



Managing waste in the metal manufacturing industry

Introduction

If you are a small to medium sized manufacturer of metal and assembled components (including casting plants, electroplaters, sheet metal fabricators and general engineering workshops), then this fact sheet may help you to:

- reduce input and waste disposal costs
- improve your environmental performance
- be more competitive!

Focusing on waste can help you to address high raw material prices, rising costs of hazardous waste treatment and disposal, and pressure to increase the sustainability of your operations.

This fact sheet provides a range of practical and cost effective waste management options. Some offer immediate savings and associated benefits while others may involve an upfront cost that can be recovered within a few months or years.

Major waste generating activities

Metal manufacturers generate waste through activities such as: casting; machining and welding; parts assembly; surface finishing; quality control; and packaging.

The major environmental wastes in this sector involve: the use and disposal of machine lubricants and coolants; aqueous and solvent cleaning systems; and recycling of scrap. Hazardous wastes, such as solvents, pickling solutions and oils, can be expensive to manage as they require special waste treatment and disposal arrangements.

Benefits of reducing waste

Improving waste management can benefit your business and the environment by:

- reducing the cost of purchasing metals and other raw materials (e.g. through identifying reuse opportunities for waste products)
- minimising waste treatment and disposal costs (and possibly generating alternative income streams)
- increasing profitability (as wasted product equals lost profit)
- reducing environmental impacts associated with hazardous chemical use, waste disposal and consumption of raw materials
- improving the reputation of your business and employee satisfaction through promoting an environmentally responsible image

- providing a safer workplace through process improvements and less waste handling.

Things to consider when improving waste management practices

Implementing waste management improvements may require forward planning and some changes to the way your business operates. For example:

- proposed changes may need to be discussed with managers, workplace safety representatives, unions, insurers, investors, suppliers and customers to check that they will not impact negatively on productivity, security or safety and other standards
- employee training and awareness may be required to successfully implement actions and support the introduction of new equipment or processes, such as recycling systems that alter the way wastes are handled
- special licences or permits may be required by your business or contractors to store, treat, transport and dispose of hazardous wastes
- results are more likely to be achieved and maintained if you have a written plan and targets agreed by all areas of management. Prioritise actions and consider beginning with the 'low-hanging fruit' for fast gains and to generate enthusiasm
- monitoring waste generation and disposal (e.g. benchmarking production against raw material purchases) is important for environmental compliance, stock control and to measure (and reward!) improvements.

The costs, savings and payback periods for the waste reduction options provided overleaf are a rough guide only. They include estimates of up front costs such as capital, labour and installation, but do not include ongoing costs unless these are fundamental to the option itself (e.g. improved maintenance regimes).

The suitability and benefits of each option depend on the nature and size of your business and the scale of application. You should also check that they comply with local environment, safety and other requirements. The waste hierarchy provides a framework for managing waste: avoid; reduce; reuse; recycle; and dispose. Waste avoidance generally delivers the best financial and environmental outcomes.

\$ up to \$1,000		\$\$ \$1,000 - \$10,000		\$\$\$ \$10,000 - \$50,000		\$\$\$\$ \$50,000+	
PROCESS CHANGE				EQUIPMENT / PLANT UPGRADE			
	OPTION	COST	SAVING	PAYBACK PERIOD	WASTE HIERARCHY		
	Purchase high-quality lubricants, coolants and metalworking fluids so you can use less and therefore generate less waste.	\$	Chemical use and hazardous waste disposal	<1 yr	Avoid		
	Extend the life of working fluids by using demineralised water for dilution. Implement a regular maintenance plan to optimise equipment operation and minimise loss of fluids.	\$\$\$	Chemical use and hazardous waste disposal	1-3 yrs	Avoid		
	Plan jobs where possible to minimise metal scrap by using the maximum percentage of sheets or blocks (e.g. provide a scrap size that is suitable for a subsequent smaller job).	\$	Raw material use		Avoid		
	Dewater sludge before disposal (as often up to 80-90% water).	\$\$\$	Hazardous waste disposal	1-3 yrs	Treat		
	Recover metals from plating and other sludges through specialist treatments or reuse in metal smelting feedstock.	\$\$\$\$	Hazardous waste disposal	10 yrs	Recycle		
	Minimise tanks wastes by ensuring parts are clean and drain times are optimised before they are moved to the next process.	\$\$\$	Waste water treatment	0-3 yrs	Avoid/ Treat		
	Remove and store waste oil from cleaning and degreasing processes for recycling.	\$\$\$\$\$\$	Chemical use and hazardous waste disposal	2-10 yrs	Recycle		
	Use efficient spray painting systems (e.g. electrostatic or airless delivery methods) to reduce overspray, increase transfer efficiency and minimise solvent emissions	\$\$\$\$	Paint and solvent use	2-5 yrs	Avoid		
	Talk to your waste management company about sending paint sludge from overspray and booth clean for energy recovery.	N/A	Hazardous waste disposal	n/a	Energy recovery		
	Reduce packaging waste by buying in bulk or sourcing packaging that is recyclable or is taken back by suppliers.	nil	Packaging use	n/a	Recycle		
	Minimise cutting fluids content in metal scrap (e.g. by increasing swarf drainage times or placing a screen above the bottom of the swarf collection bin) to make both streams easier and safer to store and recycle (or filter and reuse fluids on-site). Compress softer metals (e.g. aluminium) into bricks in a bale press.	\$\$\$\$\$ (\$)	Chemical use and hazardous waste disposal	4-5 yrs (Swarf drainage 0-1 yr)	Recycle		
	Cover tanks when not in use to reduce solvent and other losses.	\$\$\$	Chemical use	1-3 yrs	Avoid		
	Extend tank life and improve process efficiency by using air agitation and eductor-jet pumps and continuously filtering contaminants out of the tanks.	\$\$	Chemical use and waste water	1-3 yrs	Avoid		
	Reduce carry-over in the plating process by counter-current rinsing or installing spray rinses over plating baths.	\$\$\$	Waste water	1-5 yrs	Avoid		

Further information

If you would like further information, or to talk to someone who can help get you started, please contact Ai Group's Energy and Sustainable Business Helpdesk on **1300 733 752** or at sustainablebusiness@aigroup.asn.au or visit the Ai Group website at www.aigroup.com.au.