

A grayscale photograph of a computer monitor and keyboard. The monitor's screen shows a blurred image of laboratory glassware, including test tubes and beakers. Overlaid on the center of the screen is the main title text in a large, bold, black sans-serif font.

# **What you need to know about electronic material safety data sheets**

*A supplement to Laboratory Compliance Insider®*

# Electronic MSDS systems help make OSHA hazard communication compliance easier

Dear reader,

The Occupational Safety and Health Administration (OSHA) requires through its hazard communication standard that your laboratory make material safety data sheets (MSDS) available to your employees. Technology can make many aspects of this compliance easier.

Using software and other electronic methods to gather, store, organize, and access your MSDSs can also enhance their usability. With that in mind, we offer this special report, which we hope will help you

- consider the benefits of electronic MSDSs
- understand how to comply with related OSHA requirements
- train your employees about access to and use of MSDSs
- prepare backup plans for when electronic MSDS access fails

We've also provided lists of resources available from OSHA to help you comply with its requirements for MSDSs and understand how they effect the use of electronic MSDS systems.

We'd like to thank **Kelly Briganti, JD**, an LCI contributing editor, for authoring this special report.

Please let us know what you think of this information and whether it was helpful. If you have any comments about the special report or if you want to pass on ideas for other stories or special reports, please call or write me.

Sincerely,



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# Consider an electronic system for MSDS maintenance

The Occupational Safety and Health Administration's (OSHA) hazard communication standard requires that laboratories make material safety data sheets (MSDS) readily accessible to all employees.

MSDSs satisfy laboratory employees' right to know what hazardous chemicals they are exposed to, says **Steven E. Brooks, PhD**, director of infection control and clinical microbiology for Kingsbrook Jewish Medical Center in Brooklyn, NY.

MSDSs provide staff who work with chemicals or those who oversee these staff with information about side effects, permissible exposure limits, and actions needed to prevent or respond to chemical exposure, he explains.

Reviewing MSDSs and becoming familiar with the chemical characteristics and adverse effects of exposure to substances used in the laboratory also allows the laboratory manager to take precautions and obtain any necessary spill kits, personal protective equipment (PPE), or respirators before a chemical exposure or spill occurs, he says.

OSHA regulations permit flexibility in how laboratories meet MSDS requirements. Laboratories can use paper MSDSs, electronic access, and microfiche to make MSDSs accessible to employees, according to the regulations. Although paper MSDSs are still common in laboratories, electronic MSDS systems offer their own benefits.

Following is an explanation of OSHA's requirements for providing MSDSs to employees and issues to consider before deciding to electronically maintain, organize, and access your MSDSs:

## What OSHA requires

OSHA regulations require laboratories to maintain MSDSs for all hazardous chemicals in the laboratory and make the MSDSs readily accessible to laboratory employees during their work shifts when they are in their work areas.

According to an OSHA standard interpretation letter, the employee must be able to immediately "read and refer to the information."

Another interpretation letter indicates that computerized systems are acceptable as long as all employees have access to computer terminals—with readable copies of the MSDSs—in their work areas during their work shifts. Employees must not only have access to MSDSs, they also must know how to obtain them, according to yet another interpretation letter.

An appendix to the regulation entitled "Guidelines for Employer Compliance"—which is only an advisory—provides helpful information about MSDS compliance to laboratories. Those guidelines state that "[a]s long as employees can get the information when they need it, any approach may be used."

However, the flexibility is limited. OSHA regulations don't permit you to use a method that presents any "barriers to immediate employee access in each workplace." The guidelines also indicate that OSHA compliance officers will talk to employees to ensure that they know where to obtain MSDSs in your laboratory. So if you decide to use computerized systems, make sure that you have computer terminals readily available to all staff and that you train them how to use these systems.

**Insider tip:** The guidelines note that certain states may also have their own requirements for MSDSs, so familiarize yourself with your state's requirements, because they could differ from those of OSHA.

## Benefits of electronic vs. paper systems

Laboratories have traditionally maintained paper MSDSs in binders, but technology now provides other options. You can obtain electronic copies of MSDSs using Internet search engines or from the chemical's manufacturer, Brooks says. There are also paid services that find and retrieve electronic MSDSs.

Keep in mind that you need to know where the MSDS that you find in your search came from—that is, the Chemical Abstracts Service Registry (CAS) number, says **Randel Roy, MT(ASCP)** clinical coordinator for Affiliated Laboratory, Inc., in Bangor, ME.

Some MSDS service providers will scan in paper MSDSs, so keep yours updated in case you want to > p. 4

create an electronic database, says **Tony Diamantidis**, managing director of Chemical Safety Software in Emeryville, CA.

Certain software programs help track, maintain, update, and organize your laboratory's electronic MSDSs, Roy says.

The benefits of these systems include search features that allow you to not only find particular MSDSs, but also to focus on specific information within an MSDS, he says. If you are part of a larger organization or are a large laboratory, software programs can allow you to easily determine the location of a certain chemical in your facility, he adds.

### What to look for when evaluating services

If you consider a move to computerized MSDSs, then the size of your laboratory, your MSDS needs, and whether you are part of a larger organization will be key factors in your decision-making.

When looking for the right software or computerized program, consider a request for proposal inviting multiple vendors to provide pricing and service information, says Roy, whose laboratory recently selected a software program to maintain its MSDSs. Consider the following issues when evaluating computerized systems:

▪ **Accessibility.** "No barriers to access is key" to MSDS compliance; staff should be able to access the electronic MSDSs from every computer, says **Stephen Ward**, founder and director of engineering of NetWARD Software, Inc., in Mesa, AZ. Electronic MSDSs must be available to all staff during working hours, which means that you need terminals accessible to all of your technologists. Depending on your laboratory's size, number of technologists, and location, this issue could present a few hurdles, says **Nick Cetani Jr., MT(ASCP), CLS** vice president and administrative director of Bio-Reference Laboratories, Inc., in Elmwood Park, NJ.

If you have an electronic MSDS system but a staff member can't access it, you aren't compliant with OSHA. Staff should not need passwords to access the MSDSs. In the stress and confusion of a spill incident

or other exposure, remembering passwords may not be easy, notes Ward. Make the MSDSs available via your intranet, so staff can find them through their browser for immediate access, he says.

If you use a customized software program to organize your electronic MSDSs, you will need to provide two types of access. The customization of the MSDS will require data entry by an authorized laboratory employee—most likely the safety officer, says Ward. That

### When it comes to MSDSs, you can phone it in

#### **Q: Is receiving material safety data sheet (MSDS) information by telephone an adequate backup substitute for an electronic MSDS system?**

**A:** Yes. On October 13, 1998, the Occupational Safety and Health Administration (OSHA) said relaying MSDS information by telephone is acceptable, but only "as a backup system in the event of failure of the primary electronic system." The letter also said the employer must provide the information as soon as possible to the requesting employee.

Another OSHA letter of interpretation from February 18, 1999, discussed telephone transmission of MSDS information, noting that prior to the 1998 letter, the only acceptable use of telephone transmission of MSDSs was for employees who traveled between sites. The 1999 letter also explained that telephone backup for electronic systems was only permitted in emergencies defined as "foreseeable failures in the electronic system" (e.g., a power outage, equipment failure, or online access delay), but not in other emergencies (e.g., catastrophic events or medical emergencies). In other emergencies, the MSDS system must be available.

*Editor's note: This Q&A is a sample of the kind of advice given through the Medical Environment consultation hotline. The hotline is available free to subscribers of the monthly newsletter **Medical Environment Update**. Go to [www.hcpro.com/services/mei](http://www.hcpro.com/services/mei) to learn more.*

person will need access to edit the MSDS data that are specific to your laboratory and should be required to log on and use a password. All other laboratory personnel should only have access to view the information, he adds.

Create backup plans if the system is down or access is impeded. One option is to keep paper copies in a binder, says Roy. An OSHA standards interpretation letter indicates that during an emergency such as a power outage, equipment failure, or online access delay, the laboratory must have “an adequate backup system for rapid access.” In addition, there must be a way to provide hard copies of MSDSs in an emergency or whenever an employee needs or wants a hard copy.

**Insider tip:** Create an emergency backup copy of your electronic MSDS files, advises Ward. Just as with any other electronic data, follow backup procedures to save your electronic MSDS files in case of technical difficulties, he says.

▪ **Searchability.** One of the most important features of a computerized MSDS system is the ability to do a keyword search, says Roy. MSDSs have multiple sections that contain information related to the chemical, and using keywords allows you to quickly search through lengthy text, he says.

For example, if your laboratory has a chemical spill, your staff need to know as quickly as possible about the health hazards associated with the chemical.

In a computerized MSDS system, the keyword search function can take staff to that health information immediately, says Roy. Using a paper system can take considerably more time.

The key information by which you want a software system to allow you to search includes product catalog number, product name, supplier name, manufacturer name, primary ingredients, CAS number, synonyms for the product or chemical, and the international unit number, says Diamantidis.

▪ **Tracking and reporting.** Evaluate how comprehensive the computerized database is and what features it offers. Some systems can track which individual employees are exposed to which chemicals, says Roy.

You'll need to be able to track which employees worked with, or were exposed to, specific chemicals in case a problem with or a side effect of that chemical is discovered many years later, explains Roy. For example, a chemical may be determined to be a carcinogen a decade after your laboratory used it, so you'll need to determine who was employed > p. 6

## OSHA resources at your fingertips

Following is a list of Occupational Safety and Health Administration (OSHA) standards, guidelines, interpretation letters, and other helpful documents that help explain the hazard communication requirements relevant to electronic material safety data sheets (MSDS):

1. OSHA's hazard communication standard: 29 *CFR* 1910.1200
2. *Guidelines for Employer Compliance* (advisory): 29 *CFR* 1910.1200 Appendix E
3. Standard interpretation letters: OSHA has addressed issues regarding electronic MSDS systems in several standard interpretation letters. Following are a few of the most helpful:
  - December 7, 1999: *Employee access to MSDSs required by 1910.1200 vs. 1910.1020*
  - February 18, 1999: *Clarification of systems for electronic access to MSDS*
  - December 30, 1997: *Manufacturer and employer responsibilities when providing MSDSs electronically*
  - January 30, 1997: *Material Safety Data Sheets*
  - July 15, 1996: *OSHA's Hazard Communication Standard*
  - July 6, 1990: *Interpretation on whether 'an equivalent electronic information system' could be used in lieu of MSDSs to satisfy the HCS*
  - January 22, 1990: *Hazard Communication Standard*
4. "Hospital eTool: Healthcare Wide Hazards Module Hazardous Chemicals," [www.osha.gov/SLTC/etools/hospital/hazards/hazchem/haz.html](http://www.osha.gov/SLTC/etools/hospital/hazards/hazchem/haz.html)
5. Hazard Communication: OSHA Standards: [www.osha.gov/SLTC/hazardcommunications/standards.html](http://www.osha.gov/SLTC/hazardcommunications/standards.html)

*Editor's note: Find all of these documents on OSHA's Web site at [www.osha.gov](http://www.osha.gov).*

in the laboratory and exposed to the chemical at that time. Using the MSDS software to do that could initially require significant data entry on the part of your laboratory, adds Roy. However, for laboratories that would have difficulty tracking that information on their own, it could be a valuable feature.

Certain software programs also allow you search for all the locations within your laboratory in which the chemical is used or located. You can also limit an MSDS search to chemicals in a particular site or location if you have multiple sites, Roy says. Or if you have a chemical that is determined to be a carcinogen, for example, you can easily and quickly determine where it is used so you can disseminate information about the new hazard determination as quickly as possible to affected personnel, he adds.

You can also generate reports using software to maintain data about all the types of hazardous chemicals in your laboratory.

Finally, by integrating your MSDS software with other electronic information systems that your laboratory uses, you can cross-link MSDSs to chemical inventories, locations, amounts, and types of storage (e.g., fire-rated cabinets and sprinklered rooms) on-site, says Diamantidis.

▪ **Customizing.** Electronic systems also allow you to customize and organize MSDS information in a way that best meets your laboratory's needs. As noted above, reviewing MSDS information allows your laboratory to be proactive in dealing with hazards (e.g., buying the proper spill kit before a spill occurs).

Electronic MSDS software programs can help your laboratory customize the MSDS online with added information about how your laboratory uses and stores that hazardous chemical. You aren't changing the language of the MSDS, but rather are adding information that analyzes how that MSDS applies to your laboratory's operations, Ward explains.

For example, whereas a typical MSDS may indicate only that the necessary PPE requires that staff "wear the appropriate gloves," you can customize the MSDS

by adding the specific type of gloves in your laboratory that would be appropriate for the hazard, explains Ward. You can also organize the MSDSs using software that allows you to search by key words that are relevant to your laboratory. Include names of products or kits that your laboratory uses that contain multiple hazardous chemicals.

By searching with the product or kit brand name as the keyword, you could pull up the MSDSs for all of the component chemicals, says Ward.

**Insider tip:** Laboratory staff may be overwhelmed by the task of entering necessary data to the potentially thousands of MSDSs relevant to their laboratory to achieve the customization discussed above. To make the task easier, start by focusing on the MSDSs relevant for chemicals that are hazards in your laboratory, suggests Ward.

▪ **Updating.** Continually update MSDSs. Check your MSDSs at least annually to determine whether hazards have changed and then react to any changes, says Roy. Determine how you will update information with the software programs that you evaluate.

▪ **Archiving.** Make sure that you have the most up-to-date MSDSs for chemicals used in your laboratory. Maintain records regarding chemicals that you don't use anymore and old versions of MSDSs for chemicals that you still use. Adverse occurrences can develop later and you need to be able to determine whether the risk was known at the time your employee used or was exposed to the chemical, Brooks says. ■

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### Insider sources

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# Train employees about how to use an MSDS

It's not enough to maintain electronic or paper material safety data sheets (MSDS) for the hazardous chemicals in your laboratory.

You must also train employees how to recognize a potential chemical hazard and how to access and use MSDSs to avoid, or react to an exposure to, that hazard.

That's because Occupational Safety and Health Administration (OSHA) regulations require that employees receive training and information about hazardous chemicals in their work area when they are first assigned to their job duties and when new hazards enter the work area.

## Why training is important

Training is essential to laboratory compliance and safety. Training employees to identify a hazard may seem obvious, but there are hazards that laboratory personnel can easily overlook.

For example, laboratory staff could work with a chemical in an area in which the ventilation might not function properly, thus creating a risk of overexposure, says St. Louis-based safety consultant **Terry Jo Gile, MT(ASCP), MA Ed.**

This situation may happen particularly with formaldehyde because the permissible exposure limit (PEL) was reduced from 1.0 parts per million (ppm) to 0.75 ppm a few years ago, and the action level (i.e., when you need to take action to avoid reaching the PEL) is 0.5 ppm, Gile says.

This year, a New York hospital was fined \$112,500 for—among other violations—failures to monitor employee exposure to formaldehyde and to provide employee training regarding exposure to the chemical.

## How to create a proper training program

Section 1910.1200(h) of OSHA's hazard communication standard requires laboratories to train employees who could be exposed to hazardous chemicals. To comply with this requirement, include in a chemical hygiene inservice or other training session information about where employees can find and access MSDSs and whether they are in paper or electronic format, suggests Gile.

An advisory to the OSHA hazard communication standard, *Guidelines for Employer Compliance*, appendix E, lists essential elements to consider when planning a training program, including

- who should conduct the training
- what training method to use (e.g., a live instructor, videotape, online tools, etc.)
- what information to include
- what procedures to follow for training new employees—and all employees—on new hazards

Section 1910.1200(h)(3) requires that such training include instruction about

- the identification of hazardous chemicals in the work environment
- the types of hazards created by the chemicals in the work area
- available personal protective equipment (PPE)
- work practices
- other protective measures access
- use of hazard information, including MSDSs
- the information contained in MSDSs

OSHA's standard and guidance materials indicate that training can—but doesn't have to be—specific to each hazardous chemical. Laboratories can instead categorize chemicals by type of hazard (e.g., flammability) and train staff on each type of hazard.

**Insider tip:** OSHA offers a *Draft Model Training Program for Hazard Communication* that can help laboratories in preparing their training programs (available at [www.osha.gov/dsg/bazcom/MTP101703.html](http://www.osha.gov/dsg/bazcom/MTP101703.html)). The model training program emphasizes that training is also an opportunity for employees to ask questions and communicate ideas and concerns to management.

## Test trainees' comprehension

According to OSHA's advisory *Guidelines*, training should educate employees not just about how to read and understand the information in MSDSs, but also how to use that information in their workplace.

That doesn't mean that employees must memorize all of the information about hazardous chemicals in their workplace, according to the *Guidelines* and a 1990 OSHA standard interpretation letter. **> p. 8**

Instead, training must enable employees to answer an OSHA inspector's questions about how to identify exposure to a hazardous chemical and where to find hazard information, according to the *Guidelines*.

Don't just give personnel the facts about MSDSs—explain how to use the information they get from MSDSs (e.g., what PPE to wear to protect against exposure).

Test employees during training sessions to make sure that they get the message. "I would have them look up a chemical they work with and locate specific information on the MSDS, such as the physical hazard, health hazard, etc.," says Gile.

If you have electronic MSDS systems, require that employees use a computer to look up a chemical during training, she adds. Also make sure that they know how to clean up a spill and where the spill kit is located.

### Address access for electronic systems

Note that if you use an electronic rather than paper MSDS system, train employees about the specifics of that system and what backup systems are in place should power outages, Internet disruptions, or other emergencies thwart electronic access.

Have your safety officer or other designated individual keep the official set of MSDS hard copies just in case your electronic system is inaccessible or otherwise fails, says Gile. Make sure that employees know about that backup MSDS source, its location, and how to find an MSDS using the paper copy.

### Document training

Keeping records of training isn't a requirement, but it is a good idea to track employee training, according to the *Guidelines*. Such records should also indicate

what was taught during training, according to an OSHA model training program.

The College of American Pathologists and the Joint Commission on Accreditation of Healthcare Organizations will want to see records of training, including attendance sheets, as well as the name of the instructor, the length of the program, and a description of the information covered during the program, notes Gile.

To ensure that employees are trained on new hazards, augment training with a log that records new hazard information and require that each person review the log when they clock in for work, says Gile. ■

### Insider source

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## OSHA resources relevant to MSDS training

- Occupational Safety and Health Administration (OSHA) hazard communication standard, 29 *CFR* 1910.1200
- OSHA *Guidelines for Employer Compliance*, Appendix E to OSHA standard 1910.1200
- OSHA interpretation letter, January 22, 1990, *Hazard Communication Standard* (addressing what OSHA requires concerning employee material safety data sheet access and training)
- OSHA interpretation letter, August 1, 1990, *OSHA's Hazard Communication Standard* (addressing elements of a hazard communication training program)
- Draft model training program for hazard communication, available at [www.osha.gov/dsg/hazcom/MTP101703.html](http://www.osha.gov/dsg/hazcom/MTP101703.html)

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