

Waste Minimisation at a Valve Manufacturer (MF9)

Case Study 9

Metal Finishing Waste Minimisation Club

Background

MF9 is situated in Westmead, the industrial township in Pinetown, South Africa. The company manufactures automotive engine valves and exports worldwide. It is approximately 20 years old and employs in the region of 300 staff members.

The Process

Raw material is in the form of metal rods which are processed into automotive valves. The main processes include turning and milling, drop-forging, heat treatment, shot blasting, and chrome plating. The company shares a site with 2 sister companies. There is one water and one electricity meter for the site as a whole, therefore the individual companies do not have records of their water and electricity use. This makes quantification of savings difficult.

Identification of Waste Minimisation Options

A total of 17 waste minimisation options were identified for the site. These ranged from suggestions such as installing additional metering for utilities to redesigning jig orientation for better drip-off. These waste minimisation options are listed in Table 1.

Table 1: Summary of Identified Waste Minimisation Options

Waste Minimisation Option	Status
1. Install automatic level controller in bath	
2. Redesign jig to improve draining	Implemented
3. Install a holding tank so that concentrated solution is stored rather than added to the drag-out tank	
4. Cover manhole to prevent spillage of effluent	
5. Read electricity sub meter on a daily basis	
6. Install additional electrical sub meters on tempering oven and compressor house	
7. Install dedicated site water meter	Implemented
8. Install dedicated plating meters to each line	Implemented
9. Correct power factor from 0.85 to > 0.95	
10. Insulate and cover hot wash bath in the forging department	
11. Consider additional insulation on tempering oven	
12. Alter product orientation in tempering oven to allow reduced convective loss	
13. Adopt a campaign to tackle compressed air leakage	
14. Apply insulating "ball blanket" to Plating line 2 rinse tanks	
15. Eliminate the use of compressed air for plating line agitation by installing high pressure blowers	
16. Install counter flows on plating lines	Implemented
17. Reusing caustic cleaner in forging department	Implemented

Implementation of Waste Minimisation

Of the waste minimisation options identified, 5 have been implemented by the company (summarised in Table 1). These have resulted in water and chemical savings.

Three water meters have been installed – two on the automatic chrome plating line and one on the manual line in order that the water consumption may be monitored on a regular basis. Counter-flow rinsing has also been installed on the plating line. Jigs have been modified to improve drainage and reduce carry-over. Savings have not been quantified as yet.

Reuse of caustic cleaner:

The caustic degreasing tank in the forging department used to be disposed of every 2 months and remade. The company now dumps 100 l of the 800 l at a time and tops up with fresh water and cleaner. This has saved 1 400 l of water and 15 kg (at R 11.70 / kg) of cleaner every two months (7 700 l / year and 82.5 kg / year cleaner).

The company has realised the importance of incorporating waste minimisation into the day to day operation of the business and is now ISO 14000 accredited.

Economic Benefits

Item	Savings (Approximate quantity / year)	Saving (Approximate Rands / annum)	Pay-back
Water	7 700 l	22	Immediate
Caustic	82.5 kg	970	Immediate
Total		992	

It must be noted that other savings were made by the company in water and chemicals, but that these were not quantified at the time of preparing this case study.

Contact Details

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