EHISEN HANDBOOK OF PRODUCT

SHAANXI EHISEN TECHNOLOGY CO., LTD.

METALLIC MATERIAL

Shaanxi Ehisen Technology Co., Ltd.

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COMPANY PROFILE

The company is founded in 2004 as a high-tech enterprise focused on advanced metal material production, including melting, profiling, machining, and precious metal anode research and development. With a 15 mu area and 50 employees, our company specializes in advanced manufacturing.

The company has equipment for alloy production, rolling, heat treatment, and stamping. Processing centers, electroplating, titanium anode production lines and precious metal coating laboratory, as well as related testing equipment. After years of development, it has become a comprehensive company integrating R&D, production, and sales.

The company is grounded in Baoji City, Shaanxi Province, known as "Titanium Valley of China ," with the advantage of a complete metal processing industry chain. We work together with local enterprises to establish an innovation platform and produce advanced new energy accessories. we are focusing on providing high-quality products and services, including customized metal deep process parts, R&D supporting, and modular product design and production.

Shaanxi Ehisen Technology Co., Ltd.

COMPANY INDUSTRY MODULE

Research Topic

Modeling-Template Product of titanium alloys, refractory alloys, medical and aerospace grade materials, nickel-based superalloys, high-performance special materials, etc.

Material Manufacturing

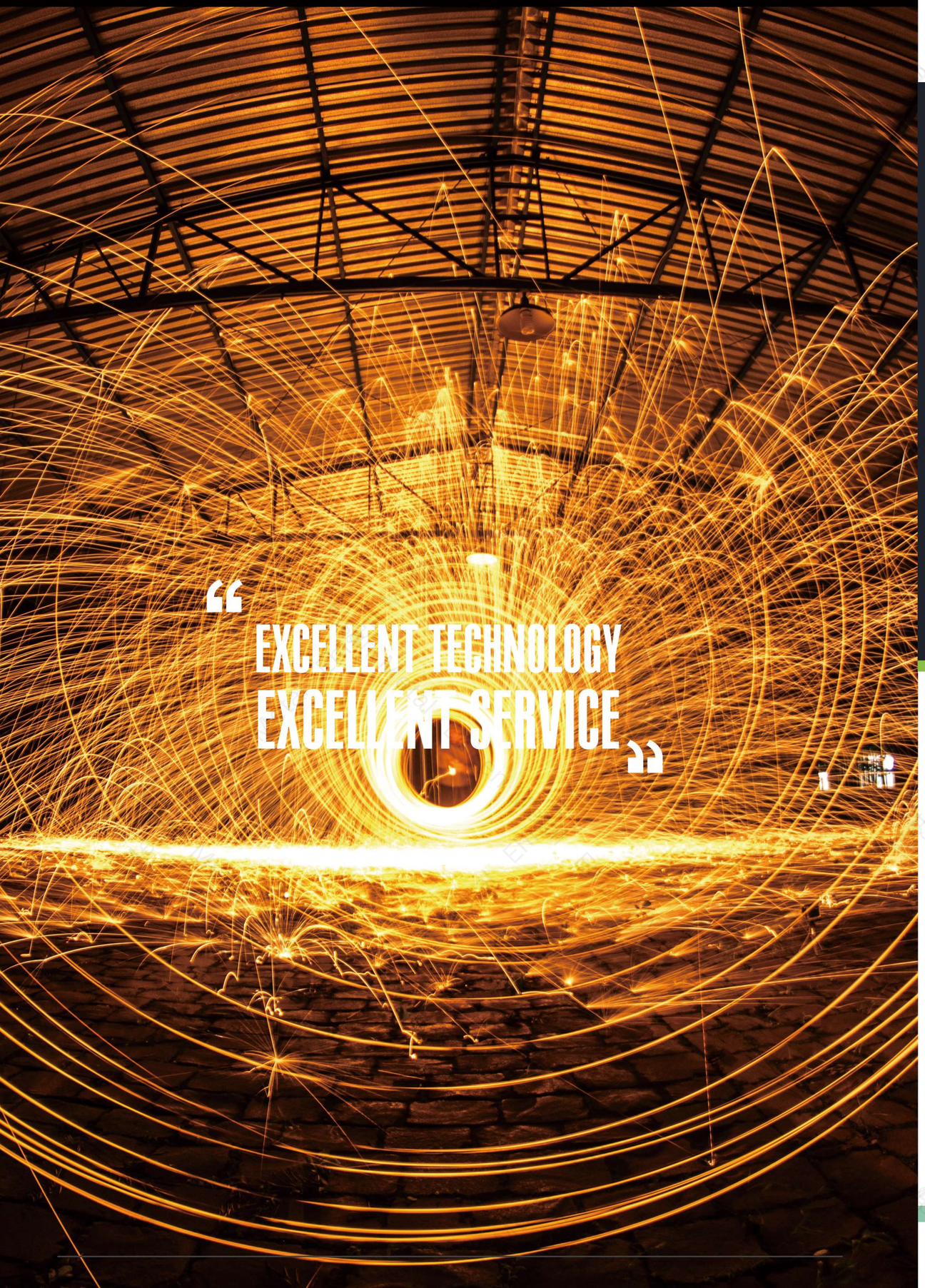
The alloy of tungsten-copper, titanium-tantalum, high-vanadium, niobium-carbon, tungsten-carbon, etc.

Metal forming field

High-end metal materials and processed parts, coated titanium electrode products, SOFC/SOEC module accessories.

Future Perspective

The technology of metal rolling and welding processing, precious metal oxide coating, precision machining, etc.



Main Products

- Modeling-Template Product of high-performance rare metal materials
- Titanium, Nickel, Tungsten and Molybdenum deep processing product
- Noble electrode via advanced manufacturing
- SOFC/SOEC device components
- Aerospace grade high-end titanium material goods

CERTIFICATES OF PRODUCT

Shaanxi Ehisen Technology Co., Ltd.

DEVELOPMENT HISTORY

Our factory was established in 2004 with a primary focus on smelting, forging, and rolling of metal materials, our company specializes in processing, researching, and developing basic rare metal alloy profiles.

2010

Introducing advanced equipment and measuring devices to improve our processing capacity of metal materials.This allows us to establish a processing center focused on metal materials and be transformed to our product structure towards higher quality, deep-processing products.

2019

In 2019, our company set up an R&D lab with Chinese universities and senior technical engineers to develop and test precious metal electrodes and metal oxide. We are continually improving our processing technology and optimizing product costs to achieve mass production of titanium anode products.

2020

In 2020, based on the superb base material production capacity, advanced molding machine processing technology.and various welding technology experience, the industrial module of SOFC/SOEC accessories products is formed.

2023

Shaanxi Ehisen Technology Co., Ltd. is established to promote our excellent products to customers all over the world. And with years of deep experience in the industry, we will provide you with the highest quality project solutions and simple and efficient procurement experience.

Metallic material

- **Modeling-Template Product of aerospace-garde high-end titanium alloy**
- **High Entropy Alloy OEM/ODM Products**
- **SOFC/SOEC accessories**
- **Tungsten, molybdenum, nickel and titanium deep processing products**

AEROSPACE-GRADE HIGH-END TITANIUM ALLOY

High-strength titanium alloy:

High-strength titanium alloy is composed of near-β titanium alloy and metastable β-titanium alloy, which mainly replaces high-strength steel load-bearing structural parts, sheet metal parts, and fasteners commonly used in aircraft structures, and can reduce More than 40% of the weight.



Damage tolerance titanium alloy:

As the main material of aircraft structures, Titanium alloy Needs to meet the design requirements of damage capacity by reducing alloy gap elements (C, N, O, etc.) content and β treatment processes (including β processing and β thermal treatment) to improve the damage tolerance of titanium alloy.



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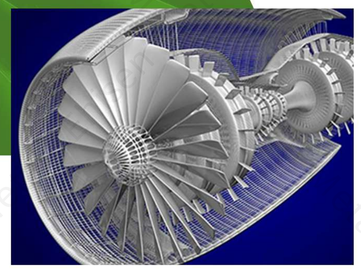
Heat-resistant titanium alloy:

Heat-resistant titanium alloy has a high room temperature and high-temperature strength, high durable strength and creep resistance, and has a good match between thermal stability and fatigue performance. It is mainly used to make rotating and bearing parts of aero engines.



Flame-retardant titanium alloy:

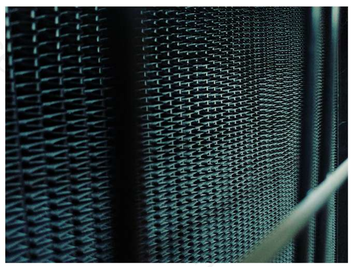
It is a high-alloyed heat-resistant titanium alloy with an anti-titanium fire function. It is mainly suitable for high-temperature, high-pressure, and high-speed airflow environments or oxygen-rich medium, such as the high-pressure compressor environment of aero-engines.



Corrosion-resistant titanium alloys:

Improve the corrosion resistance of titanium materials in corrosive environments, add precious metal elements, such as platinum (Pt), palladium (Pd), ruthenium (Ru), etc., to promote the formation and stability of oxide films, and also add nickel (Ni), molybdenum (Mo) and other economic elements, while improving the corrosion resistance and strength of the alloy. Corrosion-resistant titanium alloys can divide into marine and chemical titanium alloys according to their uses.

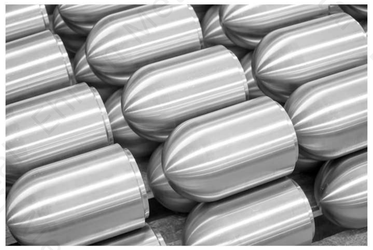




Remark: We offer customized processing for high-end titanium alloy products of varying sizes to meet all your needs.

HIGH ENTROPY ALLOY OEM/ODM PRODUCTS

High-entropy alloys (HEAs) are alloys that are formed by mixing equal or relatively large proportions of (usually) five or more elements. Prior to the synthesis of these substances, typical metal alloys comprised one or two major components with smaller amounts of other elements.
Our company has a vacuum electron beam melting furnace, with many years of excellent melting and forging technology, we can produce titanium-tantalum alloy, tungsten-copper alloy, high-vanadium alloy, silver-copper alloy and other products according to your requirements.



SOFC/SOEC ACCESSORIES

Our company produces SOFC/SOEC solid fuel cell supporting devices which include a series of corrugated pipes, plate heat exchangers, thermocouples, and custom machined products. Made of imported nickel-based alloys, our products are optimized according to our experience or designed based on your specific parameters. We offer complele pre-, during-, and after-sales services with technical support to ensure excellent customer satisfaction.

● Plate heat exchanger series products

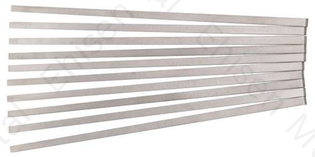
Inconel 600

Standard: ASTM B366 (forging) ASTM B168 (plate/foil) ASTM B166 (bar)

Elemental Components

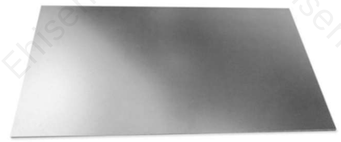
ELEMENT	%	Ni	Cr	Fe	Mn	Cu	Si	S	C	Nb	P
STANDARD	MNi	≥72	14.0	6.0	--	--	--	--	--	--	--
	MAX	--	17.0	10.0	1.0	0.50	0.50	0.015	0.15	1.0	0.04

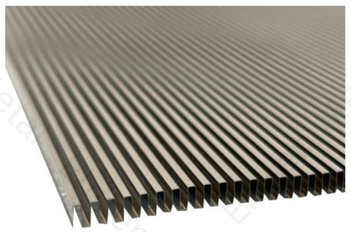
Inconel 600 is a nickel-chromium-iron based solid solution strengthening alloy with excellent resistance to high temperature corrosion and oxidation. It is highly versatile with excellent cold and hot working and welding properties. It possesses satisfactory high-temperature strength below 700℃ and high ductility. Its strength can be enhanced through cold working.



SUPPORT SQUARE ROD SERIES PRODUCTS	
PRODUCT SPECIFICATION	3 mm*4 mm, 4 mm*6 mm, 4 mm*12 mm
DIMENSIONAL TOLERANCE	±0.01~0.03 mm
MATERIALS	Inconel 600 and other high heat-resistant nickel-based alloys, etc.
OTHER TECHNICAL REQUIREMENTS	Deburring, sharp edge blunt, *Ra* 3.2

PARTITION/COVER PLATE SERIES PRODUCTS	
PRODUCT SPECIFICATION	Thk0.4 mm、0.8 mm、1.0 mm、2.0 mm、4.0 mm、6.0 mm
DIMENSIONAL TOLERANCE	±0.01~0.05 mm
MATERIALS	Inconel 600 and other high heat-resistant nickel-based alloys, etc.
OTHER TECHNICAL REQUIREMENTS	Parts must be free of distortion and free from pits and scratches on the surface. *Ra* 6.3
FLATNESS	0.015 mm/100 mm

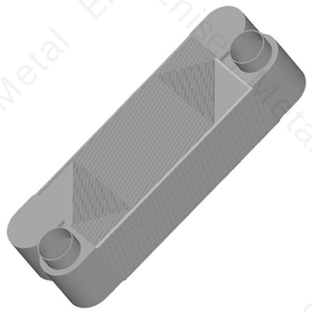




BACKFLOW HEAT EXCHANGE CORRUGATED PLATE PRODUCTS	
PRODUCT SPECIFICATION	Thk0.076 mm*H4 mm
SUBSTRATE THICKNESS TOLERANCE	Thk±0.013 mm
CORRUGATED PLATE THICKNESS TOLERANCE	Thk±0.0254 mm
MATERIALS	Inconel 600 and other high heat-resistant nickel-based alloys, etc.
OTHER	Size can be customized according to customer drawings

ULTRA-THIN HIGH TENSILE FOIL TAPE	
PRODUCT SPECIFICATION	Thk0.076 mm*W200 mm、Thk0.15 mm*W200 mm、Thk0.4 mm*W200 mm
DIMENSIONAL TOLERANCE	Thk±0.013 mm
MATERIALS	Inconel 600 and other high heat-resistant nickel-based alloys, etc.
OTHER TECHNICAL REQUIREMENTS	The surface must be free from defects including scratches, cracks, dents or any abnormal deformations that may cause irregularities.

PLATE HEAT EXCHANGER PRODUCTS



● Metal support series products for stacks

445 ferritic heat-resistant stainless steel

The 445 steel exhibits excellent flexibility and ductility under solution annealing conditions, but can provide excellent performance with good corrosion resistance, high hardness, toughness, and strength by a single precipitation or aging treatment.

Elemental Components

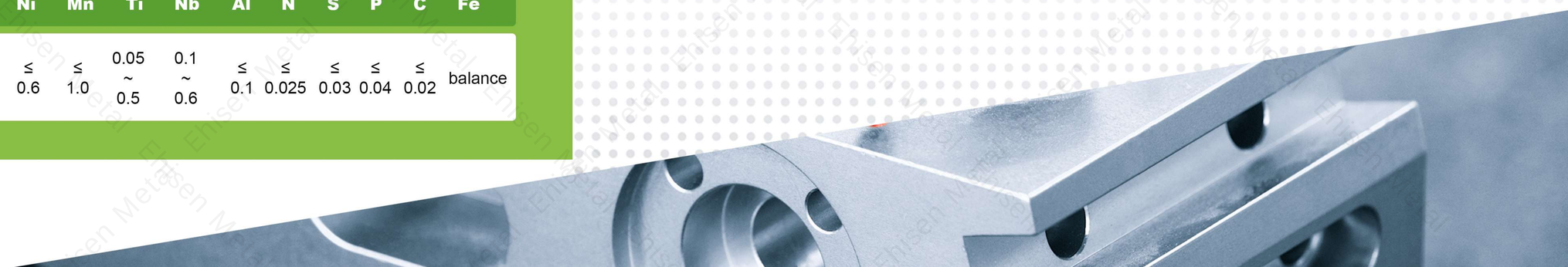
ELEMENT	Cr	Mo	Si	Ni	Mn	Ti	Nb	Al	N	S	P	C	Fe
WT%	22±1	1~1.5	≤ 0.25	≤ 0.6	≤ 1.0	0.05 ~ 0.5	0.1 ~ 0.6	≤ 0.1	≤ 0.025	≤ 0.03	≤ 0.04	≤ 0.02	balance

Shaanxi Ehisen Technology Co., Ltd.

Physical properties

PROJECT	TYPICAL VALUE	PROJECT	TYPICAL VALUE
MAXIMUM TEMPERATURE AVAILABLE	~1000°C (Maintain ferrite structure in this temperature range)	TENSILE STRENGTH, ULTIMATE	＞500MPa(plate)
THERMAL CONDUCTIVITY	＞20W/m-K	HARDNESS, VICKERS HARDNESS TESTER	＞150
SPECIFIC HEAT CAPACITY	＞0.45J/g.°C	DENSITY	7.7±0.1g/cc
CTE,LINEAR 850℃	12.3±0.3×10^-6(1/K)	SURFACE CONDITION	2B surface-
RESISTIVITY	＜6.5e - 5Ω.cm	HIGH TEMPERATURE OXIDATION RESISTANCE	Oxidation at 900°C for 50 hours, the oxide layer on the steel surface does not fall off, and the weight gain △W≤s5μg/m ㎡

END PLATE&COVER PLATE	
PRODUCT SPECIFICATION	Thk20 mm~Thk36 mm
DIMENSIONAL TOLERANCE	Thk±0.3 mm
MATERIALS	445 ferritic heat-resistant stainless steel, 444 ferritic stainless steel, etc.
OTHER	Size can be customized according to customer drawings



● Pipe series products

Inconel 625

Standard: ASTM B564 (forging) ASTM B443 (plate/foil) ASTM B444 (pipe)

Elemental Components

ELEMENT	%	Ni	Cr	Mo	Mn	Cu	Co	Fe	C	Nb	Al
STANDARD	min	balance	20.0	8.0	--	--	--	--	--	3.15	--
	max	balance	23.0	10.0	0.5	0.07	1.0	5.0	0.10	4.15	0.4

Inconel 625 is a precipitation strengthened nickel-based high-temperature alloy, mainly reinforced with molybdenum and niobium. It exhibits excellent corrosion and oxidation resistance, and maintains good tensile and fatigue properties from low temperatures up to 980℃. Additionally, it is highly resistant to stress corrosion in saline environments. As a result, Inconel 625 can be widely utilized in the manufacturing of airplane engine components, aerospace structural parts, and professional chemical equipment.

METAL BELLOWS SERIES PRODUCTS	
PRODUCT NAME	Gas piping, air piping components, flareless bellows, flanges, etc.
PRODUCT SPECIFICATION	The size can be customized according to the customer's drawing or the specification can be calculated according to the parameters
MATERIALS	Inconel 600、Inconel 625、SUS 444、310S, etc.
WELDING AIR TIGHTNESS TECHNICAL REQUIREMENTS	The detection pressure is 0.3 MPa, hold the pressure for 10min

● Other SOFC/SOEC customized products

Inconel 601

Standard: ASTM B366 (forging) ASTM B168 (plate/foil) ASTM B166 (bar)

Elemental Components

ELEMENT	%	Ni	Cr	Al	Mn	Cu	Si	Fe	C	Nb	P
STANDARD	min	58.0	21.0	1.0	--	--	--	balance	--	--	--
	max	63.0	25.0	1.70	1.0	1.0	0.50	balance	0.10	1.0	0.03

Inconel 601 is a nickel-chromium alloy with excellent oxidation resistance at temperatures up to 1200°C. It forms a dense oxide layer that prevents oxidation in harsh cyclic heat environments. The alloy also maintains exceptional high-temperature strength and toughness over prolonged periods. In addition, Inconel 601 exhibits excellent corrosion resistance under oxidizing conditions, but is not recommended for use in highly-reducing sulfidizing environments.

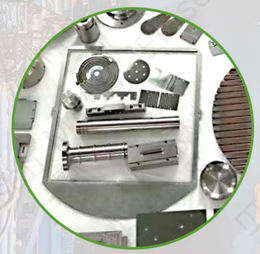
THERMOWELL PRODUCTS	
PRODUCT SPECIFICATION (MM)	3*20, 3*50, 3*60, 3*100, 3*200, etc. Wall thickness 0.5
THERMOCOUPLE DIMENSIONAL TOLERANCE	Length tolerance ± 0.5 mm
AIR TIGHTNESS TECHNICAL REQUIREMENTS	The detection pressure is 0.1~0.3 MPa, keep the pressure for 10 minutes, no abnormal sound, no leakage
OTHER TECHNICAL REQUIREMENTS	Laser welding, *Ra* 3.2~6.3, can be customized according to drawings

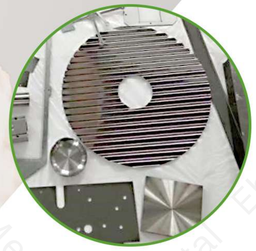
TUNGSTEN, MOLYBDENUM, NICKEL AND TITANIUM DEEP PROCESSING PRODUCTS

Our company has electron beam furnaces for metal smelting, forging presses for improving the mechanical properties of materials, and five-axis machining centers for precision machining. We can control product performance from raw materials and customize production according to drawings.

TUNGSTEN AND MOLYBDENUM DEEP PROCESSING PRODUCTS	
MATERIAL	Pure tungsten, pure molybdenum, tungsten alloy, molybdenum alloy, etc.
SPECIFICATION	Foil, plate, rod, wire, tube and customized processing according to customer drawings
PRODUCT FEATURES	1. High density 2. High strength 3. High-temperature resistance 4. Low pollution 5. Strong service life

NICKEL AND TITANIUM DEEP PROCESSING PRODUCTS	
MATERIAL	Pure titanium, pure nickel, titanium alloy, nickel alloy, nickel-titanium memory alloy, etc.
SPECIFICATION	Foil, plate, rod, wire, tube and customized processing according to customer drawings
PRODUCT FEATURES	1. Lightweight 2. High strength 3. High-temperature resistance 4. Corrosion resistance 5. Environmentally friendly metal 6. Good heat transfer performance



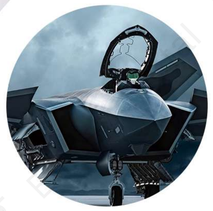



EHISEN METAL MATERIAL APPLICATION


ARTIFICIAL SATELLITES


SEAWATER DESALINATION PIPES


OFFSHORE OIL DRILLING PUMPS


FUSELAGE PARTS


PROPELLER

Shaanxi Ehisen Technology Co., Ltd.

COMPANY'S FACILITY


MELTING EQUIPMENT


FORGING EQUIPMENT


PLATE ROLLING EQUIPMENT


MACHINING CENTER


PIPE PRODUCTION EQUIPMENT


FIELD EMISSION SCANNING ELECTRON MICROSCOPY


NORMAL TEMPERATURE TENSILE TESTING MACHINE

OPTICAL DETECTOR

CMM

OUR COMPANY SPECIALIZES IN HIGH-END MANUFACTURING.

We are focusing on providing high-quality products and services,including customized metal deep process parts, R&D support, and modular product design and production.

PARTNER COMPANY

佛燃能源 FORAN ENERGY

A.O.SMITH 史密斯

VAREX IMAGING

CCTC 三环集团

ALFA LAVAL

CSSC

BAOTi

BPEC

ET Enterprises electron tubes

SILVER RAVEN

SALUPO INNOVATION TECHNOLOGY

BOSCH Invented for life