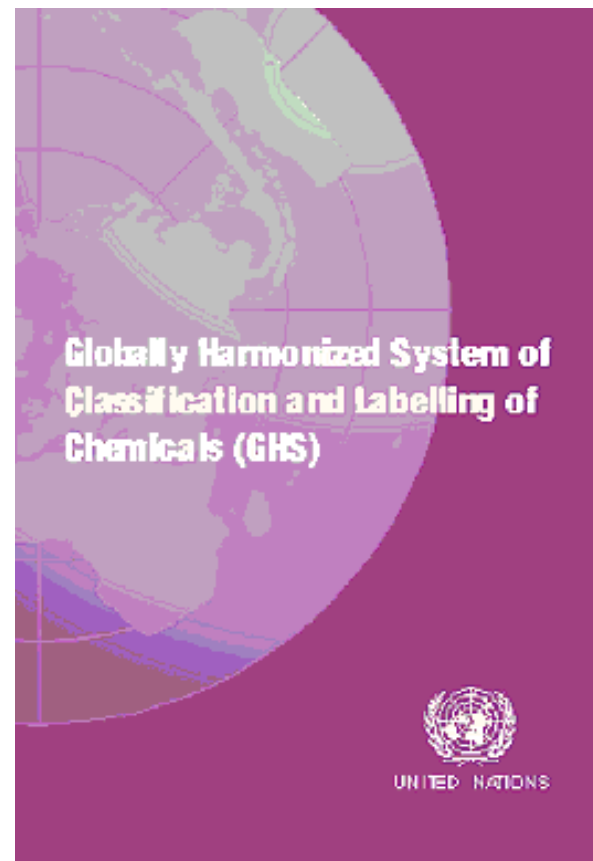


The Globally Harmonized System for Classification & Labeling of Chemicals (GHS)

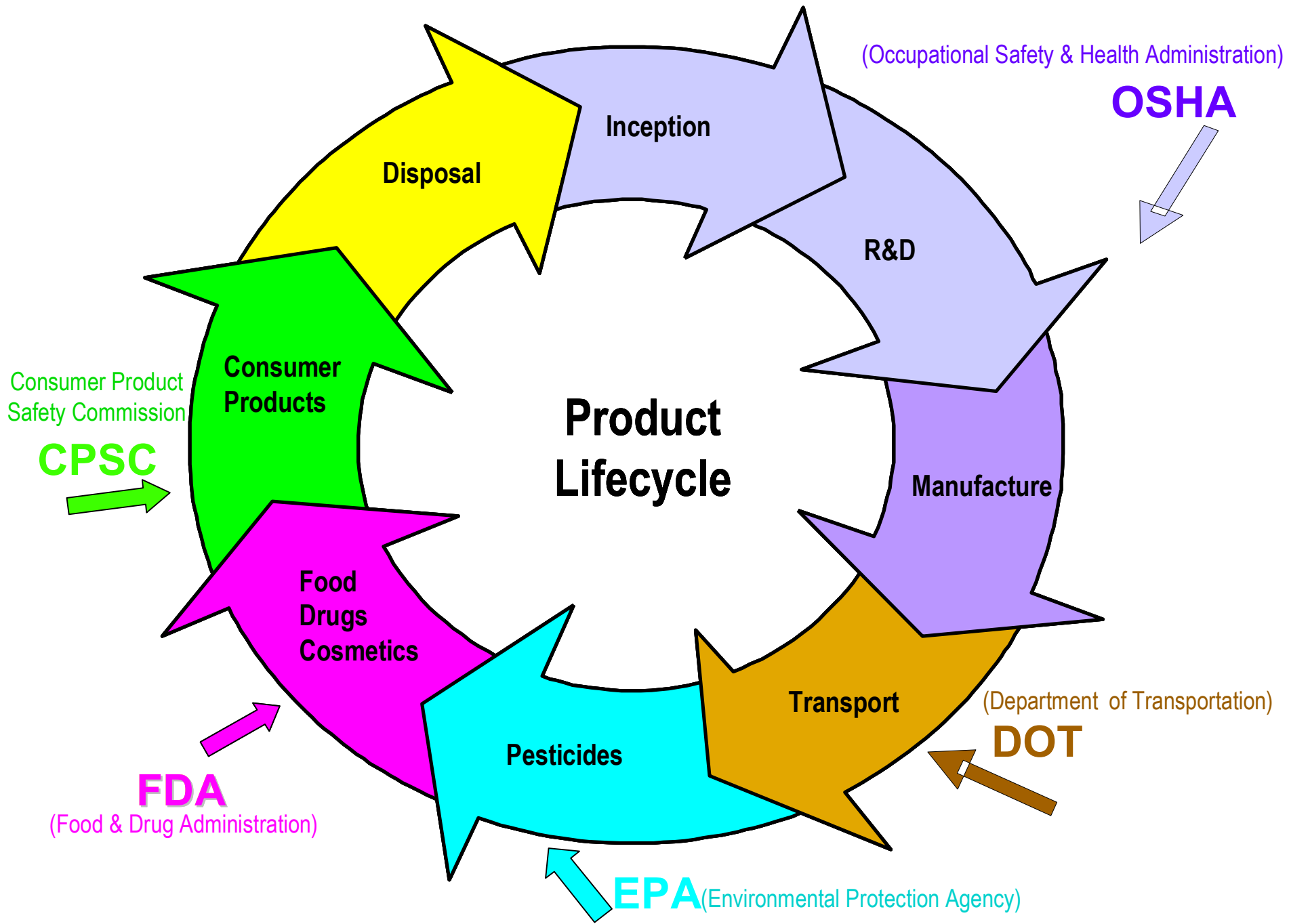


GHS Purple Book



















©Michele Sullivan, Ph.D., MRS Associates
703-527-2596, Sulliva1@aol.com

Why is GHS needed?

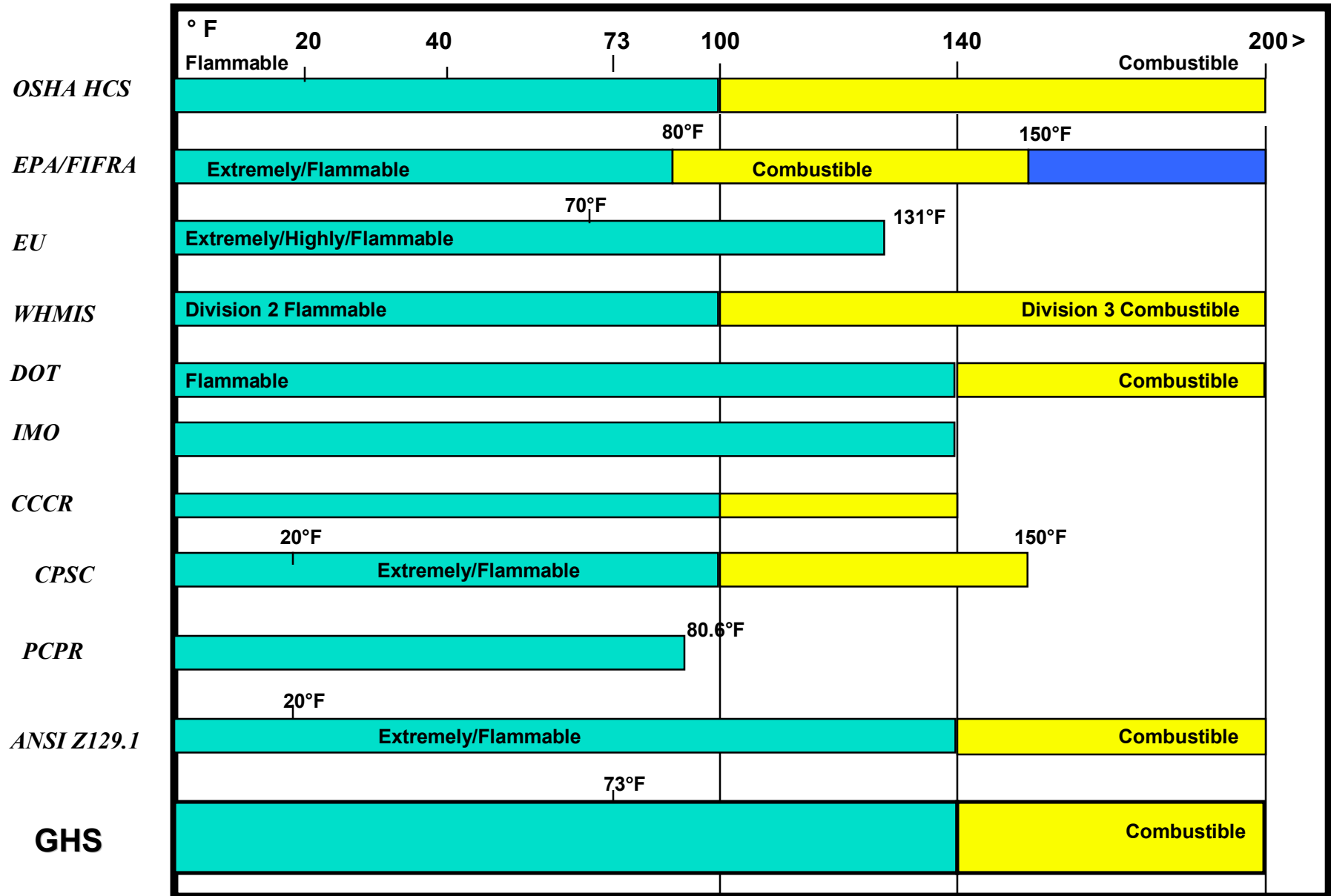
- The purpose of classification and MSDS/labeling is
 - to **provide information** to users or handlers of chemicals
 - to **minimize** the possibility of **adverse effects**
- Regulatory schemes for hazardous materials differ between USA government agencies (CPSC, DOT, EPA, OSHA, etc.) as well as internationally
- Resulting in multiple classifications, labels and MSDSs for the same product/chemical
 - users see **different label** warnings or **MSDSs** for the same product
 - Same chemical product classified as toxic in one country and not in another, etc
 - complying with multiple regulations is **costly** and **time-consuming**
- Impact on both protection and trade



ACUTE ORAL TOXICITY

OSHA	Highly Toxic		Toxic				
	LD ₅₀ ≤ 50 mg/kg Appropriate Hazard Warning		LD ₅₀ > 50 ≤ 500 mg/kg Appropriate Hazard Warning				
ANSI	Highly Toxic		Toxic		Harmful		
	LD ₅₀ ≤ 50 mg/kg  POISON DANGER May Be Fatal If Swallowed		LD ₅₀ > 50 ≤ 500 mg/kg WARNING Harmful if swallowed		LD ₅₀ > 500 ≤ 2,000 mg/kg CAUTION May be harmful if swallowed		
FIFRA	I		II		III	IV	
	LD ₅₀ ≤ 50 mg/kg  POISON DANGER Fatal if swallowed		LD ₅₀ > 50 ≤ 500 mg/kg No symbol WARNING May be fatal if swallowed		LD ₅₀ > 500 ≤ 5000 mg/kg No symbol CAUTION Harmful if swallowed	LD ₅₀ > 5000 mg/kg No symbol CAUTION No statements	
CPSC	Highly Toxic		Toxic				
	LD ₅₀ ≤ 50 mg/kg  POISON DANGER Fatal If Swallowed		LD ₅₀ > 50 ≤ 5000 mg/kg No symbol WARNING or CAUTION Harmful If Swallowed				
DOT	PkG 1	Packing Group II		Packing Group III			
	LD ₅₀ < 5 	LD ₅₀ > 5 ≤ 50 		LD ₅₀ > 50 ≤ 500 mg/kg (liquid); > 50 ≤ 200 mg/kg (solid) 			
EU	Very Toxic		Toxic		Harmful		
	LD ₅₀ ≤ 25 Very toxic if swallowed (R28) 		LD ₅₀ > 25 ≤ 200 Toxic if swallowed (R25) 		LD ₅₀ > 200 ≤ 2,000 Harmful if swallowed (R22) 		
WHMIS	Class D1A, Very Toxic		Class D1B, Toxic				
	LD ₅₀ ≤ 50 Appropriate risk phrase 		LD ₅₀ > 50 ≤ 500 Appropriate risk phrase 				
GHS	Category 1	Category 2		Category 3		Category 4	Category 5
	LD ₅₀ ≤ 5 mg/kg  or  Danger Fatal if swallowed	LD ₅₀ > 5 < 50 mg/kg  or  Danger Fatal if swallowed		LD ₅₀ ≥ 50 < 300 mg/kg  or  Danger Toxic if swallowed		LD ₅₀ ≥ 300 < 2000 mg/kg  Warning Harmful if swallowed	LD ₅₀ ≥ 2000 < 5000 mg/kg No symbol Warning May be harmful if Swallowed

FLAMMABILITY



My Company

XYZ Chemical



UN 2074



























Multiple columns of faint, illegible text, likely safety instructions or technical specifications.
























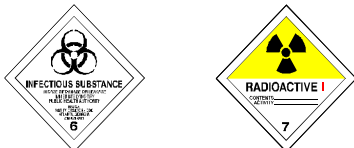
WARNING
This material is extremely flammable and may cause fire. It is highly volatile and may cause severe respiratory irritation. Avoid contact with skin and eyes. Use in a well-ventilated area. Do not inhale dust or fumes. Keep away from heat, sparks, and open flames. Store in a cool, dry place. Do not use in confined spaces. For more information, see the Safety Data Sheet (SDS) on file.



DRY CRYSTALLINE ACRYLAMIDE, DRYTENV BECS

Technical data sheet for Dry Crystalline Acrylamide, DRYTENV BECS. The sheet includes a central diagram of a rectangular container with a lid, flanked by two smaller diagrams. The text is organized into sections for identification, physical and chemical properties, and safety information. The entire sheet is enclosed in a blue and white diagonal striped border.



Hazard	Existing Symbols	Transport Symbols	GHS Symbols
Acute	   		
Chronic	  		
Corrosive to Human Tissue	  		
Irritant	  		
Less Severe Acute	  		
Environment			

Hazard	Existing Symbols	Transport Symbols	GHS Symbols
Explosive			
Flammable	  		
Oxidizer	 		
Gasses under Pressure	 		
Corrosive to Metals	 		
Reactive			
Other			

**USA
OSHA:**

ToxiFlam
TOXIC
COMBUSTIBLE LIQUID AND VAPOR
My Company, My Street, MyTown NJ 00000
Tel: 444 999 9999

**Canada
WHMIS:**

 **ToxiFlam** 

TOXIC
COMBUSTIBLE LIQUID AND VAPOR

Do not taste or swallow. 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, do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

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

My Company, My Street, MyTown NJ 00000, Tel: 444 999 9999

EU:

ToxiFlam (contains XYZ)



Harmful If Swallowed (R22)
Flammable (R10)
Keep away from food, drink and animal feedingstuffs. (S13)
Wear suitable protective clothing. (S36)
If swallowed, seek medical advice immediately and show this container label. (S46)
In case of fire use, water fog, CO2, or alcohol foam. (S43)

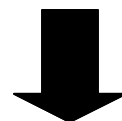
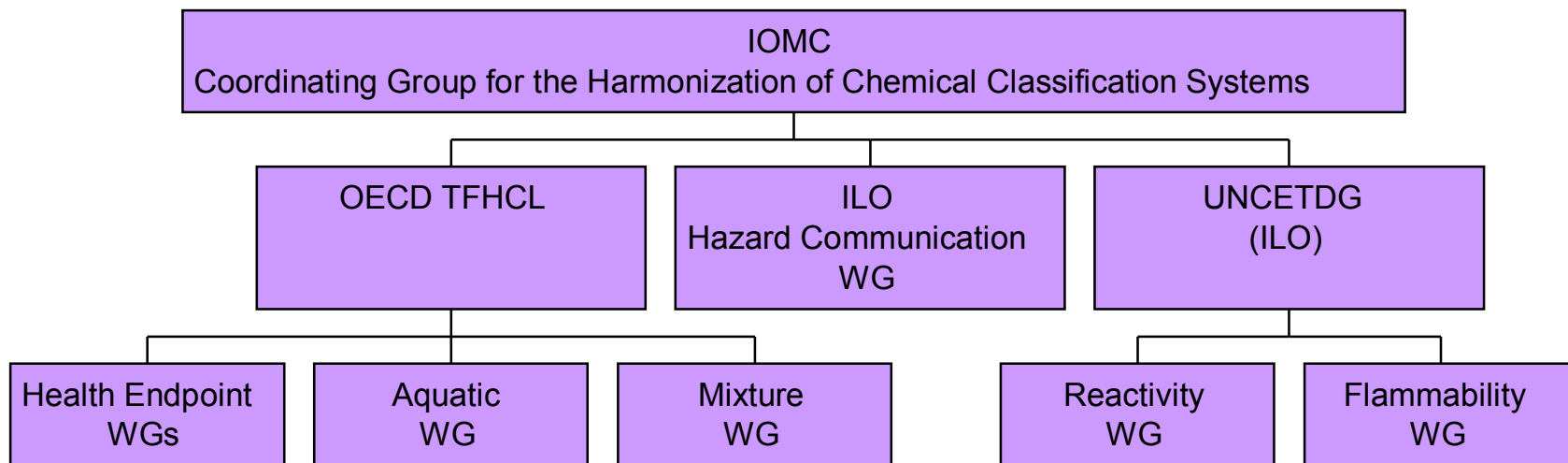
My Company, My Street, MyTown XX 00000 Tel: 44 22 999 9999

Specific Mandate for GHS

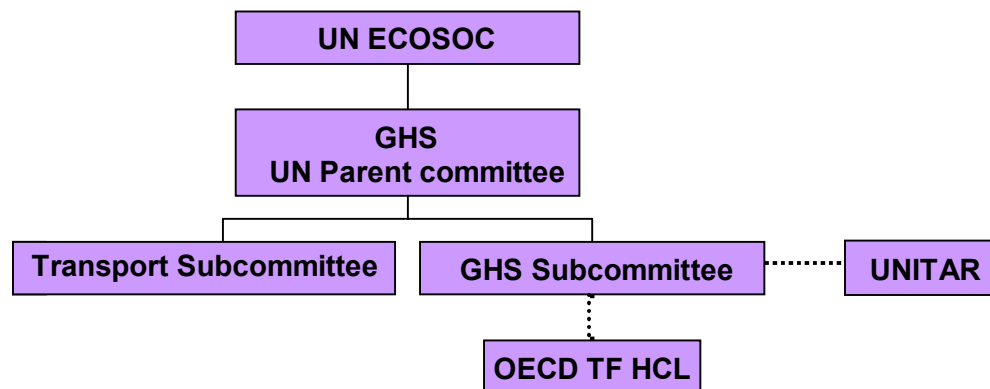
A globally harmonized hazard classification and compatible labelling system, including material safety data sheets and easily understandable symbols, should be available, if feasible, by the year 2000.

**UNCED Agenda 21, Chapter 19
1992 “Earth Summit” Rio De Janerio, Brazil**

GHS Development



GHS Maintenance & Implementation







What is the GHS?




- Common and coherent approach
 - to **defining** and **classifying** hazards, and
 - to **communicating** information on **labels** and **MSDS**
- It provides the informational framework as a basis for the sound management of chemicals – no testing
- Covers all hazardous chemical substances, dilute solutions, and mixtures.
- It consists of **harmonized** and standardized elements which are specified and assigned.
- It permits self-classification
- Structured so that appropriate components for classification and communication, which address the target audiences, can be selected (Building Blocks).

The GHS Harmonized Elements (Building Blocks)

- **Classification Criteria**

-  Physical Hazards
-  Health Hazards
-  Environmental Hazards
-  Mixtures

- **Hazard Communication**

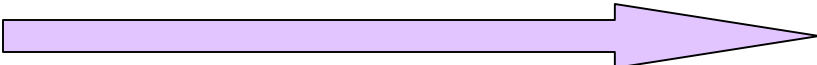
-  Labels
 - Symbols/pictograms
 - Signal Words
 - Hazard Statements (e.g., H200)
 - [Precautionary information (e.g., P201)]
 - Product identifier/ingredient disclosure
-  MSDS / Safety Data Sheets
-  Risk-based labeling for chronics in consumer uses

OSHA NPRM GHS – Physical Hazards (Building Blocks)

Hazard Class

Hazard Category

	Unstable Explosives	Div 1.1	Div 1.2	Div 1.3	Div 1.4	Div 1.5	Div 1.6
Explosives							
Flammable Gases	1	2					
Flammable Aerosols	1	2					
Oxidising Gases	1						
Pressurized Gases							
Compressed Gases	1						
Liquefied Gases	1						
Refrigerated Liquefied Gases	1						
Dissolved Gases	1						
Flammable Liquids	1	2	3	4			
Flammable Solids	1	2					
Self-reactive Substances							
Type A	1						
Type B	1						
Type C	1	2					
Type D	1	2	3				
Type E	1	2	3				
Type F	1	2	3				
Type G	1						
Organic Peroxides							
Type A	1						
Type B	1						
Type C	1	2					
Type D	1	2	3				
Type E	1	2	3				
Type F	1	2	3				
Type G	1						
Corrosive to Metals	1						

High Hazard  Low Hazard

OSHA NPRM GHS – Health Hazards (Building Blocks)

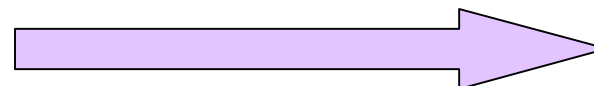
Hazard Class

Hazard Category

Acute Toxicity, Oral
 Acute Toxicity, Dermal
 Acute Toxicity, Inhalation
 Aspiration hazard
 Skin Corrosion/Irritation
 Eye Corrosion /Irritation
 Respiratory Sensitisation
 Skin Sensitisation
 Germ Cell Mutagenicity
 Carcinogenicity
 Reproductive Toxicity - Fertility
 Reproductive Toxicity - Development
 SpecTargetOrganTox – Single Dose
 SpecTargetOrganTox – Repeat Dose

1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2			
1 (Corrosion)			Irritation	
1A	1B	1C	2	3
1	2(A)	2(B)		
1	(1A)	(1B)		
1	(1A)	(1B)		
1A	1B	2		
1A	1B	2		
1A	1B	2	Lactation	
1A	1B	2		
1	2	3		
1	2			

High Hazard



Low Hazard

OSHA NPRM GHS – Environmental Hazard (Building Blocks)

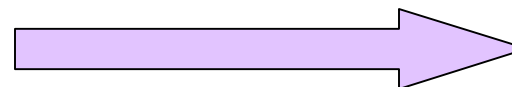
Hazard Class

Acute Aquatic Toxicity
Chronic Aquatic Toxicity
Hazardous To The Ozone Layer

Hazard Category

1	2	3	
1	2	3	4
1			

High Hazard



Low Hazard

Hazard Communication: Labels

Labels and other forms of warning

OSHA GHS NPRM Labels on Shipped Containers

OSHA HCS (performance-oriented)



OSHA GHS NPRM (specified)

- containers of hazardous chemicals
- Identity of hazardous chemical(s)
- Appropriate hazard warnings
- Name/address of chemical manufacturer, importer, or other responsible party.
- (3 month updating - stayed)

- containers of classified hazardous chemicals
 - Product identifier
 - Signal word
 - Hazard statement(s)
 - Pictogram(s)
 - Precautionary statement(s)
 - Name, address, telephone number of responsible party
 - In some cases,
 - Unclassified hazards
 - × *percent of the mixture consists of ingredient(s) of unknown toxicity*
 - Supplemental information

Specified

Key GHS Label Elements

Product identifier/ingredient disclosure

Supplier identification

Symbols/Hazard pictograms*

Signal words*

Hazard statements*

Precautionary information{*}

*Standardized

TRANSPORT "PICTOGRAMS"



- Flammable Liquid
- Flammable Gas
- Flammable Aerosol



- Flammable solid
- Self-Reactive Substances



- Pyrophorics (Spontaneously Combustible)
- Self-Heating Substances



- Substances, which in contact with water, Emit flammable gases (Dangerous When Wet)



- Oxidizing Gases
- Oxidizing Liquids
- Oxidizing Solids



- Explosive Divisions 1.1, 1.2, 1.3
- Self-Reactives
- Organic Peroxides



- Explosive Division 1.4



- Explosive Division 1.5



- Explosive Division 1.6



- Compressed Gases



- Organic Peroxides



- Acute Toxicity (Poison): Oral, Dermal, Inhalation



- Corrosive












- Marine Pollutant



- New (GHS) Marine Pollutant

GHS Pictograms & Hazard Classes

<p><u>Flame over circle</u></p>  <ul style="list-style-type: none"> • Oxidizers 	<p><u>Flame</u></p>  <ul style="list-style-type: none"> • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self Reactives • Organic Peroxides 	<p><u>Exploding bomb</u></p>  <ul style="list-style-type: none"> • Explosives • Self Reactives • Organic Peroxides
<p><u>Skull and crossbones</u></p>  <ul style="list-style-type: none"> • Acute toxicity (severe) 	<p><u>Corrosion</u></p>  <ul style="list-style-type: none"> • Corrosives 	<p><u>Gas cylinder</u></p>  <ul style="list-style-type: none"> • Gases under pressure
<p><u>Health Hazard</u></p>  <ul style="list-style-type: none"> • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity 	<p><u>Environment</u></p>  <ul style="list-style-type: none"> • Aquatic Toxicity 	<p><u>Exclamation mark</u></p>  <ul style="list-style-type: none"> • Irritant • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic effects • Respiratory Tract Irritation • Hazardous to Ozone Layer

GHS Signal Words

Signal Words Definition:

word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label.

- **2 Signal words used in the GHS to emphasize hazard and distinguish levels of hazard :**
 - **“Danger”** (more severe hazards);
 - **“Warning”** (less severe hazards).
- **Not all GHS hazards have signal words assigned**

GHS Hazard Statements

Definition:

Phrase assigned to a hazard class and category that describes the nature of the hazards of a hazardous product, including, where appropriate, the degree of hazard.

- A single harmonized hazard statement for each level of hazard within each hazard class
 - Example: Flammable liquids

Category 1	Extremely flammable liquid and vapor	H224
Category 2	Highly flammable liquid and vapor	H225
Category 3	Flammable liquid and vapor	H226
Category 4	Combustible liquid	H227

- Example: Acute oral toxicity

Category 1, 2	Fatal if swallowed	H300
Category 3	Toxic if swallowed	H301
Category 4	Harmful if swallowed	H302
Category 5	May be harmful if swallowed	H303

GHS Precautionary Information

5 types of precautionary statements:

1. General

Example: *Read label before use* (P103)

2. Prevention

Example: *Wear face protection* (P280)

3. Response (in case of spillage/exposure, first aid, emergency response)

Example: *Get immediate medical advice* (P315)

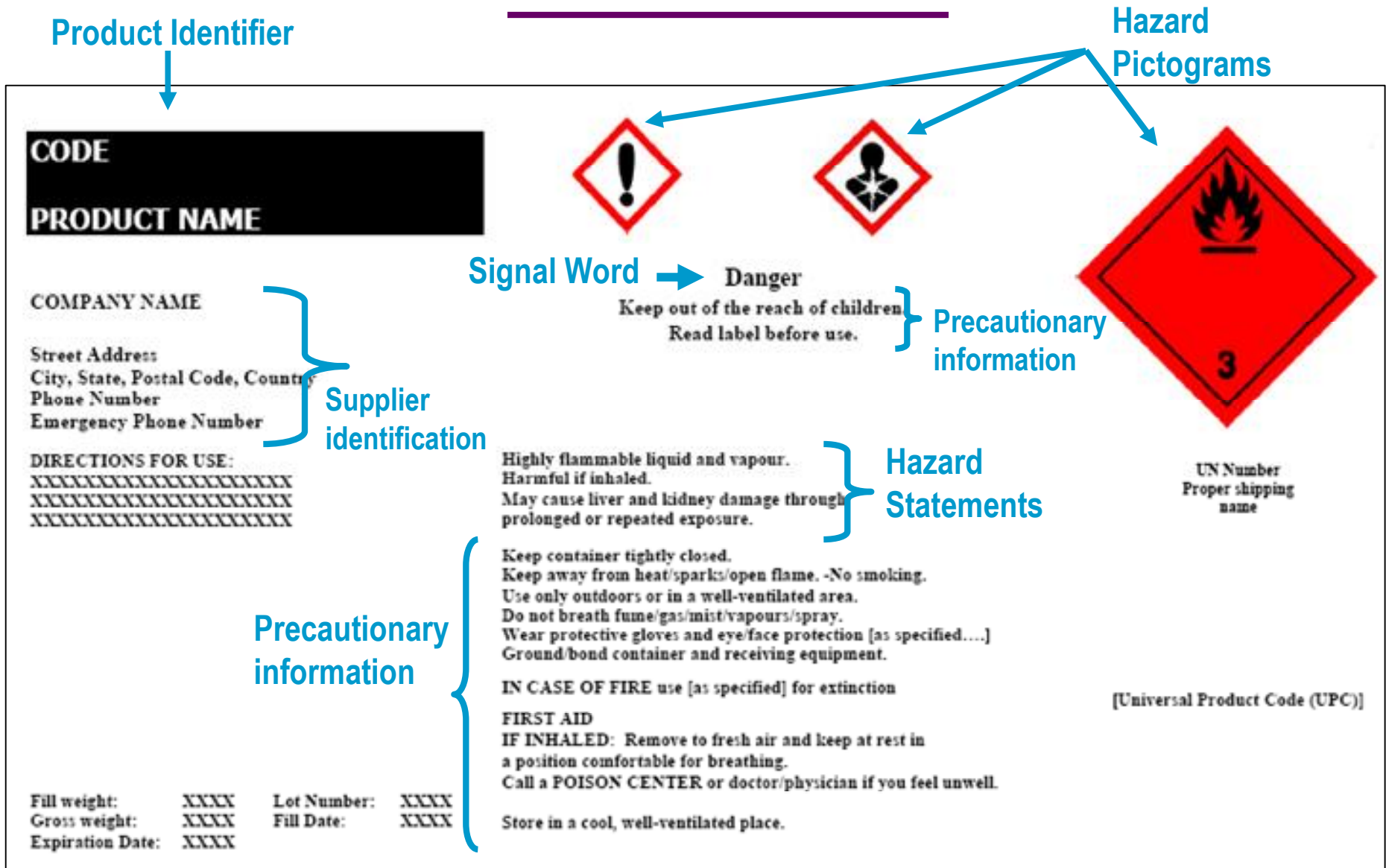
4. Storage

Example: *Keep container tightly closed* (P233)

5. Disposal

Example: *Dispose of contents/container to... .. in accordance with local/regional/national/international regulations* (P501)

GHS Label Elements



Example: GHS Container Label



ToxiFlam (Contains: XYZ)



Danger! Toxic if swallowed. Flammable liquid and vapor

Keep container tightly closed. Keep away from ignition sources such as heat/sparks/open flame— No smoking. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Wear protective gloves and eye/face protection. Ground/Bond container and receiving equipment. Use explosion-proof electrical/ventilating/ lighting/equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Store in cool/well-ventilated place. Store locked up. Dispose of contents/container to in accordance with local/regional/national/international regulation.

FIRST AID

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

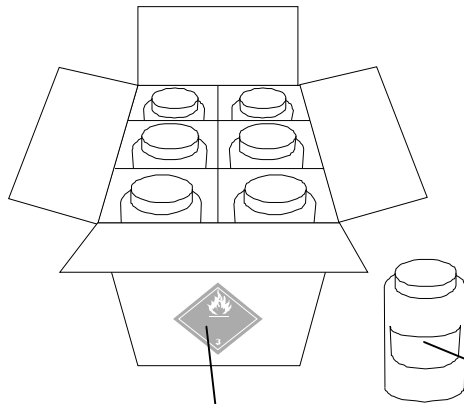
IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

In case of fire, use water fog, dry chemical, CO₂, or “alcohol” foam.

Read Safety Data Sheet Before Use

My Company, MyStreet, MyTown, NJ 00000 Tel: 444.999.9999

Label Configuration For a Combination Package



The transport label would be shown on the outer packaging

The GHS label would be on the inner package

A diagram of a single inner container with a GHS label. A line points from this label to the text 'The GHS label would be on the inner package'.

PAINT (METHYLOME)

UN1263
CAS# XXXX-XX-X

DANGER!



Causes organ damage (liver, kidneys) through prolonged or repeated exposure to skin.

Highly flammable liquid and vapour.

Keep away from heat and ignition sources.

Keep away from food and drink.

Wash hands thoroughly after use and before eating.

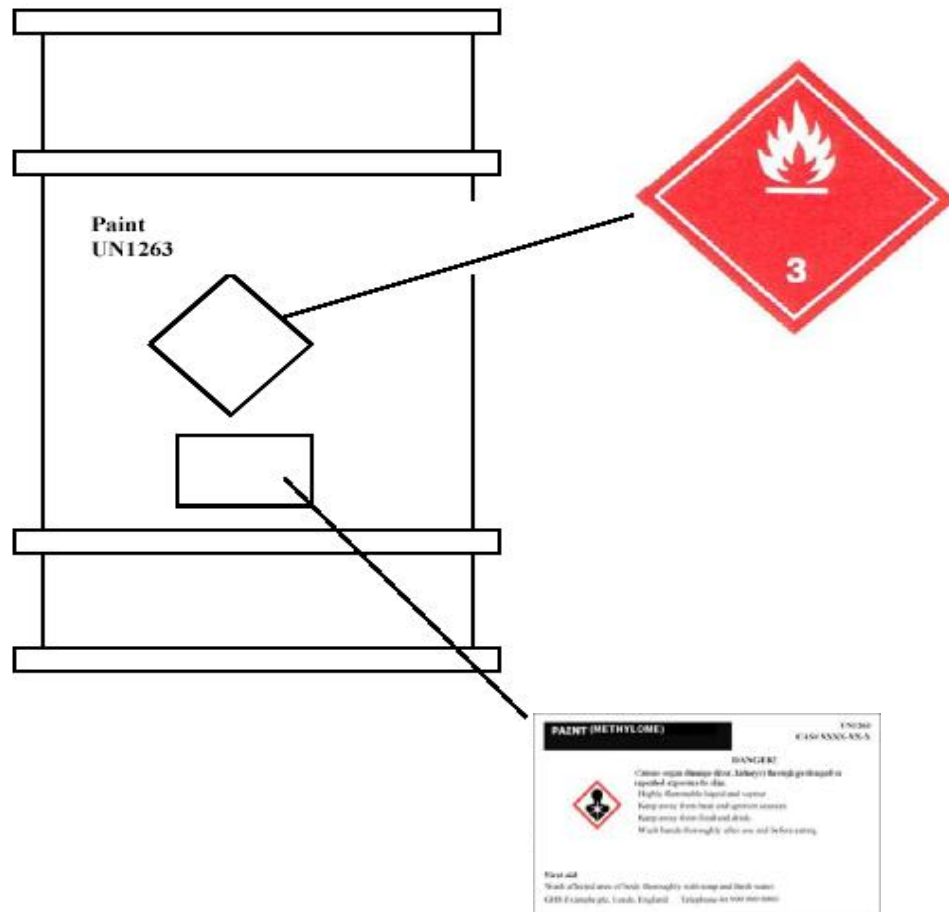


First aid

Wash affected area of body thoroughly with soap and fresh water.

GHS Example plc, Leeds, England. Telephone 44 999 999 9999

Label Configuration For a Single Package

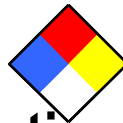


OSHA GHS NPRM Labels - § (f) workplace labeling

- Maintains the approach allowing employers to use workplace-specific labeling systems as long as they provide the required information
- Such workplace label systems will have to be updated to make sure the information is consistent with the new classifications

HMIS/NFPA Numerical Ratings

Currently, the HMIS/NFPA and GHS hazard criteria are different.



HMIS/NFPA Hazard Ratings

- 0 = Minimal Hazard
- 1 = Slight Hazard
- 2 = Moderate Hazard
- 3 = Serious Hazard
- 4 = Severe Hazard



GHS Hazard Categories

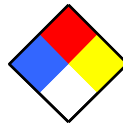


- Cat. 1 ~ 'Severe Hazard'
- Cat. 2 ~ 'Serious Hazard'
- Cat. 3 ~ 'Moderate Hazard'
- Cat. 4 ~ 'Slight Hazard'
- Cat. 5 ~ 'Minimal Hazard'



HMIS/NFPA Numerical Ratings

HMIS/NFPA should arrange NPRM hazard criteria to fit the order of the HMIS/NFPA ratings



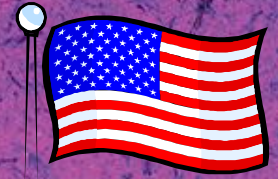
HMIS/NFPA Hazard Ratings

GHS Hazard Categories/Criteria

0 = Minimal Hazard	←	Cat. 5 GHS Hazard Criteria
1 = Slight Hazard	←	Cat. 4 GHS Hazard Criteria
2 = Moderate Hazard	←	Cat. 3 GHS Hazard Criteria
3 = Serious Hazard	←	Cat. 2 GHS Hazard Criteria
4 = Severe Hazard	←	Cat. 1 GHS Hazard Criteria

Hazard Communication: SDSs

OSHA NPRM SDS Format



Use the 16 Section headings as follows:

1. Identification
- 2. *Hazard(s) Identification***
3. Composition/information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage
8. Exposure controls/personal protection (PELs)
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
- 12. *Ecological information***
- 13. *Disposal considerations***
- 14. *Transport information***
- 15. *Regulatory information***
16. Other information

A new Appendix D, Safety Data Sheets, provides the details of what is to be included in each section

SDS Section 2: ToxiFlam

2. HAZARD(S) IDENTIFICATION

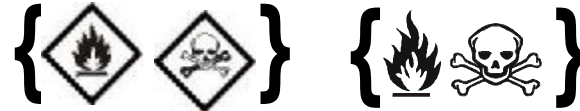
(a) **Classification:** Flammable liquid, Category 3
Acute Toxicity, Category 3

(b) **Labeling:**

Signal word: Danger

Hazard statement(s): Flammable liquid and vapor.
Toxic if swallowed

Symbol(s): Flame, Skull & crossbones



Precautionary statements:

Keep container tightly closed. Keep away from ignition sources such as heat/sparks/open flame— No smoking. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Wear protective gloves and eye/face protection. Ground/Bond container and receiving equipment. Use explosion-proof electrical/ventilating/ lighting/equipment. Take precautionary measures against static discharge. Use only non-sparking tools. Store in cool/well-ventilated place. Store locked up. Dispose of contents/container to in accordance with local/regional/national/international regulation. In case of fire, use water fog, dry chemical, CO₂, or “alcohol” foam.

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

IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

(c) **Unclassified Hazards:** None

OSHA GHS NPRM SDS

Table D.1--Minimum Information for an SDS

1. Identification	(a) Product identifier used on the label; (b) Other means of identification; (c) Recommended use of the chemical and restrictions on use; (d) Name, address, and telephone number of the manufacturer, importer, or other responsible party; (e) Emergency phone number.
2. Hazard(s) identification	(a) Classification of the chemical in accordance with paragraph (d) of this section; (b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of this section. (Hazard symbols may be provided as graphical reproductions or the name of the symbol, e.g., flame, skull and crossbones); (c) Unclassified hazards (e.g., combustible dust or dust explosion hazard); (d) Where an ingredient with unknown acute toxicity is used in a mixture at a concentration \geq 1%, a statement that x percent of the mixture consists of ingredient(s) of unknown toxicity is required.
3. Composition/information on ingredients	Except as provided for in paragraph (i) of this section on trade secrets: <i>For Substances</i> (a) Chemical name; (b) Common name and synonyms; (c) CAS number and other unique identifiers; (d) Impurities and stabilizing additives which are themselves classified and which contribute to the classification of the substance. <i>For Mixtures</i> The chemical name and concentration or concentration ranges of all ingredients which are classified as health hazards in accordance with paragraph (d) of this section. For All Chemicals Where a Trade Secret is Claimed Where a trade secret is claimed in accordance with paragraph (i) of this section, a statement that the specific chemical identity and/or percentage of composition has been withheld as a trade secret is required.
4. First-aid measures	(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.
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). (c) Special protective equipment and precautions for fire-fighters.
6. Accidental release measures	(a) Personal precautions, protective equipment, and emergency procedures. (b) Methods and materials for containment and cleaning up.
7. Handling and storage	(a) Precautions for safe handling. (b) Conditions for safe storage, including any incompatibilities.
8. Exposure controls/personal protection	(a) OSHA permissible exposure limit (PEL) and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet. (b) Appropriate engineering controls. (c) Individual protection measures, such personal protective equipment.

OSHA GHS NPRM SDS

9. Physical and chemical properties	<ul style="list-style-type: none"> (a) Appearance (physical state, color, etc.); (b) Odor; (c) Odor threshold; (d) pH; (e) Melting point/freezing point; (f) Initial boiling point and boiling range; (g) Flash point; (h) Evaporation rate; (i) Flammability (solid, gas); (j) Upper/lower flammability or explosive limits; (k) Vapor pressure; (l) Vapor density; (m) Relative density; (n) Solubility(ies); (o) Partition coefficient: n-octanol/water; (p) Auto-ignition temperature; (q) Decomposition temperature; (r) Viscosity.
10. Stability and reactivity	<ul style="list-style-type: none"> (a) Reactivity; (b) Chemical stability; (c) Possibility of hazardous reactions; (d) Conditions to avoid (e.g., static discharge, shock, or vibration); (e) Incompatible materials; (f) Hazardous decomposition products.
11. Toxicological information	<p>Description of the various toxicological (health) effects and the available data used to identify those effects, including:</p> <ul style="list-style-type: none"> (a) information on the likely routes of exposure (inhalation, ingestion, skin and eye contact); (b) Symptoms related to the physical, chemical and toxicological characteristics; (c) Delayed and immediate effects and (also chronic effects from short and long term exposure); (d) Numerical measures of toxicity (such as acute toxicity estimates).
12. Ecological information (Non-mandatory).	<ul style="list-style-type: none"> (a) Ecotoxicity (aquatic and terrestrial, where available); (b) Persistence and degradability; (c) Bioaccumulative potential; (d) Mobility in soil; (e) Other adverse effects (such as hazardous to the ozone layer).
13. Disposal considerations (Non-mandatory).	<p>Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.</p>
14. Transport information (Non-mandatory).	<ul style="list-style-type: none"> (a) UN number; (b) UN proper shipping name; (c) Transport hazard class(es); (d) Packing group, if applicable; (e) Environmental hazards (e.g., Marine pollutant (Yes/No)); (f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code); (g) Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises.
15. Regulatory information (Non-mandatory)	<p>Safety, health and environmental (regulations specific for the product in question.</p>
16. Other information including date of last change to it.	<p>The date of preparation of the SDS or the preparation or last revision.</p>

MATERIAL SAFETY DATA SHEET

SECTION 1	Identification
------------------	-----------------------

PRODUCT

Product name: Extra Special Chemical Mixture
Product description: Hydrocarbon solvents and epoxy resin
Product code: 123-SKU-987
Intended use: Adhesive for all kind of materials, except metals.

COMPANY IDENTIFICATION: ChemicalCompany Ltd, UK
 Southwarkbridge1
 London, SE SS179JB

Product Technical Information: +44 1715.64.88.99
Product MSDS Information: +44 1715.99.99.88

EMERGENCY TELEPHONE NUMBER:

24-Hour Transportation Emergency: +44 1715.00.00.00
24-Hour Health Emergency: +44 1715.11.11.11

SECTION 2	Hazard(s) identification
------------------	---------------------------------

Classification: Flammable liquid, Category 2
 Eye irritation, Category 2A
 Hazardous to the aquatic environment; Acute Category 3

Labeling :

Symbol: Flame, Exclamation mark
Signal word: Danger



Hazard statements: Highly flammable liquid and vapour
 Causes severe eye irritation
 Harmful to aquatic life

Precautionary statements: Keep away from heat, spark or flame – No Smoking.
 Wear Safety glasses.
 Wear impervious gloves.
 Do not breathe solvent fumes.
 Use only in well ventilated areas

SECTION 3	Composition/information on ingredients
------------------	---

Reportable Hazardous Substances

Chemical Identity	CAS#	Concentration, %Wt
Solvent A	99999-99-9	70-80
Epoxy resin B	888-88-8	< 0.1
Binder C	7777-77-7	25

Hazard Symbol	Personal Protective Equipment	Transport Symbol
		

Issuing Date 10-Aug-2006

Revision Date

Revision Number 0

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product Name UK Therma Solve NF
 Product Code(s) WPS-NCH-2006926
 UN-No UN1760
 Recommended Use No information available

Contact Manufacturer
 The Wercs, Ltd.
 23 British American Blvd.
 Latham, NY 12110
 Telephone: 800-572-6501
 Fax: 518-640-9299
 Email: mail@thewercs.com

Emergency Telephone Number Chemtrec 1-800-424-9300

2. HAZARDS IDENTIFICATION

GHS Precautionary Statements 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 advice/attention. Immediately call a POISON CENTER or doctor/physician if you feel unwell.




Signal Word: Danger

Skin Corrosion/irritation
 Category 1
 Subcategory 1A



Causes severe skin burns and eye damage

Serious Eye Damage/Eye Irritation
 Category 1



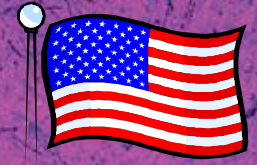
Signal Word: Danger

Skin Corrosion/irritation
Category 1
Subcategory 1A

OSHA's GHS NPRM – 9/30/09 Fed Reg

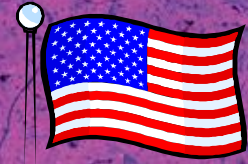
- The major change is the switch from performance-oriented requirements to specified requirements.
- OSHA sought to maintain/enhance the protection provided by the current rule
 - scope and application are basically unchanged, maintaining practical accommodations made by OSHA
 - Written hazard communication program requirements, worker training, and trade secret provisions are all largely unchanged from the existing rule
- The NPRM maintains consistency with the GHS as negotiated/adopted – GHS Rev3
 - OSHA is changing/revising definitions
 - Generally, aligning labels/SDSs requirements with GHS
 - Updating training provisions
 - Maintain consistency with major trading partners' GHS implementation, where appropriate

Organization of the OSHA NPRM



- Sept 30, 2009 Proposed Regulatory Text
 - (a) Purpose
 - (b) Scope and Application
 - (c) Definitions
 - (d) Hazard Classification
 - (e) Written Hazard Communication Program
 - (f) Labels and Other Forms of Warning
 - (g) Safety Data Sheets
 - (h) Employee Information and Training
 - (i) Trade Secrets
 - (j) Effective Dates

OSHA GHS NPRM Appendixes



Appendix A, Health Hazard Criteria (Mandatory) (NEW)

Appendix B, Physical Hazard Criteria (Mandatory) (NEW)

Appendix C, Allocation of Label Elements (Mandatory)
(NEW)

Appendix D, Safety Data Sheets (Mandatory) (NEW)

Appendix E, Definition of “Trade Secret” (Mandatory)

Appendix F, Guidance for Hazard Classifications re:
Carcinogenicity (Non-Mandatory) (NEW)

OSHA Health Standards

- Substance-specific standards (benzene, MC, formaldehyde, etc.)
 - generally pre-date the current HCS
 - do not have a comprehensive approach to hazard communication
- The proposal includes references to the HCS in each of these standards to ensure they have all the protections of the rule
- In addition, OSHA has updated the provisions regarding what is to be communicated to workers to ensure the health effects are consistent with the GHS criteria
 - Labels/signage
 - Table XV-1 Proposed Regulated Area Signs
 - Hazards
 - Table XV-2 Health Effects determined for the Substance Specific Standards

OSHA Safety Standards

- OSHA updating some safety standards to be consistent with the revised HCS
 - Approaches varied dependent on the provisions of the standard being considered
- Integration of the physical hazards criteria would:
 - Incorporate GHS definitions of flammable liquid/gas into PSM and health hazard into Hazardous Waste Operations and Emergency Response (HAZWOPER);
 - Change flammable/combustible liquids to conform in categories, terminology, FP and BP to the GHS
 - Table XV -3 Flammable Liquid definitions
 - Incorporate definition of flammable aerosols into the Flammable and Combustible Liquids Standard, 1910.106
- Sought to minimize impact on scope or substantive provisions of the standards that were updated

OSHA GHS NPRM

Flammable and Combustible Liquid Classification

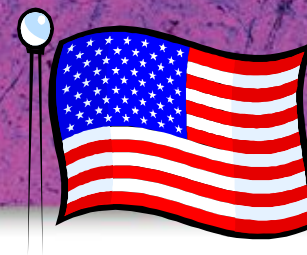
Table XV -3 Flammable Liquid Definitions

GHS/NPRM			Flammable & Combustible Liquid Standard (29 CFR 1910.106)		
Category	Flashpoint (°C)	Boiling Point (°C)	Class	Flashpoint (°C)	Boiling Point (°C)
Flammable 1	< 23 (73.4°F)	≤ 35 (95°F)	Flammable Class 1A	< 22.8 (73.04°F)	< 37.8 (100.04°F)
Flammable 2	< 23 (73.4°F)	> 35 (95°F)	Flammable Class 1B	< 22.8 (73.04°F)	≥ 37.8 (100.04°F)
Flammable 3	≥ 23 (73.4°F) and ≤ 60 (140°F)		Flammable Class 1C	≥ 22.8 (73.04°F) and < 37.8 (100.04°F)	
			Combustible Class II*	≥ 37.8 (100.04°F) and < 60 (140°F)	
Flammable 4	> 60 (140°F) and ≤ 93 (199.4°F)		Combustible Class IIIA	≥ 60 (140°F) and < 93.3 * (199.94°F)	
None			Combustible Class IIIB	≥ 93.3 ** (199.94°F)	

GHS Flammable Liquid
Hazard Statements

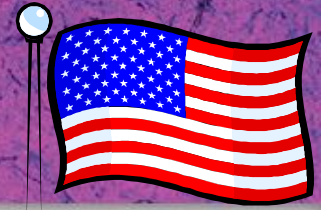
GHS Flammable Liquid Category 1	Extremely flammable liquid and vapor
GHS Flammable Liquid Category 2	Highly flammable liquid and vapor
GHS Flammable Liquid Category 3	Flammable liquid and vapor
GHS Flammable Liquid Category 4	Combustible liquid

GHS NPRM (j) Effective Dates



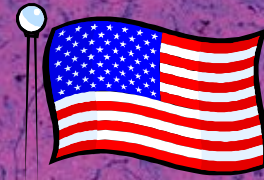
- OSHA is proposing:
 - Employees be trained within **two years** of the completion of the final rule.
 - Details of the hazard communication program
 - Explanation of the labels on shipped containers and the workplace labeling system used by the employer
 - SDS
 - » the order of information and
 - » how employees can obtain & use the appropriate hazard information.
 - All other provisions to be in effect in **three years** after completion.
- During the **3-year transition** period after the final rule is promulgated, either the **current rule** or the **new final rule** can be followed
- Final rule is estimated to take 18 months from 9/30/09 – ? (3/30/2011)

GHS NPRM USA OSHA Implementation





- Next steps
 - Comment period until December 29, 2009
 - Public hearings:
 - March 2-5, 2010, in Washington, DC
 - March 31, 2010, in Pittsburgh, PA
 - Post-hearing comment period – 60 days from 3/31/10
 - Analyze all information received
 - Administrative review within OSHA, DOL, OMB
 - Publish Final GHS Standard in Federal Register
 - Typically ~18 months
- Then the compliance/transition period begins

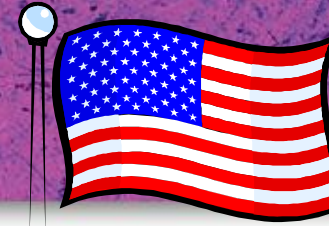
USA GHS Implementation – DOT



U.S. Department
of Transportation
Pipeline and
Hazardous Materials
Safety Administration

- Actions to Align Transport with GHS
 - Flammable Aerosols
 - Acute Toxicity
 - Flammable liquids
 - Environmentally hazardous materials
- 49 CFR aligned with 14th edition UN model regulations and international modal regulations
 - Revision of the Organic Peroxide label and placard.
 - classification criteria for Class 3 PG III flammable liquids.
 - classification criteria and packing groups for Division 6.1
 - mandatory on 1/1/2008
 - Transition period: Class 3/Division 6.1 classification criteria and packing group assignments in effect on 12/31/2006 can continue until 1/1/2012
 - Materials listed by name in Orange Book/HMR 172.101 have not been reviewed against new GHS criteria
- Environmentally hazardous substances: required 1/1/2010
 - Maintain current marine pollutant criteria/list; Permit use of GHS Aquatic Toxicity criteria adopted by the IMDG Code (Acute Cat.1, Chronic Cat. 1 & 2)
 - Adopt new marking for marine pollutants consistent with the marking adopted within the IMDG Code  

USA GHS Implementation



- EPA

- Impacts Pesticides – including sanitizers, disinfectants, and cleaners
- Federal Register notice Aug. 25, 2004
 - White paper
 - Situational analysis (side-by-side comparison)
- Stakeholder consultation ongoing, pursuing voluntary pilot activities, outreach
- Scope of hazards to be covered not finally determined
 - Not expected to include chronic hazards
 - White paper did not include chronic health classes/categories
 - White paper did not include chronic aquatic classes/categories
- Ozone Depleting Substances – in GHS 2009 3rd Ed.

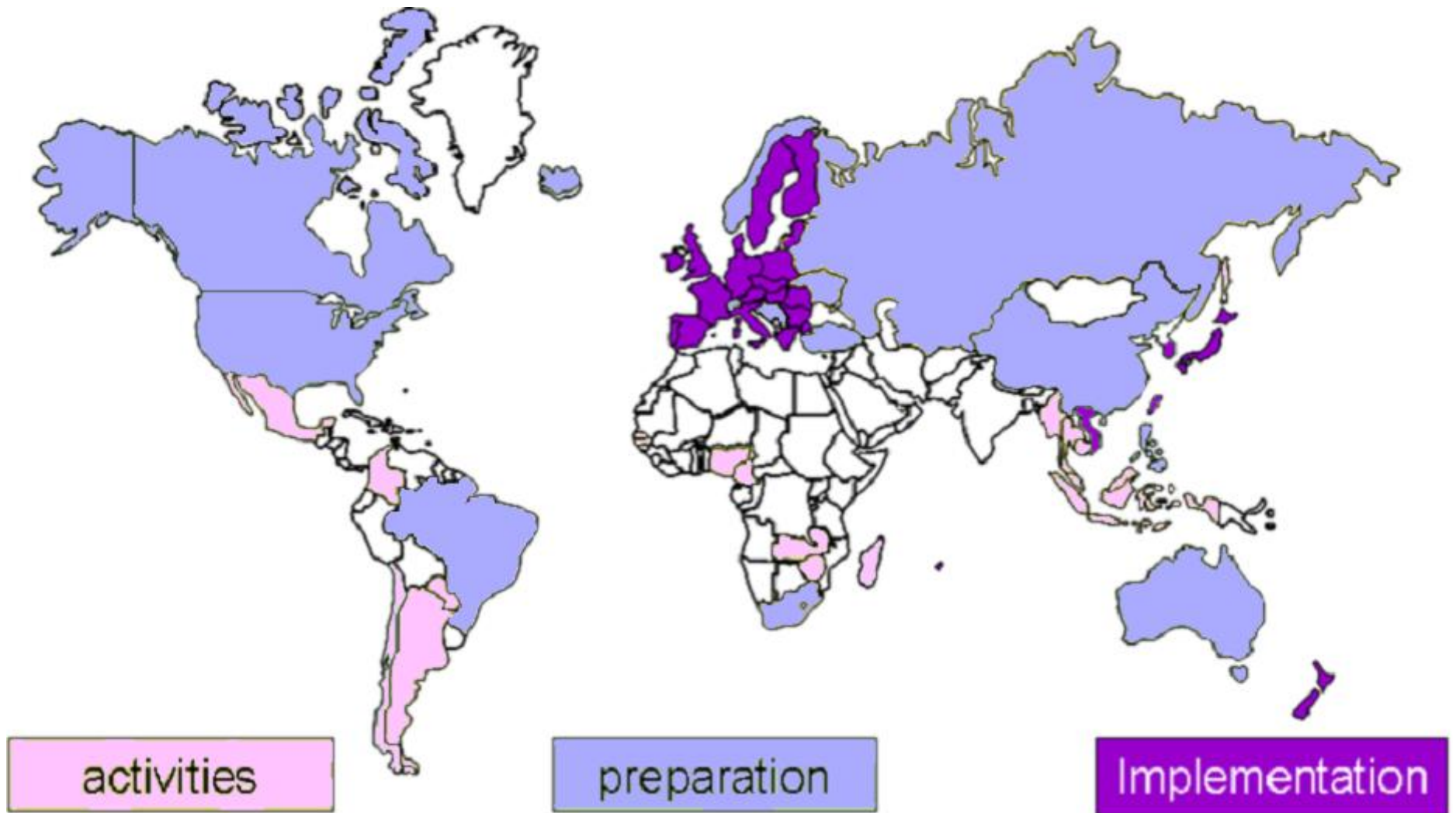


- Consumer Product Safety Commission (CPSC)

- Implementation of the GHS for FHSA is currently **on hold**
- Situational analysis nearly complete.
- Scope of hazards to be covered not finally determined
 - Not expected to include environmental hazard classes
- Implementation likely to involve both regulatory & statutory amendment
- Formal Commission decision required to implement
- Commission intends to follow the **risk based labeling** option specified in Annex 5 of the GHS.



Global GHS Implementation – July 2010



NPRM References

OSHA GHS NPRM Federal Register Notice 74:50280-50549 (2009, September 30).
<http://edocket.access.gpo.gov/2009/pdf/E9-22483.pdf>

Side-by-side comparison of the current HCS to the Proposed Rule
www.osha.gov/dsg/hazcom/hcs_side_by_side_draft_100109.pdf

Proposed Appendix A: Health Hazard Criteria (Mandatory)
www.osha.gov/dsg/hazcom/appendix_a.pdf

Proposed Appendix B: Physical Hazard Criteria (Mandatory)
www.osha.gov/dsg/hazcom/appendix_b.pdf

Proposed Appendix C: Allocation of Label Elements (Mandatory)
www.osha.gov/dsg/hazcom/appendix_c.pdf

Proposed Appendix D: Safety Data Sheets (Mandatory)
www.osha.gov/dsg/hazcom/appendix_d.pdf

Proposed Appendix E (Existing Appendix D): Definition of Trade Secret (Mandatory)
www.osha.gov/dsg/hazcom/appendix_e.pdf

Proposed Appendix F: Guidance for Hazard Classifications Regarding Carcinogenicity
www.osha.gov/dsg/hazcom/appendix_f.pdf

Docket: www.regulations.gov/search/Regs/home.html#docketDetail?R=OSHA-H022K-2006-0062

GHS Information

UN GHS Purple Book

www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html

UN GHS Implementation Status of Countries/Regions

www.unece.org/trans/danger/publi/ghs/implementation_e.html

GHS Guide

www.osha.gov/dsg/hazcom/ghsguideoct05.pdf

USA

DOT: <http://hazmat.dot.gov/regs/intl/globharm.htm>

EPA: www.epa.gov/oppfead1/international/globalharmon.htm

OSHA: www.osha.gov/dsg/hazcom/global.html

www.osha.gov/dsg/hazcom/index.html

CPSC: www.cpsc.gov/phth/GHSpolicy.html

Canada

www.hc-sc.gc.ca/ahc-asc/intactiv/ghs-sgh/index_e.html

March 2010 *Draft Discussion Document Rev1: Implementing the GHS in WHMIS*

Thank You

Questions?

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