

Focus on Safety:

How to Read and Understand a Material Safety Data Sheet

Since the passage of the comprehensive Health and Safety Regulations in the 1970s and '80s, it has been necessary for chemical manufacturers to provide a tremendous amount of information to the users of their products. As lithographers, it is our responsibility to know the materials we handle in the day to day operation of our shops. This information is available to us through the use of Material Safety Data Sheets (MSDSs).

An MSDS expands on the information available on the chemical's label. It provides information on the chemical composition of the product, potential physical and health hazards, protective and first aid procedures, storage and disposal methods, and much more. All manufacturers of chemicals are required to provide an MSDS for each individual chemical. MSDSs for chemicals used in your shop should be stored in a binder and are available for you to use as a reference. Yet many lithographers still don't know how to get the most benefit from these resources to help keep their shops safe. This article is intended to maximize your understanding of the MSDSs.

Many lithographers think there is a mandatory format that all suppliers must use for their MSDSs. This is not true. There are guidelines concerning the information that must be contained, but the manufacturer can choose the format that suits its needs.

Starting at the top, the manufacturer's name should be spelled out clearly, unless you purchased the product from a

distributor, in which case the distributor's name should appear on the form. The form should also list an address and phone number to call if questions arise. In addition, it should specify emergency phone numbers for the distributor, manufacturer, and Chemtrec (Chemical Transportation Emergency Center) to call in the event of an accident with the chemical.

This section should also identify the nature of any hazards involved with using the product. These include flammability, corrosivity, toxicity and reactivity characteristics, as well as special hazards, such as carcinogenicity - the ability to cause cancer - and teratogenicity - related to birth defects.

For lithographers, fire and explosion are the most common hazards, since virtually all blanket and roller washes and other cleaning solvents are flammable. All lithographers know what they need in a blanket and/or roller wash: rapid cleaning and quick drying. Unfortunately, such behavior is often associated with a hazardous nature and can be harmful. For an organic solvent to dry quickly, it must be very volatile, which means the air over the work place will contain a relatively large amount of the solvent in vapor form.

Many solvents used in blanket and roller washes are very volatile, which means they are usually quite flammable. If the principle hazard is toxicity, highly volatile substances pose another threat because inhaling them can cause harm.

Another listing that should be found in this section is the U.S. Department of Transportation (DOT) hazard classification. It might describe the hazard as flammable or combustible liquid, for example. Many printers use acidic and basic materials, which can be corrosive - meaning the pH is below 2 or above 12 standard units, respectively.

Section I of an MSDS should be used to identify and describe the hazardous substances the product contains. They are usually identified by their chemical name, but should also be labeled with their Chemical Abstracts Service Number (CAS No.). The CAS No. is used to "fingerprint" the chemical, distinguishing it from all other chemical species.

In addition, exposure limits should be set forth in this section. If the material is toxic, its exposure limit might be expressed as a threshold limit value (TLV). This is the content of the material in air at which the toxic effects become apparent. The exposure limit may also be

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expressed as time-weighted average (TWA) or short-term exposure limit (STEL).

In general, the lower this number, the more toxic the material. However, this number must be coupled with the vapor pressure to assess the potential hazard because, if the material has a low vapor pressure, it may never reach a toxic content in the air - no matter how low its TLV.

If the substance can be absorbed through the skin, exposure limits may be expressed in terms of skin limits. Exposure limits can be specified by a number of different federal and state agencies.

If a toxic material is ingested, TLV data is of limited value. In these cases, use the Lethal Concentration 50 (LC50) data - the concentration at which half the animal test population died after ingestion. These numbers are rarely seen in printing related MSDS forms.

Section II usually specifies what to do if the product accidentally comes into contact with the eyes or skin, or if a significant amount has been inhaled or ingested. Don't wait for an emergency to read the MSDS; be familiar with this material ahead of time. A few seconds saved here can save a life or prevent serious injury.

In general, follow these rules:

- * Call a doctor;
- * Flood the affected external area with water;
- * Remove employee from immediate area if a large amount has been ingested; and
- * Do *not* induce vomiting, because many substances can cause lung damage if inhaled during vomiting.

For toxic materials, Section III should provide information as to how the body can be harmed by the hazardous material, as well as describe symptoms resulting from over exposure.

Section IV should contain protective measures you can take to safely use the

product, including the use of gloves, eye protection and ventilation devices. Use some common sense here, too: If the MSDS specifies that gloves should be worn, it's a good idea to wear protective glasses and long sleeves.

Section V covers reactivity; fortunately, very few products used by lithographers involve this type of hazard. However, watch out for inadvertent reactions, such as a chlorinated product in the presence of an aluminum pump coming into direct contact with an alkali or amine.

You can find advice on how to deal with spills and leaks in Section VI. In general, "dike" the affected area, keep fire or sparks away, absorb the spill and properly dispose of all cleanup materials.

Section VII should clearly outline storage conditions for the substance, along with any special handling requirements.

Conditions under which the chemical may become explosive or flammable are usually found in Section VIII. Explosion limits tell the range of explosive mixtures formed by the hazardous chemical in the air. Unfortunately, this data isn't too useful because lithographers aren't in a position to measure air composition during normal product usage. This section should also specify the flash point, which can be used as a guide to the product's flammability hazard.

A flash point above 200° F signifies no flammability hazard and, as a result, usually receives a DOT hazard classification of "no hazard." If the flash point is between 200°F and 100°F, the DOT will classify the substance as a "combustible liquid." When the flash point dips below 100°F, it becomes a "flammable liquid." In addition, flash points below 0°F may be classified as "very" or "extremely flammable." This section should advise you on how to fight a fire and state measures to take to prevent fire or explosion.

It's common for this section of the MSDS to contain the HMIS rating. You

should realize that this is strictly voluntary and that suppliers differ in their interpretation of hazard levels for HMIS purposes. Thus, two manufacturers may rate the same composition 1-1-0-B and 2-2-0-B, respectively.

The final section, IX, details physical properties such as density, evaporation rates, vapor pressure and density, appearance, pH, percentage volatile, water solubility, melting point, boiling point and other data. Some suppliers may provide information regarding VOC content here, too.

Although ingesting this article won't make you an MSDS expert, it should help maximize the useful information such sheets contain. Since no sheet can cover all printing information needs, don't hesitate to contact your suppliers to obtain more data, as well as guidance and advice on how to best use their products.

MSDSs are a valuable source of information about the chemical products you use in your shops. Familiarize yourself with their location in the shop and the information they contain before you handle any chemicals in the performance of your job. Remember, too, that the MSDSs contain useful information on first aid procedures to follow in case of an accident or injury. For this reason, MSDSs *must* remain in their binder so that they are readily available when needed. ***Do not remove any MSDSs from their binder.***

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