



Addressing Common Problems in Metal Finishing and Printed Circuit Board Shops

Commercial Hazardous Waste Factsheet

Electroplating and printed circuit board shops use a number of toxic and corrosive liquids. Improper handling of these liquids can lead to the corrosion of and permeation through unprotected flooring. This results in contamination of the flooring itself as well as the potential for impacting the underlying soil and ground water. The bottom line is increased long-term liability for the company.

Other compliance problems at electroplating and printed circuit board shops result from ineffective employee training programs and the absence of management oversight of employees, to ensure they are correctly performing their assigned hazardous waste duties.

Problems & Solutions

These are some of the most common problems found in metal finishing shops

Problem: *Avoidable releases of hazardous liquids from spills, dragout, leaking tanks and pipes, over-flows and other sources.*

Solution: Identify work practices and engineering changes that can be made to minimize releases and in turn reduce liability. Use your imagination. Pick the low-hanging fruit first and work your way up. Be proactive about maintenance and equipment replacement. Set up an equipment maintenance schedule and log sheet to track maintenance. Stop releases immediately. Install overflow alarms or auto-shutoff valves. Inspect the shop daily to make sure that spills have been cleaned up and problems causing the spills have been corrected and document the inspections.

Problem: *Use of flooring, secondary containment and sumps to store waste or to transfer wastes to the treatment system.*

Solution: Hazardous waste leaks and spills – big or small – on the floor must be cleaned up immediately. A dry floor is the ideal. Make cleanup equipment readily available and instruct employees as to their responsibilities. Hard pipe waste whenever possible. If use of the floor as a channel to convey waste to the treatment system cannot be avoided, a floor management plan should be set up. The plan must address the construction materials that the floor is made of, and coatings that will be used to protect it, along with procedures for inspection, maintenance and repair of floors and coatings. An integral part of the plan should be a maintenance schedule, including regular

flooring inspections, along with a cleaning, maintenance and inspection logs. Identify areas where liquid pools and take action to stop it.

Problem: *Accumulation of solids and debris on the floor.*

Solution: Cleaning up spills immediately will minimize buildup of solids, salts and sludges. Making sure employees avoid throwing personal trash like cigarette butts or candy wrappers on the floor will further reduce accumulation of hazardous solids. Set up a cleaning schedule to make it easier to keep the floor clean and keep a logbook to keep track of when floor cleaning is done. Under no circumstances should hazardous liquids or solids be stored or accumulated on the floor.

Problem: *Too little preventive maintenance of tanks, piping, pumps, floor coatings and sewer lines.*

Solution: Set up a preventive inspection and maintenance schedule and keep a logbook to confirm that scheduled inspections and maintenance are being performed. The frequency of inspection and maintenance for each item or system on the schedule may vary and should be based on the probability of a serious problem occurring. Inspections of underground piping, including sewer lines that take waste from the shop to the metro sewer, must be included. Repair or replace corroded, leaking or otherwise damaged piping, pumps, and tanks immediately.

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Rule References

Minnesota Rule 7045.0566 states that "Facilities must be maintained and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release to air, land, or water of hazardous waste or hazardous waste constituents that could threaten human health or the environment."

Minnesota Rule 7045.0275 dictates how generators must respond to spills and other releases of hazardous waste.

Minnesota Rule 7045.0626 sets standards for the use and management of hazardous waste storage containers.

Minnesota Rule 7045.0628 sets standards for storing and treating hazardous waste in tanks and tank systems.

Minnesota Rules 7045.0652 and 0655 cover standards for elementary neutralization, pre-treatment, and wastewater treatment units.

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Problem: *Cracked, corroded, and uncoated flooring.*

Solution: Install impermeable coatings on floors. Keep floor coatings in good repair. Do not lap coatings up to the edge of tanks or other equipment; protective coatings should be continuous over the whole floor in areas where contact with hazardous materials is inevitable. Use an inspection and maintenance schedule and log as described above to identify and stop problems before they get out of control.

Problem: *Use of pits and sumps with no secondary containment or leak detection for waste collection or treatment prior to discharge to the sewer.*

Solution: Install an inner tank inside treatment pits and sumps. Use the pit or sump itself as secondary containment. Inspect for leaks from the inner tank daily and document the inspections; or install an alarm. Repair leaks in the inner tank immediately and remove any accumulation in the secondary containment immediately. If you must use pits or sumps without secondary containment or leak detection to accumulate or treat waste, regularly inspect them for cracks, corrosion or other problems, and correct them immediately.

Problem: *No measures to keep incompatible materials (such as acid and cyanide) segregated from each other so they can not mix if there is an emergency involving a leak or spill.*

Solution: Be aware of mixing hazards and use common sense to avoid them. Do not store incompatible materials where they can mix in an accident and cause toxic gases, fires, explosions or violent reactions. Distance or engineering measures can be used to keep incompatible materials separate.

Problem: *Lax inspection of hazardous waste containers, tank systems and treatment units resulting in labeling, open-container, damaged-container, spill and time-limit violations.*

Solution: Use tank, container and pretreatment unit inspections to make a complete check of containers, tanks, storage and treatment areas for any and all problems and correct them immediately. See the Hazardous Waste Regulations for specific requirements regarding inspections. Spills must be cleaned up right away and the source identified and repaired immediately.

Problem: *No follow-up by management to check up on employees to ensure they are performing their assigned duties.*

Solution: Set up a checklist of things to check on a regular basis (say monthly or quarterly) to make sure that employees are taking care of their hazardous waste responsibilities. Check to make sure that scheduled maintenance and inspections are being conducted and documented.

Problem: *Disorganized records; not being able to find records; not keeping records current.*

Solution: Train responsible employees on how to organize records. Make sure that as many employees as necessary know the record-keeping system so that at least one employee familiar with the system is available during business hours, taking into account, vacations, illnesses and other absences, to show records to inspectors. Keep personnel training records up-to-date. Set up a system to make sure new employees receive training as needed and training is documented. Contingency plans should be reviewed for changes whenever the plant is remodeled, processes change or employees turnover. A system should be set up to make sure shipping records are kept in order.

Problem: *Soil and groundwater contamination.*

Solution: If floors, walls or sewer lines in contact with hazardous materials and wastes are cracked or severely corroded, or if they allow hazardous materials to soak through, you must find out if soils and groundwater underneath have become contaminated. Most companies will need to hire a qualified environmental consultant to do that. You must also take action to prevent the possibility of further contamination. Releases to the environment must be reported to the Minnesota Pollution Control Agency and addressed according to local, state and federal laws and regulations.

Additional Information

**U.S. EPA's
National Metal Finishers Strategic Goals Program**

www.strategicgoals.org

This program is a voluntary collaborative effort to achieve ambitious environmental goals. The website explains the benefits of participating.



**Hennepin County
Environmental Services**

612-348-3777

Ask for the environmentalist-on-call

www.hennepin.us search: business hazardous waste

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