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脉诺®

金属表面处理设备 EQUIPMENT
金属表面处理药剂 CHEMICAL REAGENT
金属表面处理加工 PROCESSING

Electrochemical Surface Processing Equipment

Electrochemical Polishing Production Line for Electrochemical-Mechanical Abrasive Polishing
Anodizing Processing Micro-arc Oxidation Chemical Passivation
Electrochemical Coloring Electrochemical Deburring Electrochemical Cleaning

脉诺®

CONTENTS

COMPANY INTRODUCTION

Shanghai Mirror Metal Surface Treatment Technology Co. Ltd., is a high-tech enterprise specialized in manufacturing metal surface treatment equipment and reagents, developing process and new technologies for surface treatment on metals such as stainless steel, aluminum alloy, magnesium alloy, titanium alloy. The company possesses a significant number of related technology patents and products with intellectual properties, aiming at providing the first-class service to the clients with its expertise and innovative spirit.

Mirror has a team of experienced professions specialized in metal surface treatment processes, including senior surface treatment experts, technical supporting forces from the campus, and top professions with rich practical experiences.

Mirror strives to continuously improve the quality of the enterprise and its employees, and innovate and improve the products to the clients. We hope to win the recognition and support from our customers with sincerity and a down-to-earth attitude.The company is currently cooperating with many universities and research institutes in various fields, continuously exploring new materials, new technologies, new processes and other areas, and continually catering to the market's demand for metal surface treatment technologies.

金属表面处理设备
EQUIPMENT

Fully Automatic Production Line for Anodic Oxidation of Aluminum Alloy, Production Line for Anodic Oxidation of High Silicon casted Aluminum Alloy, Production Line for Self-lubricating Anodic Oxidation of Aluminum Alloy, Hard Anodic Oxidation Production Line of Normal Temperature for Aluminum Alloy, Production Line For Antimicrobial Anodic Oxidation of Aluminum Alloy, Anodizing Production Line Of Aluminum Foil, Micro-arc Oxidation Equipment for Aluminum Alloy, Titanium Alloy and Magnesium Alloy, Anode Oxidation Equipment for Titanium Alloy, Production Line for Chemical Passivation of Aluminum Alloy ;

Electrochemical Polishing Production Line for Stainless Steel, Electrochemical Passivating Equipment for Stainless Steel, Pickling and Passivation Equipment for Stainless Steel, Electrochemical Deburring Machining Equipment, Color Oxidation Equipment For Stainless Steel, Electrochemical Machining Equipment, Plasma Polishing Equipment, Fully Automatic Electrochemical Polishing, Cleaning and Drying Equipment for Vacuum Insulation Cup of Stainless Steel;

Production Line for Tungsten Alloy Coating in place of Hard Chromium Coating ;

Chemical Cleaning Equipment, Ultrasonic Cleaning Equipment, Electroplating Equipment, and various production lines for automatic metal surface treatment.

金属表面处理药剂
CHEMICAL REAGENT

Nickel Free Sealing Reagent, Acid-resisting and Alkali-resisting Sealant, Chromium-free Passivating Reagent, Anodic Oxidation Stabilizer of High Silicon casted Aluminum Alloy, Hard Oxidation Additives of Normal Temperature, Smokeless Chemical Polishing Reagent, Aluminum Alloy Acid Cleaning Reagent, Aluminum Alloy Weak Alkaline Degreasing Reagent, Aluminum Alloy Neutral Degreasing Reagent;

Environmental-friendly Electrochemical Polishing Liquid for Stainless Steel (two types: "phosphorus-free" and "chromium-free"), Electrochemical Passivating Liquid for Stainless Steel, Environmental-friendly Chemical Passivating Liquid for Stainless Steel, Environmental-friendly Chemical Passivating Liquid for Stainless Iron, Pickling and Passivating Liquid (Paste) for Stainless Steel.

DEFINITION OF ELECTROCHEMICAL SURFACE TREATMENT

Electrochemical surface processing is to use electrochemical methods to form a functional film on the surface of the workpiece to improve the workpiece' s environmental adaption or appearance. It includes electrochemical polishing, electrochemical passivation, electrochemical oxidation, electrochemical deburring, electrochemical coloring, and electrochemical cleaning on metals or metal alloys and etc.

Please note that electrochemical surface processing mentioned above is different from electroplating. Electrochemical surface processing requires the workpiece to be placed on the anode (positive electrode) and form a functional film on its surface, and the film is integrated with the workpiece matrix. While, electroplating requires the workpiece to be placed on the cathode (negative electrode), the principle is to combine another substance on the surface of the workpiece, which has a risk of falling off.

INTRODUCTION OF ELECTROCHEMICAL SURFACE PROCESSING EQUIPMENT

1 The electrical cabinet is made of thickened plastic-sprayed steel plate with forced ventilation

2 Electrical components produced by prestigious brands

3 Solid relay controls the start-stop system of the heater

4 Equipped with supporting tablet or touch screen operation interface

5 Equipped with liquid reagent cooling system (optional)

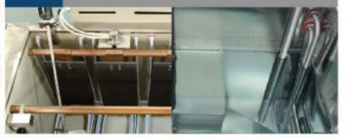
6 The tank is made from high quality A grade PP or medical grade stainless steel plate

7 Equipped with high quality PPH pipes, fittings or medical grade stainless steel pipes

8 Equipped with online detection on the reagent' s proportion, acidity and PH value (optional)

9 Equipped with reagent circulation filtration system

10 PTFE, titanium alloy or stainless steel 316L heater



11 All the power supplies are produced by prestigious brands

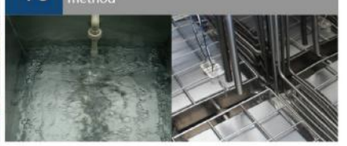
12 Equipped with up and down lifting mechanism (optional)

13 The conductive rod is made of copper material, and the cathode plate is supported by a short-circuit protective cover

14 Waterproof stainless steel control switch

15 Equipped with acid mist absorption system

16 Adopt ultrasonic or air bubbling cleaning method



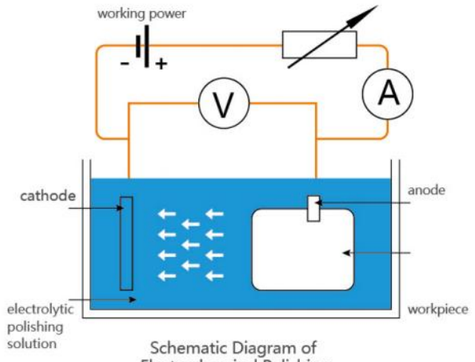
ELECTROCHEMICAL POLISHING EQUIPMENT

Definition of EP

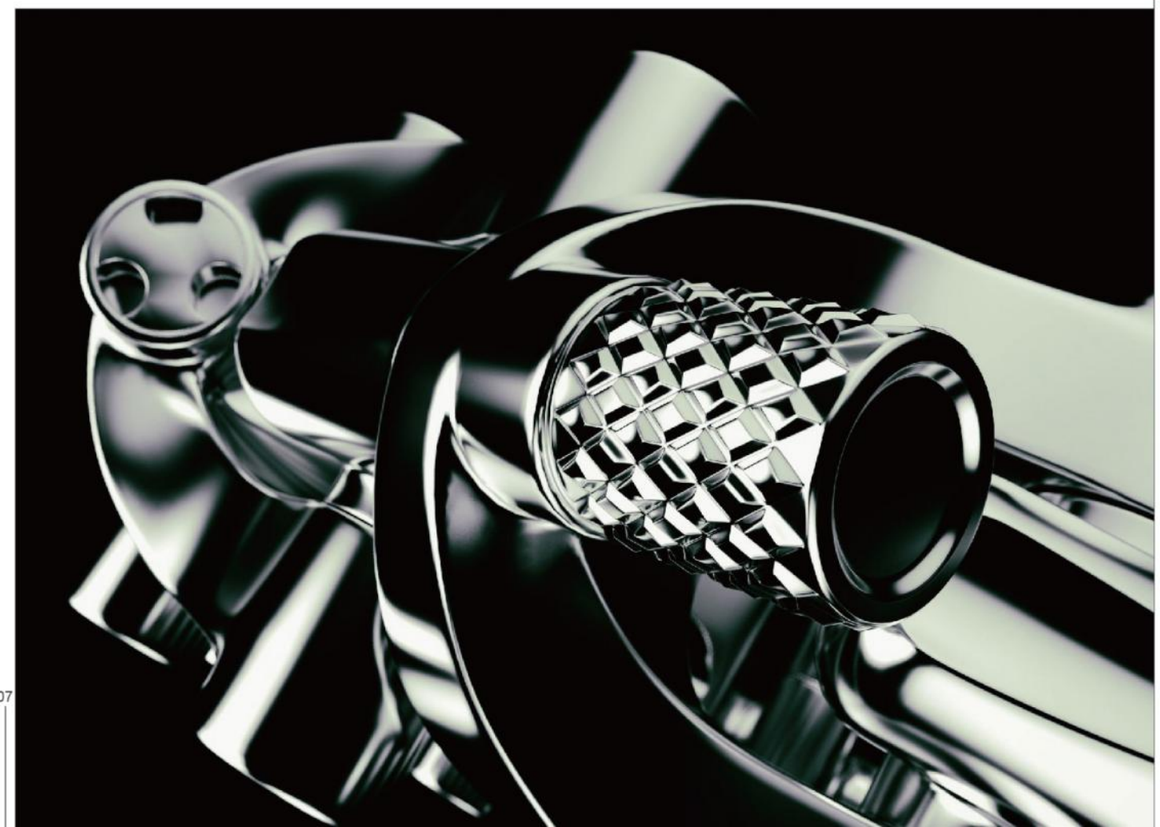
Electrochemical polishing is also known as electrolytic polishing and electropolishing. The process applies a polished workpiece as the anode and an insoluble metal as the cathode, and the electrodes will be immersed in the electrochemical polishing tank together. Direct currents will be applied in the tank to produce selective anode dissolution to increase the workpiece's brightness.

Principle of EP

Electrochemical polishing is based on the theory of mucous membrane. The metal ions separated from the workpiece and the polishing solution's components will form a thin metal salt film attached to the workpiece's surface. This mucosa is thinner in the convex parts and thicker in the concave portions because the convex parts' current densities are high, and the mucosa dissolves quickly. As the mucosa flows, the unevenness changes continuously, and the rough surfaces are gradually leveled; Microscopically level the surface of the workpiece to reduce the surface roughness;



Schematic Diagram of Electrochemical Polishing



Advantage of EP

- Microscopically level the surface of the workpiece to reduce the surface roughness;
- Improve the corrosion resistance of the workpiece surface;
- The surface of the processed workpiece is easy to clean, and less liable to accumulate garbage and breed bacteria;
- The inner and outer colors are consistent, the gloss is long-lasting, and the concave parts that cannot be polished through mechanical polishing will be leveled;
- High production efficiency and low cost;
- Can find hidden defects on the surface of the product;
- Can remove burrs on the surface of parts;
- No Beilby layer will be produced.

Application Area

Pharmaceutical machinery, medical devices, vacuum electronics, semiconductors, aeronautics and astronautics, dairy equipment, food machinery, environmental protection equipment, chemical equipment, precision machinery, stainless steel products, water treatment systems, fluid transmission equipment, petrochemical equipment, textile machinery, paper making machinery, polysilicon, auto parts, hardware tools, crafts and accessories, and etc.

Material Application

Austenitic stainless steel (301, 302, 303, 304 (L), 316 (L)), martensitic stainless steel (410, 420, 430, 440A, 440B, 440C), 201, 202, copper alloy, aluminum alloy, nickel-based alloy, chromium-based alloy, titanium alloy, magnesium alloy, Monel alloys, tungsten alloy, and etc.

Typical Flow of EP

Electrochemical Polishing Corrosion Apparatus

Equipment parameters	Electrochemical Polishing Corrosion Apparatus
Total power of the equipment	2KW
Input parameters	220V ± 10%, 50Hz ± 10%, three-phase five-wire system
Output parameters	0 ~ 80V ± 0.01V, 0 ~ 10A ± 0.01A
Working time setting	1s ~ 99min
Soft start	✓
Protection method	overcurrent, short circuit, phase loss, overheating automatic protection, text prompt
Working method	long-term continuous work
Power cooling method	air-cooling
Equipment dimensions	380X325X210mm
Ambient temperature	-25℃ ~ 40℃
Ambient humidity	≤ 80%

The equipment is used in small-scale experimental development and metallographic structure research, and has a small size, complete functions, a user-friendly operation interface, and high control accuracy. It is suitable for experimental researches on various materials.
It has touch screen operation mode;
It has real-time display of the curve of voltage and current with time;
It has program storage function; and voltage, current, temperature are constantly displayed in real-time;
It can communicate with the computer; output and save data; connect to the printer to communicate and output;
The equipment can be equipped with a constant temperature tank; heating method: thermoelectric cooling; has a magnetic stirring function; has a temperature detection function;
It can switch automatically between voltage stabilization and steady flow;
It can communicate with the computer and save data;

METAL SURFACE TREATMENT COMPLETE SOLUTION PROVIDER · MIRROR

Pilot Electrochemical Polishing

It is suitable for expanded workpiece production and customers with a small number of electrochemical polishing processes; the equipment has a small footprint, is easy to use and simple to operate, and requires little investment.

Equipment parameters	Basic Type of EP Equipment
Total power of the equipment	15 ~ 30KW
Input parameters	380V ± 10%, 50Hz ± 10%, three-phase five-wire system
Output parameters	0 ~ (12-25) V ± 0.01V, (300-1000) A ± 1A
Working time setting	1s ~ 59min
Soft start	✓
Protection method	overcurrent, short circuit, phase loss, overheating automatic protection
Working method	long-term continuous work
Power cooling method	air-cooling
Equipment dimensions	Following customer requirements
Ambient temperature	-25℃ ~ 40℃
Ambient humidity	≤ 80%

It is integrated trial design and production;
It only includes four processes: electrochemical polishing, primary cleaning, passivation and secondary cleaning;
The production material of the cathode plate is graphite;
It is equipped with protective casing for workpiece short-circuit damage;
It uses electric heater with PTFE material for electrochemical polishing solution heating;
It prepares air stirring device;
It can be transportable, which is convenient for customers.

Standard Electrochemical Polishing

The production is built on the typical process of electrochemical (electrolytic) polishing, the whole process is available and meets the requirements of certain mass productions and factories with strict processing requirements. The process is complete, the control precision is high, the processing quality is stable and guaranteed, and it is able to carry out large-scale production and processing.

The production line has refined production and processing flow;
It can be equipped with flowing water circulation, and has high cleaning efficiency;
It uses electric heater with PTFE material for electrochemical polishing solution heating;
The temperature of each heating tank is adjustable, and equipped with functions such as constant temperature control, water level control, and heating protection;
The Line includes electrochemical polishing processes such as degreasing, derusting, electrolytic polishing, passivation, neutralization, cleaning, drying.

Equipment parameters	Standard Electrochemical Polishing
Total power of the equipment	45 ~ 80KW
Input parameters	380V ± 10%, 50Hz ± 10%, three-phase five-wire system
Output parameters	0 ~ (12-25) V ± 0.01V, (1500-3000) A ± 1A
Working time setting	1s ~ 59min
Soft start	⊗
Protection method	overcurrent, short circuit, phase loss, overheating automatic protection
Working method	long-term continuous work
Power cooling method	air-cooling
Equipment dimensions	based on the actual situation
Ambient temperature	-25℃ ~ 40℃
Ambient humidity	≤ 80%

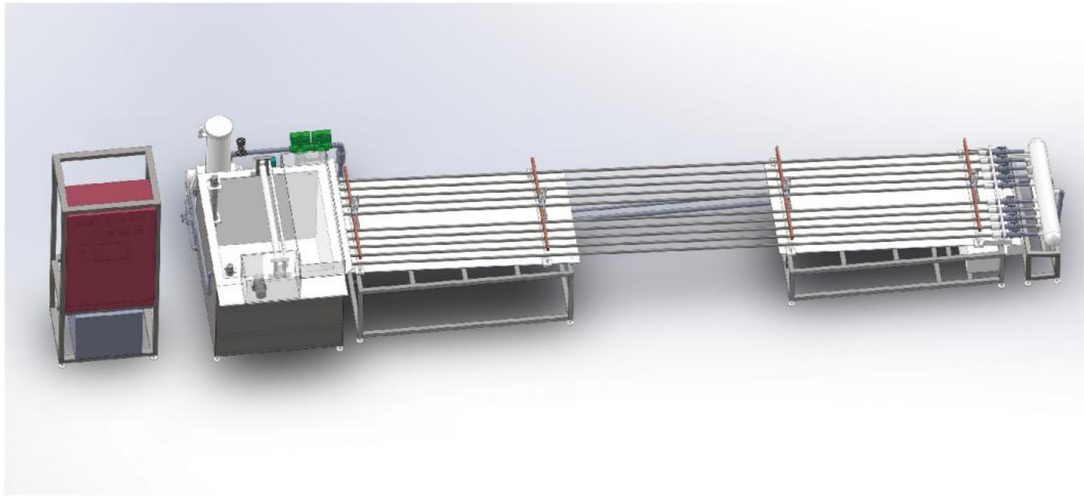
Electrochemical Polishing Automated Production Lines

The equipment is for fully automated production of electrochemical polishing. The entire process (such as electrolytic polishing, cleaning, passivation, neutralization) is completed automatically, and all operations can be performed on the touch screen, without direct contact by personnel, reducing the possible harm to the operating staff during the process. The parameters of the execution module can be stored, which is convenient for retrieval and use, and the production efficiency is high.
It is especially suitable for occasions with limited types and mass processing.
The automated production line consists of two types: single-arm type and gantry type, according to the processing volume of a single batch. The single-arm type can be used in the occasions with a small processing volume and continuous processing and production; the gantry type is suitable for the case with a large processing volume or a sizable single workpiece.

Features:
1. The processing production line can be a fully automatic production process, greatly reducing labor intensity, operating staff, operating risks, and production costs;
2. The electrochemical polishing solution adopts the environment-friendly formula and does not contain heavy metals (hexavalent chromium), which greatly reduces the harm to the environment. The sewage treatment cost is low and can be certified by ROHS; it has low energy consumption, long life and lower cost;
3. The tank body is made of high-quality PP, PVD or stainless steel. The tank body has heat resistance and corrosion resistance. The exterior is reinforced with a steel structure to ensure the long-term service life of the equipment;
4. The operation is all carried out on the touch screen, and has two modes for users to choose: automatic and manual;
5. The set parameters can be saved to ensure that the mature processing technology can be retrieved and easy to use;
6. The user levels corresponds to different permissions. A user can access with the corresponding password, which is safe and convenient for management;
7. The production line has program saving function for power failure or other fault alarms. After the power is restored and the fault is removed, the subsequent program can continue to be executed;
8. The electrical control accessories are all made by Schneider, Omron, Fuji and other large manufacturers, with reliable quality and stable performance;
9. The electric heating uses heaters with materials of PTFE, pure titanium, stainless steel and others, which can be designed in accordance with customer demands. The structure is compact and the heating effect is good; constant temperature control, flow water circulation, adjustable temperature in each tank, water level control, heat protection;
10. The anode and cathode materials can be made of copper, aluminum, stainless steel, graphite, lead and other materials in accordance with the customer demands, and metal titanium with strong acid resistance is used as the processing hanger, which has a long service life and low operating cost.
11. System matching functions: ultrasonic cleaning, online detection of potion proportion, acidity, and PH value, electrolytic polishing solution circulating filtration system, acid mist recycling system, power supply protection system;

Equipment parameters	Electrochemical Polishing Automated Production Lines
Total power of the equipment	80 ~ 300KW
Input parameters	380V ± 10%, 50Hz ± 10%, three-phase five-wire system
Output parameters	0 ~ (12-25) V ± 0.01V, (3500-6000) A ± 1A
Working time setting	1s ~ 59min
Soft start	⊗
Protection method	overcurrent, short circuit, phase loss, overheating automatic protection
Working method	long-term continuous work
Power cooling method	air-cooling or water-cooling
Equipment dimensions	based on the actual situation
Lifting method	gantry or single-arm
Ambient temperature	-25℃ ~ 40℃
Ambient humidity	≤ 80%

Electrochemical Polishing Equipment of Stainless Steel Inner Tube



This equipment is a special electrochemical polishing equipment for the electrochemical polishing of the inner side of high-purity stainless steel pipes in the area such as semiconductor, vacuum, pharmaceutical, food. The electrochemical polishing solution flows in the tube, and the processing electrode (negative) is exceptionally mobile, and the gas generated during the process is discharged out of the pipe with the solution.

high degree of automation, high production efficiency, can be applied to mass production, stable quality, low processing cost, good polishing quality, high luminance.

Equipment specifications and performance indicators:

SPECIFICATION	UNIT	MIR-TEP-0	MIR-TEP-1	MIR-TEP-2	MIR-TEP-3	MIR-TEP-4
Machinable pipe diameter	mm	≤Φ5	Φ6~13	Φ14~32	Φ33~89	≥Φ89
Machinable tube length	mm	≤2000	2000~4000	4000~6000	4000~6000	4000~8000
Equipment power	kw	≤30	36	48	48	≥60
Single processing amount	Piece	10~20	10~15	5~10	1~5	1~5
Auxiliary electrode		mobile	mobile	mobile	stationary	stationary
control method		manual or automatic				
Processing quality grade		in accordance with customer demands				
control precision		≤1%				
Environment condition		0℃~50℃				

Note: Special processing specifications and sizes can also be customized in accordance with customer demands.

Handheld Electro-Brush Polishing Device

This equipment is for workpieces that require partial electrochemical polishing due to damage caused by other reasons after partial or overall electrochemical polishing. It helps avoid overall re-polishing caused by partial polishing effect damage. For some large-scale equipment, partial repair is more convenient and has a lower cost.

After the treatment, the luminance is high, and the finish is excellent. Also, the mirror surface treatment helps maintain the highlight effect of the mirror surface.

Equipment parameters	Handheld Electro-Brush Polishing Device
Power of the equipment	1.2KW
Input parameters	22V ± 10%, 50Hz ± 10%, three-phase five-wire system
Protection method	overcurrent, short circuit, phase loss, overheating automatic protection
Working method	long-term continuous work
Power cooling method	air-cooling
Operating parameter accuracy	voltage 0.1v, current 1A
Ambient temperature	-25℃ ~ 40℃
Ambient humidity	≤ 80%
Polishing method	Brush polishing

Equipment operation process

1 / Prepare wrapping　2 / Dip the potion　3 / Start to work

Comparison between electro-brush electrochemical polishing and immersion electrochemical polishing:

No.	Compare Content	Immersion	Electro-brush
1	Electric Polishing Effect	Good	Average
2	Processing Efficiency	High	Low
3	Processing Cost	Low	High
4	Operating Temperature	Need Heating	Normal Temperature
5	Harm To Human Body	No	No
6	Use Potion Formula	Environment Friendly	Environment Friendly
7	Minimum Roughness	0.1 ~ 0.2μM	≤0.1Mm
8	Best Luminance	Average	Excellent

Electrochemical Polishing Equipment of Tank

The stainless steel electrochemical polishing equipment of tank is for the internal and external electro-polishing of tank products. There are two ways of implementation, rolling, and full immersion.
The rolling type requires little electro-polishing solution, the power consumption is low, the initial investment cost is low, and the rolling can adopt a stepless rate per customer needs.
Full immersion, as the name implies, is to immerse the entire tank in the potion, and the process can be completed at one time. The processing time is short, the consistency is better than the rolling type, and it is very suitable for mass production. However, the electro-polishing requires more potion, the power consumption is high, and the initial investment cost is high.

Electrochemical Polishing Equipment of Plate

The stainless steel electrochemical polishing equipment of plate is designed and manufactured based on cathode automatic walking, and the walking distance and speed are adjustable, the processing quality is stable, the reproducibility is high, and the output is high. Stainless steel plate processing size is not subject to any restrictions.
The equipment can also be used for stainless steel plate electrochemical etching.

Electrochemical Polishing on Wires (Tapes, Threads, Coils)

This special equipment is for electrochemical polishing on wires (such as tapes, threads, coils). The unwinding, electrochemical polishing, cleaning, and rewinding can be conducted at the same time, and the production line can be completed at one time.
The equipment enables high output, low processing cost, stable quality and high efficiency.

Electrochemical Polishing Equipment of Scroll Mode

The equipment is for the situations that hanging electrochemical polishing is not available, or the processing cost is high, for example, the electrochemical polishing for small workpieces such as screws, nuts, and needles. Place the workpieces in the drum, and conduct electro-polishing while rolling the drum. The rolling speed can be adjusted according to the actual needs, which can ensure the polishing effect of all workpieces and protect the polished workpieces from damage.

Electrochemical Passivating Equipment

Electrochemical passivation is from the principles of electrochemistry. The process forms a layer of infusible dense, firm composite film with oxide or multiple compounds on the metal surface. Since the electrochemical reaction is strong, the passivation film formed from it has excellent corrosion resistance.
On the one hand, after electrochemical passivation, a passivation film is formed on the stainless steel matrix surface and is integrated with its matrix. It does not adhere to the surface like a coating, and therefore, it does not shed; on the other hand, the surface maintains the previous surface treatment state after the process-for example, mirror polishing or brushed surface. After electrochemical passivation, the surface remains the original effect without visible appearance change; while, its corrosion resistance is much higher than the original state. The operational test shows that the salt fog resistance test on stainless steel can be improved by many orders of magnitude after the electrochemical passivation.

The process of electrochemical passivation:

Cleaner for Welding of Stainless Steel

The device can help quickly remove the hot oxide scale produced by welding. It is small in size, light in weight, and portable. It can be washed directly with clean water after removing the weld bead oxide and can be widely used in factories and engineering project sites.
The bead treatment cloth is a material resistant to strong acid corrosives, and has a long service life and does not require frequent replacement. It has relatively high operating efficiency and low cost.
There are two types of potions for welding bead treatment, one is acidic, and the other is neutral, both of which adopt environmentally friendly formulas, non-toxic substances, and can be SGS certified. There are no environmentally friendly discharge control requirements on the neutral potion, and this type of potion dramatically reduces the harm to the operators during the process.

Application:
It applies to stainless steel parts and plates, such as 304, 316, 316L, 321, 301, 202, 201, and their equipment. The machine can remove the rusts and oxide scales on the surfaces of the materials mentioned above, as well as the yellow, blue, and black dirt and oil generated during welding, such as weld spots. After cleaning, the surface becomes silvery white;

Features:
1. Cleaning is fast and thorough, and does not need mechanical grinding;
2. No damage to the machine materials, restore the original color and gloss of stainless steel;
3. Dramatically reduce labor intensity and improve production efficiency;
4. Convenient to use, use at normal temperature, can carry out degreasing and derusting at the same time;
5. Equipped with leakage protection function, safe and reliable.

There is no need to use acid passivation solution and acid paste to remove scale.

Caution: For your safety, it is recommended to provide relevant protective measures during the operation.

ANODIZING PROCESSING EQUIPMENT

Definition of anodic oxidation

Anodizing is the electrochemical oxidation process for metal or alloy. The method uses metals (such as aluminum) or alloy parts as anodes. An oxide film is formed under corresponding electrolytes, specific process conditions, and applied current during the process.

Anodizing applies the electrochemical method to form an oxide film on a surface. It changes the state and performance of the surface, including changing the surface coloration, improving corrosion resistance, enhancing wear resistance and hardness, and protecting metal surfaces. For example, aluminum anodizing placed aluminum or aluminum alloy in the corresponding electrolyte (such as sulfuric acid, chromic acid, oxalic acid, etc.) and use it as the anode. The anodizing process happens under specific process conditions and applied current. Once aluminum or aluminum alloy on the anode is oxidized, a thin layer of aluminum oxide will be formed on the surface. The coating thickness is 5-30 microns, while the film generated from the hard anodizing process can reach 25-150 microns. After anodizing, the surface hardness and wear resistance of aluminum or aluminum alloy is improved to 250～500kg/mm2. The surface has good heat resistance. The melting point of a hard-anodized film is as high as 2320K. It also has excellent insulation and resistance, and the breakdown voltage is as high as 2000V. The anodizing process also enhances the surface' s corrosion resistance, and the surface does not corrode in ω=0.03NaCl salt spray for thousands of hours.

Material Application

Various types of aluminum alloy, magnesium alloy, titanium alloy and other materials;

Application Area

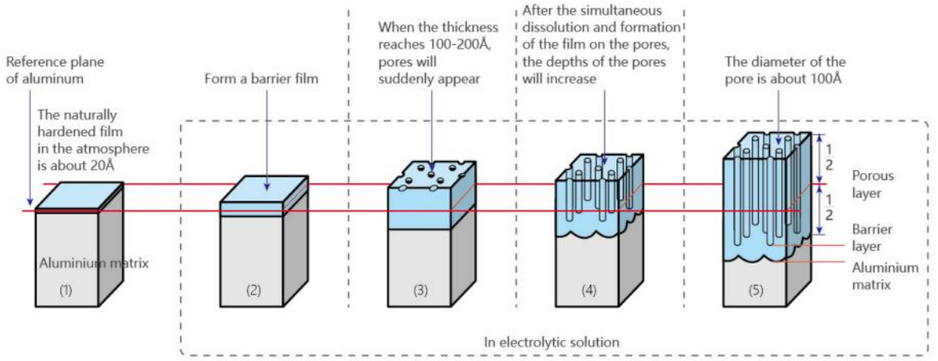
Building materials, hardware and electrical appliances, mobile phone accessories, auto parts, aeronautics and astronautics, precision manufacturing, household appliances, 3C products, textile machinery, medical devices, electronic products and other fields.

Anodizing Mechanism

The mechanism for generating anodized films is a very complex physical and (electro) chemical process. The anodized film's formation process goes through repeated generating and dissolving processes, and an oxide film is gradually formed through the process.

The whole method consists of the following three processes. The first process is the formation process of the barrier layer that occurs in the initial stage of anodization, which produces a dense film with poor conductivity on the surfaces of the aluminum and its alloy base materials. The film's hardness is higher than the porous film. The second process is the dissolution process of the barrier layer. The anodizing voltage will gradually reach the highest value in the whole process, and the thickness of the barrier layer will slowly get the peak. The third process is the formation of the porous layer. The areas with the lowest thickness on the oxide film will gradually dissolve, and pores will occur. The electrolyte penetrates the aluminum's surface and its alloy base material through the pores generated by the film dissolution and helps the anodization continue and keeps forming anodized films.

The three processes are recurrent and simultaneous. The generation of new oxide films and the dissolution of other oxide films happen at the same time. When the new oxide film's generation rate is greater than the dissolution rate, the oxide film will gradually grow thicker. When the generation rate is the same as the dissolution rate, the anodized film will be forming steadily.



The growth process model of oxide film

Standard Anodizing Process of Aluminum Alloy

Fully Automatic Production Line of Anodic Oxidation

The production line is for mass production of aluminum, magnesium, and titanium alloy anodizing, and the production process can be fully automated;
The entire production process (such as degreasing, chemical polishing, alkaline etching, oxidizing, coloring, sealing, drying, cleaning) can all be operated on the touch screen (tablet computer);
The operating system is a three-level management mode, which is convenient for safety management;
The equipment power supply adopts invertible transmission technology. The output current is high and low frequency pulsed direct current. Compared with the traditional power supply, the power conversion rate is higher, and the power frequency, duty cycle, current, and voltage values can be adjusted as needed;
During the entire production process, the transportation of the workpieces is completed by multiple cranes;
The tank body is made of high-quality PP, PVDF or stainless steel. The tank body is resistant to low temperature and corrosion and is equipped with an air stirring device. Even stirring can make the heat of the solution in the tank more uniform;
After strict calculation of the equipment cooling capacity, the energy efficiency ratio is optimal, and the refrigeration system accessories are selected from Copeland, Bitzer, Taikang, Danfoss, Emerson, and other major products;
Refrigeration compressors are equipped with start-up delay protection to prevent damage to the compressor caused by frequent start-ups; after power failure and other fault alarms, the program has a self-save function. After the power is restored and the fault is removed, it can continue to execute subsequent programs;

The electrical control mode can be selected from manual and automatic modes. The automatic mode is realized by "touch screen (tablet computer) + PLC," which can carry out convenient storage and retrieval of various parameters, and can also communicate with external computers through the interface;
The electrical control components are selected from Schneider, Siemens, Omron, Fuji, Mitsubishi, and other prestigious manufacturers;
Constant temperature control, water level control, heating protection, active water circulation, self-adjustable temperature in each tank;
The operator is not in direct contact with the potion, which reduces the possible harm to the operator during the production process;
The system matching items also include: ultrasonic cleaning, online detection of potion proportion, acidity, and PH value, anodizing solution circulating filtration system, acid mist recycling system, power supply protection system, original record preservation, and others;

It is especially suitable for production occasions with mass processing.

Single-arm Automatic Production Line of Anodic Oxidation

It is mostly consistent with the function of the fully automatic anodizing production line;
It is specially used for small workpieces, and its one-time processing capacity is less than the former;
A single-arm manipulator is used for lifting, and multiple cranes can be configured according to the production cycle;
It is a servo motor drive mode. The up and down movements and walking speed are adjustable;
Maximum load weight ≤50KG;
It has a high degree complete automation, high production efficiency, and demands few operators, and has low processing cost;
We use copper and aluminum as the primary materials for the conductive part of the cathode and anode materials to ensure excellent conductivity. The cathode plate is made of stainless steel, graphite, lead, and other materials;
The anode workpiece hanger uses a titanium alloy with excellent acid resistance;

It is suitable for anodizing occasions with high requirements, limited types, and large quantities.

Production Line of Anodic Oxidation for High Silicon High Copper Casted Aluminum Alloy

The production line is for anodizing of high silicon high copper casted aluminium. It solves the problem that the high silicon high copper casted aluminum is hard to be anodized.
By adjusting the processing technology parameters, the thickness of the high silicon high copper casted aluminum anodized film can be above 30um, and the highest can be above 50um;
By adjusting the processing parameters, the hardness (Hv) of the anodized film layer can be 400-500;
It can be anodized in a wide temperature range of 10 ~ 20 ℃;
The oxidized film is hard and has excellent wear resistance;
It has excellent salt spray etching resistance and fastness to sunlight (UV resistance);

With proper post-treatment, the wear resistance of the film layer is further improved, the friction coefficient is greatly reduced, and the service life is longer;
There are two kinds of anodizing methods: sulfuric acid method and oxalic acid method. The process has broad applicability and stable oxidation;
A high degree of automation, simple operation, and stable quality.

The standard process of high silicon casted aluminum anodizing:

Hard Anodizing Production Line of Normal Temperature for Aluminum Alloy

It is mostly consistent with the function of the fully automatic anodizing production line;
It is specially used for small workpieces, and its one-time processing capacity is less than the former;
A single-arm manipulator is used for lifting, and multiple cranes can be configured according to the production cycle;
It is a servo motor drive mode. The up and down movements and walking speed are adjustable;
Maximum load weight ≤50KG;
It has a high degree complete automation, high production efficiency, and demands few operators, and has low processing cost;
We use copper and aluminum as the primary materials for the conductive part of the cathode and anode materials to ensure excellent conductivity. The cathode plate is made of stainless steel, graphite, lead, and other materials;
The anode workpiece hanger uses a titanium alloy with excellent acid resistance;

The standard process of aluminum alloy hard anodizing under normal temperature:

Production Line of Self-lubricating Anodic Oxidation For Aluminum Alloy

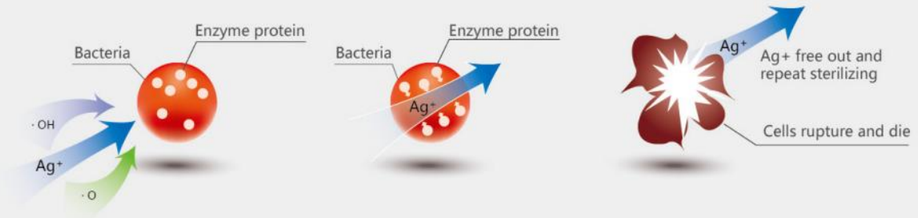
In the process of aluminum alloy hard oxidation, the ultrafine lubrication factor is introduced into the micro-pores of the hard oxide film to prepare a composite film with self-lubricating properties, which improves frictional damping;
Combined with the company's normal temperature hard oxidation process, it can be used in the temperature range of 10 to 15 ° C. Under the same hardness, the friction performance can be improved by multiple times or even tens of times, and the friction coefficient can be as low as 0.1 or less;
This process consists of a one-step method and a two-step method. The one-step method is to immerse the anti-friction lubrication factor into the micro-pores of the anodized film during anodization to achieve one-time completion. The two-step method is to immerse the workpiece into the anti-friction lubrication factor solution and complete the manual line, semi-automated line, and fully automatic line in two steps.

The standard process of anti-friction self-lubricating anodizing:

Production Line of Antimicrobial Anodic Oxidation for Aluminum Alloy

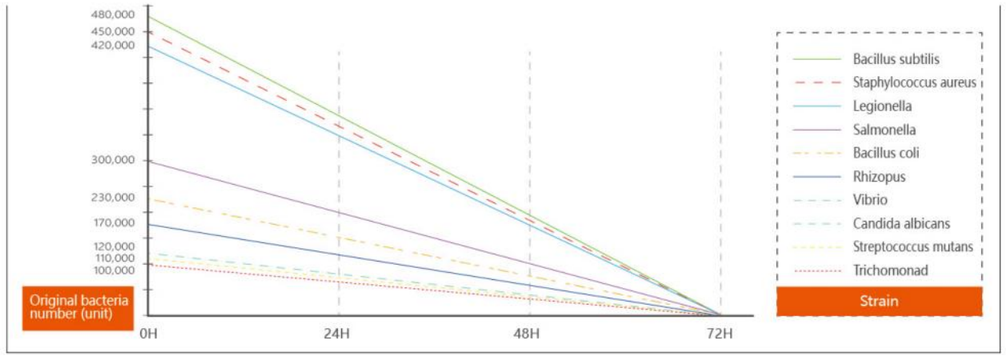
Mirror' s antimicrobial anodizing technology has the following advantages:

1. Good antibacterial and antifungal effect;
2. Low cost;
3. Good thermal conductivity;
4. Anti-static function;
5. High hardness and good wear resistance;
6. Excellence heat and fire resistance;
7. Corrosion resistance and fading resistance;
8. UV protection;



Ag^+ Sterilization Mechanism Diagram

Number Variation of Bacteria



The experiment shows that the number of escherichia coli and staphylococcus aureus is less than 10 in 2 hours, and we can take it that they cannot be detected.

The process of antimicrobial anodizing:

Anodizing Production Line of Aluminum Foil

This production line is a special machine for continuous oxidation processing of aluminum foil rolls. It can continuously produce if it is not stopped. Both the front and rear rewinding and unwinding machines are equipped with a tension adjustment device to ensure that the aluminum foil runs smoothly without wrinkling or folding. The company can customize the production line following the size, film thickness, quality, technical requirements, and production capacity of the aluminum foil. The size and quantity of the tank, process procedures, power, and footprint of the production line are all designed according to actual needs.
The equipment can be used in the formation of aluminum foil, hydrophilic (hydrophobic) coating aluminum foil, and other functional aluminum foils.

The process of aluminum foil anodizing:

Micro-arc Oxidation Equipment for Aluminum Alloy, Titanium Alloy and Magnesium Alloy

This equipment is used for micro-arc hard oxidation surface treatment for metals such as aluminum alloy, magnesium alloy, titanium alloy. It uses the micro-arc discharge phenomenon to make micro-plasma oxidation reactions on the surface of the anode of the workpiece, and generate high-quality reinforced ceramic films on the surface of the workpiece made of metals such as aluminum, titanium, magnesium and their alloys. The equipment dramatically improves the surface wear resistance, corrosion resistance, insulation resistance, and heat resistance of the workpiece. The process and equipment enable fast film-forming speed, high film hardness, and simple procedures; the metal surface with films has high wear resistance, high insulation, and high corrosion resistance.

The standard process of micro-arc hard anodizing:

Equipment specifications and performance indicators:

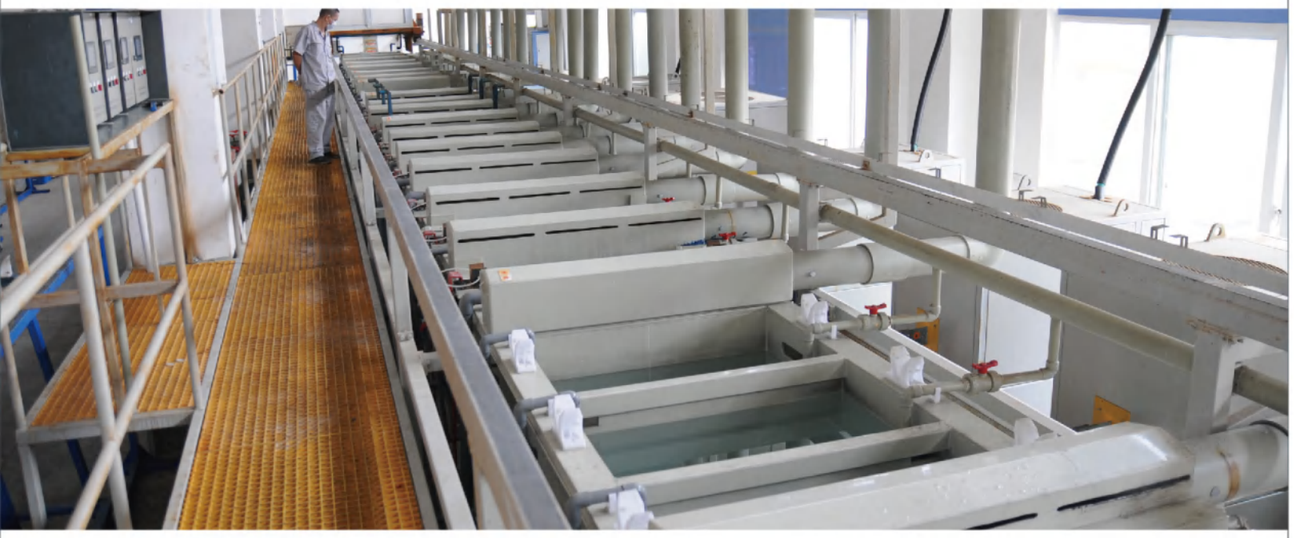
Specifications	Unit	MIR-MAO-TI	MIR-MAO-MG	MIR-MAO-AL
Machinable materials		titanium, titanium alloy	magnesium, magnesium alloy	aluminum, aluminum alloy
The output voltage	V	0 ~ 300	0 ~ 500	0 ~ 750
Equipment power	kw	30 ~ 450, 50Hz±10%, three-phase five-wire system		
Oxide film thickness	um	0 ~ 100	2 ~ 150	40 ~ 300
Film hardness	Hv	300 ~ 1200	300 ~ 1200	400 ~ 2500
Neutral salt spray test	h	≥1000	48 ~ 500	≥500
Wear resistance		Increase by 3 to 30 times	Increase by 3 to 30 times	Increase by 8 to 50 times
Oxide film color		gray, gray black	gray white	gray white, gray black
Bonding strength with substrate		axial tension >60Mpa shear >25Mpa	axial tension >70Mpa shear >30Mpa	axial tension >70Mpa shear >35Mpa
Flexibility		average	good	good
Working power		positive and negative pulse power supply, duty cycle (5 ~ 95%), (100 ~ 2000Hz) adjustable		
Auxiliary cathode		316L stainless steel		
Control method		manual or automatic		
Processing quality		in accordance with customer demands		
Control precision		≤1%		
Protection method		overcurrent, short circuit, phase loss, overheating protection		
Environment condition		ambient temperature: 0 ℃ ~ 50 ℃, ambient humidity: ≤80%		
Cooling method		configured refrigeration unit, refrigeration temperature: 0 ~ 20 ℃		

Note: According to the requirements, the positive and negative pulse widths can be adjusted separately, and the number of positive and negative pulses (setting range 0 to 30) can be adjusted in any combination;

Electrochemical Coloring Equipment for Stainless Steel, Aluminum Alloy and Titanium Alloy

Aluminium alloy electrochemical coloring is a process of obtaining different colors by the "interference" effect on light through depositing very tiny metal and metal oxide particles on the bottom of the micro-pores on the porous anodic oxide film.
When coloring, put the aluminum alloy into a sulfuric acid solution to make a clean, transparent, and porous anodized film. Then move it into an acidic metal salt solution, impose alternating current treatment to it, and irreversibly electrodeposits metal particles on the bottom of the pores on the oxide film. The weather resistance, corrosion resistance, and service life of the electrochemically colored film are better than the ones of dyed film, and its energy consumption and coloring cost are much lower than the dyed film.
In addition to aluminum alloys, titanium alloys can also be electrochemically colored. The process is to form a transparent oxide film on the surface of the titanium alloy in an electrochemical manner and form different colors by the interference effect of the oxide film on the light. The surface of the colored titanium alloy can create more than four colors, such as green, blue, purple, and golden, and improves the wear resistance, corrosion resistance, and weather resistance. Similarly, this process can also apply stainless steel products, and it significantly expands the scope of stainless steel use. The mature color series includes colors such as black, brown, dark brown, navy blue, gem blue, blue, gray, light yellow, golden yellow, golden red, purple-red, sky blue, green, yellow-green.

Please note that it forms a transparent oxide film on the surface of silver-white stainless steel. It is not a colored coating. The surface does not have any coating and is non-toxic.

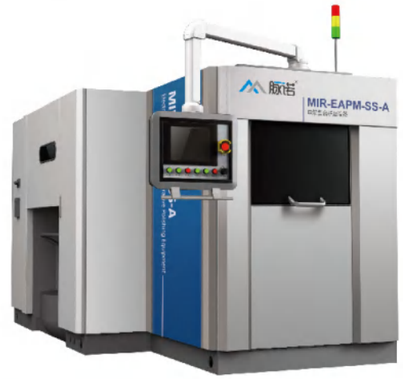


The process of electrochemical coloring:

OTHER EQUIPMENTS

Electrochemical Abrasive Polishing Equipment

Electrochemical abrasive polishing is a composite process combines electrochemical abrasive polishing and mechanical abrasive polishing. During electrochemical abrasive polishing, the abrader serves as the cathode and the tool for abrasive polishing, and the workpiece is the anode; the electrolyte is usually formulated based on saline solution.
Electrochemical abrasive polishing is suitable for stainless steel, aluminum alloy, titanium alloy, nickel alloy, magnesium alloy, hastelloy alloy, copper alloy, carbon steel, bearing steel, die steel, and other materials.
The abrasive speed of a workpiece is mainly determined by the effect of electrochemical abrasive polishing. Therefore, under the same surface roughness, the effect of the electrochemical process is higher than the mechanical process, and there are no remaining burrs on the workpiece after electrochemical abrasive polishing.
An electrochemical abrasive polishing process can make a workpiece surface roughness reach mirror effect, Rz 0.2 ~ 0.01μm, from a roughness of Rz 10 ~ 20μm. When the abrasive condition is adjusted, the surface roughness can reach an ultra-mirror degree, Ra 0.001μm (Ra=1nm).



The equipment is a precision abrasive machine with high dimensional accuracy and stable quality, and can be used in batch production.

Comparison Of Electrochemical-mechanical Abrasive Polishing, Electrochemical Abrasive Polishing, Chemical Abrasive Polishing, Mechanical Abrasive Polishing

	Electrochemical-mechanical Abrasive Polishing	Electrochemical Abrasive Polishing	Chemical abrasive polishing	Mechanical abrasive polishing
1	A process combining electrochemical and mechanical abrasive polishing that makes the metal surface smooth or even	Electrochemical abrasive polishing that makes the metal surface smooth or luminous	Chemical abrasive polishing that makes the metal surface smooth or luminous	Mechanical cutting, rubing, polishing and metal deformation that makes the metal surface smooth or even
2	Level the surface of the workpiece through both macro and micro ways to reduce the surface roughness	Level the surface of the workpiece through the micro way to reduce the surface roughness	Level the surface of the workpiece through the micro way to reduce the surface roughness	Level the surface of the workpiece through the macro way to reduce the surface roughness
3	No cold work hardened deformation layer (Beilby Layer), and no oxide film formed	Oxide film formed on the surface	Thin oxide film formed on the surface	Cold work hardened deformation layer (Beilby Layer) formed on the surface
4	The corrosion resistance of the polished surface is average, and the luminance is long lasting	The corrosion resistance of the polished surface is good, and the luminance is long lasting	The corrosion resistance of the polished surface is average, and the luminance is average	The corrosion resistance of the polished surface is poor, and the luminance does not last
5	Can achieve 12k high mirror effect, surface roughness can reach nm level	Cannot achieve 8k mirror effect, surface roughness limit is under 0.1um	Cannot achieve mirror effect, surface roughness does not change	Can achieve 8k or even 12k high mirror effect, surface roughness can be lower than 0.01um
6	Can see hidden defects in the lower layer of the product surface	Can see hidden defects in the lower layer of the product surface	Possible to see hidden defects in the lower layer of the product surface	Will cover the defects on the product surface
7	Polished surface without stress and debris	Polished surface without stress and debris	Polished surface without stress and debris	Polished surface is stressed and contains polishing abrasives
8	The surface of the processed workpiece is easy to clean, not easy to form dirt or breed bacteria	The surface of the processed workpiece is easy to clean, not easy to form dirt or breed bacteria	The surface of the processed workpiece is easy to clean, not easy to form dirt or breed bacteria	Not applicable
9	Can polish materials such as flat surface, curved surface, inner surface of small diameter cylinder	Can polish materials with complicated shape, small parts and thin thickness	Can polish materials with complicated shape, small parts, tiny aperture inner surface and thin thickness	Cannot polish materials with complicated shape, small parts and thin thickness
10	Fast processing speed, high productivity, allows mass production, easy to realize automation	Fast processing speed, high productivity, allows mass production, easy to realize automation	Fast processing speed, high productivity, allows mass production, easy to realize automation	Low processing speed, low productivity, hard to realize mass production or automation
11	No dust or waste gas generated from the polishing process	Dust and waste gas will be generated from the polishing process	Waste water and gas will be generated from the polishing process	Dust will be generated from the polishing process
12	Use neutral salt as polishing solution	Use strong acid as polishing solution	Use strong acid as polishing solution, high temperature	Use physical polishing materials
13	The polishing method is suitable for any metal material	The polishing method is suitable for any metal material	The polishing method is suitable for materials such as stainless steel	Difficult to conduct mechanical polishing on hard metal materials
14	Low requirements on materials	Certain requirements on materials	Certain requirements on materials	Low requirements on materials
15	The composition and structure of the base material have certain influence on the polishing effect	The composition and structure of the base material have large influence on the polishing effect	The composition and structure of the base material have large influence on the polishing effect	The base material has little influence on the polishing effect
16	The labor intensity of the operation is low and the process requires workers to have skills	The labor intensity of the operation is average and the process has low requirements on the skills of workers	The labor intensity of the operation is average and the process has high requirements on the skills of workers	The labor intensity of the operation is high and the process has high requirements on the skills of workers

Electrochemical Processing Machine of Inner Tube

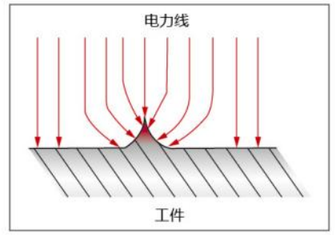
The equipment is suitable for precision electrochemical processing of various inner tubes, which can remove the processing traces on the surface of the inner tube, reduce the surface roughness, and improve the surface smoothness.
In general, electrochemical processing fluids mainly contain neutral inorganic salts, which have low risks and are more environmental friendly;
The machine is equipped with secondary filtration system;
It has automatic cooling function;
The machine is equipped with specific gravity indication and alarm of processing liquid;
The machine is equipped with level control;
The length of the processed workpiece can be adjusted automatically or manually before use;

The processing machine can also be equipped with an automatic locking mechanism for tooling according to the actual customer needs, which is more convenient to operate and greatly reduces labor intensity.

Equipment parameters 设备参数	Electrochemical Processing Machine of Inner Tube 内管电化学加工机床
Equipment footprint (length x width x height)	8800 x 7500 x 2200mm
Total weight of the equipment	about 4000kg
Total power of the whole machine	120KW, 380V, three-phase
Processing dimensional specifications	inner diameter: 4mm~25mm, length: 200mm~1000mm
Number of workpieces processed at one time	3
Working power	18V 1500A, 3 units
Working parameters controllable accuracy	voltage: 0.01V, current: 0.1A
Liquid temperature range	20℃ ~ 40℃
Water consumption	1T/h
Control method	touch screen + PLC
Daily processing volume	600~800 unit/day (8h)

Electrochemical Deburring Machine

Electrochemical deburring is an advanced deburring process. The basic principle is that, according to the "tip discharge" effect, when the workpiece is in a special environment with a strong electric field (this strong electric field is formed by strengthening a large current outside a specific solution), the protruding part of the edge immediately gathers a strong current and generates a "tip discharge", and then, an electric spark is generated, so that the tip of the workpiece edge becomes a smooth arc, and the processing residue is completely removed to make the wall smooth. According to the electric field theory, it is known that the burrs and other protruding parts on the surface of the part are more concentrated in charge, while the surface depressions have less charge. Due to the uneven distribution of power lines, the distribution of power lines in the protruding parts is dense, the current density is high, and more metals are removed (see graph); the distribution of power lines in the concave parts is relatively sparse, the current density is lower, and the less metals are removed. Since the current density passing through the burr is much high than other parts of the anode surface of the workpiece, the burr is quickly dissolved.
In addition, through the rational use of tool masking technology, burrs can be selectively removed without affecting the original dimensional accuracy and surface quality of the anode surface of the workpiece.



电力线分布示意图

It has high efficiency, fast speed and stable quality;
Since the gap effect of pulse current and the stirring effect of pressure wave improve the electric field and flow field conditions in the processing gap, and reduce the requirements for the flow characteristics of the electrolyte, it is conducive to obtaining a stable and ideal process;
It will not cause any damage to the physical and chemical properties of the processed parts, and there is no obvious damage to the processed dimensions;
Since there is no cutting force during the processing, no additional stress or surface modification layer will be formed, and the micro-geometry of the processed surface and the physical, chemical and mechanical properties of the parts can be improved;
It can be used where mechanical methods cannot be achieved and is widely used.

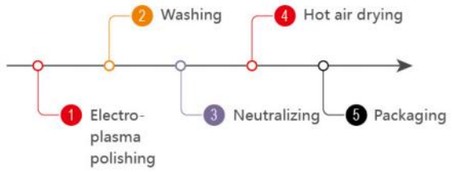
Electro-plasma Polishing Equipment

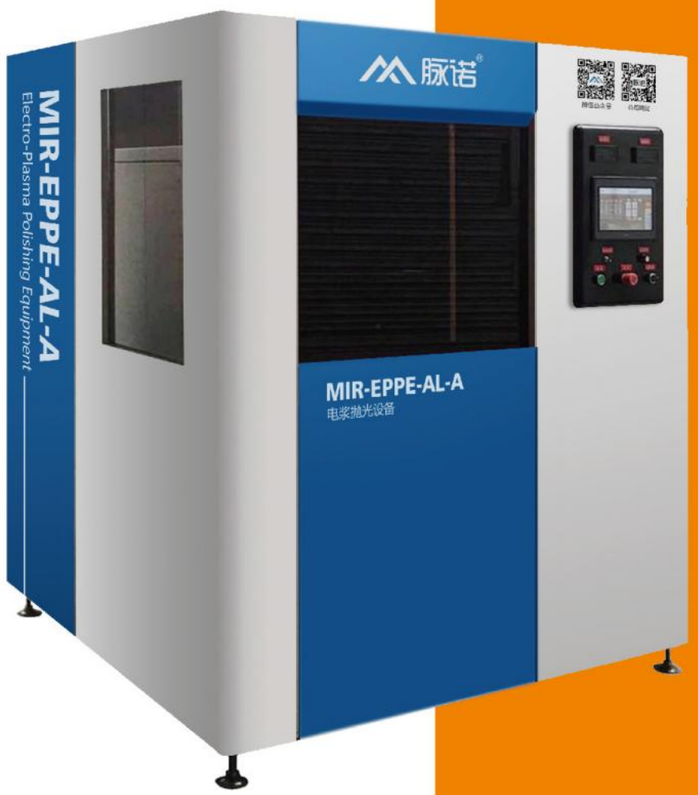
Electro-plasma polishing is a process that under high temperature and high pressure, electrons from the polishing agent escape from the nucleus, and then the nucleus form a positively charged ion, and when these ions reach a certain number, they become a plasma state. The energy of the plasma state is very large. When these plasmas rub against the object to be polished, the object will be instantly illuminated.
Electro-plasma polishing is a new metal surface treatment process. Compared with other polishing methods, electro-plasma polishing has very high quality, fast speed, and low cost that cannot be achieved through traditional methods, while the raw materials used in the process do not contain chemicals (polishing salts) that pollute the environment or harm the health of the producers.

Applicable materials: all conductive materials such as stainless steel, titanium, aluminum, copper, silver, zinc and alloys.

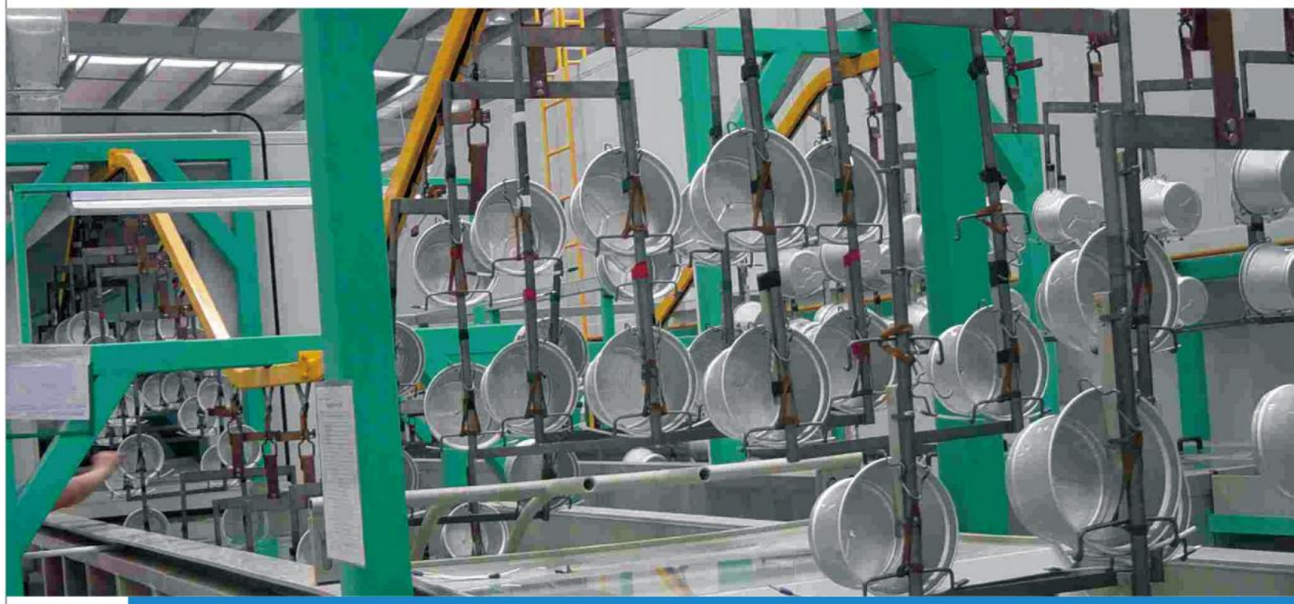
It improves production efficiency and reduce production costs: easy to deburr the holes and solve other surface polishing problems, the polishing process is within a few minutes, greatly reducing the labor;
The process is fully automatic control, easy to operate;
The process is safe and stable, simple maintenance: equipped with protection sensor to prevent accidents, user-friendly design, convenient maintenance and inspection;
The polishing has a high degree of uniformity, as the surface of each piece and each batch of workpieces is not affected by human, and this enables consistent mirror effects on workpieces.

Process of electro-plasma polishing:





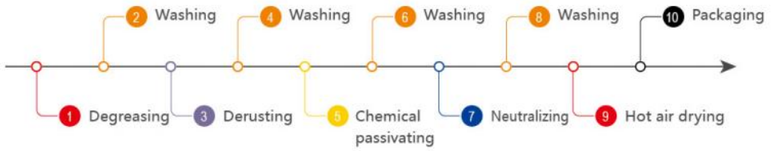
Chemical Passivation Equipment for Stainless Steel (Iron)



The equipment is for chemical passivation production of stainless steel (iron). It is used with a more environment-friendly passivation chemical formula, which is more convenient for sewage treatment and lower in cost.

Features:
1. All the parts are made of high-quality stainless steel materials - 304 and 316L, and the welding part is treated with acid passivation;
2. The passivating chemical solution adopts an environment-friendly formula and does not contain heavy metals or toxic or harmful substances, which significantly reduces the harm to the environment and can pass the ROHS certification;
3. The cleaning method can include ultrasonic cleaning function to ensure the workpiece has no residual solution, and improve the cleaning efficiency and effect;
4. Touch screen + PLC control mode, processing parameters are easy to save and retrieve, to ensure the use of mature processing technology;
5. The management is a three-level program, and different levels of users correspond to different permissions. A user can access with the corresponding password, which is safe and convenient for management;
6. Equipped with self-save function for power failure. After the power is restored and the fault is removed, it can continue to execute subsequent programs;
7. Constant temperature control, active water circulation, adjustable temperature in each tank, water level control, and heating protection;
8. It can be configured with functions such as online detection of potion proportion, acidity, PH value, the solution circulating filtration system, the acid mist recovery system, the power supply protection system;

The process of chemical passivation:



Fully Automatic Electrochemical Polishing, Cleaning & Drying Equipment for Vacuum Insulation Cup Stainless Steel Vacuum Insulation Cup

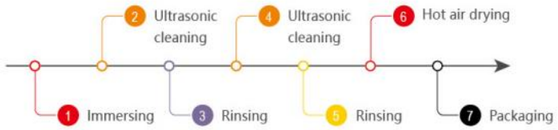
We have developed a fully automatic cleaning and drying equipment for vacuum insulation cup post electrochemical polishing per domestic market demands.
The equipment is for cleaning and drying stainless steel vacuum insulation cup after electrochemical polishing. The process can be completed at one time; the structure is reasonable, and the production efficiency and automation degree are high.

Equipment parameters	Fully Automatic Electrochemical Polishing,Cleaning and Drying Equipment for Vacuum Insulation Cup of Stainless Steel
Equipment footprint (length x width x height)	9400 x 3100 x 2350mm
Total weight of the equipment	about 2000kg
Total power of the whole machine	100KW, three-phase 380V
Electricity consumption	40KW.H
Water consumption	3T/H
Cleaning output	14400 ~ 19200 unit/day (8hr)
Conveying rate	0.7 ~ 1.1m/min (adjustable)
High pressure cleaning pressure	0.3 ~ 0.4Mpa
Compressed air pressure	≥400Kpa
Drying method	hot air drying
Compressed air consumption	about 0.1m³/min

Fully Automatic Ultrasonic Cleaning & Drying Equipment

The equipment is developed and designed for cleaning the remaining stain on the products. The operator places a product at the starting position of the equipment at the material loading and unloading level. The automated conveying unit of the equipment conveys the product to the corresponding cleaning area for cleaning, and then, the transfer robot transfers the product to each cleaning tank for ultrasonic cleaning, bubbling rinsing, ultrasonic rinsing and other processes. After completion, the product is transferred to the tunnel section for spray cleaning, wind shear water removal, hot air circulation drying, and fan cooling, and finally, discharge at the manual loading and unloading level, in order to complete the product cleaning, drying, cooling, and discharging process. The whole working process is controlled by PLC and monitored by the touch screen.
This cleaning equipment is mainly composed of ultrasonic generator, ultrasonic vibration plate, stainless steel cleaning tank, stainless steel liquid storage tank, stainless steel preheating water tank, filter circulation device, tunnel hot air drying system, automatic temperature control heating device, gantry single-arm mechanical arm (crane), parabolic lifting mechanism, slow-pulling dehydration mechanism, stainless steel pipeline system, automatic control and electrical control part, bracket chassis and painted shell.

The typical process of ultrasonic cleaning



Surface Treatment Reagent for Aluminum Alloy

Product Type	Product Name	Features	Process Conditions				Application Scope
			Method	Temperature (℃)	PH Value	Duration (min)	
MIR-AL-101	Acid cleaning Reagent for aluminum	Strong cleaning ability, can remove oxide scale, no loss of gloss on the surface	Immerse or spray	Room temperature	Strong acid	1~5	Aluminum and aluminum alloys
MIR-AL-102	Alkaline etching Reagent	Strong degreasing ability, satin or matt effect	Immerse	35~75	strong alkali	5~10	Aluminum and aluminum alloys
MIR-AL-103	Weak base degreasing Reagent	Strong degreasing ability, can remove oxide scale, no loss of gloss on the surface	Immerse or spray	25~45	weak alkali	1~5	Aluminum and aluminum alloys, cast aluminum
MIR-AL-104	Oxidation stabilizer	Shorten reaction time, save energy, reduce cooling process					
MIR-AL-105	Aluminum alloy environmental friendly degreasing solution	Alkali-free, no corrosion to aluminum, no loss of gloss on the surface	Immerse	50~60	weak acid	5~20	Aluminum and aluminum alloys
							Aast aluminum, die-cast aluminum
MIR-AL-106	Aluminum alloy environmental friendly activation solution	No strong acid, little corrosion to aluminum, no loss of gloss on the surface	Immerse	Room temperature	weak acid	1~5	Aluminum and aluminum alloys
							cast aluminum, die-cast aluminum
MIR-AL-201	Nickel-free low temperature sealing Reagent ~70	Nickel-free, nitrogen-free, low COD&BOD, no heavy metals, fast sealing speed, high corrosion resistance, strong light fastness	Immerse	30~50	7.5~9.0	5~20	Aluminum and aluminum alloys
MIR-AL-202	Nickel-free medium temperature sealing Reagent	Nickel-free, fluorine-free, nitrogen-free, low COD&BOD, no heavy metals, fast sealing speed, high corrosion resistance, strong light fastness	Immerse	55~85	7.5~9.0	5~20	Aluminum and aluminum alloys
MIR-AL-203	Medium temperature sealing Reagent	Nickeliferous sealing	Immerse	55~85	5.5~7.0	5~20	Aluminum and aluminum alloys
MIR-AL-204	High temperature sealing Reagent	Nickel-free sealing	Immerse	75~95	6.5~8.5	5~20	Aluminum and aluminum alloys
MIR-AL-301	Nano chromium-free conversion	Chromium-free, no heavy metal substances, no pollution to the environment, strong corrosion resistance, the passivation film has high compactness, long gloss retention,chromium-free, no heavy metal substances, no pollution to the environment	Immerse or spray	Room temperature	3.0~3.6	5~180S	Aluminum and aluminum alloys
MIR-AL-302	Chromium-free Silane Conversion Coating Reagent	Strong corrosion resistance, the passivation film has high compactness, long gloss retention, Few work stations, no need for heating, no waste	Immerse or spray	Room temperature	7.0~9.0	5~180S	Aluminum and aluminum alloys
MIR-AL-518	Nickel-free, Acid and Alkali Resistant Sealing Reagent	Acid and alkali resistant, nickel-free, nitrogen-free, low COD&BOD, no heavy metals, tasteless	Immerse	15~40	2.5~3.5	10~30	Aluminum and aluminum alloys
MIR-AL-806	Nickel-free, Acid and Alkali Resistant Sealing Reagent	Acid and alkali resistant, nickel-free, nitrogen-free, low COD&BOD, no heavy metals, tasteless	Immerse	80~95	11.5~12.5	20~40	Aluminum and aluminum alloys
MIR-AL-401	Room Temperature Hard Oxidizing Additive	Often used for hard oxidation at room temperature, chromium-free, no heavy metal substances	Immerse	10~20	7.0~9.0	30~60	Aluminum and aluminum alloys, cast aluminum
MIR-AL-402	High Silicon Die-cast Aluminum Oxidizing Additive	Often used for anodizing of high silicon die-cast aluminum, chromium-free, no heavy metal ubstances	Immerse	20~25	7.0~9.0	5~20	High silicon die-cast aluminum
MIR EP-AL-NCr	Environmental-friendly Eletrochemical Polishing Reagent for Aluminum Alloy	Chromium-free, no toxic or harmful ingredients, no heavy metal substances	Immerse	75~80	Strong acid	3~5	Aluminum and aluminum alloys
MIR-CP-AL-NN	Environmental-friendly Chemical Polishing Reagent for Aluminum Alloy	Chromium-free, nitrogen-free, no heavy metal substances	Immerse	90~110	Strong acid	1~5	Aluminum and aluminum alloys

Note: product details and sample trial are available upon request

Surface Treatment Reagent for Stainless Steel

Product Type	Product Name	Features	Process Conditions				Application Scope
			Method	Temperature (℃)	PH Value	Duration (min)	
MIR EP-SS-NCr	Chromium-free electrochemical polishing solution for stainless steel	Chromium-free, long service life	Immerse	40~70	Strong acid	1~10	Stainless steel
MIR EP-SI-NCr	Chromium-free electrochemical polishing solution for stainless iron	Chromium-free, long service life	Immerse	40~70	Strong acid	1~10	Stainless iron
MIR EP-SS-NP	Phosphorus-free electrochemical polishing solution for stainless steel	Contains no toxic or hazardous substances, no flammable or explosive substances	Immerse	40~80	Strong acid	3~5	Austenitic stainless steel
MIR EP-SS-HM	High mirror electrochemical polishing solution for stainless steel	Chrome-free, high gloss mirror effect	Immerse	40~70	Strong acid	1~10	Austenitic stainless steel
MIR CP-SS-NCr	Chromium-free chemical polishing solution for stainless steel	Chromium-free, long service life	Immerse	80~90	Strong acid	1~10	Stainless steel
MIR EPas-SS	Electrochemical passivation solution for stainless steel	Contains chromium, phosphorus-free, nitrogen-free	Immerse	50~70	Strong acid	10	Stainless steel, stainless iron
MIR QWC-SS	Bead treatment solution for stainless steel	Chromium-free, nitrogen-free	Brush	room temperature	Strong acid	1	Stainless steel, stainless iron
MIR QWC-SS	Bead treatment solution for stainless steel	Chromium-free, phosphorus-free, nitrogen-free	Brush	room temperature	Neutral	1	Stainless steel, stainless iron
MIR CP-SS-NCr	Chemical passivation solution for stainless steel	Chromium-free, phosphorus-free, nitrogen-free	Immerse	room temperature ~70	Strong acid	20~60	Stainless steel
MIR CP-SI-NCr	Chemical passivation solution for stainless steel	Chromium-free, phosphorus-free, nitrogen-free	Immerse	room temperature ~70	Strong acid	20~60	Stainless steel
MIR CPP-SS-NCr	Pickling passivation solution for stainless steel	Chromium-free, phosphorus-free	Immerse	room temperature ~70	Strong acid	20~60	Stainless steel
MIR CPPP-SS-NCr	Pickling passivation paste for stainless steel	Chromium-free, phosphorus-free	Brush	room temperature	Strong acid	60~120	Stainless steel

Surface-Treatment Solution of Other Alloy

Product Type	Product Name	Features	Process Conditions				Application Scope
			Method	Temperature (℃)	PH Value	Duration (min)	
MIR EP-St-NCr	chromium-free electrochemical polishing solution for stellite alloy	Chromium-free	Immerse	20~30	Strong acid	1~10	Stellite
MIR EP-Ni-NCr	chromium-free electrochemical polishing solution for nickel-based alloy	Chromium-free	Immerse	40~70	Strong acid	1~10	Nickel-based alloy
MIR EP-NiTi	electrochemical polishing solution for nitinol	Chromium-free, phosphorus-free, nitrogen-free	Immerse	≤10	Strong acid	30s	Nitinol
MIR EP-Ti	electrochemical polishing solution for titanium alloy		Immerse	≤10	Strong acid	30s	Pure titanium, titanium alloy
MIR CP-Ti	chemical polishing solution for titanium alloy		Immerse	80~90	Strong acid	30s	Pure titanium, titanium alloy
MIR OA-Ti	anodizing solution for titanium alloy	Acidic system, reagent grade, chromium-free, No toxic or harmful ingredients, no heavy metal substances	Immerse	15~25	Strong acid	≦60s	Pure titanium, titanium alloy
MIR MAO-Ti	micro-arc oxidation solution for titanium alloy		Immerse	15~25	Strong acid	10~20	Pure titanium, titanium alloy

Note: product details and sample trial are available upon request

SURFACE TREATMENT TECHNOLOGY SERVICE

Stainless steel surface treatment technology service

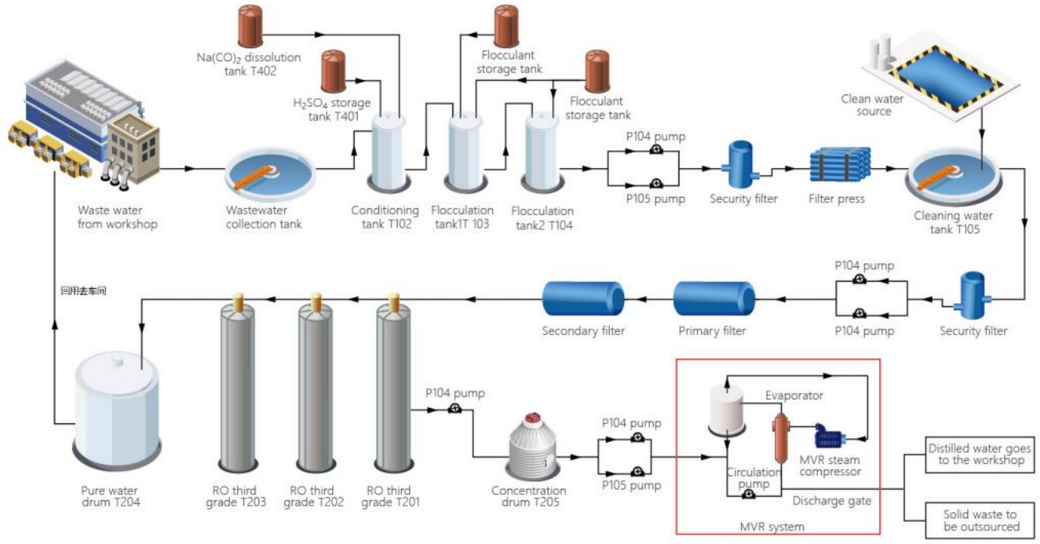
- Electrochemical surface treatment processing technology for stainless steel, technology transfer;
- Technical support on electrochemical surface treatment for stainless steel;
- Research and development of new electrochemical surface treatment equipment, electrochemical polishing solution and processing technology;
- Research and development of electrochemical surface treatment processing technology for stainless steel;
- Research and development of environmental friendly electrochemical surface treatment solution for stainless steel;
- Technical support on sewage treatment after surface treatment for stainless steel;
- The overall design of the electrochemical surface treatment workshop;
- General contracting on the turnkey project of electrochemical surface treatment workshop;

Anodizing technical service

- Research and development of anodizing process for new alloy materials;
- Research and development and technology transfer of new technology for alloy surface treatment;
- Technical support on electrochemical coloring and sealing for aluminum-magnesium-titanium alloy;
- Technical support on chemical polishing and chemical cleaning for aluminum-magnesium-titanium alloy;
- Exploring the special processing technology for aluminum-magnesium-titanium alloy anodizing;
- Technical support on electrochemical polishing for aluminum-magnesium-titanium alloy;
- Technical support on anodized wastewater treatment;
- Design of anodizing process workshop;
- General contracting on the turnkey project of anodizing process workshop;

SOLUTION OF “THREE WASTES”

Provide customers with corresponding wastewater and gas treatment programs and supporting facilities, which fully comply with the emission requirements according to the national laws and regulations.
The process adopts the diffluent collection mode according to the composition and characteristics of the process wastewater. The process uses chemical precipitation method, chemical reduction method, electrochemical method, membrane separation technology, ion exchange method, biological treatment technology, heavy metal trapping reagent, and other methods, and combine these methods with RO water system. It helps water reuse and reduces the consumption of cleaning water by 1/3 to 1/5.
The process will help achieve the goal of "zero" discharge of wastewater combined with the evaporation concentration method.



Metal Surface Treatment Complete Solution Provider

Customer Purchasing Requirements Form

Company Name		Contacts		Mobile	
Address		Department/ Position		Tel	
Website		E-mail		Fax	

Product Category

Surface Treatment Equipment:

- ☐ Electropolishing Equipment
- ☐ Anodizing Equipment
- ☐ Hard Anodizing Equipment
- ☐ Micro-arc Oxidation Equipment
- ☐ Anodizing Production Line
- ☐ Ultrasonic Cleaning Equipment
- ☐ Chemical Cleaning Equipment
- ☐ Pickling and Passivating Equipment
- ☐ Electropolishing Production Line
- ☐ Stainless steel Electrochemical Coloring equipment
- ☐ Others (please specify)_____

Surface Treatment Agent:

- ☐ Electropolishing Agent
- ☐ Passivationg Agent
- ☐ Nickel-Free Sealing Agent
- ☐ Chromium-Free Passivating Agent
- ☐ Smokeless Chemical Polishing Agent
- ☐ Chemical Cleaning Agent
- ☐ Neutral Degreasing Agent
- ☐ Tungsten Alloy Coating in place of Hard Chromium Coating
- ☐ Others (please specify)_____
- ☐ Technical Service of Metal Surface Treatment (please specify)_____

Product Name		Specification And size		Daily Processing Quantity	
Material		Purchase Quantity		Purchase Plan	
Provide Samples ?	☐ Yes ☐ No	Purchase	☐ Self Use ☐ Sales ☐ Others		
Market Region	☐ Domestic ☐ Europe ☐ America ☐ Africa ☐ Asia ☐ Australia ☐ Others (please specify)_____				
Quality and Technical Requirements					
Configuration Requirements					
Remarks					

After completing this form, Please mail or fax it to the relevant departments of our company.
We will arrange the relevant personnel to provide technical support for you.
Thank you for your support and trust.

Official Accounts

Website

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