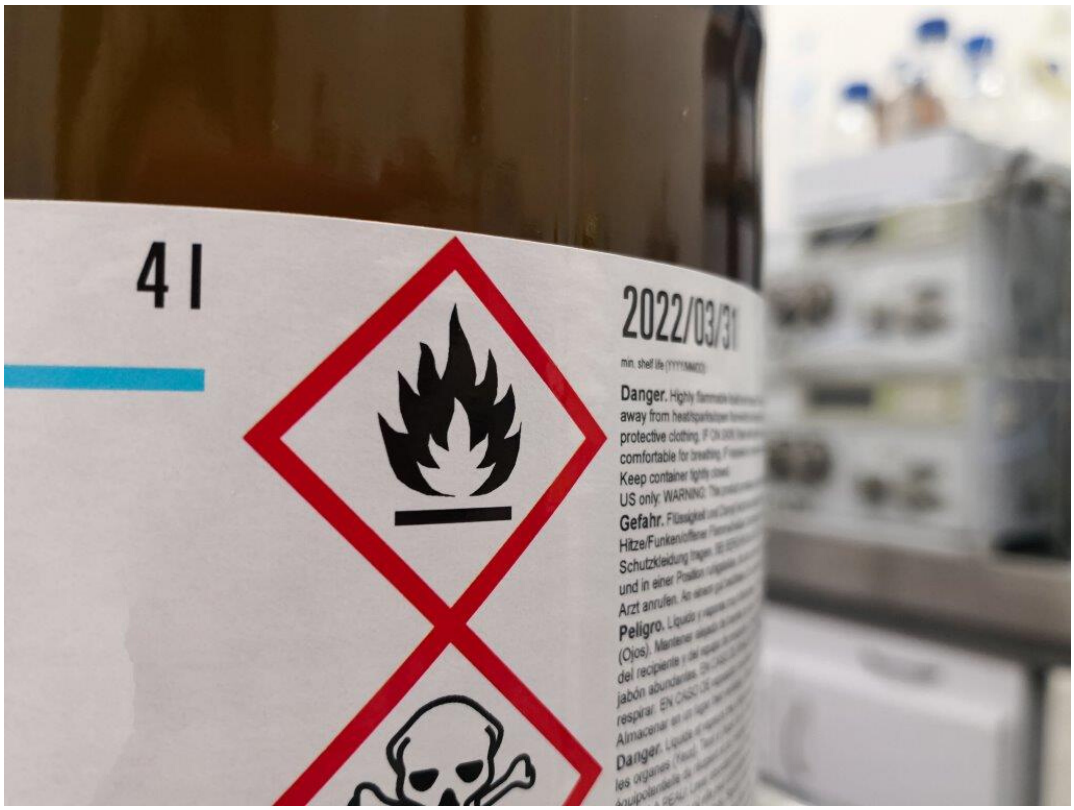
Your Guide to Simplified GHS Labeling



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What is GHS?

By now, **GHS** is likely a term you recognize. However, how much do you really know about what it is and the important steps you need to take to ensure your business is in compliance?

GHS, or Globally Harmonized System of Classification, is an international system that the United Nations created for the unified classification and labeling of chemicals. In 2012, OSHA updated its HazCom Standard to align with GHS in order to support global efforts to standardize chemical labeling.

The GHS standard allows for the import, export and usage of chemicals to be as safe and efficient as possible by keeping those who handle chemicals better informed. Below we review the differences between the old and the new standards:

1994 HazCom Standard

Chemical manufacturers and importers could convey hazard information on labels and material safety data sheets (MSDS) **in the format of their choice.**

2012 HazCom Standard w/ GHS

Provides a **single set of harmonized criteria for classifying chemicals** according to their health and physical hazards and specifies hazard communication elements for labeling and safety data sheets.

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Additional Areas of Change Include:

Hazard Classification

Follow specific criteria to address health and physical hazards, as well as classification of chemical mixtures.

Labels

Labels must include a signal word, pictogram, hazard statement and precautionary statement for each hazard class and category.

Safety Data Sheets

New format requires 16 specific sections, ensuring consistency in presentation of important protection information.

Information and Training

Workers should have been trained by Dec. 1, 2013 on the new label elements and safety data sheet format, in addition to the training requirements for new chemicals and new workers.

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The Advantages of GHS

Improve the quality and consistency of hazard information in the workplace, making it safer for workers to do their jobs and easier for employers to stay competitive.

Improve the quality and consistency of hazard information in the workplace, making it safer for workers to do their jobs and easier for employers to stay competitive.

Provide workers quicker and more efficient access to information on the safety data sheets.

Cost savings to American businesses of more than $475 million in productivity improvements, fewer safety data sheet and label updates and simpler new hazard communication training.

Reduce trade barriers by harmonizing with systems around the world.

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Chemical Labeling

Labeling is the foundation of GHS. In fact, GHS specifically aims to improve the quality and consistency of chemical labeling in order to enhance worker comprehension for safer chemical handling.

Primary chemical containers must have 6 key elements in order to be safely and compliantly handled in the workplace. The pictograms on the labels should be consistent with the pictograms that OSHA has provided, utilizing matching symbols and color schemes.

All chemicals that are shipped from chemical manufacturers must contain this information, so let's dive into the 6 label elements and pictograms you need.

Primary Container

The chemical container sent directly from your chemical manufacturer.

Secondary Container

The container that chemicals are transferred to once within the workplace.

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Chemical Labeling

Primary Container Labeling

Primary chemical containers are the bags, barrels, bottles, boxes, cans, cylinders and drums that you receive from the manufacturer. These containers should be labeled following the GHS mandates with the 6 label elements including the appropriate hazard pictograms.

When a label is on a container directly from a supplier, this label cannot be removed, altered or defaced. If it needs to be replaced, the new label must contain the same information as the original.

Secondary Container Labeling

Secondary containers are usually smaller containers, such as spray bottles, jugs, carboys or jars, that chemicals are transferred to from the primary container once within the workplace.

According to OSHA, secondary containers must always comply with the labeling requirements. The only exception is if the secondary container meets the following criteria:

- The material is used within the work shift of the individual who makes the transfer.
- The worker who made the transfer is in the work area the entire time during use.
- The container stays within the work area and in the possession of the worker who filled the container.

Chemical Labeling

Secondary Container Labeling Cont.

For secondary container labeling specifically, OSHA has not changed the general requirements. That means that employers have the option to create their own workplace labels by either using all of the information that is on the label provided by the chemical manufacturer or using a combination of the product identifier, words, pictures and symbols to provide specific information regarding the hazards of the chemicals.

Employers may continue to use rating systems such as National Fire Protection Association (NFPA) diamonds or Hazardous Materials Identification System (HMIS) requirements for workplace labels. So long they are consistent with the HazCom/GHS standard.

DOT Placards

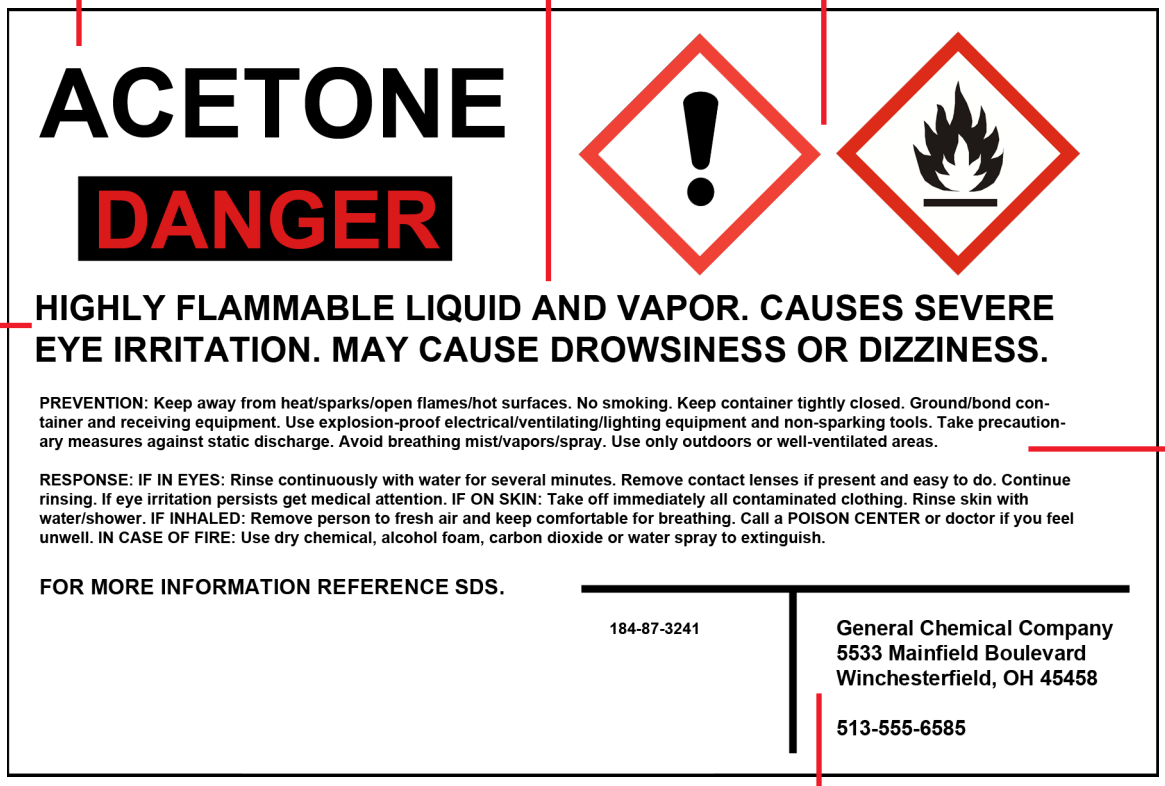
While GHS requires proper chemical labeling, the Department of Transportation (DOT) requires proper labeling when you're shipping chemicals. This means when the product is shipped, the outer package must bear all of the required DOT marks and labels, as well as the GHS label information if it is a primary container. Essentially, DOT labeling does not change with GHS. When the primary container is also the shipping container, you'll need both.

GHS Label Example

#3 Product Name or Identifiers

#4 Hazard Statements

#2 Symbols (Hazard Pictograms)



ACETONE

DANGER

HIGHLY FLAMMABLE LIQUID AND VAPOR. CAUSES SEVERE EYE IRRITATION. MAY CAUSE DROWSINESS OR DIZZINESS.

PREVENTION: Keep away from heat/sparks/open flames/hot surfaces. No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment and non-sparking tools. Take precautionary measures against static discharge. Avoid breathing mist/vapors/spray. Use only outdoors or well-ventilated areas.

RESPONSE: IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. If eye irritation persists get medical attention. IF ON SKIN: Take off immediately all contaminated clothing. Rinse skin with water/shower. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell. IN CASE OF FIRE: Use dry chemical, alcohol foam, carbon dioxide or water spray to extinguish.

FOR MORE INFORMATION REFERENCE SDS.

184-87-3241

General Chemical Company
5533 Mainfield Boulevard
Winchesterfield, OH 45458

513-555-6585

#1 Signal Word

#6 Manufacturer Information

#5 Precautionary Statements

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GHS Label Elements

According to OSHA, there are six core parts that must be included in any hazardous chemical label.

#1 Signal Word

There are two types of signal words used to determine the severity of the hazard. “Danger” is used for most severe instances, while “Warning” is less severe.
(SDS Section 2)

#2 Symbols (Hazard Pictograms)

Composed of a hazard symbol surrounded by a red border to visually illustrate the hazards of a chemical so they are universally readable. May use a combination of 1-5 symbols.
(SDS Section 2)

#3 Product Name or Identifiers

Identifies the hazardous chemical by an appropriate term, and can include the chemical name, code number and/or batch number.
(SDS Section 1)

#4 Hazard Statements

Describes the nature/degree of the hazard. Labels can contain multiple hazard statements, and should always be consistent within each hazard classification category
(SDS Section 2)

#5 Precautionary Statements

Instructs users on measures for minimizing exposure and lowering the risk of harm from a chemical including prevention, response, storage or disposal precautions.
(SDS Section 2)

#6 Manufacturer Information

Company name, address & telephone number

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Pictogram Guide

Chemical/ Physical

EXPLODING BOMB
Explosives, self-reactives, organic peroxides

FLAME
Flammable gases, liquids & solids; self reactives; pyrophorics; self-heating

FLAME OVER CIRCLE
Oxidizing gases, liquids and solids

GAS CYLINDER
Compressed gases; liquified gases; dissolved gases

CORROSION
Corrosives to metals

Health Risk

CORROSIVE
Skin corrosion; eye damage

SKULL AND CROSSBONES
Acute toxicity (severe, fatal)

EXCLAMATION MARK
Irritant, dermal sensitizer, acute toxicity (harmful)

HEALTH HAZARD
Carcinogens, respiratory sensitizers, reproductive toxicity, target organ toxicity, germ cell mutagens

Environmental Risk

ENVIRONMENT
Aquatic toxicity

(Not regulated by OSHA)

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GHS Label Printing Technology Overview

A common question that many companies face when beginning their GHS project relates to the process of printing GHS compliant product and container labels. What GHS label printing options are available, and which method is the best fit for their business?

Thermal Transfer (1-color ribbon) w/ Pre-Printed Labels

Use pre-printed labels with red pictogram borders, and print the "black" portion of the label with a standard thermal transfer printer.

Thermal Transfer (2-color ribbons) w/ Blank Labels

Use blank labels to print both the red and black label components simultaneously with a dual printhead thermal transfer printer.

Laser (Mono) w/ Pre-Printed Labels

Use pre-printed laser-sheet labels with red pictogram borders, and print the "black" portion of the label with a monochrome laser printer.

Color Laser w/ Blank Labels

Use blank laser-sheet labels to print full color labels with a color laser printer.

Color Inkjet w/ Blank Labels

Use blank inkjet-receptive labels and specifically formulated ink cartridges to print full color labels with a color inkjet printer.

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Thermal Transfer (1 Color) w/ Pre-Printed Labels

Description

This method uses a thermal transfer label printer, a thermal transfer ribbon, and thermal transfer labels pre-printed with red diamond borders for the pictogram. The thermal transfer printer prints black text, images and pictograms on the label, with the pictograms printed inside the pre-printed red diamonds.

Components Needed

- Thermal transfer printer
- Black thermal transfer ribbon matched to the printer and label facestock you are using
- Thermal transfer labels pre-printed with red diamond pictogram borders
  - The number of red diamond borders you will need corresponds to the number of pictograms that are required for the product you are about to label. All pictograms must be contained in a red diamond border, and no blank red diamond borders are allowed.
- Label printing software

How It Works

This method of GHS label printing uses labels that have been pre-printed with the red pictogram border. The thermal transfer printer is equipped with a printer ribbon, and the pre-printed labels are loaded into the thermal transfer printer. You use pre-defined formats designed for the product to be labeled and the layout of the pre-printed red diamonds on the labels to print the “black” portion of the required elements needed for a GHS-compliant label.

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Thermal Transfer (1 Color) w/ Pre-Printed Labels

Pros

- Uses thermal transfer printers that may already be present in your operations
- Fast throughput
- Lots of flexibility for label facestock depending on your needs, from low-cost paper labels to high-durability synthetic labels, or other specialty labels.
  - Synthetic film labels are needed for applications requiring chemical resistance
  - The surface to be labeled may require a special adhesive
- Overall lower media (labels and printer ribbons) costs compared to inkjet and laser

Cons

- Must maintain an inventory of pre-printed labels
- Must ensure the correct diamond configurations on the labels are ordered
- Frequent label roll changes or multiple printers may be required to print different product labels or label formats
- Having one preprint with multiple red diamonds present and “blacking out” unused diamonds, is NOT allowed.

When To Consider This Option

- You have a very small number of product SKUs that need to be labeled
- Products that need to be labeled use the same label size and format, including the number of red diamond borders
- A special custom label is required

See more information on Thermal Transfer Printers at:

https://www.general-data.com/products/printers/thermal

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Two Color Thermal Transfer with Blank Labels

Description

GHS labels require two colors--black and red--and this method is ideally suited for two color label printing. The thermal transfer label printer is equipped with two separate printheads and requires both a black and a red thermal transfer printer ribbon. It can then print both the red diamond borders and the black information and pictograms on blank thermal transfer labels in one pass.

Components

- Thermal transfer label printer equipped with two printheads
- Black thermal transfer printer ribbon matched to the printer and the label facestock you are using
- Red thermal transfer printing ribbon matched to the printer and the label facestock you are using
- Blank thermal transfer labels
- Label printing software

How It Works

These thermal transfer printers are built with dual printheads, capable of running two thermal transfer ribbons simultaneously. One printhead is equipped with a red thermal transfer ribbon, the other printhead with a black thermal transfer ribbon, and the blank thermal transfer labels are loaded into the printer. Pre-defined label formats are sent to the printer through the label printing software, and the labels are printed with both black and red in one pass.

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Two Color Thermal Transfer with Blank Labels

Pros

- No need to carry an inventory of pre-printed labels
- Multiple product configurations that need different layouts and number of red diamond pictogram borders can be printed without the need to change label rolls or purchase multiple printers
- Lots of flexibility for label facestock depending on your needs, from low-cost paper labels to high-durability synthetic film labels, or other specialty labels
    - Synthetic film labels are needed for applications requiring chemical resistance
    - The surface to be labeled may require a special adhesive
- Overall low media (labels and printer ribbons) costs
- Fast throughput

Cons

- Because of the dual printhead configuration, these printers are more expensive than standard thermal transfer printers
- Must carry 2x the inventory of printer ribbons
- Ribbon changeover takes longer as there are two printer ribbons to replace and load
- Dual printhead mechanism is more complex than standard thermal transfer printers,

When To Consider This Option

- You have a large number of product SKUs that have different label layouts and pictogram requirements
- You have a high volume of products that need to be labeled
- A special custom label is required

See more information on Thermal Transfer Printers at:

https://www.general-data.com/products/printers/thermal

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Laser (Monochrome) with Pre-Printed Labels

Description

This method uses a standard monochrome laser printer, toner, and laser sheet labels preprinted with red diamond borders for the pictograms. The laser sheets are fed through the laser printer to print the black text, images and pictograms on the labels, with the pictograms printed inside the pre-printed red diamonds.

Components

- Monochrome laser printer
- Black laser toner
- Laser sheet labels pre-printed with red diamond pictogram borders
  - Sheets are typically 8.5” x 11” the number of labels per sheet depends on label size
  - The number of red diamond borders you will need corresponds to the number of pictograms that are required for the product you are about to label. All pictograms must be contained in red diamond border, and no blank red diamond borders are allowed.
- Label printing software

How It Works

Laser sheets pre-printed with red diamond pictogram borders are loaded into the laser printer. Pre-defined label formats designed for the product you are labeling and the preprinted red diamonds on the labels are sent to the printer to print the “black” portion of the required elements needed for a GHS-compliant label. The pictograms are printed inside the red diamond borders.

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Laser (Monochrome) with Pre-Printed Labels

Pros

- You can use laser printers that may already be present in your operations

Cons

- Must maintain an inventory of pre-printed laser sheets labels
- Excessive printer wear and maintenance costs - office laser printers are typically not built for extended label printing use, may frequently jam and break down
- Wasted labels and laser sheets if every label on the sheet is not printed and used
- Slow throughput
- Limited choice of laser label sheet materials designed for chemical exposure

When To Consider This Option

- You have a limited number of product SKUs at a low volume that need to be labeled

See More Information on Laser Printers at:

https://www.general-data.com/products/printers/laser

Color Laser with Blank Labels

Description

Color laser printers are found more and more in today's business environments. This method creates GHS-compliant labels by printing the black text, images and pictograms, and the red diamond pictogram borders, on blank laser sheet labels that are fed through the color laser printer.

Components

- Color laser printer
- Color laser toner
- Blank laser sheet labels
  - Sheets are typically 8.5"x11" - number of labels per sheet depends on label size
- Label printing software

How It Works

Blank laser sheet labels are loaded into the laser printer. Pre-defined label formats are sent to the printer through the label printing software, and the labels are printed in full color.

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Color Laser with Blank Labels

Pros

- No need for pre-printed label inventory
- You can use color laser printers that may already be present in your operations
- Enables corporate branding on demand, as well as ability to highlight other content on the label in full color

Cons

- Equipment cost
- Cost of color toner
- Excessive printer wear and maintenance costs - office laser printers are typically not built for extended label printing use, may frequently jam and break down
- Wasted labels and laser sheets if every label on the sheet is not printed and used
- Slow throughput
- Limited choice of laser label sheet materials designed for chemical exposure

When To Consider This Option

- You have a limited number of product SKUs at a low volume that need to be labeled
- The color laser printer can be used to create color documents for use in other areas or applications in your operations

See More Information on Laser Printers at:

https://www.general-data.com/products/printers/laser

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Color Inkjet with Blank Labels

Description

Color inkjet label printing has seen some significant technological advances in terms of print speed, resolution, and image durability. With these advances, the concept of "on demand color label printing" has finally achieved a level of quality, durability and an overall price/performance ratio that makes it a viable alternative for industrial labeling applications. For GHS labels, color inkjet label printers use specially-formulated ink to print both black information and pictograms and red diamond pictogram borders on label facestock that is formulated specifically for that ink to produce high-quality and very durable images.

Components

- Special industrial color inkjet label printer
- Inkjet cartridges for the printer containing special pigmented ink
- Blank labels with ink-receptive surface that is formulated for use with the special pigmented ink
- Label printing software

How It Works

The color inkjet label printer is equipped with inkjet cartridges containing the specially formulated ink and loaded with the special inkjet-receptive blank labels. Pre-defined label formats are sent to the printer through the label printing software, and the labels are printed in full color.

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Color Inkjet with Blank Labels

Pros

- No need for pre-printed label inventory
- Multiple product configurations that need different layouts and number of red diamond pictogram borders can be printed without the need to change label rolls
- No waiting time for image to dry
- Image is highly durable and resistant to water and chemicals compared to dye-based ink systems
- Can use a variety of label sizes
- Custom label can be produced for use in these printers
- Can be used to create other color labels for use in other areas and applications outside of GHS labels
- Enables corporate branding on demand, as well as ability to highlight other content on the label in full color

Cons

- Cannot use standard inkjet labels- labels that are formulated specifically for this application and ink must be used
- Cost of labels and ink (but still cheaper than most laser label options)
- Slower print speeds
- Ink waste during printer stop/start cycling

When To Consider This Option

- You have a large number of product SKUs that have different label sizes, layouts and pictogram requirements
- You have a high volume of products that need to be labeled
- You have potential uses and applications for on-demand color labeling in other areas of your operation

See More Information on Laser Printers at:

https://www.general-data.com/products/printers/inkjet

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Choosing the Right Label

What Happens If You Choose The Wrong Label

A label is a label - you print on the front, there's sticky stuff on the back, so your best strategy is to find the least expensive source for labels, right?

Unfortunately, too many companies take this approach to sourcing labels for their operations, and the result is always disastrous. Problems such as labels tearing or falling off and printing images smearing or degrading can (and will) happen, resulting in your company facing non-compliance penalties and other customer headaches. And if you are labeling chemical drums that will be shipped overseas by boat, you may be required to comply with additional mandates that specify exactly what type of label material you are allowed to use for product labeling. You can't afford not to know these specification and act accordingly.

Factors to Consider When Choosing Labels

- What type of print technology and printer will be used to print the labels?
- What type of surface does the label need to adhere? Does it ever need to be removed?
- What type of temperatures and environmental conditions will the label be exposed to? (heat, cold, humidity, salt water, etc)
- Will the label need to withstand exposure to water or chemicals? If so, what kind of chemicals? What type of exposure? (spray, immersion, etc.)
- Will the label need to withstand any unusual handling? (squeeze bottles, abrasion caused by contact rubbing against other containers, conveyor rails, forklifts, etc.)
- How long is the label required to last?

The answers to these questions have a significant impact on what type of label you need. There are different label facestocks, including synthetic films, and different label adhesives that are designed for specific applications. Make sure the label you choose can satisfy all of your requirements.

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Choosing the Right Label

> A critical component for an effective GHS labeling system is making sure you have chosen the right label for the application.

About The BS5609 Specification

BS5609 is an internationally recognized standard that covers the labeling of products and containers for marine shipment. Under the provisions of the Merchant Shipping Regulations of the International Maritime Dangerous Goods (IMDG), it is mandated that shippers durably label chemical drums and packages for carriage by sea.

Labels manufactured to BS5609 standards are regarded by the Department of Transportation as complying with the regulations. GHS standards require that certain products must met IMDG certification, part of which requires the identification labels to conform to BS5609. The BS5609 certification is a two-part certification for both the label material and the printed information on the label. Both elements must be tested successfully and certified for a label to achieve the BS5609 certification.

What Does This Mean For You?

If you ship chemical drums or other packaging via marine transport, your GHS labeling system must use labels for those products that are certified to BS5609 specifications. If this applies to you, you must work closely with your label supplier to make sure your labels have received BS5609 certification.

Follow The Implementation Plan

1. Get your product information organized and re-categorized per GHS regulations.

There are many online resources available to help you do this.
To begin, we recommend OSHA's new hazard communication site at:
https://www.osha.gov/dsg/hazcom/

2. Assess your current situation.

Audit your current infrastructure and label printing systems: the equipment used, the processes and procedures, and the types of labels you use.

3. Clearly understand and define your labeling needs.

What needs to be labeled? How many different existing or new products, containers or cartons? GHS labels require specific components to be present on each label. You will need to determine the correct information necessary for proper labeling of your products. For each product, container or carton, what are the application and use requirements? Are there any special compliance considerations (ie. BS5609)?

4. Evaluate the different label printing technology alternatives.

Take a look at each different printing technology; you can use this buyer's guide as a starting point. Evaluate the pros and cons of each technology as they relate to your operations and the needs of your facilities. Your labeling needs directly affect your choice of printing technology, as some have limited options for the types of labels that can be used. Be sure to factor this into your evaluation.

5. Test sample labels to determine suitability for your applications and needs.

You'll want to obtain blank and/or pre-printed samples of labels for testing and evaluation. Make sure you have chosen a label that can adequately perform in your specific environments and applications and on your products' containers.

Follow The Implementation Plan

6. Evaluate software and integration options.

Look at your current software tools, systems, and IT infrastructure, and determine their suitability for GHS label printing. If any new software is needed, determine its suitability for the scale of your operation and the other software systems you have now. Also factor in the printing technology you are evaluating in order to determine compatibility.

7. Determine service and support requirements.

For your printer service plan, how many printers will be part of your GHS label printing system? What is your anticipated label volume for these printers? What type of impact would a malfunctioning printer have on your operations, and how do you need to be able to respond to it? You will want to choose a service plan with options that address your operation's unique needs and requirements. Also, make sure any software systems you put in place has an adequate support plan behind it.

8. Evaluate the TCO (total cost of ownership) for your different options and select the best one for your needs.

Evaluate the TCO (total cost of ownership) for your different options and select the best one for your As you have probably learned by reading this buyer's guide, putting a GHS labeling system in place involves many factors, and each factor can impact the choice or availability of others. For example, the per-label cost of printer supplies--ink, toner, thermal transfer ribbons--varies widely. But your labeling needs can impact the choice of printing technology, which then determines the type of printer supplies you will need to use.

9. Schedule time for testing prior to going live.

Before going live with your GHS labeling system, you should schedule time and resources to thoroughly test the system in your environment and under your typical usage conditions. This way, any bugs or issues in the process, system or any individual components can be identified and addressed before your target go-live date. If your plan involves multiple facilities and locations, don't assume that if it is working at one location then it will work at all locations. Each location should have its own testing plan and process to follow before going live.

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General Data Is Your Partner for GHS Label Printing Systems

General Data provides complete, reliable GHS label printing systems to all kinds of manufacturers, distributors and even users of chemical and other hazardous substances. We've got you covered with everything you need to print GHS labels in a manner that best fits your specific business needs.

GHS and Chemical Label Expertise

General Data is the one-stop-shop for all components of a GHS labeling system, including:

- Printers
- Printer Supplies
- Labels
- Software
- Service and Technical Support

What makes General Data uniquely qualified to provide you with a GHS label printing system?

- General Data is one of the nation's largest manufacturers of labels, specializing in chemical labels and other harsh-environment labeling applications.
- General Data is a national premier distributor and integrator for the top industrial printer brands.
- General Data is a nationwide factory-certified provider of both depot and on-site partner service.

We will provide you with a GHS label printing system that maximizes your ROI and keep you in compliance with GHS label printing regulations.

Don't Stress GHS - Contact Us Today To Speak With One Of Our GHS Experts

Our GHS labeling experts will explain your choices and options, and help you select the right mix of components for your GHS labeling printing system.

www.general-data.com/GHS
844-643-1129
talktous@general-data.com

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