



## GHS – and Hazard Communications for the Welder

### INTRODUCTION

The United States Occupational Safety and Health Administration (OSHA) adopted the United Nation's Globally Harmonized System of Classification and Labeling of Chemicals (GHS) into its Revised Hazard Communication Standard in March of 2012. A majority of the new OSHA requirements took effect on June 1, 2015. The European Union had the same deadline for its final GHS requirements to take effect. Many countries worldwide have similarly adopted GHS into their regulatory framework – or have plans to do so. It is important to note that GHS labels pertain only to chemical hazards, and do not alert you to physical hazards such as electric shock, arc radiation or noise. Be sure to read and understand all label and warning information provided by manufacturers.

### WHY DID WE ADOPT THE GHS?

The GHS system was developed to provide universal precautionary information about the physical, health and environmental hazards of the chemicals in manufactured products for worldwide use. It also is designed to require the same types and quality of precautionary information to be provided by all manufacturers to the end users of their products. Up until now, the label wording, symbols and information used in the U.S. were often different from those used in Europe, Asia and other regions.

This made it difficult when products were shipped to different parts of the world. Users in other places might find the precautionary information confusing and different.










### WHAT HAS REALLY CHANGED?

It's true that Material Safety Data Sheets (MSDSs) and precautionary labels on product containers have been around for many years as required by OSHA in the U.S. and the Workplace Hazardous Materials Information System (WHMIS) regulation in Canada. Other countries have had similar laws. The difference is that, before, it was up to the manufacturer to figure out what the hazards of their products were and to then develop data sheets and labels with whatever they decided was necessary to warn users in the workplace. Under the GHS, manufacturers must first classify their products based on what is in them according to these new rules. Then they must provide the appropriate precautionary statements and information about the product's physical, health and environmental hazards that the rules tell them are required. Under the GHS, the old Material Safety Data Sheet (MSDS) has now become simply, the Safety Data Sheet (SDS). The new SDSs tend to have more pages of information in them than the old MSDSs. Also, a new GHS label is required on products classified as hazardous under the GHS - and there are new symbols that must be used that have very specific meanings.

## GHS – THE NEW LABEL LANGUAGE

If a product is classified as hazardous under the GHS rules then its label will have one or more of these nine (9) hazard

pictograms. The pictograms indicate the nature of the product's physical, health or environmental hazards. These pictograms will also be displayed in Section 2 of the product SDS.

<p><b>Health Hazard</b></p>  <ul style="list-style-type: none"> <li>• Carcinogen</li> <li>• Mutagenicity</li> <li>• Reproductive Toxicity</li> <li>• Respiratory Sensitizer</li> <li>• Target Organ Toxicity</li> <li>• Aspiration Toxicity</li> </ul>	<p><b>Flame</b></p>  <ul style="list-style-type: none"> <li>• Flammables</li> <li>• Pyrophorics</li> <li>• Self-Heating</li> <li>• Emits Flammable Gas</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>	<p><b>Exclamation Mark</b></p>  <ul style="list-style-type: none"> <li>• Irritant (skin and eye)</li> <li>• Skin Sensitizer</li> <li>• Acute Toxicity (Harmful)</li> <li>• Narcotic Effects</li> <li>• Respiratory Tract Irritant</li> <li>• Hazardous to Ozone Layer (Non-Mandatory)</li> </ul>
<p><b>Gas Cylinder</b></p>  <ul style="list-style-type: none"> <li>• Gases Under Pressure</li> </ul>	<p><b>Corrosive</b></p>  <ul style="list-style-type: none"> <li>• Skin Corrosion/Burns</li> <li>• Eye Damage</li> <li>• Corrosive to Metals</li> </ul>	<p><b>Exploding Bomb</b></p>  <ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>
<p><b>Flame Over Circle</b></p>  <ul style="list-style-type: none"> <li>• Oxidizers</li> </ul>	<p><b>Environment (Non-Mandatory)</b></p>  <ul style="list-style-type: none"> <li>• Aquatic Toxicity</li> </ul>	<p><b>Skull and Crossbones</b></p>  <ul style="list-style-type: none"> <li>• Acute Toxicity (Fatal or Toxic)</li> </ul>

Along with a list of hazardous ingredients, the label will have precautionary statements that depend on the nature and severity of the product's hazards. The required precautionary statements will give you more information about the potential physical hazards (e.g., flammability). The label may also give you information about long term and short-term health effects that could be caused by overexposure, and what part of the body could be affected. It may also give you information about whether the product could be harmful if released to the environment.

The hazard statements on the GHS labels and SDSs may also include numerical hazard categories. These categories depend on the specific type of hazards and the ratings under the GHS. The important thing to note is the lower the number, the higher the risk under the GHS. A Category 1 rating means a higher hazard than a Category 4 or 5. This runs the opposite of what you may be used to with the optional Hazardous Materials Identification System (HMIS) or National Fire Protection Association (NFPA) hazard identification systems commonly used on hazard communication labels in the US. On HMIS or NFPA symbols, a 0 or 1 rating has meant low risk and a 4 rating has meant the highest risk level.

GHS labels do not always have to include these numerical categories and they may be listed on the product SDSs even though they may not be included on the label. Some GHS SDSs may continue to show the optional HMIS or NFPA hazard rating information in Section 16, but it will likely not appear on manufacturer's product labels anymore.

The GHS label system for providing precautionary statements also requires the appropriate use of one of two "Signal Words" which must appear on all GHS required container labels and SDSs. These are "DANGER" or "WARNING". These two terms may seem to be about equal, but according to GHS there is a real difference as far as their use and intent. The signal word "DANGER" identifies chemicals and materials that are, relatively, a greater or more immediate hazard to the worker. "WARNING" refers to chemicals and materials that are less hazardous but still might be potentially harmful.

Prior to GHS, hazard communication labels and MSDSs often used the "Danger", "Warning", and "Caution" signal words that followed the American National Standards Institute (ANSI) Z535 Standards and OSHA's 1910.145 which now will pertain only to other workplace signs and precautionary information. Under GHS the signal word "Caution" is not used.

#### **ALWAYS:**

- Read and understand the material label and its precautionary information before using any material
- Heed the label's directions and follow any precautions given
- Be aware that the lower the GHS hazard category number the higher the level of risk that is being indicated (1 is highest risk and 5 is the lowest. GHS also does not use 0 as does HMIS or NFPA).
- Ask your supervisor or safety professional when there is something you

don't understand or if you need more information to work safely

## **GHS – THE NEW SAFETY DATA SHEET**

The GHS SDS has 16 required sections. Each section always has the same information. For example, Section 1 always has basic company and material identification information. Section 2 always has information about the whole material's hazards and hazard classification under GHS. Section 3 always tells you specifically what is in the material that may be hazardous...and so on.

The SDS has sections with a great deal of technical information such as material toxicity based on laboratory testing, lists of global exposure limits for the materials, health and environmental regulatory lists and various regulatory classifications in different countries. Much of this material information is designed to inform safety, health and environmental professionals.

The information most useful to the welder or end user in the workplace will be found in Sections 1-7 where basic material hazards and safe use or precautionary information is provided.

### **ALWAYS:**

- Understand the basic hazards of the material you are using. This will be in SDS Section 2.
- Take time to read the information on the SDS – particularly in Sections 1-7 - that tell you what to watch out for and how to protect yourself as well as how to use the material safely.

- Ask your supervisor or safety professional if there is something you don't understand or if you need more information to use the material safely.

## **GHS AND WELDING CONSUMABLES**

GHS hazard classification is the key for providing SDS and product labeling that meets the new requirements. According to the written GHS classification rules, "Only the intrinsic hazardous properties of substances and mixtures are to be considered." This is important when considering the classification of welding consumables as they may not pose any risks until they are actually used in welding. For this reason it is correct to consider them as "Not classified as hazardous according to GHS". Depending on the manufacturer, you may see a statement on wire and electrodes saying that they are not classified as hazardous under GHS. Of course, this statement does not mean that they do not pose physical hazard or health risks when they are actually used to weld. For this reason, the welding industry will continue providing the appropriate precautionary labels, SDSs and other safe use information.

There are other types of welding products that may be intrinsically hazardous. This means they can pose some type of potential risk in the form that the users receive them. Examples include products like granular submerged arc welding fluxes, metal powders, as well as anti-splatter and other surface cleaning products. Many of these materials will be classified as hazardous and will have GHS labels with the appropriate pictograms and precautions.

## SUMMARY

It is important to understand some of the changes that the new GHS hazard communication process will bring to the Safety Data Sheets and labeling information on the welding materials you use. Just as before, this precautionary information continues to be your best guide about what hazards may be present as well as how to protect yourself and use the materials safely. **Remember, GHS labels address chemical hazards and do not alert you to physical hazards such as electric shock, arc radiation or noise.**

## INFORMATION SOURCES

*Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Purple Book*, third revised edition; Copyright © United Nations, 2009  
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Occupational Safety and Health Administration (OSHA); GHS Fact Sheet; <https://www.osha.gov/dsg/hazcom/HCSFactsheet.html>; March 2012.

The Welding Journal; October 2014, pg. 48-51; "Changes are Coming to Hazard Communication." Published by The American Welding Society, 8669 NW 36 Street #130, Miami, FL 33166; telephone 800-443-9353; web site: [www.aws.org](http://www.aws.org).

Occupational Safety and Health Administration (OSHA). Code of Federal Regulations, Title 29 Labor, Part 1910, available from the U.S. Government Printing Office, 732 North Capitol Street NW, Washington, DC 20401; Web site: [www.osha.gov](http://www.osha.gov).

ANSI Z535.1-2006 (R2011); Reaffirmation of ANSI Z535.1-2006. 1300 North 17th Street, Rosslyn, VA 22209; © Copyright 2011 by National Electrical Manufacturers Association

American Welding Society (AWS). *Safety and Health Fact Sheets*, published by the American Welding Society, 8669 NW 36 Street #130, Miami, FL 33166; telephone 800-443-9353; web site: [www.aws.org](http://www.aws.org).

American National Standards Institute (ANSI). *Safety in Welding, Cutting, and Allied Processes, Z49.1*, published by the American Welding Society, 8669 NW 36 Street #130, Miami, FL 33166; telephone 800-443-9353; web site: [www.aws.org](http://www.aws.org).

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