Advice & Counsel

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More on Lead &TRI Reporting

This month we will continue our discussion of TRI reporting issues related to the recent reduction of the threshold for lead to 100 pounds. This series of articles concludes with a discussion of processing and emission calculation issues.

1. Processing Issues

One of the most common errors on a TRI report is the misstatement of whether a regulated material is "processed" or "otherwise used."

Elements/Compounds "Processed"

A regulated element or chemical compound is considered to be "processed" if the element or compound is incorporated into the final product. An example is the use of lead fluoborate in lead or tin-lead plating. Because the lead becomes part of the product, lead fluoborate is considered to be "processed." If you are buffing brass that contains lead (> 0.1%), then the article you are buffing is considered to be processed, because the lead stays within the product.

Elements/Compounds "Otherwise Used"

A regulated element or chemical compound is considered to be "otherwise used" if the element or compound is *not* incorporated into the final product. For example, if parts are buffed with buffing compound that contains lead (normally as an impurity), the buffing compound is considered "otherwise used," because it does not become part of the final product.

2. Form R Reportable Information

You will need to report:

A. The maximum amount of lead on-site on any given day during the reporting year.
B. The activities that involve the use of lead and/or lead compounds.
C. On-site waste treatment methods and treatment efficiencies.
D. On-site recycling involving lead/lead compounds.
E. Pollution prevention/waste minimization measures applied to lead/lead compounds.
F. Quantities of lead or lead compounds released to the air, water, and land.

Item "F" is what we will cover this month.

Quantities of Lead or Lead Compounds Released to the Air, Water & Land

Air Emissions

You must evaluate each process utilizing products containing lead or lead compounds and estimate the air emissions from that process. This can be a very difficult task, because there is little guidance available for many processes using lead/lead compounds.

Electrolytic Processes

Electrolytic processes with the potential of emitting lead include lead plating, tin-lead plating, chromium plating, anodizing (if lead-lined tanks or lead cathodes are used), and electrocleaning of lead-bearing metal parts.

Non-Electrolytic Processes

Non-electrolytic processes with the potential of emitting lead include air-agitated acid dips used on lead-bearing parts, stripping, soldering, brazing, painting (with lead-bearing paint or primers) and welding.

Calculating/Estimating Emissions

Your choices for estimating lead/lead compound emissions for any process are rather limited:

1. Test the discharge.
2. Search USEPA AP-42 (and all the latest revisions, additions) for estimation factors.
3. Estimate based upon gassing factors in *Electroplating Engineering Handbook.*

Note that tanks that are not exhausted may still be a source of fugitive emissions, which must be estimated.

Testing the air emission can be very expensive, so most companies resort to emission estimating methods. AP-42 is available from EPA through its website (www.epa.org) or via mail.

USEPA AP-42 is periodically updated, so if you have an older copy, be sure to get the latest update(s). AP-42 does not have factors for all processes that may emit lead, however. You may need to estimate based upon articles in the literature, or guidance from chemical or equipment suppliers. I wrote an article on how the gassing rate can be used to estimate emissions from metal finishing processes (see *P&SF*, June 1989, p. 12).

Water Emissions

Fortunately, most metal finishers have actual data to use for reporting water emissions to POTWs. It then is reduced to an exercise of calculating the pounds of lead emitted, using the average concentration from the lab reports, and the total gallons of water discharged during the reporting year.

Sample Lead Release To POTW Calculation

The semi-annual, self-monitoring required by federal regulations showed the following results for wastewater leaving the pretreatment system:

Date	Flow	Avg. Total Pb
Feb. 3,4,5, 2001	42,500 gpd	0.120 mg/L
July 1,2,3, 2001	45,900 gpd	0.135 mg/L

The plant typically operates 250 days/yr. Using the self-monitoring reports, lead discharged to the POTW is calculated as:

Avg. daily lead discharged during self-monitoring x 250:

$$\frac{(0.120 \times 42500 + 0.135 \times 45{,}900) \times 8.35}{2 \times 1{,}000{,}000} = 0.04716 \text{ lb/day}$$

Assuming 260 working days/yr, this totals to:

260 x 0.04716 = 12.26 lb/yr
Releases to the land

Each lead-bearing waste that is sent off-site for disposal must be included in this exercise. Analytical data are normally available or easily obtained at low cost from a commercial laboratory. Be sure to include in your emission estimates any residual material containing lead that is left in any empty containers sent off-site.

Example Land Release Calculation

An analysis of spent solder stripper shows that the waste contains approximately 10,000 ppm total lead. Off-site shipments totaled 200 gal. Additionally 30 cubic yards (density of this waste was 9.1 lb/gal) of F-006 waste containing 200 ppm of lead were sent for land disposal. Calculation:

Lead shipped off-site in F-006 sludge = Total volume shipped x density x ppm lead

$$= 30 \text{ cubic yards} \times 202 \text{ gal/cubic yard} \times 9.1 \text{ lb/gal} \times \frac{200}{1{,}000{,}000} = 10 \text{ lb}$$

Lead shipped off-site in spent stripping solution = Total volume shipped x density x ppm lead

$$= 200 \text{ gal} \times 10.5 \text{ lb/gal} \times \frac{10{,}000}{1{,}000{,}000} = 20 \text{ lb}$$

Total lead land disposed = 20 + 10 = 30 lb