

1. IDENTIFICATION

Product Name	Caustic Soda
Other Names	Soda lye; Sodium hydroxide
Uses	Food processing aid; Industrial/commercial use: In flotation agents; in pH regulation; as a solvent; in water treatment; as a photochemical; as a reducing agent; and in hydraulic fracturing. Domestic use: In cleaning/washing agents and additives; adhesives; and cosmetic use.
Chemical Family	No Data Available
Chemical Formula	NaOH
Chemical Name	Caustic soda
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)

Schedule 6

Fax

ABN

Globally Harmonised System

Redox Ltd Corporate Office Sydney Locked Bag 15 Minto NSW 2566 Australia 2 Swettenham Road Minto NSW 2566 Australia All Deliveries: 4 Holmes Road Minto NSW 2566 Australia

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Phone +61 2 9733 3000 +61 2 9733 3111 E-mail sydney@redox.com Web www.redox.com 92 000 762 345

Australia New Zealand Auckland Adelaide Christchurch Brisbane Melbourne Hawke's Bay Perth UK London Sydney

Malaysia Kuala Lumpur USA Los Angeles Oakland Mexico Saltillo



Hazard Classification		Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)		
Hazard Categories		Corrosive to Metals - C	Category 1	
		Skin Corrosion/Irritatior	- Category 1A	
		Serious Eye Damage/Ir	ritation - Category 1	
Pictograms				
Signal Word		Danger		
Hazard Statements		H290	May be corrosive to metals.	
		H314	Causes severe skin burns and eye damage.	
		AUH071	Corrosive to the respiratory tract	
Precautionary Statements	Prevention	P280	Wear protective gloves/protective clothing/eye protection/face protection.	
		P260	Do not breathe dusts or mists.	
	Response	P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.	
		P310	Immediately call a POISON CENTER or doctor.	
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	
		P390	Absorb spillage to prevent material-damage.	
		P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.	
		P363	Wash contaminated clothing before reuse.	
		P304 + P340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.	
	Storage	P406	Store in corrosive resistant container with a resistant inner liner.	
		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	Health Hazards	6.1D	Substances that are acutely toxic - Harmful
		8.1A	Substances that are corrosive to metals
		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
Sodium hydroxide	NaOH	1310-73-2	>=98 %

4. FIRST AID MEASURES

Description of necessary measu	res according to routes of exposure
Swallowed	IF SWALLOWED: Rinse mouth, then drink a glass of water. Do NOT induce vomiting. Immediately call a Poison Centre or doctor/physician for advice. Never give anything by mouth to an unconscious person.
Еуе	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 flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes. Immediately call a Poison Centre or doctor/physician for advice.
Skin	IF ON SKIN (or hair): Remove contaminated clothing and shoes immediately. Flush skin and hair with running water for at least 15 minutes. 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.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a Poison Centre or doctor/physician for advice. Apply resuscitation if victim is not breathing - Do not use direct mouth-to-mouth method if victim ingested or inhaled the substance; use alternative respiratory method or proper respiratory device - Administer oxygen if breathing is difficult.
Advice to Doctor	Treat symptomatically and supportively. Keep victim calm and warm - Obtain immediate medical care. Ensure that attending medical personnel are aware of the identity and nature of the product(s) involved, and take precautions to protect themselves.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out. Avoid getting water inside containers.
Flammability Conditions	Non-combustible; Material itself does not burn.
Extinguishing Media	If material is involved in a fire, use extinguishing measures that are appropriate to local circumstances and the surrounding environment - Do not use water jets.
Fire and Explosion Hazard	Risk of violent reaction or explosion! Containers may explode when heated or contaminated with water. The heat generated by contact with water (heat of dilution) may be sufficient to ignite combustible materials. Contact with metals may evolve flammable hydrogen gas.
Hazardous Products of Combustion	Fire or heat will produce irritating, toxic and/or corrosive gases, including oxides of Sodium.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may be toxic and/or corrosive and may pollute waterways.
Personal Protective Equipment	Wear self-contained breathing apparatus (SCBA) and chemical splash suit. Fully-encapsulating, gas-tight suits should be worn for maximum protection. Structural firefighter's uniform is NOT effective for this material.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2W

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure

Ensure adequate ventilation - Ventilate enclosed spaces before entering. ELIMINATE all ignition sources. Do not touch or walk through spilled material. Avoid generating dust. Do not breathe dust and prevent contact with eyes,

	skin and clothing.
Clean Up Procedures	Collect mechanically (sweep or vacuum up) and seal in suitable, properly labelled containers for disposal (see SECTION 13). Do NOT get water inside containers.
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Prevent dust cloud. Cover with dry earth, sand or other non-combustible material followed by plastic sheet to minimise spreading or contact with rain.
Decontamination	The product can be neutralised using highly diluted hydrochloric acid, which should be added very slowly by specialised personnel wearing the proper protection. NEVER neutralise the solid product.
Environmental Precautionary Measures	Spillages and decontamination runoff should be prevented from entering drains and watercourses.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Keep upwind and to higher ground. Large spill: Immediately contact Police or Fire Brigade; Consider initial downwind evacuation of areas within at least 250 m.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8). Large spill: Wear SCBA and chemical splash suit. Fully-encapsulating, gas-tight suits should be worn for maximum protection.

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Avoid generating dust. Do not breathe dusts or mists and prevent contact with eyes, skin and clothing. Do not ingest. Wear protective gloves/protective clothing/eye protection/face protection (see SECTION 8). WARNING! Water reactive - Heat of reaction may be enough to ignite combustible materials. When diluting, always add the product to water - Never add water to the product.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Protect from moisture/humidity (hygroscopic). Keep away from heat and sources of ignition - No smoking. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store locked up.
Container	Keep only in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	For Sodium hydroxide (CAS No. 1310-73-2): - Safe Work Australia Exposure Standard: TWA = 2 mg/m3 Peak limitation. - New Zealand Workplace Exposure Standard: TWA = 2 mg/m3 Ceiling. - NIOSH REL/OSHA PEL: TWA = 2 mg/m3 - Immediately dangerous to life or health (IDLH) concentration: 10 mg/m3.
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	Use local exhaust ventilation to prevent the chemical from entering the breathing zone of any worker. Air monitoring is recommended to ensure control measures in place are working effectively.
Personal Protection Equipment	 Respiratory protection: In the case of sodium hydroxide powder emissions, wear respiratory protection. Recommended: Particulate filter respirator (refer to AS/NZS 1715 & 1716). Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Chemical goggles; Full face shield may be required for supplementary protection. Hand protection: Wear protective gloves. Recommended: Elbow length PVC gloves. Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Overalls; PVC apron; PVC protective suit may be required if exposure severe.
Special Hazards Precaustions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash hands and face thoroughly after handling. Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State

Solid

Appearance	Flake, pearl, prill, beads, blocks		
Odour	Odourless		
Colour	White, translucent		
pН	14		
Vapour Pressure	No Data Available		
Relative Vapour Density	No Data Available		
Boiling Point	1,388 °C		
Melting Point	323 °C		
Freezing Point	No Data Available		
Solubility	Soluble in water (Water reactive)		
Specific Gravity	2.13		
Flash Point	No Data Available		
Auto Ignition Temp	No Data Available		
Evaporation Rate	No Data Available		
Bulk Density	No Data Available		
Corrosion Rate	No Data Available		
Decomposition Temperature	No Data Available		
Density	2.13 g/cm3		
Specific Heat	No Data Available		
Molecular Weight	No Data Available		
Net Propellant Weight	No Data Available		
Octanol Water Coefficient	No Data Available		
Particle Size	No Data Available		
Partition Coefficient	No Data Available		
Saturated Vapour Concentration	No Data Available		
Vapour Temperature	No Data Available		
Viscosity	No Data Available		
Volatile Percent	No Data Available		
VOC Volume	No Data Available		
Additional Characteristics	No information available.		
Potential for Dust Explosion	No information available.		
Fast or Intensely Burning Characteristics	No information available.		
Flame Propagation or Burning Rate of Solid Materials	No information available.		
Non-Flammables That Could Contribute Unusual Hazards to a Fire	The heat generated by contact with water (heat of dilution) may be sufficient to ignite combustible materials.		
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; Material itself does not burn.		
Reactions That Release Gases or Vapours	Fire or heat will produce irritating, toxic and/or corrosive gases, including oxides of Sodium.		
Release of Invisible Flammable Vapours and Gases	Contact with metals may evolve flammable hydrogen gas.		

10. STABILITY AND REACTIVITY

General Information	Reacts violently with acid and is corrosive to metals such as aluminium, tin, lead and zinc; This produces a combustible/explosive gas (hydrogen). Reacts with ammonium salts; This produces ammonia and generates fire hazard. Contact with moisture and water generates heat - Heat of reaction may be enough to ignite combustible materials.
Chemical Stability	The substance is stable under normal (and foreseeable) conditions of temperature and pressure during storage and

	handling.
Conditions to Avoid	Avoid generating dust.
Materials to Avoid	Incompatible/reactive with aluminium, tin, zinc and their alloys, copper, lead, etc; acetic acid, allyl chloride, chlorine trifluoride, chloroform, methylic alcohol, chloronitrotoluene, chlorosulphonic acid, glyoxal, cyanohydrin, hydrochloric acid, hydrofluoric acid, hydroquinone, nitric acid, sulphuric acid and oleum, nitropropane, phosphorous, propiolactone, phosphorous pentoxide, tetrachlorobenzene, tetrahydrofuran, nitromethane and nitroparaffins.
Hazardous Decomposition Products	Fire or heat will produce irritating, toxic and/or corrosive gases, including oxides of Sodium. Contact with metals may evolve flammable hydrogen gas.
Hazardous Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

General Information	 Acute toxicity: Corrosive on ingestion; Symptoms include abdominal pain, burns in mouth and throat, burning sensation in the throat and chest, nausea, vomiting, shock or collapse. The substance is not expected to be systemically available and the effects are expected to be due to pH changes. Skin corrosion/irritation: Corrosive; Causes severe skin burns. Symptoms include redness, pain, burns, blisters. Eye damage/irritation: Corrosive; Causes serious eye damage. Symptoms include redness, pain, blurred vision, severe burns. Respiratory/skin sensitisation: Based on data obtained in a study with human volunteers the substance has no skin sensitisation potential. Germ cell mutagenicity: Both the in vitro and the in vivo genetic toxicity tests indicated no evidence of mutagenic activity. Carcinogenicity: Systemic carcinogenicity is not expected to occur because the substance is not expected to be systemically available in the body. Reproductive toxicity: The substance is not expected to be systemically available in the body and for this reason it
	 can be stated that the substance will not reach the foetus nor reach male and female reproductive organs. STOT (single exposure): Corrosive to the respiratory tract; Symptoms include cough, sore throat, burning sensation, shortness of breath. STOT (repeated exposure): The substance is not expected to be systemically available in the body and therefore
	systemic effects of the substance after repeated exposure are not expected to occur. - Aspiration toxicity: No information available.
Carcinogen Category	None

12. ECOLOGICAL INFORMATION	
Ecotoxicity	Aquatic toxicity: - LC50, Fish: All available tests resulted in a range of toxicity values between 35 to 189 mg/l. However, in the majority of these test reports there were no data on pH variation. - EC50, Crustacea (Ceriodaphnia): 40.4 mg/l (48 h) [based on immobility]. - NOEC, Fish/Crustacea: It is not required to conduct this study since the substance dissociates in water and the only possible effect would result from the pH effect. However, pH will remain within environmentally expected ranges.
Persistence/Degradability	NaOH is a strong alkaline substance that dissociates completely in water to Na+ and OH High water solubility and low vapour pressure indicate that NaOH will be found predominantly in aquatic environment. This implies that it will not adsorb on particulate matter or surfaces. Atmospheric emissions as aerosols are rapidly neutralised by carbon dioxide and the salts will be washed out by rain.
Mobility	High water solubility and mobility. If emitted to soil, sorption to soil particles will be negligible. Depending on the buffer capacity of the soil, OH- will be neutralised in the soil pore water or the pH may increase. There is no direct exposure of soil to NaOH based on the available uses. In addition, no indirect exposure via air is expected as it rapidly neutralises in air.
Environmental Fate	The hazard of the substance for the environment is caused by the hydroxyl ion (pH effect). For this reason the effect of the substance on the organisms depends on the buffer capacity of the aquatic or terrestrial ecosystem.
Bioaccumulation Potential	Considering its high water solubility, NaOH is not expected to bioconcentrate in organisms. In addition, sodium is a naturally-occurring element that is prevalent in the environment and to which organisms are exposed regularly, for which they have some capacity to regulate the concentration in the organism.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information

Dispose of contents/container in accordance with local/regional/national regulations. Special Precautions for Land Fill Any contaminated absorbent products must be treated by an authorised waste manager, along with any used packaging and residue.

14. TRANSPORT INFORMATION

Land Transport (Australia) ADG Code		
Proper Shipping Name	SODIUM HYDROXIDE, SOLID	
Class	8 Corrosive Substances	
Subsidiary Risk(s)	No Data Available	
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible	
UN Number	1823	
Hazchem	2W	
Pack Group	11	
Special Provision	No Data Available	
Land Transport (Fiji)		
Proper Shipping Name	SODIUM HYDROXIDE, SOLID	
Class	8 Corrosive Substances	
Subsidiary Risk(s)	No Data Available	
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible	
UN Number	1823	
Hazchem	2W	
Pack Group	Ш	
Special Provision	No Data Available	
Land Transport (Malaysia) ADR Code		
Proper Shipping Name	SODIUM HYDROXIDE, SOLID	
Class	8 Corrosive Substances	
Subsidiary Risk(s)	No Data Available	
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible	
UN Number	1823	
Hazchem	2W	
Pack Group	II	
Special Provision	No Data Available	
Land Transport (New Caledonia)		
Proper Shipping Name	SODIUM HYDROXIDE, SOLID	
Class	8 Corrosive Substances	
Subsidiary Risk(s)	No Data Available	
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible	
UN Number	1823	

2W	
ll	
No Data Available	
SODIUM HYDROXIDE, SOLID	
8 Corrosive Substances	
No Data Available	
37 Toxic And/Or Corrosive Substances Non-Combustible	
1823	
2W	
ll	
No Data Available	

Land Transport (Papua New Guinea)

Proper Shipping Name	SODIUM HYDROXIDE, SOLID	
Class	8 Corrosive Substances	
Subsidiary Risk(s)	No Data Available	
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible	
UN Number	1823	
Hazchem	2W	
Pack Group	II	
Special Provision	No Data Available	

Land Transport (United States of America) US DOT

Proper Shipping Name	SODIUM HYDROXIDE, SOLID	
Class	8 Corrosive Substances	
Subsidiary Risk(s)	No Data Available	
ERG	154 Substances - Toxic and/or Corrosive (Non-Combustible)	
UN Number	1823	
Hazchem	2W	
Pack Group	ll	
Special Provision	No Data Available	

Land Transport (Vanuatu)

Proper Shipping Name	SODIUM HYDROXIDE, SOLID	
Class	8 Corrosive Substances	
Subsidiary Risk(s)	No Data Available	
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible	
UN Number	1823	
Hazchem	2W	
Pack Group	II	
Special Provision	No Data Available	

Sea Transport IMDG Code

Proper Shipping Name	SODIUM HYDROXIDE, SOLID
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1823
Hazchem	2W
Pack Group	II
Special Provision	No Data Available
EMS	F-A, S-B
Marine Pollutant	No
Air Transport IATA DGR	
•	SODIUM HYDROXIDE, SOLID
IATA DGR	SODIUM HYDROXIDE, SOLID 8 Corrosive Substances
IATA DGR Proper Shipping Name	,
IATA DGR Proper Shipping Name Class	8 Corrosive Substances
IATA DGR Proper Shipping Name Class Subsidiary Risk(s)	8 Corrosive Substances No Data Available
IATA DGR Proper Shipping Name Class Subsidiary Risk(s) UN Number	8 Corrosive Substances No Data Available 1823

National Transport Commission (Australia)

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

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

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	Schedule 6

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code HSR001547 (Reissued)

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Listed
Canada (NDSL)	Not Listed
China (IECSC)	Listed
Europe (EINECS)	215-185-5
Europe (REACh)	01-2119457892-27-
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)	Listed
USA (TSCA)	Listed

16. OTHER INFORMATION

Related Product Codes	CASODA0300, CASODA1000, CASODA1001, CASODA1002, CASODA1003, CASODA1004, CASODA1005,
	CASODA1006, CASODA1007, CASODA1008, CASODA1009, CASODA1010, CASODA1011, CASODA1012,
	CASODA1013, CASODA1014, CASODA1015, CASODA1016, CASODA1017, CASODA1018, CASODA1019,
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	CASODA9000, CASODA9100, CASODA9600, CASODI3800
Revision	5
Revision Date	05 Feb 2018
Key/Legend	< Less Than
	> Greater Than
	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 Farenheit 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 **Ib** 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. Itr 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 Heath 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