exceeding international standards.



#### **OPTIMIZE YOUR MANUFACTURING PROCESSES**

Extensive range of mechanical treatment possibilities to find the best fit for your production process.



#### **EXCEED YOUR CUSTOMERS' EXPECTATIONS**

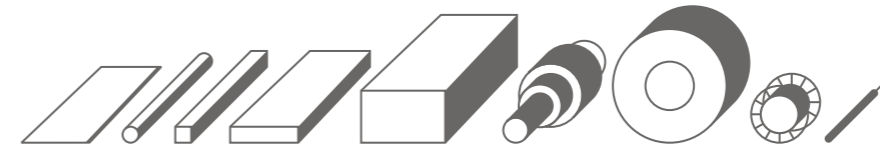
Strong in-house R&D Department and broad applied knowledge helps you get the best solutions for your customers' needs.



**SINOXX**...



**SINOXX**...



**SINOXX** represents a family of stainless steel products. The main advantages of SINOXX steels are: corrosion resistance, good weldability and formability, high thermal resistance, low life-cycle cost, full recycling and biological neutrality.

SINOXX products, produced by SIJ Group companies, are used in even the most demanding environments and applications in the following industries:

- Oil and gas
- Chemical and petrochemical
- Pulp and paper
- Energy
- Desalination
- Mining
- Automotive
- Household appliances
- Furniture
- Machinery and equipment

#### **CORROSION RESISTANCE**

SINOXX steels have excellent corrosion resistance. The brand comprises steels which contain more than 10.5 % chromium in solid solution, and nickel, molybdenum, titanium or niobium can be added to increase corrosion resistance. Some SINOXX steels are very stable in humid atmospheres and at the same time resistant to acidic and alkaline environments. Others maintain excellent corrosion resistance even at temperatures above 550 °C.

#### **PRODUCT RANGE**

SINOXX combines a wide range of stainless steel products. The diverse applicability of SINOXX steels depends on their chemical composition. A single steel product cannot meet all operational requirements. Under the SINOXX brand, we have developed various steels, each with some selected properties emphasized. Product durability and usability thus depend on the selection of an appropriate grade of steel. All SINOXX products are available in quenched or rolled condition.



**Austenitic stainless steels** are the most common. They are non-magnetic. In addition to 18 % of chromium, they also contain a minimum of 8 % of nickel which increases their corrosion resistance. The latter is markedly improved by alloying with molybdenum, thus forming a stable protective passivation oxide layer to provide additional protection. These steels are also characterised by excellent toughness and the maintenance of mechanical properties at very low temperatures.

**Ferritic stainless steels** are magnetic with a low carbon content. The main alloying element is chromium (between 13 % and 17 %); nickel is not added. Their main advantage is resistance to stress-corrosion cracking and atmospheric corrosion. Their advantage is a relatively low price, while special steps must be taken into consideration prior, during and after fusion welding.

**Martensitic stainless steels** have a ferritic structure in annealed condition, and a martensitic structure in quenched and tempered condition. Compared to conventional martensitic steel grades, they have improved corrosion resistance. These steels contain between 12 and 15 % of chromium and between 0.1 and 0.5 % of carbon. By adding molybdenum, their corrosion and wear resistance is increased. Steels containing between 0.1 and 0.25 % of carbon are mostly used in constructions which require corrosion resistance and enhanced mechanical properties. Steel grades with 0.3 % of carbon or more are used for cutting tools due to their high hardness and wear resistance.

**Precipitation hardened stainless steels** are iron-chromium-nickel alloys characterised by high strength which is obtained by precipitation hardening of the austenitic or martensitic structure. This enables alloying with one or more alloying elements, such as copper, aluminium, titanium, niobium and molybdenum.

**Duplex stainless steels** have a typical austenitic-ferritic microstructure in the ratio of 50:50 (commercial grade). The chromium content is approximately 22 %, and nickel content amounts to 5 %. These steels are additionally alloyed with molybdenum and nitrogen. They are characterised by very good mechanical properties, particularly yield strength and tensile strength. These steels are partly magnetic, and resistant to pitting and stress-corrosion cracking.

STEEL GRADES	SIJ DESIGNATION	WNR	DESIGNATION AISI/ ASTM	DESIGNATION EN	DESIGNATION GOST	QUARTO PLATES	HOT- AND COLD- ROLLED COILS AND SHEETS	FORGED AND ROLLED BARS FORGINGS	MACHINED FORGINGS	COLD-DRAWN / GROUND BARS	COLD- DRAWN WIRE	WELDING CONSUMABLES	OLD DESIGNATION METAL RAVNE
AUSTENITIC	SINOXX 4301	1.4301	304	X5CrNi18-10	12X18H9	•		•	•	•	•	•	PK11EX
	SINOXX 4305	1.4305	303	X8CrNiS18-9		•		•	•	•	•	•	PK11S
	SINOXX 4306	1.4306	304L	X2CrNi19-11	06X18H11	•		•	•	•	•	•	
	SINOXX 4307	1.4307	304L	X2CrNi18-9	04X18H10	•		•	•	•	•	•	
	SINOXX 4307 machinability	1.4307	304L	X2CrNi18-9		•		•	•			•	
	SINOXX 4310	1.4310	301	X12CrNi17-7						•	•	•	PK11VZ
	SINOXX 4311	1.4311	304LN	X2CrNiN18-10		•						•	
	SINOXX 4315	1.4315	304N	X5CrNiN19-9		•						•	
	SINOXX 4541	1.4541	321	X6CrNiTi18-10	08X18H10T	•		•	•	•	•	•	PK11SP
	SINOXX 4550	1.4550	347 / 347 H	X6CrNiNb18-10	08X18H12B	•		•	•			•	PK11NB
	SINOXX 4878	1.4878	321H	X8CrNiTi18-10	12X18H10T / 08X18H10T	•						•	
	SINOXX 4948	1.4948	304H	X6CrNi18-10		•						•	
AUSTENITIC WITH MO	SINOXX S451				12X18H9T	•							
	SINOXX S461				05X18H10T	•							
	SINOXX S462				03X18H10T	•							
	SINOXX S463				12X18H12T	•							
	SINOXX S464				08X18H12T	•							
	SINOXX S465				03X18H11	•							
	SINOXX S466				08X18H10	•							
	SINOXX S471		317L			•						•	
	SINOXX 4401	1.4401	316	X5CrNiMo17-12-2		•		•	•	•	•	•	PK12
	SINOXX 4404	1.4404	316L	X2CrNiMo17-12-2		•		•	•	•	•	•	PK12
	SINOXX 4404 machinability	1.4404	316L	X2CrNiMo17-12-2		•		•	•			•	
	SINOXX 4406	1.4406	316LN	X2CrNiMoN17-12-2		•							
	SINOXX 4432	1.4432	316L	X2CrNiMo17-12-3		•		•	•			•	
	SINOXX 4435	1.4435	316L	X2CrNiMo18-14-3	03X17H14M3	•		•	•			•	PK327
	SINOXX 4436	1.4436	316L	X3CrNiMo17-13-3		•		•	•			•	
	SINOXX 4438	1.4438	317L	X2CrNiMo18-15-4		•						•	
	SINOXX 4441	1.4441		X2CrNiMo18-15-3				•					PK332
	SINOXX 4560	1.4580	316Cb	X6CrNiMoNb17-12-2				•	•			•	PK12NB
	SINOXX 4571	1.4571	316Ti	X6CrNiMoTi17-12-2	10X17H13M2T	•		•	•			•	PK12SP
	SINOXX 4919	1.4919	316H			•				•	•	•	

STEEL GRADES	SIJ DESIGNATION	WNR	DESIGNATION AISI/ ASTM	DESIGNATION EN	DESIGNATION GOST	QUARTO PLATES	HOT- AND COLD- ROLLED COILS AND SHEETS	FORGED AND ROLLED BARS FORGINGS	MACHINED FORGINGS	COLD-DRAWN / GROUND BARS	COLD- DRAWN WIRE	WELDING CONSUMABLES	OLD DESIGNATION METAL RAVNE
HEAT- RESISTANT AUSTENITIC	SINOXX 4828	1.4828		X15CrNiSi20-12		•		•	•			•	PK15
	SINOXX 4833	1.4833	309/309S/309H	X12CrNi23-13		•						•	
	SINOXX 4835	1.4835	S30815	X9CrNiSiNc21-11-2		•				•	•	•	
	SINOXX 4841	1.4841	314	X15CrNiSi25-21		•		•	•	•	•	•	PK19
	SINOXX 4845	1.4845	310/310S/310H	X8CrNi25-21	20X23H18	•						•	
	SINOXX 4864	1.4864	330	X12NiCrSi36-16				•	•				
HEAT- RESISTANT FERRITIC	SINOXX 4713	1.4713		X10CrAlSi7		•	•	•	•			•	X10CrAl7
	SINOXX 4724	1.4724		X10CrAlSi13		•	•	•	•			•	PK924
	SINOXX 4725	1.4725		CrAl14-4			•						
	SINOXX 4742	1.4742		X10CrAlSi18		•	•	•	•			•	PK925
	SINOXX 4746	1.4746				•	•					•	
		1.4749										•	
	SINOXX 4762	1.4762		X10CrAlSi25		•	•	•	•			•	PK10
	SINOXX 4767	1.4767		CrAl205			•						
FERRITIC	SINOXX 4000	1.4000	403/405/410S/429	X6Cr13		•		•	•			•	PK1
	SINOXX 4002	1.4002	405	X2CrNi12		•							
	SINOXX 4003	1.4003		X2CrNi12		•				•	•	•	
	SINOXX 4016	1.4016	430	X6Cr17		•		•		•	•	•	PK336
	SINOXX 4105	1.4105	430F	X6CrMoS17				•		•	•	•	PK331
	SINOXX 4113	1.4113										•	
	SINOXX 4138	1.4138		X120CrMo29-2				•				•	PK324
	SINOXX 4509	1.4509										•	
	SINOXX 4510	1.4510	439	X3CrTi17		•		•				•	PK328
	SINOXX 4511	1.4511										•	
	SINOXX 4512	1.4512	S40910/S40920	X2CrTi12		•						•	

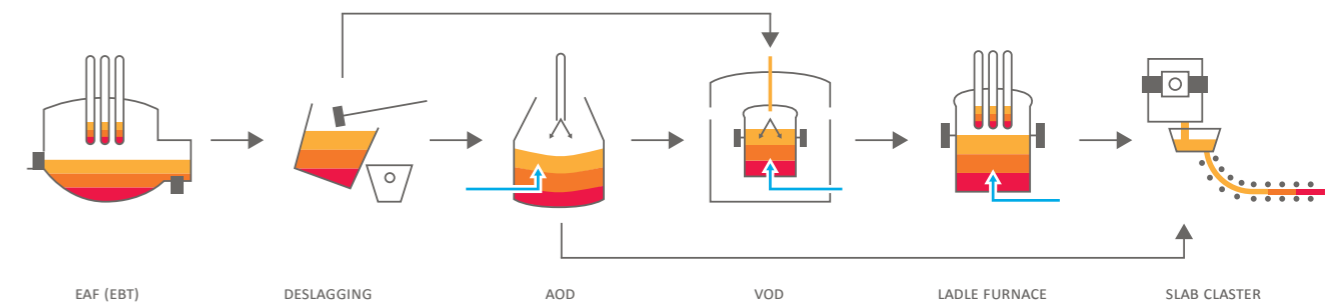


# sij | acroni



**SIJ ACRONI** is the largest Slovenian steel manufacturer, producing steel by recycling scrap in an electric arc furnace, casting it on a continuous caster and rolling it into quality flat-rolled steel products.

With our modern plate mill, we are able to offer plates up to 2500 mm in width. Besides stainless plates, we also produce ferritic hot- and cold-rolled coils and sheets, and other high added value non-stainless flat-rolled products.



## DIMENSIONAL RANGE

	Quarto plates	
Thickness [mm]	8	9–130
Width [mm]	1000–2000	1000–2500
Length [mm]	2000–12000	2000–12000
Weight [mm]	max. 9600 kg	max. 9600 kg

	Hot- and cold-rolled STRIPS	Hot- and cold-rolled SHEETS
Thickness [mm]	1.0–6.0	1.0–6.0
Width [mm]	1000	1000
Length [mm]	2000–6000	2000–6000
Coil weight [kg/mm width]	6–8	
Internal diameter [mm]	508–610	

## TYPE OF PROCESS ROUTE AND SURFACE FINISH OF THE PRODUCTS (EN 10088-2)

Symbol	Type of condition	Surface finish	Notes
1D	Hot-rolled, heat-treated, pickled	Free of scale	Usually standard for most steel grades; also, a common finish for further processing.
1C	Hot-rolled, heat-treated, not descaled	Covered with rolling scale	Suitable for parts which will be descaled or machined in subsequent production or for certain heat-resisting applications.
HOT-ROLLED 1C	Hot-rolled, heat-treated, not descaled	Covered with rolling scale	Suitable for parts which will be descaled or machined in subsequent production or for certain heat-resisting applications.
COLD-ROLLED 2C	Cold-rolled, heat-treated, not descaled	Smooth with scale from heat treatment	Suitable for parts which will be descaled or machined in subsequent production or for certain heat-resisting applications.



## APPROVALS, STANDARDS AND CERTIFICATES

SIJ Acroni follows international standards to assure a high level of quality, as shown by the various approvals and certificates awarded to us by trusted certification authorities.

### MANAGEMENT SYSTEM CERTIFICATES

SYSTEM:	ISO 9001 Quality management systems
	ISO 14001 Environmental management systems
	OHSAS 18001 Occupational Health and Safety Assessment Series
	ISO 50001 Energy management systems
LABORATORIES:	EN ISO/IEC 17025 Competence of testing and calibration laboratories

### PRODUCT APPROVALS

CERTIFIER	APPROVAL	FOR
TÜV SÜD INDUSTRIE SERVICE	AD 2000-Merkblatt W0/TRD 100	Plates, coils, sheets cut from coils and slabs of ferritic, austenitic and ferritic-austenitic steels
TÜV SÜD INDUSTRIE SERVICE	Pressure Equipment Directive 97/23/EC	Plates, coils, sheet cut from coils and slabs of ferritic, austenitic and ferritic-austenitic steels
TÜV SÜD INDUSTRIE SERVICE	Construction Products Directive (CPD) 89/106/EEC	Hot-rolled products of structural steels; Sheet/plate and strip of corrosion resisting steels acc. to EN 10025-1, 2, 6 / EN 10088-4
DNV GL	Manufacturer certificate in acc. with DNV GL rules for classification – Ships	Steelmaking and rolled steel products made of normal and high strength steels, steels for boiler and pressure vessels and stainless steel
LLOYD'S REGISTER	LR requirements	Steelmaking and plates of ferritic and austenitic steels
TÜV SÜD INDUSTRIE SERVICE	NORSOK M-650 requirements	Plates of duplex steels acc. to ASTM A240/A240M UNS S32205 MDS D45 REV. 5
TÜV SÜD INDUSTRIE SERVICE	NORSOK M-650 requirements	Plates of superduplex acc. to UNS 32750, MDS D55 REV. 5
BUREAU VERITAS	Recognition of test laboratory for material testing and non-destructive testing	Testing of steel for pressure vessels, structural steel, stainless steel and duplex
RUSSIAN MARITIME REGISTER OF SHIPPING	Recognition certificate for manufacturer, Rules (2013), Vol. 2, part XIII	Hot-rolled stainless steel plates for grades AISI 321, ASTM A240/A240 M/ED.12 GOST 5632-72, 7350-77, 19903-74

### MATERIAL PRODUCTION STANDARDS

EN 10028-7	Flat products made of steels for pressure purposes – Part 7: Stainless steels
EN 10088-2	Stainless steels – Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes
EN 10088-4	Stainless steels – Part 4: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for construction purposes
EN 10095	Heat-resisting steels and nickel alloys
ASME BOILER AND PRESSURE VESSEL CODE SA-240/SA-240M	Specification for chromium and chromium-nickel stainless steel plate, sheet, and strip for pressure vessels and for general applications
ASTM A240/A240M	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A167	Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM A693	Standard Specification for Precipitation-Hardening Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
GOST 5632	Stainless steels and corrosion resisting, heat-resisting and creep resisting alloys – Grades
GOST 7350	Corrosion-resistant, heat-resistant and high-temperature steel plate – Specifications

### DIMENSIONAL STANDARDS

EN ISO 9444-2	Continuously hot-rolled stainless steel – Tolerances on dimensions and form – Part 2: Wide strip and sheet/plate
EN ISO 9445-2	Continuously cold-rolled stainless steel – Tolerances on dimensions and form
EN ISO 18286	Hot-rolled stainless steel plates – Tolerances on dimensions and shape
ASTM A480/A480M	Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
GOST 19903	Hot-rolled steel sheets – Dimensions

### CORROSION RESISTANCE STANDARDS

EN ISO 3651	Determination of resistance to intergranular corrosion of stainless steels – Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels – Corrosion test in media containing sulfuric acid
EN ISO 15156-3	Petroleum and natural gas industries – Materials for use in H <sub>2</sub> S-containing environments in oil and gas production – Part 3: Cracking-resistant CRAs (corrosion-resistant alloys) and other alloys
ASTM A262	Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels
NACE MR0103	Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments
NACE MR0175	Petroleum and natural gas industries – Materials for use in H <sub>2</sub> S-containing environments in oil and gas production – Part 1: General principles for selection of cracking-resistant materials
GOST 6032	Corrosion-resistant steels and alloys – Test methods of inter-crystalline corrosion resistance

### CERTIFICATION STANDARDS

EN 10204 codes for inspection documents:	
3.1	Manufacturers inspection
3.2	Notified body inspection or third-party inspection

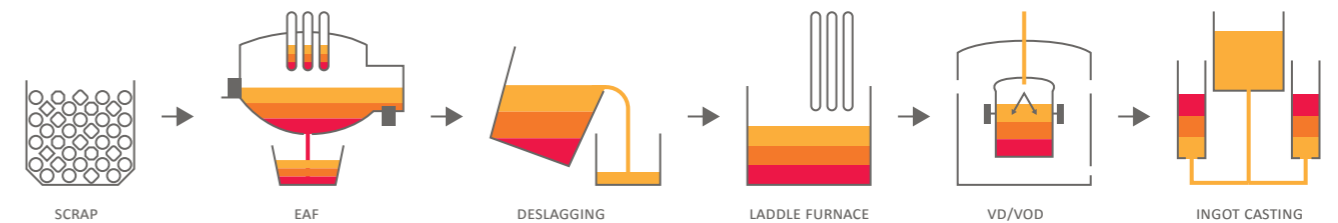
# sij | metal ravne



**SIJ METAL RAVNE**, the second largest Slovenian steel manufacturer, produces steel in an electric arc furnace, casting it into ingots and rolling or forging it into quality long steel products.

We make martensitic, ferritic, austenitic and precipitation hardening steels. Besides stainless, SIJ Metal Ravne is also a widely recognized producer of tool, high speed and special structural steels.

For the most challenging conditions, we offer steel grades made according to the ESR method.



## ROUND

Rolled	Ø 16 – 105 mm (0.63" – 4.13"), L = 3000 – 6000 mm (9.84 ft – 19.67 ft), according to EN 10060
Peeled/peeled&polished	Ø 15 – 80 mm (0.59" – 3.15"), L = 2500 – 6000 mm (8.20 ft – 19.67 ft), according to EN 10278
Ground/ground&polished	Ø 7 – 80 mm (0.28" – 3.15"), L = 2000 – 4000 mm (6.56 ft – 13.11 ft), according to EN 10278
Forged&peeled	Ø 105 – 205 mm (4.14" - 8.07"), L = 2000 – 6000 mm (6.56 ft – 19.67 ft), tol. +1 /-0 mm (+0.04"/-0")
Forged&turned:	Ø 206 – 300 mm (8.11" - 11.81"), L = 2000 – 6000 mm (6.56 ft – 19.67 ft), tol. +2 /-0 mm (+0.08"/-0") Ø 301 mm - 610 mm (11.85" – 24.01"), L = 2000 – 6000 mm (6.56 ft – 19.67 ft), tol +3mm/-0mm

## FLAT

Rolled EN 10058	width 40 – 150 mm (1.57" – 5.91") × thickness 7 – 65 mm (0.28" – 2.56"), L = 3000 – 6000 mm (9.84 ft – 19.67 ft)
Rolled DIN59200	width 151 – 255 mm (5.94" – 10.04") × thickness 15 – 65 mm (0.59" – 2.56"), L = 3000 – 6000 mm (9.84 ft – 19.67 ft) surface: sandblasted
Forged DIN 7527/6	square 100 – max 400 mm (3.94" – max 15.75"), L = 2000 – 6000 mm (6.56 ft – 19.67 ft), flat width 100 – 1200 mm (3.94" – 47.24") × thickness 100 – max. 90000 mm <sup>2</sup> (3.94"– max. 139.50"²)
Forged&milled (tol. + 2 / - 0 mm)	square 100 – max 400 mm (3.94" - max 15.75"), L = 2000 – 6000 mm (6.56 ft – 19.67 ft), flat width 100 – 1200 mm (3.94" – 47.24") × thickness 100 – max. 90000 mm <sup>2</sup> (3.94"–max. 139.50"²)



## OPEN-DIE MACHINED FORGINGS

Machined forgings produced by SIJ include rolls, shafts, mandrels, sleeves and bushes, rings and plates.

All open-die forgings can be subjected to heat treatment (normalizing, soft annealing, hardening&tempering, quenching, etc.) and machining by

- turning
- milling
- drilling

Our staff is highly skilled working on advanced quality testing equipment (US, hardness, MT, test of mechanical properties, microstructure, etc.).

## DIMENSIONAL RANGE OF FORGINGS

### Rolls, axles, shafts

max. dia.	1000 mm (39.37")
max. length	10000 mm (32.8 ft)
max. weight	20000 kg (44.093 lbs)

### Rings, discs

max. external dia.	2000 mm (90.55")
max. weight	15000 kg (32.8 ft)

### Bushes

max. dia.	1400 mm (55.12")
max. length	2200 mm (7.87 ft)
max. weight	15000 kg (33.060 lbs)

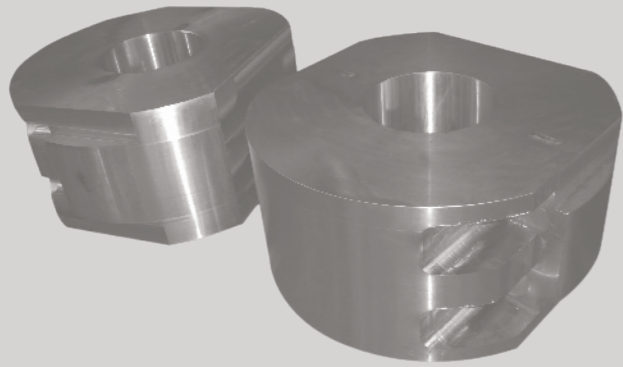


## APPLICATION AREAS

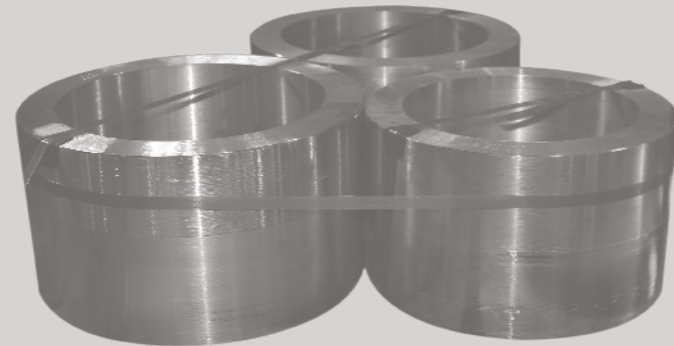
- Mechanical engineering (rolls, shafts...)
- Hot-forming rolls ( for steel, aluminium, aluminium foil, ...)
- Mining industry (shafts, gears...)
- Car industry ( dies, frames...)
- Shipbuilding industry ( shafts, stabilizers ...)
- Metallurgical industry ( tools, mandrels, extrusion sleeves...)
- Metalworking industry (sleeves, rings for cutting dies)
- Energy industry (turbine shaft housing, sealing rings, shafts, ...)
- Oil&gas industry ( tubes, connectors...)
- Graphic industry (rolls for newspaper printing,...).

## GRADE RANGE

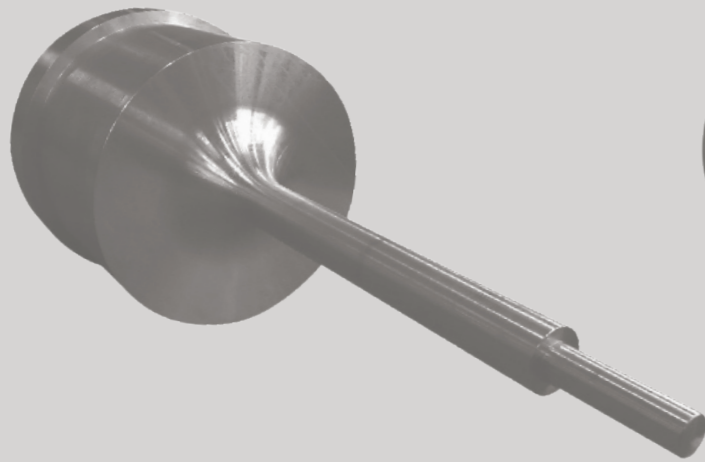
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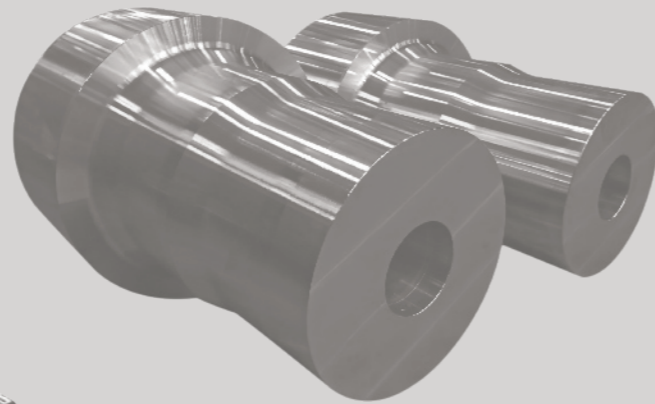
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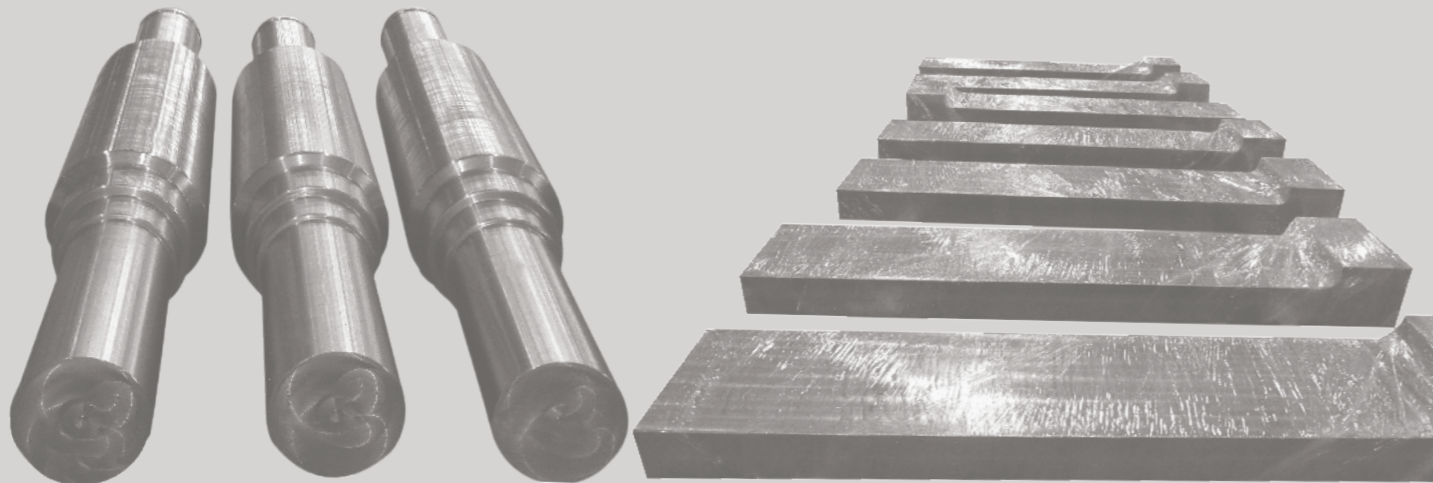
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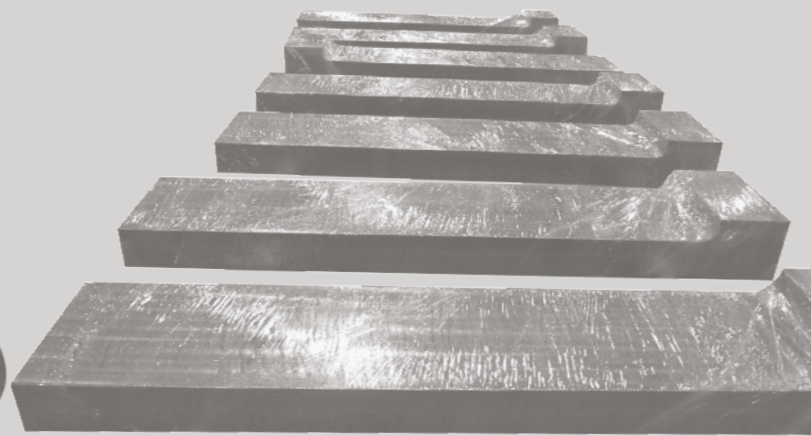
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4



5



6

### 1 TURBINE SHAFT HOUSING

SIQUAL 1151; W.Nr. 1.1151; AISI 1022

Dim: D800×400 mm (31.49" × 1.3 ft)

**SIQUAL** 1151

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.20	max. 0.40	0.55	max. 0.40	max. 0.10	max. 0.40	/	/	(Cr+Mo+Ni)= max. 0.63

### 2 SLEEVES FOR SEALING RINGS

Dim: D450/370×350 mm (17.71"/14.56" × 1.14 ft)

SINOXX 4021; W.Nr. 1.4021; AISI 420

**SINOXX** 4021

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.20	max. 1.0	max. 1.50	13.0	/	/	/	/	/

### 3 VALVE SPINDLE

Dim: D700×1620 mm (27.56" × 5.31 ft)

SINOXX 4923; W.Nr. 1.4923; X22CrMoV12

**SINOXX** 4923

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.22	max. 0.5	0.65	12.00	1.00	0.55	0.30	/	/

### 4 INLET STUB

Dim: D820/540×1205 mm (D32.28"/21.26" × 3.95 ft)

SINOXX 4903; W.Nr. 1.4903; AISI A213/P91

**SINOXX** 4903

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.10	0.35	0.45	9.00	0.95	max. 0.4	0.20	/	Nb=0.08, N=0.05

### 5 ROLLS FOR PRINTING MACHINES

Dim: D400×2550 mm (D15.74" × 8.36 ft)

SINOXX 4006; W.Nr. 1.4006; AISI 410

**SINOXX** 4006

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.12	max. 1	max. 1.5	12.50	/	0.75	/	/	/

### 6 ELEMENTS OF A WINDING MACHINE FOR SHEET METAL

Dim: 530×265×2525 mm (20.86" × 10.43" × 8.28 ft)

SINOXX 4923; W.Nr.1.4923, X22CrMoV12

**SINOXX** 4923

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.22	max. 0.5	0.65	12.00	1.00	0.55	0.30	/	/



**SIJ SUZ** is a manufacturer of cold drawn, ground, peeled and hot rolled steel bars and wire. The product range comprises round, hexagonal and specially-shaped bars.

**DIMENSIONAL RANGE**

Bars		Wire	
Round	2 – 120 mm (0.079"–4.72")	Round	0,1 – 45 mm (0.0039" – 1.77")
Hexagonal	5 – 50 mm (0.197"–1.97")	Special	profiles in coils
Square	5 – 50 mm (0.197"–1.97")		
Special	(on the request of the customer)		

**DELIVERY CONDITIONS AND TOLERANCES**

Bars	
Cold drawn	h8 – h11
Peeled	h9 – h11
Ground	h6 – h11

SUZ also manufactures finished products, semi-products and spare parts on a classical turning machine and on universal CNC turning centers.

**DIMENSIONAL RANGE OF CLASSICAL TURNING**

- Turning of pieces up to 720 mm (28.35")
- Max. length of 4000 mm (13.11 ft)

**DIMENSIONAL RANGE OF UNIVERSAL CNC TURNING**

- Turning of pieces up to 360 mm (14.17")
- Max. length of 532 mm (1.74 ft)

# sij | elektrode



**SIJ ELEKTRODE** is the largest welding materials manufacturer in Slovenia, and a prominent one in Europe. Our manufacturing program includes welding materials for manual, semi-automatic and automatic robotic welding of all steel types. Our broad product range contains all kind of welding wires, electrodes, flux-cored wires and fluxes.

Our products are used for welding in the automotive industry, agro-machinery, heavy transportation, lifting, excavating and mining, energy and power, railways and shipyards, oil and gas, off shore and pipeline, chemical processing, pharmaceutical and food, maintenance and repair, construction and other industry sectors.

## DIMENSIONAL RANGE

Welding parameters			Packaging		
Diam.	Length	Current A	Weight / Packet	Weight / Carton	**Weight / 1000 pcs
2 mm (0.079")	300 mm (0.98 ft)	55-65	3,4 kg (7.5 lbs)	17 kg (37.48 lbs)	10,5 kg (23.15 lbs)
2,5 mm (0.098")	350 mm (1.15 ft)	60-90	4,0 kg (8.82 lbs)	25,0 kg (55.11 lbs)	19,6 kg (43.21 lbs)
3,25 mm (0.128")	350 /450 mm (1.15/1.48 ft)	90-140	4,0/5,0 kg (8.82/11.02 lbs)	20,0/25,0 kg (44.09/55.11 lbs)	32,8/43,0 kg (72.31/94.8 lbs)
4 mm (0.158")	450 mm (1.48 ft)	140-190	5,0 kg (11.02 lbs)	25,0 kg (55.11 lbs)	66,7 kg (147.05 lbs)
5 mm (0.197")	450 mm (1.48 ft)	190-250	5,0 kg (11.02 lbs)	25,0 kg (55.11 lbs)	100,0 kg (220.46 lbs)
6 mm (0.236")	450 mm (1.48 ft)	250-320	5,0 kg (11.02 lbs)	25,0 kg (55.11 lbs)	134,0 kg (295.41 lbs)

\* valid for all electrodes- example EVB S / E 7016 | \*\* approx.data

Packaging wires			Packaging rods		
Diam.	Spools	Spools weight	Drums	Diam. mm/ length 1000 mm (3.28 ft)	Rods weight
0,8 mm (0.032")	K300,	5 kg (11.02 lbs)	250 kg (551.15 lbs)	1,6 mm (0.063")	25 kg (55.115 lbs)
1,0 mm (0.039")	D300,	15 kg (33.07 lbs)	350 kg (771.60 lbs)	2,0 mm (0.079")	5 kg (11.02 lbs) *
1,2 mm (0.047")	BS300,		500 kg (1102.29 lbs)	2,5 mm (0.098")	stainless rods
1,4 mm (0.055")	D200			3,0 mm (0.118")	
1,6 mm (0.063")				4,0 mm (0.158")	
Wires for SAW-Submerged Arc Welding					
Diam.	K435	25 kg (55.12 lbs)	2,0 mm (0.079")	2,5 mm (0.098")	3,0 mm (0.118")

\*\*\* valid for all wires and rods - example MIG 75 / VAC 65 and TIG VAC 65

## INCREASE IN WELDING EFFICIENCY OF UP TO 10%

Welding consumables produced by SIJ Elektrode are a carefully developed, customized solution for welding SINOXX grades, based on the specific characteristics of SINOXX steels. As a result, we are able to offer optimization and cost reduction for your welding processes. Welding SINOXX with Elektrode welding consumables has been shown to be up to 10%\* more efficient in comparison to other combinations. The smooth welding process and more precise welding flow results in a perfect joint welding structure.

\* internal testing data

## WELDING CONSUMABLES

DESIGNATION WELDING CONSUMABLES				TYPE	REMARK
W.NR	AWS	EN ISO 3581, EN ISO 14343 in EN ISO 14174	SIJ ELEKTRODE	WELDING CONSUMABLES	SUITABLE FOR WELDING STEEL GRADES*
1.3416	308L	E 19 9 LR 12	INOX R 19/ 9NC	ELECTRODES	AUSTENITIC, FERRITIC
1.3416	308L	S 19 9 L/ SA FB 2 63 DC	EPP 19/9NC/ flux FB CrNi	WIRES /FLUXES	AUSTENITIC, FERRITIC
1.3416	308LSi	G 19 9 L Si	MIG 19/ 9 NC Si	WIRES /RODS	AUSTENITIC, FERRITIC
1.3416	308LSi	W 19 9 L Si	TIG 19/ 9 NC Si	WIRES /RODS	AUSTENITIC, FERRITIC
1.4009	410	E 13 B 43	INOX B 13 Fe	ELECTRODES	FERRITIC, MARTENSITIC
1.4009			INOX B 13/6 Fe	ELECTRODES	FERRITIC
1.4015	430	E 17 B 43	INOX B 17 Fe	ELECTRODES	FERRITIC
1.4015	430Mo		INOX B 17 Mo Fe	ELECTRODES	FERRITIC
1.4016	430	G 17	MIG 17	WIRES /RODS	FERRITIC
1.4018		E 13 1 B 43	INOX B 13/1 Fe	ELECTRODES	FERRITIC, MARTENSITIC
1.4332	309L	E 23 12 IR 12	INOX R 25/14NC	ELECTRODES	FERRITIC, MARTENSITIC, HEAT RESISTANT
1.4332	309LSi	G 23 12 L Si	MIG 25/14NC Si	WIRES /RODS	FERRITIC, MARTENSITIC, HEAT RESISTANT
1.4332	309LSi	W 23 12 L Si	TIG 25/14NC Si	WIRES /RODS	FERRITIC, MARTENSITIC, HEAT RESISTANT
1.4337	312	E 29 9 R 12	INOX R 29/9	ELECTRODES	DUPLEX, MARTENSITIC
1.4337	312	G 29 9	MIG 29/9	ELECTRODES	DUPLEX, MARTENSITIC
1.4337	312	W 29 9	TIG 29/9	WIRES /RODS	DUPLEX, MARTENSITIC
1.4337	2209	E 22 9 3 NL	INOX R 22/9/3LN	ELECTRODES	DUPLEX
1.4337	2209	W 22 9 3 NL	TIG 22/9/3LN	WIRES /RODS	DUPLEX
1.4351	410NiMo	E 13 4 B 43	INOX B 13/4Fe	ELECTRODES	FERRITIC
1.4351	E410NiMo	E 13 4 B 43	INOX B 13/4FeNC	ELECTRODES	FERRITIC
1.4370	307	E 18 8 Mn B 22	INOX B 18/8/6	ELECTRODES	FERRITIC, MARTENSITIC
1.4370	308	E 18 8 Mn R 12	INOX R 18/8/6Fe	ELECTRODES	FERRITIC
1.4370	308	E 18 8 Mn R 26	INOX R 18/8/6	ELECTRODES	FERRITIC
1.4370	308	S18 8 Mn / SA FB 2 63 DC	EPP 18/8/6/Flux FB CrNi	WIRES /FLUXES	FERRITIC
1.4370	3087Si	G 18 8 Mn	MIG 18/8/6 Si	WIRES /RODS	FERRITIC, MARTENSITIC
1.4370	308Si	W 18 8 Mn	TIG 18/8/6 Si	WIRES /RODS	FERRITIC, MARTENSITIC
1.4430	316L	E 19 12 3 LR 12	INOX R 19/3/4 L INOX R 19/ 12/3NC	ELECTRODES	AUSTENITIC WITH Mo, FERRITIC
1.4430	316L	S 19 12 3 L/ SA FB 2 63 DC	EPP 19/ 12/3NC/ flux FB CrNi	WIRES /FLUXES	AUSTENITIC WITH Mo, FERRITIC

## SPECIFIC PROCEDURES

- The correct welding material according to corrosion resistance, tensile strength and the temperature of application should be selected.
- To reduce corrosion and the appearance of cracks it is important to select the correct tools, to clean the surfaces, to remove the slag after welding and passivation, and to carefully control the heat input.
- Ferritic steel grades can be welded with appropriate ferritic or with suitable austenitic welding filler materials.

DESIGNATION WELDING CONSUMABLES				TYPE	REMARK
W.NR	AWS	EN ISO 3581, EN ISO 14343 in EN ISO 14174	SIJ ELEKTRODE	WELDING CONSUMABLES	SUITABLE FOR WELDING STEEL GRADES*
1.4430	316LSi	G 19 12 3 L Si	MIG 19/ 12/3 NC Si	WIRES /RODS	AUSTENITIC WITH Mo, FERRITIC
1.4430	316LSi	W 19 12 3 L Si	TIG 19/ 12/3 NC Si	WIRES /RODS	AUSTENITIC WITH Mo, FERRITIC
1.4453	317L	E 19 13 4 IR 12	INOX R 19/13/4	ELECTRODES	AUSTENITIC WITH Mo
1.4551	347	E 19 9 Nb B 12	INOX B 19/9 Nb	ELECTRODES	AUSTENITIC, FERRITIC, MARTENSITIC
1.4551	347	E 19 9 Nb R 12	INOX B 13/4 Fe ,13/6 Fe INOX R 19/9 Nb	ELECTRODES	AUSTENITIC, FERRITIC, MARTENSITIC
1.4551	347	G 19 9 Nb Si	MIG 19 9 Nb Si	WIRES /RODS	AUSTENITIC, FERRITIC, MARTENSITIC
1.4551	347	S 19 9 Nb/ SA FB 2 63 DC	EPP 19/9Nb/fluxFB CrNi	WIRES /FLUXES	AUSTENITIC, FERRITIC, MARTENSITIC
1.4551	347	W 19 9 Nb Si	TIG 19 9 Nb Si	WIRES /RODS	AUSTENITIC, FERRITIC, MARTENSITIC
1.4576	318	E 19 12 3 Nb B 12	INOX B 19/12/3 Nb	ELECTRODES	AUSTENITIC WITH Mo, FERRITIC
1.4576	318	E 19 12 3 Nb R 12	INOX R 19/12/3 Nb	ELECTRODES	AUSTENITIC WITH Mo, FERRITIC
1.4576	318	S 19 12 3 Nb/ SA FB 2 63 DC	EPP 19/ 12/3 Nb/ flux FB CrNi	WIRES /FLUXES	AUSTENITIC WITH Mo, FERRITIC
1.4576	318Si	G 19 12 3 Nb Si	MIG 19/ 12/3 Nb Si	WIRES /RODS	AUSTENITIC WITH Mo, FERRITIC
1.4576	318Si	W 19 12 3 Nb Si	TIG 19/ 12/3 Nb Si	WIRES /RODS	AUSTENITIC WITH Mo, FERRITIC
1.4820	446	E 25 4 B 43	INOX B 25/4 Fe	ELECTRODES	FERRITIC, HEAT RESISTANT
1.4820	446	E 25 4 R 43	INOX R 25/4 Fe	ELECTRODES	FERRITIC
1.4842	310	E 25 20 B 42	INOX B 25/20	ELECTRODES	FERRITIC, HEAT RESISTANT
1.4842	310	E 25 20 R 42	INOX R 25/20	ELECTRODES	HEAT RESISTANT
1.4842	310	G 25 20	MIG 25/20	WIRES /RODS	FERRITIC, HEAT RESISTANT
1.4842	310	W 25 20	TIG 25/20	WIRES /RODS	FERRITIC, HEAT RESISTANT
1.4842	309Mo	E 23 12 2 IR 12	INOX R 25/14/3NC	ELECTRODES	FERRITIC
1.4842	309Mo	E 23 12 2 R 12	INOX R 22/12/3 Fe	ELECTRODES	FERRITIC

\* please consult datasheets for detailed instructions

**DISSIMILAR WELDING**

SIJ BRAND		SINOXX 4301	SINOXX 4845	SINOXX 4404	SINOXX 4541	SINOXX 4835	SINOXX 4162	SINOXX 4462	SINOXX 4410	SINOXX 4547				
BASE METAL	AISI/AWS	AISI 304L	AISI 310	AISI 316L	AISI 321	Acroni 4835	S32101*	AISI 2205	AISI 2507	Alloy 625 **	904L	S31254	CARBON STEEL	
		W.Nr.	1.4301	1.4845	1.4404	1.4541	1.4835	1.4162	1.4462	1.4410	2.4856	1.4519	1.4547	
SINOXX 4301	AISI 304L	1.4301	308L TIG19/9NCsi	309L INOX R 25/14 NC	308 /316L TIG 19/12/3Nb	347 INOX R 19/9NB	INOX R 25/14 NC	309LMo INOX R 25/14/3NC	309LMo INOX R 25/14/3NC	309LMo INOX R 25/14/3NC	625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	309L INOX R 25/14NC
SINOXX 4851	AISI 310	1.4845	309L INOX R 25/14 NC	310 INOX B 25/4Fe	309L/625 INOX R 25/14 NC	309L INOX R 25/14NC	253MA/309L INOX R 20/10/3L	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R25/14/3NC	309LMo/2209 INOX R 25/14/3NC	625 TIG/MIG 625	309L/904L INOX R 25/14NC	310/625 INOX R 25/20	309L INOX R 25/14NC
SINOXX 4404	AISI 316L	1.4404	3016LMo INOXR25/14/3NC	309L/625 INOX R 25/14 NC	316L INOX R 19/12/3NC	316L/309LMo MIG/TIG 19/12/3Nb	309L/253MA INOX R 25/14NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	625 TIG/MIG 625	625/904L INOX R 20/25L	309LMo/625 INOX R 25/20	309L/ 309LMo INOX R 25/14/3NC
SINOXX 4541	AISI 321	1.4541	309L INOX R 25/14	309L INOX R 25/14 NC	309LMo INOX R 25/14/3NC	347 INOX R 19/9NB	309L/253MA INOX R 25/14NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	309L INOX R 25/14NC
SINOXX 4835	Acroni 4835	1.4835	309LMo INOX R 25/14 NC	309L INOX R 25/14NC	309L INOX R25/14NC	309L INOX R 25/14NC	253MA INOX R 20/10/3L	309L/2209 INOX R 25/14NC	309L/2209 INOX R 25/14NC	309L/2209 INOX R 25/14NC	625 TIG/MIG 625	309L 625 INOX R 25/14NC	309L 625 INOX R 25/14NC	309L INOX R 25/14NC
SINOXX 4162	S32101*	1.4162	309LMo/2209 INOX R 25/14/3 NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	309L INOX R 25/14NC	2101/2209 INOX R 25/4Fe	2209 INOX R 22/9/3LN	2209 INOX R 22/9/3LN	INOX R 25/14 NC	309L/309LMo INOX R 25/14/3NC	309L/309LMo INOXR25/14/3NC	309LMo/2209 INOXR25/14/3NC
SINOXX 4462	AISI 2205	1.4462	309LMo/2209 INOX R 25/14/3 NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	309L INOX R 25/14NC	2101/2209 INOX R 22/9/3 LN	2209 INOX R 22/9/3LN	2209 INOX R 22/9/3LN	INOX R 25/14 NC	309L/309LMo INOX R 25/14/3NC	309L/309LMo INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC
SINOXX 4410	AISI 2507	1.4410	309LMo/2209 INOX R 25/14/3 NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	309L INOX R 25/14NC	2101/2209 INOX R 25/4Fe	2209 INOX R 22/9/3LN	2507 INOX R 25/14NC	INOX R 25/14 NC	309L/309LMo INOX R 25/14/3NC	309L/309LMo INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC
	Alloy 625 **	2.4856	625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	625 / 2209 INOX R 22/9/3LN	625 / 2209 MIG 625 INOX R 22/9/3LN	625 / 2209 MIG 625 INOX R 22/9/3LN	625 TIG/MIG 625	904L INOX R 20/25L	625 TIG/MIG 625	625 MIG 625
	904L		625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/ NC	309LMo/2209 INOX R 25/14/3NC	625 TIG/MIG 625	904L INOX R 20/25L	625 TIG/MIG 625	309LMo INOX R 25/14/3NC
SINOXX 4547	S31254	1.4547	625 TIG/MIG 625	625 MIG 625	625/309LMo INOX R 25/14/3NC	625/309LMo INOX R2 5/14/3NC	625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	625 MIG 625	625 TIG/MIG 625	625/309LMo INOX R 25/14/3NC
	CARBON STEEL		309L INOX R 25/14NC	309L INOX R 25/14NC	309LMo INOX R 25/14/3NC	309L INOX R 25/14NC	309L INOX R 25/14NC	309LMo/2209 INOX R 25/14/3NC	309LMo/2209 INOX R 25/14/3NC	2505 INOX R 25/14/3NC	625 TIG/MIG 625	625 TIG/MIG 625	625 TIG/MIG 625	Carbon steel

Special grades available upon request

\* S32101; W.nr.:1.4162 = Lean Duplex

\*\* Alloy 625; W.nr.:1.4162 Wire classification : ERNiCrMo- 3





### SIJ STEEL SERVICE AND PROCESSING DIVISION

At the SIJ Group we make our customers the focus of our everyday activities, so we are constantly looking for ways to get closer to our customers, to understand their needs and to improve our services to best meet their demands. The SIJ Steel Service and Processing Division is oriented toward professional service, quick delivery and a high level of flexibility.

Located in key markets, the SIJ Steel Service and Processing Division member companies offer technical support and services such as cutting, surface grinding, edge preparation, straightening and shearing.

When quick delivery and reliable professional service are required, the SIJ Steel Service and Processing Division companies are your answer.

### CUSTOM MADE SHAPES, HIGH FLEXIBILITY, QUICK DELIVERY

SIJ NIRO WENDEN,  
WENDEN, DE

SIJ GRIFFON & ROMANO,  
CORSICO, IT

SIJ KOPO INTERNATIONAL,  
NEW JERSEY, US

SIJ STEEL SHANGHAI,  
SHANGHAI, CN

# sij | niro wenden

## **PRECISION-ENGINEERED PRODUCTION AND FULLY-AUTOMATED ORDER PROCESSING SYSTEMS COMBINED WITH STATE-OF-THE-ART LOGISTICS COME AS STANDARD.**

Founded in 1994, NIRO Wenden GmbH is currently one of the leading stainless steel processors on the German and international markets, with the potential to process plates of up to 150 mm (5.91") in thickness. As a part of SIJ the Steel Service and Processing Division, and in conjunction with its specialist partners, NIRO covers an extensive range of stainless steel blanks and machining options, and offers a complete supply program for stainless steel fabricators from a single source.

Precision-engineered production and fully-automated order processing systems combined with state-of-the-art logistics come as standard.

Special priority is given to the regular availability of special and heat resistant materials. This guarantees efficient on-time delivery of precision cut blanks and unit weights from a few grams to several tonnes. By offering additional services such as edge preparation for welding and surface grinding, NIRO is able to meet a wide variety of commercial and technical requirements.

### **SERVICE OVERVIEW**

- Plasma cutting
- Waterjet cutting
- Laser cutting
- Shearing
- Straightening with multi-roll flattener
- Hydraulic straightening
- Surface grinding (dry)
- Edge preparation





# sij | griffon & romano

Since 1954, Griffon & Romano has been pursuing a constant policy of modernization by the timely application of every technological innovation. Today Griffon & Romano is considered a company of primary importance in the field of stainless steel in Italy, particularly in plasma and mechanic cutting. With a full complement of appropriate machinery, the company has reached a high qualitative level, ensuring its ability to satisfy the requirements of the most demanding customers.

Being able to process plates up to 150 mm (5.91") thick and up to 3000 mm (118.11") wide gives us a high level of flexibility, meeting all the diverse needs of our clients: from the cutting of very small to large pieces in custom forms, and from a minimal batch of one piece up to serial production. We use plasma high definition and saw cutting technology to produce customized stainless steel from 8 mm (0.32") to 150 mm (5.91") thick. The wide range of stainless steel and complementary products in stock ensures fast delivery of all products. This, along with our high cutting quality, are the features most appreciated by our customers.

## **SERVICE OVERVIEW**

- Plasma cutting
- Saw cutting
- Hydraulic straightening
- Deburring
- Shearing



# sij | kopo international

Since its inception in 1991, Kopo International, has been a major sales, marketing and metallurgical engineering company , servicing the Specialty steel, tool steel and stainless steel industries in The USA, Canada, and Mexico. As the wholly owned supply division for SIJ group companies, including Acroni and Metal Ravne, Kopo International has become one of the major suppliers for Specialty steels in the Power generation, Petrochemical, Tooling, Automotive, oil and gas, food equipment , turbine blade and Nuclear industries through out North America.

We are able to service multi layered supply chains with mill direct shipments , mill depot stock and customer specific programs to ensure total service to our customers Also offered is metallurgical engineering services to aid in developing new grades or end uses, failure analysis, customer joint calls and product analysis.

KOPO INT. supplies stainless plate and bar in 300 series, 400 series , 500 series , PH grades , hi temp grades, Tool Steel in all ASTM A 681. A 600 grades and Alloy steel from 4140 to 8630 mod and can supply specials based on customer chemistries based on our experience with over 900 grades offered to better service our customer needs .

## **SERVICE OVERVIEW**

- sales coverage throughout North America
- joint call sales and marketing
- metallurgical engineering / quality / R&D services
- depot stock / specialized stock programs

TRUSTED BY THE BEST

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**ANDRITZ**

 **BALTIC SHIPYARD**  
SHIPBUILDING

**VOITH**

**ASP ARSOPI**

**INOXCVA**  
Experience × Expertise × Excellence

**WEISSTALER**  
BÖDENPRESSWERKE

**JACQUET**

 **PELFA**  
group

  
**HOLTEC**  
INTERNATIONAL

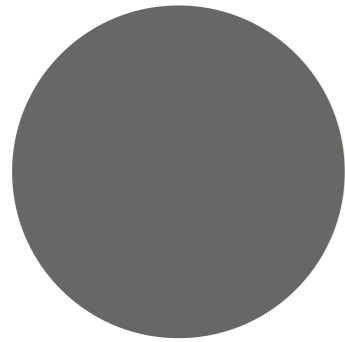
 **INOX**  
**TECH**

  
**FIB** *industries*

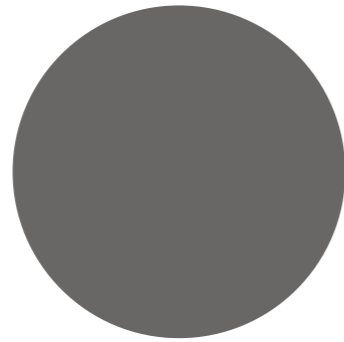
 **HONEX**

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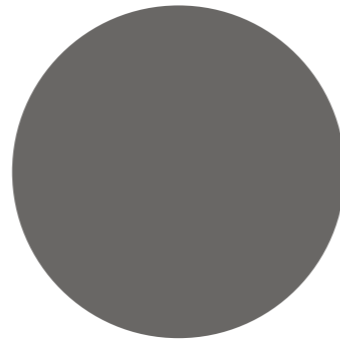
Our work is never truly done; we are a part of an endless process. This is symbolised by the **three dots** in our corporate logo, and the logos of each SIJ Group product and service brand. **Three dots represent three values.** Each one stands firmly on its own, and they all stand together, forever. As a sign of trust and quality, they symbolise our three main values, which define who and what we are.



**CUSTOMISATION.**

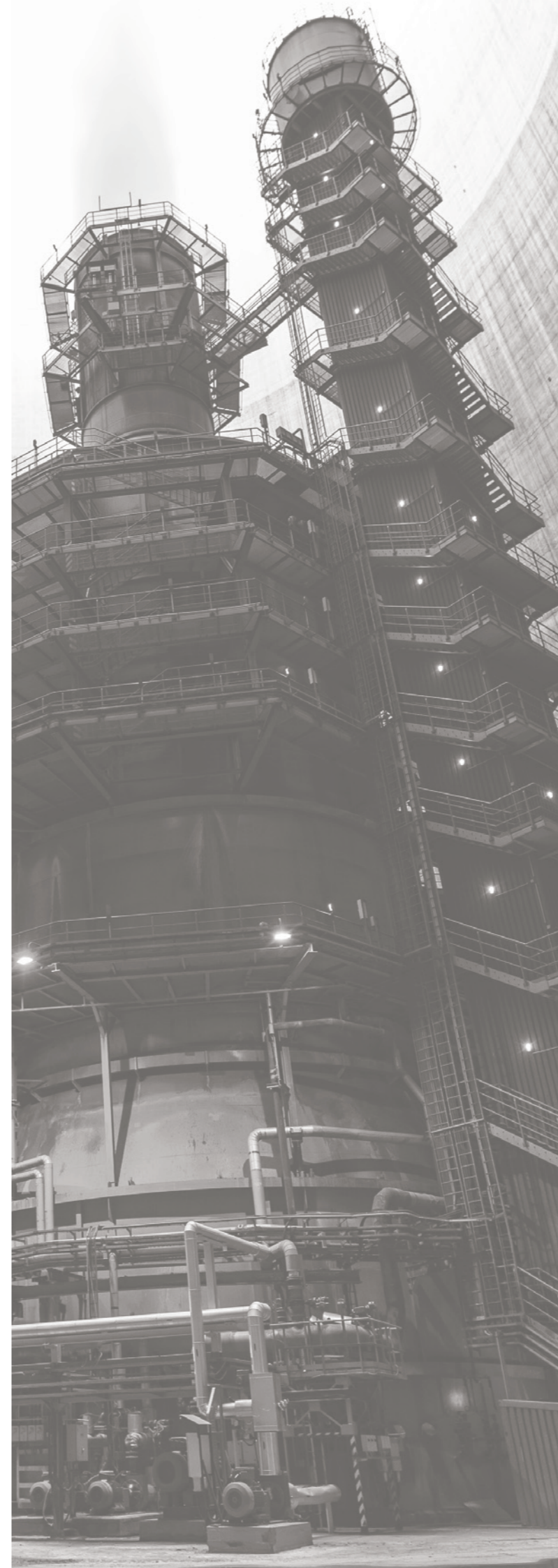


**DILIGENCE.**

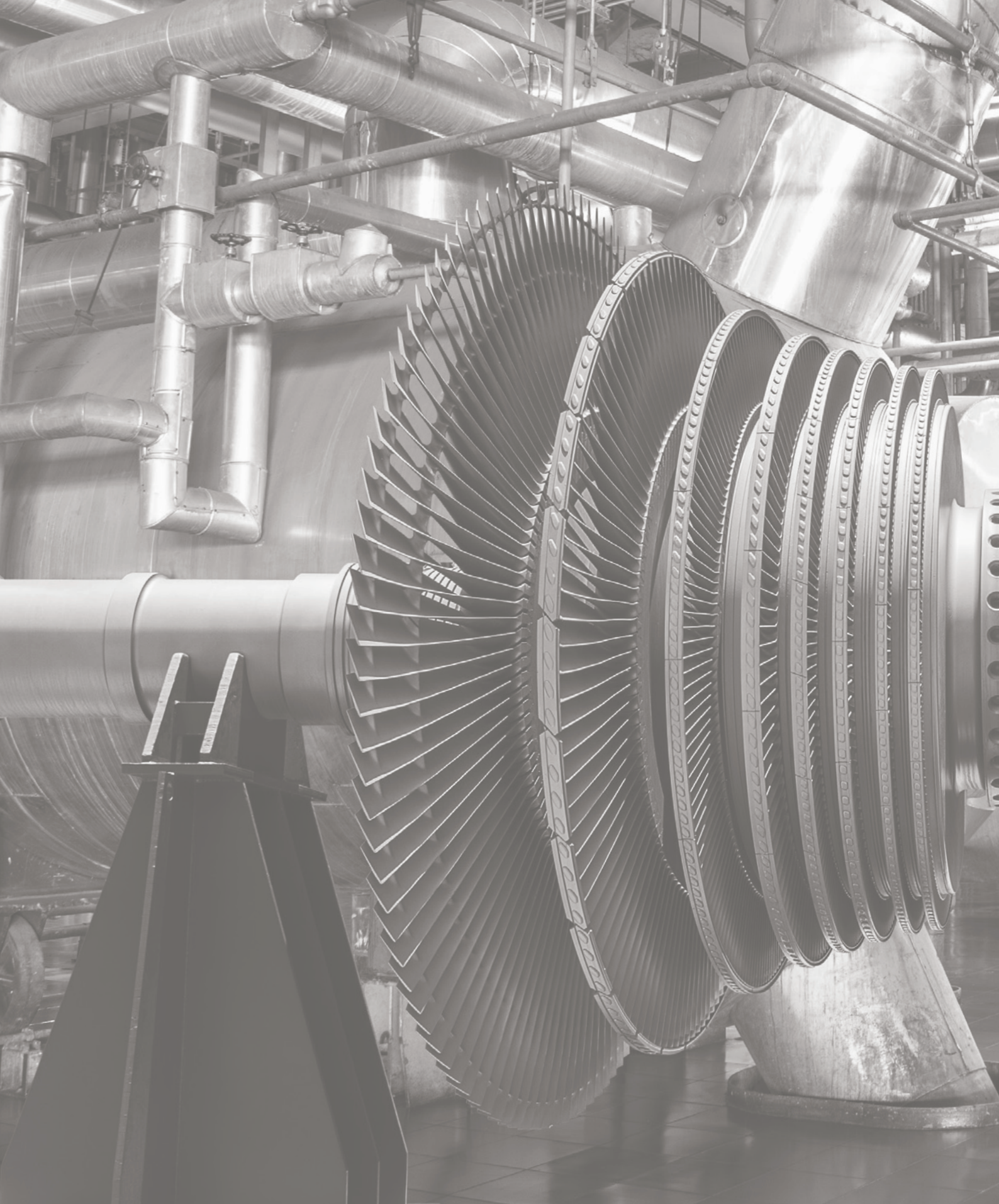


**RELIABILITY.**

**sij** | group



**THE BEST THINGS IN THE WORLD  
CONTAIN SLOVENIAN STEEL**



**SIJ Group**

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1000 Ljubljana

[www.sij.si](http://www.sij.si)