

# HazCom

## Most Frequently Asked Questions

By Glenn Trout and Chuck Haling

**O**n March 25, 2012, OSHA published a final rule aligning its HazCom Standard, also known as HCS, HazCom and 1910.1200, with the UN's Third Revision of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). HazCom covers more than 43 million workers in more than 5 million workplaces, more than 880,000 hazardous chemicals and millions of safety data sheets (SDS), affecting everyone in the hazardous chemical life cycle (OSHA, 2012g).

OSHA refers to the revised rule as HazCom 2012 to distinguish it from the iteration it will replace, now referred to as HazCom 1994. The final rule went into effect on May 25, 2012, and encompasses a series of four phased-in compliance deadlines.

As these deadlines near, more questions are surfacing for SH&E professionals preparing to comply. The authors and their company have been educating people about HazCom and OSHA's alignment with GHS for several years, and have compiled a list of the most frequently asked questions, which are the focus of this article:

- 1) What are the biggest changes to HazCom as part of GHS alignment?
- 2) What are the compliance deadlines?
- 3) What are the new label requirements?
- 4) How are MSDS changing?
- 5) What are the employee training requirements?
- 6) What do I need to know about SDS authoring?

7) What should I do with older versions of MSDS?

8) What is Canada's plan for GHS adoption?

9) How does GHS alignment change electronic MSDS/SDS management?

10) Are any other standards affected by HazCom alignment with GHS?

### GHS Changes to HCS

**Question 1: What are the biggest changes to HazCom as part of GHS alignment?**

While GHS adoption is new to the HCS, harmonizing the standard globally is an objective OSHA began to pursue when it first issued the standard in 1983. The agency references this commitment in the rule's preamble (OSHA, 2004).

In addition, OSHA played a significant role in GHS development. Its HazCom Standard was one of four major systems referenced in the development process, and the agency chaired a coordinating group responsible for managing the work involved in integrating all the international systems that were being evaluated to develop what is now GHS (OSHA, 2012e).

### IN BRIEF

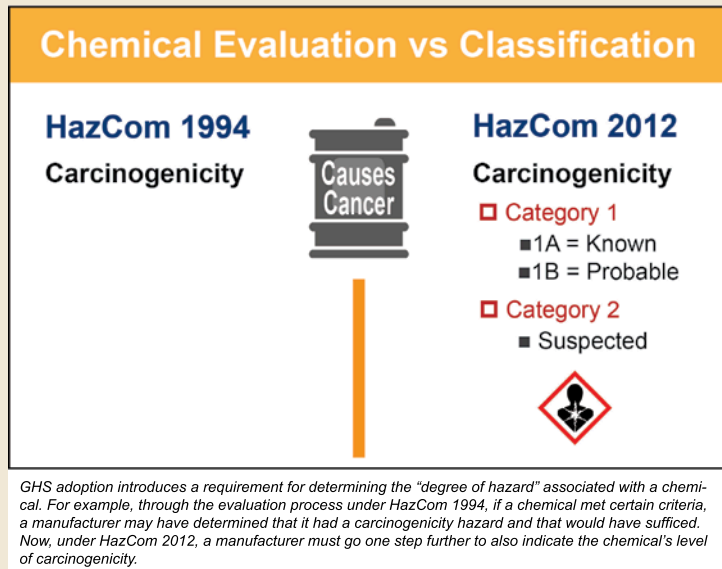
- OSHA's adoption of GHS provides consistency to the classification and communication of dangerous chemicals in the workplace, which not only brings the U.S. closer to unifying its system for international trade purposes, but also helps elevate the rule from a right-to-know to a right-to-understand standard.
- OSHA's revised GHS-aligned HazCom Standard went into effect in May 2012. As the different phase-in deadlines approach, compliance questions are arising.
- This article answers 10 frequently asked questions about how the changes will affect employers and employees.

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Figure 1

## Chemical Evaluation vs. Classification for Carcinogenicity



Determining the degree of a hazard associated with a chemical is fundamental to GHS and affects not only how hazards are classified but also how hazards are communicated on labels and SDS.

In essence, GHS is a compilation of global HazCom best practices. GHS in itself is not a regulation governed by any international regulatory authority. Adopting countries select system elements that work best for their particular needs; this is referred to as the building block approach (OSHA, 2012e). They are still responsible for governing and enforcing their respective hazardous chemical programs.

When OSHA adopted GHS, it took advantage of this approach. The agency did not completely rewrite HCS or eliminate existing protections; it simply made updates to better align certain areas of the regulation with GHS. OSHA retained the standard's framework, including the five main components of a compliant HazCom program: 1) written plan/program; 2) chemical inventory; 3) labels and warnings; 4) training; and 5) MSDS documents. It left areas not affected by GHS unchanged.

To simplify the process, OSHA placed most of the technical changes in the rule's appendixes rather than within the regulatory text (OSHA, 2009). These appendixes are most helpful to chemical producers that need to reference them for guidance on reclassifying chemicals and preparing updated labels and SDS. However, employers may also find appendixes C and D helpful for better understanding the new format SDS and labels that are or will be entering work environments as a result of GHS alignment.

Here is a list of HazCom 2012 appendixes:

- Appendix A: Health Hazard Criteria;
- Appendix B: Physical Hazard Criteria;
- Appendix C: Allocation of Label Elements;
- Appendix D: Safety Data Sheets;
- Appendix E: Definition of Trade Secret;
- Appendix F: Guidance for Hazard Classification Regarding Carcinogenicity (nonmandatory).

### Two Significant Changes

At a high level, the two most significant changes involve hazard classification and HazCom. Hazard classification has changed under HazCom 2012 thanks to new definitions and processes. OSHA replaced the term *hazard determination* with the term *hazard classification*. According to 1910.1200(c):

Classification means to identify the relevant data regarding the hazards of a chemical; review those data to ascertain the hazards associated with the chemical; and decide whether the chemical will be classified as hazardous according to the definition of hazardous chemical in this section. In addition, classification for health and physical hazards includes the determination of the degree of hazard, where appropriate, by comparing the data with the criteria for health and physical hazards.

Determining the degree of a hazard associated with a chemical is fundamental to GHS and affects not only how hazards are classified but also how hazards are communicated on labels and SDS. Using carcinogenicity as an example, compare how the health hazard was treated under HazCom 1994 to how it is treated under HazCom 2012 (Figure 1). In HCS 1994, if a chemical met certain criteria, it was simply deemed a carcinogen (OSHA, 1994). GHS-aligned HazCom 2012 delineates tiers of severity that define and help communicate the extent of a chemical's carcinogenic properties. A chemical can be classified as a Category 1 or 2 carcinogen, with Category 1 used for chemicals are that are known or presumed carcinogens and Category 2 used for suspected carcinogens. The first category has two subcategories, 1A for known and 1B for presumed carcinogens (OSHA, 2012i).

GHS uses numbers to indicate hazard severity; the lower the number, the more severe. This numbering scheme is opposite of that used by NFPA and Hazardous Material Information System (HMIS) (OSHA, 2009) (Figure 2). OSHA received push-back on this during the prerule stage, but decided to adopt the GHS numbering scheme. OSHA felt this would minimize confusion since the numbers used in GHS help determine which communication elements are to be used to convey a chemical's hazard information. The numbers themselves appear on the SDS, not on the label as they do with NFPA and HMIS. Furthermore, where the numbers do appear on an SDS, so does additional contextual information that further defines their purpose.

Despite OSHA's opinion that adoption of the GHS numbering scheme should not present a problem, concerns have been raised in the marketplace. In response, OSHA collaborated with NFPA to release an educational QuickCard in 2013. It explains the difference between the purpose of NFPA 704 and OSHA HazCom labels. It also notes that under NFPA 704, labels are designed to help determine appropriate response measures in the event of fires, spills or other emergency situations, and convey flammability, instability and acute health hazard information. OSHA HazCom-compliant labels provide both chronic and acute health haz-

ard information and physical hazard information to ensure that workers are protected during normal working conditions, as well as foreseeable emergencies.

The card also describes how NFPA label information comes from the NFPA system, while HazCom 2012 label information comes from OSHA's HCS. More specifically, HazCom label information is derived from appendixes A and B, which provide classification information for health and physical hazards, respectively, and Appendix C, which explains what hazard information must appear on the label based on the outcome of the chemical classification process.

In addition to adding the term *classification* and its corresponding definition, OSHA changed other definitions, including that for *hazardous chemical*. In HazCom 1994, a hazardous chemical was any chemical that has a health or physical hazard (OSHA, 2012j). HazCom 2012 contains specific criteria about what constitutes a physical or health hazard, and it is limited to the adopted GHS crite-

ria. Any hazards falling outside the prescribed criteria are not included.

As a result, three hazards OSHA had historically covered under the HazCom 1994 definition were in danger of being left out when the agency adopted GHS. Therefore, OSHA applied the building block approach and changed the definition of hazardous chemical to include any chemical that meets the adopted GHS criteria for health or physical hazard or is one of the following hazards: a combustible dust, simple asphyxiant, pyrophoric gas or a hazard not otherwise classified, which is designated for any chemical that is determined to be hazardous but does not fit within the preceding umbrella of classifications. By doing this, OSHA retained the protections in place with HazCom 1994.

The second biggest change pertains to how hazard information is conveyed to users through the rule's primary means of communication: labels, SDS and training. OSHA now has specific guidelines for what must appear on labels and SDS, and employers must address this new information in employee training that must be completed by Dec. 1, 2013.

The new guidelines remove some performance-based aspects of SDS and label compliance requirements, which eliminates some variability that had existed. The revised rule tells manufacturers exactly what to include, at a minimum, on an SDS and label based on a chemical's classification.

Consider the following example of how this prescriptive approach works at a high level: A chemical classified as a pyrophoric gas receives the signal word *danger* and is assigned the hazard statement, "Catches fire spontaneously if exposed to air," and is assigned the flame pictogram. This information comes directly from the rule and must appear on both the chemical's shipping container label and corresponding SDS.

To further demonstrate how the prescribed communication elements work and the relationship between the label and SDS, Figure 3 (p. 46) presents an example of the minimum information required for a compliant HazCom 2012 shipped label for citric acid, along with a note indicating where that information is found on the corresponding SDS.

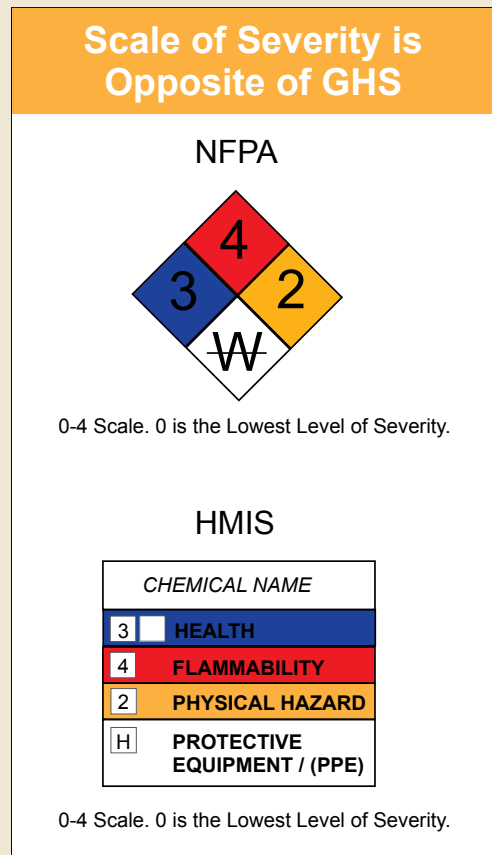
OSHA believes that the new classification process and harmonization of label and SDS information will improve worker understanding of the hazards associated with chemicals in their work environment, ultimately resulting in safer workplaces. Much of the heavy lifting to comply with the changes lies in the hands of chemical manufacturers that must reclassify chemicals and provide the appropriate labels and SDS to downstream users. As employers, chemical manufacturers have responsibilities, as do other employers, to complete employee training on the new GHS label and SDS changes by Dec. 1, 2013.

#### Deadlines

##### Question 2: What are the compliance deadlines?

OSHA recognized that compliance could not happen overnight, so it implemented a series of four phased-in compliance deadlines. All HazCom-

**Figure 2**  
**NFPA & HMIS Scale vs. GHS**



With the NFPA and HMIS hazard scales, the lowest number represents the lowest level of hazard severity. On the contrary, the lowest number on the GHS scale represents the highest level of hazard severity. However, unlike the numbers used in NFPA and HMIS, the numbers used in GHS do not appear on labels.

covered groups are affected: chemical manufacturers, distributors and importers, and employers.

**Phase 1:** Dec. 1, 2013: Employers must complete training on the new label elements and SDS format.

**Phase 2:** June 1, 2015: Manufacturers must begin shipping HazCom-2012-compliant SDS and labels based on their completed reclassification of chemicals.

**Phase 3:** Dec. 1, 2015: Distributors/importers must start shipping products with only the new HazCom-2012-compliant labels and SDS.

**Phase 4:** June 1, 2016: Employers must update their HazCom programs as necessary, complete additional employee training for any newly identified physical or health hazards based on manufacturers' reclassification of chemicals, update alternative workplace labeling systems as needed, and ensure that SDS and labels are up-to-date.

Recognizing that updated labels and SDS could begin arriving in workplaces shortly after the final rule was published on May 25, 2012, OSHA enacted the Dec. 1, 2013, employee training deadline to ensure the safety of workers who must interpret the new information.

The next deadline applies to manufacturers. By June 1, 2015, manufacturers must complete chemical reclassifications and update the corresponding SDS and labels. Beginning on that date, manufacturers can only send HazCom-2012-compliant SDS and labels with their chemical shipments.

While some chemical manufacturers jumped on GHS alignment changes and began sending updated SDS and labels in 2012, most manufacturers have not done so and some may intend to wait until the June 1, 2015, compliance deadline.

The Dec. 1, 2015, deadline applies to distributors and importers. By this date, they must begin shipping products with newly formatted labels and SDS. OSHA has given them 6 months beyond the manufacturer deadline to comply to account for the lag time that might exist between when they receive product shipments from manufacturers and when those products are scheduled to be distributed to downstream users. This will be helpful for any shipments received close to the manufacturers' June 1, 2015, deadline (OSHA, 2012e).

The final effective date is June 1, 2016; by this date, employers must be in full compliance. OSHA gave employers a full year after the manufacturer deadline to comply, expecting that this would allow ample time for their chemical inventories to turn over and to receive fresh shipments of products with updated HazCom-2012-compliant SDS and labels.

#### Timeline Challenges

The phased-in compliance dates are intended to account for the need to transition to compliance, rather than expecting immediate compliance by all groups at once. However, more than a year into the process, two challenges have surfaced.

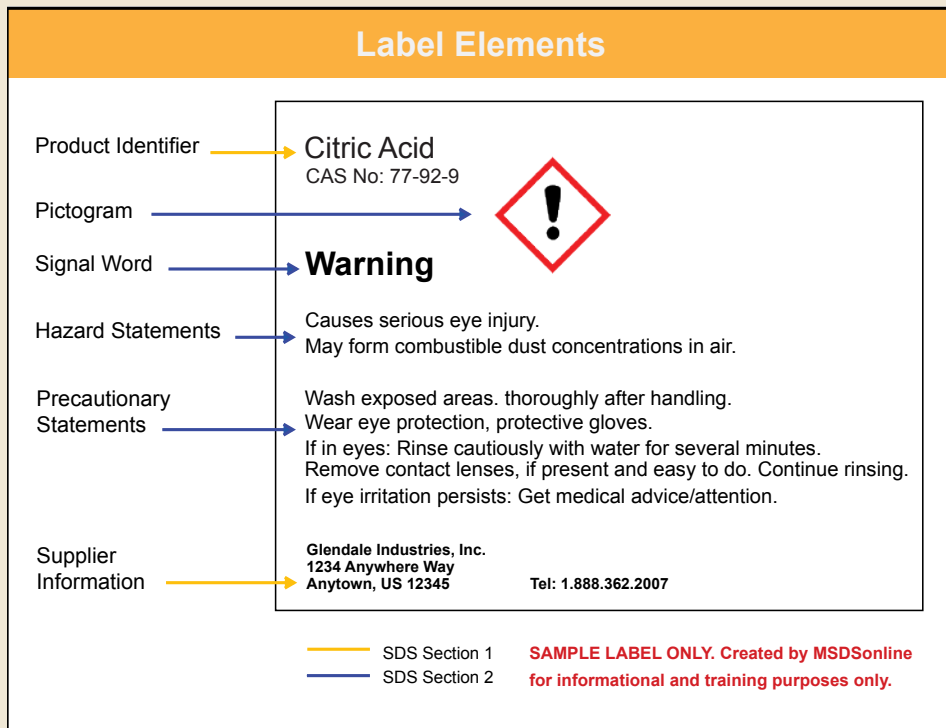
First, many manufacturers are waiting until the June 1, 2015, deadline to complete their chemical reclassifications and update SDS and labels. This creates a logjam in the transition process that affects everyone downstream as they wait for manufacturers to complete their process.

This may be a more vexing issue for distributors than it is for employers, especially for distributors who require original manufacturer ingredients to mix and create their own chemical products for distribution. These distributors are in limbo as they try to comply with OSHA's manufacturer deadline, which is imposed on them as well, since according to OSHA, they are functioning as manufacturers.

While some may plan to follow the take-no-action-until-the-deadline approach during the transition period, not all are doing so. OSHA gives companies flexibility during the GHS transition to comply with the old, the new or a

OSHA believes that the new classification process and harmonization of label and SDS information will improve worker understanding of the hazards associated with chemicals in their work environment, ultimately resulting in safer workplaces.

**Figure 3**  
**Sample Label for Citric Acid**



Under HazCom 2012, shipped labels must include, at a minimum, these six elements. These label elements also appear in Sections 1 and 2 of the corresponding SDS.



combination of the two HazCom iterations before the respective effective dates. This creates the second challenge.

Some manufacturers have or will be making progress by integrating GHS elements into their labels and documents. Similarly, eager distributors that would otherwise be at the mercy of their original manufacturers may also begin incorporating their own interpretations of the GHS modifications onto labels and SDS while they await updated information from manufacturers.

Conceptually, this may seem like a good idea, signaling progress in the transition process. However, the result of such interim efforts may actually complicate matters. This is true for employers that are already encumbered by new employee training and HazCom program update requirements. Their inventory and libraries will be flooded with semicompliant, in-between versions of MSDS, along with a mix of old and new versions during the transition period and beyond.

The combination documents may be the most problematic. To the untrained eye, these may appear to be HazCom 2012 compliant when in fact they are not. This means employers and employees will need to be diligent in reviewing inventory as they try to determine which documents are 2012 compliant. The same confusion could occur with labels.

These issues underscore the importance of completing OSHA's required GHS employee training and asking manufacturers about their transition plans. Knowing manufacturers' plans will help all users in the transition, including employees who will be on the front line interacting with the information.

In terms of downstream user expectations, even on June 1, 2015, a switch will not be flipped to trigger the mass distribution of updated documents and labels. Downstream users can expect to be affected by manufacturers' progress in the alignment process. Furthermore, GHS adoption has not changed manufacturers' SDS distribution requirements under HazCom. Following is an excerpt of the regulation's SDS distribution requirements:

- (g)(6)(i) Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate safety data sheet with their initial shipment, and with the first shipment after a safety data sheet is updated;
- (g)(6)(ii) The chemical manufacturer or importer shall either provide safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment;
- (g)(6)(iii) If the safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the distributor or employer shall obtain one from the chemical manufacturer or importer as soon as possible;
- (g)(6)(iv) The chemical manufacturer or importer shall also provide distributors or employers with a safety data sheet upon request. (OSHA, 2012e)

## Labels

### Question 3: What are the new label requirements?

This question has a two-part answer because of the different requirements for labels on shipped containers and workplace labels. Let's first review shipped container label requirements, which also provide guidance for handling workplace container labeling.

### Shipped Label

The six main label elements are:

- 1) product/chemical identifier;
- 2) signal words;
- 3) hazard statements;
- 4) hazard pictograms;
- 5) precautionary statements;
- 6) supplier identifier.

At a minimum, OSHA requires manufacturers to include these six elements on shipped container labels. Once a manufacturer classifies a chemical, it can reference Appendix C of the rule to determine what specific information is required for the chemical label (OSHA, 2012a). While these six main elements are required, OSHA does not mandate the layout, typeface or font size.

However, the agency says the pictogram element must include the red color of its diamond border. This is another example of where OSHA deviated from GHS, which permits adopting countries to use black diamond borders for domestic shipments. OSHA requires the red diamond border regardless of shipment destination because it felt red better alerts users to the chemical's hazards (OSHA, 2012e). Of the six elements, OSHA wants items 2 to 4 (signal word, hazard statement and hazard pictogram) grouped on the label (OSHA, 2012e).

Here is a brief description of each element:

**1) Product identifier.** The nomenclature used to identify the chemical, such as the chemical name or code number. The same identifier should also appear in Section 1 of the SDS (OSHA, 2013c).

**2) Signal words.** After a chemical has been classified, it is assigned one of two signal words, *danger* or *warning*. *Danger* is the more severe term; only one of the two signal words should appear on the label, that which represents the most severe of hazards.

**3) Hazard statements.** These statements describe the nature and degree of hazard associated with a particular chemical. For example, "Causes damage to lungs through prolonged or repeated exposure when inhaled into lungs." Hazard statements are harmonized under HazCom 2012 so that all chemicals with the same hazards, no matter what they are, will have the same base hazard statements.

A base hazard statement is specified here because Part C.2.2.1 of the rule says hazard statements can be combined to reduce the amount of information on the label and to improve readability, provided the hazards are conveyed as required (OSHA, 2012e). Per C.2.2.2, OSHA also allows statements to be omitted if the manufacturer or other responsible party can demonstrate that all or part of the prescribed hazard statement is inappropriate (OSHA, 2012a).

**4) Hazard pictograms.** A pictogram is a harmonized black hazard symbol surrounded by a red diamond border on a white background. Pictograms are new to the rule and, as noted, OSHA requires that they appear with their red diamond borders on shipped container labels. OSHA has adopted eight of nine UN GHS pictograms. It did not adopt the environment pictogram since the agency does not cover environmental hazards.

OSHA has published an HCS pictogram Quick Card that provides a reference to all eight adopted GHS pictograms ([www.osha.gov/dsg/hazcom/index.html](http://www.osha.gov/dsg/hazcom/index.html)). To be considered compliant, a pictogram must contain all of its elements. This means no red diamond borders should appear without their respective black hazard symbols, and no black hazard symbols should appear without their respective red diamond borders.

**5) Precautionary statements.** OSHA now requires manufacturers to place harmonized precautionary statements on labels; this is a key change. These statements describe measures to take when handling or storing a chemical to prevent or minimize adverse effects resulting from exposure. The rule provides four types of precautionary statements: prevention, response, storage and disposal (OSHA, 2012a). Appendix C specifies which precautionary statements should be included for a particular chemical. Like hazard statements, precautionary statements may be combined on the label to save space and improve readability.

Here's an example from the OSHA brief, "Hazard Communication Standard: Labels and Pictograms" (OSHA, 2013c): "Keep away from heat, spark and open flames"; "Store in a well-ventilated place"; and "Keep cool" may be combined to read: "Keep away from heat, sparks and open flames, and store in a cool, well-ventilated place."

In addition since manufacturers may combine statements using an order of precedence when multiple similar precautionary statements are provided for a hazard, the manufacturer, importer or distributor must place the most stringent statements on the label to ensure that rapid action can be taken if a chemical exposure occurs (OSHA, 2013c).

**6) Supplier identifier.** The label must include the name, address and phone number of the chemical manufacturer, importer or other responsible party (OSHA, 2012a).

What about information that does not fall into one of these categories? OSHA does not preclude manufacturers from including additional nonstandardized information on labels, but it says that manufacturers may do so only when the information "provides further detail and does not contradict or cast doubt on the validity of the standardized hazard information" (OSHA, 2012a). The agency also states that the placement of such information shall not impede identification of information required by the rest of the rule. If these conditions are met, then OSHA says the extra information can be provided in a supplementary information section of the shipped label.

Supplementary information might include de-

tails about any hazards not otherwise classified; PPE pictograms, such as the HMIS pictogram of a person wearing goggles; directions of use; chemical expiration dates; and fill dates (OSHA, 2013c).

As part of the HCS revision, OSHA is lifting the 3-month stay on enforcement related to the timeline by which labels are updated when new information on hazards becomes available:

Chemical manufacturers, importers, distributors or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within 6 months of becoming aware of the new information, and shall ensure that labels on containers of hazardous chemicals shipped after that time contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importer, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again. (OSHA, 2012c)

The reference to employers pertains to those who are blending or mixing chemicals on site, thereby manufacturing new chemical products. In these instances, they are assuming the same responsibilities as chemical manufacturers and must also classify their chemicals, identify their hazards, and create updated SDS and labels for use with subsequent distributions of the product, within the 6-month time frame.

While much has changed for shipped label requirements, what has not changed is the requirement that labels be in English. Other languages are permitted, but not required, according to (f)(2) of the standard.

#### Workplace Labels

While the requirements for workplace labels differ, the information presented on the shipped label serves as OSHA's benchmark for determining the effectiveness of an employer's workplace label. OSHA still uses a flexible, performance-based approach for workplace labels. At a high level, employers have two options for secondary or workplace label systems: use an alternative compliant label or replicate the shipped label.

Employers may retain their HazCom-1994-compliant system, which can include homegrown systems unique to their workplace, or alternative labeling systems such as NFPA or HMIS, or some combination of systems, provided the information does not conflict with GHS alignment changes and, when combined with training and other hazard warning information in the workplace, provides employees with the same level of understanding they would receive if a compliant shipped label were used (OSHA, 2012c).

Companies that use NFPA labels as part of their workplace labeling system should know that NFPA 704 labels on their own do not meet OSHA's HazCom workplace label requirements. NFPA 704 labels do not have to contain a product identifier, for example, and OSHA continues to require that information on its HazCom workplace labels.

Additionally, employers using NFPA or HMIS systems must ensure that employees have immediate access to specific hazard information and are fully aware of the health and physical hazards of a chemical to which they may be exposed.

The other option, and what OSHA might consider a best practice, is to replicate elements of the shipped label. A residual benefit to this option is that it may simplify some training requirements since OSHA already requires employers to train employees on the shipped label elements. Also, by using the same elements, employers establish consistency in how hazards are communicated in the workplace. This benefits employees who are tasked with interpreting the information.

In terms of compliance, anything other than replicating the shipped label could place an additional burden on employers. For example, an OSHA inspector may test for employee comprehension of a workplace label system by having an employee look at a container with said label, and asking that employee to convey his/her understanding of the hazards based on the label's information. The employee's response will dictate whether an employer's workplace label system is deemed effective. This is why OSHA's approach to workplace labels is still considered performance-based; either the labels perform or they do not.

HazCom 2012 continues to allow alternatives to affixing workplace labels to portable containers used to transfer materials from labeled containers, provided the portable containers remain under the control of the employee who performs the transfer and are used within a work shift. An example would be a scoop used to transfer chemicals from one labeled container to a second labeled container. As long as the scoop is used only during the work shift by the worker performing the transfer, and none of the transferred chemical remained inside the scoop, then the scoop would not necessarily need a label.

Unlike shipped labels, OSHA does not require pictograms to have a red diamond border on workplace labels. This makes things easier for employers who wish to closely replicate the shipped label format if they do not have access to a color printer.

OSHA continues to require workplace label information to be presented in English at a minimum, but allows additional languages to accommodate multilingual workforces. OSHA requires that employers present HCS information to employees in a language and manner that they understand, so employers must consider this when determining what language(s) to use on their workplace labels.

### Label Challenges

Tackling the task of creating HazCom-2012-compliant labels could require more than just a time investment for companies with elaborate label systems. These companies must first understand GHS requirements, then decide how or whether their systems can meet the new mandates or if they should seek alternative solutions. For example, some systems simply cannot generate pictograms or their red diamond borders. In these cases, companies will

have to spend money as well as to time researching, implementing and training workers.

### Safety Data Sheets

#### Question 4: How are MSDS changing?

MSDS are to be reformatted under HazCom 2012 to follow a strictly ordered 16-section format and are renamed SDS (Figure 4, p. 50). Despite the formality of the name change, the documents' overall purpose remains the same. An SDS is the linchpin to an employer's HazCom program; it provides downstream users with comprehensive safety information about hazardous chemicals in their workplace; aids chemical inventory management; and connects the dots to container labels and other forms of workplace warnings.

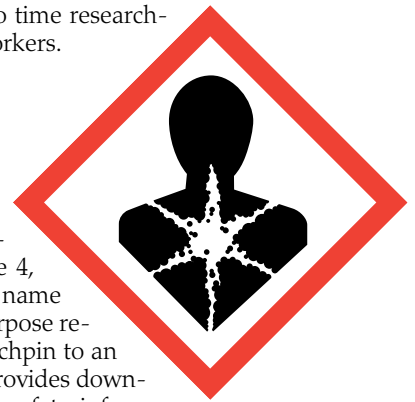
To ensure compliance, employers should first verify that their MSDS inventory is up-to-date. This process will provide a clear picture of which chemicals need updated SDS and labels. The hazardous chemical inventory list, one of the five main components of a compliant employer HazCom program, can serve as the employer's checklist for managing SDS and label turnover expected as part of GHS adoption.

During the transition, inbound SDS may look significantly different from the MSDS they are replacing. Following is the ordered list of sections required on a HazCom-2012-compliant SDS, as of June 1, 2015:

- Section 1. Identification;
- Section 2. Hazard(s) identification;
- Section 3. Composition/information on ingredients;
- Section 4. First-Aid measures;
- Section 5. Firefighting measures;
- Section 6. Accidental release measures;
- Section 7. Handling and storage;
- Section 8. Exposure controls/personal protection;
- Section 9. Physical and chemical properties;
- Section 10. Stability and reactivity;
- Section 11. Toxicological information;
- Section 12. Ecological information;
- Section 13. Disposal considerations;
- Section 14. Transport information;
- Section 15. Regulatory information;
- Section 16. Other information, including date of preparation or last revision.

A compliant SDS must include all 16 sections and their corresponding headings, and the sections must appear in the prescribed order. However, OSHA will not enforce the content contained in Sections 12 through 15 since those sections cover regulations outside of OSHA's jurisdiction (OSHA 2012f). If no relevant information is found for any given subheading within a section, OSHA says the SDS preparer should clearly indicate within the given section that no applicable information is available (OSHA, 2012k).

One of the most valuable sections of the SDS is Section 2, Hazard identification. It contains in-

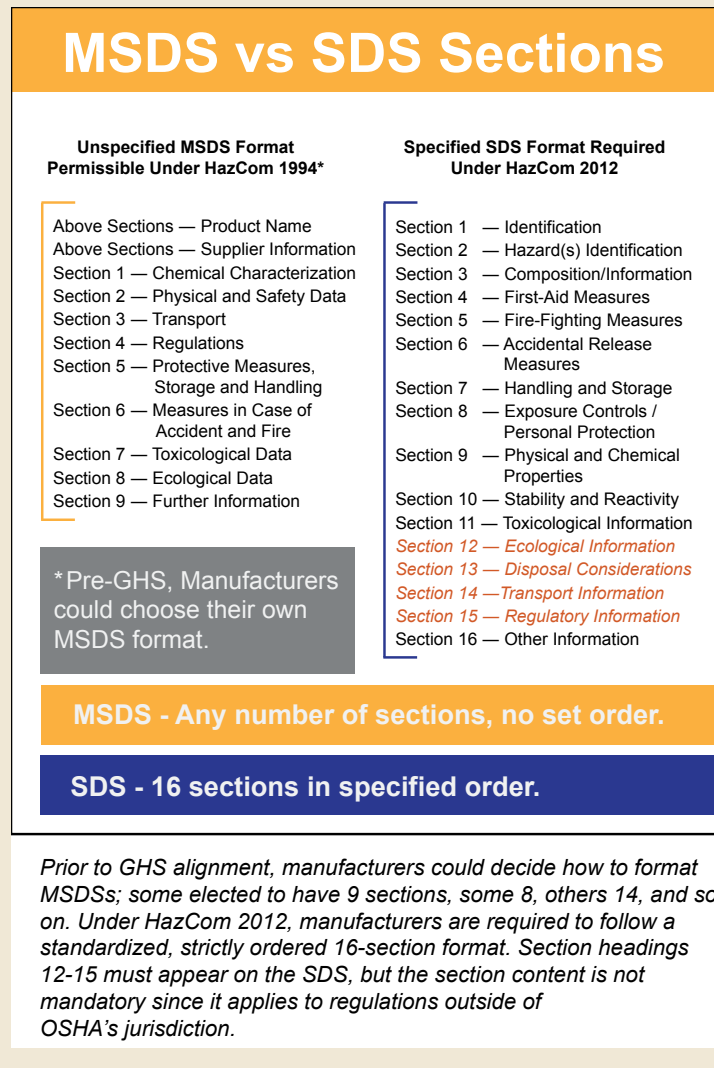


**Pictograms are new to the HCS rule and OSHA requires that they appear with their red diamond borders on shipped container labels.**





**Figure 4**  
**MSDS vs. SDS Sections**



formation about a chemical's physical and health hazards, such as the precautionary and health hazard statements, signal word, pictograms and other elements from the shipped label. Two compliance-related points are noteworthy. First, OSHA does not require pictograms on SDS to have red borders. Second, OSHA allows the text description for a given pictogram to be used in lieu of the black hazard symbol and respective diamond border. For example, OSHA allows the hazard "acute toxicity (fatal or toxic)" to be represented with the words *skull and crossbones* instead of being depicted using the pictogram image (Figure 5).

The changes improve the overall utility of an SDS. For example, the strictly ordered, logically sequenced format makes it easier for employees and first responders to navigate to critical information of interest, such as that found in Section 4, First-aid measures, and Section 5, Firefighting measures. OSHA intentionally positioned emergency response information near the top (Sections 1-8), while plac-

ing more technical information (e.g., Section 11, Toxicological information) in lower sections (OSHA, 2012e). Also, the harmonization information in each section produces a document that is more useful in sustainability initiatives, as it allows employers to compare multiple SDS of a particular product to identify safer substitutes.

OSHA still requires SDS to be provided in English at a minimum. However, versions in other languages are acceptable as needed in multilingual work environments and, in some instances, may even be required.

As noted, SH&E professionals should expect to see various document types, some old, some new and some semi-compliant, during the GHS transition and beyond. This can complicate the GHS transition for employers that must closely monitor their hazardous chemical inventory, not only to ensure that they have documents for all chemicals in a facility, but also to determine which of those documents are HazCom-2012-compliant. Once employees are trained on the GHS changes, they will better understand what to look for on incoming shipments and can help employers manage the document churn. Electronic management systems can also help via notifications that new GHS documents are

available for products in their inventory.

### Training

#### Question 5: What are the employee training requirements?

Training is another area in which OSHA departed from the UN template. One of OSHA's alignment principles was to retain any protections of HazCom 1994. Since GHS contains no training requirements, OSHA added provisions to ensure that its employee training requirements remained intact. Thus, the five components of a compliant employer HazCom program remain in place: 1) written plan; 2) chemical inventory; 3) labels and warnings; 4) training; and 5) SDS. Therefore, under the revised HCS, employers have the same basic training obligations.

The only real change involves what must be covered during the phase-in periods to meet the compliance deadlines of Dec. 1, 2013, and June 1, 2016. By Dec. 1, 2013, employers must complete employee training on the new labels and SDS formats.



The sooner employers train employees on this information, the sooner those employees will be able to alert them when new SDS and labels arrive, which will ease the HazCom transition. As noted, employers should ask suppliers about their transition plans so employers know when to expect compliant SDS and labels, and can adjust their activities and program updates accordingly.

In a 2013 brief, OSHA describes what must be covered to meet the employee training deadline requirements. Essentially, training must extend beyond a quick rundown of the names of SDS section headings and six label elements. It must explain what each section of an SDS and label represents; what types of information might appear in each section, along with some examples; how information can be used in the workplace; and how that information ties into other areas of the employer's HazCom program (OSHA, 2013a).

For example, when covering labels, an employer might explain that the product identifier is the name used to refer to a given chemical. It can be an actual product name, a batch number or some other reference, and the same name should also appear in Section 1, Identification, of the SDS. The employer might add how the product identifier is used in the company's HazCom program on the required chemical inventory list.

By June 1, 2016, the final effective date for the revised standard, employers must complete any necessary HazCom program updates, including those to the written plan and the chemical inventory list. They must also use updated SDS and labels, update workplace labels as necessary, and complete training on any newly identified hazards that may have resulted from manufacturer chemical reclassifications.

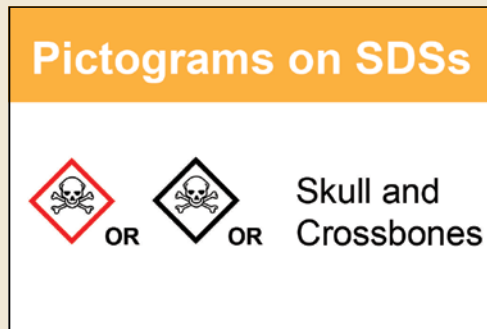
### Authoring

#### Question 6: What do I need to know about SDS authoring?

Under the standard, manufacturers and distributors must provide SDS to downstream users. GHS adoption is forcing chemical manufacturers to reclassify their chemicals and provide updated SDS and labels by June 1, 2015. All companies that manufacture chemicals must comply with this effective date, including any distributors, importers or employers who mix chemicals on site, as well as those who elect not to rely on manufacturer-provided SDS and labels. These companies assume the same responsibilities as manufacturers and must prepare compliant SDS and labels by June 1, 2015. OSHA has no rules regarding how companies achieve this, only that the final products be compliant. This means companies can prepare the documents and labels independently or can enlist professional authoring services.

Once companies have identified an appropriate label and SDS authoring solution, and are up to speed on chemical classification, they should find that GHS alignment makes label preparation and SDS authoring easier. For example, it reduces some of the testing requirements placed on U.S. manu-

## Figure 5 Pictograms on SDS



*Unlike the HazCom shipped label requirement, OSHA allows pictograms on SDSs to appear with the red diamond border, a black diamond border, or the text equivalent of the icon.*

facturers, allowing them to use bridging principles to reference existing scientific data for the chemicals they are classifying (OSHA, 2009).

In addition, GHS removes the guesswork from determining what information to place on labels and SDS. Once a chemical's hazard class and possibly its hazard category are identified, Appendixes C and D can be referenced to determine what must appear on corresponding labels and SDS. The appendixes serve as the recipe book for label and SDS preparation. In terms of SDS authoring, for companies already using the ANSI format, the transition will be more of a hop than a leap since the two formats are similar.

Since one objective of GHS adoption is simplifying international trade, some companies have asked whether it is permissible to author hybrid documents that aim to meet multiple country or agency requirements. OSHA permits this, but companies must consider several factors. If a company has identified a legitimate rationale for adding information to an SDS, perhaps to meet multiple agency or country requirements, it must consider where the document will be shipped to and used. While a company may favor the idea of consolidating information into a single document, it must confirm that other countries, regions or agencies will accept a hybrid SDS. A company should also consider how downstream users might interpret a document that contains multiple agency or country guidelines. It could cause confusion to those who must decipher it and may consequently create additional training burdens.

Consider the following situation for which a hybrid document might work. A company is interested in creating a North American document that would be compliant in the U.S., Canada and Mexico. Depending on where the document will be distributed, it may only need to be translated into Mexican Spanish and Canadian French. A situation for which a hybrid document might not

work involves countries such as China and Japan, which have such different requirements that trying to combine, condense and communicate via a single document could complicate matters more than help them.

Regardless, each business has unique needs and a hybrid document may be the best avenue for some. For those that use or plan to use an authoring service, an experienced provider will help the manufacturer determine the best approach.

Another common compliance concern relates to the treatment of non-HazCom-2012-mandated information. OSHA (2012i) permits SDS preparers to include additional information in various sections of the document. An example of additional information a manufacturer may want to incorporate is NFPA and HMIS rating information. Such information can be included in Section 16, other information, or possibly other applicable sections. Authors may find that by placing NFPA and HMIS information in Section 16, as opposed to alternative sections, they help mitigate some user confusion surrounding the systems' different numbering schemes; it distances that information from the classification numbers listed in Section 2.

### **Managing Versions of MSDS**

#### ***Question 7: What should I do with older versions of MSDS?***

As updated SDS start rolling in, employers must review and compare them to the MSDS they are replacing to learn what has changed, if anything. Beyond the new format, the SDS may cite new hazards that must be addressed in employee training. Then, employers will need to update their SDS libraries.

Some decisions regarding older MSDS are left to an employer's discretion. HCS does not require employers to retain the older versions; however, OSHA's standard on access to employee exposure and medical records permits the archiving of MSDS as a way to document employee exposure to substances in the work environment (OSHA, 1996). If employers select this option rather than opting to maintain a list of chemicals documenting where and when they were stored, then employers must retain older versions.

Regardless of current practices, employers should consider how they might handle a hypothetical situation in which a former employee asks about certain chemicals that s/he was exposed to while employed with the company. In this case, the more information an employer has available, the better able it is to provide an accurate picture of the hazards to which the employee was exposed and the type and quality of hazard information available at that time. That said, if an employer maintains thousands of documents, it may not be practical to file and store all old MSDS and their many revisions for 30 years or more. An electronic archival system allows employers to retain information, not only older versions but also additional information about where and when those chemicals were used.

### **Canada's Adoption of GHS**

#### ***Question 8: What is Canada's plan for GHS adoption?***

Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazardous chemical communication standard administered by Health Canada and implemented throughout the country via coordinated federal, provincial and territorial legislation (Health Canada, 2013). Canada played a large role in GHS. Like OSHA's standard, WHMIS was one of four major standards on which GHS was based. Canada has since been working on its own plan to adopt the system, carefully considering how to best implement it given the country's layers of territorial, provincial, multiagency and stakeholder interests.

Canada and the U.S. are working to ensure that WHMIS and HazCom 2012 are tightly aligned. The governments have formed the Joint Action Plan for Canada-U.S. Regulatory Cooperation Council, through which they have pledged to "align and synchronize implementation of common classification and labeling requirements for workplace hazardous chemicals" (UN, 2012).

The expectation is that Canada will publish its final rule to align WHMIS with GHS in spring 2014. This would have a June 1, 2015, expected effective date for implementation at the territory and province level. The timing is intended to bring WHMIS alignment on line at the same time as the U.S. hits its major GHS adoption compliance deadline of June 1, 2015.

### **Electronic MSDS Management**

#### ***Question 9: How does GHS alignment change electronic MSDS/SDS management?***

Updates to HCS as part of GHS adoption have not changed the rules surrounding electronic management and deployment of MSDS and SDS. Electronic systems are still permitted so long as they create no barrier to employee access to the SDS; a compliant backup system is in place for use during foreseeable emergencies such as power outages; and hard copies of SDS can be provided on request.

This excerpt from the directive in the 2012 regulatory text, paragraph (g)(8), explains OSHA's provisions for electronic management of SDS:

The employer shall maintain in the workplace copies of the required safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access and other alternatives to maintaining paper copies of the safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.) (OSHA, 2012e)

This excerpt from paragraph (g)(11) states the requirement to produce a hard copy on request: "Safety data sheets shall also be made readily available, upon request, to designated representatives, the Assistant Secretary and the Director, in accordance with the requirements of 29 CFR 1910.1020(e)."

For employers managing SDS libraries with paper binders only, handling the impending document churn due to GHS alignment may prove to be a daunting task, especially for businesses with hundreds to thousands of documents and several departments or facilities to manage. This is where a cloud-based solution can help. This approach consolidates company-wide SDS inventories, alerts users when new versions of SDS arrive and provides several means for generating compliant backups. In addition, some cloud-based solutions can facilitate employee right-to-know access to SDS.

### Other Areas Affected

#### Question 10: Are other standards affected by HazCom alignment with GHS?

OSHA's adoption of GHS has affected other OSHA substance-specific and industry standards that refer to HCS. In fact, most of OSHA's substance-specific health standards were modified to ensure that definitions of hazards and requirements for elements such as signs, labels and SDS are consistent with the modified rule. The scopes of certain standards were also modified to prevent the GHS-alignment revisions from changing those scopes. The final rule includes a list of all updated standards.

The new wording requirements for warning signs and labels for the affected health standards are listed in Table XIII-4, Regulated Area Signs in Substance-Specific Health Standards, of the final rule (OSHA, 2012e). Following is an example of the language change for Lead, 1910.1025:

The original area signs had to display the following language: WARNING, LEAD WORK AREA, POISON, NO SMOKING OR EATING. With HazCom 2012 alignment, the signs now have to read DANGER, LEAD, MAY DAMAGE FERTILITY OR THE UNBORN CHILD, CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM, DO NOT EAT, DRINK OR SMOKE IN THIS AREA. (OSHA, 2012e)

In addition to language for regulated area signs, OSHA added a new paragraph to each related substance-specific standards to achieve consistency across the standards and with GHS principles. The new paragraph states:

Hazard Communication—General. (i) Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the Hazard Communication Standard (HCS) (29 CFR 1910.1200) for [chemical name] 508. (ii) In classifying the hazards of [chemical name] at least the following hazards are to be addressed: [hazard information]. (iii) Employers shall include [chemical name] in the hazard communication program established to comply with the HCS. Employers shall ensure that each employee has access to labels on containers of [chemical name] and to safety data sheets, and is trained in accordance with the requirements of HCS and paragraph [Training paragraph] of this section. (OSHA, 2012e)

OSHA's HazCom 2012 deadlines also affect substance-specific standards. According to the final rule:

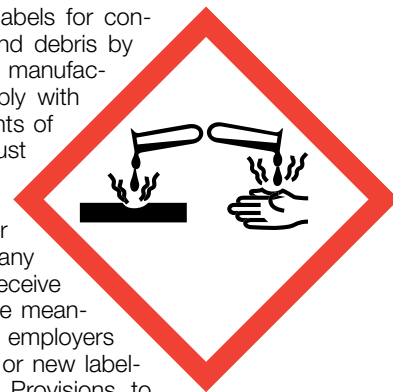
Employers must be using new labels for contaminated clothing and waste and debris by June 1, 2015, the date by which manufacturers and importers must comply with the labeling and SDS requirements of the revised HCS. Employers must post the new signs by June 1, 2016, the same date by which employers must also update their hazard communication plans for any new hazard information they receive as a result of the final rule. In the meantime, as with the revised HCS, employers must comply with either the old or new labeling and signage requirements. Provisions to this effect are inserted for each substance-specific standard in this final rule. (OSHA, 2012e)

Other rules affected include standards covering HazWOPER; welding, cutting and brazing; flammable and combustible liquids; process safety management (PSM); and occupational exposure to hazardous chemicals in laboratories.

For example, the definition of *health hazard* was modified in the HazWOPER Standard. Definitions in the Flammable and Combustible Liquids Standard were aligned. Labeling requirements for the Welding, Cutting and Brazing standard were modified. For the Laboratory standard, OSHA modified most of the definitions paragraph (b) in 1910.1450 to ensure that the definitions in the GHS-modified HCS would also apply to the standard (OSHA, 2012e). Modifications included deleting some definitions, revising others and adding new definitions. For example, OSHA revised the definitions of *hazardous chemical*, *physical hazard* and *reproductive toxins* and added definitions for *health hazard* and *mutagen*.

Additionally, to maintain the scopes of certain other standards, technical amendments were made to standards that currently use the term *combustible* (OSHA, 2012e). Another example involves the PSM standard, in which OSHA changed the provision covering flammable gases and liquids to include only Category 1 flammable liquids and gases that have flashpoints below 100 °F (37.8 °C) to be consistent with the criteria specified in HazCom 1994 (OSHA, 2012e). Had OSHA not modified this provision, the scope of PSM would have expanded because GHS alignment changed the HCS definition of flammable liquid from liquids with a flashpoint below 100 °F (37.8 °C) to liquids with a flashpoint at or below 199.4 °F (93 °C).

An EPA regulation is also affected by the HazCom-GHS alignment. Companies that meet certain reporting threshold criteria set forth by Section 311 of EPA's Emergency Planning and Community Right-to-Know Act (also known as SARA Title III) must provide MSDS to their state emergency response commission, local emergency planning committee and the fire department with jurisdiction over their facilities. While Section 311 is typically a one-time reporting requirement, EPA requires covered companies to provide updates when the information submitted changes signifi-



**By June 1, 2016, employers must complete necessary HazCom program updates, including those to the written plan and the chemical inventory list.**







**OSHA's adoption of GHS provides consistency to the classification and communication of dangerous chemicals in the workplace.**

cantly. Thus, companies should be prepared to submit any new health hazard information and SDS updates that result from OSHA aligning HazCom with GHS (EPA, 2012).

### Conclusion

OSHA's adoption of GHS provides consistency to the classification and communication of dangerous chemicals in the workplace, which brings the U.S. closer to unifying its system for international trade purposes, and also helps elevate the rule from a right-to-know to a right-to-understand standard to allow all users, even low-literacy workers, to better understand the hazards associated with chemicals in their work environment.

Such knowledge can save lives and money. In fact, OSHA (2012c) estimates annualized long-term benefits to include saving the lives of 43 workers and \$585 million in cost reductions and productivity improvements. However, because GHS adoption requires companies to reclassify chemicals, create new labels, author new SDS documents, train employees and update HazCom compliance systems, adoption will likely cost money and time in the short term.

In October 2013, OSHA released its top 10 list of most frequently cited standards and, as in 2012, HazCom ranked second on the list (OSHA, 2013d). Given that GHS adoption is the biggest change to HazCom in decades and that HazCom remains a frequently cited standard, it will likely be top-of-mind for OSHA inspectors. To avoid non-compliance, all companies covered by the standard should endeavor to ensure that their HazCom programs are current and that they have fulfilled their obligations to train employees on the GHS changes to labels and SDS.

Regardless of a company's place in the hazardous chemical lifecycle, SH&E professionals are not alone in their quest to comply with the GHS-aligned HCS. With a little patience, a commitment to understanding what has changed and what remains the same, and some helpful resources, employers can simplify their HazCom 2012 compliance roadmap. **PS**

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