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Version 7 SDS No. Exempt, SR&D

MOEL's Public Notice No. 2023-9 (Standards for Classification and Labeling of Chemical Substances and Safety Data Sheets)

# SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THECOMPANY/UNDERTAKING

**Product Identifier** 

Product Description: Formic acid, 97%

Cat No.:
Synonyms
Methanoic acid
CAS No
64-18-6
Molecular Formula
CAS No
C H2 O2

Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Laboratory chemicals.
Uses advised against No Information available

Details of the supplier of the safety data sheet

Importer Supplier

Fisher Scientific Korea Thermo Fisher Scientific Chemicals, Inc.

D5,D6, Incheon Airport Logistics Complex 30 Bond Street

150, Gonghangdong-Ro 296 Beon-Gil Ward Hill, MA 01835-8099

Jung-Gu, Incheon Tel: +82-1661-9555 Fax: +82-2-2023-0603

E-mail address Chem.KR@thermofisher.com

Emergency Telephone Number

Emergency telephone: Medical: +(82) 070-7686-0086 or + 1-703-741-5970

CHEMTREC: 080 822 1374 (Local), CHEMTREC: 1-800-424-9300 or + 1-703-527-3887

Korea: 00-308-13-2549 (24 hours a day, 7 days a week)

# **SECTION 2: HAZARDS IDENTIFICATION**

## Classification of the substance or mixture

Physical hazards

Flammable liquids Category 3

**Health hazards** 

Acute Oral Toxicity

Acute Inhalation Toxicity - Vapors

Skin Corrosion/Irritation

Serious Eye Damage/Eye Irritation

Category 1

Category 1

Category 1

**Environmental hazards** 

Based on available data, the classification criteria are not met

#### Label Elements



## Signal Word

## **Danger**

#### **Hazard Statements**

- H226 Flammable liquid and vapor
- H302 Harmful if swallowed
- H314 Causes severe skin burns and eye damage
- H331 Toxic if inhaled
- H318 Causes serious eye damage

#### **Precautionary Statements**

#### Prevention

- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
- P240 Ground and bond container and receiving equipment
- P241 Use explosion-proof electrical/ ventilating/ lighting equipment
- P264 Wash hands and face thoroughly after handling
- P261 Avoid breathing dust/fume/gas/mist/vapors/spray
- P271 Use only outdoors or in a well-ventilated area
- P233 Keep container tightly closed
- P242 Use non-sparking tools
- P243 Take action to prevent static discharges
- P280 Wear protective gloves/protective clothing/eye protection/face protection
- P270 Do not eat, drink or smoke when using this product
- P260 Do not breathe dust/fume/gas/mist/vapors/spray

#### Response

- P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
- P330 Rinse mouth
- P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing
- P311 Call a POISON CENTER or doctor
- P321 Specific treatment (see supplemental first aid instructions on this label)
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower
- P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction
- P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting
- P363 Wash contaminated clothing before reuse
- P310 Immediately call a POISON CENTER or doctor

## **Storage**

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

#### Disposal

P501 - Dispose of contents/ container to an approved waste disposal plant

## Other Hazards

Lachrymator (substance which increases the flow of tears)

This product does not contain any known or suspected endocrine disruptors

# NFPA

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HealthFlammabilityInstabilityPhysical hazards321N/A

# **SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

#### 3.1. Substances

Component	Common Name	CAS No	Index No	Weight %
Formic acid	Methanoic acid	64-18-6	KE-17233	99 - 100

# **SECTION 4: FIRST AID MEASURES**

Description of first aid measures

General Advice Immediate medical attention is required. Show this safety data sheet to the doctor in

attendance.

Eye Contact In the case of contact with eyes, rinse immediately with plenty of water and seek medical

advice.

**Skin Contact** Wash off immediately with plenty of water for at least 15 minutes. Immediate medical

attention is required.

**Ingestion** Do NOT induce vomiting. Call a physician or poison control center immediately.

**Inhalation** Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give

artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Remove to fresh air. Immediate medical attention is

required. If not breathing, give artificial respiration.

Self-Protection of the First Aider Ensure that medical personnel are aware of the material(s) involved, take precautions to

protect themselves and prevent spread of contamination.

Most important symptoms and effects, both acute and delayed

Difficulty in breathing. Causes burns by all exposure routes. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Ingestion causes severe swelling, severe

damage to the delicate tissue and danger of perforation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

# **SECTION 5: FIREFIGHTING MEASURES**

Extinguishing media

**Suitable Extinguishing Media** 

Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.

Extinguishing media which must not be used for safety reasons

No information available.

Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors. Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

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#### **Hazardous Combustion Products**

Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>), Hydrogen, Thermal decomposition can lead to release of irritating gases and vapors.

## Advice for fire-fighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

# **SECTION 6: ACCIDENTAL RELEASE MEASURES**

## Personal Precautions, Protective Equipment and Emergency Procedures

Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.

## Environmental precautions

Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information.

## Methods and Material for Containment and Cleaning Up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

#### Reference to Other Sections

Refer to protective measures listed in Sections 8 and 13.

# **SECTION 7: HANDLING AND STORAGE**

# Precautions for Safe Handling

Use only under a chemical fume hood. Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Do not breathe mist/vapors/spray. Do not ingest. If swallowed then seek immediate medical assistance. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Take precautionary measures against static discharges.

### Conditions for Safe Storage, Including any Incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area. Keep away from heat, sparks and flame. Containers should be vented periodically in order to overcome pressure buildup.

## Specific End Uses

Use in laboratories.

# **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

#### **Control Parameters**

Component	CAS No	Korea	ACGIH TLV	OSHA PEL
Formic acid	64-18-6	TWA: 5 ppm	TWA: 5 ppm	(Vacated) TWA: 5 ppm
		TWA: 9 mg/m <sup>3</sup>	STEL: 10 ppm	(Vacated) TWA: 9 mg/m <sup>3</sup>
				TWA: 5 ppm
				TWA: 9 mg/m <sup>3</sup>

Component	CAS No	European Union	The United Kingdom	Germany
Formic acid	64-18-6	TWA: 5 ppm 8 hr	STEL: 15 ppm 15 min	TWA: 5 ppm (8 Stunden).

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TWA: 9 mg/m <sup>3</sup> 8 hr	STEL: 28.8 mg/m³ 15 min TWA: 5 ppm 8 hr TWA: 9.6 mg/m³ 8 hr	AGW - exposure factor 2 TWA: 9.5 mg/m³ (8 Stunden). AGW - exposure factor 2 TWA: 5 ppm (8 Stunden). MAK TWA: 9.5 mg/m³ (8 Stunden). MAK
		Höhepunkt: 10 ppm
		Höhepunkt: 19 mg/m <sup>3</sup>

**ACGIH - Biological Exposure Indices** 

	Component	CAS No	ACGIH - Biological Exposure Indices
ı	Formic acid	64-18-6	Not listed

#### **Exposure Controls**

#### **Engineering Measures**

Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting equipment. Ensure adequate ventilation, especially in confined areas.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

## Personal protective equipment

**Eye Protection** Face protection shield or Goggles

Hand Protection Protective gloves

Skin and body protection Chemical resistant apron. Boots. Chemical protection suit (EN 14605).

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Personal protective equipment

**Respiratory Protection** 

Use only those certified by the Korea Occupational Safety and Health Administration. When workers are facing concentrations above the exposure limit they must use

appropriate certified respirators

Recommended Filter type:

Particulates filter conforming to EN 143 Acid gases filter Type E Yellow conforming to

EN14387

To protect the wearer, respiratory protective equipment must be the correct fit and be used

and maintained properly

When RPE is used a face piece Fit Test should be conducted

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice

**Environmental exposure controls** Prevent product from entering drains

# **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

Information on basic physical and chemical properties

Appearance (Physical State, Color, Colorless Liquid

etc.)

**Odor** pungent

Odor Threshold No data available

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Liquid

Liquid

2.1 10 g/L aq.sol рH

8 °C / 46.4 °F **Melting Point/Range Softening Point** No data available 101 °C / 213.8 °F **Boiling Point/Range** 

@ 760 mmHg Flash Point 50 °C / 122 °F Method - No information available

**Evaporation Rate** No data available Flammability (solid,gas) Not applicable

**Explosion Limits** Lower 10 vol%

Upper 57 vol%

**Vapor Pressure** 44 mbar @ 20 °C

**Vapor Density** No data available (Air = 1.0)

Specific Gravity / Density 1.220 Not applicable **Bulk Density** 

Miscible **Water Solubility** 

Solubility in other solvents No information available

Partition Coefficient (n-octanol/water)

Component	CAS No	log Pow
Formic acid	64-18-6	-0.54

**Autoignition Temperature** 520 °C / 968 °F **Decomposition Temperature** 

**Viscosity** 

**Explosive Properties Oxidizing Properties** 

No data available 1.47 mPa.s @ 20 °C

No information available

explosive air/vapour mixtures possible

C H2 O2 Molecular Formula **Molecular Weight** 46.02

# **SECTION 10: STABILITY AND REACTIVITY**

Reactivity None known, based on information available

Chemical Stability Hygroscopic. heat sensitive. Risk of explosion if heated under confinement.

Possibility of Hazardous Reactions

**Hazardous Polymerization** Hazardous polymerization does not occur.

None under normal processing. **Hazardous Reactions** 

Conditions to Avoid Incompatible products. Excess heat. Keep away from open flames, hot surfaces and

sources of ignition. Exposure to moist air or water.

Incompatible Materials Strong oxidizing agents. Metals. Finely powdered metals. Strong bases.

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## **Hazardous Decomposition Products**

Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>). Hydrogen. Thermal decomposition can lead to release of irritating gases and vapors.

## **SECTION 11: TOXICOLOGICAL INFORMATION**

#### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

## **Product Information**

Information on expected route of exposure

**Inhalation** Causes severe burns. May be harmful if inhaled. Harmful by inhalation.

Ingestion Causes severe burns. May be harmful if swallowed. Ingestion causes burns of the upper

digestive and respiratory tracts. Can burn mouth, throat, and stomach. Harmful if

swallowed.

Eyes Causes severe burns. Causes burns. Corrosive to the eyes and may cause severe damage

including blindness. Risk of serious damage to eyes.

**Skin** Causes severe burns. May be harmful in contact with skin. Causes burns.

Information on Health Hazards

(a) acute toxicity;

OralCategory 4DermalNo data availableInhalationCategory 3

Component	CAS No	LD50 Oral	LD50 Dermal	LC50 Inhalation
Formic acid	64-18-6	730 mg/kg (Rat)	No data available	7.85 mg/l (Rat) 4h OECD 403

(b) skin corrosion/irritation; Category 1

(c) serious eye damage/irritation; Category 1

(d) respiratory or skin sensitization;

Respiratory No data available Skin No data available

Component	CAS No	Test method	Test species	Study result
Formic acid	64-18-6	No data available	No data available	No data available

(e) germ cell mutagenicity; No data available

Component	CAS No	Test method	Test species	Study result
Formic acid	64-18-6	No data available	No data available	No data available

(f) carcinogenicity; No data available

Component	CAS No	Test method	Test species / Duration	Study result
Formic acid	64-18-6	No data available	No data available	No data available

There are no known carcinogenic chemicals in this product

Component	CAS No	IARC	NTP	ACGIH	OSHA	UK
Formic acid	64-18-6	Not listed				

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(g) reproductive toxicity; No data available

Component	CAS No	Test method	Test species / Duration	Study result
Formic acid	64-18-6	No data available	No data available	No data available

(h) STOT-single exposure; No data available

(i) STOT-repeated exposure; No data available

Target Organs None known.

(i) aspiration hazard; No data available

## **Other Adverse Effects**

Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

Component	CAS No	EU - Endocrine Disrupters Candidate	EU - Endocrine Disruptors - Evaluated	Japan - Endocrine Disruptor Information
		List	Substances	
Formic acid	64-18-6	Applicable	Not applicable	Not applicable

# **SECTION 12: ECOLOGICAL INFORMATION**

<u>Ecotoxicity effects</u>

Contains a substance which is:. Harmful to aquatic organisms. The product contains

following substances which are hazardous for the environment.

	Component	CAS No	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Γ	Formic acid	64-18-6	Leuciscus idus: LC50	EC50 = 34  mg/L/48h	EC50 = 25  mg/L/96h	EC50 = 46.7
-			= 46-100  mg/L / 96 h			ma/l /17h

Persistence and degradability Readily biodegradable

Persistence Miscible with water

Degradation in sewage treatment plant

Miscible with water, Persistence is unlikely, based on information available.

Contains substances known to be hazardous to the environment or not degradable in waste

water treatment plants.

Bioaccumulative potential Bioaccumulation is unlikely

<del></del>		
Component	log Pow	Bioconcentration factor (BCF)
Formic acid	-0.54	0.22 dimensionless

<u>Mobility in soil</u> The product is water soluble, and may spread in water systems . Will likely be mobile in the

environment due to its water solubility. Highly mobile in soils.

**Ozone Depletion Potential** 

Component	CAS No	Ozone Depletion Potential
Formic acid	64-18-6	Not listed

Other adverse effects No information available

# SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

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Waste from Residues/Unused

**Products** 

Waste is classified as hazardous. Dispose in accordance with the Wastes Control Act

(폐기물관리법).

Contaminated Packaging Dispose of this container to hazardous or special waste collection point. Empty containers

retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and

empty container away from heat and sources of ignition.

Other Information Do not flush to sewer. Waste codes should be assigned by the user based on the

application for which the product was used. Can be landfilled or incinerated, when in compliance with local regulations. Do not empty into drains. Large amounts will affect pH

and harm aquatic organisms.

## **SECTION 14: TRANSPORT INFORMATION**

**Road and Rail Transport** 

UN-No UN1779

Proper Shipping Name FORMIC ACID

Hazard Class 8
Subsidiary Hazard Class 3
Packing Group ||

**IATA** 

**UN-No** UN1779

Proper Shipping Name FORMIC ACID

Hazard Class 8

Subsidiary Hazard Class 3 Packing Group ||

IMDG/IMO

UN-No UN1779
Proper Shipping Name FORMIC ACID

Hazard Class 8

Subsidiary Hazard Class 3
Packing Group ||

Marine Pollutant No hazards identified

Special Precautions for User No special precautions required

# **SECTION 15: REGULATORY INFORMATION**

Safety, health and environmental regulations/legislation specific for the substance or mixture

Legend: X - Listed '-' - Not Listed

## **International Inventories**

Component	CAS No	KECL	TSCA	EINECS	IECSC	DSL	NDSL	PICCS	ENCS	ISHL	AICS
Formic acid	64-18-6	Х	Х	200-579-1	Х	Х	-	Х	Х	Х	Х

Component	CAS No	Seveso III Directive	Seveso III Directive	Rotterdam	Basel Convention
		(2012/18/EC) - (2012/18/EC) -		Convention (PIC)	(Hazardous Waste)
		<b>Qualifying Quantities</b>	<b>Qualifying Quantities</b>	, ,	, ,
		for Major Accident	for Safety Report		
		Notification	Requirements		
Formic acid	64-18-6	Not applicable	Not applicable	Not applicable	Annex I - Y34

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential
Formic acid	64-18-6	Listed	Not applicable	Not applicable

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# **Korean National Regulations**

Component	CAS No	Act on Registration and Evaluation of Chemical Substances (K-REACH)	Ministry of Environment CMR risk	-Ministry of Environment - Critically Controlled Substance	
Formic acid	64-18-6	Annex 1 - KE-17233	Not applicable	Not applicable	
Component	CAS No	Chemical Control Act - Acute Hazard to Human Health	Chemical Control Act - Chronic Hazard to Human Health	Chemical Control Act - Ecological Hazard	
Formic acid	64-18-6	2022-1-1091 (>=10%)	Not applicable	Not applicable	
		•		•	
Component	CAS No	Chemical Control Act - Accident Precaution Chemicals (% in mixtures)	Chemical Control Act - Accident Precaution Chemicals - Quantity limits Storage (% in mixtures)	Chemical Control Act - Accident Precaution Chemicals - Quantity limits Manufacture/Use (% in mixtures)	
Formic acid	64-18-6	>25%	20000 kg/yr	1500000 kg/yr	
Component	CAS No	Chemical Control Act - Prohibited Chemicals	Chemical Control Act - Use Restricted Chemicals	Chemical Control Act - Authorised Chemicals	
Formic acid	64-18-6	Not applicable	Not applicable	Not applicable	
	Т				
Component		CAS No		te Control Law	
Formic acid		64-18-6	>	> 10% (CCA)	

Compo	nent	CAS No	ISHA - Harmful Agents Subject to Work Environment Monitoring	ISHA - Prohibited substances	ISHA - Substances requiring permission
Formic	acid	64-18-6	Listed	Not applicable	Not applicable
Compo	nent	CAS No	ISHA - Substances	ISHA - Harmful Agents	ICHA Dammiasible
Compo	Alone	OAO NO	subject to control	Requiring Health Examination	ISHA - Permissible Exposure Limits

Component	CAS No	ISHA - Subject to Process Safety Reports (minimum quantity)	ISHA - Threshold Limit Values (TLVs) Chemicals	ISHA - Special management materials
Formic acid	64-18-6	5000 kg	TWA: 5 ppm	Not applicable

# National Fire Association - Dangerous Substances Minimum quantity requiring a permit

Component	CAS No	Class 1 - Oxidising solids	Class 2 - Flammable solid	Class 3 - Spontaneously Combustible Substances and Dangerous Substances When Wet	Class 4 - Flammable liquids	Class 5 - Self-reactive substances	Class 6 - Oxidising liquids
Formic acid	64-18-6	Not applicable	Not applicable	Not applicable	4. Group 2 Petroleum (Soluble) 2000 L	Not applicable	Not applicable

# **Control Parameters**

Component	CAS No	Korea	ACGIH - Biological Exposure Indices
Formic acid	64-18-6	TWA: 5 ppm	Not listed

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TWA: 9 mg/m <sup>3</sup>	

#### **US Management Information**

**OSHA** - Occupational Safety and Health Administration

Not applicable

Component	CAS No	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Formic acid	64-18-6	Not applicable	Not applicable

**CERCLA** 

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355)

Component	CAS No	CERCLA Extremely Hazardous Substances RQs	Hazardous Substances RQs	SARA 313 - Threshold Values %
Formic acid	64-18-6	Not applicable	5000 lb	1.0

## GHS Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

Danger.

H226 - Flammable liquid and vapor. H302 - Harmful if swallowed. H314 - Causes severe skin burns and eye damage. H331 -Toxic if inhaled. EUH071 - Corrosive to the respiratory tract.

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P280 - Wear protective gloves/protective clothing/eye protection/face protection. P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 - Immediately call a POISON CENTER or doctor/physician.

## **SECTION 16: OTHER INFORMATION**

## Legend

**CAS** - Chemical Abstracts Service

TSCA - United States Toxic Substances Control Act Section 8(b)

EINECS/ELINCS - European Inventory of Existing Commercial Chemical DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances/EU List of Notified Chemical Substances

Substances List

PICCS - Philippines Inventory of Chemicals and Chemical Substances **IECSC** - Chinese Inventory of Existing Chemical Substances **KECL** - Korean Existing and Evaluated Chemical Substances

**ENCS** - Japanese Existing and New Chemical Substances AICS - Australian Inventory of Chemical Substances NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit

TWA - Time Weighted Average

**ACGIH** - American Conference of Governmental Industrial Hygienists

IARC - International Agency for Research on Cancer

RPE - Respiratory Protective Equipment LC50 - Lethal Concentration 50% POW - Partition coefficient Octanol:Water LD50 - Lethal Dose 50% EC50 - Effective Concentration 50%

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road

IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code

Transport Association MARPOL - International Convention for the Prevention of Pollution from

ICAO/IATA - International Civil Aviation Organization/International Air

**OECD** - Organisation for Economic Co-operation and Development

Ships

**BCF** - Bioconcentration factor

ATE - Acute Toxicity Estimate **VOC** - (Volatile Organic Compound)

Key literature references and sources for data

https://echa.europa.eu/information-on-chemicals

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

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## **Training Advice**

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Prepared By Health, Safety and Environmental Department

Creation Date02-Nov-2009Revision Date08-Aug-2025

Revision Number 7

**Revision Summary** SDS sections updated.

# MOEL's Public Notice No. 2023-9 (Standards for Classification and Labeling of Chemical Substances and Safety Data Sheets)

#### **Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of Safety Data Sheet**