SECTION 1 – PRODUCT & COMPANY IDENTIFICATION

Product Identification **CARBON DIOXIDE CYLINDER 150 GRAM**

Application & Use Carbon dioxide cylinder contains compressed gas for fire system manual actuation.

Manufacturer Address

PT ETI FIRE SYSTEMS
Jl. Magelang – Kopeng Km 11 Tegalrejo
Magelang – Central Java 56192
Indonesia
Phone : +62 293 314 8990 FAX : +62 293 314 8991
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Product Description The ETI carbon dioxide cylinder is contains 150 grams of liquefied carbon dioxide (CO_2). Each cylinder is manufactured to Australian Standard AS2469. Each cylinder contains a pressure relief device. Specification – copper rupture disc, 0.5 mm copper over 5 mm orifice.

Applicable Part Numbers RPCYLCO2S

SECTION 2 – COMPOSITION

INGREDIENT	CONCENTRATION %	CAS NO.
Carbon Dioxide (CO_2)	> 99	124-38-9

SECTION 3 – HAZARD IDENTIFIACTION

D.G. Class	2.2
UN No.	1013
Hazchem Code	2 RE
EPG	2C1
Packing Instruction	None allocated

SECTION 4 – FIRST AID MEASURES

Skin	Cold burns, remove contaminated clothing and gently flush affected areas with warm water (30^0 C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.
Eye	Cold burns, immediately flush with tepid water or sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention. Advice to doctor treat for asphyxia and cold burns.
Ingestion	Due to the product being a gas, ingestion is considered unlikely.
Inhalation	If inhaled, remove from contaminated area. To protect rescuer, use an air-line respirator or Self Contained Breathing Apparatus (SCBA). Apply artificial respiration if not breathing. Give oxygen is available. Seek advice from doctor.
Advice to doctor	Treat for asphyxia and cold burns.

SECTION 5 – FIRE FIGHTING MEASURES

Extinguishing Media	Not applicable – Non Flammable
Hazards from Combustion	Pressurised cylinders exposed to fire may further elevate pressure and weaken the pressure vessel. ETI cylinders are provided with a copper rupture seal that will act a safety relief in the event that cylinders are exposed to fire.
Precautions	Fire fighters should wear normal personal protective equipment for fire fighting. As a minimum this should include a helmet with visor, fire turnout clothing including gloves and protective footwear. Cylinders containing Carbon Dioxide which have been exposed to fire should be allowed to cool and should be handled with extreme care. Water may be used to assist cooling.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Spillage	If the cylinder is leaking, inform manufacturer/supplier of leak. Use personal protective equipment. Carefully move material to a well ventilated safe area. Do not attempt to repair leaking valve or cylinder safety devices.

SECTION 7 – HANDLING AND STORAGE

Handling	Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm.
Storage	Do not store near incompatible materials. Cylinders should be stored below 45^0 C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

SECTION 8 – EXPOSURE CONTROL & PERSONAL PROTECTION

Exposure Standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m^3	ppm	mg/m^3
Carbon dioxide	ASCC (AUS)	5000	9000	30000	54000
Carbon dioxide in coal mining	ASCC (AUS)	12500	22500	30000	54000

Biological	No biological limits apply
Engineering limits	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.
Personal protective equipment	Wear safety boots, cotton or leather gloves and safety glasses. Where an inhalation risk exists, wear: an air-line respirator or Self Contained Breathing Apparatus (SCBA).

SECTION 9 – PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE	Colourless gas	Solubility (water)	0.759 cm^3/mol
pH at 20^0 C	Not applicable	Volatiles	100 %
Boiling Point	Not applicable	Flash point	Not Relevant
Odour	Odourless	Specific gravity	Not applicable
Flammability	Non flammable	Vapour density	Not applicable
Density	1.53	Sublimation Temperature	-78^0C (Approximately)
Upper explosion limit	Not Relevant	Melting point	Not applicable
Lower explosion limit	Not Relevant	Evaporation point	Not applicable
Critical pressure	7,380 kPa (Approximately)	Critical temperature	31^0 C (Approximately)
Vapour pressure	6300 kPa @ 25^0 C (Approximately)		
Cylinder pressure	6300 kPa @ 25^0 C (Approximately)		

SECTION 10 – REACTIVITY & STABILITY

Stability	Stable under recommended conditions of storage.
Incompatible Materials	Moist carbon dioxide is corrosive, hence acid resistant materials are required (stainless steel). Certain properties of some plastics and rubbers may be affected by carbon dioxide, i.e. embrittlement, leaching of plasticisers, etc. Dust of aluminium, chrome and manganese ignite and explode when heated in carbon dioxide. Incompatible with acrylaldehyde, aziridine, metal acetylides, sodium peroxide. Corrosive when moist.
Hazardous decomposition products	May evolve toxic gases if heated to decomposition.
Hazardous reactions	Polymeriation will not occur.
Condition to avoid	Avoid shock, friction, heavy impact, heat, sparks, open flames and other ignition sources.

SECTION 11 – TOXICOLOGICAL INFORMATION & HEALTH EFFECT

Summary	Asphyxiant gas. Severe frost-bite burns may result from exposure to cold vapour or liquid. Carbon dioxide concentrations of 3-5 % in air cause increased respiration and headache. Concentrations of 8-15 % cause headache, nausea and vomiting which may lead to unconsciousness if not moved to open air and given oxygen. Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death may follow in minutes. Adverse health effects to long term exposure to carbon dioxide have not been reported.
Inhalation	Non irritant. Asphyxiant. Effect are proportional to oxygen displacement.
Ingestion	Ingestion is considered unlikely due to the product form. Ingestion will cause severe cold burns to mouth and throat.
Eye	Non irritant. However, direct contact with evaporating liquid may result in severe cold burns with possible permanent damage. Contact with dry ice powder could result in frostbite or cold burns.
Skin	Non irritant. However, direct contact with the liquefied material or escaping compressed gas may cause frostbite injury. Skin contact with dry ice powder could result in frostbite or cold burns.
Toxicity Data	Carbon Dioxide (124-38-9) LC50 (Inhalation) : 470000 ppm/30M (rat) LCLo (Inhalation) : 9 pph/5M (human)

SECTION 12 – ECOLOGICAL INFORMATION

Environment	Carbon Dioxide is a naturally occurring gas in the atmosphere and has no harmful effect.

SECTION 13 – DISPOSAL CONSIDERATION

Disposal	Cylinder should be returned to the manufacturer or supplier for disposal of contents.
Legislation	Dispose of in accordance with relevant local legislation.

SECTION 14 – TRANSPORT INFORMATION

Transport	Ensure cylinder is separated from driver and that outlet of relief device is not obstructed.
Dangerous good class	Classified as a dangerous good by criteria of the ADG Code UN No. 1013 D.G. Class 2.2 Packing Instruction : None allocated Hazchem Code : 2RE EPG : 2CI

SECTION 15 – REGULATORY INFORMATION

Poison Schedule	A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemical listed on the Australian Inventory of Chemical Substances (AICS).

SECTION 16 – OTHER INFORMATION

Information	First issue in document format to Australian National Occupation Health and Safety Commission Code of practice – 2nd Edition NOHSC 2010 (2003), 25 May 2010.
Revision & Re-Issued	Jul 2012 Rev. D Mar 2015 Re-Issued E Sept 2017 Rev. F

Disclaimer

This document has been compiled by ETI Fire Systems to serve as the manufacturer's material Safety Data Sheet (MSDS). It is based on information concerning the product which has been provided to ETI by other manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. While ETI has taken all due care to include accurate and up-to-date information in this MSDS, ETI in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.