

# Advice & Counsel

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## **Rules for Packaging Hazardous Materials**

Dear Advice and Counsel, I am new to the metal finishing industry, having been recently hired to run the shipping department at a small jobshop. One of my duties is to send out various samples to a laboratory located in another state. Some of these samples contain some "nasty" stuff. Are there regulations that cover shipment of these? Signed, Fred L. Express

Dear Fred,

Funny you should send this letter about the same time I received a request for quotation (RFQ) from a local office of the Department of Transportation (DOT). They wanted a quote on testing randomly intercepted packages to determine if they met DOT regulations for labeling and packaging. (Because the testing involved placing portions of the contents into the eyes of rabbits, we declined to quote.)

The RFQ seems to indicate that DOT has some definite plans to enforce its regulations for packaging of hazardous materials. Let's cover some basic information, as compiled by Dan Bell, an environmental engineer working in our office.

The most important point to keep in mind when shipping hazardous materials, including plating solutions and sludge samples, is that the ultimate responsibility is with the shipper. The DOT and the courier will not accept the excuse that the shipper "was unaware" of specific packaging and labeling requirements. Basic responsibilities include labeling identification, such as the proper classification and description of the hazardous material being shipped.

Many couriers (UPS, FedEx, etc.) require the shipper to register before they will accept hazardous materials for shipment. UPS has a guide for shipping hazardous materials that is sent to a shipper on request. This guide summarizes many of the DOT regulations, and provides the necessary information for shipping packages in compliance with the regulations. Packages containing hazardous materials must have a "Hazardous Materials Shipping Paper" displayed on the outside of the package. This five-part shipping form provides some basic information about the hazardous material contained in the package, including:

- The DOT proper shipping name as listed in the Hazardous Materials Table in 49CFR 172.101. Many hazardous chemicals may be known by several different names. There is only one "proper shipping name," however, for identifying the chemical on the shipping label.
- There are specific identification numbers (usually beginning with UN) that must be provided on the shipping paper. These ID numbers are also shown in the Hazardous Material Table.
- The hazard class must be identified (what makes the chemical hazardous?). Some common classes for the plating industry would be class 8 (corrosive) for acidic materials, and class 6.1 (poisonous) for plating solutions containing cyanide.
- The quantity of hazardous material inside the package.
- The type of DOT label that is required. Most hazardous materials will require a standardized placard identifying and symbolizing the hazard. Also in this section, certain hazardous materials may be shipped in quantities below thresholds set by DOT, without having to meet special provision that would be required otherwise. If the package

is being sent under this limited quantity exemption, it must be so stated in this section of the shipping paper. Unfortunately, the largest quantity allowed under this exemption would not be enough for analyses in most cases. Special exemptions are also allowed for specific packaging systems previously approved by the DOT as acceptable for meeting its requirements. If the material is being sent in this approved packaging, the exemption number must be provided in this section. A copy of the DOT exemption must also be placed in a resealable pouch affixed to the outside of the package. In addition, a copy of the exemption must be kept on hand at your shop and at the receiving location of the hazardous material shipment.

• A 24-hour emergency response telephone number must be provided. This telephone must be monitored at all times by a person, agency, or organization capable of, and accepting responsibility for, providing detailed information concerning the hazardous materials being shipped.

There are also additional packaging requirements that will more or less ensure that the hazardous chemical will remain contained during normal transport. In summary of 49CFR 173.24, each package used for the shipment of hazardous materials shall be designed, constructed, maintained, filled, its contents so limited, and closed or sealed, so that under conditions normally incident to transportation, there will be no release of hazardous materials to the environment. Some hazardous materials may be *required* to be shipped in the preapproved, exempt packaging. Specific requirements are listed in the Table of

Concentrations & Assigned Packing Groups for Hazardous Material in the Poison Class (Class 6.1)

			& Mists LD <sub>50</sub> (mg/kg)
Ι	≤5	≤40	≤0.5
II	5, ≤50	>40, ≤200	>0.5, ≤2
III	Solids: >50, <200 Liquids: >50, <500	>200, <1000	>2, <10

Packing Group | Oral Toxicity LD<sub>50</sub> (mg/kg) | Dermal Toxicity LD<sub>50</sub> (mg/kg) | Inhalation Toxicity by Dusts

Hazardous Materials 49CFR 172.101, and also in the UPS Guide.

Depending on the toxicity, there are also limitations on the quantity that may be shipped in any one package. Often, chemicals are listed in the Table of Hazardous Materials with three different Packing Groups. The Packing Groups must be reported on the Shipper's Certification. These groups pertain to different concentrations of the hazardous material, with Packing Group I representing the most hazardous, and Packing Group III representing the least hazardous. Assignment of the Packing Group for a hazardous material in the poison hazard class (Class 6) has to do with the lethal dose (oral, dermal, and inhalation of dusts or mists) as defined in the Federal Register. LD<sub>50</sub> is defined as the dose of the hazardous material that will cause death in 50 percent of the rats in a study after exposure for a given amount of time. When a hazardous chemical has more than one route of administration, the highest toxicity should be applied for determining the Packing Group. The accompanying table shows the concentrations and the assigned Packing Groups for hazardous material in the Poison Class (Class 6.1).

#### **Shipping Corrosive Materials**

Packing Groups for hazardous materials in the Corrosive Class (Class 8) are slightly different. Corrosives in Packing Group I cause visible destruction or irreversible alterations of the skin tissue at the site of contact when tested on the intake skin of an animal for a period of not more than three minutes. Packing Group II extends the time for developing visible destruction to more than four hours. Alternatively, if nothing else applies, but the hazardous materials can be demonstrated to have a corrosion rate on steel or aluminum of greater than 6.25 mm (0.246 in.) a year at 55 °C, Packing Group III should be used.

Deciding on the Packing Group has been confusing for shippers who do not know the LD<sub>50</sub> or degree of corrosivity of the chemical being shipped. Because the packing requirements for Packing Group III are much less stringent than the other two groups, shippers often select this category without any basis for making the determination. For example, a cyanide solution in Packing Group III has special requirements, including a label "Keep Away From Food." Shipping under Packing Groups I and II, however, requires that the package be shipped only in approved exempt packages. Information regarding LD<sub>50</sub> and corrosivity is sometimes provided on the MSDS for chemicals. If this information is not available, some effort should be made and documentation should be kept, to show how the Packing Group was determined. Remember, the ultimate responsibility is with the shipper. When in doubt, the stricter shipping requirements should be followed.

Couriers may have specific requirements aside from DOT regulations. For example, UPS will not accept shipments of hazardous materials categorized as Packing Group I under the limited quantity exemption. It is important to check both the DOT regulations and any specific rules enforced by your courier.

Some other packing tips include:

- Never mix regulated items of different classes or divisions in the same container. For an obvious example, acids and cyanides should not be shipped together.
- Highly reactive chemicals must

always be packaged alone and not in containers with any other chemical.

In general, shipment of sludge and waste samples for analysis by a testing lab would follow the same requirements. If it is being sent to a laboratory for analysis, a manifest is not required. All other DOT regulations would apply (*i.e.*, if it is corrosive, it should be labeled as such).

### Dear Advice and Counsel,

I own a small jobshop and would like to put money away for the day that I decide to walk away from my business and clean up the building and site for the next generation to use. A major stumbling block is that the IRS does not recognize this as a legitimate business expense, so I have to pay taxes on this money before I put it away. Isn't this unfair and a boulder on the highway to a "greener" environment? Signed, Rocks in my Head

#### Dear Rocks,

I urge you to write your representatives in Congress and urge them to support HR 2919, introduced by Congressmen Quinn, McHale and Franks of New Jersey. This bill would do exactly what you want, allowing up to \$5,000,000 per year to be set aside, and removing the CERCLA liability from you and any lenders associated with the clean-up of a brown field site.

A copy of the bill can be obtained from Bill Sonntag, NES, 2600 Virginia, NW, Washington, DC 20037 (Phone: 202/965-5190). *P&SF*