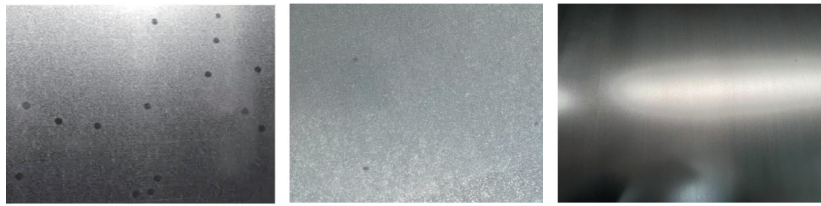


01 / Intelligent Control for ZAM Galvanizing



Defect picture of strip steel

After the use of post-coating cooling model, the picture of the strip steel

- What to solve?**
- ✓ Poor cooling control after plating → Surface black spot defects, secondary grade rate remains high.
 - ✓ Manual adjustment lag, low accuracy, easy to neglect → Loss of 20 tons of secondary products per month
 - ✓ Senior craftsmen are difficult to recruit and training costs are high.

AI vision intelligent regulation in three steps:

- Machine vision monitoring
Self-developed cameras are installed at the tower fan to capture the cooling status of the strip surface in real time.
- Multi-parameter AI analysis
Integrate strip specifications and production conditions to dynamically set the best cooling target.
- Fully automatic control
Calculate the fan frequency in seconds, send out control signals, and respond with zero delay

Our solution

- ✓ Quality: Basically eliminate black spots and ensure that the cooling process is consistent in each batch of products, improve the consistency of product surfaces, and meet the needs of high-end customers.
- ✓ Cost reduction: reduce manual debugging and eliminate trial and error costs
- ✓ Cost saving: 490,000 CNY per year
 - ▶ Reduce defective product losses: 240,000 CNY
 - ▶ Save the labor cost of post-plating cooling and debugging process: 250,000 CNY
- ✓ Efficiency: Specification switching response time < 1 second

Core values

02 / Zinc layer closed-loop control system

Industry pain points

- ✓ Under manual adjustment, it is difficult to correct the fluctuation of zinc layer thickness in time, and the control accuracy of zinc layer thickness depends on the experience of operators, and the control accuracy of different teams is different
- ✓ In order to prevent the product from failing, the operator tends to control the zinc layer thicker, which increases the cost.
- ✓ Over-reliance on manual intervention restricts digital transformation and production line efficiency improvement.

Industry pain points

- ✓ Feedforward prediction: When changing specifications/speed adjustments, calculate the zinc demand in advance according to its own large database
- ✓ Real-time feedback: dynamically correct thickness deviations, and correct deviations immediately.
- ✓ Self-learning algorithm: Historical data optimization control accuracy

Core strengths

- ✓ Zinc consumption direct reduction: Accurately lock the target thickness and reduce the consumption of the zinc layer thickened to ensure quality
- ✓ Stable quality: the production consistency of different teams increases, eliminating the deviation of different teams in debugging
- ✓ Liberate labor: reduce manual regulation

Direct benefits

- ✓ Quality: The thickness uniformity of the zinc layer is significantly improved
- ✓ Cost: Annual savings of 2.79 million CNY
 - ▶ Zinc ingot savings: 2.54 million CNY
 - ▶ Save labor cost of zinc layer regulation: 250,000 CNY

03 / Intelligent combustion control system for continuous annealing furnace

Pain point sniping >>

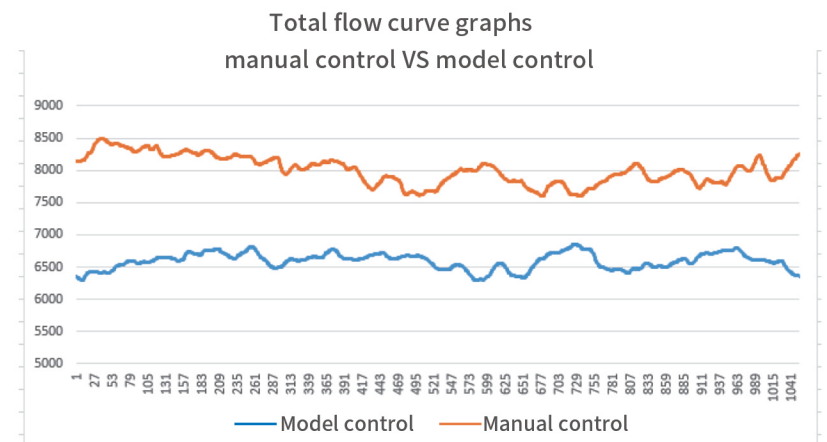
- ✓ The temperature control is unstable, affecting the subsequent process, and it is easy to produce degraded products
- ✓ High fuel consumption and high cost
- ✓ Calorific value fluctuates frequently, and manual intervention is not timely and accurate, affecting the atmosphere and heating quality in the furnace
- ✓ It is difficult to recruit craftsmen with relevant experience and the training cost is high
- ✓ The salary cost of craftsmen is high

Technology breaks the wall >> Physics and Intelligence Fusion Technology: PINN Model

- PIN physical information neural network
 - ▶ AI algorithm that integrates the laws of heat transfer physics and large databases
- Combustion dynamic optimization
 - ▶ Automatically matches the optimal temperature required for different strip specifications to use the optimal amount of gas
- Unattended control
 - ▶ 24-hour unmanned accurate maintenance of furnace temperature

Value crystallization >>

- ✓ Improved stability: Reduce the performance instability caused by replacing strip specifications and enhance market competitiveness
- ✓ Cost reduction: annual savings of 1.64 million CNY
 - ▶ Gas savings: 1.28 million CNY
 - ▶ Save the cost of debugging process personnel: 360,000 CNY
- ✓ Efficiency Improvement: 5% increase in gas utilization





Enterprise purpose

- For customers
 - For employees
 - For society



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concentration is the basis

Technology comes first

Satisfaction is the standard

Persistence is constant