

# **GHS**

## **Implementation status and issues**

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**3E Company/Ariel Research Corporation Europe**

**August 2007**

- Click Q&A button to submit your questions. Questions will be answered at the end of the presentation.
- The web seminar will be recorded. The audio and visual presentation link will be sent to you after the web seminar.

**Jytte Syska:**

Vice President, International and Authoring Operations,  
3E Company

- Leads the company's international and authoring operations from Copenhagen, Denmark
- More than 20 years of experience as an EH&S Regulatory expert
- Extensive experience in worldwide Safety Data Sheet Authoring, Labeling, Product Registration and New Chemical Notification requirements
- Master of Science, Engineering, from the Technical University of Denmark

## An overview of GHS

- Classification of substances and mixtures
- Hazard Communication requirements
- Implementation status
- Issues relevant to employee chemical safety and training

- ➔ Globally Harmonized System of Classification and Labelling of Chemicals
- ➔ A common and coherent United Nations approach to defining and classifying intrinsic hazards of chemical substances and mixtures, and conveying information about those hazards on labels and Safety Data Sheets (SDS).
- ➔ Criteria for hazard classification and Hazard communication (Labels and SDSs) are harmonized and standardized.
- ➔ One system for workers, consumers, transport workers, and emergency responders.
- ➔ Provides the underlying infrastructure for establishment of national, comprehensive chemical safety programs.

- GHS is not legally binding but is to be implemented by countries/regions
- Building block approach: countries and systems take what is required, choosing how to match their current level of protection
  - Different target audiences may have different blocks
- GHS will increase harmonization but we will not see complete harmonization (harmonisation)
- The GHS/UN document is a living document and is updated every 2 years
  - First edition was published in 2003
  - First revision published in 2005
  - Second revision in July 2007

- Guidance on the interpretation of the building block approach
- Revision of Annex 3 (replacement)
- Additional guidance on respiratory and skin sensitization;
- Guidance on how to consider important factors in determining the carcinogenic potential of chemicals;
- Classification and labelling provisions (e.g. for unstable explosives and toxic gas mixtures);
- A new subsection to be added under section 14 of the Safety Data Sheet, concerning cargoes to be carried in bulk according to Annex II of the MARPOL Convention and the IBC Code.

## Classification:

- Hazard classes
- Hazard categories

## Example:

- Acute oral toxicity Category 4
- Acute dermal (skin) toxicity Category 3
- Skin irritation/corrosion Category 1C
- Eye irritation/serious eye damage Category 1
- Flammable liquid Category 4

## Label:

- Pictogram/symbol
- Signal word (Danger or Warning)
- Hazard statement
- Precautionary statement




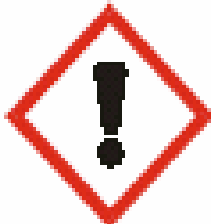
## MSDS:

- Section 2 (Hazard Identification) to provide the GHS classification and the GHS label elements

PHYSICAL HAZARDS	HEALTH HAZARDS	ENVIRONMENTAL HAZARDS
Explosives	Acute toxicity (Oral)	Acute aquatic toxicity
Flammable gases	Acute toxicity (Dermal)	Chronic aquatic toxicity
Flammable aerosols	Acute toxicity (Inhalation: gas)	
Oxidizing gases	Acute toxicity (Inhalation, vapor)	
Gases under pressure	Acute toxicity (Inhalation: dust and mist)	
Flammable liquids	Skin corrosion/irritation	
Flammable solids	Serious eye damage/eye irritation	
Self-reactive substances and mixtures	Respiratory sensitization	
Pyrophoric liquids	Skin sensitization	
Pyrophoric solids	Germ cell mutagenicity	
Self-heating substances and mixtures	Carcinogenicity	
Substances and mixtures which, in contact with water, emit flammable gases	Reproductive toxicity	
Oxidizing liquids	Specific target organ systemic toxicity (Single exposure)	
Oxidizing solids	Specific target organ systemic toxicity (Repeated exposure)	
Organic peroxides	Aspiration hazard	
Corrosive to metals		

Table 3.1.1: Acute toxicity hazard categories and acute toxicity estimates (ATE) values defining the respective categories

Exposure route	Category 1	Category 2	Category 3	Category 4	Category 5
<b>Oral</b> (mg/kg bodyweight) <i>see: Note (a)</i>	5	50	300	2000	5000
<b>Dermal</b> (mg/kg bodyweight) <i>see: Note (a)</i>	50	200	1000	2000	<i>See detailed criteria in Note (f)</i>
<b>Gases</b> (ppmV) <i>see: Note (a) Note (b)</i>	100	500	2500	5000	
<b>Vapours</b> (mg/l) <i>see: Note (a) Note (b) Note (c) Note (d)</i>	0.5	2.0	10	20	
<b>Dusts and Mists</b> (mg/l) <i>see: Note (a) Note (b) Note (e)</i>	0.05	0.5	1.0	5	

ACUTE TOXICITY: ORAL				
Category 1	Category 2	Category 3	Category 4	Category 5
				<i>No pictogram</i>
<b>Danger</b>	<b>Danger</b>	<b>Danger</b>	<b>Warning</b>	<b>Warning</b>
Fatal if swallowed	Fatal if swallowed	Toxic if swallowed	Harmful if swallowed	May be harmful if swallowed

- are assigned a unique alphanumeric code which consists of one letter and three numbers:
- the letter "H" (for "hazard statement");
  - a number designating the type of hazard:
    - "2" for physical hazards;
    - "3" for health hazards;
    - "4" for environmental hazards;
  - two numbers corresponding to the sequential numbering of hazards arising from the intrinsic properties of the substance or mixture, such as explosivity (codes from 200 to 210), flammability (codes from 220 to 230), etc.

<b>Code</b> <b>(1)</b>	<b>Hazard statements for health hazards</b> <b>(2)</b>	<b>Hazard class (GHS Chapter)</b> <b>(3)</b>	<b>Hazard category</b> <b>(4)</b>
H300	Fatal if swallowed	Acute toxicity – oral (Chapter 3.1)	1, 2
H301	Toxic if swallowed	Acute toxicity – oral (Chapter 3.1)	3
H302	Harmful if swallowed	Acute toxicity – oral (Chapter 3.1)	4
H303	May be harmful if swallowed	Acute toxicity – oral (Chapter 3.1)	5

are assigned a unique alphanumeric code which consists of one letter and three numbers as follows:



- a letter "P" (for "precautionary statement")
- one number designating the type of precautionary statement as follows:
  - "1" for general precautionary statements;
  - "2" for prevention precautionary statements;
  - "3" for response precautionary statements;
  - "4" for storage precautionary statements;
  - "5" for disposal precautionary statements;
- two numbers (corresponding to the sequential numbering of precautionary statements)

Code (1)	Prevention precautionary statements (2)	Hazard class (3)	Hazard category (4)	Conditions for use (5)
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.	Acute toxicity – inhalation (Chapter 3.1)	3, 4	Manufacturer/supplier or the competent authority to specify applicable conditions.
		Respiratory sensitization (Chapter 3.4)	1	
		Skin sensitization (Chapter 3.4)	1	
		Specific target organ toxicity – single exposure; respiratory tract irritation (Chapter 3.8)	3	
		Specific target organ toxicity – single exposure; narcosis (Chapter 3.8)	3	
P262	Do not get in eyes, on skin, or on clothing.	Acute toxicity – dermal (Chapter 3.1)	1, 2	

# GHS Pictograms



## A2.17 Acute toxicity (See Chapter 3.1 for details)

Hazard category	Criteria	Hazard communication elements	
1	LD <sub>50</sub> ≤ 5 mg/kg bodyweight (oral) LD <sub>50</sub> ≤ 50 mg/kg bodyweight (skin/dermal) LC <sub>50</sub> ≤ 100 ppm (gas) LC <sub>50</sub> ≤ 0.5 (mg/l) (vapour) LC <sub>50</sub> ≤ 0.05 (mg/l) (dust, mist)	Symbol	
		Signal word	Danger
		Hazard statement	Fatal if swallowed. (oral) Fatal in contact with skin (dermal) Fatal if inhaled (gas, vapour, dust, mist)
2	LD <sub>50</sub> between 5 and less than 50 mg/kg bodyweight (oral) LD <sub>50</sub> between 50 and less than 200 mg/kg bodyweight (skin/dermal) LC <sub>50</sub> between 100 and less than 500 ppm (gas) LC <sub>50</sub> between 0.5 and less than 2.0 (mg/l) (vapour)	Symbol	
		Signal word	Danger
			Fatal if swallowed. (oral)

ACUTE TOXICITY - ORAL (CHAPTER 3.1)			
			Symbol Exclamation mark
Hazard category	Signal word	Hazard statement	<b>!</b>
4	Warning	Harmful if swallowed H302	
Precautionary statements			
Prevention	Response	Storage	Disposal
P264 <b>Wash ... thoroughly after handling.</b> ... Manufacturer/supplier or the competent authority to specify parts of the body to be washed after handling.	P301 + P312 <b>IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.</b>  P330 <b>Rinse mouth.</b>		P501 <b>Dispose of contents/container to...</b> ... in accordance with local/regional/national/international regulations (to be specified).
P270 <b>Do not eat, drink or smoke when using this product.</b>			

- Only the intrinsic hazardous properties of substances and mixtures are considered (hazard not risk)
- Identify relevant hazard data.
- Review those data to estimate hazards. May use expert judgment and weight of evidence.
- Decide on classification and its degree by comparison with agreed hazard classification criteria.
- Self-classification: Evaluators may arrive at different classifications because of interpretation.
- There is no requirement to generate new test data. Test methods must be scientifically sound and properly validated.

## - to Mixture Classification

Use test data for the mixture, when available

**If not ↓**

Use “bridging” principles, if applicable

- ▶ Dilution
- ▶ Batching
- ▶ Concentration of Highly Toxic Mixtures
- ▶ Interpolation within One Toxic Category
- ▶ Substantially Similar Mixtures
- ▶ Aerosols

**If not ↓**

Estimate (calculate) hazard(s) based on the known ingredient information

## Health and Environment

End Point	Calculation Type		
	Simple Threshold	Proportional Equation	Summation Methods
Acute Toxicity		√	
Skin Corrosion/Irritation	√ <sup>1</sup>		√
Serious Eye Damage/Irritation	√ <sup>1</sup>		√
Sensitization	√		
Mutagenicity	√		
Carcinogenicity	√		
Reproductive Toxicity	√		
Target Organ Systemic Toxicity			√
Aspiration			√ <sup>2</sup>
Environmental <ul style="list-style-type: none"> <li>• Acute Additivity Method</li> <li>• Acute Summation Method</li> <li>• Chronic Summation Method</li> </ul>		√	√ √

1. Only if Additivity does not apply
2. In conjunction with the viscosity of the mixture

- ➡ New Zealand
- ➡ Japan
- ➡ Korea
- ➡ EU
- ➡ Australia
  
- ➡ Malaysia – 3E seminar in October 2007
- ➡ US
- ➡ Canada

- ▶ GHS classification criteria implemented by the Hazardous Substances & New Organisms Act in July 2001
- ▶ Classification description based on:
  - ▶ Class number e.g. Class 6 - toxicity
  - ▶ Subclass number e.g. 6.1 – acute toxicity
  - ▶ Hazard category e.g. A –  $LD50 \leq 5\text{mg/kg}$
  - ▶ Combination of the class, subclass and category constitutes a hazard classification - 6.1A
- ▶ NZ classifications have some additions to GHS
  - ▶ Ecotoxicity (class 9) includes soil, terrestrial vertebrate and invertebrate ecotoxicity - based largely on US EPA criteria
  - ▶ some discrepancies with final version for aerosols
- ▶ Hazard classification data on chemicals, mixtures, kept on a database at ERMA New Zealand
  - ▶ 4400 chemicals fully classified against GHS endpoints at present
  - ▶ Further 7600 chemicals partially or not classified

- GHS label (article 57-1) and GHS MSDS (article 57-2) required by the Industrial Safety and Health law as of December 1, 2006
- Applies to listed substances
  - 640 listed for MSDS (specific cut off values)
  - 99 listed for labels
- Advisory list with GHS classifications published by NITE (National Institute of Technology and Evaluation)
- All UN hazard categories are applied in Japan under ISHL
- GHS requirements not yet implemented by other Regulations than ISHL but GHS classification is recommended by the regulatory bodies managing other regulations, e.g PDSCCL and PRTR

- GHS requirements implemented by the Ministry of Labor Industrial Safety and Health Law (ISHL)
- Classification, labels and MSDSs: The Standard for Preparing and Keeping on File the Material Safety Data Sheets, etc. (Ministry of Labor Notice No. 2006-36)
- This new, updated standard must be complied with latest July 1, 2008. Until then classification, labeling and MSDSs can be prepared according to the old standard
- Ministry of Labor (MoL) has classified 310 substances under GHS.
  - The classification is to be used for reference only.
  - The classification is published by the Korea Occupational Safety and Health Agency

**KOSHANET**  
 안전보건정보서비스

SAFETY & HEALTH DATA BASE

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**GHS 검색 및 관점**

☰ > 안전보건 DB > MSDS/GHS > GHS > GHS 관점 및 검색

**GHS 시스템 안내문**

GHS 체계 화학물질 유해 위험성 분류정보 시스템은 전 세계적으로 통일된 화학물질 분류기준을 바탕으로 한 노동부고시 제2006-36호(화학물질의 분류 표시 및 물질안전보건자료에 관한 기준, 2006.12.12)의 기준에 따라 화학물질의 유해·위험성을 분류하여 불합된 형태의 경고표지를 출력할 수 있습니다.

본 시스템에서 제공하는 화학물질의 유해 위험성 분류결과는 인증된 참고자료에 따라 차이가 발생할 수 있습니다. 자세한 문의 사항은 산업안전보건연구원 화학물질안전보건센터 화학물질정보운영팀 (TEL:042-869-0315~0317)으로 연락하시기 바랍니다.

※ 현재 제공되는 데이터(310개 물질) 및 시스템은 시범운영되고 있으며, 추후 예고없이 변경될 수 있습니다.

물질명  
  관용명/동의어  
  CAS NO  
  RTECS NO  
  UN NO  
  EN NO  
  본문

번호	CAS NO	GHS검색및관점(물질명)	GHS 보기	MSDS 보기
1	89-72-5	0-sec 부틸과놀	GHS	MSDS
2	88-72-2	0-나이트로플루엔(나이트로플루엔)	GHS	MSDS
3	95-50-1	0-다이클로로벤젠	GHS	MSDS
4	97-56-3	0-아미노아조톨루엔	GHS	MSDS
5	95-47-6	0-자일렌	GHS	MSDS
6	95-49-8	0-클로로톨루엔	GHS	MSDS
7	95-53-4	0-톨루엔	GHS	MSDS
8	108-03-2	1-나이트로프로페인(1-나이트로프로판)	GHS	MSDS
9	86-68-4	1-나프틸싸이오요소(안두)	GHS	MSDS
10	97-00-7	1-클로로-2, 4-디니트로벤젠	GHS	MSDS
11	71-55-6	1, 1, 1-트리클로로에테인	GHS	MSDS

<http://www.kosha.net/index.jsp>

Requires pass word

The following GHS hazard categories have not been implemented in Korea  
(\*: also not included in the proposed EU implementation):

### Physical hazards

- \*Flammable gas Haz Cat 2
- \*Flammable liquid Haz Cat 4 (flash point > 60C and =<93C)
- Self-reactive materials Type G
- Organic peroxides Type G

### Health hazards

- \*Acute toxic materials Haz Cat 5 (LD50 oral, skin or dermal)
- \*Skin-corrosive or irritating materials Haz Cat 3 (Mild Irritant)
- \*Serious eye-injury causing or irritating materials Haz Cat 2B (mild irritant). 2A (from UN) is called 2
- Carcinogenic materials Haz Cat 2 (suspected)
- Reproductive toxic materials
- Effect on or via lactation
- Aspiration hazards

### Environmental hazards

- \*Aquatic environmental hazard materials Acute Haz Cat 2 and 3. Chronic Haz Cat 3 and 4

- ▶ Not all hazard categories are suggested implemented
- ▶ Some of the existing classification and labelling is suggested kept
- ▶ Reclassification is not required (article 59):
  - ▶ Annex VII: translation table for suppliers of substances and mixtures already evaluated under the current rules for those hazard categories where a simple equivalence exists.
- ▶ Classification and labeling inventory (from entry into force)
- ▶ Substances: classification, labeling and packaging in accordance with Substance Directive (67/548/EEC) until December 1, 2010
- ▶ Mixtures: classification, labeling and packaging in accordance with Preparations Directive (1999/45/EC) until June 1, 2015
  - ▶ But GHS can be applied earlier and in that case only the EU/GHS label is to be used
- ▶ Substances: must be classified in accordance with both EU/GHS and Substance Directive until June 1, 2015
- ▶ Expected into force 2007/2008

The following GHS hazard categories have **not** been suggested implemented in the EU

### Physical hazards

Flammable aerosols Haz Cat 2

Flammable liquid Haz Cat 4 (flash point > 60C and =<93C)

### Health hazards

Acute toxic materials Haz Cat 5 (LD50 oral skin or dermal)

Skin-corrosive or irritating materials Haz Cat 3 (Mild Irritant)

Serious eye-injury causing or irritating materials Haz Cat 2B (mild irritant). 2A (from UN) is called 2

Aspiration hazards Haz Cat 2

### Environmental hazards

Aquatic environmental hazard materials Acute Haz Cat 2 and 3.

- ▶ GHS part of the new draft regulation of Workplace Hazardous Chemicals
- ▶ For hazardous chemicals that meet the GHS classification criteria for the following hazard classes and categories, it is not mandatory to include information or hazard communication elements relating to these hazards on labels of workplace hazardous chemicals.
  - ▶ Acute toxicity - oral - category 5; or
  - ▶ Acute toxicity - dermal - category 5; or
  - ▶ Acute toxicity - inhalation - category 5; or
  - ▶ Acute hazard to the aquatic environment – all categories (1, 2, 3); or
  - ▶ Chronic hazard to the aquatic environment – all categories (1, 2, 3, 4)
  - ▶ Explosives – all divisions
- ▶ Keeps the classification for Combustible liquids (high flash point [ $>93^{\circ}\text{C}$ ]) that cannot otherwise be classified into any GHS hazard class or category

**New Zealand:**

Class 3 - Flammability, Subclass 3.1 - Liquids, Hazard Classification C  
Class 6 - Toxicity, Subclass 6.1 - Acutely toxic, Hazard Classification C  
Class 6 - Toxicity, Subclass 6.4 - Eye irritant, Hazard Classification A  
Class 9 - Ecotoxicity, Subclass 9.2 - Soil, Hazard Classification B  
Class 9 - Ecotoxicity, Subclass 9.3 - Terrestrial vertebrates, Hazard Classification C

**Korea Ministry of Labour:**

Flammable liquids: Hazard category 3  
Acute toxicity (oral): Hazard category 4  
Acute toxicity (dermal): Hazard category 3  
Acute toxicity (inhalation - vapour): Hazard category 3  
Skin corrosion/irritation: Hazard category 2  
Serious eye damage: Hazard category 1  
Target organ systemic toxicity following repeat exposure: Hazard category 1

**3E's UN GHS classification**

Flammable liquids: Hazard category 3  
Acute toxicity (oral): Hazard category 4  
Acute toxicity (dermal): Hazard category 3  
Acute toxicity (inhalation - vapour): Hazard category 3  
Skin corrosion/irritation: Hazard category 2  
Serious eye damage: Hazard category 2A  
Germ cell mutagenicity: Hazard category 2  
Toxic to reproduction: Hazard category 2  
Target organ systemic toxicity following single exposure: Hazard category 1  
Target organ systemic toxicity following repeat exposure: Hazard category 1 (Liver, Kidney)  
Aspiration hazard: Hazard category 2

**Japan NITE:**

Flammable liquids: Hazard category 3  
Acute toxicity (oral): Hazard category 4  
Acute toxicity (dermal): Hazard category 3  
Acute toxicity (inhalation - vapour): Hazard category 3  
Skin corrosion/irritation: Hazard category 2  
Serious eye damage/eye irritation: Hazard category 2A  
Germ cell mutagenicity: Hazard category 2  
Carcinogenicity: Hazard category 2  
Toxic to reproduction: Hazard category 2  
Target organ systemic toxicity following single exposure: Hazard category 1, 2 and 3  
Target organ systemic toxicity following repeat exposure: Hazard category 1  
Aspiration hazard: Hazard category 2

**Current EU classification**

R10, Xn;R20 Flammable. Harmful by inhalation.

**EU/GHS (converted)**

Flammable liquids: Hazard category 3  
Acute Tox. 4 (minimum classification)

Product No.: 123456

2-Propanol (KE-29363) 40%  
Methanol (KE-23193) 1 - 5%  
Formaldehyde (KE-17074) 1%



**Signal Word:** Danger

**Hazard Statement:**

Highly flammable liquid and vapor. Harmful if swallowed. Causes serious eye irritation. Causes skin irritation. May cause allergic or asthmatic symptoms or breathing difficulties if inhaled. May cause allergic skin reaction. May cause cancer. May cause damage to the following organs: Visual organ. Respiratory system. May cause damage to the following organs through prolonged or repeated exposure: Central nervous system. Visual organ. Liver.

**Precautionary Statement(s):**

**Prevention**

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep container tightly closed. Keep away from ignition sources such as heat/sparks/open flame - No smoking. Wear protective gloves and eye/face protection. Avoid breathing gas/mist/vapors/spray. In case of inadequate ventilation wear respiratory protection. Use only outdoors or in a well-ventilated area. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Take precautionary measures against static discharge. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Ground the storage container. Wash hands thoroughly after handling.

**Response**

IF SWALLOWED: Call a doctor if you feel unwell. Rinse mouth. IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms call a doctor.

IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation or rash occurs, seek medical advice/attention. Wash/Decontaminate removed clothing before reuse.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. If eye irritation persists, get medical advice/attention.

Wash hands after handling. IF exposed or concerned: Get medical attention/advice. Get medical attention/advice if you feel unwell.

**Storage**

Store locked up. Store in a well-ventilated place.

**Disposal**

Dispose of the contents and container in accordance with applicable regulations.

**Supplier:**

Ariel Research Corporation  
Company address

**Emergency Telephone:**

1-888-111-2222

**Manufacturer:**

Ariel Research Corporation  
Company address

2-Propanol (KE-29363) 40%  
 Methanol (KE-23193) 1 - 5%  
 Formaldehyde (KE-17074) 1%



**신호어:** 위험

**유해·위험분류:**

고인화성 액체 또는 증기. 삼키면 해로움. 눈에 심한 자극을 일으킴. 피부에 자극을 일으킴. 흡입시 알레르기성 반응, 천식또는 호흡 곤란을 일으킬 수있음. 알레르기성 피부 반응을 일으킬 수 있음. 암을 일으킬 수 있음. 다음 장기에 손상을 일으킬 수 있음: 시각기관, 호흡계. 장기간 또는 반복노출 되면 다음 장기에 손상을 일으킬 수 있음: 중추 신경계, 시각기관, 간.

**예방조치분류:**

**예방**

사용 전 취급 설명서를 확보하십시오. 모든 안전 예방조치 문구를 읽고 이해하기 전에는 취급하지 마시오. 용기를 단단히 밀폐하십시오. 열-스파크·화염과 같은 점화원으로부터 격리하십시오 - 금연. 적절한 보호장갑 및 눈-안면보호구를 착용하십시오. 입자·흡·가스·미스트·증기·스프레이를 흡입하지 마시오. 환기가 잘 되지 않는 곳에서는 (제조사·공급자가 지정하거나, 관련법규에서 지정한) 호흡용 보호구를 착용하십시오. 옥외 또는 환기가 잘 되는 곳에서만 취급하십시오. 이 제품을 사용 시에는 먹거나, 마시거나 흡연하지 마시오. 작업장 밖에는 오염된 의복을 반출하지 마시오. 경전기 방지 조치를 취하십시오. (제조사·공급자 또는 주부 관청에 의해 정해진) 폭발 방지용 전기·환기·조명·장비를 사용하십시오. 스파크 방지용 도구만을 사용하십시오. 용기 및 저장용기를 잘지·결합 시키시오. 취급 후에는 손을 철저히 씻으시오.

**대응**

삼켰을 때 의료기관(의사)의 도움을 받으시오. 입을 씻어내시오. 흡입 시 신선한 공기가 있는 곳으로 옮기고 호흡하기 쉬운 자세로 안정을 취하십시오. 호흡기 증상이 나타나면 의료기관(의사)의 도움을 받으시오. 피부(또는 머리카락) 오염 시 즉시 오염된 모든 의류를 벗고, 피부를 물로 씻으시오/샤워하십시오. 피부자극성 또는 홍반이 나타나면, 의학적인 조언·주의를 구하십시오. 재사용 전에 오염된 의복을 세척하십시오. 눈에 접촉 시 몇 분 간 물로 조심해서 씻으시오/가능하면 콘택트렌즈를 제거하십시오. 자극이 지속되면 의료기관(의사)의 도움을 받으시오. 취급 후에는 손을 씻으시오. 노출 또는 노출 우려가 있는 경우 의학적인 주의·조언을 받으시오. 불편함을 느끼면 의학적인 주의·조언을 받으시오.

**저장**

밀봉하여 저장하십시오. 잘 환기되는 곳에 보관하십시오.

**폐기**

관련법규에 명시된 경우 규정에 따라 내용물·용기를 폐기하십시오.

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 Ariel Research Corporation  
 Company address

**정보제공서비스 또는 긴급연락 전화번호:**  
 1-888-111-2222

- GHS is implemented in some countries (Asia Pacific)
- GHS regulation is drafted in some countries (EU, Australia as the majors)
- National GHS classification and labeling requirements are based on the UN criteria but there are and will be national differences
- The differences may involve differences in the information provided on the label and in the MSDS (hazard and associated label elements: Pictograms, hazard and precautionary statements)

- Training
- WebInsight: lists and national regulation
- MSDGen (authoring software) is GHS ready
  
- Classifications:
  - Identification of relevant data (tox/ecotox/physchem)
  - Review of data
  - Classification of substances and mixtures
  
- Labels:
  - UN/GHS
  - Japan
  - Korea
  - EU/GHS & Australia/GHS based on draft regulation
  
- MSDSs:
  - UN GHS MSDS
  - National compliant MSDSs based on actual GHS implementations and other national requirements
    - Currently offering: Japan, Korea as standard

# Thank you for your attention!