

SAFETY DATA SHEET

Version: 2.0

Date of issue: 07 July 2021

Date of First Issue: 22 May 2018

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SAFETY DATA SHEET IN ACCORDANCE WITH: Schedule 1 of Hazardous products regulations (HPR) (WHMIS 2015)

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name M-Bond AE Resin
Other Means of Identification None

Recommended use and restrictions

Recommended use Adhesives
Restrictions on use None known

Initial Supplier Identifier

Company Identification

Telephone VISHAY MEASUREMENTS GROUP, INC.
Post Office Box 27777
Raleigh, NC 27611
USA
E-Mail (competent person) mm.us@vishaypg.com

Emergency telephone number

Emergency Phone No. 1-800-424-9300 CHEMTREC (24 hours)
Languages spoken English

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

In accordance with Schedule 1 of Hazardous Products Regulations (HPR) (WHMIS 2015)

Skin corrosion/irritation - Category 2
Skin sensitization - Category 1
Eye damage, category 1
Specific target organ toxicity — single exposure - Category 1
Specific target organ toxicity — single exposure - Category 2
Germ cell mutagenicity - Category 2
Aquatic toxicity, Chronic - Category 2

Label elements

Hazard Pictogram(s)



Signal Word(s)

DANGER

Hazard Statement(s)

Causes skin irritation.
May produce an allergic reaction.
Causes serious eye damage.
Causes damage to organs: Central nervous system and Blood.
May cause damage to organs: Respiratory system.
May cause genetic defects.
Toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe vapour.
Wash hands and exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not eat, drink or smoke when using this product.

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IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 Immediately call a POISON CENTER/doctor.
 IF ON SKIN: Wash with plenty of water.
 If skin irritation or rash occurs: Get medical advice/attention.
 Store locked up.
 Dispose of contents in accordance with local, state or national legislation.
 Avoid release to the environment.

Other hazards

None known

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances Not applicable

Mixtures

GHS Classification

Chemical Name	CAS No.	Concentration (%W/W)	Common name(s), synonym(s) of the substance	Hazard classification
Bis-[4-(2,3-epoxypropoxy)phenyl]propane	1675-54-3	60 - 80	2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Skin corrosion/irritation - Category 2 Skin sensitization - Category 1 Eye Irritation - Category 2 Aquatic toxicity, Chronic - Category 2 Specific Concentration Limit Skin corrosion/irritation - Category 2: C ≥ 5% Eye Irritation - Category 2: C ≥ 5%
Bisphenol A Diglycidyl Ether	25085-99-8	10 - 30	Oxirane, 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis-, homopolymer	Skin corrosion/irritation - Category 2 Skin sensitization - Category 1 Eye Irritation - Category 2 Aquatic toxicity, Chronic - Category 2
2,3-Epoxypropyl o-tolyl ether	2210-79-9	1 - 5	Glycidyl 2-methylphenyl ether	Skin corrosion/irritation - Category 2 Skin sensitization - Category 1 Germ cell mutagenicity - Category 2 Aquatic toxicity, Chronic - Category 2
1,3-Benzenediol	108-46-3	1 - 5	Resorcinol; 1,3-Dihydroxybenzene	Acute toxicity (Oral) - Category 4 Skin corrosion/irritation - Category 2 Skin sensitization - Category 1 Eye damage, category 1 Specific target organ toxicity — single exposure - Category 1 Specific target organ toxicity — single exposure - Category 2 Aquatic toxicity, Acute - Category 1 Aquatic toxicity, Chronic - Category 3

Prescribed Concentration Ranges used for trade secret purposes (Canada Gazette, Part II, Vol. 152, No. 8)

SECTION 4: FIRST AID MEASURES



Description of first aid measures

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Self-protection of the first aider	Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Avoid all contact. Do not breathe vapour.
Inhalation	IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF exposed or concerned: Get medical advice/attention.
Skin Contact	IF ON SKIN: Remove contaminated clothing and wash all affected areas with plenty of water. If irritation (redness, rash, blistering) develops, get medical attention. IF exposed or concerned: Get medical advice/attention.
Eye Contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
Ingestion	IF SWALLOWED: Rinse mouth. Make victim drink plenty of water. Do not induce vomiting unless instructed to do so by medical personnel. Immediately call a POISON CENTER/doctor.
Most important symptoms and effects, both acute and delayed	Causes skin irritation. May produce an allergic reaction. Causes serious eye damage. May cause genetic defects. Causes damage to organs: Central nervous system and Blood. May cause damage to organs: Respiratory system.
Indication of any immediate medical attention and special treatment needed	Treat symptomatically. IF IN EYES: Obtain prompt consultation, preferably from an ophthalmologist. Following severe exposure the patient should be kept under medical review for at least 48 hours.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media Suitable Extinguishing Media	As appropriate for surrounding fire. Extinguish with carbon dioxide, dry chemical, foam or waterspray.
Unsuitable extinguishing Media	Do not use water jet. Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	May decompose in a fire giving off toxic fumes. Decomposes in a fire giving off toxic fumes: Phenolics, Carbon monoxide and Carbon dioxide.
Special protective equipment and precautions for fire fighters	Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Ensure adequate ventilation. Stop leak if safe to do so. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe vapour. Avoid all contact. Do not ingest. If swallowed then seek immediate medical assistance. Isolate the area and allow vapours to disperse.
Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body.
Methods and material for containment and cleaning up	Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a container for disposal. Ventilate the area and wash spill site after material pick-up is complete. Dispose of this material and its container as hazardous waste.
Reference to other sections	See Section: 8, 13

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Avoid all contact. Do not breathe vapour. Ensure adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact. Use personal protective equipment as required. See Section: 8. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Contaminated clothing should be laundered before reuse.
Conditions for safe storage, including any incompatibilities Storage temperature	Store in a well-ventilated place. Keep container tightly closed. Keep cool. Keep away from heat, sources of ignition and direct sunlight. Ambient. Keep at temperature not exceeding (°C): 27

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Incompatible materials

Keep away from: Flammable liquids, Strong Oxidizing agents, Corrosive Substances, Strong Acids and strong mineral and organic bases, especially primary and secondary aliphatic amines.

Specific end use(s)

See Section: 1.2

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational Exposure Limits

SUBSTANCE	CAS No.	ACGIH® TLV® (ppm)		OSHA PEL (ppm)		Note
		TWA	STEL	TWA	STEL	
1,3-Benzenediol	108-46-3	10	20	-	-	A4

Source: ACGIH: American Conference of Governmental Industrial Hygiene. TLV: Threshold Limit Value (ACGIH) PEL (OSHA)/Pas de limite d'exposition autorisée (PEL) OSHA.

A4: Not Classifiable as a Human Carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of the lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

Alberta: Occupational Health And Safety Code, 2009; Quebec: Health and Safety Work Act, 2016

SUBSTANCE	CAS No.	8-hour Occupational Exposure Limits			15-minute or ceiling (c) Occupational Exposure Limits		Note
		ppm	mg/m ³	f/cc	STEL (ppm)	STEL (mg/m ³)	
1,3-Benzenediol	108-46-3	10	45	-	20	90	Alberta, 1
		10	45	-	20	90	OEL

Source: Alberta: Occupational Health And Safety Code, 2009

OEL: Quebec Work Health and Safety Regulations, Health and Safety Work Act, (Chapter S – 2.1, a. 223)

1: Occupational exposure limit is based on irritation effects and its adjustment to compensate for unusual work schedules is not required.

British Columbia: Occupational Health and Safety Guidelines, 2015; Northwest Territories: Occupational Health and Safety Regulations, 2012; Yukon Territory: Occupational Health and Safety Act, 1986

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
1,3-Benzenediol	108-46-3	10	-	20	-	WEL
		10	-	20	-	NW
		10	45	20	90	YK

Source: WEL: Occupational Health and Safety Guidelines Part 5: Chemical Agents and Biological Agents (British Columbia)

NW: WSCC, Occupational Health and Safety Regulations, Northwest Territories Volume 3

Yukon Territory (YK): Occupational Health and Safety Act. O.I.C. 1986/164 Occupational Health Regulations.

Saskatchewan: Occupational Health and Safety Regulations, 1996.

SUBSTANCE	CAS No.	Time Weighted Average (TWA)	STEL (ppm)	Note
1,3-Benzenediol	108-46-3	10	20	WEL

Source: Saskatchewan (SK): Occupational Health and Safety Act, 1993. O-1.1 REG 1 Occupational Health and Safety Regulations, 1996.

Biological limit value

Not established.

Exposure controls

Appropriate engineering controls

Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. A washing facility/water for eye and skin cleaning purposes should be present.

Individual protection measures, such as personal protective equipment (PPE)

Keep good industrial hygiene. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe vapour. Wash hands before breaks and after

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Eye/face protection



work. Keep work clothes separately. Contaminated clothing should be laundered before reuse. Do not eat, drink or smoke at the work place.

Wear protective eye glasses for protection against liquid splashes. Recommended: Eye protection with side protection

Skin protection



Hand protection:

Wear impervious gloves. Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Respiratory protection



Body protection:

Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

In case of inadequate ventilation wear respiratory protection. Open system(s): Wear suitable respiratory protective equipment. A suitable mask with filter type A may be appropriate.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear - Amber Coloured liquid.
Odour	Faint Epoxy Odour
Odour threshold	Not available.
pH	Not established.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate (Water = 1)	Not available.
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	1 @ 118°C (mmHg)
Vapour density	>3.8 (Air = 1)
Relative density	1.15 (H ₂ O = 1)
Solubility(ies)	The substance is essentially insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition Temperature	Not available.
Viscosity	Not available.
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.

Other information

None

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Stable under normal conditions.

Chemical stability

Stable under normal conditions. May decompose if heated.

Possibility of hazardous reactions

Hazardous polymerisation will not occur.

Conditions to avoid

Keep away from heat, sources of ignition and direct sunlight. Keep at temperature not exceeding (°C): 27

Incompatible materials

Flammable liquids, Strong Oxidizing agents, Corrosive Substances, Strong Acids and strong mineral and organic bases, especially primary and secondary aliphatic amines.

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Hazardous decomposition product(s)

Decomposes in a fire giving off toxic fumes: Phenolics, Carbon monoxide and Carbon dioxide.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity - Ingestion

1,3-Benzenediol

Based upon the available data, the classification criteria are not met.
Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.

Acute toxicity (Oral) - Category 4
LD50 (oral,rat) mg/kg: 510 (OECD 401)

Acute toxicity - Inhalation

Based upon the available data, the classification criteria are not met.
Acute Toxicity Estimate Mixture Calculation: Estimated LC50 >20.0 mg/l.

Acute toxicity - Skin Contact

Based upon the available data, the classification criteria are not met.
Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.

Skin corrosion/irritation

Bis-[4-(2,3-epoxypropoxy)phenyl]propane

Skin corrosion/irritation - Category 2: Causes skin irritation.

Skin corrosion/irritation - Category 2

Bisphenol A Diglycidyl Ether

Irritating to skin. (rabbit) (OECD 404)

Skin corrosion/irritation - Category 2

2,3-Epoxypropyl o-tolyl ether

No data

Skin corrosion/irritation - Category 2

1,3-Benzenediol

Not irritating to skin (rabbit) (OECD 404)

Skin corrosion/irritation - Category 2

Irritating to skin. (rabbit) (Flickinger, 1976)

Serious eye damage/irritation

Bis-[4-(2,3-epoxypropoxy)phenyl]propane

Eye damage, category 1: Causes serious eye damage.

Eye Irritation - Category 2

Bisphenol A Diglycidyl Ether

Mildly irritating to eyes. (rabbit) (OECD 405)

Eye Irritation - Category 2

1,3-Benzenediol

No data

Eye damage, category 1

Severely irritating to eyes. (rabbit) (Flickinger, 1976)

Respiratory or skin sensitization

Bis-[4-(2,3-epoxypropoxy)phenyl]propane

Skin sensitization - Category 1: May cause an allergic skin reaction.

Skin sensitization - Category 1

Bisphenol A Diglycidyl Ether

Positive (mouse) (OECD 429)

Skin sensitization - Category 1

2,3-Epoxypropyl o-tolyl ether

No data

Skin sensitization - Category 1

1,3-Benzenediol

Positive (Guinea pig) (OECD 406)

Skin sensitization - Category 1

Positive (mouse) (OECD 429)

Germ cell mutagenicity

2,3-Epoxypropyl o-tolyl ether

Germ cell mutagenicity - Category 2: May cause genetic defects.

Germ cell mutagenicity - Category 2

In vitro: Positive (OECD 471)

In vivo: Negative (mouse) (OECD 474)

Carcinogenicity

Reproductive toxicity

STOT - single exposure

1,3-Benzenediol

Based upon the available data, the classification criteria are not met.

Based upon the available data, the classification criteria are not met.

Specific target organ toxicity — single exposure, Category 1: Causes damage to organs: Central nervous system and Blood

Specific target organ toxicity — single exposure, Category 2: May cause damage to organs: Respiratory system

Specific target organ toxicity — single exposure, Category 1

LD50 (oral,rat) mg/kg: 510. Dyspnoea. Can form methaemoglobin in the blood, causing cyanosis. (OECD 420)

Specific target organ toxicity — single exposure, Category 2

The ingestion of significant quantities may cause damage to lungs.

Based upon the available data, the classification criteria are not met.

Based upon the available data, the classification criteria are not met.

STOT - repeated exposure

Aspiration hazard

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Other information

None known.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity	Aquatic toxicity, Chronic - Category 2; Toxic to aquatic life with long lasting effects. Estimated Mixture LC50 > 1 ≤ 10 mg/l. (Fish)
Bis-[4-(2,3-epoxipropoxy)phenyl]propane	Aquatic toxicity, Chronic - Category 2 Acute: LC50 (fish) mg/l (96 hour) 1.5 (OECD 203) Chronic: No data
Bisphenol A Diglycidyl Ether	Aquatic toxicity, Chronic - Category 2 Acute: No data Chronic: No data
2,3-Epoxypropyl o-tolyl ether	Aquatic toxicity, Chronic - Category 2 Acute: LC50 (fish) mg/l 2.8 (OECD 203) Chronic: No data
1,3-Benzenediol	Aquatic toxicity, Acute - Category 1 Aquatic toxicity, Chronic - Category 3 Acute: LC50 (Fathead minnow) mg/l (96 hour) 26.8 (EPA-660/3/75-009) Chronic: EC50 (Fish) mg/l (60 days) 260 (Van Leeuwen, 1990)
Persistence and degradability	Part of the components are poorly biodegradable. Not readily biodegradable
Bis-[4-(2,3-epoxipropoxy)phenyl] propane:	Water % Degradation: 5% (28 days) (OECD 301 F)
Bisphenol A Diglycidyl Ether:	No data
2,3-Epoxypropyl o-tolyl ether:	Not readily biodegradable Water % Degradation: ~1 - ~4% (28 days) (OECD 301 B)
Resorcinol:	Readily biodegradable. Water % Degradation: 100% (14 days) (OECD 301 C)
Bioaccumulative potential	The product has low potential for bioaccumulation.
Bis-[4-(2,3-epoxipropoxy)phenyl] propane:	The substance has low potential for bioaccumulation. Bioconcentration factor (BCF) : 31 ((Q)SAR) (Unnamed publication, 2010)
Bisphenol A Diglycidyl Ether:	No data
2,3-Epoxypropyl o-tolyl ether:	No data - Can be waived on basis of: Log Koc : ≤ 3
Resorcinol:	The substance has low potential for bioaccumulation. Bioconcentration factor (BCF) : 3.16 (EPA, 2000)
Mobility in soil	The product is predicted to have low mobility in soil (Insoluble in water).
Bis-[4-(2,3-epoxipropoxy)phenyl] propane:	The substance has moderate mobility in soil. Log Koc: 2.65 ((Q)SAR) (Unnamed publication, 2010)
Bisphenol A Diglycidyl Ether:	No data
2,3-Epoxypropyl o-tolyl ether:	The substance has moderate mobility in soil. Log Koc: 2.32 (OECD 121)
Resorcinol:	The substance has high mobility in soil. Log Koc: 0.98 (Schuurmann, G et al. 2006)
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Dispose of this material and its container as hazardous waste. Send after pre-treatment to a appropriate hazardous waste incinerator facility according to legislation.

SECTION 14: TRANSPORT INFORMATION

	ADR/RID	IMDG	IATA/ICAO
14.1 UN number	UN 3082	UN 3082	UN 3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Bis-[4-	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Bis-[4-	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Contains: Bis-[4-

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	(2,3-epoxipropoxi)phenyl]propane)	(2,3-epoxipropoxi)phenyl]propane)	(2,3-epoxipropoxi)phenyl]propane)
14.3	Transport hazard class(es)	9	9
14.4	Packing group	III	III
14.5	Environmental hazards	Environmentally hazardous substance.	Classified as a Marine Pollutant.
14.6	Special precautions for user	See Section: 2	Environmentally hazardous substance.
14.7	Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable	

SECTION 15: REGULATORY INFORMATION

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

National regulations

CEPA, Domestic Substances List

CEPA, Priority Substances List

CEPA, List of Toxic Substances (Schedule 1)

CEPA, National Pollutant Release Inventory

CEPA, Environmental Emergency Regulations

Non-Regional

IARC Monographs, List of Classifications

Bis-[4-(2,3-epoxipropoxi)phenyl]propane: Yes

Bisphenol A Diglycidyl Ether: Yes

2,3-Epoxypropyl o-tolyl ether: Yes

1,3-Benzenediol: Yes

All chemicals are not listed

All chemicals are not listed

All chemicals are not listed

All chemicals are not listed

Bis-[4-(2,3-epoxipropoxi)phenyl]propane: IARC Classification: Group 3.

1,3-Benzenediol: IARC Classification: Group 3.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated substance / mixture classification. Updated version and date. Please review SDS with care. See below -

Sections indicated with the following have been revised:

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References:

Existing Safety Data Sheet (SDS).

EU: Harmonised Classification(s) for Bis-[4-(2,3-epoxipropoxi)phenyl]propane (CAS No. 1675-54-3), 2,3-Epoxypropyl o-tolyl ether (CAS No. 2210-79-9), 1,3-Benzenediol (CAS No. 108-46-3). Existing ECHA registration(s) for Bis-[4-(2,3-epoxipropoxi)phenyl]propane (CAS No. 1675-54-3), 1,3-Benzenediol (CAS No. 108-46-3) and the Classification and Labelling Inventory for Bisphenol A Diglycidyl Ether (CAS No. 25085-99-8).

Literature References:

1. Flickinger, C.W. 1976. The benzenediols: catechol, resorcinol and hydroquinone - a review of the industrial toxicology and current industrial exposure limits. American Industrial Hygiene Association Journal, 37:596-606.
2. Van Leeuwen, C.J., Grootelaar, E.M.M., Niebeek, G. 1990. Fish embryos as teratogenicity screens: a comparison of embryotoxicity between fish and birds. Ecotoxicology and Environmental Safety 20:42-52. Reprinted with permission from Elsevier.

LEGEND

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS	Chemical Abstracts Service
CEPA	Canadian Environmental Protection Act
EC	European Community
ECHA	European Chemicals Agency

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EU	European Union
IATA	International Air Transport Association
IARC	International Agency for Research on Cancer
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
LC50	Lethal concentration at which 50% of the population is killed
LD50	Lethal dose at which 50% of the population is killed
LTEL	Long term exposure limit
OECD	Organisation for Economic Cooperation and Development
OSHA	Occupational Safety and Health Administration
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
STEL	Short term exposure limit
TWA	Time Weighted Average
UN	United Nations

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