

PolyOne FAQs for the Globally Harmonized System (GHS) Safety Data Sheets (SDS) and Product Labeling.

Version 6, April 2015 (additions are denoted in underlined text)

General information on GHS and timelines

Q1: What is GHS?

GHS is short for Globally Harmonized System for Classification and Labeling of Chemicals, a framework designed to harmonize the very different current requirements in many countries for classifying hazardous substances and mixtures, labeling them and creating appropriate hazard communication documentation for such materials. GHS strives to improve the quality and uniformity of safety and environmental information provided on hazardous materials. The United States, Canada, European Union member states and many other countries have either committed to adopting GHS requirements, or have done so already. Not all countries have adopted the same GHS requirements in the same way or in the same timeframe; there are still differences that likely will not go away in the near term. Generally speaking though, June 2015 is the deadline for new GHS requirements in the U.S. and Europe, two of our key markets. PolyOne will be ready for the June 2015 deadline, and thereafter for its new formulations.

Q2: How does GHS affect PolyOne?

We must make changes to our Material Safety Data Sheets (MSDSs), soon to be called Safety Data Sheets (SDSs) under the new GHS format. These changes correspond to differences in how mixtures of chemicals must be classified as hazardous based on their constituents and the mixtures' properties, and changes in the disclosure required under GHS. After these changes are made, corresponding changes will be made to classification labels on our products so that classifications and warnings on documentation and labels match. Some changes will come later than others since we will be phasing in some changes such as new hazard pictograms on both the SDS and the labels to more closely match the timeline required in the U.S. and Europe.

However, since PolyOne relies on hazard and classification information from its suppliers, not all of whom will be on the same timeframe for their own GHS transitions (different source countries), not all of the changes ultimately required by GHS will be evident immediately for our products. Changes will continue to be made in our data which will come both from our vast supply base as well as from global chemical and toxicity data used in determining GHS classifications.

GHS generally strives to improve the quality and amount of hazard information presented on an SDS, and does so by first requiring hazard information on the end product, and if information of that final product is not available, then information on the constituents of the product, down to the level of each substance that product contains. As a result of more information being required than before, we can expect the SDSs to become longer than the original MSDSs for the same products.

Q3: What are the applicable timelines for GHS implementation in the U.S. and North America?

The U.S. federal Occupational Safety and Health Administration (OSHA) has implemented its plan to align its Hazard Communication Standard (HCS) with the GHS framework. Broadly, the HCS covers how chemical manufacturers must determine and communicate the hazards of their products. OSHA implemented a phased system and timeline for implementing GHS changes in the U.S. First came the requirement for employers to train their employees on the new requirements by December 1, 2013 so our

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workers would be prepared to properly understand the changes made to labeling and documents such as SDSs in the workplace.

OSHA established a date of June 1, 2015 for those required to generate SDSs for their formulation or mixture products to start using the new GHS format. Distributors have until December 1, 2015 to implement the same changes. OSHA has stated that it will not implement enforcement of the new labeling requirements in the U.S. until December 2015 to allow the logistics of implementing new color labeling.

Canada amended the Hazardous Product Act (HPA) which repealed the Controlled Products Regulation (CPR) and the Ingredient Disclosure List and replaced with it the new Hazardous Products Regulations (HPR). The modified WHMIS regulation is now referred to as WHMIS 2015; which adopts GHS. Implementation of GHS in Canada is to take place over a 3 year transition period and will be synchronized across all federal, provincial, territorial jurisdictions. Complete implementation for suppliers and employers will be required by December 1, 2018.

Q4: What are the applicable timelines for GHS in the European Union?

European countries must also start using the new overall format for chemical mixtures (most of PolyOne's products and solutions are considered mixtures). The European Union has already required several changes to SDSs under both the chemical registration framework of REACH, and the Classification Labeling and Packaging (CLP) which result in similar format changes to those required under GHS. These changes have been in place in Europe since 2011.

Q5: What are the applicable timelines for GHS in Asia?

Asian countries have varying implementation requirements and timelines for GHS. China requires GHS format SDSs in local language (Simplified Chinese), to meet these requirements PolyOne has implemented GHS SDS authoring capabilities for this region. Click [here](#) for a link to an external source for specific Asia-Pacific GHS implementation dates.

Q6: What are the applicable timelines for GHS in South America?

Brazil and other countries in South America in which PolyOne has significant business also have varying requirements and timelines for GHS adoption. PolyOne now generates GHS formatted SDSs in this region in order to meet these requirements. Click [here](#) for a link to an external source for specific South American GHS implementation dates.

Q7: Why did PolyOne make this change a year before the required timeline in the U.S. and Europe?

As a global company, PolyOne must meet requirements in many countries around the world. Some of these regions have timelines that are sooner than those in the U.S. and Europe, and require that we make changes across our enterprise regulatory system. Additionally, other aspects of meeting the new GHS requirements, such as labeling, require that we have portions of the solution in place in a phased manner, starting with the hazard classification under GHS in our SDSs. Beginning in mid-April 2014, PolyOne

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began generating SDSs with GHS hazard classifications for new formulations, or existing formulations with significant changes. As June 2015 approaches, we are generating SDSs with GHS hazard classifications for all existing products. Both formats (existing MSDSs and new SDSs) will be compliant with regulations in the regions in which they are offered until that time, and then all our products requiring an SDS will utilize the new format. Because we have so many specifications for finished goods, this is a very time-consuming and exacting process across the globe and across our different businesses, and we are starting the process with those formulations most likely to have classification differences under GHS rules compared to previous classifications. Formulations that are not classified as hazardous under either will have minimal changes to the SDS documents, those being mainly in the format of the SDS itself (see Q8, below).

What will change with GHS adoption?

Q8: What changes can be expected on PolyOne's Safety Data Sheets?

The new SDS uses a 16 section format as do our existing MSDSs, and generally requires the same information to be printed, but some differences will be evident. The GHS SDS will contain an Emergency Overview with a GHS classification summary in Section 2, which makes pertinent product hazard information and emergency response measures easily accessible. Additionally, GHS changes the basic way in which the hazards of a chemical or mixture of chemicals are determined by comparison against specific criteria and providing a prescribed approach to determine hazard classifications and levels of severity. If a mixture of chemicals is not assessed for hazards as a whole, then the constituents that comprise the mixture are assessed against hazard criteria, and relevant information is required to be printed for these constituents on the SDS. This generally results in a longer SDS as more information is provided, and potentially new hazards identified for a mixture because of application of the evaluation criteria to the constituents, which is not required now. Pictograms, simplified graphical representations of the hazard classes will be required on SDSs, and the product labels, though PolyOne's initial SDSs did not display pictograms as our labeling systems were still being developed. As June 2015 approaches, pictograms where necessary will display in color on both SDSs and product labels.

Q9: I have received some new format SDSs, but other PolyOne solutions still have the original format. Why? Can I get all new format SDSs now?

In order to ensure we can meet the established timelines for North America and Europe implementation of GHS, we started converting our systems about one year early. To control the impact of this decision, we generated many existing products' MSDSs using the pre-GHS format just before our mid-April 2014 conversion. The only PolyOne products that will then use the new format for SDS will be new formulations, or existing formulations with significant changes. We will not be in a position to generate new format SDSs for all existing products until closer to the implementation timeline required by applicable regulations, in mid-2015. Both formats (existing MSDSs and new SDSs) will be compliant with regulations in the regions in which they are offered until that time, then all our products will utilize the new format.

Specific Safety Data Sheet questions with GHS adoption

Q10: Why are new hazards shown on the SDS for a product that has not changed?

Several things can drive the classification of new hazards for a mixture which are displayed on the SDS. First are changes to the formulation which now introduce new substances to the mixture which drive changes in the classifications and precautionary statements. Assuming no changes have been made to the formulation, regulations or hazard definitions may change, which must then be considered in the software evaluating the hazards of the product. This can result in new hazard classifications. For example, in the GHS adoption in the U.S., the hazard associated with combustible dust has been added as a required consideration in the hazard evaluation. For the conversion to GHS format, we expect that new classifications will result for some PolyOne formulations showing new hazards due to the constituents being evaluated, which is a requirement in the new system. Rest assured that PolyOne's Hazard Communication/Regulatory specialists carefully review changes that might be evident under a GHS classification, to ensure that such hazard really is presented by the product to downstream users. This will help ensure that the improved hazard communication intent of the GHS conversion is maintained.

Q11: Carbon Black and Titanium Dioxide (TiO₂) show up as carcinogenic hazards on some of our SDSs, and not on others. Why is this?

Some substances are classified as hazardous for a particular route of exposure, such as respirable dust. This means that when inhaled, the effects may be indicated from testing conducted by the manufacturer, but that under other use or exposure conditions, the effect is not associated. If the route of exposure is not likely under reasonably foreseen circumstances, OSHA's Hazard Communication Standard does not require classification for that hazard. Many of PolyOne's products encapsulate additives in the polymer matrix, or in a physical form such that they are not available in the route required to be classified for that hazard. In such cases, the hazard is not displayed. However, this evaluation may not be applicable in all cases, for all such substances. It is expected that different products may have different hazards, due to physical form and expected, reasonable usage.

In other cases, PolyOne has been advised by the suppliers of certain raw materials (carbon black and titanium dioxide are two prime examples) that the classification of their materials as IARC category 2B carcinogens are based on certain studies involving rats, and due to a toxicological phenomenon known as "rat lung overload," carcinogenicity seen in such rats is not believed to be extended to humans. Therefore, they recommend a non-carcinogenic classification of these materials under GHS. PolyOne utilizes appropriate sources of information in making its classification determinations, including such information.

Q12: The SDS for a solid pellet product contains a combustible dust warning. Why is this, as these are pellets, not dust or fine particles?

Many organic particles, including those with an organic base resin and various additives which may also include organic as well as inorganic fractions, when mixed with air in the correct concentrations, can

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become ignitable under various industry definitions commonly used by OSHA. While pellets may be large particles on the scale of fractions of an inch and not likely to be airborne, they may become worn mechanically, and fines of the compound may be formed. Such fines, when conveyed by air or otherwise entrained in an air mixture, can become ignitable under certain conditions. OSHA requires notice of combustible dust hazards on the SDS under the revised Hazard Communication Standard for foreseeable uses and conditions as a hazard, "not otherwise classified." It is PolyOne's practice to provide warning of this potential for managing fines that may be generated from otherwise solid form materials, like pellets.

Q13: I notice some other changes in my PolyOne SDSs. Are these required by GHS?

PolyOne continually reviews its formulations and hazard communication requirements as well as best practices and may make changes in how certain information is communicated on its SDSs. Some changes may be required by changes in regulations, while other changes reflect information PolyOne believes improve the sharing of hazard information. If you have specific questions on documents you have received from PolyOne, please contact your PolyOne seller or Customer Service Representative, who can put you in touch with one of our Product Stewardship representatives to help explain the change.

Product Labeling questions with GHS adoption

Q14: What will change on GHS compliant product labels?

GHS compliant product labels will incorporate six elements to be expressed on product labels that aim to better communicate the hazards associated with product use and the safety measures that should be taken to properly handle or transport a product. The six elements required on all Hazard Communication Standard Labels are: pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier information. [Click Here](#) to learn more about GHS labeling guidelines in the United States.

Q15: Will GHS change how product labels are marked for transport of hazardous ingredients?

No, GHS elements (including diamond shaped pictograms) are not to replace or modify how hazardous products are labeled for transport. For example; the U.S. Department of Transport (DOT) will still require their diamond shaped labels as well as the applicable written information aside from GHS label elements for the transport of chemicals.

Q16: How will PolyOne address GHS compliant product labels globally?

Polyone is addressing GHS label compliance globally. PolyOne currently aims to for all global facilities impacted by the new GHS labeling conventions to be equipped to produce and implement GHS compliant labels by June 2015.