

Automating a bicycle wheel plating operation



Background

Shaoxing General Bicycle Plant consists of 11 branches, of which the bicycle wheel electroplating branch causes the most serious pollution. The plant has end-of pipe wastewater treatment facilities which cost more than 0.2 million RMB a year to run. Even so, the quality of effluent does not meet National Environmental Standards. As production increases, environmental damage is likely to mount.

Cleaner production

A cleaner production audit was carried out to reduce environmental pollution, improve working conditions and raise efficiency. The audit revealed 38 cleaner production options; 24 of them were no-cost options and have already been implemented, producing savings of about 57 500 yuan (RMB) monthly in raw materials and environmental protection. A further 11 options are low-cost and will be implemented when the installation work is completed. The other three are high-cost and lengthy options. After an analysis of their technical and economic feasibility, and their environmental benefits, the option of automating the plating line—was implemented first.

Enabling technology

The automatic system will include:

- ❖ rearranging and resiting the plating baths
- ❖ automating the control of temperature, the addition of materials and the





maintenance of correct process parameters

- ❖ doubling output and productive efficiency
- ❖ lowering the cost of waste treatment and reducing effluent.

Advantages

The benefits are savings in raw materials, increased productivity and a reduction in the costs of waste treatment. Technical engineering works for a new production line for 0.3 million medium- to high-grade bicycles will be completed soon. The new automated electroplating line will be able to supply the high quality plated wheels needed for this development, and will provide a sound basis for raising the quality and the price of the bicycles produced.

The new development will also enable the factory to meet national environmental standards, notably those in the ISO 9000 Series Quality Identification.

Economic benefits

	RMB/year
Net savings	978 180
Capital investment	5 000 000
Payback period	4.6 years

These figures are based on electroplating 300 000 pairs of wheels a year.

The reduction of wastewater and effluents is as follows:

- ❖ acid and alkaline wastewater, 38 per cent
- ❖ nickel rinsing wastewater, 35 per cent
- ❖ nickel contained in rinsing water, 23 per cent
- ❖ chrome rinsing wastewater, 33 per cent
- ❖ chrome contained in rinsing water, 90 per cent.

Country

The People's Republic of China

Industry

Bicycle industry

Company

The Shaoxing General Bicycle Plant is a large state-owned enterprise, which has a total output of one million bicycles annually. In 1992, the total value of production reached 280 million yuan (RMB).

Contact

Mr Wang Jutang

Vice-director

The Shaoxing General Bicycle Plant

No 4 Jiefang Nanlu

Shaoxing

Zhejiang Province

Zip Code 31200

Tel: +86 575 8062300

Telex: 53740 ZSGBF CN

