Globally Harmonized System

Environmental & Occupational Health Assessment Program

- PEOSH Unit
- Consultation & Outreach Unit
- Childcare Unit
- School & Community Unit

2

PEOSH Unit

Enforcement

- Conduct on-site inspections
- Report findings & recommendations
- Issue citations for violations
- Follow up inspections

3

PEOSH Unit

Enforcement

– **Industrial hygiene investigations**

- Employee complaints
  - Referrals
- Accident/fatalities

Programmed Inspections

4

Consultation & Outreach

Evaluate the work environment

Provide information and technical assistance

Prevent hazardous conditions and practices

5

Consultation & Outreach

- Process
  - Request assistance
  - Opening conference
  - Walkthrough
  - Closing conference
  - Report

6

*Consultation & **Outreach***

- Seminars and Presentations
- Information Bulletins, Alerts
- Model Programs
- Guidelines, Checklists

7

Educational Presentations

- Presentations on common workplace health hazards.
- Customized training to fit specific needs.
- Seminars to help you understand and implement new or amended standards.

8

To Schedule a Consultation or Presentation

For occupational **health** hazards
PEOSH Unit, NJDoH at **(609) 984-1863**

For occupational **safety** hazards
Div. of Public Safety and Occupational Safety and Health, DoLWD at
(609) 292-7036

9

Visit us on the web at:

www.nj.gov/health/peosh

NJ Department of Health 10

The

Globally Harmonized System

of

Classification and Labeling

Chemicals

Globally Harmonized System

- MSDS - 16 section ANSI version
- Label - GHS pictograms, signal words and standardized hazard warnings
- Minor classification changes & additions to many health & physical hazards

http://www.osha.gov/dsg/hazcom/index2.html

Why GHS?

Nations have adopted different:

- Hazard definitions & classifications
- Information requirements
- Label formats
- Material Safety Data Sheet formats

Negatively impacts health & safety and trade

Why GHS in the US?

Need to Harmonize domestic regulations

The same product may have:

- Different regulatory requirements by sector
- Different classification by sector
- Multiple information requirements
- Multiple Label requirements

Why GHS in the US?

- Identify and regulate hazardous chemical products (estimated 945,000 in US, 7 million workplaces)
- Define information needed to address protection of workers, the public and the environment
- Provides standard phrases & translations

Major Change in Approach

Labeling & MSDS

- will have a consistent format
- improve comprehensibility and compliance

Hazard Classification criteria

- Add/redefine criteria for many classifications
- Consistent across nations & standards

Material Safety Data Sheets

HCS allows any order of information vs
GHS specifies the order of information

Consistent with industry approaches in ANSI, ISO, EU

Improve ability to find the information needed

Improve depth, comprehensibility and accuracy of the information

GHS Benefits in the US

- Costs and benefits
  - $97 million annual cost
    - training, SDSs & labels, management
  - $851 million annual benefit
    - reduced injuries/illnesses/fatalities,
    - improved productivity and cost reduction

$754 million net annual benefit

Benefits to OSHA & Workers

Hazard Communication is performance-oriented

- Inconsistent classification
- Labels contain different information & format
- Safety Data Sheets differ in depth & format
- would improve usability

GHS provides a more standard approach

Global Benefits

Nations, international organizations, chemical producers and users of chemicals will all benefit.

- Enhance protection of people and environment.
- Facilitate international trade.
- Reduce need for testing and evaluation.
- Assist in the sound management of chemicals

GHS Regulatory History

May 16, 2005

Semi-annual Regulatory Agenda

Sept. 12, 2006

Advance Notice of Proposed Rulemaking

Sept. 30, 2009

Notice of Proposed Rulemaking

- Public Comment Period ended Dec. 29, 2009
- Public Hearings March and April, 2010
- Post-hearing Comment Period ended June 1, 2010

GHS Regulatory History

- OMB Review
- February 21, 2012 Final Standard
- In Federal Register March 25, 2012
- Phase-in Period for Compliance
  - 2-4 years (as proposed)

US Agencies Affected by GHS

- Environmental Protection Agency (EPA)
- Department of Transportation
- Consumer Product Safety Commission (CPSC)
- Occupational Safety and Health Administration (OSHA)

GHS Requirements

- Sets criteria for classification of health, environmental and physical hazards
- Provisions for communicating information:
  - Standardized labels (pictograms, hazard statements, and signal words)
  - Standardized 16-section Safety Data Sheet

GHS Requirements

Defined criteria to assign a hazard classification

- Physical Hazards - 16 categories
- Health Hazards - 10 categories
- Environmental Hazards

Classification guidance for mixtures of chemicals

GHS Physical Hazards

- Flammable Gases
- Flammable Aerosols
- Flammable Liquids
- Flammable Solids
- Oxidizing Gases
- Oxidizing Liquids
- Oxidizing Solids
- Substances which react with water & emit flammable gas
- Explosives
- Pyrophoric Liquids
- Pyrophoric Solids
- Self-Heating Substances
- Self-Reactive Substances
- Organic Peroxides
- Corrosive to Metals
- Gases Under Pressure

Table 1: Flammable and(Combustible) Liquid Classification Comparison

Flash Point Closed Cup	<20°F(-7°C)	20°F(-7°C)-100°F(38°C)	100°F(38°C)-140°F(60°C)	140°F(60°C)-150°F(66°C)	150°F(66°C)-200°F(93°C)
OSHA	Flammable	Flammable	Combustible	Combustible	Combustible
ANSI	Extremely Flammable	Flammable	Flammable (<141°F/60.5°C)	Combustible	Combustible
RCRA (EPA)	Ignitable	Ignitable	Ignitable		
DOT	Flammable	Flammable	Flammable (<141°F/60.5°C)	Combustible	Combustible
CPSC	Extremely Flammable	Flammable	Combustible	Combustible	
NFPA 30	Class I	Class I	Class II	Class III	Class III

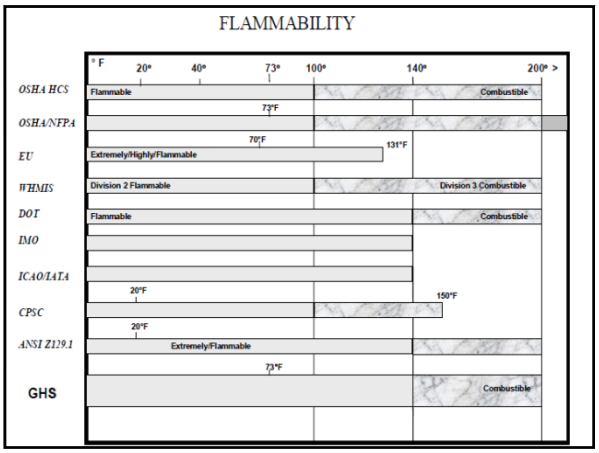


Table 2: GHS Flammable (and Combustible) Liquid Criteria

Criteria	GHS Category
Flash point < 73°F(23°C) and initial boiling point ≤ 95°F(35°C)	1
Flash point < 73°F(23°C) and initial boiling point > 95°F(35°C)	2
Flash point ≥ 73°F(23°C) and ≤ 140°F(60.5°C)	3
Flash point > 140°F(60.5°C) and ≤ 199.4°F(93°C)	4

GHS Hazard Communication

GHS Label Elements for Flammable Liquids

Table 3: GHS Label Elements for Flammable (and Combustible) Liquids

	Category 1	Category 2	Category 3	Category 4
Symbol				No symbol
Signal Word	Danger	Danger	Warning	Warning
Hazard Statement	Extremely flammable liquid and vapor	Highly flammable liquid and vapor	Flammable liquid and vapor	Combustible liquid

GHS Health Hazards

- Acute Toxicity
- Skin Corrosion/Irritation
- Serious Eye Damage/Eye Irritation
- Respiratory or Skin Sensitization
- Germ Cell Mutagenicity
- Carcinogenicity
- Reproductive Toxicology
- Target Organ Systemic Toxicity
  – Single Exposure
  – Repeated Exposure
- Aspiration Toxicity

GHS Environmental Hazards

Hazardous to Aquatic Environments

- ➢Acute aquatic toxicity
- ➢Chronic aquatic toxicity
  - Bioaccumulation potential
  - Rapid degradability

OSHA vs GHS Labels

- ➢HCS - performance-oriented
- ➢GHS – specific requirements for use of:
  - ➢pictograms,
  - ➢signal words
  - ➢standardized hazard statements
- ➢GHS also has suggested precautionary statements (in process)

GHS Label Elements

Signal Words - "Danger" or "Warning"

Hazardous chemical ingredients

Hazard Statements - "Toxic if swallowed"

"Suspected of causing cancer"

Precaution & First Aid Statements

Manufacturer/Supplier identification

GHS Pictograms & Hazard Classes

- Explosives
- Self-reactives
- Organic peroxides

- Flammables
- Self-reactives
- Pyrophorics
- Self-heating
- Emits flammable gas

- Oxidizers
- Organic peroxides

- Gases under pressure

- Acute toxicity

- Acute toxicity
- Skin irritation
- Eye irritation
- Skin sensitizers

- Carcinogens
- Respiratory sensitizers
- Reproductive toxicity
- Target organ toxicity
- Germ cell mutagens

- Eye corrosion
- Skin corrosion
- Corrosive to metal

- Aquatic toxicity

Health Hazard Classes

- Acute toxicity (Severe)

- Acute toxicity
- Eye irritation
- Skin irritation
- Skin sensitizers

Health Hazard Classes

- Carcinogen
- Mutagenicity
- Respiratory Sensitizer
- Reproductive Toxicity
- Target Organ Toxicity
- Aspiration Toxicity

Health Hazard Classes

- Eye corrosion
- Skin corrosion
- Corrosive to metal

Hazard Classes & Categories

Acute toxicity	1	2	3	4	5
Skin corrosion/irritation	1	2	3		
Serious eye damage/eye irritation	1	2A	2B		
Respiratory sensitizer	1				
Skin sensitizer	1				
Germ cell mutagenicity	1	2			
Carcinogenicity	1	2			
Toxic to reproduction / *= Effects on lactation	1	2	*		
Specific target organ toxicity (single exposure) * Cat. 3 for respir. irritation and narcotic effects	1	2	3*		
Specific target organ toxicity (repeated exposure)	1	2			
Aspiration hazard	1	2			
Acute hazards to the aquatic environment	1	2	3		
Chronic hazards to the aquatic environment	1	2	3	4	

Physical Hazard Pictograms

- Flammable
- Pyrophoric
- Self-Heating
- Self Reactive
- Emits Flammable Gas
- Organic Peroxide

Fire Hazard Examples

Flammable solids: aluminum powder, magnesium ribbons

Pyrophorics: organometallics, silane

Self-heating: linseed oil rags

Flammable gases: acetylene, hydrogen

Self-reactive: acetylene, azides

Emit flammable gas: lithium, calcium carbide

Organic peroxides: MEK peroxide

Physical Hazard Pictograms

- Explosive
- Self Reactive
- Organic Peroxide

- Oxidizer

Physical Hazard Pictograms

Gases Under Pressure

GHS Pictograms

Environmental Toxicity

ACUTE ORAL TOXICITY

	Category 1	Category 2	Category 3	Category 4	Category 5
LD_{50}	< 5 mg/kg	5 - 50 mg/kg	50 - 300 mg/kg	300 - 2000 mg/kg	2000 - 5000 mg/kg
Pictogram					No symbol
Signal word	Danger	Danger	Danger	Warning	Warning
Hazard statement	Fatal if swallowed	Fatal if swallowed	Toxic if swallowed	Harmful if swallowed	May be harmful if swallowed

C.4.3 ACUTE TOXICITY - INHALATION
(Classified in Accordance with Appendix A.1)

			Pictogram Skull and crossbones
Hazard category	Signal word	Hazard statement	
1	Danger	Fatal if inhaled	
2	Danger	Fatal if inhaled	

Precautionary statements

Prevention	Response	Storage	Disposal
Do not breathe dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. Use only outdoors or in a well-ventilated area. [In case of inadequate ventilation] wear respiratory protection. Chemical manufacturer, importer, or distributor to specify equipment. - Text in square brackets may be used if additional information is provided with the chemical at the point of use that explains what type of ventilation would be adequate for safe use.	If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center/doctor/… … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. Specific treatment is urgent (see … on this label) … Reference to supplemental first aid instruction. - if immediate administration of antidote is required.	Store in a well-ventilated place. Keep container tightly closed. - if product is volatile as to generate hazardous atmosphere. Store locked up.	Dispose of contents/container to… … in accordance with … local/regional/national/international regulations (to be specified).

C.4.3 ACUTE TOXICITY – INHALATION (CONTINUED)
(Classified in Accordance with Appendix A.1)

			Pictogram Skull and crossbones
Hazard category	Signal word	Hazard statement	
3	Danger	Toxic if inhaled	

Precautionary statements

Prevention	Response	Storage	Disposal
Avoid breathing dust/fume/gas/mist/ vapors/spray. Chemical manufacturer, importer, or distributor to specify applicable conditions. Use only outdoors or in a well-ventilated area.	If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor/… … Chemical manufacturer, importer, or distributor to specify the appropriate source of emergency medical advice. Specific treatment (see … on this label) … Reference to supplemental first aid instruction. - if immediate specific measures are required.		

ANSI Label

ToxiFlam

WARNING!
HARMFUL IF SWALLOWED
FLAMMABLE LIQUID AND VAPOR

Do not taste or swallow. Get medical attention. Do not take internally. Wash thoroughly after handling. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation.

FIRST AID
If swallowed, induce vomiting immediately, as directed by medical personnel. Never give anything by mouth to an unconscious person.

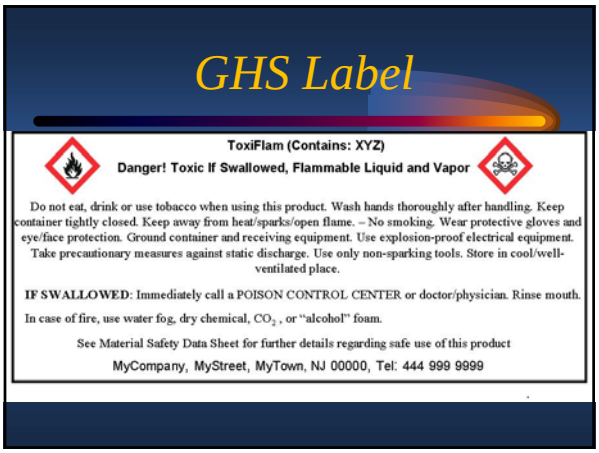
IN CASE OF FIRE, use water fog, CO_2, or alcohol foam. Water may be ineffective. Flash Point = 120° F

Residue vapor may explode or ignite on ignition; do not cut, drill, grind, or weld on or near this container.

see Material Safety Data Sheet for further details regarding safe use of this product.

Company name, Address, Phone number

GHS Label



ToxiFlam (Contains: XYZ)

Danger! Toxic If Swallowed, Flammable Liquid and Vapor

Do not eat, drink or use tobacco when using this product. Wash hands thoroughly after handling. Keep container tightly closed. Keep away from heat/sparks/open flame. – No smoking. Wear protective gloves and eye/face protection. Ground container and receiving equipment. Use explosion-proof electrical equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Store in cool/well-ventilated place.

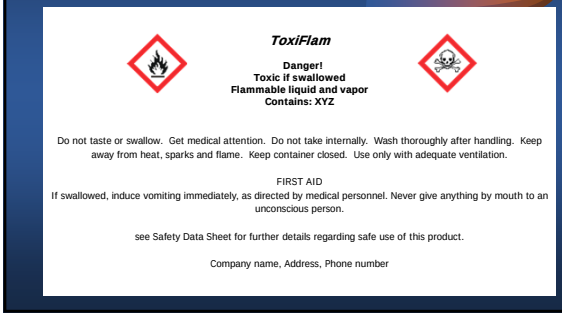
IF SWALLOWED: Immediately call a POISON CONTROL CENTER or doctor/physician. Rinse mouth.

In case of fire, use water fog, dry chemical, CO_2, or "alcohol" foam.

See Material Safety Data Sheet for further details regarding safe use of this product

MyCompany, MyStreet, MyTown, NJ 00000, Tel: 444 999 9999

GHS Label



ToxiFlam

Danger!
Toxic if swallowed
Flammable liquid and vapor
Contains: XYZ

Do not taste or swallow. Get medical attention. Do not take internally. Wash thoroughly after handling. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation.

FIRST AID
If swallowed, induce vomiting immediately, as directed by medical personnel. Never give anything by mouth to an unconscious person.

see Safety Data Sheet for further details regarding safe use of this product.

Company name, Address, Phone number

ANSI Label

My Product

CAUTION!

MAY CAUSE SKIN AND EYE IRRITATION

ATTENTION! POSSIBLE CANCER HAZARD - CONTAINS MATERIAL THAT MAY CAUSE CANCER BASED ON ANIMAL DATA

Do not breathe vapors or mist.
Use only with adequate ventilation.
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.

FIRST AID
EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

SKIN: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if irritation develops and persists.

INHALED: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
INGESTION: If swallowed, DO NOT induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

SPILL OR LEAK
Take steps to contain liquid and avoid runoff to waterways and sewer.

FIRE
In case of fire, use water spray, foam, dry chemical or CO2.

HANDLING AND STORAGE
Keep away from strong acids and oxidizers. Do not apply air pressure, puncture or weld on or near this container.

For additional information, read Safety Data Sheet for this product.

24-hour emergency phone number

Company name, Address, Phone number

GHS Label

My Product

Warning!
Cause Skin And Eye Irritation
Suspected of causing cancer by inhalation
Contains: XYZ

Do not breathe vapors or mist. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling

FIRST AID
EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
SKIN: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if irritation develops and persists.

Company name, Address, Phone number

How nasty is it?

Signal word present?

Danger > Warning > None

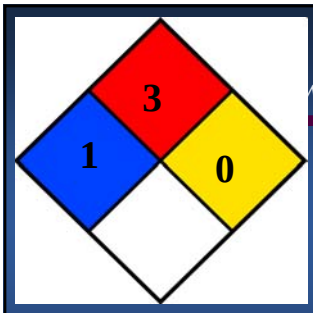
Pictogram present?

 >  > none

Hazard statement

Extremely > highly

Fatal > toxic > harmful



If you use in-house, train
Watch for conflict with GHS

Issue if using NFPA, HMIS

GHS 1 = **High** Risk

vs

NFPA 1 = Low Risk

HMIS 1 = Low Risk

GHS Safety Data Sheet

Similar to ISO, EU, and ANSI Z400.1 MSDS/SDS requirements with:

- 16 headings
- Specified order

OSHA MSDS format (old)

OSHA-174 (1989), (non-mandatory)

1. Manufacturer information
2. Hazardous Ingredients/Identity Information
3. Physical/chemical properties
4. Fire and Explosion Hazard Data
5. Reactivity Data
6. Health Hazard Data
7. Precautions for Safe Handling and Use
8. Control Measures

GHS Safety Data Sheet

Identity

1. Product and Company Identification
2. Hazard Identification
3. Composition / Information On Ingredients

GHS Safety Data Sheet

Emergency Information

4. First Aid Measures
5. Fire Fighting Measures
6. Accidental Release Measures

GHS Safety Data Sheet

Safe Use & Physical Properties

7. Handling and Storage
8. Exposure Control / Personal Protection
9. Physical and Chemical Properties
10. Stability and Reactivity

GHS Safety Data Sheet

Information for Professionals

11. Toxicological Information
12. Ecological Information*
13. Disposal Considerations*
14. Transport Information*
15. Regulatory Information*
16. Other Information

*** Non-mandatory**

Appendices

- Appendix A: Health Hazard Criteria
- Appendix B: Physical Hazard Criteria
- Appendix C: Allocation Of Label Elements
- Appendix D: Safety Data Sheets
- Appendix E: Definition of "Trade Secret "
- Appendix F: Guidance for Hazard Classifications Re: Carcinogenicity **

All are Mandatory except App F

Testing of Chemicals

- No new testing to determine hazards.
- Evaluations based on available data.
- Classification of health hazards are test method neutral.
- Use only scientifically valid test data.

Mixture Provisions

HCS – uses test data or a percentage floor

GHS - Bridging principles*, extrapolation of data, additivity and varied cut-off approach.

i.e. Professional judgement

***Dilution, Batching, Concentration of Highly Toxic Mixtures, Interpolation within One Toxic Category, Substantially Similar Mixtures, Aerosols**

Competent Authority

OSHA, EPA, DOT, CPSC Directors make decisions about implementing GHS

- hazard classes (e.g., environment, endocrine disruption)
- may not regulate all hazard categories (e.g., aspiration hazard)
- physical hazards (eg., important in the workplace and transport sectors, but not for consumers)

Safety and IH Professionals

- Become familiar with new classifications
- Modify training program
- Train on incoming GHS labels and SDS
- Collect new SDSs
- Adjust internal workplace labeling

Manufacturers' Responsibilities

Prepare and use new GHS labels

Prepare and distribute new GHS SDS

Commercial "authoring" firms are ready and willing to help

OSHA's Responsibilities

Modify OSHA Standards:

- HazCom,
- Chemical specific standards
- Flammable liquids
- address label & SDS changes: text (R&S), pictograms, format.

- Change some definitions add, eliminate,
  (Chemical name = substance, Chemical name = Chemical Identity

OSHA's Responsibilities

Update the language for workplace signs and labels

- Incorporate the GHS hazard statements
- Incorporate precautionary statement(s), where required.

Identify selected classifications and test methods

*Most OSHA substance-specific health standards require hazard warning signs for regulated areas

OSHA's Responsibilities

The following are not affected:

- written hazard communication program,
- inventories of hazardous products
- training
- PELs

Suggestion: Require that HMIS be modified

- **Technical updates** for minor terminology changes,
- **Direct Final Rules** for text clarification, and
- **Notice and Comment rulemaking** for more substantive or controversial updates

PEOSH's Responsibilities

N.J.A.C. 12:100-7 Hazard Communication

- Sec 7.3 Definitions - criteria for hazard classes
- Sec 7.4 Hazard Determination (OSHA?)
- Sec 7.6 Label - specify label format
- Sec 7.7 MSDS – specify SDS format

PEOSH's Responsibilities

N.J.A.C. 12:100-7 Hazard Communication

- App A Health Hazard Definitions,
- App. B Hazard Determination
- App E Guidelines for Employer Compliance (Advisory)
- MSDS to SDS throughout

* Sec. 7.5 Written Program, Sec. 7.8 Training, Sec 7.9 and App. D Trade Secrets are not affected

PEOSH's Responsibilities

Other standards and documents:

- IAQ – MSDS to SDS
- Firefighter - none
- Indoor firing range - none
- Other templates, guidance, etc.
- Adopt all OSHA Standard changes

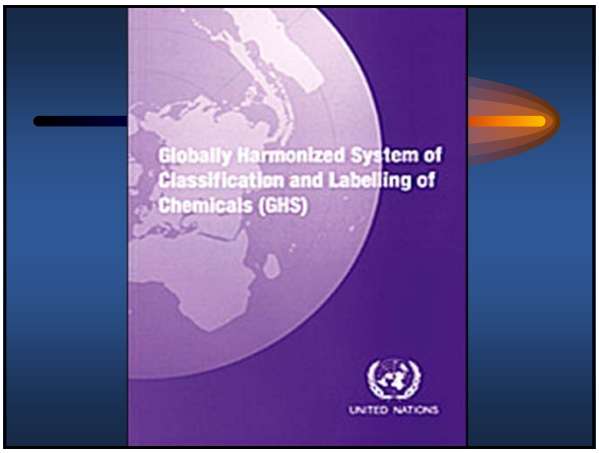
Guidance to the GHS

OSHA's web page.

A guide to the GHS
http://www.osha.gov/dsg/hazcom/ghs.html

Compares GHS and HCS in detail
http://www.osha.gov/dsg/hazcom/ghoshacomparison.html

FAQs
http://www.osha.gov/as/opa/facts-hcs-ghs.html



Timing

Training:	Dec. 1 2013
SDS & Label:	June 1, 2015*
Workplace Labeling:	June 1, 2016
Additional training:	June 1, 2016

* All shipments must have GHS Label

Questions & Discussion

Changes/additions:
HMIS/NFPA Categories are opposite GHS
- 1= most hazardous
- 4= least hazardous

Recommend eliminating use of HMIS & NFPA

Training Link: https://www.osha.gov/Publications/OSHA3642.pdf
https://www.osha.gov/Publications/OSHA3491QuickCardPictogram.pdf
https://www.osha.gov/Publications/OSHA3492QuickCardLabel.pdf
https://www.osha.gov/Publications/OSHA3493QuickCardSafetyDataSheet.pdf

Section 4. First-aid measures. This section contains no new requirements other than format

HCS 1994	HCS 2012
4. First-aid measures · Emergency and first-aid procedures **(g)(2)(x)** · Signs and symptoms of exposure **(g)(2)(iv)**	(a) Description of necessary measures, subdivided according to the different routes of exposure, i.e., inhalation, skin and eye contact, and ingestion; (b) Most important symptoms/effects, acute and delayed. (c) Indication of immediate medical attention and special treatment needed, if necessary.

Section 5. Fire-fighting measures. This section contains no new requirements other than format.

HCS 1994	HCS 2012
· Physical hazards (potential for fire, explosion) **(g)(2)(iii)** · Emergency procedures**(g)(2)(x)**	**5. Fire-fighting measures** (a) Suitable (and unsuitable) extinguishing media. (b) Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products).

TABLE B.6.1 CRITERIA FOR FLAMMABLE LIQUIDS

Category	Criteria
1	Flash point < 23°C (73.4°F) and initial boiling point ≤ 35°C (95°F)
2	Flash point < 23°C (73.4°F) and initial boiling point > 35°C (95°F)
3	Flash point ≥ 23°C (73.4°F) and ≤ 60°C (140°F)
4	Flash point > 60°C (140°F) and ≤ 93°C (199.4°F)