

UNION Hardware

Quality Stainless Steel Products for Global Industries

YOUR TRUSTED PARTNER IN STAINLESS STEEL SOLUTIONS

**Innovation, Quality
and Service for a Sustainable Future**



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Organizational structure

UHC Group

Production Bases

- Washer Production Base
- Bolt and Nut Production Base
- Screws Production Base
- Studs Production Base
- Hardware Production Base
- Solar Energy
- Wind Energy
- Nuclear Energy
- Railway
- Aerospace

Import & Export Company--Jiaxing Union

UHC Group Vision, Mission, and Goals

Vision

To become a world-renowned stainless steel products supplier.

UHC Group is committed to establishing an outstanding brand image in the global stainless steel products industry, becoming the preferred partner for customers, and earning international market recognition through high-quality products and services.

Mission

To make stainless steel products business easy for everyone.

We focus on customer needs, providing innovative solutions, efficient services, and reliable products to help customers streamline their business processes, reduce operational costs, and achieve mutual success.

Goal

Sustainable operation for 100 years.

UHC Group aims for long-term development, emphasizing technological innovation, quality improvement, and environmental sustainability. We are dedicated to building a century-old enterprise that creates lasting value for society, employees, and customers.

Core Values

★ Innovation:

Continuously exploring new technologies and processes to drive industry progress.

★ Quality:

Ensuring every product meets the highest standards to achieve customer satisfaction.

★ Service:

Providing efficient and professional services with a customer-centric approach.

★ Sustainability:

Focusing on environmental protection and social responsibility for long-term development.



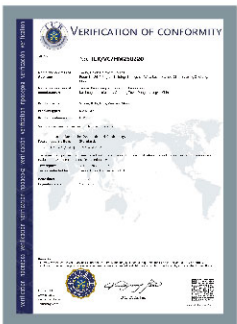
ISO 45001



ISO 9001



ISO 14001



CE-PED

Core Strengths:

Professional Production:

Five production bases covering a full range of stainless steel product needs.

High-End Industry Services:

Focused on industries such as solar energy, wind energy, nuclear energy, railways, and aerospace. Quality Assurance: Independent laboratory with rigorous product testing and quality control.

International Certifications:

Certified with ISO 9001, ISO 14001, ISO 45001, and the EU Pressure Equipment Directive (PED).

Intelligent Management:

ERP system for end-to-end process control, ensuring efficient operations.

Global Market:

Products exported worldwide, trusted by customers.



About Us

Founded in 2017, UHC Group is a professional stainless steel products supplier committed to becoming a world-renowned provider in the industry. Guided by our mission to "make stainless steel products business easy for everyone," we focus on delivering high-quality products and solutions to our customers. The group operates five production bases and one import & export company. The five production bases specialize in washers, bolts and nuts, screws, studs and rivets, and hardware products. The hardware production base primarily serves high-end industries such as solar energy, wind energy, nuclear energy, railways, and aerospace, with our products exported worldwide.

As a leading stainless steel products supplier, UHC Group prioritizes quality above all else. We have an independent laboratory equipped to conduct comprehensive dimensional and mechanical performance tests, ensuring every product meets the highest standards. Additionally, the company has obtained international certifications including ISO 9001 (Quality Management System), ISO 14001 (Environmental Management System), ISO 45001 (Occupational Health and Safety Management System), and the European Union's Pressure Equipment Directive (PED) certification, further demonstrating our commitment to quality, environmental protection, and employee safety.

To enhance operational efficiency and service quality, UHC Group utilizes an advanced ERP system to intelligently manage the entire production, sales, and management processes, ensuring every step—from raw material procurement to finished product delivery—is efficient, transparent, and traceable.

With the goal of "sustainable operation for 100 years," UHC Group is dedicated to building a century-old enterprise through innovation and operational excellence. Moving forward, we will continue to uphold our core values of "Innovation, Quality, and Service," expand our global market presence, and provide customers with superior products and services, striving to become a benchmark in the stainless steel products industry.

Vision: To become a world-renowned stainless steel products supplier.

Mission: To make stainless steel products business easy for everyone.

Goal: Sustainable operation for 100 years.

UHC Group Quality Control

UHC Group has always regarded quality as the core of our business development, committed to providing customers with high-quality and reliable stainless steel products. Through a rigorous quality management system and advanced technical methods, we ensure that every step—from raw material procurement to finished product delivery—meets the highest standards.

1. Independent Laboratory

UHC Group operates an independent laboratory equipped with advanced testing equipment and a skilled technical team. The laboratory conducts comprehensive dimensional measurements, mechanical performance tests, and chemical composition analyses. All testing processes strictly adhere to international standards, ensuring that every product meets customer requirements and industry specifications.

2. Strict Quality Management System

The company has obtained international certifications including ISO 9001 (Quality Management System), ISO 14001 (Environmental Management System), and ISO 45001 (Occupational Health and Safety Management System). We have established a robust quality management system, ensuring that every stage of the production process is controlled through standardized and procedural management.

3. Full-Process Quality Monitoring

From raw material intake to finished product delivery, UHC Group implements full-process quality monitoring. We conduct rigorous inspections on every batch of raw materials to ensure they meet production requirements. During production, advanced testing equipment is used to monitor key processes in real time. Before products leave the factory, comprehensive final inspections are performed to ensure zero-defect delivery.



4. Continuous Improvement

UHC Group emphasizes continuous improvement, regularly conducting internal audits and external evaluations of the quality management system to identify opportunities for enhancement and implement optimization measures. We encourage employees to propose improvement suggestions and enhance overall quality awareness through training and incentive mechanisms.

5. Customer Feedback and After-Sales Service

We highly value customer feedback and have established a robust feedback handling mechanism. Whether it is a product quality issue or a service improvement suggestion, we respond promptly and take effective measures. Additionally, we provide professional after-sales services to ensure customers have no concerns during product usage.

6. Green Environmental Protection and Sustainable Development

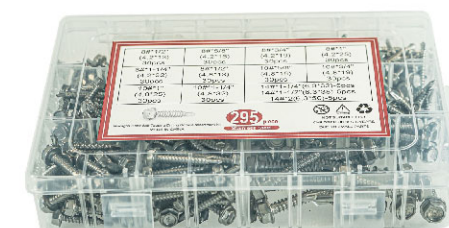
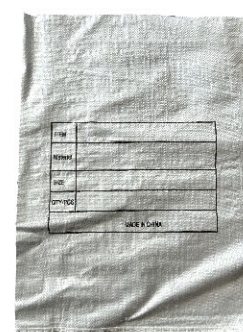
While ensuring quality control, UHC Group also focuses on environmental protection and sustainable development. By optimizing production processes, reducing resource waste, and minimizing emissions, we strive to achieve green production, providing customers and society with environmentally friendly, high-quality products.

Quality Commitment

UHC Group promises that every product undergoes strict quality control to ensure reliable performance, long service life, and compliance with specific customer needs. With quality as our core competitiveness, we are committed to becoming the most trusted partner for our customers.

Customized Services

UHC Group offers highly customized packaging services, capable of designing and producing personalized packaging solutions tailored to the specific needs of clients. Equipped with state-of-the-art automatic packaging machines, the company significantly enhances packaging efficiency while ensuring high precision and consistency throughout the process. Whether for small-batch custom orders or large-scale production, UHC can adapt flexibly, helping clients optimize their packaging processes, reduce costs, and improve product appearance and market competitiveness.



Bolt



DIN933-1987 FULL THREAD

Size: M27-M160
Length: 60-1000 mm

JIS B1180-1994 TYPE 1

Size: M22-M160
Length: 60-1000 mm

DIN609 HEXAGON FIT BOLT

WITH LONG THREADED DOG POINT
Size: M16-M52
Length: 30-200mm

DIN931-1987 PARTIAL THREAD

Size: M27-M160
Length: 80-1000 mm

DIN6914 HIGH STRENGTH HEX BOLT

Size: M16-M36
Length: 30-200mm

DIN610 HEXAGON FIT BOLT

WITH LONG THREADED DOG POINT
Size: M16-M52
Length: 30-200mm

ANSI/ASME B18.2.1-2010

Size: 1-1/8"-4"
Length: 2"-20"

ASTM A193 HEAVY HEX BOLT

Size: 7/8"-4"
Length: 2"-20"

DIN960 HEX BOLT WITH FINE THREAD

Size: M22-M100
Length: 70-300mm

We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.

Bolt

We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.

JIS U-BOLT&J-BOLT

Size: M6-M90
Length: 45-1000 mm

FOUNDATION BOLT

HG/T21545-2006 L TYPE&J TYPE
Size: M10-M64
Length: 45-1000 mm
Size: 1/2"- 2-1/2"
Length: 2"-12ft

ASME/IFI U-BOLT&J-BOLT

Size: 1/4" - 3-1/2"
Length: 2" - 12ft

FOUNDATION BOLT

JIS B1178-2009 JA TYPE
Size: M10-M64
Length: 45-1000 mm
Size: 1/2"- 2-1/2"
Length: 2"-12ft

DIN3570 STEEL STRAPS

Size: M6-M24
FOR TUBE OF DN 20-500

DIN 529 FOUNDATION BOLT

Size: M16-M72
Length: 80-1000 mm

ANSI/ASME B18.2.1 SQUARE BOLT

Size: 7/8" - 1-1/2"
Length: 2-1/4"-18"



Screws



DIN 7981 CROSS RECESSED PAN HEAD

Size: ST 2.9-ST 6.3
Length: 6.5-100 mm

ISO 14586 TX CSK HEAD

Size: ST 2.9-ST 6.3
Length: 6.5-100 mm

DIN 7982 CROSS RECESSED CSK HEAD

Size: ST 2.9-ST 6.3
Length: 6.5-100 mm

DIN 7983 CROSS RECESSED RAISED CSK HEAD

Size: ST 2.9-ST 6.3
Length: 6.5-100 mm

ISO 14585 TX PAN HEAD

Size: ST 2.9-ST 6.3
Length: 6.5-100 mm

WS 9200 SOCKET HEAD

Size: ST 2.9-ST 6.3
Length: 9.5-70 mm

DIN 912-1983

Size: M22-M64
Length: 45-1000 mm

JIS 1176-2000 TYPE 1

Size: M22-M64
Length: 45-1000 mm

ANSI/ASME B18.3-2012

Size: 7/8"-2-1/2"
Length: 1-3/4"-20"

We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.

Screws

We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.

DIN 7985 RAISED CHEESE HEAD

Size: M3-M10
Length: 5-100 mm

ISO 14581 TX CSK FLAT HEAD

Size: M3-M10
Length: 5-100 mm

ISO 14584 TX RAISED CSK HEAD

Size: M3-M10
Length: 5-100 mm

DIN 965 CSK HEAD

Size: M3-M10
Length: 5-100 mm

ISO 14582 TX CSK HIGH HEAD

Size: M3-M10
Length: 5-100 mm

DIN 84 SLOTTED CHEESE HEAD

Size: M3-M10
Length: 5-100 mm

ISO 14580 TX CHEESE HEAD

Size: M3-M10
Length: 5-100 mm

ISO 14583 TX PAN HEAD

Size: M3-M10
Length: 5-100 mm

DIN 963 SLOTTED CSK HEAD

Size: M3-M10
Length: 5-100 mm



Screws



POZI CSK HEAD FULL THREAD
Size: M3-M6
Length: 10-120mm

POZI PAN HEAD FULL THREAD
Size: M3-M6
Length: 10-120mm

TORX PAN / CSK HEAD FULL THREAD
Size: M3-M6
Length: 10-120mm

DIN7504-K HEX WASHER HEAD
Size: ST4.8-6.3
Length: 19-80mm

DIN7504-N PHILLIPS PAN HEAD
Size: ST4.8-6.3
Length: 19-80mm

DIN7504-P PHILLIPS FLAT HEAD
Size: ST4.8-6.3
Length: 19-80mm

We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.

Screws

We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.

DIN913/ISO4026 SOCKET SET SCREW WITH FLAT POINT
Size: M2-M16 / #10-5/8"
Length: 2 - 50mm / #10- 2"

DIN916/ISO4029 SOCKET SET SCREW WITH CUP POINT
Size: M2-M16 / #10-5/8"
Length: 2 - 50mm / #10- 2"

ISO 4766 SLOTTED SET SCREWS WITH FLAT HEAD
Size: M5-M12
Length: 10-90 mm

DIN914/ISO 4027 HEX SOCKET SET SCREW WITH CONE POINT
Size: M2-M16 / #10-5/8"
Length: 3 - 50mm / #10- 2"

DIN915/ISO 4028 HEX SOCKET SET SCREW WITH DOG POINT
Size: M2-M16 / #10-5/8"
Length: 3 - 50mm / #10- 2"

DIN 34827 - 2005 HEXALOBULAR SOCKET SET SCREWS
Size: M3-M16
Length: 3-50 mm



Nut



DIN934-1987 HEX NUT

Size: M2-M5 M27-M160

ASTM A194 GR.8&8M HEAVY

Size: 1"-2 1/2"

DIN439-1987 HEX THIN NUT

Size: M27-M160

DIN935-1-1987 CASTLE NUT

Size: M27-M160 1/2"-2 1/2"

DIN 1816 ROUND NUT WITH

SET PIN HOLES INSIDE

Size: M20-M52

DIN 6330 1.5D HEIGHT HEX NUT

Size: M24-M48

DIN 6915 HIGH STRENGTH NUT

Size: M16-M36

ANSI B18.2.2-2010 HEX NUT

Size: 1-1/8"-2 1/2"

DIN982-1987 HEX NONMETALLIC

Size: M22-M160

ANSI B18.2.2 HEX JAM NUT

Size: 7/8"-2 1/2"

DIN1804 SLOTTED NUT

Size: M20-M52

DIN 6334 HEX COUPLING NUT

Size: M20-M36

DIN6331 1.5D HEIGHT HEX COLLAR NUT

Size: M20-M36

DIN7967 SELF LOCKING COUNTER NUT

Size: M24-M48

JIS B1181-1993 HEX NUT

Size: M22-M160

DIN985-1987 HEX NYLON NUT

Size: M3-M5 M22-M160 7/8"-4"

DIN1587-1987 CAP NUT

Size: M22-M160 7/8"-2 1/2"

DIN 508 NUT FOR T SLOTS

Size: M16-M48

DIN 981 LOCK NUT

Size: M20-M75

HEX COUPLING NUT

Size: 1/2" -1-1/2"

DIN 6923 FLANGE NUT

Size: M3-M4

We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.

Studs and Rivets

We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.



DIN975/DIN976

Size: M27-M130

Length: 1m-6m

DIN 835 DOUBLE END STUDS(2d)

Size: M27-M130

Length: 40-200mm

IF136-2002

Size: 1-1/8"-5"

Length: 1ft-20ft

DIN938 DOUBLE END STUDS(b1 = 1d)

Size: M6-M52

Length: 25-400mm

DIN940 DOUBLE END STUDS(2.5d)

Size: M12-M24

Length: 40-200mm

DIN939 DOUBLE END STUDS(1.25d)

Size: M6-M52

Length: 25-400mm



OPEN TYPE CSK HEAD

ISO 15978/15980/15982/15984/16583

DIN 7337

Size: 3mm-6.4mm

Material: AL/AL, AL/ST,AL/SS,
SS/SS,ST/SS,ST/ST

OPEN TYPE ROUND HEAD

ISO15977/15979/15981/15983/16582/16584

DIN 7337

Size: 3mm-6mm

Material: AL/AL, AL/ST,AL/SS,
SS/SS,ST/SS,ST/ST

CLOSE END TYPE

ISO15973/15974

Size: 3.2mm-6.4mm

Material: AL/AL, AL/ST,AL/SS,
SS/SS,ST/SS,ST/ST

Washers



DIN125 A&B
Size: M3-M160

ISO 7092 A 200HV
Size: M3-M64

DIN 7349 100HV&200HV
Size: 3.2-17mm

DIN137 WAVE(A&B)
Size: M3-M20

WS 9240 SS
Size: M3-M36

DIN9021 A
Size: M3-M160

ISO 7093 A 200HV
Size: M3-M36

DIN 436 SQUARE WASHER
Size: M10-M20

DIN6797 TOOTHED LOCK(A,J&V)
Size: M3-M24

ANSIB18.22.1-1983
Size: 1/4-5"

DIN 433 A
Size: M3-M36

NFE 25-514(Z,M&L)
Size: M3-M16

DIN 6798 SERRATED LOCK (A,J&V)
Size: M3-M24

ISO7089 A 200HV
Size: M3-M64

DIN 440 R
Size: M5-M16

NFE 25-511 (Z,M&L)
Size: M3-M20

DIN 9250 SS
Size: M3-M20

DIN988 SHIM RINGS
Size: 3-20mm

DIN94/ISO1234 SPLIT PINS
Size: 2-10mm



We offer high-quality products made from materials such as stainless steel, duplex stainless steel, and high-temperature, high-pressure alloy steel.

Hardware

DOWEL SCREWS(ASSEMBLING)
Size: M10&M12
Length: 150-300mm

MOUNTING RAIL CONNECTOR, 4-Hole

ADJUSTING PLATE FOR M10&M12

ROUND SEAM CLAMPS

ROOF HOOKS

LOWERED BRACKETS

STANDING SEAM CLAMPS

ROOF HOOKS - 3 WAYS ADJUSTABLE

ROOF HOOK FOR SLATE ROOFS,ADJUSTABLE



Type of grade	Symbol ^b	ISO 15510 Steel number ^c	European designation		Designation in ASTM standards UNS	USA Common designation
			Steel number ^c	Steel designation		
Molybdenum containing austenitic	A4	4401-316-00-I	1.4401	X5CrNiMo17-12-2	S31600	316
	A4L	4404-316-03-I	1.4404	X2CrNiMo17-12-2	S31603	316L
	A4L	4406-316-53-I	1.4406	X2CrNiMoN17-11-2	S31653	316LN
	A4L	4432-316-03-I	1.4432	X2CrNiMo17-12-3	S31603	316L
	A4L	4435-316-91-I	1.4435	X2CrNiMo18-14-3	S31603	316L
	A4	4436-316-00-I	1.4436	X3CrNiMo17-13-3	S31600	316
	A4	4578-316-76-E	1.4578	X3CrNiCuMo17-11-3-2	-	-
	A5	4571-316-35-I	1.4571	X6CrNiMoTi17-12-2	S31635	316Ti
	A2L	4307-304-03-I	1.4307	X2CrNi18-9	S30403	304L
	A2L	4306-304-03-I	1.4306	X2CrNi19-11	S30403	304L
General purpose austenitic	A2L	4311-304-53-I	1.4311	X2CrNiN18-9	S30453	304LN
	A2	4301-304-00-I	1.4301	X5CrNi18-10	S30400	304
	A2	4567-304-30-I	1.4567 ^d	X3CrNiCu18-9-4	S30430	304Cu
	A2	-	1.4560	X3CrNiCu19-9-2	-	304Cu
	A2	4303-305-00-I	1.4303	X4CrNi18-12	S30500	305
	A3	4550-347-00-I	1.4550	X6CrNiNb18-10	S34700	347
	A3	4541-321-00-I	1.4541	X6CrNiTi18-10	S32100	321
	c	4615-201-75-E	1.4615	X3CrMnNiCu15-8-5-3	-	201Cu
	c	4310-301-00-I	1.4310	X10CrNi18-8	S30100	301
	A8	4478-083-67-U	1.4478	X2NiCrMoN25-21-7	N08367	-
High molybdenum Super-austenitic	A8	4529-089-26-I	1.4529	X1NiCrMoCuN25-20-7	N08926	"926"
	A8	4547-312-54-I	1.4547	X1CrNiMoCuN20-18-7	S31254	F44
Highly alloyed austenitic for special purposes	SD ^{fg}	4980-662-86-X	1.4980	X6NiCrTiMoVB25-15-2	S66286	A286 Alloy 660
	S ^f	-	1.4986	X7CrNiMoBNb16-16	-	-
	e	4539-089-04-I	1.4539	X1NiCrMoCu25-20-5	N08904	904L
	e	4841-314-00-E	1.4841	X15CrNiSi25-21	S31400	314
	c	4828-305-09-I	1.4828	X15CrNiSi20-12	-	-
	c	4845-310-08-E	1.4845	X8CrNi25-21	S31008	310S
	c	4020-241-00-X	1.4020	X13CrMnNiN18-13-2	S24100	XM28
High manganese super-austenitic	c	4378-240-00-X	1.4378	X6CrMnNiN18-13-3	S24000	XM29
	SB ^{fg}	-	2.4952	NiCr20TiAl	N07080	Alloy 80A
Nickel alloy	718 ^g	-	2.4668	NiCr19NbMo	N07718	Alloy 718
	D2 ^h	4482-320-01-X	1.4482 ⁱ	X2CrMnNiMoN21-5-3	S32001	2001
Duplex	D2 ^h	4362-323-04-I	1.4362 ^j	X2CrNiN23-4	S32304	2304
	D4	4162-321-01-E	1.4162 ^j	X2CrMnNiN21-5-1	S32101	2101
	D4	4062-322-02-U	1.4062 ^j	X2CrNiN22-2	S32202	2202
	D6	4462-318-03-I	1.4462	X2CrNiMoN22-5-3	S31803,S32205	1803,2205
	D6	4481-312-60-J	1.4481	X2CrNiMoN25-7-3	S31260	SUS329J4L ⁱ
	D8	4410-327-50-E	1.4410	X2CrNiMoN25-7-4	S32750	2507
	D8	4501-327-60-I	1.4501	X2CrNiMoCuWN25-7-4	S32760	-
	D8	4507-325-20-I	1.4507	X2CrNiMoCuN25-6-3	S32520	-

Application domain

Sales Area

Aerospace



High speed railway



Nuclear power



Car industry



Solar power



Wind power



Shipbuilding industry



Intelligent industry



UHC Group's products have earned the trust of customers worldwide for their exceptional quality and reliability. We have established long-term partnerships with many globally renowned companies, providing high-quality fasteners and hardware solutions to industries such as automotive, aerospace, energy, and construction. Whether for standard or customized products, UHC always prioritizes customer needs, delivering efficient and precise services. Our global supply chain network and advanced production technologies ensure fast delivery and compliance with the stringent requirements of diverse markets. Choosing UHC means choosing a reliable partner that stands alongside the world's leading enterprises.

Appendix

◎ Application Prospects of Duplex Stainless Steel

Duplex stainless steel has a broad application prospect in many fields due to its excellent performance. The following are its main application prospects:

1. Oil and gas

Applications: Used in submarine pipelines, storage tanks, pressure vessels, etc.
 Advantage: Corrosion resistance, high strength, suitable for harsh environments.

2. Chemical

Application: Used in reactor, heat exchanger, storage tanks, etc. Advantage: Chemical corrosion resistance, prolong the life of the vessel.
 Advantage: chemical corrosion resistance, prolong the life of equipment.

3. Desalination

Application: Used for pipelines and pressure vessels in desalination equipment.
 Advantage: seawater corrosion resistance, to ensure long-term operation of equipment.

4. Construction

Application: Used in bridges, building structures, curtain walls, etc.
 Advantage: High strength, corrosion resistance, and improved structural durability.

5. Energy

Application: Used for pipelines and pressure vessels in nuclear power and thermal power equipment.
 Advantage: high temperature and corrosion resistance, to ensure the safety of equipment.

6. Transport

Applications: Structural parts and components for ships, trains and automobiles.
 Advantage: Light weight, corrosion resistance, improve transport efficiency.

7. Environmental protection

Application: Used in wastewater treatment equipment, flue gas desulphurisation devices.
 Advantage: corrosion-resistant, wear-resistant, adaptable to complex environments.

8. Food Processing

Application: Used in food processing equipment, storage tanks, etc..
 Advantage: corrosion-resistant, easy to clean, in line with health standards.

9. Medical

Application: Used in medical devices, implants, etc..
 Advantage: good biocompatibility, corrosion resistance.

10. Emerging Fields

Application: Used in 3D printing, new energy equipment.
 Advantage: Adapt to the needs of new technologies and promote material innovation.

Summary

Duplex stainless steel with its excellent corrosion resistance, high strength and good processing performance, in many areas show a wide range of application prospects, the future with the advancement of technology, the scope of its application will be further expanded.

◎ Why Do Stainless Steel Products Rust?

Stainless steel products rust primarily due to damage to their protective surface layer, usage environment, and chemical composition. Below are the specific reasons:

1. Damage to the Protective Surface Layer

- Mechanical Damage: Scratches or abrasions on the surface can damage the protective layer, exposing the internal metal and causing rust.
- Chemical Corrosion: Strong acids, alkalis, and other chemicals can damage the protective layer, leading to rust.

2. Usage Environment

- Humid Environments: High humidity or prolonged exposure to water can accelerate rusting.
- Salt Spray Environments: Salt spray in coastal or industrial areas can damage the protective layer, causing rust.
- High-Temperature Environments: High temperatures can accelerate chemical reactions, increasing the risk of rust.

3. Chemical Composition

- Impurity Elements: Impurity elements (such as sulfur and phosphorus) in the material can reduce corrosion resistance.
- Insufficient Alloying Elements: Insufficient alloying elements like chromium and nickel can affect the formation of the protective layer, reducing corrosion resistance.

4. Processing Techniques

- Welding Defects: Improper welding can reduce the corrosion resistance of the welded area.
- Improper Heat Treatment: Incorrect heat treatment processes can affect the material's corrosion resistance.

5. Improper Maintenance

- Incomplete Cleaning: Failure to promptly remove surface dirt or impurities can damage the protective layer.
- Damaged Protective Coatings: Failure to repair damaged protective coatings in time can accelerate rusting.

Summary

The reasons for rusting in stainless steel products include damage to the protective surface layer, harsh usage environments, issues with chemical composition, defects in processing techniques, and improper maintenance. Proper material selection, processing techniques, and maintenance measures can effectively prevent rust.

Appendix

◎ Why are stainless steel products magnetic?

Stainless steel products exhibit magnetism primarily due to their chemical composition, crystal structure, and processing techniques. Below are the specific reasons:

1. Chemical Composition

- Ferritic and Martensitic Stainless Steels: These contain a higher proportion of chromium and a small amount of nickel, making them ferromagnetic and thus magnetic.
- Austenitic Stainless Steels: These have a higher proportion of nickel and manganese, typically making them non-magnetic. However, they may develop slight magnetism after cold working.

2. Crystal Structure

- Ferritic Stainless Steels: The crystal structure is body-centered cubic (BCC), which is ferromagnetic.
- Martensitic Stainless Steels: The crystal structure is body-centered tetragonal (BCT), which is also ferromagnetic.
- Austenitic Stainless Steels: The crystal structure is face-centered cubic (FCC), usually non-magnetic. However, cold working can partially transform it into martensite, resulting in magnetism.

3. Processing Techniques

- Cold Working: Processes like cold rolling and cold drawing can cause partial transformation of austenitic stainless steel into martensite, thereby inducing magnetism.
- Heat Treatment: Different heat treatment processes can affect the crystal structure and magnetism of stainless steel.

4. Microstructure

- Phase Transformation: During processing or use, austenitic stainless steel may undergo phase transformation, forming magnetic martensite.
- Impurities and Alloying Elements: Impurities and certain alloying elements can also influence magnetism.

5. Application Environment

- Temperature and Stress: Under high temperature or stress conditions, austenitic stainless steel may undergo phase transformation, resulting in magnetism.

Summary

The magnetism of stainless steel mainly depends on its chemical composition, crystal structure, and processing techniques. Ferritic and martensitic stainless steels are usually magnetic, while austenitic stainless steels are typically non-magnetic but may develop slight magnetism after cold working.

◎ How to reduce magnetism in stainless steel products?

To reduce the magnetism or demagnetize stainless steel products, appropriate measures need to be taken based on the type of stainless steel and the cause of magnetism. Below are specific methods for different situations:

1. Austenitic Stainless Steel (e.g., 304, 316)

- Issue: During cold working (e.g., cutting, bending, stamping), some austenite in austenitic stainless steel may transform into martensite, causing the material to exhibit weak magnetism.
- Solutions:① Annealing Treatment: Heat the stainless steel to a high temperature (approximately 1050° C to 1100° C) and then rapidly cool it (water quenching or air cooling). This method can restore the austenitic structure and reduce or eliminate magnetism.② Avoid Excessive Cold Working: Minimize cold deformation during processing to reduce the likelihood of martensite transformation.③ Select Low-Magnetic Materials: Choose solution-treated austenitic stainless steel during procurement to ensure its initial state is non-magnetic.

2. Ferritic Stainless Steel (e.g., 430)

- Issue: Ferritic stainless steel has a body-centered cubic (BCC) crystal structure, which is inherently magnetic and cannot be fully demagnetized by conventional methods.
- Solutions:① Change Material: If non-magnetic properties are strictly required, consider switching to austenitic stainless steel (e.g., 304, 316).② Surface Treatment: Use methods like electroplating or coating to reduce the impact of surface magnetism on appearance.

3. Martensitic Stainless Steel (e.g., 410, 420)

- Issue: Martensitic stainless steel has a body-centered tetragonal (BCT) crystal structure, exhibiting strong magnetism that cannot be removed by conventional methods.
- Solutions:① Change Material: If non-magnetic properties are essential, consider switching to austenitic stainless steel.② Limit Application Scenarios: Martensitic stainless steel is typically used in applications like cutlery and bearings, where magnetism is not a concern.

4. Duplex Stainless Steel (e.g., 2205)

- Issue: Duplex stainless steel consists of both austenite and ferrite phases, typically exhibiting weak magnetism.
- Solutions:① Annealing Treatment: High-temperature annealing can partially reduce magnetism but cannot completely eliminate it.② Optimize Composition: Choose duplex stainless steel with lower ferrite content to reduce magnetism.

5. General Demagnetization Methods

- AC Demagnetization: Place the stainless steel product in an alternating magnetic field and gradually reduce the field strength to weaken or eliminate magnetism.
- Heat Demagnetization: Heat the stainless steel above the Curie temperature (approximately 750° C) and then cool it slowly to remove magnetism. However, this method may affect the material's mechanical properties and should be used with caution.

Appendix

6. Preventive Measures

- **Select Appropriate Materials:** Choose the right type of stainless steel based on the application. If non-magnetic properties are required, prioritize austenitic stainless steel (e.g., 304, 316).
- **Control Processing Techniques:** Avoid excessive cold deformation during processing to reduce the likelihood of martensite transformation.
- **Regular Maintenance:** Regularly clean and maintain stainless steel products to prevent surface contamination and damage.

Conclusion

Reducing magnetism or demagnetizing stainless steel products requires targeted measures based on the material type and the cause of magnetism. For austenitic stainless steel, annealing and avoiding excessive cold working are effective methods. For ferritic and martensitic stainless steels, due to their inherent crystal structures, complete demagnetization is usually not possible, and changing materials or optimizing application scenarios is recommended.

