Understanding GHS and Chemical Safety

Jason McGee, Southeastern Tank, Inc.

Globally Harmonized System

- Classification and Labelling of Chemicals (GHS) is an internationally agreed-upon system created by the United Nations to standardize and harmonize the
- Classification
- Labeling
- SDS (Safety Data Sheets)

History of GHS

- Concerns about inconsistencies in chemical hazard communication arose as global trade increased.
- Various countries and organizations began developing their own classification and labeling systems, leading to confusion and potential hazards.

History of GHS

- The United Nations Conference on Environment and Development (UNCED) in 1992 highlighted the need for international cooperation in chemical safety.
- In 1992, the International Labour Organization (ILO) called for the development of a globally harmonized system for hazard communication.
- In 1997, the United Nations Economic Commission for Europe (UNECE) initiated efforts to develop the GHS to address these concerns.
- From 1999 to 2002, the first edition of the GHS was developed through a series of meetings involving experts from governments, industry, labor organizations, and international organizations.

History of GHS

- The first edition of the GHS, containing the framework and general principles for hazard classification and communication, was published in 2002.

History of GHS

- Since the publication of the first edition, the GHS has undergone several revisions and updates to refine its criteria, harmonize hazard communication elements, and address emerging issues.
- These revisions have included updates to classification criteria, addition of new hazard categories, refinement of labeling requirements, and improvements to safety data sheets (SDS).

History of GHS

- Following the development of the GHS, efforts were made to promote its adoption and implementation by countries around the world.
- Many countries have incorporated or aligned their chemical regulations with the GHS, either fully or partially, to improve consistency in hazard communication and facilitate international trade.

SOUTHEASTERN TANK

History of GHS

- The GHS has gained widespread recognition as the international standard for chemical hazard communication.
- It has been endorsed by various international organizations, including the United Nations, World Health Organization (WHO), International Labour Organization (ILO), and Organisation for Economic Co-operation and Development (OECD).

SOUTHEASTERN TANK

History of GHS

- The development and refinement of the GHS continue to evolve as new scientific information becomes available and as global chemical management practices evolve.
- Efforts are ongoing to address challenges such as ensuring consistency in implementation, promoting awareness and understanding of the GHS, and addressing emerging issues in chemical safety.

SOUTHEASTERN TANK

History of GHS

Overall, the history of the GHS reflects a concerted international effort to harmonize chemical hazard communication and improve chemical safety worldwide.

SOUTHEASTERN TANK

Purpose of GHS Implementation

- **Standardization**: GHS implementation aims to standardize the classification, labeling, and safety data sheets (SDS) of chemicals internationally. By establishing consistent criteria and communication elements for identifying and conveying chemical hazards, GHS promotes clarity and uniformity in hazard communication across different countries and regulatory systems.

Purpose of GHS Implementation

- **Hazard Communication**: GHS implementation improves hazard communication by ensuring that information about chemical hazards and associated risks is effectively conveyed to workers, consumers, emergency responders, and other stakeholders. By using standardized pictograms, signal words, hazard statements, and precautionary statements, GHS facilitates better understanding of chemical hazards and enables individuals to take appropriate safety measures.

SOUTHEASTERN TANK

Purpose of GHS Implementation

- **Risk Management**: GHS implementation supports effective risk management practices by providing clear and reliable information on chemical hazards. By accurately classifying chemicals based on their hazards and communicating this information through labels and SDS, GHS helps employers, workers, and regulators identify potential risks associated with chemical handling, storage, use, and disposal, enabling them to implement appropriate control measures to mitigate these risks.

Purpose of GHS Implementation

- **International Trade Facilitation**: GHS implementation facilitates international trade by harmonizing the classification and labeling requirements for hazardous chemicals across different countries and regulatory systems. By aligning with GHS standards, countries can reduce barriers to trade, streamline regulatory compliance, and enhance transparency and efficiency in the global supply chain, promoting economic growth and competitiveness.

SOUTHEASTERN TANK

Purpose of GHS Implementation

- **Protection of Human Health and the Environment**: GHS implementation contributes to the protection of human health and the environment by promoting the safe and responsible management of chemicals. By improving hazard communication and supporting informed decision-making about chemical risks, GHS helps minimize the potential for accidents, injuries, illnesses, and environmental harm associated with the use and handling of hazardous substances.

SOUTHEASTERN TANK

Purpose of GHS Implementation

- **Capacity Building and Awareness**: GHS implementation fosters capacity building and awareness-raising efforts related to chemical safety. By promoting education, training, and outreach initiatives on GHS principles and practices, countries can enhance stakeholders' understanding of chemical hazards and their roles and responsibilities in ensuring safe chemical management, thus strengthening overall chemical safety culture.

The Globally Harmonized System of Classification and Labelling of Chemicals (GHS) comprises several key components designed to ensure consistent and effective communication of chemical hazards. These components include:

Key Components of GHS

- **Classification Criteria**: GHS provides a set of standardized criteria for classifying chemicals based on their inherent hazards. These criteria cover physical hazards (e.g., flammability, explosiveness), health hazards (e.g., acute toxicity, carcinogenicity), and environmental hazards (e.g., aquatic toxicity). Classification involves assessing the available data on a chemical's properties and determining its hazard classes and categories according to established criteria.

SOUTHEASTERN TANK

Components of GHS

- **Hazard Communication Elements**:
- **Labels**: GHS requires the use of standardized labels to convey hazard information on chemical containers. Labels include pictograms, signal words (e.g., "Danger" or "Warning"), hazard statements, and precautionary statements. Pictograms are graphical symbols that represent specific types of hazards (e.g., flame, skull and crossbones) and provide quick visual recognition of the hazards associated with the chemical.
- **Safety Data Sheets (SDS)**: SDS provide detailed information about the hazards, composition, safe handling, storage, and emergency procedures for chemicals. SDS are organized into sections, including identification, hazards identification, composition/information on ingredients, first-aid measures, fire-fighting measures, accidental release measures, handling and storage, exposure controls/personal protection, physical and chemical properties, stability and reactivity, toxicological information, ecological information, disposal considerations, transport information, regulatory information, and other information.

SOUTHEASTERN TANK

Key Components of GHS

- **Classification and Labeling Inventory**: GHS encourages the development and maintenance of inventories of classified chemicals, including information on their hazard classes and categories. These inventories help ensure that appropriate hazard communication measures, such as labeling and SDS, are applied consistently to chemicals in the workplace.

Key Components of GHS

- **Training and Education**: GHS emphasizes the importance of training and education on hazard communication for workers who handle or are potentially exposed to hazardous chemicals. Training programs should cover GHS principles, hazard classification, label interpretation, SDS comprehension, safe handling practices, and emergency response procedures.

Key Components of GHS

- **Implementation and Compliance**: GHS implementation involves incorporating its principles and requirements into national or regional chemical safety regulations. This includes establishing mechanisms for compliance monitoring, enforcement, and verification to ensure that chemical manufacturers, importers, distributors, and employers comply with GHS requirements.

Key Components of GHS

- Revision and Updates: GHS is a dynamic system that undergoes periodic revisions and updates to reflect new scientific knowledge, address emerging hazards, and improve hazard communication effectiveness. Countries and regulatory bodies are encouraged to stay informed about GHS revisions and incorporate them into their regulatory frameworks as appropriate.

Importance of GHS in Chemical Safety

chemical safety cannot be overstated, as it plays a critical role in protecting human health and the environment while facilitating global trade.

SOUTHEASTERN TANK

GHS Classification

SOUTHEASTERN TANK

Physical Hazards

- **Explosives**: Substances and mixtures that can explode under certain conditions are classified based on their sensitivity to mechanical or thermal stimuli.
- **Flammable Gases, Liquids, and Solids**: Substances and mixtures that can ignite and burn in the presence of an ignition source are classified based on their flashpoint, boiling point, and flammability limits.
- **Self-Reactive Substances and Mixtures**: Substances and mixtures that can undergo rapid exothermic reactions, resulting in heat and gas generation, are classified based on their reactivity and potential for self-accelerating decomposition.

SOUTHEASTERN TANK

Physical Hazard

- **Oxidizing Gases, Liquids, and Solids**: Substances and mixtures that can facilitate the combustion of other materials are classified based on their oxidizing properties and ability to enhance the combustion of flammable substances.
- **Pyrophoric Liquids, Solids, and Gases**: Substances and mixtures that can ignite spontaneously in air are classified based on their ability to react with oxygen and ignite without an external ignition source.
- **Corrosive to Metals**: Substances and mixtures that can cause corrosion damage to metals are classified based on their corrosivity towards metal surfaces.

SOUTHEASTERN TANK

Health Hazards

- **Acute Toxicity**: Substances and mixtures that can cause harmful effects when exposure occurs within a short period are classified based on their toxicity and acute effects observed in animal studies or human data.
- **Skin Corrosion/Irritation**: Substances and mixtures that can cause severe skin damage or irritation are classified based on their corrosivity or irritancy towards skin tissues.
- **Serious Eye Damage/Eye Irritation**: Substances and mixtures that can cause serious eye damage or irritation are classified based on their corrosivity or irritancy towards eye tissues.

SOUTHEASTERN TANK

Health Hazards

- **Respiratory or Skin Sensitization**: Substances and mixtures that can induce allergic reactions after exposure to the skin or respiratory system are classified based on their sensitizing properties and potential to cause allergic responses in susceptible individuals.
- **Germ Cell Mutagenicity**: Substances and mixtures that can induce genetic mutations in reproductive cells are classified based on their genotoxicity and potential to cause heritable genetic changes.
- **Carcinogenicity**: Substances and mixtures that can cause cancer in humans or animals are classified based on their carcinogenic properties and evidence from carcinogenicity studies.

SOUTHEASTERN TANK

Health Hazards

- **Reproductive Toxicity**: Substances and mixtures that can cause adverse effects on sexual function or fertility are classified based on their reproductive toxicity and potential to affect reproductive organs or functions.
- **Specific Target Organ Toxicity (STOT)**: Substances and mixtures that can cause specific toxic effects on target organs after exposure are classified based on their organ-specific toxicity and observed effects on target organs.
- **Aspiration Hazard**: Substances and mixtures that can cause lung damage if aspirated into the respiratory system are classified based on their ability to induce chemical pneumonitis or pulmonary injury following aspiration into the lungs.

SOUTHEASTERN TANK

Environmental Hazards

- **Acute Aquatic Toxicity**: Substances and mixtures that can cause harmful effects to aquatic organisms within a short period are classified based on their toxicity to aquatic organisms and acute effects observed in ecotoxicity studies.
- **Chronic Aquatic Toxicity**: Substances and mixtures that can cause long-term harmful effects to aquatic organisms are classified based on their toxicity to aquatic organisms and chronic effects observed in ecotoxicity studies

SOUTHEASTERN TANK

Environmental Hazards

- **Bioaccumulation**: Substances and mixtures that can accumulate in the tissues of organisms are classified based on their bioaccumulative potential and bioaccumulation factors.
- **Rapid Degradation**: Substances and mixtures that degrade quickly in the environment are classified based on their biodegradability and degradation rates

SOUTHEASTERN TANK

GHS Labeling

Globally Harmonized System (GHS) labeling is a standardized approach to conveying information about the hazards of chemicals through labels affixed to containers or packaging. GHS labels consist of several key elements designed to communicate hazard information clearly and effectively to users. Here's an overview of GHS labeling requirements:

SOUTHEASTERN TANK

Pictograms

GHS labels feature standardized pictograms, which are graphical symbols that represent specific types of hazards associated with the chemical. Each pictogram has a unique shape and color to facilitate quick visual recognition of the hazard.

SOUTHEASTERN TANK

Flame

Represents flammable hazards, such as flammable liquids, gases, or solids.

Health Hazard

Indicates health hazards, including acute toxicity, carcinogenicity, and respiratory or skin sensitization.

SOUTHEASTERN TANK

Exclamation Mark

Indicates less severe health hazards, such as skin or eye irritation

SOUTHEASTERN TANK

Skull and Crossbones

Indicates acute toxicity hazards that can cause serious or fatal harm.

SOUTHEASTERN TANK

Environment

Indicates environmental hazards, such as aquatic toxicity or environmental persistence.

SOUTHEASTERN TANK

Signal Words

Danger

- Used for more severe hazards that pose a significant risk to health or the environment.

Warning

- Used for less severe hazards that may cause moderate or minor harm.

Hazard Statements

GHS labels include hazard statements that describe the nature and degree of the hazard posed by the chemical. Hazard statements provide concise information about the specific hazards associated with the chemical, such as "Causes skin irritation" or "May cause cancer."

SOUTHEASTERN TANK

Precautionary Statements

GHS labels include precautionary statements that provide guidance on safe handling, storage, use, and disposal of the chemical. Precautionary statements help users take appropriate precautions to minimize the risk of exposure and prevent accidents or injuries. Examples of precautionary statements include "Wear protective gloves/eye protection" and "Dispose of contents/container in accordance with local/regional/national/international regulations."

Product Identification

GHS labels include product identification information, such as the chemical name or identifier, the supplier's name and contact information, and any other relevant product identifiers or codes.

Additional Information

GHS labels may include additional information or instructions as required by national or regional regulations, such as batch numbers, expiration dates, or supplementary hazard information.

SOUTHEASTERN TANK

SODIUM HYPOCHLORITE
(5% SOLUTION)

WARNING

CAUSES SKIN IRRITATION.
CAUSES SERIOUS EYE IRRITATION.

CORROSIVE

PREVENTION

Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/eye protection/face protection.

RESPONSE

IF IN EYES: Rinse cautiously 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: Wash with plenty of water and soap. If skin irritation occurs: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF SWALLOWED: Rinse mouth. Call a POISON CENTER or physician if you feel unwell. Take off contaminated clothing and wash it before reuse. IN CASE OF FIRE: Use a tri-class dry chemical fire extinguisher.

STORAGE

Store in a secure, cool and well-ventilated place. Keep container tightly closed.

DISPOSAL

Dispose of contents/container to a licensed chemical disposal agency in accordance with local/regional/national regulations.

For more information reference SDS

SOUTHEASTERN TANK

Safety Data Sheets (SDS)

The Globally Harmonized System of Classification and Labelling of Chemicals (GHS) mandates the creation of Safety Data Sheets (SDS), formerly known as Material Safety Data Sheets (MSDS), to provide comprehensive information about the hazards, safe handling, storage, and emergency response procedures for chemicals.

SOUTHEASTERN TANK

SDS are standardized documents that follow a specific format to ensure consistency and clarity in conveying important safety information to users

SOUTHEASTERN TANK

- **Identification**: This section provides basic information about the chemical, including:
  - Product identifier (name, code, or number)
  - Manufacturer or supplier information (name, address, phone number)
  - Emergency phone number
  - Recommended use of the chemical
  - Restrictions on use
- **Hazards Identification**: This section describes the hazards associated with the chemical, including:
  - GHS classification of the chemical (physical hazards, health hazards, environmental hazards)
  - Hazard pictograms
  - Signal word (e.g., "Danger" or "Warning")
  - Hazard statements
  - Precautionary statements

SOUTHEASTERN TANK

- **Composition/Information on Ingredients**: This section lists the chemical ingredients of the product, including:
  - Chemical name or identifier
  - Concentration or concentration range of each ingredient
  - Chemical identity and concentration of impurities or stabilizing additives
- **First-Aid Measures**: This section provides guidance on appropriate first-aid measures in case of exposure to the chemical, including:
  - Symptoms/effects of exposure
  - First-aid measures for different routes of exposure (inhalation, skin contact, eye contact, ingestion)
  - Recommendations for medical attention

SOUTHEASTERN TANK

- **Fire-Fighting Measures**: This section outlines appropriate fire-fighting measures in case of a fire involving the chemical, including:
  - Suitable extinguishing media
  - Special hazards arising from the chemical (e.g., flammable gases)
  - Special protective equipment and precautions for firefighters
- **Accidental Release Measures**: This section provides guidance on responding to spills, leaks, or releases of the chemical, including:
  - Personal precautions, protective equipment, and emergency procedures
  - Methods and materials for containment and cleanup
  - Environmental precautions

SOUTHEASTERN TANK

Physical and Chemical Properties: This section lists the physical and chemical properties of the chemical, including:

- Appearance (physical state, color)
- Odor
- pH
- Melting point/freezing point
- Boiling point
- Flash point
- Flammability
- Explosive properties
- Vapor pressure
- Solubility

•**Stability and Reactivity**: This section provides information on the chemical's stability and reactivity, including:

- Chemical stability
- Possibility of hazardous reactions
- Conditions to avoid (e.g., heat, light, incompatible materials)
- Incompatible materials

SOUTHEASTERN TANK

Toxicological Information: This section provides information on the toxicological properties of the chemical, including:

- Acute toxicity
- Skin corrosion/irritation
- Serious eye damage/eye irritation
- Respiratory or skin sensitization
- Germ cell mutagenicity
- Carcinogenicity
- Reproductive toxicity
- Specific target organ toxicity (single and repeated exposure)

- **Ecological Information**: This section provides information on the environmental impact of the chemical, including:

- Ecotoxicity (aquatic and terrestrial)
- Persistence and degradability
- Bioaccumulative potential
- Mobility in soil
- Other adverse effects

SOUTHEASTERN TANK

Disposal Considerations: This section provides guidance on the safe disposal of the chemical, including:

- Appropriate disposal methods
- Disposal considerations for unused product or contaminated materials
- Local/regional/national regulations

- **Transport Information**: This section provides information on the transportation of the chemical, including:

- UN number
- Proper shipping name
- Hazard class
- Packing group
- Transport hazard pictograms
- Environmental hazards
- Special precautions for users

SOUTHEASTERN TANK

Regulatory Information: This section provides information on regulatory requirements related to the chemical, including:

- Safety, health, and environmental regulations specific to the product or its use
- International regulations (e.g., GHS, REACH, TSCA)
- National or regional regulatory requirements

•**Other Information**: This section includes any additional information that may be relevant to the safe handling, use, or disposal of the chemical, such as date of preparation, revision history, and contact information for further inquiries.

Accessing and understanding Safety Data Sheets (SDS) is crucial for several reasons

SOUTHEASTERN TANK

Safety Compliance: SDS provide essential information on the hazards of chemicals, enabling employers and workers to comply with safety regulations and standards. Accessing and understanding SDS helps ensure that proper safety measures are implemented to protect workers' health and safety in the workplace.

Hazard Communication: SDS serve as a primary tool for communicating hazard information about chemicals to workers, emergency responders, and other stakeholders. Understanding SDS helps individuals identify potential hazards associated with chemicals and take appropriate precautions to minimize risks.

SOUTHEASTERN TANK

Emergency Response Preparedness: SDS contain detailed instructions for responding to chemical spills, leaks, fires, and other emergencies. Accessing and understanding SDS equips emergency responders with the information they need to effectively and safely manage chemical incidents and mitigate potential hazards.

Risk Assessment and Management: SDS provide valuable information for conducting risk assessments and managing chemical risks in the workplace. Understanding SDS helps employers and workers assess the potential hazards associated with chemicals and implement appropriate control measures to minimize risks and prevent accidents or exposures.

SOUTHEASTERN TANK

Safe Handling and Storage: SDS offer guidance on the safe handling, storage, use, and disposal of chemicals. Accessing and understanding SDS helps ensure that chemicals are handled and stored properly to prevent accidents, spills, exposures, or environmental contamination.

Health Protection: SDS provide information on the health effects of chemicals, including acute and chronic health hazards, routes of exposure, and symptoms of exposure. Understanding SDS enables individuals to protect themselves from chemical-related health risks by implementing appropriate personal protective measures and medical surveillance programs.

SOUTHEASTERN TANK

- **Environmental Protection**: SDS contain information on the environmental hazards of chemicals, such as toxicity to aquatic organisms, persistence, and bioaccumulative potential. Accessing and understanding SDS helps individuals minimize the environmental impact of chemical use and disposal by implementing proper containment, cleanup, and disposal procedures.
- **Training and Education**: SDS serve as valuable educational resources for training workers on chemical safety and hazard communication. Understanding SDS enables employers to provide effective training programs that empower workers with the knowledge and skills needed to work safely with chemicals.

SOUTHEASTERN TANK

Benefits of GHS

- Improved Communications of Hazards
- Enhanced Safety in Handling Chemicals
- Facilitated International Trade
- Standardized Training and Education

SOUTHEASTERN TANK

GHS Compliance and Responsibilities

SOUTHEASTERN TANK

Employers Should Provide

- **Communication**:
- Employers are responsible for ensuring that workers have access to GHS-compliant labels and SDS for hazardous chemicals in the workplace.
- Employers must also provide training and education on GHS hazard communication and safe handling practices to workers who may be exposed to hazardous chemicals.

Employers Should Provide

Training and Education:

- Employers are responsible for providing training and education to workers on GHS hazard communication, including the meaning of GHS pictograms, signal words, hazard statements, and precautionary statements.
- Workers should be trained on how to interpret and use SDS and labels effectively to minimize risks associated with hazardous chemicals.

Employers Should Provide

Recordkeeping:

- Employers should maintain records of GHS classification, labeling, SDS, and training activities to demonstrate compliance with GHS requirements.
- This may include records of chemical inventories, SDS availability, training sessions, and employee certifications.

Thank You

Jason McGee

Business Development Director

931-993-0881

jason@setank.com

www.setank.com


SOUTHEASTERN
TANK