

## **3.9.1 Metal Fabrication/Finishing**

### *Tip Sheet #1*

**WASTE ORIGIN:** Metal Surface Finishing and Plating

**WASTE TYPES:** Cutting Oils and Fluids, Spent Process Baths, Dye Penetrants, Sludges, Solvents, and Rinsewater

#### **WASTE REDUCTION AND RECYCLING METHODS:**

- ! Replace cutting oils with **water-soluble coolants**.
- ! Separate **dye penetrants** from water.
- ! Consider **ultrafiltration** for water/organic mixtures.
- ! Phase out 1,1,1-Trichloroethane and flammable solvents and convert to **water-based cleaners**.
- ! Implement **metal recovery** with state-of-the-art ion exchange.
- ! Implement electrochemical **extraction of heavy metals** from water.
- ! Increase **solution life** (e.g., with proper design and maintenance).
- ! Control **viscosity and surface tension** of process solutions.
- ! Use **material or process substitution** (e.g., trivalent chromium instead of hexavalent; chemical vapor deposition).
- ! Use **low-solvent paint** for coating.
- ! Use mechanical **cladding and coating**.
- ! Use cleaning baths as **pH adjusters**.
- ! **Recover metals** from process solutions.

#### **Sources:**

*Facility Pollution Prevention Guide*, U.S. EPA, May 1992, EPA/600/R-92/088.

Fact Sheet, *Waste Reduction for the Aerospace Industry*, CA DHS Alternative Technology Division, August 1989.

*Guides to Pollution Prevention: The Fabricated Metal Products Industry*, U.S. EPA, July 1990, EPA/625/7-90/006.

*Metal Fabricators: Pollution Prevention Opportunities Checklist*, Industrial Waste Section, County Sanitation Districts of Los Angeles County, Whittier, CA.

Seminar Publication: *Meeting Hazardous Waste Requirements for Metal Finishers*, U.S. EPA, Office of Research and Development, Center For Environmental Research Information, September 1987, EPA/625/4-87/018.

*Waste Minimization in Metal Parts Cleaning*, U.S. EPA, Office of Solid Waste, August 1989, EPA/530-SW-89-049.

## **3.9.1 Metal Fabrication/Finishing**

*Tip Sheet #2*

**WASTE ORIGIN:** Machining

**WASTE TYPES:** Metal Working Fluid, Metal Wastes, Dust, and Sludge

### **WASTE REDUCTION AND RECYCLING METHODS:**

- ! Use **water-soluble** metal working fluids.
- ! Use de-mineralized **water make-up**.
- ! Perform regularly scheduled **sump and machine cleaning**.
- ! Perform regularly scheduled **gasket, wiper, and seal maintenance**.
- ! Filter, pasteurize, and treat **metal working fluid for reuse**.
- ! Switch to **synthetic fluids**.
- ! Use **gas coolants** where possible instead of liquid.
- ! Assign **fluid control** responsibility to one person.
- ! Standardize **coolant types** used on machining equipment.
- ! **Reuse or recycle** cutting, cooling, and lubricating oils (skimming, coalescing, hydrocloning, centrifuging, pasteurization, downgrading, filtration, dissolved air flotation).

### **Sources:**

*Facility Pollution Prevention Guide*, U.S. EPA, May 1992, EPA/600/R-92/088.

Fact Sheet, *Waste Reduction for the Aerospace Industry*, CA DHS Alternative Technology Division, August 1989.

*Guides to Pollution Prevention: The Fabricated Metal Products Industry*, U.S. EPA, July 1990, EPA/625/7-90/006.

*Metal Fabricators: Pollution Prevention Opportunities Checklist*, Industrial Waste Section, County Sanitation Districts of Los Angeles County, Whittier, CA.

Seminar Publication: *Meeting Hazardous Waste Requirements for Metal Finishers*, U.S. EPA, Office of Research and Development, Center For Environmental Research Information, September 1987, EPA/625/4-87/018.

*Waste Minimization in Metal Parts Cleaning*, U.S. EPA, Office of Solid Waste, August 1989, EPA/530-SW-89-049.