

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION
PRODUCT NAME: Carbon Dioxide

MANUFACTURER: Tyco Electronics Corporation
DIVISION: Tyco Electronics Telecom OSP
ADDRESS: 8000 Purfoy Road
 Fuquay-Varina, NC 27526

SUPPLIERS Tyco Electronics Telecom OSP
 8000 Purfoy Road
 Fuquay-Varina, NC 27526

EMERGENCY TELEPHONE NUMBERS: US: CHEMTREC 1-800-424-9300
 CN: CHEMTREC 1-800-424-9300
 EU and Outside North America: 1-703-527-3887 (Collect calls accepted)

NON-EMERGENCY HEALTH/SAFETY INFORMATION: North America: 1- 888-557-8901

CHEMICAL FAMILY: Carbon dioxide, compressed gas.

PRODUCT USE: For Non-Consumer, Industrial use only.

This product contains a Hazardous Substance, Preparation that is regulated under US-OSHA; CAN-WHMIS; IOSH; ISO; UK-CHIP; or EU Directives (67/548/EEC-Dangerous Substance Labelling, 98/24/EC-Chemical Agents at Work, 99/45/EC-Preparation Labelling, 2001/58/EC-MSDS Content, and 1907/2006/EC-REACH), and an MSDS/SDS is required for this product considering that when used as recommended or intended, or under ordinary conditions, it may present a health and safety exposure or other hazard.

Additional Information

See Section 10 for temperatures to avoid.

SECTION 2: HAZARDS IDENTIFICATION
GHS Classification: Compressed Gas

Health	Environmental	Physical
Acute Toxicity – NL Eye Corrosion - NL Skin Corrosion – NL Skin Sensitization – NL Mutagenicity – NL Carcinogenicity – NL Reproductive/Developmental – NL Target Organ Toxicity (Repeated) – NL	Aquatic Toxicity – NL	NFPA - NL CN - NL EU - NL

NL: Not listed

GHS Label: Compressed Gas, Carbon Dioxide

As required for Finished Goods according to End-Use Products Regulations
Symbols:

<u>Hazard Statements</u>	<u>Precautionary Statements</u>

EMERGENCY OVERVIEW: Contact with pressurized gas may cause skin burns and frostbite. Contact with eyes may cause transient corneal damage. Carbon dioxide can displace oxygen and cause dizziness, disorientation, lack of coordination, excitation, headache and nausea. High concentrations (greater than 10% carbon dioxide) may result in unconsciousness,

respiratory failure, coma and death. Prolonged or repeated exposure may cause damage of the retinal ganglion cells, central nervous system and heart. Avoid inhalation of gas. Avoid contact with eyes or skin. In case of eye or skin contact, immediately flush affected area(s) with lukewarm water for 15 minutes. Apply a sterile dry dressing and treat as a burn. Seek medical attention. If inhaled, and respiratory symptoms or other symptoms of exposure develop, move victim to fresh air and seek medical attention. If breathing difficulties develop, qualified personnel should administer oxygen. If victim is not breathing, move to fresh air and immediately begin artificial respiration. Keep victim warm and quiet; seek immediate medical attention.

POTENTIAL HEALTH EFFECTS:

EYES: Contact with pressurized gas may cause momentary freezing followed by slight swelling and transient corneal damage. Persons with pre-existing eye disorders may be more susceptible to the effects of this product. Contents under high pressure. Rupture or puncture of the container may create projectile hazard.

SKIN: Skin absorption of this product is unlikely. Contact with the pressurized gas may cause skin burns and frostbite. Persons with pre-existing skin disorders may be more susceptible to the effects of this material. Contents under high pressure. Rupture or puncture of the container may create projectile hazard.

INGESTION: Ingestion of this material is unlikely.

INHALATION: The presence of increased levels of carbon dioxide in the immediate area can displace oxygen and cause dizziness, disorientation, and lack of coordination, excitation, headache and nausea. High concentrations (greater than 10% carbon dioxide) may result in unconsciousness, respiratory failure, coma and death. Persons with respiratory or blood disease or whose oxygen carrying capacity is already compromised (e.g., anaemia or smokers) may be more sensitive to the effects of this material. Persons over 65 and those with a recent history of epilepsy, stroke, fainting, heart disease, respiratory disease, glaucoma, endocrine disease, gastric or duodenal ulcers, or high blood pressure should be excluded from working with high levels of dioxide.

ACUTE HEALTH HAZARDS:

See above.

CHRONIC HEALTH HAZARDS:

Prolonged or repeated contact to carbon dioxide may cause damage to the retinal ganglion cells. Long-term exposure to carbon dioxide can alter the acid-base and calcium-phosphorus balance, resulting in metabolic acidosis and calcium deposits in soft tissue. Prolonged or repeated over exposure to carbon dioxide may also cause damage to the retinal ganglion cells, central nervous system and heart diminished contractile force).

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Breathing disorders may be aggravated by exposure to this product. Exposure to high levels of carbon dioxide temporarily increases the breathing rate.

Additional Information

None.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**INGREDIENTS (Chemical/Common Names):**

Carbon dioxide

CAS No.:

124-38-9

% by Wt:

100

NA – Not applicable/NE – Not Established/ND – Not determined

Additional Information

None.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: For cold burns, irrigate with lukewarm water for at least 15 minutes. Apply a sterile dry dressing and treat as a burn. Seek medical attention.

- SKIN CONTACT:** For cold burns, irrigate with lukewarm water for at least 15 minutes. Apply a sterile dry dressing and treat as a burn. Seek medical attention.
- INGESTION:** Ingestion of this material is unlikely.
- INHALATION:** If respiratory symptoms or other symptoms of exposure develop, move victim to fresh air and seek medical attention. If breathing difficulties develop, qualified personnel should administer oxygen. Seek immediate medical attention. If victim is not breathing, move to fresh air and immediately begin artificial respiration. Keep victim warm, quiet and seek immediate medical attention.

Additional Information

Note to Physician: Carbon dioxide is the most potent cerebrovascular dilator known.

SECTION 5: FIRE-FIGHTING MEASURES**SUITABLE EXTINGUISHING MEDIA:**

Not flammable. Use appropriate extinguishing media for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES & PROTECTIVE EQUIPMENT:**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

None Known.

SPECIFIC HAZARDS IN CASE OF FIRE:

None Known.

Additional Information

None.

SECTION 6: ACCIDENTAL RELEASE MEASURES**PERSONAL PRECAUTIONS:**

Wear appropriate personal protection when responding, as specified under Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION below.

ENVIRONMENTAL PRECAUTIONS:

NA

SPILL CONTAINMENT & CLEANUP METHODS/MATERIALS:

Evacuate all personnel from affected area. Use self-contained breathing apparatus, if necessary, to enter area. Ventilate area of leak or move leaking container to a well-ventilated area. Take measures to stop the leak at the source.

Additional Information

None.

SECTION 7: HANDLING AND STORAGE**PRECAUTIONS FOR SAFE HANDLING AND STORAGE:**

Handling: Avoid contact with eyes and skin. Carbon dioxide gas reduces the amount of oxygen available for breathing. Keep container closed. Use only with adequate ventilation.

OTHER PRECAUTIONS (e.g.; Incompatibilities):

DO NOT enter storage area unless adequately ventilated. Store in a cool, dry, well-ventilated place away from incompatible materials and direct sunlight. Do not store cylinders over 120°F. Store carbon dioxide cylinders with the valve end up. Follow normal compressed gas storage recommendations. Protect containers from physical damage.

Additional Information

None.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**ENGINEERING CONTROLS/SYSTEM DESIGN INFORMATION:**

None required under normal use conditions.

VENTILATION:

General dilution ventilation is acceptable.

RESPIRATORY PROTECTION:

If ventilation is inadequate to keep airborne concentrations below the established exposure limits (see Exposure Guidelines, below), a NIOSH-approved positive pressure air-supplied respirator is recommended.

EYE PROTECTION:

Use safety glasses with side shield or goggles to prevent contact with eyes, as appropriate to the given operation.

SKIN PROTECTION:

Avoid contact with skin. Use cryogenic gloves to prevent skin contact, as appropriate to the given operation.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

None required under normal use conditions.

EXPOSURE GUIDELINES & LIMITS:

ACGIH	Threshold Limit Value (TLV)	Carbon dioxide	5000 ppm
	Short-Term Exposure Limit	Carbon dioxide	30,000 ppm
Quebec	Permissible Exposure Value (PEV)	Carbon dioxide	5000 ppm
	Short Term Exposure Limit	Carbon dioxide	30,000 ppm
Ontario	Occupational Exposure Level (OEL)	Carbon dioxide	5000 ppm
	Short Term Exposure Value	Carbon dioxide	30,000 ppm
		TWA – 8-Hour Time Weighted Average/ NE – Not Established	

Additional Information

None known.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colorless gas
ODOR:	None
ODOR THRESHOLD:	NA
PHYSICAL STATE:	Gas
pH:	(3.7 for carbonic acid)
BOILING POINT:	-56.6°C at 5.2 atm
MELTING POINT:	NA
FREEZING POINT:	NA
VAPOR PRESSURE (mm Hg):	830 psi at 21° C
VAPOR DENSITY (AIR = 1):	1.52
SPECIFIC GRAVITY (H₂O = 1):	NA
EVAPORATION RATE (Butyl acetate=1):	Much greater than 1
SOLUBILITY IN WATER:	NA
FLASH POINT:	NA
AUTO-IGNITION TEMPERATURE:	NA
LOWER EXPLOSIVE LIMIT (LEL):	NA
UPPER EXPLOSIVE LIMIT (UEL):	NA
PARTITION COEFFICIENT:	NA
VISCOSITY (centipoise @ 25° C):	NA
DECOMPOSITION TEMPERATURE:	2000° C

FLAMMABILITY/HMIS HAZARD CLASSIFICATIONS (US/CN/EU):

HEALTH: 1 FLAMMABILITY: 0 REACTIVITY: 0

Additional Information

None.

SECTION 10: STABILITY AND REACTIVITY

STABILITY:
INCOMPATIBILITY (MATERIAL TO AVOID):

This chemical is stable under normal conditions at ambient temperature. Avoid contact with alkali metals, alkaline earth metals, metal acetylides, chromium, titanium above 550°C and uranium above 750°C. Moist carbon dioxide can form carbonic acid.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

Carbon dioxide is a non-flammable gas. In the presence of an electrical discharge or temperatures in excess of 2000°C, it decomposes to form carbon monoxide and oxygen.

HAZARDOUS POLYMERIZATION:
CONDITIONS TO AVOID:

Will not occur
Protect containers from sources of heat.

Additional Information

None.

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (Test Results Basis and Comments):

LC_{Lo} (inhalation, human) = 90,000 ppm/5minutes

LC_{Lo} (inhalation, mammal) = 90,000 ppm/5minutes

TC_{Lo} (inhalation, rat) = 60,000 ppm/24 hrs – reproductive and teratogenic effects

SUBCHRONIC/CHRONIC TOXICITY (Test Results and Comments):

Carbon dioxide is not listed by OSHA, NTP, or IARC as a carcinogen.

Additional Information

None.

SECTION 12: ECOLOGICAL INFORMATION

PERSISTENCE & DEGRADABILITY:

No data available on biodegradation.

BIO-ACCUMULATIVE POTENTIAL (Including Mobility):

No data available on bioaccumulation.

AQUATIC TOXICITY (Test Results & Comments):

LC₅₀ (Freshwater fish): NA

LC₅₀ (Marine fish): NA

Additional Information

- No known effects on stratospheric ozone depletion.
- Volatile organic compounds: None.
- Water Endangering Class (WGC): NA

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
HAZARDOUS WASTE CLASS/CODE:

Follow local, State/Provincial, and Federal/National regulations applicable to as-used, end-of-life characteristics to be determined by end-user.

US - Not applicable to material as manufactured for distribution into commerce.
CN – Not applicable to material as manufactured for distribution into commerce.
EWC – Not applicable to material as manufactured for distribution into commerce.

Additional Information

Not Included – Dispose/Recycle as allowed by local jurisdiction for the end-of-life characteristics as-disposed.

SECTION 14: TRANSPORT INFORMATION

GROUND – US-DOT/CAN-TDG/EU-ADR/APEC-ADR:

Proper Shipping Name Carbon dioxide, compressed

MATERIAL SAFETY DATA SHEET
RAY4049
 (US, CN, EU Version for International Trade)

Hazard Class	2.2	ID Number	UN1013
Packing Group	NA	Labels	Non-Flammable Gas

AIRCRAFT – ICAO-IATA:

Proper Shipping Name	Compressed gas, Non-Flammable (Carbon dioxide)		
Hazard Class	2.2	ID Number	UN1013
Packing Group	NA	Labels	Non-Flammable Gas

VESSEL – IMO-IMDG:

Proper Shipping Name	Compressed gas, Non-Flammable (Carbon dioxide)		
Hazard Class	2.2	ID Number	UN1013
Packing Group	NA	Labels	Non-Flammable Gas

Additional Information

- Transport requires proper packaging and paperwork, including the Nature and Quantity of goods, per applicable origin/destination/customs points as-shipped. Statement of Jurisdictional/Modal Special Provision(s) required.
- Not restricted for any mode of international transport as finished goods.
- Not a Marine Pollutant as-shipped per IMO/IMDG.

SECTION 15: REGULATORY INFORMATION

INVENTORY STATUS:

All components are listed on the TSCA; EINECS/ELINCS; and DSL, unless noted otherwise below.

U.S. FEDERAL REGULATIONS:

TSCA Section 8b – Inventory Status: All chemicals comprising this product are either exempt or listed on the TSCA Inventory.

TSCA Section 12b – Export Notification: If the product contains chemicals subject to TSCA Section 12b export notification they are listed below:

<u>Chemical</u>	<u>CAS #</u>
None	NA

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT)

Chemicals present in the product which could require reporting under the statute:

<u>Chemical</u>	<u>CAS #</u>
None	NA

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

If the product contains chemicals subject to the reporting requirements of Section 313 of SARA Title III, they are listed below.

<u>Chemical</u>	<u>CAS #</u>	<u>% wt</u>
None	NA	NA

CERCLA SECTION 311/312 HAZARD CATEGORIES: Note that this product is exempt from these regulations.

Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	No
Immediate Hazard	No
Delayed Hazard	No

STATE REGULATIONS (US):

California Proposition 65

The following chemicals identified to exist in the product as distributed into commerce are known to the State of California to cause cancer, birth defects, or other reproductive harm:

<u>Chemical</u>	<u>CAS #</u>	<u>% Wt</u>
None	NA	NA

California Consumer Product Volatile Organic Compound Emissions

This product may be regulated as a Consumer Product for purposes of CARB/OTC VOC Regulations, as-sold for the

intended purpose and into the industrial/Commercial supply chain (See Section 12 for VOC information).

INTERNATIONAL REGULATIONS (Non-US):**Canadian Domestic Substance List (DSL)**

All ingredients remaining in the product as distributed into commerce are included on the Domestic Substances List.

WHMIS Classifications

Class A – Compressed Gas.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

NPRI and Ontario Regulation 127/01

This product contains the following chemicals subject to the reporting requirements of Canada NPRI and/or Ont. Reg. 127/01:

<u>Chemical</u>	<u>CAS #</u>	<u>% Wt</u>
None	NA	NA

European Inventory of Existing Commercial Chemical Substances (EINECS)

All ingredients remaining in the product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.

European Communities (EC) Hazard Classification according to directives 67/548/EEC and 1999/45/EC.

<u>R-Phrases</u>	<u>S-Phrases</u>
NA	NA

Additional Information

This product may be regulated under additional regulations and laws not identified above, such as for uses other than described or as-designed/as-intended by the manufacturer, or for distribution into specific domestic destinations.

SECTION 16: OTHER INFORMATION**OTHER INFORMATION:**

Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).

Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as-sold.

SOURCES OF INFORMATION:

International Agency for Research on Cancer (1987), *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Overall Evaluations of Carcinogenicity: An updating of IARC Monographs Volumes 1-42, Supplement 7, Lyon, France.*

Ontario Ministry of Labour Regulation 654/86. Regulations Respecting Exposure to Chemical or Biological Agents.

RTECS – Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health.

MSDS/SDS PREPARATION INFORMATION:

DATE OF ISSUE: **21 February 2008**

SUPERCEDES: **11 May 2005**

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The information presented herein was prepared at Tyco Electronics by qualified technical personnel, and to our knowledge it is true and accurate. The information and recommendations are furnished for this product with the understanding that the purchaser/user will independently determine the suitability of the product for this purpose. The data do not constitute a warranty, expressed or implied, statutory or otherwise, nor are they a representation for which Tyco Electronics assumes legal responsibility. The data are submitted for the user's information and consideration only. Any use of this product must be determined by the user to be in accordance with the applicable federal, State/Provincial, and local laws and regulations.

Users are advised that they may have additional disclosure obligations under other national and local laws. Users are advised to ensure that this information is brought to the attention of all employees, agents, and contractors handling this product. Users of Tyco Electronics products should make their own evaluation to determine the suitability of each such product for the specific application and to establish safe handling and installation procedures. Distributors of this product are advised to



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forward this document, or the information contained herein, to every purchaser of this product.

END