Suzhou Newlead Augmented Intelligence Equipment Co.Ltd

ZhangJiaGang QRD Machinery Manufacturing Co., Ltd.

1. Introducing our company

Our company was established in 2000

Our main machinery

1.1PV ribbon production line (we were the first manufacturer in China to produce PV ribbon production line, the technology was from Korea and Italy. Five generations have been updated

Our technology is at least one year ahead of other companies.

Our auto spools change over system, which is the only one ,it can run well stable.

The automatic spooler systems of other companies are currently unstable.

They are conducting trial runs in China and relying on timely after-sales service to support and improve.

1.2Enameled flat wire production line(drawing ,rolling mills and enameling machine)

2.1Enameled flat wire was used for E-auto (vehicle)motor and Fast charging system

2.2And Magnet Wire for transformer

1.3.Our recent new development target is PEEK insulated electromagnetic wire production line

PEEK insulated electromagnetic wire for 800-1000V high-voltage fast charging system.

This technology supports charging speeds of 5C or even higher, using a 1000kW super fast charging pile to fully charge a 100 kWh battery in just 10-15 minutes.

Previously, we mainly focused on selling our machines domestically, mainly for these two industries, with 80-90% of our production capacity in China.

But in the past two years, these two industries have reached capacity saturation, and we have started to develop foreign markets.

2.Introduction to the Three Generations PV Ribbon production lines

2.1Before 2022, it is like following **(speed 250mpm)**

Payoff+annealing+tinning with flux+Take up(Semi-automatic dual spooler)

2.2From 2022 to 2023. (speed 300mpm)

Drawing+annealing+tinning with flux+Take up(Semi-automatic dual spooler)

2.3From 2024 to future (speed 400mpm)

Drawing+induction annealing+tinning with flux+Take up(Automatic Spools Changer)

3.How to choose the machine?

Firstly,this industry has been developing in China for 30 years and the technology is already very mature. Both the previous generation machines and the latest technology machines can produce high-quality products. You don't have to worry about whether Chinese machines can produce high-quality products now, as long as the raw materials are suitable, the product quality is not a problem.

If you visit major PV ribbon companies in China, you will find that they have both old and new technology machines in using. Because they started early and the machines were updated step by step.

Second,big PV Ribon companies and should have seen that scale, automation, and intelligence are the trends of the future. At present, the development direction of large companies producing PV ribbon in China is to consider cost reduction and efficiency improvement. It means using automated equipment to reduce material loss, labor costs ,management cost and so on. This is the core competitiveness of the future.

Third, as newcomers, you have a latecomer advantage and can directly use the most advanced equipment. Our company is the first in China to bring technology from South Korea and Italy to produce PV ribbon machines, and our technology is at least one year ahead of other companies. By choosing to cooperate with us, you have directly used China's most advanced production line, saving a lot of trial and error costs.

Fourth, some companies will recommend semi-automatic equipment to you, mainly because their fully automatic equipment is not mature enough and they dare not sell it to foreign markets. Even some competitors have told us not to sell fully automatic equipment abroad and not to let them use such good equipment. They believe this is a patriotic expression.

Finally,I would like to say that India, like China, is a country that relies on energy imports. Developing the solar energy industry is an inevitable choice and a good thing for the country and the people. This industry will definitely develop step by step in India. Just like in China, there are three companies specializing in the production of PV ribbon in this industry, and after 10 years of development, they have become listed companies.

4. Copper wire online annealing method: comparative analysis of resistance and induction annealing (you can ask deepseek and chatGPT this question)

In the online annealing process of copper wire, resistance and induction are two mainstream technologies, and their core differences are reflected in heating principles, energy consumption, equipment structure, and process effects. The following comprehensive comparative analysis based on literature review and engineering practice:

1.Comparison of Technical Principles

1. Resistance annealing

Principle: Heating is achieved by utilizing Joule heat (Q=I ^ 2Rt) generated when current passes through copper wire, and annealing temperature is controlled by adjusting current or voltage.

Equipment structure: The core components include electrode wheels, electric brushes, cooling systems, etc., which need to transmit high currents to copper wires through electric brushes.

Typical application: Suitable for continuous annealing of small and medium-sized copper wires, with annealing speed and current/voltage linkage control.

2. Induction annealing

Principle: Based on the electromagnetic induction effect, an alternating magnetic field excites eddy currents inside the copper wire, and non-contact heating is achieved through the eddy current thermal effect.

Equipment structure: composed of induction coil, power supply, and cooling tank, without electrode contact, copper wire is directly heated when passing through the induction coil.

Typical application: Suitable for high-precision, high-speed continuous annealing, especially for large wire diameter or high-purity copper wire.

3.Comparison of core parameters

Comparative	Resistance Annealing	Induction Annealing
heating efficiency	Low heating efficiency (energy loss due to brush contact resistance)	high (no contact loss, eddy current heating efficiency>90%)
energy consumption	High energy consumption (maintaining high current)	low energy consumption (saving 30-50% energy)
Annealing uniformity	easily affected by contact point oxidation or brush wear	electromagnetic field penetration heating, no local overheating
Surface quality	may be affected by electrical discharge, resulting in surface oxidation	without contact and a shiny, undamaged surface
maintenance	Regular replacement of brushes and electrode wheels	only cleaning of induction coils

4.Process effect analysis

1. Limitations of resistance annealing

Electric brush contact can easily cause scratches or oxidation on the surface of copper wire, affecting its conductivity.

The annealing temperature is constrained by both wire diameter and speed, which can lead to uneven elongation in a bamboo like shape.

2. Advantages of Induction Annealing

Supporting precise temperature control (± 5 ℃), the grain size is more uniform after annealing, and the resistivity is stable at 0.01724 Ω· mm ²/m (standard value for soft copper).

Can be combined with inert gas protection to prevent copper wire from high-temperature oxidation.

5.Suggestions on Economy and Applicable Scenarios

1. Applicable scenarios for resistance annealing

Small and medium-sized cable enterprises have lower equipment investment costs (about 500000 to 1 million yuan).

Conventional wire production with low requirements for annealing uniformity.

2. Applicable scenarios for induction annealing

High end electromagnetic wires, high-frequency communication cables, and other fields that require high surface quality and electrical performance.

Large scale continuous production scenarios result in significant long-term energy savings (the case shows a 3-year price difference for recyclable equipment).

6.Technological development trends

At present, induction annealing technology is developing towards high frequency and intelligence, for example:

-Adopting IGBT high-frequency power supply (20-50kHz) to improve heating efficiency.

-Integrated online monitoring system, real-time adjustment of annealing parameters to match copper wire diameter and speed.

It is recommended that enterprises choose a technical route based on product positioning and production capacity requirements, and prioritize the use of induction annealing technology for high value-added products.

5. we recommend three listed companies in China that produce PV Ribbon

1.http://www.yourbest.com.cn

2.**http://www.tonyshare.com**

3.https://www.wetown.com.cn

They the tops PV ribbon manufacturers in China.Their annual output value is around 500 million US dollars.

You can browse their company website or download their annual report for research.