SAFETY DATA SHEET

Creation Date Oct-2013 **Revision Date** Oct-2018 **Revision Number** 2

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

1.1. Product identification

Product Description:	**Tetrachloroethylene**
Product Grade:	SQ
Cat No. :	Q34305
Synonyms	Perchloroethylene
CAS-No	127-18-4
EC-No.	204-825-9
Molecular Formula	C2 Cl4
Reach Registration Number	01-2119475329-28

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

Recommended Use	Laboratory chemicals.
Sector of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
Product category	PC21 - Laboratory chemicals
Process categories	PROC15 - Use as a laboratory reagent
Environmental release category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Uses advised against	No Information available

1.3. Details of the supplier of the safety data sheet

Company	Thermo Fisher Scientific India Pvt. Ltd 403-404, B-wing, Delphi, Hiranandani Business Park, Powai, Mumbai 400076, INDIA.
E-mail address	laboratorysolutions@thermofisher.com

1.4. Emergency telephone number

India Toll Free: 18 00 22 22 30
Chemtrec US: (800)424-9300
Chemtrec EU: 001(202)483-7616

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Based on available data, the classification criteria are not met

Health hazards

Skin Corrosion/irritation	Category 2 (H315)
Serious Eye Damage/Eye Irritation	Category 2 (H319)
Skin Sensitization	Category 1 (H317)
Carcinogenicity	Category 2 (H351)
Specific target organ toxicity - (single exposure)	Category 3 (H336)

Environmental hazards

Chronic aquatic toxicity	Category 2 (H411)

2.2. Label elements

Signal Word **Warning**

Hazard Statements

H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H336 - May cause drowsiness or dizziness
H351 - Suspected of causing cancer
H411 - Toxic to aquatic life with long lasting effects

Precautionary Statements

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P333 + P313 - If skin irritation or rash occurs: Get medical advice/ attention
P337 + P313 - If eye irritation persists: Get medical advice/ attention
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P312 - Call a POISON CENTER or doctor/ physician if you feel unwell
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection

2.3. Other hazards

No information available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Component	CAS-No	EC-No.	Weight %	CLP Classification - Regulation (EC) No 1272/2008
Tetrachloroethylene	127-18-4	EEC No. 204-825-9	>95	Skin Irrit. 2 (H315) Skin Sens. 1 (H317) Eye Irrit. 2 (H319) STOT SE 3 (H336) Carc. 2 (H351) Aquatic Chronic 2 (H411)

Reach Registration Number	01-2119475329-28

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General Advice If symptoms persist, call a physician.

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.
Ingestion	Clean mouth with water and drink afterwards plenty of water.
Inhalation	Move to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.
Protection of First-aiders	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

4.2. Most important symptoms and effects, both acute and delayed

None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically. Symptoms may be delayed.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated.

Hazardous Combustion Products
Chlorine, Hydrogen chloride gas, Phosgene.

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Ensure adequate ventilation.

6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Ensure adequate ventilation. Avoid ingestion and inhalation.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Wash hands before breaks and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from sunlight.

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits
List source(s): **UK** - EH40/2005 Containing the workplace exposure limits (WELs) for use with the Control of Substances Hazardous to Health Regulations (COSHH) 2002 (as amended). Updated by September 2006 official press release and October 2007 Supplement. **IRE -** 2010 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. Published by the Health and Safety Authority.

Component	European Union	The United Kingdom	France	Belgium	Spain
Tetrachloroethylene		STEL: 100 ppm 15 min STEL: 689 mg/m³ 15 min TWA: 50 ppm 8 hr TWA: 345 mg/m³ 8 hr	TWA / VME: 20 ppm (8 heures). restrictive limit TWA / VME: 138 mg/m³ (8 heures). restrictive limit STEL / VLCT: 40 ppm. restrictive limit STEL / VLCT: 275 mg/m³. restrictive limit	TWA: 25 ppm 8 uren TWA: 172 mg/m³ 8 uren STEL: 100 ppm 15 minuten STEL: 695 mg/m³ 15 minuten	STEL / VLA-EC: 100 ppm (15 minutos). STEL / VLA-EC: 689 mg/m³ (15 minutos). TWA / VLA-ED: 25 ppm (8 horas) TWA / VLA-ED: 172 mg/m³ (8 horas)

Component	Italy	Germany	Portugal	The Netherlands	Finland
Tetrachloroethylene		TWA: 20 ppm (8 Stunden). AGW - exposure factor 2 TWA: 138 mg/m³ (8 Stunden). AGW - exposure factor 2 Haut	STEL: 100 ppm 15 minutos TWA: 25 ppm 8 horas		TWA: 10 ppm 8 tunteina TWA: 70 mg/m³ 8 tunteina

Component	Austria	Denmark	Switzerland	Poland	Norway
Tetrachloroethylene	MAK-KZW: 200 ppm 15 Minuten MAK-KZW: 1380 mg/m³ 15 Minuten MAK-TMW: 50 ppm 8 Stunden MAK-TMW: 345 mg/m³ 8 Stunden	TWA: 10 ppm 8 timer TWA: 70 mg/m³ 8 timer Hud	Haut/Peau STEL: 100 ppm 15 Minuten STEL: 690 mg/m³ 15 Minuten TWA: 50 ppm 8 Stunden TWA: 345 mg/m³ 8 Stunden	STEL: 170 mg/m³ 15 minutach TWA: 85 mg/m³ 8 godzinach	TWA: 6 ppm 8 timer TWA: 40 mg/m³ 8 timer STEL: 6 ppm 15 minutter. STEL: 40 mg/m³ 15 minutter. Hud

Component	Bulgaria	Croatia	Ireland	Cyprus	Czech Republic
Tetrachloroethylene	TWA: 120.0 mg/m³	TWA-GVI: 50 ppm 8 satima. TWA-GVI: 345 mg/m³ 8 satima. STEL-KGVI: 100 ppm 15 minutama. STEL-KGVI: 689 mg/m³ 15 minutama.	TWA: 25 ppm 8 hr. TWA: 170 mg/m³ 8 hr. STEL: 100 ppm 15 min STEL: 678 mg/m³ 15 min		TWA: 250 mg/m³ 8 hodinách. Potential for cutaneous absorption Ceiling: 750 mg/m³

Component	Estonia	Gibraltar	Greece	Hungary	Iceland
Tetrachloroethylene	TWA: 10 ppm 8 tundides. TWA: 70 mg/m³ 8 tundides. STEL: 25 ppm 15 minutites. STEL: 170 mg/m³ 15 minutites.		STEL: 150 ppm STEL: 1000 mg/m³ TWA: 50 ppm TWA: 335 mg/m³	STEL: 50 mg/m³ 15 percekben. CK TWA: 50 mg/m³ 8 órában. AK lehetséges borön keresztüli felszívódás	TWA: 10 ppm 8 klukkustundum. TWA: 20 ppm 8 klukkustundum. regulated under Tetrachloroethene TWA: 70 mg/m³ 8 klukkustundum. Skin notation Ceiling: 20 ppm Ceiling: 140 mg/m³ Ceiling: 40 ppm regulated under Tetrachloroethylene

Component	Latvia	Lithuania	Luxembourg	Malta	Romania
Tetrachloroethylene	TWA: 10 mg/m³	TWA: 10 ppm IPRD TWA: 70 mg/m³ IPRD STEL: 25 ppm STEL: 170 mg/m³			TWA: 7 ppm 8 ore TWA: 50 mg/m³ 8 ore STEL: 14 ppm 15 minute STEL: 100 mg/m³ 15 minute

Component	Russia	Slovak Republic	Slovenia	Sweden	Turkey
Tetrachloroethylene	TWA: 10 mg/m³ STEL: 30 mg/m³ vapor	Ceiling: 690 mg/m³ Potential for cutaneous absorption TWA: 50 ppm TWA: 345 mg/m³	TWA: 50 ppm 8 urah TWA: 345 mg/m³ 8 urah Koža STEL: 200 ppm 15 minutah STEL: 1380 mg/m³ 15 minutah	STV: 25 ppm 15 minuter STV: 170 mg/m³ 15 minuter LLV: 10 ppm 8 timmar. LLV: 70 mg/m³ 8 timmar.	

Biological limit values
List source(s):

Component	European Union	United Kingdom	France	Spain	Germany
Tetrachloroethylene			Perchloroethylene: 1 mg/L blood prior to last shift of workweek Trichloroacetic acid: 7 mg/L urine end of workweek	Perchloroethylene: 3 ppm alveolar air start of last shift of workweek end-cut of exhaled air Perchloroethylene: 0.5 mg/L blood start of last shift of workweek	Tetrachloroethylene: 0.4 mg/L whole blood (before last shift of work week)

Component	Italy	Finland	Denmark	Bulgaria	Romania
Tetrachloroethylene		Tetrachloroethylene concentrated: 1.2 µmol/L blood prior to shift.			Trichloroethanol +Trichloroacetic acid: 300 mg/g Creatinine urine end of work week

Component	Gibraltar	Latvia	Slovak Republic	Luxembourg	Turkey
Tetrachloroethylene			Tetrachloroethylene: 0.5 mg/L blood before the next work shift Acetic acid: 3.5 mg/L		

			urine end of exposure or work shift		

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
MDHS70 General methods for sampling airborne gases and vapours
MDHS 96 Volatile organic compounds in air - Laboratory method using pumped solid sorbent tubes, solvent desorption and gas chromatography

Derived No Effect Level (DNEL) Workers

Route of exposure	Acute effects (local)	Acute effects (systemic)	Chronic effects (local)	Chronic effects (systemic)
Oral				39.4 mg/kg/bw/day
Dermal				275 mg/m³
Inhalation	138 mg/m³	138 mg/m³	275 mg/m³	

Predicted No Effect Concentration (PNEC) See values below.

Fresh water	0.051 mg/l
Fresh water sediment	0.903
Marine water	0.0051 mg/l
Marine water sediment	0.0903 mg/kg
Water Intermittent	0.0364 mg/l
Microorganisms in sewage treatment	11.2 mg/l
Soil (Agriculture)	0.01 mg/kg

8.2. Exposure controls

Engineering Measures
Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.
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 Goggles (European standard - EN 166)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber	> 480 minutes	0.38 mm	Level 6	As tested under EN374-3 Determination of
Viton (R)	> 480 minutes	0.3 mm	EN 374	Resistance to Permeation by Chemicals

Skin and body protection Long sleeved clothing

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.

Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

Large scale/emergency use Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
Recommended Filter type: Organic gases and vapours filter Type A Brown conforming to EN14387

Small scale/Laboratory use Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure

limits are exceeded or if irritation or other symptoms are experienced.
Recommended half mask:- Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141
When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls Prevent product from entering drains. Do not allow material to contaminate ground water system.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Colorless	
Physical State	Liquid	
Odor	Characteristic, sweet	
Odor Threshold	No data available	
pH	No information available	
Melting Point/Range	-22 °C / -7.6 °F	
Softening Point	No data available	
Boiling Point/Range	120 - 122 °C / 248 - 251.6 °F	@ 760 mmHg
Flash Point	No information available	**Method -** No information available
Evaporation Rate	6.0 (Ether = 1.0)	
Flammability (solid,gas)	Not applicable	Liquid
Explosion Limits	No data available	
Vapor Pressure	18 mbar @ 20 °C	
Vapor Density	No data available	(Air = 1.0)
Specific Gravity / Density	1.625 1.619	
Bulk Density	Not applicable	Liquid
Water Solubility	0.15 g/L (20°C)	practically insoluble
Solubility in other solvents	No information available	

Partition Coefficient (n-octanol/water)

Component	**log Pow**
Tetrachloroethylene	2.88

Autoignition Temperature	No data available
Decomposition Temperature	> 150°C
Viscosity	0.89 mPa s at 20 °C
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

Molecular Formula	C2 Cl4
Molecular Weight	165.83

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

10.4. Conditions to avoid

Incompatible products. Excess heat. Exposure to moist air or water.

10.5. Incompatible materials

Strong acids. Strong oxidizing agents. Strong bases. Metals. Zinc. Amines. Aluminium.

10.6. Hazardous decomposition products

Chlorine. Hydrogen chloride gas. Phosgene.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Product Information

(a) acute toxicity;

Oral Based on available data, the classification criteria are not met
Dermal Based on available data, the classification criteria are not met
Inhalation Based on available data, the classification criteria are not met

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Tetrachloroethylene	LD50 = 2629 mg/kg (Rat)	LD50 > 10000 mg/kg (Rat)	LC50 = 27.8 mg/L (Rat) 4 h

(b) skin corrosion/irritation; Category 2

(c) serious eye damage/irritation; Category 2

(d) respiratory or skin sensitization;

Respiratory Based on available data, the classification criteria are not met
Skin Category 1

No information available

(e) germ cell mutagenicity; Based on available data, the classification criteria are not met

(f) carcinogenicity; Category 2

The table below indicates whether each agency has listed any ingredient as a carcinogen

Component	EU	UK	Germany	IARC
Tetrachloroethylene			Cat. 3 Cat. 3B	Group 2A

(g) reproductive toxicity; Based on available data, the classification criteria are not met

(h) STOT-single exposure; Category 3

Results / Target organs Central nervous system (CNS).

(i) STOT-repeated exposure; Based on available data, the classification criteria are not met

Target Organs None known.

(j) aspiration hazard; Based on available data, the classification criteria are not met

Other Adverse Effects Tumorigenic effects have been reported in experimental animals.

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Tetrachloroethylene	LC50: 4.73 - 5.27 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: 11.0 - 15.0 mg/L, 96h static (Lepomis macrochirus) LC50: 8.6 - 13.5 mg/L, 96h static (Pimephales promelas) LC50: 12.4 - 14.4 mg/L, 96h flow-through (Pimephales promelas)	EC50: 6.1 - 9.0 mg/L, 48h Static (Daphnia magna)	EC50: > 500 mg/L, 96h (Pseudokirchneriella subcapitata)	EC50 = 100 mg/L 24 h EC50 = 112 mg/L 24 h EC50 = 120.0 mg/L 30 min

12.2. Persistence and degradability

Persistence Insoluble in water, Persistence is unlikely, based on information available.

Degradation in sewage treatment plant Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential May have some potential to bioaccumulate

Component	log Pow	Bioconcentration factor (BCF)
Tetrachloroethylene	2.88	25.8 - 77.1 OECD 305C

12.4. Mobility in soil Spillage unlikely to penetrate soil The product is insoluble and sinks in water The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces . Is not likely mobile in the environment due its low water solubility. Will likely be mobile in the environment due to its volatility.

12.5. Results of PBT and vPvB assessment No data available for assessment.

12.6. Other adverse effects

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Tetrachloroethylene	Group II Chemical		

Persistent Organic Pollutant This product does not contain any known or suspected substance

Ozone Depletion Potential This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues / Unused Products Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

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

European Waste Catalogue (EWC) According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.

Other Information Do not dispose of waste into sewer. Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Do not let this chemical enter the environment.

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO

14.1. UN number	UN1897
14.2. UN proper shipping name	TETRACHLOROETHYLENE
14.3. Transport hazard class(es)	6.1
Subsidiary Hazard Class	P
14.4. Packing group	III

ADR

14.1. UN number	UN1897
14.2. UN proper shipping name	TETRACHLOROETHYLENE
14.3. Transport hazard class(es)	6.1
14.4. Packing group	III

IATA

14.1. UN number	UN1897
14.2. UN proper shipping name	TETRACHLOROETHYLENE
14.3. Transport hazard class(es)	6.1
14.4. Packing group	III

14.5. Environmental hazards Dangerous for the environment
Product is a marine pollutant according to the criteria set by IMDG/IMO

14.6. Special precautions for user No special precautions required

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

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

International Inventories X = listed

Component	EINECS	ELINCS	NLP	TSCA	DSL	NDSL	PICCS	ENCS	IECSC	AICS	KECL
Tetrachloroethylene	204-825-9	-		X	X	-	X	X	X	X	X

National Regulations

Component	Germany - Water Classification (VwVwS)	Germany - TA-Luft Class
Tetrachloroethylene	WGK 3	Class I : 20 mg/m³ (Massenkonzentration)

Component	France - INRS (Tables of occupational diseases)
Tetrachloroethylene	Tableaux des maladies professionnelles (TMP) - RG 3,RG 12

Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment.
Take note of Dir 94/33/EC on the protection of young people at work
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H336 - May cause drowsiness or dizziness

H351 - Suspected of causing cancer
H411 - Toxic to aquatic life with long lasting effects

Legend

CAS - Chemical Abstracts Service
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japanese Existing and New Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
DNEL - Derived No Effect Level
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
NOEC - No Observed Effect Concentration
PBT - Persistent, Bioaccumulative, Toxic

TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
PNEC - Predicted No Effect Concentration
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%
POW - Partition coefficient Octanol:Water
vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
MARPOL - International Convention for the Prevention of Pollution from Ships
ATE - Acute Toxicity Estimate
VOC - Volatile Organic Compounds

Key literature references and sources for data
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

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.
Chemical incident response training.

Creation Date	Oct-2013
Next Revision Date	Oct-2023
Revision Summary	SDS section 1 updated and update of Format.

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

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