

If a facility ships their hazardous waste off-site, the manifest certification states this facility must have a program in place to reduce the volume and toxicity of the waste generated if a fully regulated generator; OR certifies that this facility has made a good faith effort to minimize the waste generation if a small quantity generator. But even without the regulatory requirement, companies with a total waste reduction plan will save time and money.

### EFFECTIVE WASTE MINIMIZATION PROGRAM

Try not to miss any steps or you may not get a complete picture of the savings. Also, there is a high probability that any waste reduction and minimization efforts will stop after the initial thrust, so extra effort must be made to keep the initiative moving.

Get top management support	<ul style="list-style-type: none"> <li>✓ Written company policy that is distributed to all departments;</li> <li>✓ Commitment to doing an evaluation;</li> <li>✓ Set specific goals;</li> </ul>
Characterize the waste generated	<ul style="list-style-type: none"> <li>✓ Identify all waste (solid, air, liquid, hazardous, etc.);</li> <li>✓ Data required includes: type of waste, amount and date(s) generated. NOTE: obtain data from your wastewater discharge report, hazardous waste biennial report, air permits, SARA Subtitle III reports.</li> <li>✓ Maintain a waste accounting system to track the types, amounts and dates of wastes generated.</li> </ul>
Write up a waste reduction plan	<ul style="list-style-type: none"> <li>✓ General safety;</li> <li>✓ Training employees on waste reduction;</li> <li>✓ Include regulations;</li> <li>✓ Business policy statement on waste reduction;</li> <li>✓ Implement the study and then recommend actions;</li> <li>✓ Designate a coordinator (someone interested);</li> <li>✓ Initiate employee involvement &amp; incentives.</li> </ul>
Assessments	<ul style="list-style-type: none"> <li>✓ Have initial and periodic reduction assessments;</li> <li>✓ Track materials that eventually wind up as waste from the loading dock to the point at which they become a waste;</li> <li>✓ Identify opportunities at all points in a process where materials can be prevented from becoming a waste;</li> <li>✓ Include a cost allocation system review;</li> <li>✓ Make sure to use a <b>fully loaded cost accounting system</b> to charge each department.</li> </ul>
Problem evaluation	<ul style="list-style-type: none"> <li>✓ Conduct a periodic review of program effectiveness;</li> <li>✓ Take advantage of technology transfer systems and employee involvement.</li> </ul>

Michigan Department of Environmental Quality Environmental Assistance Center 1-800-662-9278

RCRA/Superfund Hotline Facility Pollution Prevention Guide (EPA\600\R-92\088) 1-800-424-9346

Office of Pollution Prevention Pollution Prevention Information Clearinghouse 1-202-260-1023

## General

- Practice good 'housekeeping' including preventative maintenance; studies have shown that product/service quality improves as 'house-keeping' improves. Items such as small leaks from machines can have expensive hidden costs (ex: down time & waste disposal).
- Recycle office paper instead of sending office paper to a landfill.
- Limit the types and amount of raw material purchased since buying in bulk or ordering on a schedule will not save money if the stock shelf life expires. This goes hand-in-hand with maintaining an accurate inventory of raw materials which eliminates excessive inventory and expired shelf life.
- Use heat from a compressor or other "hot" machine to warm areas such as chemical storage or hot water rinse baths.
- Look at each waste stream separately because in numerous cases separate streams have more value than a 'potluck' waste stream in such areas as reclaim, recycle and waste exchange.
- Completely empty raw material drums.
- Before accepting small samples from sales representatives evaluate waste disposal options and possible permits first.

## Painting

- High volume low pressure or airless spray paint guns reduces the volume of paint wasted and VOC emissions.
- Clean the lines/gun of high volume colours with the same solvent used to cut the paint. Then use solvent to cut tomorrow's paint.
- Use compressed air first to clean the paint lines and push the paint back into the paint pot, then flush with solvent.
- Reduce the number of primers, if possible to one, then designate a line for primer and install a constant paint circulating system. You eliminate the need to clean paint lines instead you just need to clean the guns.

## Plating

- Slow line to an 8 second count for removal from baths which drastically reduces the dragout and in turn reduces waste in rinse water. Now you can reduce rinse water flow and ultimately reduce sludge generated.
- Hold the rack for a 10 second count over the bath during which time the majority of drips will fall. By doing this you will reduce waste in rinse water.
- Put drip catchers between the baths to catch and return to the bath any solution. This will also eliminate most of the buildup between the baths and ultimately reducing the cleanup time & waste generated.
- Use rinse bath water over again in a different area. Example: if there is a line with a chromic acid etch bath followed by counter flow rinse baths and a neutralizer bath followed by counter flow rinse baths, use the dirtiest rinse after the neutralizer bath and pipe to the rinse baths after the chromic acid tank. This saves water and reduces sludge.
- Spraying or aerating the rinses uses less water and does a better job. Also, counter flow rinses will save water.
- Assess wastewater treatment chemicals, replace chemicals that create large volumes of sludge with chemicals that don't.
- If you have a 3 bath rinse after a metal bath; leave the first rinse as a dead bath and use as make-up for the metal bath.
- Cost out a dryer for the sludge to reduce volume of sludge.
- Look at metal recovery on-line and either reuse or sell as scrap.
- Look at sending your waste to a smelter who recovers metals from dried sludge. Separate wastewater treatments may be needed for metal separation.

## Metal Finishing

- Soap and water, d-limonene (orange peel), ultra-sonic are all degreasing methods instead of using solvents.
- If you degrease with solvents then attach a distillation unit to the degreaser.
- Change the coolant at least monthly in your machines and do a complete breakdown/clean-out once a year. The machines will run better, longer, use less coolant and leak less.
- Keep your oil separate from other waste streams and send the oil out to be repressed which costs less.

## Printing

- Use soybean inks to avoid generating toxic ink waste.

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