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**Safety Data Sheet****1. Chemical product and company identification****Product name** : Epichlorohydrin-d<sub>5</sub> solution**SDS code** : GA-03**Company/undertaking identification** :

HAYASHI PURE CHEMICAL IND.,LTD.

Address : 3-2-12 Uchihiranomachi, Chuo-ku, Osaka, Osaka, Japan

Telephone : 06-6910-7305

E-mail : shiyaku\_kikaku@hpc-j.co.jp

URL : <https://www.hpc-j.co.jp/>**Emergency number** : 06-6910-7305**Recommended use** : For research and experimental use only.**Restrictions on use** : Do not use for any purpose other than research and experiment. Do not use on a human body or for animal medicines, foods, household products, cosmetics, etc. Do not use in the environment.**2. Hazards identification****GHS classification**

Physical hazards	Explosives	No classification	
	Flammable gases	No classification	
	Aerosol	No classification	
	Oxidizing gases	No classification	
	Gases under pressure	No classification	
	Flammable liquids	Category 2	
	Flammable solids	No classification	
	Self-reactive substances and mixtures	classification not possible	
	Pyrophoric liquids	No classification	
	Pyrophoric solids	No classification	
	Self-heating substances and mixtures	classification not possible	
	Substances and mixtures which in contact with water emit flammable gases	No classification	
	Oxidizing liquids	No classification	
	Oxidizing solids	No classification	
	Organic peroxides	No classification	
	Corrosive to metals	classification not possible	
	Desensitized explosives	classification not possible	
	Health hazards	Acute toxicity (oral)	No classification
		Acute toxicity (dermal)	No classification
		Acute toxicity (inhalation:gas)	No classification
Acute toxicity (inhalation:vapors)		No classification	
Acute toxicity (inhalation:dust/mist)		classification not possible	
Skin corrosion/irritation		No classification	
Serious eye damage/eye irritation		Category 2B	
Respiratory sensitization		classification not possible	
Skin sensitization		No classification	
Germ cell mutagenicity		classification not possible	
Carcinogenicity	Category 1B		
Reproductive toxicity	Category 2		
Specific target organ toxicity (single exposure)	Category 3 (Narcosis)		

	Specific target organ toxicity (single exposure)	Category 3 (Respiratory tract irritation.)
	Specific target organ toxicity (repeated exposure)	Category 1 (central nervous system, respiratory system, digestive tract)
	Aspiration hazard	classification not possible
Environmental hazards	Hazardous to the aquatic environment, short-term (acute)	No classification
	Hazardous to the aquatic environment, long-term (chronic)	No classification
	Hazardous to the ozone layer	classification not possible

## Hazard pictograms (GHS JP)



GHS02



GHS07



GHS08

## Signal word (GHS JP)

: Danger

## Hazard statements (GHS JP)

: Highly flammable liquid and vapor (H225)  
 Causes eye irritation (H320)  
 May cause respiratory irritation (H335)  
 May cause drowsiness or dizziness (H336)  
 May cause cancer (H350)  
 Suspected of damaging fertility or the unborn child (H361)  
 Causes damage to organs (central nervous system, respiratory system, digestive tract) through prolonged or repeated exposure (H372)

## Precautionary statements (GHS JP)

## Prevention

: Obtain special instructions before use. (P201)  
 Do not handle until all safety precautions have been read and understood. (P202)  
 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210)  
 Ground and bond container and receiving equipment. (P240)  
 Use explosion-proof electrical/ventilating/lighting equipment. (P241)  
 Use only non-sparking tools. (P242)  
 Take action to prevent static discharges. (P243)  
 Do not breathe dust/fume/gas/mist/vapors/spray. (P260)  
 Wash hands, forearms and face thoroughly after handling. (P264)  
 Do not eat, drink or smoke when using this product. (P270)  
 Use only outdoors or in a well-ventilated area. (P271)  
 Wear protective gloves/protective clothing/eye protection/face protection. (P280)

## Response

: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. (P303+P361+P353)  
 IF INHALED: Remove person to fresh air and keep comfortable for breathing (P304+P340)  
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305+P351+P338)  
 IF exposed or concerned: Get medical advice/attention. (P308+P313)  
 Get medical advice/attention if you feel unwell. (P314)  
 If eye irritation persists: Get medical advice/attention. (P337+P313)  
 In case of fire: Use specify appropriate media to extinguish. (P370+P378)

## Storage

: Store in a well-ventilated place. Keep container tightly closed. (P403+P233)  
 Store in a well-ventilated place. Keep cool. (P403+P235)  
 Store locked up. (P405)

## Disposal

: Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation. (P501)

### 3. Composition/information on ingredients

Distinction of substance or mixture : Mixture

Name	Concentration or Concentration range	Formula	Kanpo number		CAS RN
			CSCL no	ISHL no	
Acetone	≥ 98%	(CH <sub>3</sub> ) <sub>2</sub> CO	(2)-542	Existing Chemical Substance	67-64-1
Epichlorohydrin-d <sub>5</sub>	About 0.13%	C <sub>3</sub> D <sub>5</sub> ClO	(2)-275	Existing Chemical Substance	69533-54-6

The above concentration or concentration range are not product specification.

All percentages listed in the above concentration or concentration range are wt%, unless otherwise specified.

### 4. First aid measures

#### First aid measures

- First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.  
Get immediate medical advice/attention.
- First-aid measures after skin contact : Remove/Take off immediately all contaminated clothing.  
Gently wash with plenty of soap and water.  
Get immediate medical advice/attention.
- First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
Get immediate medical advice/attention.
- First-aid measures after ingestion : Do NOT induce vomiting.  
Rinse mouth.  
Get immediate medical advice/attention.

### 5. Fire fighting measures

- Suitable extinguishing media : Water spray, Alcohol-resistant foam, Dry powder, Carbon dioxide, Sand.
- Unsuitable extinguishing media : Do not use a heavy water stream.
- Fire hazard : Extremely flammable liquid and vapor.
- Explosion hazard : Danger of the steam explosion in indoor, outdoor, sewer.  
May induce explosion of containers by heating.
- Hazardous decomposition products in case of fire : In case of fire, product may produce irritative or toxic fumes/gases.
- Firefighting instructions : If ignited, for the initial fire-fighting, cut off combustion sources, extinguish fire at a stroke using appropriate fire-extinguishers.  
In the case of peripheral fire, quickly remove movable containers to safe places.  
If unable to be moved containers, sprinkle water to containers and surrounding equipment, etc. to cool.  
Even after extinguishing fire, thoroughly cool containers by using plenty of water.
- Protection during firefighting : Wear appropriate fire-resistant clothing including self contained-compressed air breathing apparatus.

### 6. Accidental release measures

#### Personal Precautions, Protective Equipment and Emergency Procedures

- General measures : Before entering, ventilate the area.  
Do not let unauthorized persons come close to the area.  
Immediately place the leakage area in isolation, with taking proper distances for all directions.  
Wear appropriate personal protective devices to prevent inhalation and contact with eye, skin, and clothing, and never attempt to work on the lee.

#### Environmental precautions

- Environmental precautions : Avoid release to the environment.  
Prevent entry to sewers and public waters.

**Methods and Equipment for Containment and Cleaning up**

- Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it.  
Collect leaking and spilled liquid in sealable containers as far as possible.  
Wash out the spilled area with large amounts of water.

**7. Handling and storage****Handling**

- Technical measures : Work with appropriate personal protective equipment to prevent inhalation or contact to eyes, skin, and clothing.  
Handle with care to prevent leakage, overflowing, or scattering, minimize generation of mist or vapor, and thoroughly ventilate.
- Precautions for safe handling : Do not eat, drink or smoke when using this product.  
Thoroughly wash your hands and gargle after handling.  
Ensure good ventilation of the work station.  
Do not contact, breathe or swallow.  
Take precautionary measures against static discharge.  
Use explosion-proof equipment.
- Prevents handling of incompatible substances or mixtures : Avoid prolonged or repeated exposure.

**Storage**

- Storage conditions : Store locked up.  
Store in a well-ventilated place, away from direct sunlight. Keep container tightly closed and keep away from fire and heat sources.
- Material used in packaging/containers : Light shielding airtight container.
- Technical measures : Comply with applicable regulations.
- Storage temperature : Freeze: -20°C

**8. Exposure controls / Personal protection equipment**

Exposure limit values	
<b>Acetone</b>	
Japan administration level	500ppm
Exposure limits (JSOH)	200ppm(470mg/m3)
Exposure limits (ACGIH)	TWA 250 ppm,STEL 500 ppm
<b>Epichlorohydrin</b>	
Exposure limits (ACGIH)	TWA 0.5 ppm,STEL - (Skin)

- Appropriate engineering controls : Cover up tightly the generation source at the handling place or install local exhaust equipment or overall ventilation equipment. Install safety showers and eye-fountains near a handling place. Clearly indicate the location.

**Protective equipment**

- Respiratory protection : Gas mask for organic gases
- Hand protection : Impervious protective gloves
- Eye protection : Protective glasses (general glasses, glasses with side-shields, goggles)
- Skin and body protection : Impervious aprons, Impervious work clothing, Protective long boots

**9. Physical and chemical properties**

- Physical state : Liquid
- Appearance : Liquid
- Color : No data available
- Odor : No data available
- pH : No data available
- Melting point : No data available
- Freezing point : No data available
- Boiling point : 57 °C (as acetone)
- Flash point : -20 °C (as acetone, tag closed cup)

Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: No data available
Relative density	: No data available
Density	: 0.8 g/cm <sup>3</sup> (as acetone)
Relative gas density	: No data available
Solubility	: No data available
Partition coefficient n-octanol/water (Log Pow)	: No data available
Explosive limits (vol %)	: No data available
Viscosity, kinematic	: No data available
Particle characteristics	: No data available

## 10. Stability and reactivity

Reactivity	: No data available
Chemical stability	: Stable under normal handling conditions.
Possibility of hazardous reactions	: Reacts with oxidizing agents, reducing agents and bases. When in contact with acetic acid or strong oxidizing agents such as nitric acid and hydrogen peroxide, it may generate explosive peroxides. In a basic condition, reacts with chloroform and bromoform to pose a risk of fire and explosion. Corrodes plastics.
Conditions to avoid	: Sunlight, heat. Ignition sources such as sparks, flame, and static electricity. Contact with oxidizing agents, reducing agents, bases, chloroform (in a basic condition) and bromoform (in a basic condition).
Incompatible materials	: Oxidizing agents, Reducing agents, Bases, Chloroform and bromoform in a basic condition
Hazardous decomposition products	: No data available

## 11. Toxicological information

The information in this section is based on the "GHS Classification Results" by NITE.

As a product	
Acute toxicity (oral)	No classification
Acute toxicity (dermal)	No classification
Acute toxicity (inhalation)	vapors:No classification Gases:No classification dust, mist:classification not possible
Skin corrosion/irritation	No classification
Serious eye damage/irritation	Category 2B
Respiratory sensitization	classification not possible
Skin sensitization	No classification
Germ cell mutagenicity	classification not possible
Carcinogenicity	Category 1B
Reproductive toxicity	Category 2
STOT-single exposure	Category 3 (Narcosis) Category 3 (Respiratory tract irritation.)
STOT-repeated exposure	Category 1
Aspiration hazard	classification not possible
Acetone	
Acute toxicity (oral)	No classification
Acute toxicity (dermal)	No classification
Acute toxicity (gas)	No classification
Acute toxicity (vapour)	No classification
Acute toxicity (inhalation:dust/mist)	classification not possible
Skin corrosion/irritation	No classification
Serious eye damage/irritation	Category 2B
Respiratory sensitization	classification not possible
Skin sensitization	No classification
Germ cell mutagenicity	classification not possible
Carcinogenicity	classification not possible

<b>Acetone</b>	
Reproductive toxicity	Category 2
STOT-single exposure	Category 3 (Narcosis) Category 3 (Respiratory tract irritation.)
STOT-repeated exposure	Category 1
Aspiration hazard	classification not possible
<b>Epichlorohydrin</b>	
Acute toxicity (oral)	Category 3
Acute toxicity (dermal)	Category 3
Acute toxicity (gas)	No classification
Acute toxicity (vapour)	Category 2
Acute toxicity (inhalation:dust/mist)	classification not possible
Skin corrosion/irritation	Category 1
Serious eye damage/irritation	Category 1
Respiratory sensitization	classification not possible
Skin sensitization	Category 1
Germ cell mutagenicity	Category 2
Carcinogenicity	Category 1B
Reproductive toxicity	Category 2
STOT-single exposure	Category 1
STOT-repeated exposure	Category 1
Aspiration hazard	classification not possible

## 12. Ecological information

The information in this section is based on the "GHS Classification Results" by NITE.

<b>As a product</b>	
Hazardous to the aquatic environment, short-term (acute)	No classification
Hazardous to the aquatic environment, long-term (chronic)	No classification
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Ozone	classification not possible
<b>Acetone</b>	
Hazardous to Aquatic Environment - Acute Hazard	No classification
Hazardous to Aquatic Environment - Chronic Hazard	No classification
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Hazardous to the ozone layer	No data available
<b>Epichlorohydrin</b>	
Hazardous to Aquatic Environment - Acute Hazard	Category 3
Hazardous to Aquatic Environment - Chronic Hazard	No classification
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Hazardous to the ozone layer	classification not possible

### 13. Disposal considerations

- Ecology - waste materials : With the detail information of the waste, subcontract its disposal to a waste disposer authorized by a Prefectural Governor.
- Contaminated container and packaging : Empty the packaging completely prior to disposal.  
Empty containers should be taken for recycle, recovery or waste in accordance with local regulation.

### 14. Transport information

#### International Regulations

##### Transport by sea(IMDG)

- UN-No. (IMDG) : 1993
- Proper Shipping Name (IMDG) : FLAMMABLE LIQUID, N.O.S.
- Packing group (IMDG) : II
- Transport hazard class(es) (IMDG) : 3
- Hazard labels (IMDG) : 3
- Class (IMDG) : 3
- Special provision (IMDG) : 274
- Limited quantities (IMDG) : 1 L
- Excepted quantities (IMDG) : E2
- Packing instructions (IMDG) : P001
- IBC packing instructions (IMDG) : IBC02
- Tank instructions (IMDG) : T7
- Tank special provisions (IMDG) : TP1, TP28, TP8
- Stowage category (IMDG) : B
- MFAG-No : 127

##### Air transport(IATA)

- UN-No. (IATA) : 1993
- Proper Shipping Name (IATA) : Flammable liquid, n.o.s.
- Packing group (IATA) : II
- Transport hazard class(es) (IATA) : 3
- Hazard labels (IATA) : 3
- Class (IATA) : 3
- PCA Excepted quantities (IATA) : E2
- PCA Limited quantities (IATA) : Y341
- PCA limited quantity max net quantity (IATA) : 1L
- PCA packing instructions (IATA) : 353
- PCA max net quantity (IATA) : 5L
- CAO packing instructions (IATA) : 364
- CAO max net quantity (IATA) : 60L
- Special provision (IATA) : A3
- ERG code (IATA) : 3H

- Marine pollutant** : Not applicable

##### Regulations in Japan

- Regulatory information by sea : Conform to the provisions of the Ship Safety Law.
- Regulatory information by air : Conform to the provisions of the Civil Aeronautics Law.
- MFAG-No : 127

- Special transport precautions** : When transporting, load containers so that they do not tip over, damage, drop or collapse. Make sure there is no leak in containers.

### 15. Regulatory information

#### National law

- Chemical Substances Control Law : Priority Assessment Chemical Substances (Law Article 2, Para.5)
- Industrial Safety and Health Law : Class 2 Organic Solvents etc. (Enforcement Order, Art., Appended Table 6-2, Ordinance on Prevention of Organic Solvent Poisoning, Art.1, Para.1, Item 4)  
Working Environment Evaluation Standards, Administrative Control Levels (Law Art.65-2, Para.1)  
Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57, Para.1, Enforcement Order Art.18 Item 1, Item 2, Attached Table No.9)  
Dangerous Substances - Flammable Substance (Enforcement Order Attached Table 1 Item 4)

		Notifiable Substances (Law Art.57-2, Enforcement Order Art.18-2 Item 1, Item 2, Attached Table No.9)
		Epichlorohydrin (Ordinance number : 87)
		Acetone (Ordinance number : 17)
		Substances on Special medical examination, Current handling workers (Act, Art.66, Para.2, Enforcement Order, Art.22 Item 1)
Japanese Poisonous and Deleterious Substances Control Law	:	Deleterious Substances (Designated Order Art.2)
Water Pollution Prevention Law	:	Epichlorohydrin and preparations containing it
Narcotics and Psychotropics Control Act	:	Designated Chemical Substances (Law Article 2, Paragraph 4, Enforcement Order Article 3-3)
Fire Service Law	:	Raw Materials(Law Art.2 (7) , Attached Table Art.4)
Air Pollution Control Law	:	Group 4 - Flammable liquids - 1st Class petroleums - soluble (Law Art.2 Para.7, Attached Table 1, Group 4)
Law Relating to Prevention of Marine Pollution and Maritime Disasters	:	Hazardous Air Pollutants (Central Environment Council Report No. 9) Volatile Organic Compounds (Law Art.2 Para.4) (MOE Official Notice to Prefectures)
Foreign Exchange and Foreign Trade Control Act	:	Noxious Liquid Substances - Category Z (Law Art.3(3), Enforcement Order, Art.1-2, Attached Table No.1 Item 3)
Ship Safety Act	:	Export Trade Control Order, Attached Table 1 Para.2 Export Trade Control Ordinance appendix 1-16 Export Approval (Export Trade Control Order, Attached Table 2)
Civil Aeronautics Law	:	Flammable liquids (Dangerous Goods Notification Schedule first second and third Article Dangerous Goods Regulations)
Port Regulation Law	:	Flammable liquids (Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)
Road Act	:	Flammable liquids (Article 21, Paragraph 2 of Law, Article 12 rule, notice attached table that defines the type of dangerous goods)
Waste Management on Public Cleansing Law	:	Restriction for Vehicle Traffic (Enforcement Order Art.19-13, Publication of Japan Highway Public Corp.)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)	:	Specially Controlled Industrial Wastes (Act Art.2, para 5, Enforcement Order Art.2-4 )
Labor Standards Act	:	Not applicable
	:	Chemical Substances Causing Occupational Illnesses (Act Art.75, Para.2, Ordinance Attached Table 1-2, Item 4-1,MHLW Notification No.36 of 1978)

## 16. Other information

Data sources	:	Handbook of 17322 Chemical Products, The Chemical Daily Co, Ltd. International Chemical Safety Cards. National Institute of Technology and Evaluation (NITE). 2020 Emergency Response Guidebook (ERG 2020).
Other information	:	The SDS is copyrighted material of Hayashi Pure Chemical Ind, Ltd. This Safety Data Sheet is intended to be provided for business operators who handle chemical substance products of the relevant product and is not intended to assure safety in any way. The Safety Data Sheet does not verify all the information on the applicable chemical substance in the present time. With the recognition in that unknown danger constantly exists in the relevant chemical substance, the product shall be used in the principle of self-responsibility of the user with the highest priority to safety from transport and unpacking to disposal. When the relevant chemical substance is used, the user him/herself shall collect safety information and shall investigate laws and regulations at the place, organizations, countries, etc. where the substance is actually used and give the highest priority to them. The Company shall take no responsibility for investigating state and local regulations and the user shall handle this problem on his/her own responsibility. In the event that SDS in Japanese and SDS translated into other languages exist, the document described in Japanese is prior to all other documents whether or not there is any difference in contents, and documents in other languages shall be references.