AGA UPDATE

Question of the Month - Form R

Question: Why do I have to report zinc compounds when I only release a few pounds a year to the environment?

Answer: When zinc compounds are manufactured in quantities greater than 25,000 pounds per year, or otherwise used in quantities greater than 10,000 pounds per year, the Form R must be completed, regardless of how much of the zinc compounds are released to the environment.

A hot-dip galvanizing facility has many reports to file each year identifying the hazardous materials on site, used in the process, or stored at the facility. The "report" requiring zinc compounds to be reported is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Superfund Amendment and Reauthorization Act of 1990 (SARA), Title III Section 313, Toxic Release Inventory. This Section of CERCLA requires reporting if the chemical used at the facility is on the 313 list and the facility "manufactures, processes or otherwise uses" the chemical above the reporting threshold quantity. Once the reporting threshold is met, the report must be filed.

If you only release a few pounds a year to the environment, then you have achieved the goal of using a listed chemical material without significant impact to the environment. However, if the total amount of zinc compounds manufactured, processed or otherwise used at your facility exceeds the reporting thresholds, you still have to complete and submit the Form R by July 1 each year. The AGA has developed a very detailed guidance document that focuses on completing the Toxic Release Inventory Form R. I have paraphrased a few sections here to assist you with the decision and calculations necessary to document your position. Please refer to the full text of the AGA guidance document for example calculations and guidance on the release estimates.

SARA III, Section 313 defines "manufacturing" and "otherwise used" as the following:

- Manufacturing is to produce, prepare, compound or import a reportable chemical. Manufacture also includes coincidental manufacture or production of an EPCRA Section 313 chemical (e.g. byproduct or impurity) because of the manufacture, processing, otherwise use, or treatment of other chemical substances.[1] The de minim is rule applies to coincidental production of an impurity but not to byproducts.

- An impurity is not separated and remains primarily in the mixture or trade name product with another chemical. A byproduct is separated from the other chemical substance or mixture and is further processed or disposed. EPCRA Section 313 chemicals produced as a result of waste management are also considered byproducts .Otherwise used is any use including a chemical in a mixture or trade name product or waste that is not covered by the terms of manufacture or process. Otherwise use activities can also be termed non-incorporative activities. Otherwise use activities can be as a chemical processing aid, manufacturing aid, and ancillary or other use. An EPCRA Section 313 chemical that is added to a reaction mixture to aid in the manufacture or synthesis of another chemical substance but is not intended to remain in or become part of the product or product mixture is otherwise used as a chemical processing aid. An EPCRA Section 313 chemical that aids the manufacturing process but does not become part of the resulting product and is not added to the reaction mixture during the manufacture or synthesis of another chemical substance is otherwise used as a manufacturing aid.

- The manufacturing and processing activities have a reporting threshold of 25,000 lbs. The otherwise use activity has a reporting threshold of 10,000 lbs. Galvanizers chemicals are otherwise used in the galvanizing process with only chromium compounds being processed, ammonia being manufactured and otherwise used and zinc compounds being otherwise used and manufactured as a byproduct. Ammonia is manufactured as it is processed for on-site use and is otherwise used as a manufacturing aid. Chromium compounds are processed as a formulation component. Hydrochloric and sulfuric acid aerosols are otherwise used as ancillary or otherwise use. Lead is otherwise used as a chemical processing aid. Zinc in the form of fume or dust is otherwise used as ancillary or otherwise use. Zinc compounds are manufactured as a byproduct and otherwise used as a chemical processing aid.[1]

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Once either threshold quantity for zinc compounds (manufactured or "otherwise used" is met, then a Release Form (Form R) must be completed for the total amount of zinc compounds at the facility. Zinc compounds are otherwise used in the galvanizing process in the flux bath as zinc chloride and are manufactured as byproducts in the dry skimmings and stripping tank. In determining the amount of zinc chloride otherwise used in a year, the total amount of flux added and the percent of zinc chloride in the flux should be known. Multiplying these together will give the total amount of zinc chloride otherwise used in a year.

Lbs. $ZnCl_2$/yr = (Amount of Flux added lbs./yr) x (% $ZnCl_2$ in Flux/100)

Zinc compounds are manufactured as byproducts at the galvanizing kettle and at the stripping tank. To determine the total amount of zinc compounds manufactured as byproducts, each of the two areas are taken separately and then totaled together. To determine the amount of byproducts manufactured as zinc oxide at the galvanizing kettle, the first step is to determine the total amount of dry skimmings in a year. Assuming the dry skimmings comprised of 100% of zinc oxide, the total weight of the dry skimmings will equal the total weight for the zinc compounds. This assumption was made because the oxygen content in the dry skimmings is not a known quantity that is evaluated. If the oxygen content is known, a more precise amount of zinc oxide could be calculated. Using the above assumption, the zinc oxide in the dry skimmings can be calculated by summing the total amount of dry skimmings generated during the reporting year. Adding both of the example quantities of the zinc oxide and zinc chloride will give the total amount of zinc compounds manufactured as byproducts.

Lbs. of Zinc Compounds/yr = (lbs. of ZnO/yr) + (lbs. of $ZnCl_2$/yr or lbs. of $ZnSO_4$/yr)

Further assistance with the estimates may be obtained by referring to the 2001 AGA Form R document. The reporting threshold quantity mandated by CERCLA Section 313 is different from the reportable quantity in CERCLA section 102(a)[ii], and the quantities of materials requiring notification under CERCLA sections 311 and 312. For further clarification, the term "Reportable Quantity" refers to the USEPA Regulation 40 CFR part 302 (CERCLA section 102(a) release notification which designates chemicals, and the quantities above which the person must report when "released to the environment". The RQ for zinc is 1000 pounds. The RQ for other typical galvanizing zinc compounds (zinc ammonium chloride, zinc chloride, zinc sulfate) is also 1000 pounds. The notification is designated as the responsibility of a person with knowledge.

Please refer to the various state and federal regulations to determine the specific requirements for your facility.

1 AGA Health Safety & Environment Notes for Hot Dip Galvanizing, "Updated Form R Calculations", January 2001,Volume 2 Issue 1, Revision 1 July 2001. T.Langill, C.Kleen.

i EPCRA: Emergency Planning and Community Right to Know Act, refers to SARA III Section 311, 312, & 313 collectively. The list of chemicals for each section is different.

ii CERLCA section 102(a) is regulated under USEPA 40 CFR Part 302-Designation, Reportable Quantities and Notification. This regulation is enforced in conjunction with other DOT and USEPA regulations.