

Waste Minimisation at a Hard Chrome Company (MF13)

Case Study 24

Metal Finishing Waste Minimisation Club

Background

MF13 is a small jobbing shop, situated in Pinetown, South Africa. The company was established in 1964, and has been on the current premises since 1973. There are 10 employees and the company carries out grinding and hard chrome plating on items for the earthmoving industry and hydraulic companies.

The Process

Machine parts for reworking are first ground down on lathes to remove the worn, damaged metal. Thereafter the jobs are cleaned by wiping with a cloth soaked with thinners. Sections of the job which are not to be plated are painted with Fortolac Stopping-Off lacquer and covered with stopping-off tape. Any holes in the job are filled with polystyrene (except those very small holes). Cleaning and lacquering of smaller parts are performed on a workbench, while the larger jobs are placed over the rinse tank.

Once cleaned, the jobs are then placed in the plating bath. Large jobs are hung from a pulley while the smaller parts are tied to wires and hung from rods which lie across the baths. All jobs are hung in the vertical position. The jobs are secured in position by means of vice grips.

The first process which occurs in the plating tanks is etching. This is performed by reversing the polarity of the plating bath for 1 - 2 minutes. The duration of etching is determined by the type of metal of the job. The plating tanks operate at between 45 and 60 °C. The bath is kept within this temperature range by a cooling coil connected to a cooling tower. The plating process takes several hours and the jobs are usually left in the tanks overnight and also over the weekend. This means that the cooling water is run continuously. Once the plating is completed, the jobs are lifted out of the bath and while suspended above the bath, the jobs are rinsed off with the water from a drum next to each plating tank. The jobs are then taken to a rinse tank and rinsed off with water from a hose. The rinse water is pumped to the rinse water effluent tank which stands at the back of the factory.

Identification of Waste Minimisation Options

The company uses very little water. The main costs are in terms of the energy required to heat the tanks. A few waste minimisation options were identified. These are summarised in Table 1.

Table 1: Summary of Identified and Implemented Waste Minimisation Options

Waste Minimisation Option	Status
1. Use rinse water effluent to top up the plating tank	
2. Recycle rinse water through cooling tower	Implemented
3. Install nozzles to hosepipes	
4. Rinse job over tank	Implemented
5. Remove tape and rinse over tank	Implemented

Implementation of Waste Minimisation

Some waste minimisation options have been implemented on site, resulting in savings in water. These include recycling the rinse water through the cooling tower rather than using fresh water. In addition, items are now rinsed over tanks such that the solution can be collected and reused. The actual savings have not been quantified.

The owner feels that he has benefited from taking part in the waste minimisation club through an increased awareness of waste minimisation aspects, and tries to incorporate this into the day-to-day operation of the business.

Contact Details

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