



The effect of the new GHS standards on the PCM industry

Manufacturers of phase change material are required to follow the new Globally Harmonized System of Classification and Labeling of Chemicals and must accurately report the hazards associated with their products.

The U.S. Occupational Safety and Health Administration (OSHA) implemented and began enforcing the [Globally Harmonized System of Classification and Labeling of Chemicals](#) (GHS) on June 1, 2015. The GHS was adopted by U.N. member states with the goal of setting a global standard for chemical classifications and hazard communications. Prior to this program, each country had its own set of regulations for rating, classifying and labeling chemicals. This fragmented system led to poor hazard communications for international companies, as they may not have understood foreign regulations and may have provided insufficient material safety data sheets (MSDS) and material labels. Benefits of the GHS include:

- Clearly defined criteria and ratings for health, physical and environmental hazards.
- Unified hazard communication and protective measures on labels and safety data sheets (SDS).
- Improved hazard awareness and workplace safety.
- Assured compliance for companies operating within U.N. member states.
- Enhanced human and environmental protection.

The GHS recognizes that chemical hazards are not as black-and-white as “non-hazardous” and “hazardous” but rather a scale of severity that needs to be properly communicated. The GHS has a categorical classification system to rate the severity of a hazard, and each chemical with a reported hazard is given a signal word (labeling) of either “Warning” or “Danger.” Chemicals that are given a “Warning” signal word could mildly harm someone or the environment. For example, a Warning-designated chemical could be a skin or eye irritant. Chemicals with a “Danger” signal word could severely harm someone or the environment. For example, a chemical with the “Danger” designation could be corrosive, highly flammable or fatal if swallowed.

Phase change material (PCM) manufacturers are chemical manufacturers under OSHA 1910.1200 and must follow the new GHS standards, including accurately reporting the hazards associated with their products. Although PCM manufacturers may still list key chemicals in their products as “trade secret,” they are required to accurately report the health, physical and environmental hazards for each of the key chemicals per the GHS guidelines. For example, if a salt-hydrate PCM contains two different salts, the manufacturer must list the hazards associated with each salt as a part of the product SDS.

Trends in hazard classifications have emerged as the PCM industry becomes GHS-compliant. Biobased PCMs, including PureTemp, typically are classified as Non-hazardous with some Warning products, the main hazard being skin and eye irritation.

Petroleum-based paraffin PCMs tend to be classified as Warning or Dangerous products, with these potential hazards:

- Skin and eye irritation
- Highly flammable
- Toxic to aquatic life
- May be fatal if swallowed or inhaled
- May cause drowsiness or dizziness if inhaled
- May cause cancer

Salt-hydrate PCMs can be classified as Non-hazardous, Warning or Dangerous, with these potential hazards:

- Corrosive to metals
- Skin and eye irritation
- Severe skin and eye damage
- Respiratory irritation
- Toxic to aquatic life
- Oxidizing agent
- May cause cancer

Entropy Solutions has performed an in-depth hazard analysis of the PureTemp product line and updated the company's [safety data sheets](#) to meet the new GHS standards. PureTemp products are classified as either Non-hazardous or Warning products due to being skin/eye irritants or toxic to aquatic life. Unlike salt-hydrate and petroleum-based PCMs, commercial PureTemp products are not labeled as Dangerous. A hazardous waste expert has reviewed the PureTemp product line hazard classifications and determined that the commercial PureTemp product line can be classified as non-regulated waste under [U.S. law](#). This classification means that PureTemp would be considered a non-hazardous

material and not subject to additional regulations or increased costs when disposed of in an environmentally appropriate manner.

Entropy Solutions recommends that customers review PCM safety data sheets before making a purchase. Understanding the potential hazards will help you to decide which PCM to use, as there may be safer alternatives within the industry. Make sure that the SDS that you are reviewing is GHS-compliant. If the SDS is not GHS-compliant, it does not meet OSHA regulations and is not acceptable to use.