Label Logistics & Technology: Meeting the GHS Challenge

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Does anyone feel like this guy meeting the GHS challenge?
What do we do first?

- As with any goal, you need to understand where you are coming from with your current HazCom labeling system.
- Does your current printer and labeling system meet the new GHS red diamond label criteria?
- Is your label generating software capable of generating GHS labels?

Best Practices

Best practices would dictate that all parties involved with creating and handling HazCom labels be involved in the evaluation. That would include, but not be limited to EH&S, Product Stewardship, IT, Marketing, Operations and Logistics.
It is best practice to generate a checklist of requirements before investigating your options

- What surfaces will these labels have to adhere to? Painted steel, PVC, fiberglass?
- What are the adhesive requirements?
- What types of surfaces? Smooth, curved, rough, etc.?
- What will the labels be exposed to? Humidity, water, chemicals, ice, snow, sunlight?

- Are the labels hand applied or applied through an auto label applicator?
- Do you have any private label printing requirements?
- What conditions are the labels applied in? Climate controlled, outside?
- What temperatures are the labels exposed to after they are applied?
- Are there any hot fill operations to consider?
- Where will the printers be located within the operation?
What does OSHA say?

- OSHA does not give guidelines as to what durability criteria HazCom labels must meet.
- They say that all the text and symbols must be readable and that the label must be affixed to the container at all times.
- All containers, large and small, must have GHS labels.

This doesn’t cut it.
Overseas Shipments

- GHS container labels that are shipped over the international waterways must meet the International Maritime Dangerous Goods (IMDG) requirements.
- Although the IMDG regulation does not require a label to be BS 5609 certified, the BS 5609 designation is recognized as the only certification.
- The BS 5609 certification was developed as a method of testing the printed label durability under conditions that would emulate the label being submerged in saltwater and abrasive sand for 90 days.

- The label must remain affixed to the container with the printed image (including the red frame, pictograms and precautionary text) remaining identifiable and readable.
- The BS 5609 certification is a two-part certification for both the label material and the printed information on the label.
- Both elements must be tested successfully, as evidenced by separate certifications, for a label to achieve the full BS 5609 certification.
- Many companies contract with independent testing laboratories to test their labels for BS 5609 compliance.
- **Best practices dictates that labels for domestic shipments also meet this criteria.**
How do they test for BS 5609 certification?

Section 2: Pressure-Sensitive, adhesive coated label base material

Must pass the following tests;

- Marine Performance Test- performed on the label base material
  - 3 month exposure to marine conditions (labels are applied to panels attached to pylon at half-tide at sea)
Section 2: Pressure-Sensitive, adhesive coated label base material

- Laboratory performance type tests
  - Dimensional stability (labels are measured for shrinkage)
  - Adhesion after 48hrs (adhesion values are measured peeling label from test panels)
  - Adhesion after artificial weathering (adhesion values are measured peeling label from test panels)
  - Adhesion after temperature cycling (adhesion values are measured peeling label from test panels)
  - Color fastness of base material (comparison of base material color before and after exposure)

Section 3: Printed Pressure-Sensitive, adhesive coated labels

Must pass the following tests;

- **Performance Requirements**
  - Print Key effectiveness (adhesive tape test)
  - Abrasion resistance (laboratory seawater, sand with labels affixed to steel rods in a rotating mill jar)
  - Permanence of print, color fastness and residual contrast (artificial weathering including saltwater spray and artificial sunlight)

- Color shall remain recognizable as the original hue and color fastness no less than 2
- Any text or symbol shall remain legible and identifiable
What are the options out there today to address GHS printing?

- Monochrome Thermal Transfer
- Two Color Thermal Transfer
- Inkjet
- Cut Sheet Color Laser
- Continuous Feed Color Laser

This is not a hardware or media decision

- All the printers that will be mentioned in this presentation require a unique enhanced surface optimized for the specific printing process for the label.
- This allows for proper ink or toner transfer to the print surface and increases print durability to meet the BS5609 Section 3 standards.
Monochrome Thermal Transfer

- Very prevalent in pre-GHS world
- Use of preprinted labels with monochrome variable print
- Will require preprinting red diamonds on the labels

Sample label for a blank thermal transfer label
Sample label from a monochrome thermal transfer printer with block out

Advantages
- Many inexpensive label material options
- Low cost per label
- Ability to print beyond a 14” length
- Continuous feed labels for auto applicators

Disadvantages
- One selectable media at a time
- Preprint inventory management
- Label size changeover
- Printer registration differences causing the red diamond not being completely covered is a violation
- Cannot efficiently address different red diamond sizes for the EU
Two Color Thermal Transfer

- Newer thermal transfer technology that has two print heads with a black and red ribbon to print red GHS diamonds
- Truly industrial printer with metal housing

Sample label from a two color thermal transfer printer
## Advantages
- Many inexpensive label material options
- Low cost per sheet
- Ability to print beyond a 14” length
- Continuous Feed for auto applicators
- Can address small labels

## Disadvantages
- High upfront capital expenditure
- One selectable media at a time
- Preprint inventory management
- Label size changeover
- Consumables cost

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### Inkjet
- New inks and label media for this technology now have BS5609 certification
- Multiple models can address large drum labels and small sample labels
- Full 4 color printing
Sample label

![Sample label image](image-url)

**Advantages**
- Relatively low capital investment
- Harsh chemical resistance
- Full color capabilities
- Ability to print beyond a 14” length
- Continuous Feed for auto applicators
- Can address small labels

**Disadvantages**
- One selectable media at a time
- Label size changeover
- Tractor feed sometimes impacts image quality (lines)
- Overall sharpness and color steadfastness of image
- Speed
- Media Cost
- Availability of BS 5609 Materials
Cut Sheet Color Laser

- Upgrade from previous monochrome laser printers
- Support multiple size media with multiple drawers
- Full 4 color printing
- Not all cut sheet printers are created equal (BS5609)

Sample label
Advantages

• Relatively low capital investment
• Full color capabilities
• Image quality
• Ease of operation
• Multiple media selectable at a time

Disadvantages

• Cannot support auto label applicator applications
• Higher cost of label media
• Cannot support labels longer than 14”
• Limited media options
• Not designed for high run batch labeling

Continuous Feed Color Laser

• Modified cut sheet printer to provide continuous feed fanfold and roll to roll
• Can run continuous feed and cut sheet labels
Sample label

Advantages
• Can be used in auto label application
• Full color capabilities
• Image quality
• Ease of operation
• Multiple media selectable at a time
• Can support labels longer than 14”

Disadvantages
• Cannot support small label applications
• Higher cost of label media
• Limited media options
Conclusions

• One size does not fit all
• Multiple printer technologies may be required to address all GHS labeling requirements within your organization
• Time is running out....June 1st is fast approaching