

COLD DRAWN BAR MANUFACTURING



At Offshore Stainless Supplies, we pride ourselves on a high level of service and aim to totally satisfy our customer expectations. We use a variety of manufacturing technologies to meet customer requirements in a safe and environmentally friendly manner, with a 'right-first-time' approach.

We also have a long-standing and highly skilled workforce who understand our manufacturing capabilities and have pride in every cold drawn bar supplied.













We are fully ISO 9001 accredited - the world's most recognised Quality Management System, plus we are members of the BVAA (British Valve & Actuator Association) and the IWMA (International Wire & Machinery Association), which are both influential corporate associations in their industries.

All this complements our recent NORSOK accreditation and approval to produce UNS 32760 Super Duplex strain hardened bars for fasteners to MDS D59/D59L Rev 3.

NORSOK standards are developed by the Norwegian petroleum industry to ensure adequate safety, value adding and cost effectiveness for petroleum industry developments and operations.

Offshore Stainless Supplies are the only cold drawn bar manufacturer in the UK to be awarded this prestigious accreditation, reinforcing our position as the UK's most trusted and reputable manufacturer and stockholder of cold drawn stainless steel and nickel alloy bars.



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X750	2.4669
825	2.4858

ABOUT OUR COMPANY



'Drawn to Quality'

The Ultimate in Cold Drawn Bar Manufacturing

Offshore Stainless Supplies Ltd is the UK's most trusted and reputable manufacturer and stockholder of cold drawn stainless steel and nickel alloy bars.

Founded in 1999, we process a range of cold-drawn round, hexagon, square and flat bar sections, offering bespoke sizes, special lengths and high tensile strengths from our production facility in the West Midlands.

Tel: +44 (0)1922 414003 Email: sales@offshorestainless.co.uk Specialising in duplex, super duplex, nickel alloys and other exotic grades and with a huge stock inventory, Offshore Stainless Supplies can produce lengths of up to 10.8 metres from rod coils and up to 16 metres on our bar-to-bar draw benches, with specific mechanical properties and close tolerances.

We offer customised solutions to meet our customer's specific requirements for unique products such as fasteners, valve bodies, manifolds and spring making applications, supplying products to more than 50 countries worldwide.

OUR PRODUCT PORTFOLIO

Today, we are recognised as the quality standard in cold drawn bar having been manufacturing high quality product for over 25 years.

We serve many different markets, including offshore, nuclear, oil and gas, marine, transportation, automotive and construction.

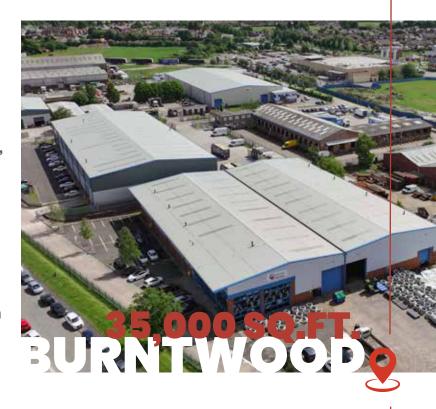
Stock Holding

We take pride in our state-of-the-art manufacturing facility that boasts both impressive stock holding and production capacities. We hold 1,500 tonnes of cold drawn sizes on the shelf rather than being manufactured on a leadtime.

Whether you require standard sizes or custom specifications, our facilities are equipped to fulfill orders of any scale with precision and reliability. With access to over 4,000 tonnes of group inventory of Stainless Steel, Duplex and Nickel Alloy grades, together with recent investments in our cold drawing machinery and production facilities, we can now offer best-in-class delivery times of typically 2 to 4 weeks for cold drawn product.

Technical Sales Team

We like nothing more than learning about the uses of our strain hardened bars, and working with our customers to support the engineering challenges they present to us. For further details contact our Technical sales team to discuss how we can meet your project requirements.



Added-Value Services

We offer linishing process where a high-quality surface finish is applied to not only improves the aesthetics of the stainless steel bars and can contribute to better corrosion resistance and overall performance in various applications.

Roll marking is also a cost-effective and efficient service we also offer to add information to the surface of bars during the manufacturing process, to provide a permanent and visible means of conveying important details about the bars, facilitating proper handling, usage, and quality control.

We hold substantial inventories of raw materials, enabling us to respond swiftly to customer demands.

GRADES:	EN:	COLD DRAWN TO:
STAINLESS STEI	EL .	
Round Bar:		Ø7.925 - 99.44mm (0.312 - 3.915")
304 / 304L	1.4301 / 1.4307	A2-70 / A2-80 / A2-100
304 / 304L	1.4301 / 1.4307	ASTM A193/A320 B8 CLASS 2, CLASS 2B, BS 4882, B8X
316 / 316L	1.4401 / 1.4404	A4-70 / A4-80 / A4-100
316 / 316L	1.4401 / 1.4404	ASTM A193/A320 B8M CLASS 2, CLASS 2B, CLASS 2C, BS 4882, B8MX
316 TI	1.4571	A5-70 / A5-80
316L MO>2.5%	1.4435	1.4435 CLASS 70 / CLASS 80
321	1.4541	ASTM A193/A320 B8T CLASS 2, BS 4882, B8TX
UNS S31254	1.4547	ASTM A193/A320 B8MCUN CLASS 2 / 31254 CLASS 80
347	1.4550	ASTM A193/A320 B8C CLASS 2

Hexagonal Bar:		10 - 55mm (0.375 - 2.165")
304 / 304L	1.4301 / 1.4307	A2-70 / A2-80 / A2-100
304 / 304L	1.4301 / 1.4307	ASTM A193/A320 B8 CLASS 2, CLASS 2B, BS 4882 , B8X
316 / 316L	1.4401 / 1.4404	A4-70 / A4-80 / A4-100
316 / 316L	1.4401 / 1.4404	ASTM A193/A320 B8M CLASS 2, CLASS 2B, CLASS 2C, BS 4882, B8MX
316 TI	1.4571	A5-70 / A5-80
316L MO>2.5%	1.4435	1.4435 CLASS 70 / CLASS 80
321	1.4541	ASTM A193/A320 B8T CLASS 2, BS 4882, B8TX
UNS S31254	1.4547	ASTM A193/A320 B8MCUN CLASS 2 / 31254 CLASS 80

Square Bar:		25.4 - 76.2mm (1-3")	
316L	1.4404	NACE MR0175	

Flat Ba	:	31.75 x 25.4mm - 88.90 x 44.45mm (1.25 x 1" - 3.5 x 1.75")
316L	1.4404	NACE MR0175

SUPER DUPLEX STEEL		
Round Bar:		Ø11.38 - 99.44mm (0.448 - 3.915")
UNS 32760	1.4501	NORSOK MDS D59/D59L REV 3*
UNS 32760	1.4501	32760 FG, FLT, CONDITION S
UNS 32750	1.4410	32750 FG, FLT, CONDITION S

^{*} Maximum diameter size 86.74mm (3.415")



STOCK LIST

GRADES:	EN:	COLD DRAWN TO:	
DUPLEX STEEL			
		(0.440, 0.000)	
Round Bar:		Ø11.38 - 99.44mm (0.448 - 3.915")	
Round Bar: UNS S20910/XM19	1.3964	Ø11.38 - 99.44mm (0.448 - 3.915) CUSTOMER SPECIFICATIONS	

NICKEL ALLOYS	3	
Round Bar:		Ø7.925 - 99.44mm (0.312 - 3.915")
C22	2.4602	CUSTOMER SPECIFICATIONS
C276	2.4819	CUSTOMER SPECIFICATIONS
400	2.4360	CUSTOMER SPECIFICATIONS
K500	2.4375	CUSTOMER SPECIFICATIONS
625	2.4856	CUSTOMER SPECIFICATIONS
718	2.4668	CUSTOMER SPECIFICATIONS
725	2.7725	CUSTOMER SPECIFICATIONS
X750	2.4669	CUSTOMER SPECIFICATIONS
825	2.4858	CUSTOMER SPECIFICATIONS

Hexagonal Bar:		10 - 55mm (0.375 - 2.165")
C22	2.4602	CUSTOMER SPECIFICATIONS
C276	2.4819	CUSTOMER SPECIFICATIONS

Square Bar:		25.4 - 76.2mm (1 - 3")
C22	2.4602	CUSTOMER SPECIFICATIONS
C276	2.4819	CUSTOMER SPECIFICATIONS

Flat Bar:		31.75 x 25.4mm - 88.90 x 44.45mm (1.25 x 1" - 3.5 x 1.75")			
C22	2.4602	CUSTOMER SPECIFICATIONS			
C276	2.4819	CUSTOMER SPECIFICATIONS			

^{*} Other Nickel Alloy grades available upon request

Larger sizes may be available upon application.

Our cutting-edge technology, skilled workforce and advanced infrastructure allows us to efficiently cold draw large volumes of materials, ensuring seamless operations and enabling us to respond swiftly to customer demands.



Cold drawn bar manufacturing is a process used to produce steel bars with improved mechanical properties and dimensional accuracy.

The manufacturing process involves pulling (drawing) an oversized bar through a carbide die at room temperature (i.e. cold-drawn). This mechanical process results in a reduction in diameter and an improvement in the surface finish of the steel bar.

After cold drawing, the steel bar will go through a straightening process to ensure it meets specified dimensional tolerances. It is then cut into the desired lengths. The cold drawing process also imparts several benefits to the steel, including:

Increased Mechanical Properties:

Cold drawing can enhance the mechanical properties of the steel, such as strength and hardness, due to the strain hardening effect.

Improved Dimensional Accuracy:

Cold drawing ensures tight dimensional tolerances, producing steel bars with precise diameters.

Enhanced Surface Finish:

The process results in a smooth and clean surface, reducing the need for additional finishing processes.

Better Surface Integrity:

The cold drawing process improves the surface integrity of the steel, making it more suitable for applications where surface quality is critical.



OUR BAR DIMENSIONS

Cold drawn bars can be produced in various shapes and dimension depending on the intended use of the bar and the specific requirements of the application to meet the needs of various industries and applications:



Round Bars:

These are cylindrical bars with a circular cross-section with precise diameter tolerances.



Hexagonal Bars:

Hex bars have a hexagonal (six-sided) cross-section, with uniform sides and sharp corners.



Square Bars:

Bars with a square cross-section that are commonly used in applications where a more geometrically defined shape is required.



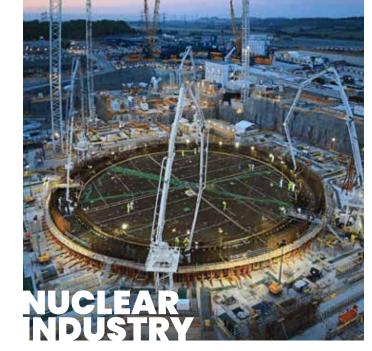
Flat Bars:

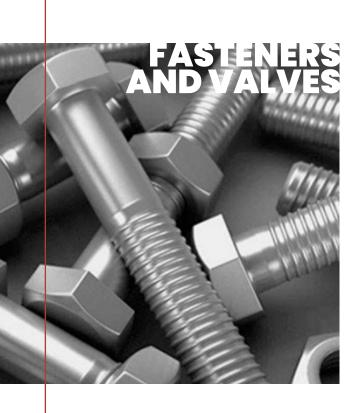
Producing flat bars with a rectangular cross-section, often used in valves, manifolds and engineering applications.

Offshore Stainless Supplies are the only UK company who can cold draw Stainless Steel, Super Duplex and Nickel Alloy bars above Ø2.5". In fact, we have the capability to draw from up to Ø4.0" due to the size and power of our draw benches.

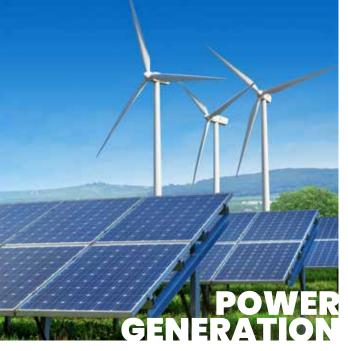
This is in addition to offering the UK's market-leading, largest profile sizes across square, hexagonal and flat bar sections.



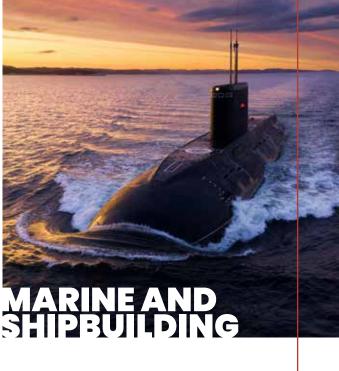


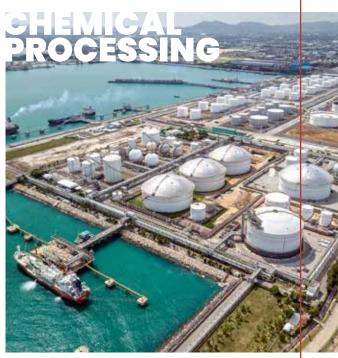






OUR MARKETS







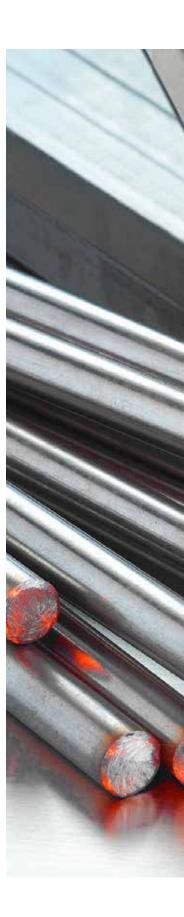




Stainless steel, including austenitic stainless steel, is popular for its strength, durability and corrosion resistance. It is aesthetically pleasing, easy to produce, clean and maintain. It is also environmentally friendly and environmentally sustainable with a high-recycled content and long service life, making it a top choice for many products including fasteners, manifolds and shafts.

However there is more than one kind. Stainless Steel is actually a broad term used to refer to iron-based alloys which contain chromium, and there are more than 100 grades of stainless steel. These are differentiated by the percentage of chromium, nickel, molybdenum and other alloying elements. Each grade is used for specific purposes and comes with its own advantages and disadvantages.

There are several types and grades of stainless steel, and the choice of grade depends on the intended use and specific requirements. The grades are grouped within 5 main categories: austenitic, ferritic, martensitic, duplex and precipitation-hardened (PH).





GRADES:		COLD DRAWN TO:
304 / 304L	1.4301 / 1.4307	A2-70 / A2-80 / A2-100
304 / 304L	1.4301 / 1.4307	ASTM A193/A320 B8 Class 2 Class 2B, BS 4882, B8X
316 / 316L	1.4401 / 1.4404	A4-70 / A4-80 / A4-100
316 / 316L	1.4401 / 1.4404	ASTM A193/A320 B8M Class 2, Class 2B, Class 2C, BS 4882, B8MX
316L	1.4404	NACE MR0175
316Ti	1.4571	A5-70 / A5-80
316L Mo>2.5%	1.4435	1.4435 Class 70 / Class 80
321	1.4541	ASTM A193/A320 B8T Class 2, BS 4882 , B8TX
UNS S31254	1.4547	ASTM A193/A320 B8MCuN Class 2 / 31254 Class 80
347	1.4550	ASTM A193/A320 B8C Class 2

304 - 1.4301 / 304L - 1.4307



304 - 1.4301/304L - 1.4307

304 and 304L are both grades of austenitic stainless steel, which is the most widely used type of stainless steel. These grades are very similar, known for their versatility and corrosion resistance, with the main difference being the carbon content. The use of 304L is often preferred in situations where welding is a significant consideration due to its improved weldability and reduced susceptibility to sensitivity.

KEY FEATURES

- Corrosion resistance
- Forming and welding characteristics
- Oxidation resistance

CHE	CHEMICAL PROPERTIES								
	Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Silicone (Si)	Nitrogen (N)	Carbon (C)	Phosphorus (P)	Sulphur (s)	
304	18-20%	8-11%	2%	1%	0.1%	0.08%	0.045%	0.03%	
304L	18-20%	8-11%	2%	1%	0.1%	0.035%	0.045%	0.03%	

MECHANICAL PROPERTIES 304 304L 500-700 500-700 Tensile strength (N/mm²) Yield strength (N/mm²) 170-220 170-220 Elongation (% in 4D) 40 40 Hardness - Rockwell C (HRC) max 92 92 Hardness - Brinell (HB) max 201 201

PHYSICALP	ROPERTIES	
Density (kg/m³)		8000
Modulus of elasticity (Gp	oa)	193
M	0-100°C (μm/m/°C)	17.2
Mean coefficient of	0-350°C (µm/m/°C)	17.8
thermal expansion	0-538°C (µm/m/°C)	18.4
Thermal	at 100°C (W/m.K)	16.2
conductivity	at 500°C (W/m.K)	21.5
Specific Heat 0-100°C (J/	500	
Electrical resistivity (nΩ.r	720	
Melting point (°C)	1450	

MARKET SECTORS



Processing

Tanks, pipes, conveyor systems



Chemical Processing

Storage tanks, vessels for chemicals, piping systems



Handrails, architectural trim, structural components



Kitchen Equipment

Countertops, sinks, ovens refrigerators, dishwashers



Pharmaceutical industry

Surgical instruments, processing equipment and storage



Engineered Components

Fasteners, bolts, valves, fittings

A2-70/A2-80/A2-100

A2-70 / A2-80 / A2-100

A2-70/80/100 are designated specifications for stainless steel fasteners. The A2 indicates that they are 304 austenitic stainless steel that have been cold drawn to provide a minimum tensile strength of 700 N/mm², 800 N/mm², or 1,000 N/mm², with good corrosion resistance in various environments.

KEY FEATURES

- Good corrosion resistance
- Good mechanical properties
- High strength

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")



CHI	CHEMICAL PROPERTIES								
	Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Silicone (Si)	Nitrogen (N)	Carbon (C)	Phosphorus (P)	Sulphur (s)	
304	18-20%	8-11%	2%	1%	0.1%	0.08%	0.045%	0.03%	
304L	18-20%	8-11%	2%	1%	0.1%	0.035%	0.045%	0.03%	

APPLICATIONS

- Fasteners, bolts, screws and nuts (GENERAL ENGINEERING)
- Structural elements (CONSTRUCTION)
- Fasteners, shafts and axles (AUTOMOTIVE)
- Vessels and oil well filter screens
 (MARINE EQUIPMENT)
- Valve stems and bodies, manifolds (OIL AND GAS INDUSTRY)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

MECHANICAL PROPERTIES							
	A2-70	A2-80	A2-100				
Tensile strength (N/mm²) min	700	800	1000				
Yield strength (N/mm²) min	500	600	800				
Elongation (% in 5D)	-	_	-				
Hardness - Rockwell C (HRC) max	-	_	-				
Hardness - Brinell (HB) max	-	_	-				
Reduction of area (min %)	-	_	-				

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304 – 1.4301 / 304L – 1.4307



304 - 1.4301 / 304L - 1.4307

304 and 304L are both grades of austenitic stainless steel, which is the most widely used type of stainless steel. These grades are very similar, known for their versatility and corrosion resistance, with the main difference being the carbon content. The use of 304L is often preferred in situations where welding is a significant consideration due to its improved weldability and reduced susceptibility to sensitivity.

KEY FEATURES

- Corrosion resistance
- Forming and welding characteristics
- Oxidation resistance

CHEMICAL PROPERTIES								
	Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Silicone (Si)	Nitrogen (N)	Carbon (C)	Phosphorus (P)	Sulphur (S)
304	18-20%	8-11%	2%	1%	0.1%	0.08%	0.045%	0.03%
304L	18-20%	8-11%	2%	1%	0.1%	0.035%	0.045%	0.03%

MECHANICAL PROPERTIES 304 304L 500-700 500-700 Tensile strength (N/mm²) 170-220 Yield strength (N/mm²) 170-220 Elongation (% in 4D) 40 Hardness - Rockwell C (HRC) max 92 92 201 Hardness - Brinell (HB) max 201

PHYSICALP	ROPERTIES	
Density (kg/m³)		8000
Modulus of elasticity (Gp	oa)	193
M	0-100°C (µm/m/°C)	17.2
Mean coefficient of	0-350°C (µm/m/°C)	17.8
thermal expansion	0-538°C (µm/m/°C)	18.4
Thermal	at 100°C (W/m.K)	16.2
conductivity	at 500°C (W/m.K)	21.5
Specific Heat 0-100°C (J/	500	
Electrical resistivity (nΩ.r	720	
Melting point (°C)	1450	

MARKET SECTORS



Food Processing

Tanks, pipes, conveyor systems



Chemical Processing

Storage tanks, vessels for chemicals, piping systems



Handrails, architectural trim, structural components



Kitchen Equipment

Countertops, sinks, ovens refrigerators, dishwashers



Pharmaceutical industry

Surgical instruments, processing equipment and storage



Engineered Components

Fasteners, bolts, valves, fittings

ASTM A193/A320 B8 Class 2/2B, BS 4882, B8X

ASTM A193/A320 B8 CLASS 2/2B, B8X

ASTM A193 and ASTM A320 are specifications that cover alloy and stainless steel bolting materials for high temperature or high pressure service. ASTM A193 B8 refers to a specification for stainless steel bolting materials and ASTM A320 B8 refers to a similar specification often used in low-temperature service. Class 2 and class 2B signifies that the material is strain-hardened.

KEY FEATURES

- Good corrosion resistance
- Good versatility and durability
- Cold workability
- High strength

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")



CHI	CHEMICAL PROPERTIES								
	Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Silicone (Si)	Nitrogen (N)	Carbon (C)	Phosphorus (P)	Sulphur (s)	
304	18-20%	8-11%	2%	1%	0.1%	0.08%	0.045%	0.03%	
304L	18-20%	8-11%	2%	1%	0.1%	0.035%	0.045%	0.03%	

^{*} B8X: Cr 10-19%, Ni 9-12%

APPLICATIONS

- Fasteners, bolts, screws and nuts (GENERAL ENGINEERING)
- Components used in boilers and turbines (POWER GENERATION)
- Wellheads, Christmas trees and platforms (OIL AND GAS INDUSTRY)
- Pipelines, valves and fittings (PETROCHEMICAL INDUSTRY)
- Heat exchangers (CHEMICAL PROCESSING)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

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	Class 2	Class 2B	B8X
Tensile strength (N/mm²)	860-690	655-550	860-650
Yield strength (N/mm²)	690-345	515-380	695-310
Elongation (% in 4D)	12-28	25-30	12-28
Hardness - Rockwell C (HRC) max	35	35	32
Hardness - Brinell (HB) max	321	321	320
Reduction of area (min %)	35-45	40	-

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316 - 1.4401 / 316L - 1.4404



316 - 1.4401 / 316L - 1.4404

Stainless steel 316 is one of the most widely used and versatile stainless steels, prized for its corrosion resistance and suitability for a broad range of applications. The 316L low carbon content helps reduce the susceptibility to sensitisation during welding, making 316L suitable for applications where post-welding annealing is not practical.

KEY FEATURES

- Excellent corrosion resistance
- · Strength and mechanical properties
- Heat resistance
- General weldability

СН	EMICAL	PROP	ERTIES						
	Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Molybdenum (Mo)	Silicone (Si)	Nitrogen (N)	Carbon (C)	Phosphorus (P)	Sulphur (s)
316	16-18%	10-12%	2%	2-3%	0.75%	0.1%	0.08%	0.045%	0.03%
316L	16-18%	10-12%	2%	2%	0.75%	0.1%	0.03%	0.045%	0.03%

MECHANICAL PROPERTIES 316 316L 500-700 500-700 Tensile strength (N/mm²) Yield strength (N/mm²) 170-220 170-220 Elongation (% in 4D) 40 40 Hardness - Rockwell C (HRC) max 92 92 Hardness - Brinell (HB) max 217 217

PHYSICALP	ROPERTIES	
Density (kg/m³)		8000
Modulus of elasticity (Gp	oa)	193
Mean coefficient of	0-100°C (µm/m/°C)	15.9
	0-350°C (µm/m/°C)	16.2
thermal expansion	0-538°C (µm/m/°C)	17.5
Thermal	at 100°C (W/m.K)	16.3
conductivity	at 500°C (W/m.K)	21.5
Specific Heat 0-100°C (J/	kg.K)	500
Electrical resistivity (nΩ.r	n)	740
Melting point (°C)	1450	

MARKET SECTORS



Boat fittings, hardware, coastal structures



Chemical Processing

Reactors, storage tanks, piping systems, heat exchangers



Medical Devices

Surgical instruments, implants, dental instruments



Food & Beverage Industry

Conveyors, mixers, brewing and distillation equipment



Pharmaceutical Industry

Vessels, reactors, piping systems, processing equipment



Aerospace Industry

Aircraft structural components, engine parts, hardware

A4-70/A4-80/A4-100

A4-70/A4-80/A4-100

A4 grade stainless steels have a slightly higher nickel and molybdenum content than A2 stainless steel. The A4 indicates that it is an austenitic stainless steel, and the following number represents the nominal tensile strength in megapascals (N/mm²) for these materials. They are used for applications that require high strength, precision and durability

KEY FEATURES

- Excellent corrosion resistance
- Increased malleability
- Excellent formability
- Good weldability and durability

BAR SHAPES

ROUND BAR:

Ø7.925 - 99.44mm (0.312 - 3.915")





CHI	EMICAL	PROP	ERTIES						
	Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Molybdenum (Mo)	Silicone (Si)	Nitrogen (N)	Carbon (C)	Phosphorus (P)	Sulphur (S)
316	16-18%	10-12%	2%	2-3%	0.75%	0.1%	0.08%	0.045%	0.03%
316L	16-18%	10-12%	2%	2%	0.75%	0.1%	0.03%	0.045%	0.03%

APPLICATIONS

- Fasteners, bolts, screws and nuts (GENERAL ENGINEERING)
- Structural elements (CONSTRUCTION)
- Tankers and containers
 (CHEMICAL PROCESSING EQUIPMENT)
- Boat fittings, rigging, components (MARINE EQUIPMENT)
- Food processing equipment (FOOD AND BEVERAGE INDUSTRY)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

MECHANICAL PROPERTIES									
	A4-70	A4-80	A4-100						
Tensile strength (N/mm²) min	700	800	1000						
Yield strength (N/mm²) min	500	600	800						
Elongation (% in 5D)	-	-	-						
Hardness - Rockwell C (HRC) max	-	-	-						
Hardness - Brinell (HB) max	_	-	-						
Reduction of area (min %)	_	-	-						

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316 - 1.4401 / 316L - 1.4404



316 - 1.4401/316L - 1.4404

Stainless steel 316 is one of the most widely used and versatile stainless steels, prized for its corrosion resistance and suitability for a broad range of applications. The 316L low carbon content helps reduce the susceptibility to sensitisation during welding, making 316L suitable for applications where post-welding annealing is not practical.

KEY FEATURES

- Excellent corrosion resistance
- · Strength and mechanical properties
- Heat resistance
- General weldability

СН	EMICAL	PROP	ERTIES						
	Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Molybdenum (Mo)	Silicone (Si)	Nitrogen (N)	Carbon (C)	Phosphorus (P)	Sulphur (s)
316	16-18%	10-12%	2%	2-3%	0.75%	0.1%	0.08%	0.045%	0.03%
316L	16-18%	10-12%	2%	2%	0.75%	0.1%	0.03%	0.045%	0.03%

MECHANICAL PROPERTIES 316 316L 500-700 500-700 Tensile strength (N/mm²) Yield strength (N/mm²) 170-220 170-220 Elongation (% in 4D) 40 40 Hardness - Rockwell C (HRC) max 92 92 Hardness - Brinell (HB) max 217 217

PHYSICALP	ROPERTIES	
Density (kg/m³)		8000
Modulus of elasticity (Gp	oa)	193
Marine	0-100°C (µm/m/°C)	15.9
Mean coefficient of	0-350°C (µm/m/°C)	16.2
thermal expansion	0-538°C (µm/m/°C)	17.5
Thermal	at 100°C (W/m.K)	16.3
conductivity	at 500°C (W/m.K)	21.5
Specific Heat 0-100°C (J/	kg.K)	500
Electrical resistivity (nΩ.r	n)	740
Melting point (°C)		1450

MARKET SECTORS



Boat fittings, hardware, coastal structures



Chemical Processing

Reactors, storage tanks, piping systems, heat exchangers



Medical Devices

Surgical instruments, implants, dental instruments



Food & Beverage Industry

Conveyors, mixers, brewing and distillation equipment



Pharmaceutical Industry

Vessels, reactors, piping systems, processing equipment



Aerospace Industry

Aircraft structural components, engine parts, hardware

ASTM A193/A320 B8M Class 2/2B/2C, BS 4882, B8MX

ASTM A193/A320 B8M CLASS 2/2B/2C, B8MX

B8M class 2, 2B and 2C are different classifications based on specific requirements and treatments. Class 2 refers to the basic strain-hardened and cold-worked condition. The 2B designation indicates that it has undergone strain hardening in addition to the carbide solution treatment. B8M Class 2C offers even higher tensile strength compared to the other two classes. B8MX is a designation specified in the BS 4882 standard for stainless steel fasteners.

KEY FEATURES

- Corrosion resistance
- Improved strength
- Wide temperature range suitability
- Reduced sensitisation

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")



CHI	EMICAL	PROP	ERTIES						
	Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Molybdenum (Mo)	Silicone (Si)	Nitrogen (N)	Carbon (C)	Phosphorus (P)	Sulphur (S)
316	16-18%	10-12%	2%	2-3%	0.75%	0.1%	0.08%	0.045%	0.03%
316L	16-18%	10-12%	2%	2%	0.75%	0.1%	0.03%	0.045%	0.03%

^{*} B8MX: Cr 16.5-18.5%, Ni 10.5-13.5%

APPLICATIONS

- Pipelines, valves and connectors (OIL AND GAS INDUSTRY)
- Fasteners, bolts, screws and nuts (GENERAL ENGINEERING)
- Pumps, valves and machinery (PULP AND PAPER INDUSTRY)
- Bolting components (POWER GENERATION)
- Pumps, valves and pipelinesent (CHEMICAL PROCESSING)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

M	ECH	ANI	CAL	PRC) P E	RTI	ES

	Class 2	Class 2B	Class 2C
Tensile strength (N/mm²)	760-620	655-550	585
Yield strength (N/mm²)	655-345	515-380	450-415
Elongation (% in 4D)	15-30	25-30	30
Hardness - Rockwell C (HRC) max	35	35	35
Hardness - Brinell (HB) max	321	321	321
Reduction of area (min %)	45	40	60

^{*} Dependent upon size

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316L - 1.4404



316L - 1.4404

316L stainless steel is a popular type of stainless steel alloy known for its corrosion resistance properties, making it suitable for various applications. It exhibits excellent corrosion resistance, particularly in chloride environments and contains molybdenum, which enhances its resistance to pitting and crevice corrosion.

KEY FEATURES

- Excellent corrosion resistance
- · Strength and mechanical properties
- Heat resistance
- General weldability

CHEMICAL PROPERTIES								
Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Molybdenum (Mo)	Silicone (Si)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (S)
16-18%	10-12%	2%	2%	0.75%	0.1%	0.045%	0.03%	0.03%

MECHANICAL PROPERTI	ES
Tensile strength (N/mm²)	500-700
Yield strength (N/mm²)	170-220
Elongation (% in 4D)	40
Hardness - Rockwell C (HRC) max	95
Hardness - Brinell (HB) max	217

PHYSICALP	ROPERTIES	
Density (kg/m³)		8000
Modulus of elasticity (Gp	oa)	193
M	0-100°C (µm/m/°C)	15.9
Mean coefficient of	0-350°C (µm/m/°C)	16.2
thermal expansion	0-538°C (µm/m/°C)	17.5
Thermal	at 100°C (W/m.K)	16.3
conductivity	at 500°C (W/m.K)	21.5
Specific Heat 0-100°C (J/	500	
Electrical resistivity (nΩ.r	740	
Melting point (°C)		1450

MARKET SECTORS



Boat fittings, hardware, coastal structures



Chemical Processing

Reactors, storage tanks, piping systems, heat exchangers



Medical Devices

Surgical instruments, implants, dental instruments



Food & Beverage Industry

Conveyors, mixers, brewing and distillation equipment



Pharmaceutical Industry

Vessels, reactors, piping systems, processing equipment



Aerospace Industry

Aircraft structural components, engine parts, hardware

316L Conforming to NACE MR0175

316L NACE MR0175

NACE MR0175, also known as ISO 15156, are materials standard issued by the National Association of Corrosion Engineers (NACE). Cold drawn flats and squares conform to NACE MR0175 which was a standard that originated in the US. It assesses the suitability of materials for oilfield equipment in environments where sulfide stress corrosion cracking may occur due to exposure to hydrogen sulfide - commonly referred to as sour environments.

KEY FEATURES

- Sulfide stress cracking (SSC) resistance
- Stress corrosion cracking (SCC) resistance
- Excellent formability
- · Good weldability and durability

BAR SHAPES

SQUARE BAR: 25.4 – 76.2mm (1 – 3")

FLAT BAR: 31.75 x 25.4mm -88.90 x 44.45mm (1.25 x 1 - 3.5 x 1.75")



CHEMI	CAL PR	ROPERTI	ES					
Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Molybdenum (Mo)	Silicone (Si)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (s)
16-18%	10-12%	2%	2%	0.75%	0.1%	0.045%	0.03%	0.03%

APPLICATIONS

- Gaskets, pipelines, tubing, gas systemss (OIL AND GAS INDUSTRY)
- Valve bodies, manifolds (VALVE COMPONENTS)
- Chemical processing equipment (PETROCHEMICAL INDUSTRY)
- Drilling, completion equipment (MARINE COMPONENTS)
- Pumps, valves and pipelines (CHEMICAL PROCESSING)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

MECHANICAL PROPERTIES	
Tensile strength (N/mm²) min	620
Yield strength (N/mm²) min	480
Elongation (% in 4D) min	30
Hardness - Rockwell C (HRC) max	22
Hardness - Brinell (HB) max	235
Reduction of area (min %)	-

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316 Ti - 1.4571



316 TI - 1.4571

Stainless steel 316Ti, also known as 1.457l, is a titanium-stabilised austenitic stainless steel. The "316" designation indicates that it belongs to the 300 series of stainless steels, which are characterised by their austenitic crystalline structure. The addition of titanium (Ti) provides stabilisation against sensitisation and intergranular corrosion, making it suitable for elevated temperature applications.

KEY FEATURES

- Excellent corrosion resistance
- Stability in high temperatures
- Good weldability
- Formability and fabrication
- Good mechanical properties

CHEMICAL PROPERTIES									
Chromium	Nickel	Molybdenum	Manganese	Silicone	Titanium	Nitrogen	Carbon	Phosphorus	Sulphur
(Cr)	(Ni)	(Mo)	(Mn)	(si)	(Ti)	(N)	(c)	(P)	(s)
16.5-18.5%	10.5-13.5%	2-2.5%	2%	1%	0.2-0.7%	0.1%	0.08%	0.045%	0.03%

MECHANICAL PROPERTIES						
Tensile strength (N/mm²)	600					
Yield strength (N/mm²)	450					
Elongation (% in 4D)	40					
Hardness - Rockwell C (HRC) max	94					
Hardness - Brinell (HB) max	215					

PHYSICAL PROPERTIES								
Density (kg/m³)		8000						
Modulus of elasticity (Gp	oa)	193						
	0-100°C (µm/m/°C)	15.9						
Mean coefficient of	0-350°C (µm/m/°C)	16.2						
thermal expansion	0-538°C (µm/m/°C)	17.5						
Thermal	at 100°C (W/m.K)	16.3						
conductivity	at 500°C (W/m.K)	21.5						
Specific Heat 0-100°C (J/	500							
Electrical resistivity (nΩ.r	740							
Melting point (°C)	1450							





Pharmaceutical Equipment



Chemical Processing

Processing equipment, mixing, storage

Reactors, vessels, piping systems

HVAC systems, chemical processing, power generation





Heat Exchangers

Platforms, pipelines, tubing, valves

Automotive

Industry

· · ·

• Food Processing

Exhaust systems, component parts

Tanks, conveyors, mixers, processing machinery

A5-70/A5-80

A5-70/A5-80

A5 Class 70 and class 80 are property classes achieved by cold drawing the steel bars which, in the context of fasteners, improves the surface finish, dimensional accuracy and mechanical properties of the bars. The higher the class number, the higher the tensile strength of the fastener material.

KEY FEATURES

- Elevated temperature use
- Improved versatility
- Flexibility in fabrication
- Reduced sensitisation risk
- · High tensile strength

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")



CHEMICAL PROPERTIES									
Chromium	Nickel	Molybdenum	Manganese	Silicone	Titanium	Nitrogen	Carbon	Phosphorus	Sulphur
(Cr)	(Ni)	(Mo)	(Mn)	(si)	(Ti)	(N)	(c)	(P)	(s)
16.5-18.5%	10.5-13.5%	2-2.5%	2%	1%	0.2-0.7%	0.1%	0.08%	0.045%	0.03%

APPLICATIONS

- Pipelines, valves and connectors (OIL AND GAS INDUSTRY)
- Fasteners, bolts, screws and nuts (GENERAL ENGINEERING)
- Pumps, valves and machinery (PULP AND PAPER INDUSTRY)
- Bolting components
 (POWER GENERATION)
- Pumps, valves and pipelines (CHEMICAL PROCESSING)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

MECHANICAL PROPERTIES								
	A5-70	A5-80						
Tensile strength (N/mm²) min	700	800						
Yield strength (N/mm²) min	500	600						
Elongation (% in 5D)	-	-						
Hardness - Rockwell C (HRC) max	-	-						
Hardness - Brinell (HB) max	-	-						
Reduction of area (min %)	-	-						

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316L Mo > 2.5% - 1.4435



316L MO>2.5% - 1.4435

Stainless Steel 316L Mo>2.5% - 1.4435 is a type of austenitic stainless steel that has a low carbon content and a high molybdenum content. It is also known as 316L UG or 316L modified. The elevated molybdenum content (greater than 2.5%) in 1.4435 provides enhanced corrosion resistance, especially in aggressive environments containing chlorides.

KEY FEATURES

- Excellent corrosion resistance
- Improved resistance to acids
- Chloride resistance
- Generally weldable
- Formability and fabrication

CHEMI	CAL PR	OPERTIE	S					
Chromium	Nickel	Molybdenum	Manganese	Silicone	Nitrogen	Phosphorus	Carbon	Sulphur
(Cr)	(Ni)	(Mo)	(Mn)	(Si)	(N)	(P)	(c)	(s)
17-19%	12.5-15%	2.5-3%	2%	1%	0.1%	0.045%	0.03%	0.02%

MECHANICAL PROPERTIES						
Tensile strength (N/mm²)	600					
Yield strength (N/mm²)	450					
Elongation (% in 4D)	40					
Hardness - Rockwell C (HRC) max	94					
Hardness - Brinell (HB) max	215					

PHYSICAL PROPERTIES								
Density (kg/m³)		8000						
Modulus of elasticity (Gp	oa)	193						
	0-100°C (μm/m/°C)	17.2						
Mean coefficient of	0-350°C (µm/m/°C)	17.8						
thermal expansion	0-538°C (µm/m/°C)	18.4						
Thermal	at 100°C (W/m.K)	15						
conductivity	at 500°C (W/m.K)	20.8						
Specific Heat 0-100°C (J/	500							
Electrical resistivity (nΩ.r	750							
Melting point (°C)	1450							

MARKET SECTORS



Marine Equipment

Boat fittings, hardware



Chemical Processing

Processing equipment, reactors, vessels, piping



Platforms, piping, tubing



Food & Beverage Industry

Brewing and distillation, dairy processing



Pharmaceutical Industry

Equipment, storage, transportation vessels



Architectural
Applications

Structural components, building facades, handrails, cladding

1.4435 Class 70 & 80

1.4435 CLASS 70 & 80

The cold working process increases the strength of the material while maintaining its corrosion resistance. 1.4435 stainless cold drawn to class 70 and class 80 has excellent corrosion resistance, especially in acidic and chloride–containing environments. The process also ensures consistency in dimensions and straightness, making them suitable for applications with specific size requirements.

KEY FEATURES

- Additional corrosion resistance
- Enhanced resistance to pitting and crevice corrosion
- Elevated temperature performance
- Extended service life

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")



СНЕМІ	CAL PR	OPERTIE	S					
Chromium (Cr)	Nickel (Ni)	Molybdenum	Manganese	Silicone (Si)	Nitrogen	Phosphorus	Carbon (C)	Sulphur
17-19%	(Ni) 12.5-15%	(Mo) 2.5-3%	(Mn) 2%	1%	(N) 0.1%	0.045%	0.03%	(s) 0.02%

APPLICATIONS

- Flanges, valves and fittings (HIGH PRESSURE PIPING SYSTEMS)
- Shipbuilding and offshore structures (MARINE EQUIPMENT)
- Exhaust systems, suspension parts (AUTOMOTIVE INDUSTRY)
- Food processing machinery (FOOD & BEVERAGE INDUSTRY)
- Reactors, tanks and pipelines (CHEMICAL PROCESSING)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

ECH	ANI	CA	L Pr	ROP	ERT	E5

	Class 70	Class 80
Tensile strength (N/mm²) min	700	800
Yield strength (N/mm²) min	500	600
Elongation (% in 5D)	-	-
Hardness - Rockwell C (HRC) max	-	-
Hardness - Brinell (HB) max	-	-
Reduction of area (min %)	_	-

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321 - 1.4541



321 - 1.4541

Stainless steel 321, with the designation 1.4541, is a type of austenitic stainless steel that has a high resistance to carbide precipitation and oxidation when exposed to high temperatures. It is stabilised with titanium and has a titanium content of at least five times the carbon content, which prevents intergranular corrosion.

KEY FEATURES

- High temperature resistance
- Good corrosion resistance
- Weldability
- Creep and stress rupture properties
- Good formability and ductility

СНЕМІ	CHEMICAL PROPERTIES								
Chromium	Nickel	Manganese	Silicone	Titanium	Nitrogen	Carbon	Phosphorus	Sulphur	
(Cr)	(Ni)	(Mn)	(Si)	(Ti)	(N)	(c)	(P)	(s)	
17-19%	9-12%	2%	1%	0.7%	0.1%	0.08%	0.045%	0.03%	

MECHANICAL PROPERTIES				
Tensile strength (N/mm²)	515			
Yield strength (N/mm²)	205			
Elongation (% in 4D)	40			
Hardness - Rockwell C (HRC) max	95			
Hardness - Brinell (HB) max	217			

PHYSICAL PROPERTIES					
Density (kg/m³)		7900			
Modulus of elasticity (Gp	oa)	193			
Mean coefficient of	0-100°C (µm/m/°C)	16.6			
	0-350°C (µm/m/°C)	17.2			
thermal expansion	0-538°C (µm/m/°C)	18.6			
Thermal	at 100°C (W/m.K)	16.1			
conductivity	at 500°C (W/m.K)	22.2			
Specific Heat 0-100°C (J/	500				
Electrical resistivity (nΩ.r	720				
Melting point (°C)	1450				

MARKET SECTORS



Food Industry

Equipment, industrial kitchens



Chemical Processing

Reactors, vessels, piping, heat exchangers



Components, pipelines, tubing



Power Generation

Boiler tubes, heat exchangers



Exhaust systems, catalytic convertors



Aerospace Applications

Aircraft exhaust stacks, components

ASTM A193/A320 B8T Class 2, BS 4882, B8TX

ASTM A193/A320 B8T CLASS 2, B8TX

ASTM A193/A320 B8T class 2 is a type of stainless steel fastener with corrosion resistance, titanium stabilisation and a specific heat treatment for high tensile strength, high temperature resistance and good corrosion resistance. A193 fasteners are intended for high temperature and high pressure applications, while A320 fasteners are for cold temperature applications.

KEY FEATURES

- High tensile strength
- High temperature performance
- Low temperature service
- Improved versatility
- Enhanced corrosion resistance

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")



CHEMICAL PROPERTIES								
Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Silicone (Si)	Titanium (Ti)	Nitrogen (N)	Carbon (C)	Phosphorus (p)	Sulphur
17-19%	9-12%	2%	1%	0.7%	0.1%	0.08%	0.045%	(s) 0.03%

^{*} B8T Class 2: C + N x 5 = Ti min, B8TX : C x 5 = Ti min

APPLICATIONS

- Fasteners, fixings, nuts and bolts (PETROCHEMICAL INDUSTRY)
- Bolting exhaust systems (AUTOMOTIVE INDUSTRY)
- Pressure piping, vessels bolting (POWER GENERATION)
- Annealing equipment, heating elements (CHEMICAL PROCESSING)
- Instruments and construction parts (FOOD & BEVERAGE INDUSTRY)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

MEGHANIGALI KOLL		
	Class 2	В
Tensile strength (N/mm²)	860-690	860
ve 1 1 1 1 (v.) a)	200 045	

MECHANICAI DDODEDTIES

Tensile strength (N/mm²)	860-690	860-650
Yield strength (N/mm²)	690-345	695-310
Elongation (%)	12-28 (4D)	12-28 (5D)
Hardness - Rockwell C (HRC) max	35	32
Hardness - Brinell (HB) max	321	320
Reduction of area (min %)	35-45	-

^{*} Dependent upon size

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UNS S31254 - 1.4547



UNS S31254 - 1.4547

UNS S31254, also known as 1.4547 or by its trade names F44 or 254 SMO. It is a high-alloy austenitic stainless steel with excellent corrosion resistance in seawater and various industrial environments, as well as high strength and ductility. It is used for applications such as pumps, valves, chokes, piping, flanges, and chemical processing equipment.

KEY FEATURES

- High corrosion resistance
- High alloy content
- Resistance to reducing acids
- Good mechanical properties
- Good weldability

CHEMICAL PROPERTIES									
Chromium (Cr)	Nickel (Ni)	Molybdenum (Mo)	Manganese (Mn)	Copper (Cu)	Silicone (Si)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (s)
19.5-20.5%	17.5-18.5%	6-6.5%	1%	0.5-1%	0.8%	0.18-0.22%	0.03%	0.02%	0.01%

MECHANICAL PROPERTIES					
Tensile strength (N/mm²)	700				
Yield strength (N/mm²)	300				
Elongation (% in 4D)	35				
Hardness - Rockwell C (HRC) max	100				
Hardness - Brinell (HB) max	250				

PHYSICAL PROPERTIES					
Density (kg/m³)		7900			
Modulus of elasticity (Gp	oa)	195			
Mean coefficient of	0-100°C (µm/m/°C)	16.5			
	0-350°C (µm/m/°C)	17.1			
thermal expansion	0-538°C (µm/m/°C)	18.5			
Thermal	at 100°C (W/m.K)	14.0			
conductivity	at 500°C (W/m.K)	19.3			
Specific Heat 0-100°C (J/	500				
Electrical resistivity (nΩ.r	800				
Melting point (°C)	1450				

MARKET SECTORS



Boat fittings, hardware, seawater handling



Chemical Processing

Reactors, piping systems, heat exchangers



Platforms, pipelines, tubing, valves, fittings



Power Generation

Heat exchangers, boiler tubes, condensers



Digesters, bleach plants, evaporators



Desalination Plants

Evaporators, heat exchangers, components, pumps

ASTM A193/A320 B8MCuN Class 2/31254 Class 80

ASTM A193/A320 B8MCUN CLASS 2/31254

ASTM A193/A320 B8MCuN Class 2 / 31254 Class 80 are types of stainless steel fasteners that are made from UNS S31254 6MO / 1.4547 / F44 stainless steel. They have high strength, high temperature resistance, and excellent corrosion resistance in seawater and various industrial environments.

KEY FEATURES

- High temperature performance
- Excellent corrosion resistance
- Resistant to pitting and crevice corrosion
- Resistant to stress corrosion cracking

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")



CHEMICAL PROPERTIES									
Chromium (Cr)	Nickel (Ni)	Molybdenum (Mo)	Manganese (Mn)	Copper (Cu)	Silicone (Si)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (s)
19.5-20.5%	17.5-18.5%	6-6.5%	1%	0.5-1%	0.8%	0.18-0.22%	0.03%	0.02%	0.01%

APPLICATIONS

- Pressure piping, vessel bolts, flanges (CHEMICAL PROCESSING)
- Threaded fasteners, countersunk screws (GENERAL ENGINEERING)
- Steam turbines, boilers and condensors (POWER GENERATION)
- Offshore platforms and pipelines (OIL AND GAS INDUSTRY)
- Pumps, piping and heat exchangers (DESALINGATION PLANTS)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

M	ECH	ANI	CAL	PRC) P E	RTIES

	Class 2	Class 80
Tensile strength (N/mm²)	760-620	800
Yield strength (N/mm²)	655-345	600
Elongation (% in 4D)	15-30	-
Hardness - Rockwell C (HRC) max	35	35
Hardness - Brinell (HB) max	321	321
Reduction of area (min %)	45	45

^{*} Dependent upon size

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347 - 1.4550



347 - 1.4550

Stainless steel 1.4550, is an austenitic stainless steel alloy that contains niobium (columbium) for stabilisation against intergranular corrosion and oxidation when exposed to high temperatures. It has similar properties and applications as 304 stainless steel, but with better performance at elevated temperatures, and a titanium content of at least five times the carbon content which prevents carbide precipitation.

KEY FEATURES

- High temperature performance
- Oxidation resistance
- Excellent corrosion resistance
- Good weldability
- · Good formability and ductility

CHEMIC	AL PROI	PERTIES					
Chromium	Nickel	Manganese	Niobium	Silicone	Carbon	Phosphorus	Sulphur
(Cr)	(Ni)	(Mn)	(Nb)	(Si)	(c)	(P)	(s)
17-19%	9-12%	2%	1.10%	1%	0.08%	0.045%	0.03%

MECHANICAL PROPERTIES			
Tensile strength (N/mm²)	515		
Yield strength (N/mm²)	205		
Elongation (% in 4D)	40		
Hardness - Rockwell C (HRC) max	92		
Hardness - Brinell (HB) max	201		

PHYSICAL PROPERTIES						
Density (kg/m³)		7900				
Modulus of elasticity (Gp	oa)	193				
Many acofficient of	0-100°C (µm/m/°C)	16.6				
Mean coefficient of	0-350°C (µm/m/°C)	17.2				
thermal expansion	0-538°C (µm/m/°C)	18.6				
Thermal	at 100°C (W/m.K)	16.1				
conductivity	22.2					
Specific Heat 0-100°C (J/	500					
Electrical resistivity (nΩ.r	720					
Melting point (°C)	1450					

MARKET SECTORS



Exhaust systems, catalytic convertors



Chemical Processing

Heat exchangers, condensers, reactors



Components, pipelines, tubing, wellhead components



Food Processing

Tanks, conveyors, mixers, machinery



Turbine exhausts systems, boiler tubes, steam piping



Aerospace Applications

Exhaust systems, turbine components

ASTM A193/A320 B8C Class 2

ASTM A193/A320 B8C CLASS 2

Cold drawn bars of ASTM A193/A320 B8C class 2 are made from 347 stainless steel with niobium stabilisation, which gives them high tensile strength, high temperature resistance, and good corrosion resistance. They are designed for use in special-purpose applications such as pressure piping and pressure vessels bolting.

KEY FEATURES

- High tensile strength
- Creep and stress rupture resistance
- High temperature performance
- Enhanced corrosion resistance
- Reduction of area

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")



CHEMIC	CAL PRO	PERTIES					
Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Niobium (Nb)	Silicone (Si)	Carbon (C)	Phosphorus (P)	Sulphur (s)
17-19%	9-12%	2%	1.10%	1%	0.08%	0.045%	0.03%

^{*} Niobium + Tantalum = C x 10min to 1.10% max

APPLICATIONS

- Pressure piping, vessel bolts, flanges (CHEMICAL PROCESSING)
- Threaded fasteners, bolts, countersunk screws (GENERAL ENGINEERING)
- Reactors, piping systems, distillation columns (PETROLCHEMICAL INDUSTRY)
- Exhaust systems, engine components (AUTOMOTIVE AND AEROSPACE)
- Boiler bolting components, steam turbines (POWER GENERATION)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

MECHANICAL PROPERTIES			
Tensile strength (N/mm²)	862-689		
Yield strength (N/mm²)	690-345		
Elongation (% in 4D)	12-28		
Hardness - Rockwell C (HRC) max	35		
Hardness - Brinell (HB) max	321		
Reduction of area (min %)	35-45		

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SUPER DUPLEX

Super duplex stainless steels are characterised by a two-phase microstructure consisting of both austenitic and ferritic phases, and it is the combination of these phases that provides enhanced mechanical and corrosion-resistant properties compared to traditional austenitic stainless steels.

All our super duplex materials are produced by Norsok M-650 Ed 4 and/or ISO 17782 qualified manufacturers. Super duplex UNS S32760 is among the most common super duplex grades in the market. It is a duplex especially designed for service in aggressive chloride-containing environments. It has very good resistance to localised corrosion and stress corrosion cracking in combination with high mechanical strength.

Common applications for cold drawn super duplex stainless steels include offshore oil and gas platforms, chemical processing plants, desalination facilities, and various marine and industrial applications where corrosion resistance, dimensional accuracy and high strength are critical.





SUPER DUPLEX

UNS 32760 - 1.4501



UNS 32760 - 1.4501

1.4501 is a specific grade of super duplex stainless steel with the common designation for this steel grade of UNS S32760, and it is also referred to as Alloy 2507. The 1.4501 (UNS S32760) super duplex stainless steel belongs to the family of duplex stainless steels, but it is specifically classified as a "super" duplex due to its higher alloy content and enhanced properties.

KEY FEATURES

- Excellent corrosion resistance
- High tensile and yield strength
- Good ductility and toughness
- High temperature resistance
- Pitting and crevice resistance

CHEN	MICAL	PROP	ERTIES	;						
Chromium (Cr)	Nickel (Ni)	Molybdenum (Mo)	Manganese (Mn)	Silicone (Si)	Tungsten (W)	Copper (Cu)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (s)
24-26%	6-8%	3-4%	1%	1%	1%	0.5-1%	0.25%	0.03%	0.03%	0.01%

MECHANICAL PROPERTIES				
Tensile strength (N/mm²)	750			
Yield strength (N/mm²)	550			
Elongation (% in 4D)	25			
Hardness - Rockwell C (HRC) max	105			
Hardness - Brinell (HB) max	270			

PHYSICALP	ROPERTIES	
Density (kg/m³)		7800
Modulus of elasticity (Gp	oa)	200
Many apoliticiont of	17.2	
Mean coefficient of	0-350°C (µm/m/°C)	17.8
thermal expansion	0-538°C (µm/m/°C)	18.4
Thermal	at 100°C (W/m.K)	14.2
conductivity	19.6	
Specific Heat 0-100°C (J/	kg.K)	500
Electrical resistivity (nΩ.r	800	
Melting point (°C)		1450

MARKET SECTORS



Pumps, valves, pipes, vessels, wellhead equipment



Desalination Components

ls, Sewage treatment, pumps, valves, piping systems



Marine Equipment

Propellers, shafts, pumps, bolts, fasteners, valves



Chemical Processing

Caustic evaporators, tankers, heat exchangers



Fans, pumps, valves, fasteners, condensers



Pulp & Paper Industry

Digester vessels, bleach towers, equipment

COLD DRAWN TO

UNS \$32760 NORSOK MDS D59/D59L Rev 3

UNS S32760 NORSOK MDS D59/D59L REV 3

This strain hardened grade is only available from qualified sources. The qualification process is verified by AKER to meet the strict requirements set by the NORSOK standard. Repeatability is the key, together with stringent mechanical testing of the finished cold drawn bars. Scan the QR code below to view our Qualification Test Record.

KEY FEATURES

- Enhances strength and hardness
- Excellent corrosion resistance
- High mechanical loads
- Elevated mechanical properties
- Wear resistance

BAR SHAPES

ROUND BAR: Ø11.38 - 86.74mm (0.448 - 3.415")



CHEMICAL PROPERTIES										
Chromium (Cr)	Nickel (Ni)	Molybdenum (Mo)	Manganese (Mn)	Silicone (Si)	Tungsten (W)	Copper (Cu)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (s)
24-26%	6-8%	3-4%	1%	1%	1%	0.5-1%	0.25%	0.03%	0.03%	0.01%

APPLICATIONS

Bolts and fasteners
 (OIL AND GAS INDUSTRY)





MECHANICAL PROPERTIES	
Tensile strength (N/mm²) min	860
Yield strength (N/mm²) min	725
Elongation (% in 4D)	16
Hardness - Rockwell C (HRC) max	35
Hardness - Brinell (HB) max	335
Reduction of area (min %)	30

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SUPER DUPLEX

UNS 32760 - 1.4501



UNS 32760 - 1.4501

1.4501 is a specific grade of super duplex stainless steel with the common designation for this steel grade of UNS S32760, and it is also referred to as Alloy 2507. The 1.4501 (UNS S32760) super duplex stainless steel belongs to the family of duplex stainless steels, but it is specifically classified as a "super" duplex due to its higher alloy content and enhanced properties.

KEY FEATURES

- Excellent corrosion resistance
- High tensile and yield strength
- Good ductility and toughness
- High temperature resistance
- Pitting and crevice resistance

CHEMICAL PROPERTIES										
Chromium	Nickel	Molybdenum	Manganese	Silicone	Tungsten	Copper	Nitrogen	Phosphorus	Carbon	Sulphur
(Cr)	(Ni)	(Mo)	(Mn)	(Si)	(w)	(Cu)	(N)	(P)	(c)	(s)
24-26%	6-8%	3-4%	1%	1%	1%	0.5-1%	0.25%	0.03%	0.03%	0.01%

MECHANICAL PROPERTIES								
Tensile strength (N/mm²)	750							
Yield strength (N/mm²)	550							
Elongation (% in 4D)	25							
Hardness - Rockwell C (HRC) max	105							
Hardness - Brinell (HB) max	270							

PHYSICAL PROPERTIES								
Density (kg/m³)		7800						
Modulus of elasticity (Gp	200							
M	0-100°C (µm/m/°C)	17.2						
Mean coefficient of	0-350°C (µm/m/°C)	17.8						
thermal expansion	0-538°C (µm/m/°C)	18.4						
Thermal	at 100°C (W/m.K)	14.2						
conductivity	at 500°C (W/m.K)	19.6						
Specific Heat 0-100°C (J/	500							
Electrical resistivity (nΩ.r	800							
Melting point (°C)	1450							

MARKET SECTORS



Pumps, valves, pipes, vessels, wellhead equipment



Desalination Components

Sewage treatment, pumps, valves, piping systems



Marine Equipment

Propellers, shafts, pumps, bolts, fasteners, valves



Chemical Processing

Caustic evaporators, tankers, heat exchangers



Fans, pumps, valves, fasteners, condensers



Pulp & Paper Industry

Digester vessels, bleach towers, equipment

COLD DRAWN TO

UNS 32760 - FG, FLT Condition S

UNS 32760 - FG, FLT CONDITION S

For UNS 32760 Super Duplex, also known as 1.4501 & F55, Condition S is the strain hardened condition. Material that is strain hardened to achieve increased mechanical properties will be further designated as variant FG (Fastener Grade) or FLT (Fastener Low Temperature). The grades also require Charpy testing results at -46°C and 101°C respectively.

KEY FEATURES

- Improved durability
- Good corrosion resistance
- Impact toughness
- Good weldability
- Resistance to pitting and crevice corrosion

BAR SHAPES

ROUND BAR: Ø11.38 - 99.44mm (0.448 - 3.915")



CHEN	CHEMICAL PROPERTIES									
Chromium (Cr)	Nickel (Ni)	Molybdenum (Mo)	Manganese (Mn)	Silicone (Si)	Tungsten (W)	Copper (Cu)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (S)
24-26%	6-8%	3-4%	1%	1%	1%	0.5-1%	0.25%	0.03%	0.03%	0.01%

APPLICATIONS

- Bars, rods, shafts (PRECISION COMPONENTS)
- Fasteners, bolts, screws and nuts (GENERAL ENGINEERING)
- Pump shafts and water treatment (CHEMICAL PROCESSING)
- Valve stems and bodies
 (PLUMBING AND AUTOMOTIVE)
- Downhole equipment and tubing (OIL AND GAS INDUSTRY)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

MECHANICAL PROPERTIES	
Tensile strength (N/mm²) min	860
Yield strength (N/mm²) min	725
Elongation (% in 4D)	16
Hardness - Rockwell C (HRC) max	35
Hardness - Brinell (HB) max	335
Reduction of area (min %)	50

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SUPER DUPLEX

UNS 32750 - 1.4410



UNS 32750 - 1.4410

UNS 32750, also known as 1.4410, is a Super Duplex Stainless Steel with a combination of excellent mechanical properties and corrosion resistance. UNS S32750 is a highly desirable material for applications requiring superior corrosion resistance, strength and toughness in aggressive environments, making it a preferred choice in critical industries worldwide.

KEY FEATURES

- Excellent corrosion resistance
- High tensile and yield strength
- Good ductility and toughness
- High temperature resistance
- Pitting and crevice resistance

СНЕМ	CHEMICAL PROPERTIES										
Chromium (Cr)	Nickel (Ni)	Molybdenum (Mo)	Manganese (Mn)	Silicone (Si)	Copper (Cu)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (s)		
24.5-26%	6-8%	3-5%	0.5-1%	0.8%	0.5%	0.3%	0.035%	0.03%	0.02%		

MECHANICAL PROPERTIES								
Tensile strength (N/mm²)	800							
Yield strength (N/mm²)	550							
Elongation (% in 4D)	25							
Hardness - Rockwell C (HRC) max	105							
Hardness - Brinell (HB) max	270							

PHYSICAL PROPERTIES								
Density (kg/m³)		7810						
Modulus of elasticity (Gp	oa)	210						
M	0-100°C (µm/m/°C)	13						
Mean coefficient of	0-350°C (µm/m/°C)	14.1						
thermal expansion	0-538°C (µm/m/°C)	15.3						
Thermal	at 100°C (W/m.K)	14.2						
conductivity	at 500°C (W/m.K)	19.6						
Specific Heat 0-100°C (J/	457							
Electrical resistivity (nΩ.r	800							
Melting point (°C)	1350							

MARKET SECTORS



Pumps, valves, oil platforms, subsea pipelines



Chemical Processing

Reactors, heat exchangers, vessels



Desalination Components

Seawater intake systems, brine heaters, evaporators



Pulp & Paper Industry

Digester vessels, bleach towers, equipment



Heat exchangers, boilers, condensers



Food Processing

Food handling machinery, storage tanks, equipment

COLD DRAWN TO

UNS 32750 — FG, FLT Condition S

UNS 32750 - FG, FLT CONDITION S

For UNS 32750 Super Duplex, also known as 1.4410, Condition S is the strain hardened condition. Material that is strain hardened to achieve increased mechanical properties will be further designated as variant FG (Fastener Grade) or FLT (Fastener Low Temperature). The grades also require Charpy testing results at -46°C and 101°C respectively.

KEY FEATURES

- Improved durability
- Good corrosion resistance
- Impact toughness
- Good weldability
- Resistance to pitting and crevice corrosion

BAR SHAPES

ROUND BAR: Ø11.38 - 99.44mm (0.448 - 3.915")



СНЕМ	CHEMICAL PROPERTIES										
Chromium (Cr)	Nickel (Ni)	Molybdenum (Mo)	Manganese (Mn)	Silicone (Si)	Copper (Cu)	Nitrogen (N)	Phosphorus (P)	Carbon (C)	Sulphur (s)		
24.5-26%	6-8%	3-5%	0.5-1%	0.8%	0.5%	0.3%	0.035%	0.03%	0.02%		

APPLICATIONS

- Bars, rods, shafts (PRECISION COMPONENTS)
- Fasteners, bolts, screws and nuts (GENERAL ENGINEERING)
- Pump shafts and heat exchangers (CHEMICAL PROCESSING)
- Turbines, boilers and condensers (POWER GENERATION)
- Downhole equipment and tubing (OIL AND GAS INDUSTRY)

APPLICATIONS ARE INCLUDING, BUT NOT LIMITED TO, THE ABOVE LIST

MECHANICAL PROPERTIES	
Tensile strength (N/mm²) min	860
Yield strength (N/mm²) min	725
Elongation (% in 4D)	16
Hardness - Rockwell C (HRC) max	35
Hardness - Brinell (HB) max	335
Reduction of area (min %)	50

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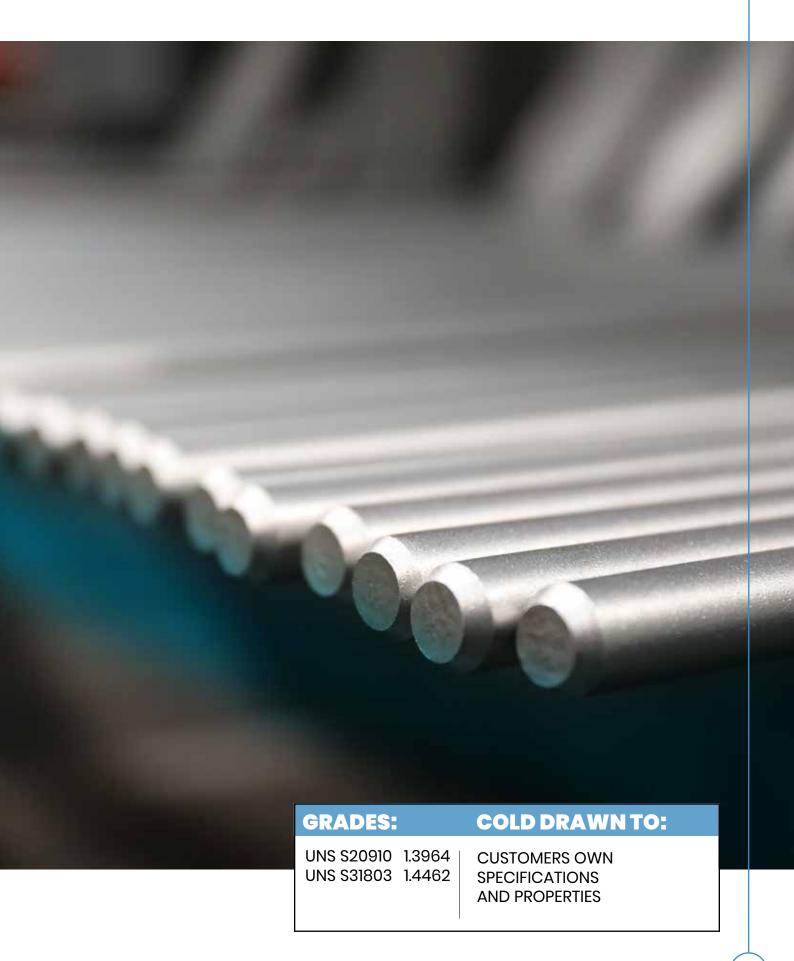
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DUPLEX STEEL

Material to UNS S31803 is described as a duplex stainless steel with a microstructure 50:50 austenite and ferrite. The steel combines good mechanical strength (typically up to over 480 MPa yield strength) and ductility with moderate to good corrosion resistance in a variety of environments.

By agreement, the alloy can be supplied with a PREN (Pitting Resistance Equivalent Number) at >34 which ensures that the resistance to pitting corrosion is as high as possible for this alloy grade. In addition, the steel offers good resistance to stress corrosion cracking. Ambient and sub-zero temperature notch ductility is also good.

These attributes mean that this duplex steel can be used successfully as an alternative to 300 series stainless steels in applications where higher mechanical strength/lower weight is required and / or resistance to stress corrosion cracking is needed. The machining and welding of this grade of duplex stainless steel presents no particular problems.



DUPLEX

UNS S20910 - 1.3964

BAR SHAPES



ROUND BAR: Ø11.38 - 99.44mm (0.448 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

UNS S20910 - 1.3964

Duplex steel 1.3964 is a stainless steel that has high strength and corrosion resistance. It is also known as Nitronic 50, XM-19, or 1.396412 and contains more chromium, nickel, molybdenum, and nitrogen than regular stainless steels, which gives it better resistance to pitting, crevice corrosion, and stress corrosion cracking.

KEY FEATURES

- Good mechanical properties
- High corrosion resistance in coastal environments
- Moderately low thermal conductivity

CHEMICAL PROPERTIES											
Chromium (Cr)	Nickel (Ni)	Manganese (Mn)	Molybdenum (Mo)	Silicone (Si)	Copper (Cu)	Carbon (C)	Nitrogen (N)	Vanadium (V)	Niobium (Nb)	Phosphorus (P)	Sulphur (S)
20-22%	11.5-13.5%	4-6%	3-3.5%	1%	0.5-1%	0.03%	0.25%	0.2%	0.2%	0.025%	0.01%

MECHANICAL PROPERTI	ES
Tensile strength (N/mm²)	700-950
Yield strength (N/mm²)	370
Elongation (% in 4D)	35
Hardness - Rockwell C (HRC) max	110
Hardness - Brinell (HB) max	293

PHYSICAL PROPERTIES						
Density (kg/m³)		7900				
Modulus of elasticity (Gp	oa)	195				
M	0-100°C (μm/m/°C)	15.7				
Mean coefficient of	0-350°C (µm/m/°C)	17.2				
thermal expansion	0-538°C (µm/m/°C)	18.0				
Thermal	at 100°C (W/m.K)	14.0				
conductivity	at 500°C (W/m.K)	19.3				
Specific Heat 0-100°C (J/	460					
Electrical resistivity (nΩ.r	810					
Melting point (°C)		1450				





Marine Components

Boat shafts, propellers, fasteners



Chemical Processing

Pumps, valves, components



Oil & Gas Industry

Valves, fittings, downhole equipment



Mechanical Components

Springs, bolts, fasteners



Aerospace Industry

Fittings, fasteners, structural elements



Power Generation

Components in power plants, turbine blades, shafts

DUPLEX

UNS 31803 - 1.4462



BAR SHAPES

ROUND BAR: Ø11.38 - 99.44mm (0.448 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

UNS 31803 - 1.4462

UNS 31803 is a type of Duplex stainless steel that has a balanced microstructure of 50% austenite and 50% ferrite. Also known as F51 or 2205, this grade is a successful alternative to the normal 300 series austenitic stainless steels, where its higher strength and resistance to stress corrosion cracking is required in critical applications.

KEY FEATURES

- · High corrosion resistance
- High strength
- Good weldability
- Good mechanical strength

CHEM	IICAL P	ROPERT	TIES						
Chromium (Cr)	Nickel (Ni)	Molybdenum (Mo)	Manganese (Mn)	Silicone (Si)	Copper (Cu)	Phosphorus (P)	Carbon (C)	Sulphur (S)	Nitrogen (N)
21-23%	4.5-6.5%	2.5-3.5%	2%	1%	0.5-1%	0.035%	0.03%	0.02%	0.15%

MECHANICAL PROPERT	TIES
Tensile strength (N/mm²)	650-880
Yield strength (N/mm²)	450
Elongation (% in 4D)	25
Hardness - Rockwell C (HRC) max	105
Hardness - Brinell (HB) max	270

PHYSICAL PROPERTIES					
Density (kg/m³)		7800			
Modulus of elasticity (Gp	200				
	0-100°C (µm/m/°C)	13.0			
Mean coefficient of	0-350°C (µm/m/°C)	13.4			
thermal expansion	0-538°C (µm/m/°C)	14.1			
Thermal	100°C (W/m.K)	15.0			
conductivity	500°C (W/m.K)	20.2			
Specific Heat 0-100°C (J/	500				
Electrical resistivity (nΩ.r	800				
Melting point (°C)		1450			

MARKET SECTORS



Marine Equipment

Ship hulls, propeller shafts, fasteners



Chemical Processing

Plant equipment, reactors, columns, vessels



Oil & Gas Industry

Pumps, valves, chokes, piping systems



Bolts, fasteners,



Pulp & Paper Industry

Digesters, bleaching tanks, piping systems



Petrochemical Industry

Heat exchangers, tanks, piping equipment

A nickel alloy is a type of metal that contains nickel as one of its primary elements. It is typically alloyed with other metals to create a material with specific properties such as high strength, corrosion resistance and excellent performance at high temperatures.

The addition of specific elements imparts unique properties to nickel alloys, making them suitable for challenging environments and demanding conditions. It is often used in extreme working environments, such as those encountered in the aerospace, chemical processing, and petroleum industries, but can also be used in electrical applications.

The cold drawing process enhances the mechanical properties of nickel alloys while maintaining or improving their corrosion resistance. This makes cold drawn nickel alloys suitable for demanding applications in industries where precise dimensions, improved mechanical properties, and enhanced surface finish are required.



C22 - 2.4602

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915") HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")

FLAT BAR: 31.75 x 25.4mm -88.90 x 44.45mm (1.25 x 1 - 3.5 x 1.75") SQUARE BAR: 25.4 – 76.2mm (1 - 3")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

C22 - 2.4602

Nickel Alloy C22, also known as Hastelloy C22, is a nickel-chromium-molybdenum alloy with the UNS N06022 designation. It is known for its exceptional corrosion resistance in highly aggressive environments and is often chosen for applications where resistance to both oxidising and reducing acids is required, especially in marine and chemical environments.

KEY FEATURES

- Excellent corrosion resistance
- Highly versatile
- High temperature stability
- Good weldability

CHE	CHEMICAL PROPERTIES										
Nickel (Ni)	Chromium (Cr)	Molybdenum (Mo)	Iron (Fe)	Tungsten (W)	Cobalt (Co)	Manganese (Mn)	Vanadium (v)	Phosphorus (P)	Silicone (Si)	Carbon (C)	Sulphur (S)
50-63%	20-22.5%	12.5-14.5%	2-6%	2.5-3.5%	2.5%	0.5%	0.35%	0.015%	0.01%	0.01%	0.01%

MECHANICAL PROPERT	IES
Tensile strength (N/mm²)	765
Yield strength (N/mm²)	359
Elongation (% in 4D)	25
Hardness - Rockwell C (HRC) max	35
Hardness - Brinell (HB) max	320

PHYSICAL PROPERTIES					
Density (kg/m³)		8650			
Modulus of elasticity (Gp	oa)	206			
	0-100°C (µm/m/°C)	6.9			
Mean coefficient of	0-350°C (µm/m/°C)	7.2			
thermal expansion	0-538°C (µm/m/°C)	7.5			
Thermal	at 100°C (W/m.K)	10.2			
conductivity	at 500°C (W/m.K)	13.1			
Specific Heat 0-100°C (J/	414				
Electrical resistivity (nΩ.r	448				
Melting point (°C)		1400			





Pollution Control

Scrubbers, ducts, stacks in air pollution control systems



Chemical Processing

Reactors, vessels, piping systems



Components for sour gas applications

Pharmaceutica Industry

Equipment for handling corrosive substances



Marine shafts, valves,



fasteners

Aerospace Industry

Valves, fasteners, electrical components

C276 - 2.4819

BAR SHAPES

ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915") HEXAGONAL BAR: 10 - 55mm A/F (0.375 - 2.165")

FLAT BAR: 31.75 x 25.4mm -88.90 x 44.45mm (1.25 x 1 - 3.5 x 1.75") **SQUARE BAR:** 25.4 – 76.2mm (1 – 3")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

C276 - 2.4819

Nickel Alloy C276, or material number 2.4819, is a corrosion-resistant nickel-molybdenum-chromium alloy with an addition of tungsten. This alloy, often referred to as Hastelloy C276, is known for its excellent resistance to a wide range of severe, corrosive environments, including strong acids, chlorides, and reducing conditions, making it suitable for various challenging applications.

KEY FEATURES

- Exceptional corrosion resistance
- Excellent resistance to oxidation
- Good mechanical properties at high temperature
- Easily fabricated

CHEMICAL PROPERTIES										
Molybdenum (Mo)	Chromium (Cr)	Iron (Fe)	Tungsten (W)	Cobalt (Co)	Manganese (Mn)	Silicone (Si)	Vanadium (V)	Carbon (C)	Sulphur (s)	Nickel (Ni)
15-17%	15-16.5%	4-7%	3-4.5	2.5%	1%	0.08%	0.1-0.3%	0.01%	0.01%	Rest

MECHANICAL PROPERTI	ES
Tensile strength (N/mm²)	750
Yield strength (N/mm²)	310
Elongation (% in 4D)	30
Hardness - Rockwell C (HRC) max	87
Hardness - Brinell (HB) max	-

PHYSICAL PROPERTIES					
Density (kg/m³)		8600			
Modulus of elasticity (Gp	oa)	208			
Mean coefficient of	0-100°C (µm/m/°C)	11.2			
	0-350°C (µm/m/°C)	11.8			
thermal expansion	0-100°C (µm/m/°C) 0-350°C (µm/m/°C) 0-538°C (µm/m/°C) at 100°C (W/m.K) at 500°C (W/m.K)	12.5			
Thermal	at 100°C (W/m.K)	10.4			
conductivity	at 500°C (W/m.K)	13.1			
Specific Heat 0-100°C (J/	415				
Electrical resistivity (nΩ.r	125				
Melting point (°C)		1350			

MARKET SECTORS



Chemical Processing 0

Pulp & Paper Industry

Reactors and vessels, pipes, fittings, and valves in chemical plants

Components exposed to corrosive chemicals



equipment

Industry

Production vessels.



Equipment for handling sour gas, pipes, valves



reatment

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Power Generation

Components in waste treatment facilities

Flue gas desulphurisation units, heat exchangers

400 – 2.4360

BAR SHAPES



ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

400 - 2,4360

Nickel alloy 400 is a single phase, solid-solution nickel-copper alloy that offers superior resistance to many corrosive environments over temperatures ranging from sub-zero to 800°F. It is known for its resistance to corrosion, especially in environments where hydrofluoric acid and fluorine gases are present, and is only hardenable through cold working, rather than heat treatment.

KEY FEATURES

- Excellent corrosion resistance
- High ductility
- Good mechanical properties
- Thermal stability
- Non-magnetic

CHEMICAL PROPERTIES							
Nickel (Ni)	Copper (Cu)	Iron (Fe)	Manganese (Mn)	Silicone (Si)	Carbon (C)	Sulphur (S)	
63%	28-34%	2.5%	2%	0.5%	0.3%	0.03%	

MECHANICAL PROPERTIES				
Tensile strength (N/mm²)	700			
Yield strength (N/mm²)	310			
Elongation (% in 4D)	35			
Hardness - Rockwell C (HRC) max	80			
Hardness - Brinell (HB) max	-			

PHYSICAL PROPERTIES					
Density (kg/m³)		8800			
Modulus of elasticity (Gp	oa)	173			
Many anotherious of	0-100°C (µm/m/°C)	13.9			
Mean coefficient of thermal expansion	0-350°C (µm/m/°C)	14.6			
thermal expansion	0-538°C (µm/m/°C)	15.3			
Thermal	at 100°C (W/m.K)	21.8			
conductivity	at 500°C (W/m.K)	26.2			
Specific Heat 0-100°C (J/	kg.K)	427			
Electrical resistivity (nΩ.r	547				
Melting point (°C)	1350				

MARKET SECTORS



Marine Equipment

Heat exchangers, condensers, fixtures, fasteners



Chemical Processing

Tanks, pumps, values, reactors, vessels, heat exchangers



Oil & Gas Industry

Components for downhole and surface applications



Aircraft components, missile systems, aircraft fuel tanks



Electrical Industry

Electrical components, springs, connectors



Food Processing

Food handling machinery, storage tanks, processing vessels

K500 - 2.4375

BAR SHAPES



ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

K500 - 2.4375

Nickel Alloy K500, also known as 2.4375 or Monel K500, is a nickel-copper alloy that can be age-hardened by adding aluminum and titanium. It is known for its resistance to corrosion and its ability to maintain good mechanical properties in challenging environments, especially in marine and chemical environments, and high strength at elevated temperatures.

KEY FEATURES

- Excellent corrosion resistance
- High strength
- Non-magnetic
- Good ductility and toughness
- Low magnetic permeability

CHEMI	CHEMICAL PROPERTIES								
Nickel (Ni)	Copper (Cu)	Aluminium (Al)	Iron (Fe)	Manganese (Mn)	Silicone (Si)	Titanium (Ti)	Carbon (C)	Sulphur (S)	
63%	27-33%	2.3-3.2%	2%	1.5%	0.5%	0.35-0.85%	0.25%	0.1%	

MECHANICAL PROPERTI	ES
Tensile strength (N/mm²)	1100
Yield strength (N/mm²)	790
Elongation (% in 4D)	20
Hardness - Rockwell C (HRC) max	34
Hardness - Brinell (HB) max	315

PHYSICALP	ROPERTIES	
Density (kg/m³)		8440
Modulus of elasticity (Gp	oa)	179
Many anofficient of	0-100°C (µm/m/°C)	13.4
Mean coefficient of thermal expansion	0-350°C (µm/m/°C)	13.9
thermal expansion	0-538°C (µm/m/°C)	14.5
Thermal	at 100°C (W/m.K)	17.2
conductivity	at 500°C (W/m.K)	20.1
Specific Heat 0-100°C (J/	(kg.K)	418
Electrical resistivity (nΩ.r	242	
Melting point (°C)		1350

MARKET SECTORS



Equipment

Marine shafts, valves, fasteners, pump and valve components



Chemical Processing

Reactors, vessels, heat exchangers, piping systems



Downhole equipment, pump shafts, valve stems, tubing



Fasteners, springs, parts, missile systems, fuel tanks



Electrical Industry

Electrical connectors, springs, switchgear components



Power Generation

Turbine components, blades, boiler feedwater systems

<mark>625 – 2.48</mark>56

BAR SHAPES



ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

625 - 2.4856

Nickel Alloy 625, also known by its material number 2.4856, is a corrosion-resistant nickel-chromium-molybdenum alloy with an addition of niobium, with significant strength and toughness. It is often referred to simply as Inconel 625, and it exhibits excellent resistance to a wide range of corrosive environments, making it suitable for various applications.

KEY FEATURES

- Highly corrosion resistant
- Excellent resistance to oxidation
- Resistance to pitting and crevice corrosion
- High temperature strength

CHEMICAL PROPERTIES								
Chromium (Cr)	Molybdenum (Mo)	Iron (Fe)	Niobium (Nb)	Cobalt (Co)	Manganese (Mn)	Silicone (Si)	Carbon (C)	Nickel (Ni)
21-23%	8-10%	5%	3.2-3.8%	1%	0.5%	0.4%	0.03%	Rest

MECHANICAL PROPERTI	IES
Tensile strength (N/mm²)	827
Yield strength (N/mm²)	413
Elongation (% in 4D)	30
Hardness - Rockwell C (HRC) max	35
Hardness - Brinell (HB) max	320

PHYSICAL PROPERTIES						
Density (kg/m³)		8440				
Modulus of elasticity (Gp	oa)	205				
Many acofficient of	0-100°C (µm/m/°C)	12.8				
Mean coefficient of thermal expansion	0-350°C (µm/m/°C)	13.4				
thermal expansion	0-538°C (µm/m/°C)	14.1				
Thermal	at 100°C (W/m.K)	9.8				
conductivity	at 500°C (W/m.K)	12.7				
Specific Heat 0-100°C (J/	/kg.K)	410				
Electrical resistivity (nΩ.r	125					
Melting point (°C)	1350					

MARKET SECTORS



Chemical Processing

Reactors, vessels, piping, heat exchangers



Marine Equipment

Propeller blades, seawater piping systems, valves



Industry

Equipment for sour gas, downhole tubing and casing in wells



Power Generation

Steam turbine shroud rings, seals, components



Nuclear

Reactors components, fuel handling systems



Aerospace Industry

Ducting systems, exhaust systems, rocket motors

<mark>718 – 2.4668</mark>

BAR SHAPES



ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

718 – 2.4668

Nickel Alloy 718, with the designation UNS N07718 and the DIN/EN designation 2.4668, is a precipitation-hardening nickel-chromium alloy. It has excellent resistance to corrosion and oxidation, as well as high tensile and fatigue strength at high temperatures, and is widely used in aerospace, oil and gas, and other high-performance applications.

(EY FEATURES

- High strength
- Good corrosion resistance
- High temperature stability
- Good weldability

CHE	CHEMICAL PROPERTIES												
Nickel	Chromium	Niobium	Molybdenum	Cobalt	Titanium	Manganese	Silicone	Copper	Aluminium	Phosphorus	Carbon	Sulphur	Iron
(Ni)	(Cr)	(Nb)	(Mo)	(Co)	(Ti)	(Mn)	(si)	(Cu)	(AI)	(P)	(c)	(s)	(Fe)
50-55%	17-21%	4.75-5.5%	2.8-3.3%	1%	0.65-1.15%	0.35%	0.35%	0.30%	0.2-0.8%	0.15%	0.08%	0.02%	Rest

MECHANICAL PROPERTI	ES
Tensile strength (N/mm²)	725
Yield strength (N/mm²)	325
Elongation (% in 4D)	30
Hardness - Rockwell C (HRC) max	36
Hardness - Brinell (HB) max	331

PHYSICALP	ROPERTIES	
Density (kg/m³)		8220
Modulus of elasticity (Gp	oa)	200
Many anotherious of	0-100°C (µm/m/°C)	12.8
Mean coefficient of thermal expansion	0-350°C (µm/m/°C)	13.4
thermal expansion	0-538°C (µm/m/°C)	14.1
Thermal	at 100°C (W/m.K)	11.4
conductivity	at 500°C (W/m.K)	14.3
Specific Heat 0-100°C (J/	kg.K)	435
Electrical resistivity (nΩ.r	132	
Melting point (°C)		1335

MARKET SECTORS



Turbocharger rotors, fasteners, components



Gas turbine components, cryogenic tanks



Downhole equipment, wellhead



components, oil well tools

Surgical instruments, medical implants, components



Reactors, nuclear fuel elements



Aerospace

Turbine disks, engine parts, structural elements

<mark>725 – 2.7725</mark>

BAR SHAPES



ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

725 - 2.7725

Alloy 725 2.7725 is a nickel-chromium-molybde-num-niobium aged hardenable grade with extremely high strength. Alloy 725 was developed from Alloy 625 by adding strengthening elements aluminium and titanium to enhance its mechanical properties and for ductility and toughness. In addition, the alloy has high corrosion resistance including resistance to hydrogen embrittlement and stress corrosion cracking.

KEY FEATURES

- High strength and toughness
- High temperature resistance
- Good resistance to oxidation
- Corrosion resistance

CHEMICAL PROPERTIES											
Nickel (Ni)	Chromium (Cr)	Molybdenum (Mo)	Niobium (Nb)	Titanium (Ti)	Aluminium (AI)	Manganese (Mn)	Silicone (Si)	Carbon (C)	Phosphorus (P)	Sulphur (S)	Iron (Fe)
55-59%	19-22.5%	7-9.5%	2.75-4%	1-1.7	0.35%	0.35%	0.2%	0.03%	0.015%	0.01%	Rest

MECHANICAL PROPERTIES					
Tensile strength (N/mm²)	1241				
Yield strength (N/mm²)	903				
Elongation (% in 4D)	31				
Hardness - Rockwell C (HRC) max	36				
Hardness - Brinell (HB) max	331				

PHYSICAL PROPERTIES								
Density (kg/m³)		8300						
Modulus of elasticity (Gp	oa)	204						
Many applicant of	0-100°C (µm/m/°C)	13						
Mean coefficient of	0-350°C (µm/m/°C)	13.6						
thermal expansion	0-538°C (µm/m/°C)	14.3						
Thermal	at 100°C (W/m.K)	10.6						
conductivity								
Specific Heat 0-100°C (J/	430							
Electrical resistivity (nΩ.r	115							
Melting point (°C)	1345							

MARKET SECTORS



Aerospace Industry

Turbine blades, discs, shafts, structural components



Marine & Shipbuilding

High strength fasteners, subsea equipment



Industry

Fasteners, valves, pumps, landing nipples, side pocket mandrels



Chemical Processing

Reactors, vessels, heat exchangers, piping systems



Power Generation

Turbine discs, blades, shafts, nuclear power plants



Petrochemical Industry

Distillation columns, catalyst support systems

X750 **– 2.**4669

BAR SHAPES



ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

X750 - 2.4669

Nickel Alloy X750 is a high-strength and versatile nickel-chromium alloy with excellent corrosion and oxidation resistance at elevated temperatures. It can be precipitation-hardened through heat treatment, and the alloy can be easily fabricated using standard techniques for nickel-based alloys. However, its high strength may require special considerations during machining.

KEY FEATURES

- Good corrosion resistance
- Resistance to oxidation
- · Good high temperature strength
- Easily fabricated

CHEMICAL PROPERTIES											
Nickel	Chromium	Iron	Titanium	Manganese	Cobolt	Niobium	Aluminium	Silicone	Copper	Carbon	Sulphur
(Ni)	(Cr)	(Fe)	(Ti)	(Mn)	(Co)	(Nb)	(AI)	(si)	(Cu)	(c)	(s)
70%	14-17%	5-9%	2.25-2.75%	1%	1%	0.7-1.2%	0.4-1%	0.5%	0.5%	0.08%	0.01%

MECHANICAL PROPERTI	ES
Tensile strength (N/mm²)	744
Yield strength (N/mm²)	365
Elongation (% in 4D)	30
Hardness - Rockwell C (HRC) max	35
Hardness - Brinell (HB) max	320

PHYSICAL PROPERTIES							
Density (kg/m³)		8260					
Modulus of elasticity (Gp	oa)	195					
M	0-100°C (µm/m/°C)	14.2					
Mean coefficient of	0-350°C (µm/m/°C)	15.2					
thermal expansion	0-538°C (µm/m/°C)	15.5					
Thermal	Thermal at 100°C (W/m.K)						
conductivity	12.9						
Specific Heat 0-100°C (J/	430						
Electrical resistivity (nΩ.r	122						
Melting point (°C)	1425						

MARKET SECTORS



Chemical & Petrochemical

Heat exchangers, chemical processing vessels



Fasteners & Fixings

High performance springs, connenctors, valves



Industry

Downhole tools, wellhead components, valves



Reactors for components, control rod components



Automotive Industry

Exhaust systems components, turbocharger parts, valves



Aerospace Industry

Gas turbine engines, turbine blades, seals, discs, casings

<mark>825 – 2.4858</mark>

BAR SHAPES



ROUND BAR: Ø7.925 - 99.44mm (0.312 - 3.915")

COLD DRAWN TO CUSTOMERS OWN SPECIFICATIONS AND PROPERTIES

825 - 2.4858

Nickel Alloy 825 is a nickel-iron-chromium alloy with additions of molybdenum, copper and titanium. Commonly referred to as Incoloy 825, this alloy is recognised for its excellent corrosion resistance in challenging environments, including those with sulfuric and phosphoric acids, and outstanding resistance to pitting and crevice corrosion, as well as to chloride-ion stress corrosion cracking.

KEY FEATURES

- Excellent corrosion resistance
- High temperature resistance
- Optimal longevity in challenging environments
- Weldable

CHEN	/ICAL	PROP	ERTIES							
Nickel	Chromium	Iron	Molybdenum	Copper	Manganese	Titanium	Silicone	Aluminium	Carbon	Sulphur
(Ni)	(Cr)	(Fe)	(Mo)	(Cu)	(Mn)	(Ti)	(si)	(AI)	(c)	(s)
38-46%	19.5-23.5%	22%	2.5-3.5%	1.5-3%	1%	0.6-1.2	0.5%	0.2%	0.05%	0.03%

MECHANICAL PROPERTIES					
Tensile strength (N/mm²)	590				
Yield strength (N/mm²)	241				
Elongation (% in 4D)	30				
Hardness - Rockwell C (HRC) max	35				
Hardness - Brinell (HB) max	320				

PHYSICAL PROPERTIES								
Density (kg/m³)		8140						
Modulus of elasticity (Gp	oa)	196						
Ma	0-100°C (μm/m/°C)	14.0						
Mean coefficient of	0-350°C (µm/m/°C)	14.9						
thermal expansion	0-538°C (µm/m/°C)	15.4						
Thermal	at 100°C (W/m.K)	11.1						
conductivity	13.5							
Specific Heat 0-100°C (J/	440							
Electrical resistivity (nΩ.r	113							
Melting point (°C)	1400							

MARKET SECTORS



Chemical Processing

Marine Equipment

Reactors, vessels, heat exchangers, piping systems, valves

Seawater piping systems, heat exchangers, valves, ship fittings



Equipment for sour gas, tubing and piping



Pulp & Paper Industry

Digesters, bleach plants, processing equipment



Generation

Heat exchangers, steam generators, components



Pollution Control

Scrubbers, ductwork, waste incinerators, reactors





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