Colorado Department of Public Health and Environment

Pollution Prevention Checklist for Metal Finishing and Electroplating Shops

COLORADO Pollution Prevention PROGRAM

Creating a Successful Pollution Prevention Program:

Establishing a pollution prevention (P2) program for your facility can result in significant cost savings while improving your facility's environmental performance, employees' health, and public image. Successful P2 programs depend on management support, leadership by a pollution prevention coordinator or team, and the involvement and training of all employees. With the commitment of management and staff as a basis, the next step is to perform a process assessment to identify and quantify hazardous chemical usage and wastes and emissions generated, and to prioritize which ones to target for reductions, and in order to measure progress. After performing this assessment, use the following checklist to help generate ideas.

Use of this Checklist:

Answering the following questions will help you identify additional pollution prevention opportunities for your shop. Any "no" answers indicate possibilities to investigate further.

General:		**Yes**	**No**
1.	Do you purchase materials only as needed and use a "first in, first out" policy?		
2.	Do you have written procedures for bath make-up and additions, limit chemical handling to trained personnel, and keep logs of all tank additions?		
3.	Do you have overflow alarms on all process tanks to prevent tank overflow when adding make-up water? Do you avoid using unmanned hoses for filling tanks?		
4.	Do you segregate waste streams which generate a Resource Conservation Recovery Act (RCRA)-listed hazardous sludge from the wastewater treatment, from those which do not? Do you segregate contact and non-contact (e.g., cooling) wastewater?		
5.	Do you maintain the physical integrity of all tanks through conducting periodic inspections and performing necessary repairs?		

Drag-Out Reduction, Rinsing, and Water Use:

		Yes	No
1.	Have you optimized drainage time and the parts withdrawal rate to reduce drag-out?		
2.	Do you rack parts in a way which minimizes drag-out? (e.g., minimizing "cup" shapes which hold water, and re-designing racks/barrels as necessary)		
3.	Do you use drain boards between tanks to return drag-out to the process tank?		
4.	Have you installed air knives or fog rinses or sprays over process tanks to remove drag-out as parts exit the process bath?		
5.	Have you optimized the following additional ways to reduce drag-out: lower bath concentrations, higher bath temperatures, and the use of surfactants or wetting agents to lower adhesion of bath liquids to parts?		
6.	Do you use static/drag-out rinse tanks for the first rinse after a process bath (to replenish the process bath, and to reduce the amount of drag-out to subsequent rinse tanks)?		
7.	Do you use counter-current rinsing (if there is space for extra rinse tank(s))?		
8.	Do you agitate rinses, either mechanically or with air?		
9.	Do you use de-ionized water for rinsing?		
10.	Do you restrict/control rinse water flow rates? Do you turn off rinse water flow when not in use?		

Bath/Chemical Solution Maintenance:

		Yes	No
1.	Do you use process baths to the maximum extent possible before discarding? Have you eliminated dump schedules, performing more frequent chemical analyses to determine when the bath has exceeded its useful life?		
2.	Have you reduced bath dumps by using filtration to remove suspended solids contamination (either in-tank or external to the tank)?		
3.	Have you considered/do you use other methods of treatment to maintain bath solutions, such as carbon treatment to remove organic contaminants or electrolysis (dummy plating) to remove metallic contaminants?		
4.	Do you use de-ionized water for bath make-up?		

Process Chemical/Material substitution: **Yes No**

1.	Have you investigated replacing cyanide-plating processes with non-cyanide processes, e.g., replacing zinc cyanide plating with zinc chloride or other non-cyanide processes, and replacing copper cyanide plating with non-cyanide processes?		
2.	Have you investigated substitutes for processes involving the use of hexavalent chromium, e.g., replacing hexavalent chromium decorative coating processes with trivalent chromium processes, and replacing chrome plating on zinc (zinc conversion) using hexavalent chromium with zinc conversion using trivalent chromium?		

Reducing Solvent Use: **Yes No**

1.	Have you minimized the need to clean as much as possible? For example, have you determined how clean your parts must be to maintain quality; have you asked your suppliers to supply clean parts? Do you use peel coatings instead of difficult to remove organic coatings?		
2.	Have you investigated replacing solvent-cleaning processes with aqueous or semi-aqueous cleaning processes?		

Chemical Recovery: **Yes No**

1.	Have you considered/do you use any treatment methods to recover and return process chemicals to the process baths, e.g., through the use of evaporator units to allow the reuse of rinse water from static rinse tanks?		
2.	Have you considered the use of ion exchange to treat rinse water and to allow the recovery of process chemicals? The regenerant from the ion exchange columns can either be returned to the process bath, or treated with an additional technology such as electrowinning to recover the metals.		
3.	Do you send metal sludges to an off-site reclamation facility rather than to a disposal facility?		

This checklist was compiled from various sources including Pollution Prevention and Control Technology for Plating Operations, National Association of Manufacturers, (1994), by the Colorado Department of Public Health and Environment's Pollution Prevention Program. For additional information call Kirk Mills at (303) 692-2977.