



SAFETY DATA SHEET BENZOYL CHLORIDE REVISION 4, DATE 29 MAY 21

1. IDENTIFICATION

Product Name	Benzoyl Chloride
Other Names	Benzenecarbonyl chloride
Uses	Used in analytical chemistry, synthesis of organic products.
Chemical Family	No Data Available
Chemical Formula	C ₇ H ₅ ClO
Chemical Name	Benzoyl chloride
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887



2. HAZARD IDENTIFICATION

Poisons Schedule (Aust)

Not Scheduled



Globally Harmonised System

Hazard Classification		Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)	
Hazard Categories		Flammable Liquids - Category 4 Acute Toxicity (Oral) - Category 4 Acute Toxicity (Dermal) - Category 4 Acute Toxicity (Inhalation) - Category 3 Skin Corrosion/Irritation - Category 1B Serious Eye Damage/Irritation - Category 1 Sensitisation (Skin) - Category 1B	
Pictograms		 	
Signal Word		Danger	
Hazard Statements		H227 H302 + H312 H314 H317 H331	Combustible liquid. Harmful if swallowed or in contact with skin. Causes severe skin burns and eye damage. May cause an allergic skin reaction. Toxic if inhaled.
Precautionary Statements	Prevention	P260	Do not breathe fume/gas/mist/vapours/spray.
		P270	Do not eat, drink or smoke when using this product.
		P271	Use only outdoors or in a well-ventilated area.
		P272	Contaminated work clothing should not be allowed out of the workplace.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
		P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
	Response	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.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
		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.
		P333 + P313	If skin irritation or rash occurs: Get medical attention.
		P363	Wash contaminated clothing before reuse.
		P370 + P378	In case of fire: Use carbon dioxide (CO2), dry chemical, regular foam extinguishing agent or water spray for extinction.
	Storage	P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
		P405	Store locked up.
	Disposal	P501	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification

Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications

Physical

Hazards

3.1D

Flammable liquid - low hazard

Health Hazards

6.1C

Substances that are acutely toxic- Toxic

6.1D

Substances that are acutely toxic - Harmful

6.5B

Substances that are contact sensitisers

8.2B

Substances that are corrosive to dermal tissue UN PGII

8.3A

Substances that are corrosive to ocular tissue

3. COMPOSITION/INFORMATION ON INGREDIENTS**Ingredients**

Chemical Entity	Formula	CAS Number	Proportion
Benzoyl chloride	C7H5ClO	98-88-4	<=100 %

4. FIRST AID MEASURES**Description of necessary measures according to routes of exposure****Swallowed**

IF SWALLOWED: Rinse mouth, then drink plenty of water (two glasses at most). Do NOT induce vomiting (risk of perforation). Immediately call a Poison Centre or doctor/physician for advice. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Never give anything by mouth to an unconscious person.

*Do not attempt to neutralise.

Eye

IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 - 20 minutes. Immediately call a Poison Centre or doctor/physician for advice.

*Do not apply neutralizing agents.

Skin

IF ON SKIN: Immediately flush skin with running water for at least 15 - 20 minutes while removing contaminated clothing and shoes. For minor skin contact, avoid spreading material on unaffected skin. Immediately call a Poison Centre or doctor/physician for advice. Wash contaminated clothing and shoes before reuse.

*Do not apply (chemical) neutralizing agents. Do not forcibly remove clothing if it adheres to the skin (requires medical assistance). Cover wounds with sterile bandage.

Inhaled

IF INHALED: Remove victim to fresh air and keep warm and at rest in a position comfortable for breathing. Give artificial respiration if victim is not breathing. Immediately call a Poison Centre or doctor/physician for advice. 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. Administer oxygen if breathing is difficult.

Advice to Doctor

Show this material safety data sheet (SDS) to the doctor in attendance. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Keep victim calm and warm. Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

Medical Conditions Aggravated by Exposure

No information available.

5. FIRE FIGHTING MEASURES

General Measures	Move containers from fire area if you can do it without risk. Cool containers with flooding quantities of water until well after fire is out. Do not get water inside containers.
Flammability Conditions	Combustible liquid; May burn but does not ignite readily.
Extinguishing Media	Use Carbon dioxide (CO ₂) or dry powder for extinction. When material is not involved in fire, do NOT use water on material itself. *Large fire: Flood fire area with large quantities of water, while knocking down vapours with water fog. If insufficient water supply: knock down vapours only.
Fire and Explosion Hazard	Risk of violent reaction or explosion! Substance will react with water, releasing corrosive and/or toxic gases and runoff. Forms explosive mixtures with air on intense heating. Flammable/toxic gases may accumulate in confined areas. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water. *Reaction with water may generate much heat that will increase the concentration of fumes in the air.
Hazardous Products of Combustion	Fire will produce irritating, corrosive and/or toxic gases, including Carbon oxides, Hydrogen chloride gas, Phosgene.
Special Fire Fighting Instructions	Prevent fire extinguishing water from contaminating surface water or the ground water system.
Personal Protective Equipment	Wear positive pressure self-contained breathing apparatus (SCBA). Wear chemical protective clothing. It may provide little or no thermal protection. Structural firefighters' protective clothing provides limited protection in fire situations.
Flash Point	72 °C [Closed cup]
Lower Explosion Limit	2.5 %
Upper Explosion Limit	27 %
Auto Ignition Temperature	600 °C
Hazchem Code	4W

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation - Ventilate enclosed areas before entering. ELIMINATE all ignition sources. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not breathe vapours and prevent contact with eyes, skin and clothing.
Clean Up Procedures	Cover with dry earth, dry sand or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain. Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal (see SECTION 13).
Containment	Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
Decontamination	Clean up affected area.
Environmental Precautionary Measures	Spillages and decontamination runoff should be prevented from entering drains and watercourses.
Evacuation Criteria	Immediately isolate spill or leak area. Keep unauthorised personnel away. Stay upwind and/or uphill.
Personal Precautionary Measures	Wear positive pressure self-contained breathing apparatus (SCBA). Fully encapsulating, vapour-protective clothing should be worn for spills and leaks with no fire. Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation - Work under hood. Handle in accordance with good industrial hygiene and safety practice. Keep workplace dry. Do not allow product to come into contact with water! Avoid generation of vapours/aerosols. Do not breathe vapours/aerosols and prevent contact with eyes, skin and clothing. Do not ingest. Wear protective gloves/protective clothing/eye protection/face protection (see SECTION 8). Keep away from heat, hot surfaces, sparks,
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open flames and other ignition sources - No smoking. Take precautionary measures against static discharges.

Storage

Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Keep away from incompatible materials (see SECTION 10). Store locked up & in an area accessible only to qualified or authorized persons.

Container

Keep only in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**General**

Australian Exposure Standards:

- No specific exposure standards are available.

International Exposure Standards:

- An exposure limit of 2.8 - 5.0 mg/m³ (0.5 ppm) time weighted average (TWA) in different countries such as Austria, Bulgaria, Hungary, Latvia, Norway, Switzerland, the USA (Alaska, Hawaii) and Venezuela [NICNAS].

Exposure Limits

No Data Available

Biological Limits

No information available.

Engineering Measures

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.

Personal Protection Equipment

- Respiratory protection: Respiratory protection required when vapours/aerosols are generated. Recommended: Full facepiece (or half facepiece with appropriate eye protection) Organic vapour/Acid gas respirator (refer to AS/NZS 1715 & 1716).

- Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Tightly fitting safety goggles. Use equipment for eye protection tested and approved under appropriate government standards.

- Hand protection: Wear protective gloves. Recommended: Viton® (Full contact). Chloroprene (Splash contact).

- Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Acid-resistant protective clothing.

Special Hazards Precautions

No information available.

Work Hygienic Practices

Do not eat, drink or smoke when using this product. Wash hands and face after working with substance. Immediately change contaminated clothing. Contaminated work clothing should not be allowed out of the workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES**Physical State**

Liquid

Appearance

Fuming liquid

Odour

Irritating/pungent

Colour

Colourless

*On exposure to air, light brown

pH

2 (0.01% w/w)

Vapour Pressure

0.84 hPa (@ 25 °C)

Relative Vapour Density

4.9 Air = 1

Boiling Point

197.2 °C (760 mmHg)

Melting Point

-1 °C

Freezing Point

No Data Available

Solubility

No Data Available

Specific Gravity

1.21

Flash Point

72 °C [Closed cup]

Auto Ignition Temp

600 °C

Evaporation Rate

No Data Available

Bulk Density

No Data Available

Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	1212 kg/m ³ (Absolute density)
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	Log Kow: 1.44 [Estimated value]
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	0.0012 Pa.s (Dynamic viscosity) - 1 mm ² /s (Kinematic viscosity) (@ 30 °C)
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	- Surface tension: 0.03917 N/m @ 20 °C - Saturation concentration: 2.9 g/m ³ - Absolute density 1212 kg/m ³
Potential for Dust Explosion	Not applicable.
Fast or Intensely Burning Characteristics	Risk of violent reaction or explosion!
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	Substance will react with water, releasing corrosive and/or toxic gases and runoff. **Reaction with water may generate much heat that will increase the concentration of fumes in the air.
Properties That May Initiate or Contribute to Fire Intensity	Combustible liquid; May burn but does not ignite readily.
Reactions That Release Gases or Vapours	Fire/decomposition will produce irritating, corrosive and/or toxic gases, including Carbon oxides, Hydrogen chloride gas, Phosgene.
Release of Invisible Flammable Vapours and Gases	Forms explosive mixtures with air on intense heating. Contact with metals may evolve flammable hydrogen gas.

10. STABILITY AND REACTIVITY

General Information	Reacts violently with many compounds! - Violent reactions possible with: Water, Alkali metals, Alkaline earth metals, alkalines, Amines, sulfoxides, Alcohols, Strong oxidizing agents. - Risk of ignition or formation of inflammable gases or vapours with: Metals. - Risk of explosion with: dimethyl sulfoxide, aluminium chloride, sodium azide.
Chemical Stability	The product is chemically stable under standard ambient conditions (room temperature). *Unstable on exposure to moisture. Unstable on exposure to air.
Conditions to Avoid	Avoid strong heating. Do not allow product to come into contact with water.
Materials to Avoid	Incompatible/reactive with water, various metals, alkalis, strong oxidising agents.
Hazardous Decomposition Products	Fire/decomposition will produce irritating, corrosive and/or toxic gases, including Carbon oxides, Hydrogen chloride gas, Phosgene.
Hazardous Polymerisation	No information available.

11. TOXICOLOGICAL INFORMATION

General Information

- Acute toxicity: Harmful if swallowed and in contact with skin. Toxic if inhaled. Acute symptoms after ingestion: Vomiting, Abdominal pain, Diarrhoea, Burns to the gastric/intestinal mucosa. Acute symptoms after inhalation: Nausea, Headache, Dry/sore throat, Coughing, Possible oedema of the upper respiratory tract, Possible inflammation of the respiratory tract, Risk of pneumonia, Respiratory difficulties, Risk of lung oedema.
- Skin corrosion/irritation: Causes severe skin burns. Caustic burns/corrosion of the skin.
- Eye damage/irritation: Causes serious eye damage. Corrosion of the eye tissue.
- Respiratory/skin sensitisation: May cause an allergic skin reaction. Not classified as sensitizing for inhalation.
- Germ cell mutagenicity: Not classified for mutagenic or genotoxicity.
- Carcinogenicity: Not classified for carcinogenicity.
- Reproductive toxicity: Not classified for reprotoxic or developmental toxicity.
- STOT (single exposure): Not classified for subchronic toxicity. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract.
- STOT (repeated exposure): Chronic effects on continuous/repeated exposure/contact: May stain the skin, Skin rash/inflammation, Coughing, Nosebleeds, Respiratory difficulties, Lung tissue effects/degeneration.
- Aspiration toxicity: No information available.

Acute**Ingestion**

- Acute toxicity (Oral):
- LD50, Rat (female): 1,900 mg/kg bw [Experimental value; OECD 401].
 - LD50, Rat (male): 3,619 mg/kg bw [Experimental value; OECD 401].

Inhalation

- Acute toxicity (Inhalation):
- LC50, Rat (male): 1.45 mg/l (4 h) (vapours) [Experimental value].
 - LC50, Rat (female): >1.98 mg/l (4 h) (vapours) [Experimental value].

Carcinogen Category

None

12. ECOLOGICAL INFORMATION**Ecotoxicity**

- Aquatic toxicity:
- LC50, Fishes (*Pimephales promelas*): 34.7 mg/l (96 h) (static system) [Freshwater; Experimental value; EPA 660/3-75/009].
 - LC50, Invertebrates (*Palaemonetes pugio*): 180 mg/l (96 h) [Experimental value; Nominal concentration; EPA 660/3-75/009].
 - NOEC, Algae/aquatic plants (*Pseudokirchneriella subcapitata*): 21.34 mg/l (72 h) [Experimental value; Growth rate; OECD 201].
 - EC50, Algae/aquatic plants (*Pseudokirchneriella subcapitata*): 85 - 110 mg/l (72 h) [Experimental value; Growth rate; OECD 201].

Persistence/Degradability

- Readily biodegradable in water. Hydrolysis in water.
- Biodegradation in water: 95 % Oxygen consumption (20 days) [Experimental value; OECD 301D: Closed bottle test].
 - Half-life, soil (t1/2 soil): <1 day

Mobility

No information available.

Environmental Fate

Harmful to algae. Slightly harmful to crustacea. Prevent soil and water pollution.

Bioaccumulation Potential

- Low potential for bioaccumulation (Log Kow < 4).
- Log Kow: 1.44 [Estimated value].

Environmental Impact

No Data Available

13. DISPOSAL CONSIDERATIONS**General Information**

Recycle/reuse. Remove waste in accordance with local and/or national regulations. Remove to an incinerator for chlorinated waste materials with energy recovery.

Special Precautions for Land Fill

Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name	BENZOYL CHLORIDE
Class	8 Corrosive Substances
Subsidiary Risk(s)	C1 Combustible Liquids - Flash Point >60°C - <=93°C, Closed Cup
EPG	39 Toxic And/Or Corrosive Substances Combustible - Water Reactive
UN Number	1736
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

Land Transport (Malaysia)

ADR Code

Proper Shipping Name	BENZOYL CHLORIDE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	39 Toxic And/Or Corrosive Substances Combustible - Water Reactive
UN Number	1736
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

Land Transport (New Zealand)

NZS5433

Proper Shipping Name	BENZOYL CHLORIDE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	39 Toxic And/Or Corrosive Substances Combustible - Water Reactive
UN Number	1736
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

Land Transport (United States of America)

US DOT

Proper Shipping Name	BENZOYL CHLORIDE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	137 Substances - Water-Reactive - Corrosive
UN Number	1736
Hazchem	4W
Pack Group	II

Special Provision No Data Available

Sea Transport

IMDG Code

Proper Shipping Name	BENZOYL CHLORIDE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1736
Hazchem	4W
Pack Group	II
Special Provision	No Data Available
EMS	F-A, S-B
Marine Pollutant	No

Air Transport

IATA DGR

Proper Shipping Name	BENZOYL CHLORIDE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1736
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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15. REGULATORY INFORMATION

General Information No Data Available

Poisons Schedule (Aust) Not Scheduled

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR002511 HSR002907 (Revoked)
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National/Regional Inventories

Australia (AIC)	Listed
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Canada (DSL)	Listed
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Canada (NDSL)	Not Listed
China (IECSC)	Listed
Europe (EINECS)	202-710-8
Europe (REACH)	01-2119487138-29-0000
Japan (ENCS/METI)	Listed
Korea (KECI)	Listed
Malaysia (EHS Register)	Listed
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Listed
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Listed
USA (TSCA)	Listed

16. OTHER INFORMATION

Related Product Codes	BENCHL1000, BENCHL1001, BENCHL1002, BENCHL1003, BENCHL1004, BENCHL1005, BENCHL1006, BENCHL1007, BENCHL1010, BENCHL2000, BENCHL3000, BENCHL3001, BENCHL4000, BENCHL4001, BENCHL4250, BENCHL5000
Revision	4
Revision Date	29 May 2021
Key/Legend	<p>< Less Than > Greater Than</p> <p>AICS Australian Inventory of Chemical Substances atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm² Square Centimetres CO₂ Carbon Dioxide COD Chemical Oxygen Demand deg C (°C) Degrees Celcius EPA (New Zealand) Environmental Protection Authority of New Zealand deg F (°F) Degrees Fahrenheit g Grams g/cm³ Grams per Cubic Centimetre g/l Grams per Litre HSNO Hazardous Substance and New Organism IDLH Immediately Dangerous to Life and Health immiscible Liquids are insoluable in each other. inHg Inch of Mercury inH₂O Inch of Water K Kelvin kg Kilogram kg/m³ Kilograms per Cubic Metre lb Pound LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.</p>

ltr or **L** Litre
m³ Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m³ Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH₂O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Health and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight