



CITY OF GARDEN GROVE
FIRE DEPARTMENT

Tel: (714) 741-5600
Fax: (714) 741-5640

5/16/17

Frank Trinidad
Odic Environmental
(213)380-0090

RE: Records Search for 11632 Anabel Ave., Garden Grove CA

Dear Frank Trinidad:

Enclosed are the records found concerning the history of the above-mentioned site(s), especially as it pertains to fire code violation history, permits, the use, storage, or disposal of hazardous substances, and the installation or removal of underground flammable or combustible liquid storage tanks.

The City of Garden Grove Fire Department has utilized its best efforts to locate the records requested. However, the City makes no representation as to the accuracy of the records or that all records requested were retained or located. The City does not provide records on spills, leaks or clean-up, as that information is provided through the County of Orange Health Dept.

Sincerely,

Brad Spell
Fire Captain/Senior Fire Protection Specialist



CITY OF GARDEN GROVE FIRE DEPARTMENT

11301 Acacia Parkway, Garden Grove, CA 92842 (714) 741-5600 (714) 741-5636

FORM 1

Hazardous Materials Business Information Form

Page 1 of 1 3

BUSINESS INFORMATION

FACILITY # (Supplied by GGFD)	3 0 0 3 5	BEGINNING DATE	1	ENDING DATE	2
BUSINESS NAME	C & C SIGNS			BUSINESS PHONE	5
BUSINESS SITE ADDRESS	11632 ANABEL AVE				6
CITY	GARDEN GROVE	STATE	CA	ZIP	92843
DUN & BRADSTREET	10	SIC CODE (4 DIGIT #)	11	FIRE DISTRICT	12
COUNTY	ORANGE				13
BUSINESS OPERATOR NAME	CHRIS CANZONE			OPERATOR'S PHONE	15

BUSINESS OWNER

OWNER NAME	CHRIS CANZONE			OWNER PHONE	17
OWNER MAILING ADDRESS	[REDACTED]				18
CITY	GARDEN GROVE	STATE	CA	ZIP	92843

ENVIRONMENTAL CONTACT

CONTACT NAME	GARY BUCKLES				23
CONTACT MAILING ADDRESS	[REDACTED]				24
CITY	GARDEN GROVE	STATE	CA	ZIP	92843

PRIMARY

EMERGENCY CONTACTS

SECONDARY

NAME	GARY BUCKLES	28	NAME	CHRIS CANZONE	33
TITLE	VP OPERATIONS	29	TITLE	PRESIDENT	34
BUSINESS PHONE	714-537-8175	30	BUSINESS PHONE	714-537-8175	35
24-HR. PHONE	[REDACTED]	31	24-HR. PHONE	[REDACTED]	36
PAGER #		32	PAGER #		37

ADDITIONAL LOCALLY COLLECTED INFORMATION

DESCRIBE THE TYPE OF BUSINESS OPERATION:	SIGN MANUFACTURING	38	TOTAL # OF EMPLOYEES	14	39
BILLING ADDRESS (IF DIFFERENT FROM ABOVE)				ATTENTION	MICHELLE
PROPERTY OWNER NAME	CHRIS CANZONE	42	ADDRESS	11632 ANABEL AVE GG, CA	43
			PHONE	714-936-0507	44

Certification: Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the information is true, accurate, and complete.

SIGNATURE OF OWNER OPERATOR OR DESIGNATED REPRESENTATIVE	[Signature]	45	DATE	6/1/07	46
NAME OF SIGNER (print)	GARY L BUCKLES	47	NAME OF DOCUMENT PREPARER (print)	GARY L BUCKLES	49
TITLE OF SIGNER	VP OPERATIONS	48	TITLE OF DOCUMENT PREPARER	VP OPERATIONS	50



HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

ADD DELETE REVISED 1

Page 1 of 3 2

FACILITY ID#	3 0 0 3 5	BUSINESS NAME	COC SIGNS
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I. FACILITY INFORMATION

CHEMICAL LOCATION	Southeast wall of shop inside building		
CONFIDENTIAL LOCATION EPCRA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	MAP #	GRID # A4

II. CHEMICAL INFORMATION

CHEMICAL NAME	ACETONE	WASTE	<input checked="" type="checkbox"/> Yes	TRADE SECRET	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
COMMON NAME	ACETONE	* If EPCRA see instructions			
CAS #	67-64-1	An EHS Chemical <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
FIRE CODE HAZARD CLASSES (supplied by GGFD)		*If EHS is "Yes", all amounts must be LBS			

TYPE (Check one item only)	<input checked="" type="checkbox"/> a. PURE <input type="checkbox"/> b. MIXTURE <input type="checkbox"/> c. WASTE	RADIOACTIVE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	CURIES	
PHYSICAL STATE (Check one item only)	<input type="checkbox"/> a. SOLID <input checked="" type="checkbox"/> b. LIQUID <input type="checkbox"/> c. GAS	FED HAZARD CATEGORIES	<input checked="" type="checkbox"/> a. FIRE <input type="checkbox"/> b. REACTIVE <input type="checkbox"/> c. PRESSURE RELEASE	<input checked="" type="checkbox"/> d. ACUTE HEALTH <input type="checkbox"/> e. CHRONIC HEALTH	
AVERAGE DAILY AMOUNT	30	MAXIMUM DAILY AMOUNT	55	ANNUAL WASTE AMOUNT	110
UNITS	<input checked="" type="checkbox"/> a. GALLONS <input type="checkbox"/> b. CUBIC FEET <input type="checkbox"/> c. POUNDS <input type="checkbox"/> d. TONS	DAYS ON SITE	365 DAYS	LARGEST CONTAINER	55

STORAGE CONTAINER (Check all that apply)	<input type="checkbox"/> a. ABOVEGROUND TANK <input type="checkbox"/> b. UNDERGROUND TANK <input type="checkbox"/> c. TANK INSIDE BLDG <input checked="" type="checkbox"/> d. STEEL DRUM	<input type="checkbox"/> e. PLASTIC DRUM <input type="checkbox"/> f. NONMETALLIC DRUM <input type="checkbox"/> g. METAL CONTAINER <input type="checkbox"/> h. CARBOY	<input type="checkbox"/> i. VAT <input type="checkbox"/> j. FIBER DRUM <input type="checkbox"/> k. BAG(S) <input type="checkbox"/> l. BOX(S)	<input type="checkbox"/> m. CYLINDER <input type="checkbox"/> n. GLASS CONTAINER <input type="checkbox"/> o. PLASTIC CONTAINER <input type="checkbox"/> p. IN MACH OR EQUIP	<input type="checkbox"/> q. TANK WAGON <input type="checkbox"/> r. RAIL CAR <input type="checkbox"/> s. TOTE BIN <input type="checkbox"/> t. OTHER
STORAGE PRESSURE	<input checked="" type="checkbox"/> a. AMBIENT <input type="checkbox"/> b. ABOVE AMBIENT <input type="checkbox"/> c. BELOW AMBIENT	STORAGE TEMPERATURE			
<input checked="" type="checkbox"/> a. AMBIENT <input type="checkbox"/> b. ABOVE AMBIENT <input type="checkbox"/> c. BELOW AMBIENT <input type="checkbox"/> d. CRYOGENIC					

%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
99	ACETONE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	67-64-1
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

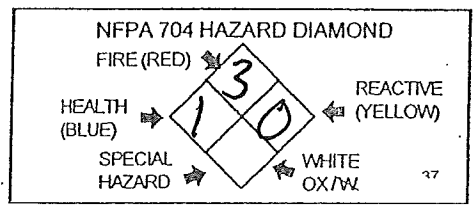
PLACARDING INFORMATION

UNDOT # 1090 33
Refer to shipping papers or MSDS

DOT HAZARD CLASS 3 34
Refer to shipping papers or MSDS

EPCRA YES NO 35

X _____ 36
If EPCRA, Please Sign Here



MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED



HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

ADD DELETE REVISED 1

Page 2 of 3 2

FACILITY ID#	3 0 0 3 5	38 BUSINESS NAME	COC SIGNS	3
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I. FACILITY INFORMATION

CHEMICAL LOCATION	Southeast wall of shop inside building			4
CONFIDENTIAL LOCATION EPCRA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5 MAP #	6 GRID #	7
			A-4	

II. CHEMICAL INFORMATION

CHEMICAL NAME	CARBON DIOXIDE	WASTE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8	TRADE SECRET	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	11	
COMMON NAME	CO2	* If EPCRA see instructions		9	An EHS Chemical	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12	
CAS #	124-38-9	* If EHS is "Yes", all amounts must be LBS		10	FIRE CODE HAZARD CLASSES (supplied by GGFD)			13

TYPE (Check one item only)	<input checked="" type="checkbox"/> a. PURE <input type="checkbox"/> b. MIXTURE <input type="checkbox"/> c. WASTE	14	RADIOACTIVE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	15	CURIES	16
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PHYSICAL STATE (Check one item only)	<input type="checkbox"/> a. SOLID <input type="checkbox"/> b. LIQUID <input checked="" type="checkbox"/> c. GAS	17	FED HAZARD CATEGORIES	<input type="checkbox"/> a. FIRE <input type="checkbox"/> b. REACTIVE <input checked="" type="checkbox"/> c. PRESSURE RELEASE	18	<input type="checkbox"/> d. ACUTE HEALTH <input type="checkbox"/> e. CHRONIC HEALTH	
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AVERAGE DAILY AMOUNT	600 CFT	19	MAXIMUM DAILY AMOUNT	700 CFT	20	ANNUAL WASTE AMOUNT	21	STATE WASTE CODE	22
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UNITS	<input type="checkbox"/> a. GALLONS <input checked="" type="checkbox"/> b. CUBIC FEET <input type="checkbox"/> c. POUNDS <input type="checkbox"/> d. TONS	23	DAYS ON SITE	365 DAYS	24	LARGEST CONTAINER	350 CFT	25
*If EHS, amount must be in pounds.								

STORAGE CONTAINER (Check all that apply)	<input type="checkbox"/> a. ABOVEGROUND TANK <input type="checkbox"/> b. UNDERGROUND TANK <input type="checkbox"/> c. TANK INSIDE BLDG <input type="checkbox"/> d. STEEL DRUM	<input type="checkbox"/> e. PLASTIC DRUM <input type="checkbox"/> f. NONMETALLIC DRUM <input type="checkbox"/> g. METAL CONTAINER <input type="checkbox"/> h. CARBOY	<input type="checkbox"/> i. VAT <input type="checkbox"/> j. FIBER DRUM <input type="checkbox"/> k. BAG(S) <input type="checkbox"/> l. BOX(S)	<input checked="" type="checkbox"/> m. CYLINDER <input type="checkbox"/> n. GLASS CONTAINER <input type="checkbox"/> o. PLASTIC CONTAINER <input type="checkbox"/> p. IN MACH OR EQUIP	<input type="checkbox"/> q. TANK WAGON <input type="checkbox"/> r. RAIL CAR <input type="checkbox"/> s. TOTE BIN <input type="checkbox"/> t. OTHER	26
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STORAGE PRESSURE	<input type="checkbox"/> a. AMBIENT <input checked="" type="checkbox"/> b. ABOVE AMBIENT <input type="checkbox"/> c. BELOW AMBIENT	27
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STORAGE TEMPERATURE	<input checked="" type="checkbox"/> a. AMBIENT <input type="checkbox"/> b. ABOVE AMBIENT <input type="checkbox"/> c. BELOW AMBIENT <input type="checkbox"/> d. CRYOGENIC	28
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%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1 99.8	CARBON DIOXIDE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	124-38-9
2 29		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3 29		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4 29		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5 29		<input type="checkbox"/> Yes <input type="checkbox"/> No	

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

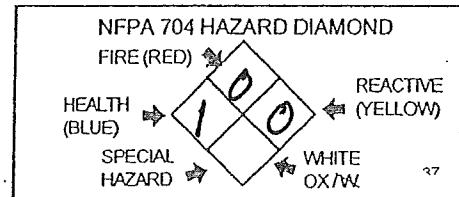
PLACARDING INFORMATION

UNDOT # 1013 33
Refer to shipping papers or MSDS

DOT HAZARD CLASS 2.2 34
Refer to shipping papers or MSDS

EPCRA YES NO 35

X _____ 36
If EPCRA, Please Sign Here



MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED



HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

ADD DELETE REVISED 1

Page 3 of 3 2

FACILITY ID#	3 0 0 3 5	BUSINESS NAME	COC SIGNS
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I. FACILITY INFORMATION

CHEMICAL LOCATION	Southeast wall of shop, inside building		
CONFIDENTIAL LOCATION EPCRA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	MAP #	GRID # A4

II. CHEMICAL INFORMATION

CHEMICAL NAME	ARGON	WASTE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	TRADE SECRET	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
COMMON NAME	ARGON	An EHS Chemical		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
CAS #	7440-37-1	FIRE CODE HAZARD CLASSES (supplied by GGFD)		*If EHS is "Yes", all amounts must be LBS	
TYPE (Check one item only)	<input checked="" type="checkbox"/> a. PURE <input type="checkbox"/> b. MIXTURE <input type="checkbox"/> c. WASTE	RADIOACTIVE	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	CURIES	
PHYSICAL STATE (Check one item only)	<input type="checkbox"/> a. SOLID <input type="checkbox"/> b. LIQUID <input checked="" type="checkbox"/> c. GAS	FED HAZARD CATEGORIES	<input type="checkbox"/> a. FIRE <input type="checkbox"/> b. REACTIVE <input checked="" type="checkbox"/> c. PRESSURE RELEASE	<input type="checkbox"/> d. ACUTE HEALTH <input type="checkbox"/> e. CHRONIC HEALTH	
AVERAGE DAILY AMOUNT	990 CFT	MAXIMUM DAILY AMOUNT	1320 CFT	ANNUAL WASTE AMOUNT	STATE WASTE CODE
UNITS	<input type="checkbox"/> a. GALLONS <input checked="" type="checkbox"/> b. CUBIC FEET <input type="checkbox"/> c. POUNDS <input type="checkbox"/> d. TONS	DAYS ON SITE	365 DAYS	LARGEST CONTAINER	
STORAGE CONTAINER (Check all that apply)	<input type="checkbox"/> a. ABOVEGROUND TANK <input type="checkbox"/> b. UNDERGROUND TANK <input type="checkbox"/> c. TANK INSIDE BLDG <input type="checkbox"/> d. STEEL DRUM	<input type="checkbox"/> e. PLASTIC DRUM <input type="checkbox"/> f. NONMETALLIC DRUM <input type="checkbox"/> g. METAL CONTAINER <input type="checkbox"/> h. CARBOY	<input type="checkbox"/> i. VAT <input type="checkbox"/> j. FIBER DRUM <input type="checkbox"/> k. BAG(S) <input type="checkbox"/> l. BOX(S)	<input checked="" type="checkbox"/> m. CYLINDER <input type="checkbox"/> n. GLASS CONTAINER <input type="checkbox"/> o. PLASTIC CONTAINER <input type="checkbox"/> p. IN MACH OR EQUIP	<input type="checkbox"/> q. TANK WAGON <input type="checkbox"/> r. RAIL CAR <input type="checkbox"/> s. TOTE BIN <input type="checkbox"/> t. OTHER
STORAGE PRESSURE	<input checked="" type="checkbox"/> a. AMBIENT <input type="checkbox"/> b. ABOVE AMBIENT <input type="checkbox"/> c. BELOW AMBIENT	STORAGE TEMPERATURE			
		<input checked="" type="checkbox"/> a. AMBIENT <input type="checkbox"/> b. ABOVE AMBIENT <input type="checkbox"/> c. BELOW AMBIENT <input type="checkbox"/> d. CRYOGENIC			

%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
39.95	ARGON	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7440-37-1
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	31
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	31
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	31
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	31
29		<input type="checkbox"/> Yes <input type="checkbox"/> No	31

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

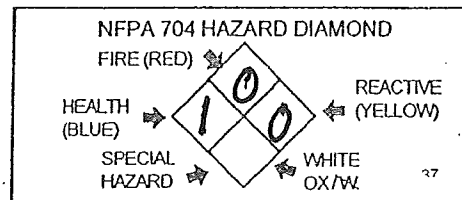
PLACARDING INFORMATION

UNDOT # 1006 33
Refer to shipping papers or MSDS

DOT HAZARD CLASS 2.2 34
Refer to shipping papers or MSDS

EPCRA YES NO 35

X _____ 36
If EPCRA, Please Sign Here



MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED

Material Safety Data Sheet

Airgas

Argon

Section 1. Chemical product and company identification

Product Name : Argon
Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253
Product use : Synthetic/Analytical chemistry.
MSDS# : 1004
Date of Preparation/Revision : 3/30/2005.
In case of emergency : 1-800-949-7937

Section 2. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
Argon	7440-37-1	100	

Section 3. Hazards identification

Physical state : Gas. (COLORLESS, ODORLESS INERT GAS)
Emergency overview : Warning!
CONTENTS UNDER PRESSURE.
Do not puncture or incinerate container.
Contact with rapidly expanding gases or liquids can cause frostbite.
Routes of entry : Inhalation
Potential acute health effects
Eyes : No known significant effects or critical hazards.
Skin : No known significant effects or critical hazards.
Inhalation : Acts as a simple asphyxiant.
Ingestion : Ingestion is not a normal route of exposure for gases
Potential chronic health effects : **CARCINOGENIC EFFECTS** Not available.
MUTAGENIC EFFECTS Not available.
TERATOGENIC EFFECTS: Not available.
Medical conditions aggravated by overexposure : Acute or chronic respiratory conditions may be aggravated by overexposure to this gas.
See toxicological Information (section 11)

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin contact : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
Frostbite : Try to warm up the frozen tissues and seek medical attention.
Inhalation : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Argon

- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

Section 5. Fire fighting measures

Flammability of the product : Non-flammable.

Fire fighting media and instructions : Use an extinguishing agent suitable for surrounding fires.

If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.
No specific hazard.

Special protective equipment for fire-fighters : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 7. Handling and storage

Handling : Do not puncture or incinerate container. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cryogenic liquids. Prevent entrapment of liquid in closed systems or piping without pressure relief devices. Some materials may become brittle at low temperatures and will easily fracture.

Storage : Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure Controls, Personal Protection

Engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

When working with cryogenic liquids, wear a full face shield.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93

Hands : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Insulated gloves suitable for low temperatures

Argon

Personal protection in case of a large spill : A self-contained breathing apparatus should be used to avoid inhalation of the product.

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Molecular weight : 39.95 g/mole
Molecular formula : Ar
Boiling/condensation point : -185.7°C (-302.3°F)
Melting/freezing point : -189.2°C (-308.6°F)
Critical temperature : -122.4°C (-188.3°F)
Vapor density : 1.38 (Air = 1)
Specific Volume (ft³/lb) : 9.70874
Gas Density (lb/ft³) : 0.103
Physical chemical comments : Not available.

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Section 11. Toxicological information

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material for humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.
Mutagenic effects : No known significant effects or critical hazards.
Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Toxicity of the products of biodegradation : The product itself and its products of degradation are not toxic.

Environmental fate : Not available.


Environmental hazards : No known significant effects or critical hazards.



Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1006	ARGON, COMPRESSED	2.2	Not applicable (gas).		Limited quantity Yes.
	UN1951	Argon, refrigerated liquid				Packaging instruction Passenger Aircraft Quantity limitation: 75 kg

Argon						
						Cargo Aircraft Quantity limitation: 150 kg
TDG Classification	UN1006 UN1951	ARGON, COMPRESSED Argon, refrigerated liquid	2.2	Not applicable (gas).		Explosive Limit and Limited Quantity Index 0.125 Passenger Carrying Road or Rail Index 75 Special provisions 42
Mexico Classification	UN1006 UN1951	ARGON, COMPRESSED Argon, refrigerated liquid	2.2	Not applicable (gas).		

Section 15. Regulatory information

United States

U.S. Federal regulations : TSCA 8(b) inventory: argon
 SARA 302/304/311/312 extremely hazardous substances: No products were found.
 SARA 302/304 emergency planning and notification: No products were found.
 SARA 302/304/311/312 hazardous chemicals: argon
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification: argon:
 Sudden Release of Pressure
 Clean Water Act (CWA) 307: No products were found.
 Clean Water Act (CWA) 311: No products were found.
 Clean air act (CAA) 112 accidental release prevention: No products were found.
 Clean air act (CAA) 112 regulated flammable substances: No products were found.
 Clean air act (CAA) 112 regulated toxic substances: No products were found.

State regulations : Pennsylvania RTK: argon: (generic environmental hazard)
 Massachusetts RTK: argon
 New Jersey: argon

Canada

WHMIS (Canada) : Class A: Compressed gas.
 CEPA DSL: argon

Section 16. Other information

United States

Label Requirements : CONTENTS UNDER PRESSURE.

Canada

Label Requirements : Class A: Compressed gas.

Argon

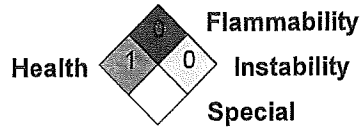
Hazardous Material Information System (U.S.A.) :

Health	1
Fire hazard	0
Reactivity	0
Personal protection	C

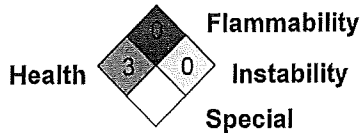
liquid:

Health	3
Fire hazard	0
Reactivity	0
Personal protection	X

National Fire Protection Association (U.S.A.) :



liquid:



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



CITY OF GARDEN GROVE
 11301 ACACIA PARKWAY
 GARDEN GROVE, CALIFORNIA 92842
 (714) 741-5636

CUPA

FACILITY INFORMATION

BUSINESS ACTIVITIES

I. FACILITY IDENTIFICATION	
FACILITY ID# 3 0 0 3 5	1. EPA ID # (Hazardous Waste Only) 2. TX R000050930
BUSINESS NAME (Same as FACILITY NAME or DBA-Doing Business As) 3. C & C SIGNS	

II. ACTIVITIES DECLARATION

NOTE: If you check YES to any part of this list, please submit the Business Owner/Operator Identification page.

Does your facility...	If Yes, please complete these pages of the UPCF...
A. HAZARDOUS MATERIALS Have on site (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO 4. ✓ HAZARDOUS MATERIALS INVENTORY - CHEMICAL DESCRIPTION (Form 3)
B. UNDERGROUND STORAGE TANKS (USTs) 1. Own or operate underground storage tanks? 2. Intent to upgrade existing or install new USTs? 3. Need to report closing a UST?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 5. ✓ UST FACILITY (Formerly SWRCB Form A) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 6. ✓ UST TANK (one page per tank) (Formerly Form B) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 7. ✓ UST FACILITY ✓ UST TANK (one per tank) ✓ UST INSTALLATION - CERTIFICATE OF COMPLIANCE (one page per tank) (Formerly Form C) ✓ UST TANK (closure portion-one page per tank)
C. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs) Own or operate ASTs above these thresholds: - any tank capacity is greater than 660 gallons, or - the total aggregate capacity for the entire facility (ASTs, drums and portable containers) greater than 1,320 gallons?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 8. ✓ NO FORM REQUIRED TO CUPAS
D. HAZARDOUS WASTE 1. Generate hazardous waste? 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC §25143.2)? 3. Treat hazardous waste on site? 4. Treatment subject to financial assurance requirements (for Permit by Rule and Condition Authorization)? 5. Consolidate hazardous waste generated at a remove site? 6. Need to report the closure/removal of a tank that was classified waste and cleaned onsite?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO 9. ✓ EPA ID NUMBER - provide at the top of this page <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 10. ✓ RECYCLABLE MATERIALS REPORT (one per recycler) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 11. ✓ ONSITE HAZARDOUS WASTE TREATMENT - FACILITY (Formerly DTSC Forms 1772) ✓ ONSITE HAZARDOUS WASTE TREATMENT - UNIT (one page per unit) (Formerly DTSC Forms 1772A,B,C,D and L) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 12. ✓ CERTIFICATION OF FINANCIAL ASSURANCE (Formerly DTSC Form 1232) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 13. ✓ REMOTE WASTE/CONSOLIDATION SITE ANNUAL NOTIFICATION (Formerly DTSC Form 1196) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 14. ✓ HAZARDOUS WASTE TANK CLOSURE CERTIFICATION (Formerly DTSC Form 1249)
E. LOCAL REQUIREMENTS Cal-ARP: California Accidental Release Prevention Program H&SC Chapter 6.95, Article 2, §25531 et seq --- Stationary Source with more than a Threshold Quantity of a Regulated Substance in a Process	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO 15. ✓ REGULATED SUBSTANCE REPORTING FORM (Orange County CUPA)

**GARDEN GROVE FIRE DEPARTMENT
HAZARDOUS MATERIALS DISCLOSURE PROGRAM**

BUSINESS EMERGENCY PLAN

Personnel Emergency Notifications and Responsibilities

Employee Evacuation and Staging Areas:

1. The type of alarm signal that will be used to initiate an evacuation at the facility (vocal, paging system, manual alarm, etc.).

PAGING SYSTEM

2. All employees shall be trained to evacuate the facility through at least one exit. Alternate exit routes shall be designated if available.
3. Staging areas shall be designated for all employees. Staging areas will be the location that all employees shall report to in the event of an emergency.

One person shall be designated to account for all personnel at the staging area. That person will be responsible for meeting the incoming Fire units and reporting the conditions known about the incident.

The Staging area is at the following location as shown on your site plan map:

K8

Employee Responsibilities:

At least one employee shall be responsible for the following minimum requirements in the event of an emergency response by the Fire Department.

1. Notify employees. Initiate evacuation procedures.
2. Notify the Garden Grove Fire Department. Dial 911.
3. Try to identify the nature of the incident.
4. Report to the staging area and account for evacuated employees.
5. Report to the incoming fire units.
6. Activate any emergency mitigation procedures that area available at your business. (List below any mitigation procedures specific to your business, if any.)

**GARDEN GROVE FIRE DEPARTMENT
HAZARDOUS MATERIALS DISCLOSURE PROGRAM**

BUSINESS EMERGENCY PLAN

Personnel Emergency Notifications and Responsibilities (Continued)

Training Requirements

State law requires training of employees where the business uses, handles or stores hazardous materials.

Employee training provided on:

- Appointment of person/persons on site who are trained in key role positions. Emergency coordinator, evacuation coordinators, staging area supervisors and documenting officers.
- Procedures to follow during a release or threatened release of a hazardous material (evacuation to staging areas).
- Information contained in material safety data sheets.
- Warning labels/placards.
- Safe work practices.
- Use of on-site emergency equipment and supplies.
- Use and location of personal protective equipment.
- Any chemical, hazardous material or substance that could be encountered in his/her work area.
- On site alarm system for evacuation.
- Discuss possible release of hazardous materials scenario.

Emergency Notifications

A handler of hazardous materials is required to immediately report any release or threatened release of hazardous materials to the Garden Grove Fire Department. Failure to do so may result in criminal and/or civil prosecution.

Required Notifications

In the event of a release or threatened release of hazardous materials, it is State law to notify each of the following agencies.

<u>Agency</u>	<u>Phone Numbers</u>
Garden Grove Fire Department, Police, Paramedics	911
Office of Emergency Services (OES)	(800) 852-7550 or (916) 427-4341
National Response Center	(800) 424-8802

**GARDEN GROVE FIRE DEPARTMENT
HAZARDOUS MATERIALS DISCLOSURE PROGRAM**

BUSINESS EMERGENCY PLAN

Personnel Emergency Notifications and Responsibilities (Continued)

Prevention

All materials are stored, used and handled within the guidelines of the Uniform Fire Code, N.F.P.A. standards, California Administrative Code, Titles 19 and 20.

This section is meant to initiate a Prevention Plan at your business and to assist in preventing a release, or threatened release, of a hazardous material. In the spaces provided, place a checkmark by the preventive actions which have been initiated by your business to abate hazards relating to hazardous material handling, use of storage.

Consideration shall include:

1. Drum storage and/or above ground tank storage areas:
 - a. Isolation and separation of incompatible materials.
 - b. Diking areas to contain spills.
 - c. Storage on paved ground.

2. Compressed and/or cryogenic gas storage areas:
 - a. Cylinder stored upright and secured.
 - b. Isolation and/or separation of incompatible cylinders (oxygen and flammable gases, etc.).

3. General:
 - a. Safe work practices are exercised in daily routines.
 - b. Employees who handle hazardous materials are properly trained.
 - c. Material Safety Data Sheets (MSDS) readily available for each hazardous material on the premises.
 - d. Labeling of all materials and storage areas with the product name and hazards associated with the product (drums, piping, tanks, etc.).
 - e. Uniform Fire Code (UFC) requires separation between outside hazardous material storage area or tanks and combustible materials (wood, bush, etc.).
 - f. Posting of "No Smoking" signs where appropriate.

GARDEN GROVE FIRE DEPARTMENT
BUSINESS EMERGENCY PLAN

A BUSINESS IS REQUIRED BY LAW TO NOTIFY THE GARDEN GROVE FIRE DEPARTMENT WITHIN 30 DAYS OF ANY OF THE FOLLOWING EVENTS.

- | |
|---|
| <ol style="list-style-type: none">1. Change of business address.2. Change of business ownership.3. Change of business name.4. Cessation of business operation (quitting business).5. Use or handling of a previously undisclosed hazardous material.6. A 100% increase in the quantity of a previously disclosed hazardous material. |
|---|

Your business is required by State law (CFC 8001.3.2) to retain a copy of this entire Hazardous Materials Disclosure information, including the Business Plan, chemical inventory, material safety data sheets and site maps, for review by Fire Department personnel. State where your disclosure and Emergency Business Plan will be kept.

<i>H7 File Cabinet</i>

Show location on site map also using symbol in the legend. *H7* *MSDS*

Note: A fee is charged for a replacement copy from the Garden Grove Fire Department.

I certify, under penalty of perjury, that the enclosed information is true and correct to the best of my knowledge.

Signature: *Gary L Buckles*
Name: *GARY L BUCKLES*
Title: *VP of OPERATIONS*
Date: *6/11/07*

Material Safety Data Sheet

Acetone

ACC# 95389

Section 1 - Chemical Product and Company Identification

MSDS Name: Acetone

Catalog Numbers: AC167640000, AC167640025, AC167645000, AC176800000, AC176800010, AC176800025, AC176800025, AC176800026, AC176800050, AC176800250, AC176805000, AC177170000, AC177170000, AC177170010, AC177170025, AC177170050, AC177170100, AC177170250, AC177170250, AC326570000, AC326570010, AC326570025, AC326700000, AC326700010, AC326700010, AC326700025, AC326740000, AC326740010, AC326740025, AC326800000, AC326800000, AC326800010, AC326801000, AC327840000, AC327840010, AC400100000, AC400100000, AC400100010, AC400105000, AC423240000, AC423240010, AC423245000, AC423245000

Synonyms: 2-Propanone**Company Identification:**

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01**For emergencies in the US, call CHEMTREC: 800-424-9300**

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-64-1	Acetone	>99%	200-662-2

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Not available. Appearance: APHA: 10 max clear liquid. Flash Point: -20 deg C.

Not available.

Target Organs: Kidneys, central nervous system, liver, respiratory system, skin.**Potential Health Effects****Eye:** Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury.**Skin:** Exposure may cause irritation characterized by redness, dryness, and inflammation. Repeated or prolonged exposure may cause drying and cracking of the skin.**Ingestion:** May cause irritation of the digestive tract. May cause central nervous system depression, kidney damage, and liver damage. Symptoms may include: headache, excitement, fatigue, nausea, vomiting, stupor, and coma.**Inhalation:** Causes respiratory tract irritation. May cause liver and kidney damage. May cause motor incoordination and speech abnormalities. May cause narcotic effects in high concentration. Inhalation of vapors may cause drowsiness and dizziness.**Chronic:** Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation may cause effects similar to those of acute inhalation.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately. Wash mouth out with water.

Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Vapor may cause flash fire.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.

Flash Point: -20 deg C (-4.00 deg F)

Autoignition Temperature: 465 deg C (869.00 deg F)

Explosion Limits, Lower:2.1 Vol %

Upper: 13 Vol %

NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear appropriate protective clothing to minimize contact with skin. Remove all sources of ignition. Use a spark-proof tool.

Section 7 - Handling and Storage

Handling: Use with adequate ventilation. Use spark-proof tools and explosion proof equipment. Avoid breathing dust, vapor, mist, or gas. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry place. Do not store in direct sunlight. Store in a tightly closed container. Flammables-area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Acetone	500 ppm TWA; 750 ppm STEL	250 ppm TWA; 590 mg/m ³ TWA 2500 ppm IDLH	1000 ppm TWA; 2400 mg/m ³ TWA

OSHA Vacated PELs: Acetone: 750 ppm TWA; 1800 mg/m³ TWA

Personal Protective Equipment

Eyes: Not available.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid

Appearance: APHA: 10 max

Odor: acetone-like

pH: Not available.

Vapor Pressure: 247mbar @20 deg C

Vapor Density: 2.00

Evaporation Rate:7.7 (n-Butyl acetate=1)

Viscosity: 0.32 mPa s @20 deg C

Boiling Point: 56 deg C @760mmHg

Freezing/Melting Point:-95 deg C

Decomposition Temperature:Not available.

Solubility: Soluble.

Specific Gravity/Density:0.790

Molecular Formula:C₃H₆O

Molecular Weight:58.08

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, ignition sources, moisture, exposure to air, temperatures above 220°C, attacks some plastics, rubber, and coatings.

Incompatibilities with Other Materials: Oxidizing agents, reducing agents, bases, acetic acid, nitric acid, sulfuric acid, May form explosive/incompatible mixtures with a wide range of substances., hydrogen peroxide, chromyl chloride, nitrosyl perchlorate, hexachloromelamine, chromic anhydride, sulfur dichloride, carbon, potassium tert-butoxide, peroxomonosulfuric acid.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 67-64-1: AL3150000

LD50/LC50:

CAS# 67-64-1:

Dermal, guinea pig: LD50 = >9400 uL/kg;
 Draize test, rabbit, eye: 20 mg Severe;
 Draize test, rabbit, eye: 20 mg/24H Moderate;
 Draize test, rabbit, eye: 10 uL Mild;
 Draize test, rabbit, skin: 500 mg/24H Mild;
 Inhalation, mouse: LC50 = 44 gm/m³/4H;
 Inhalation, rat: LC50 = 50100 mg/m³/8H;
 Oral, mouse: LD50 = 3 gm/kg;
 Oral, rabbit: LD50 = 5340 mg/kg;
 Oral, rat: LD50 = 5800 mg/kg;

Carcinogenicity:

CAS# 67-64-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.**Teratogenicity:** No developmental toxic effects were seen in rats and mice exposed to atmospheric concentrations of acetone vapour up to 11,000 ppm and 6000 ppm respectively 6 hr/day for 7 day. [Mast, T.J; et al. Energy Res. Abstr. 1989, 14(7), Abstr. No. 13672]**Reproductive Effects:** Fertility: post-implantation mortality. Ihl, mam: TCLo=31500 ug/m³/24H (1-13D preg)**Mutagenicity:** Cytogenetic analysis: hamster fibroblast, 40 g/LSex chromosome loss/non-disjunction: S.cerevisiae, 47600 ppmSalmonella typhimurium TA92, TA94, TA98, TA100, TA1535, TA1537 with metabolic activation negative. Chinese hamster fibroblast (24 hr) without metabolic activation induced chromosomal aberrations. [Ishidate, M; et al. Food Chem. Toxicol. 1984, 22(8), 623-636].**Neurotoxicity:** No information available.**Other Studies:**

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.**Environmental:** No information available.**Physical:** No information available.**Other:** On soil, substance volatilizes and biodegrades.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series:

CAS# 67-64-1: waste number U002 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ACETONE	ACETONE
Hazard Class:	3	3
UN Number:	UN1090	UN1090
Packing Group:	II	II

Section 15 - Regulatory Information
--

US FEDERAL**TSCA**

CAS# 67-64-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

CAS# 67-64-1: Test for Health Effects

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 67-64-1: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 67-64-1: immediate, fire.

Section 313 No chemicals are reportable under Section 313.**Clean Air Act:**

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 67-64-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI F

Risk Phrases:

- R 11 Highly flammable.
- R 36 Irritating to eyes.
- R 66 Repeated exposure may cause skin dryness or cracking.
- R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

- S 16 Keep away from sources of ignition - No smoking.
- S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 67-64-1: 0

Canada - DSL/NDSL

CAS# 67-64-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 67-64-1 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information
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MSDS Creation Date: 7/27/1999

Revision #10 Date: 6/14/2005

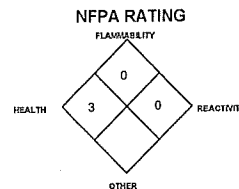
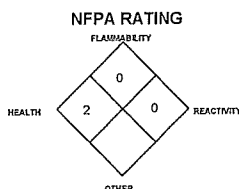
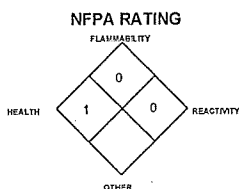
The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.



CARBON DIOXIDE GAS

CARBON DIOXIDE SOLID

CARBON DIOXIDE LIQUEFIED



MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS:

CARBON DIOXIDE - CO₂, GASEOUS
CARBON DIOXIDE - CO₂, CRYOGENIC
CARBON DIOXIDE - CO₂, SOLID
 Document Number: 001013

PRODUCT USE:

For general analytical/synthetic chemical uses.

SUPPLIER/MANUFACTURER'S NAME:

AIRGAS INC.

ADDRESS:

259 N. Radnor Chester Road
 Suite 100
 Radnor, PA 19087-5283

BUSINESS PHONE:

1-610-687-5253

EMERGENCY PHONE:

1-800-949-7937

International: 1-423-479-0293

DATE OF PREPARATION:

May 20, 1996

DATE OF REVISION:

August 3, 2002

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA		IDLH ppm	OTHER ppm
			TLV ppm	STEL ppm	PEL ppm	STEL ppm		
Carbon Dioxide	124-38-9	> 99.8	5000	30,000	5000 10,000 (Vacated 1989 PEL)	30,000 (Vacated 1989 PEL)	40,000	DFG-MAK: 5000 NIOSH REL TWA: 5000 ST: 30000 ppm
Maximum Impurities		< 0.2	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established

C = Ceiling Limit.

See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.



3. HAZARD IDENTIFICATION



Carbon Dioxide Gas and Cryogenic Liquid

EMERGENCY OVERVIEW: Carbon Dioxide is a colorless gas, or a colorless, cryogenic liquid. At low concentrations, both the gas and the liquid are odorless. At higher concentrations Carbon Dioxide will have a sharp, acidic odor. At concentrations between 2 and 10%, Carbon Dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. If the gas concentration reaches 10% or more, suffocation and death can occur within minutes. Contact with the cold gas can cause freezing of exposed tissue. Moisture in the air could lead to the formation of carbonic acid that can be irritating to the eyes. All forms of Carbon Dioxide are non-combustible. Carbon Dioxide is heavier than air and should not be allowed to accumulate in low lying areas.

CARBON DIOXIDE GAS

CARBON DIOXIDE LIQUEFIED

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH	(BLUE)	1	
FLAMMABILITY	(RED)	0	
REACTIVITY	(YELLOW)	0	
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH	(BLUE)	3	
FLAMMABILITY	(RED)	0	
REACTIVITY	(YELLOW)	0	
PROTECTIVE EQUIPMENT			X
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

~~See Section 16 for Definition of Ratings~~

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant route of overexposure for this gas is by inhalation. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: Carbon Dioxide is an asphyxiant and a powerful cerebral vasodilator. If the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur rapidly. Inhalation of concentrations between 2 and 10% can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Carbon Dioxide initially stimulates respiration and then causes respiratory depression. Inhalation of low concentrations (3-5%) have no known permanent harmful effects. Symptoms in humans at various levels of concentration are as follows:

<u>CONCENTRATION</u>	<u>SYMPTOMS OF EXPOSURE</u>
1%:	Slight increase in breathing rate.
2%:	Breathing rate increases to 50% above normal; prolonged exposure can cause headache, tiredness.
3%:	Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increase in blood pressure and pulse rate.
4-5%:	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident and slight choking may be felt.
5-10%:	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment and ringing in the ears. Judgment may be impaired, followed by loss of consciousness.
50-100%:	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.

High concentrations of this gas can also cause an oxygen-deficient environment. However, the asphyxiating properties of Carbon Dioxide will be reached before oxygen-deficiency is a factor.

3. HAZARD IDENTIFICATION (Continued)

OTHER POTENTIAL HEALTH EFFECTS: Contact of the cold gas with the skin can lead to frostbite or dermatitis (red, cracked, irritated skin), depending upon concentration and duration of exposure. Contact of the cold gas with the eyes can cause pain, redness, burns, and severe exposure could cause blindness. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with cold gas can quickly subside. Moisture in the air could lead to the formation of carbonic acid, which can be irritating to the eyes.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to Carbon Dioxide may cause the following health effects:

ACUTE: Inhaling high concentrations of Carbon Dioxide can lead to coma or death. At low concentrations, inhalation of Carbon Dioxide can cause nausea, dizziness, visual disturbances, shaking, headache, mental confusion, sweating, increased heartbeat, and elevated blood pressure and respiratory rate. High concentrations of the gas in air may cause eye irritation or damage.

CHRONIC: Reversible effects on the acid-base balance in the blood, blood pressure, and circulatory system may occur after prolonged exposure to elevated Carbon Dioxide levels.

TARGET ORGANS: Respiratory system, cardiovascular system, eyes.

Carbon Dioxide Solid



EMERGENCY OVERVIEW: Solid Carbon Dioxide (dry ice), is a white, opaque solid which releases colorless, gas. This solid sublimates to gas quickly at standard temperatures and pressures, forming a fog in air. As a result, the main hazards associated with Carbon Dioxide are related to Carbon Dioxide gas formation and the cold temperature of the solid and evolved gas. At concentrations between 2 and 10%, Carbon Dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. If the gas concentration reaches 10% or more, suffocation and death can occur within minutes. Contact with the solid can cause freezing of exposed tissue. Moisture in the air could lead to the formation of carbonic acid which can be irritating to the eyes. Carbon Dioxide is heavier than air and should not be allowed to accumulate in low lying areas.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of overexposure for Carbon Dioxide are by inhalation of Carbon Dioxide gas, and skin or eye contact with the solid or gas. Symptoms of such exposure are as follows:

INHALATION: Carbon Dioxide is an asphyxiant and a powerful cerebral vasodilator. If the concentration of Carbon Dioxide reaches 10% or more, suffocation can occur rapidly. Inhalation of concentrations between 2 and 10% can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. Carbon Dioxide initially stimulates respiration and then causes respiratory depression. Inhalation of low concentrations (3-5%) have no known permanent harmful effects. Symptoms in humans at various levels of concentration are as follows:

CONCENTRATION	SYMPTOMS OF EXPOSURE
1%:	Slight increase in breathing rate.
2%:	Breathing rate increases to 50% above normal; exposure causes headache, tiredness.
3%:	Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increase in blood pressure and pulse rate.
4-5%:	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident; slight choking may be felt.
5-10%:	Labored breathing, headache, visual impairment, ringing in the ears, impaired judgment, followed by loss of consciousness.
50-100%:	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.

CARBON DIOXIDE SOLID

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	2
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

See Section 16 for Definition of Ratings

3. HAZARD IDENTIFICATION (Continued)

INHALATION (Continued): High concentrations of this gas can also cause an oxygen-deficient environment. However, the asphyxiating properties of Carbon Dioxide will be reached before oxygen-deficiency is a factor.

OTHER POTENTIAL HEALTH EFFECTS: Contact with solid Carbon Dioxide can cause frostbite to skin, eyes, and other exposed tissue. Contact of the cold gas generated from the solid with the skin can lead to frostbite or dermatitis (red, cracked, irritated skin), depending upon concentration and duration of exposure. Contact of the cold gas with the eyes can cause pain, redness, burns, and severe exposure could cause blindness. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with cold gas or solid can quickly subside. Moisture in the air could lead to the formation of carbonic acid, which can be irritating to the eyes.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Overexposure to Carbon Dioxide may cause the following health effects:

ACUTE: Contact with solid Carbon Dioxide or cold gas can cause frostbite to skin, eyes, and other exposed tissue. Carbon Dioxide gas evolved from the sublimation of the solid is an asphyxiant and a powerful cerebral vasodilator. Inhaling high concentrations of Carbon Dioxide can lead to coma or death. At low concentrations, inhalation of Carbon Dioxide can cause nausea, dizziness, visual disturbances, shaking, headache, mental confusion, sweating, increased heartbeat, and elevated blood pressure and respiratory rate. High concentrations of the gas in air may cause eye irritation or damage.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to solid Carbon Dioxide or the gas which is generated by sublimation.

TARGET ORGANS: Respiratory system, cardiovascular system, eyes.

PART III *How can I prevent hazardous situations from occurring?*

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus should be worn.

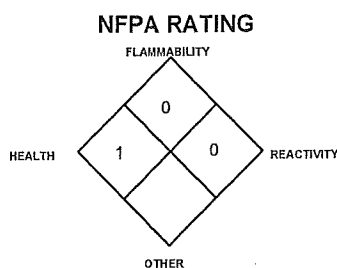
Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

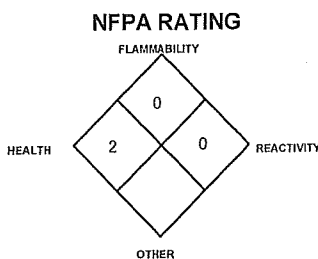
Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

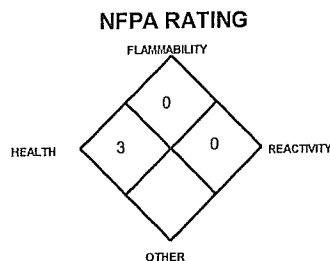
CARBON DIOXIDE GAS



CARBON DIOXIDE SOLID



CARBON DIOXIDE LIQUEFIED



See Section 16 for Definition of Ratings

FLASH POINT: Not Applicable.

AUTOIGNITION TEMPERATURE: Not Applicable.

FLAMMABLE LIMITS (in air by volume, %): Lower: Not Applicable.
Upper: Not Applicable.

5. FIRE-FIGHTING MEASURES (Continued)

FIRE EXTINGUISHING MATERIALS: Carbon Dioxide is commonly used as an extinguishing agent, and therefore, should not present a problem when trying to control a blaze. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Carbon Dioxide does not burn; however, containers, when involved in fire, may rupture or burst in the heat of the fire. Dusts of various reactive metals (e.g. magnesium, zirconium, titanium alloys), are readily ignited and explode in the presence of Carbon Dioxide. Mixtures of solid Carbon Dioxide with sodium and potassium alloys are impact sensitive and explode violently. In the presence of moisture, cesium oxide ignites on contact with Carbon Dioxide. Metal acetylides or hydrides will also ignite or explode.

Explosion Sensitivity to Mechanical Impact: Not sensitive, except as noted above.

Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed cylinders if it can be done without risk to firefighters. Otherwise, cool containers with hose stream and protect personnel. Withdraw immediately in case of rising sounds from venting safety device or any discoloration of tanks due to the fire.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. Minimum Personal Protective Equipment should be **Level B: protective clothing, mechanically-resistant gloves and Self-Contained Breathing Apparatus**. Locate and seal the source of the leaking gas.

Allow the gas, which is heavier than air, to dissipate. Monitor the surrounding area for Carbon Dioxide and Oxygen levels. Colorimetric tubes are available for Carbon Dioxide. The levels of Carbon Dioxide must be below those listed in Section 2 (Composition and Information on Ingredients) and the atmosphere must have at least 19.5 percent Oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

RESPONSE TO LIQUID RELEASE: Releasing liquid will immediately turn to dry ice. Clear the affected area and allow the solid to evaporate and the gas to dissipate. Clean up the solid as detailed below. After the gas is formed, follow the instructions provided in the previous paragraph. If the area must be entered by emergency personnel, SCBA, Kevlar gloves, and appropriate foot and leg protection must be worn.

RESPONSE TO SOLID RELEASE: Pick-up and immediately place solid pieces of dry ice in an appropriate, thermally-insulated, vented container. Alternatively, allow the solid to sublimate and the gas that is generated to dissipate.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting Carbon Dioxide IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness, fatigue, or any exposure symptom described in Section 3 (Hazard Identification); exposures to fatal concentrations of Carbon Dioxide could occur without any significant warning symptoms.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Containers of Carbon Dioxide can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Store containers away from process and production areas, away from elevators, building and room exits or main aisles leading to exits. Containers should be stored in dry, well-ventilated areas away from sources of heat, ignition and direct sunlight. Protect containers against physical damage. Isolate from other non-compatible chemicals (refer to Section 10, Stability and Reactivity).

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated, fireproof area, away from flammable materials and corrosive atmospheres. Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Do not allow area where cylinders are stored to exceed 52°C (125°F). Use only storage containers and equipment (pipes, valves, fittings to relieve pressure, etc.) designed for the storage of Solid, Gaseous or Liquefied Carbon Dioxide. Do not store containers where they can come into contact with moisture.

7. HANDLING and STORAGE (Continued)

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS (Continued): Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. Liquefied Carbon Dioxide must be stored and handled under positive pressure or in a closed system to prevent the infiltration and solidification of air or other gases. The following rules are applicable to situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap in-place (where provided) until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap (where provided). Mark empty cylinders "EMPTY".

NOTE: Use only DOT or ASME code containers. In the event of an electrical discharge, Carbon Dioxide gas will produce carbon monoxide and oxygen. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner.

SPECIAL PRECAUTIONS FOR HANDLING PRESSURIZED CONTAINERS OF LIQUID CARBON DIOXIDE: Cold liquids can present significant safety hazards. Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cold fluids. The extremely cold metal of the container will cause moist flesh to stick fast and tear when one attempts to withdraw from it. The following rules are applicable to work situations in which liquid containers are being used.

Check all hoses and transfer equipment before filling them with the liquid. Replace any worn or cut hoses prior to use. Liquid Carbon Dioxide is extremely cold and is under pressure. A leak will result in the formation of "Dry Ice" particles which will be forcibly ejected from the system, possibly injuring the operator. A complete hose failure can result in a large release of Carbon Dioxide and violent movement of the hose and associated equipment, which may cause severe injury or death. Special care must be taken when depressurizing and disconnecting hoses. Releasing the contents of a liquid-filled line to atmospheric pressure may result in the formation of a solid dry ice plug in the line. This plug will prevent further removal of the liquid behind the plug, resulting in either an unexpected, rapid release of Carbon Dioxide as the line warms, or the catastrophic failure of the line as the liquid warms behind the plug. Sufficient vapor pressure must be applied and maintained behind the liquid before opening a discharge valve. This action will prevent the depressurization of the liquid to the point of solid formation before it exits the line.

High-pressure containers for liquid product are equipped with pressure relief devices to control internal pressure. Under normal conditions, these containers will periodically vent small amounts of product. Some metals such as carbon steel may become brittle at low temperatures and will easily fracture. Prevent entrapment of liquid in closed systems or piping without pressure relief devices.

SPECIAL PRECAUTIONS FOR HANDLING OF SOLID CARBON DIOXIDE: Do not handle solid Carbon Dioxide with bare hands. Use heavy gloves or dry ice tongs. Handle blocks of dry ice carefully, as injuries can occur if one is accidentally dropped on the feet. Never store dry ice in a standard refrigerator, cooler, or freezer designed for food storage. Containers of solid Carbon Dioxide should be stored upright and be firmly secured to prevent falling or being knocked-over. Containers should be vented, to prevent the build-up of Carbon Dioxide gas. Carbon Dioxide sublimates at -78.5°C (-109.3°F); containers should be thermally insulated and kept at the lowest possible temperature to maintain the solid and avoid generation of Carbon Dioxide gas. Storage containers and equipment used with Carbon Dioxide should not be located in sub-surface or enclosed areas, unless engineered to maintain a concentration of Carbon dioxide below the TLV (TLV = 5000 ppm in the event of a release. Solid consignment of dry ice in a gas-tight vessel can lead to catastrophic failure of the vessel by over-pressurization. Storage of dry ice should never occur in a gas-tight container.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (e.g., Nitrogen) before attempting repairs.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Carbon Dioxide accumulates in low-lying areas with limited air movement. Natural or mechanical ventilation should be available in the worker's breathing zone to prevent levels of Carbon Dioxide above exposure limits (see Section 2, Composition and Information on Ingredients). Local exhaust ventilation is preferred, because it prevents dispersion of this gas into the work place by eliminating it at its source. Areas of Carbon Dioxide use should be engineered to remove vapor from the lowest possible level and exhaust vapor to a well-ventilated area or to the outside. Carbon Dioxide levels should be monitored to assure levels are maintained below the TLV. If appropriate, install automatic monitoring equipment to detect the levels of Carbon Dioxide and of Oxygen.

RESPIRATORY PROTECTION: Maintain Carbon Dioxide levels below those listed in Section 2 (Composition and Information on Ingredients) and Oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if Carbon Dioxide levels are above the IDLH (40,000 ppm) or during emergency response to a release of this product. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). The following are NIOSH respiratory protective equipment recommendations for Carbon Dioxide concentrations in air and are provided for further information:

CONCENTRATION

UP TO 40,000 ppm:

RESPIRATORY EQUIPMENT
Supplied Air Respirator (SAR); or full-facepiece Self-Contained Breathing Apparatus (SCBA).
EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

ESCAPE:

Escape-type SCBA.

EYE PROTECTION: Splash goggles, face-shields or safety glasses. Face-shields must be worn when using cryogenic Carbon Dioxide. If necessary, refer to U.S. OSHA 29 CFR 1910.133, or Canadian Standards.

HAND PROTECTION: Wear mechanically-resistant gloves when handling cylinders of Carbon Dioxide. Recommended use of low-temperature protective gloves (e.g. insulated polyvinyl chloride or insulated nitrile) when working with containers of Liquefied Carbon Dioxide. Wear thermally insulating gloves when handling Dry Ice.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well provide sufficient insulation from extreme cold.

9. PHYSICAL and CHEMICAL PROPERTIES

GAS DENSITY @ 21°C (70°F) and 1 atm: 0.1144 lb/ft³ (1.833 kg/m³)

LIQUID DENSITY @ 21.1°C (70°F) and 838 psig (5778 kPa): 47.35 lb/ft³ (761.3 kg/m³)

SOLID DENSITY @ -78.5°C (-109.3°F): 97.59 lb/ft³ (1569 kg/m³)

SPECIFIC GRAVITY (gas) @ 21°C (70°F): 1.52

SPECIFIC GRAVITY (solid) @ 0°C (32°F): 1.54

VAPOR PRESSURE (psia): 844.7

SOLUBILITY IN WATER @ 20°C (68°F): 0.90%

ODOR THRESHOLD: Not applicable.

EXPANSION RATIO: Not applicable.

BOILING POINT @ 1 atm (sublimation point): -78.5°C (-109.3°F)

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

APPEARANCE AND COLOR: Carbon dioxide is a colorless to opaque, white solid; a colorless gas; or a colorless cryogenic liquid. All forms of Carbon Dioxide are odorless at low concentrations. At high concentrations, Carbon Dioxide will have a sharp, acidic odor.

HOW TO DETECT THIS SUBSTANCE (warning properties): The odor is not a good warning property, as the asphyxiation properties of Carbon Dioxide may present a hazard before the odor at high concentrations is readily detectable. In terms of leak detection for the gas, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation. In conditions of high humidity, the solid form of Carbon Dioxide may release visible vapors. Colorimetric tubes are available for the detection of Carbon Dioxide.

10. STABILITY and REACTIVITY

STABILITY: Normally stable.

DECOMPOSITION PRODUCTS: Carbon Dioxide gas in an electrical discharge yields carbon monoxide and oxygen. In the presence of moisture, Carbon Dioxide will form carbonic acid.

10. STABILITY and REACTIVITY (Continued)

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Carbon Dioxide will ignite and explode when heated with powdered aluminum, beryllium, cerium alloys, chromium, magnesium-aluminum alloys, manganese, thorium, titanium, and zirconium. In the presence of moisture, Carbon Dioxide will ignite with cesium oxide. Metal acetylides will also ignite and explode on contact with Carbon Dioxide.

HAZARDOUS POLYMERIZATION: Will not occur, however Carbon Dioxide acts to catalyze the polymerization of acrylaldehyde and aziridine.

CONDITIONS TO AVOID: Avoid exposing cylinders of Carbon Dioxide to extremely high temperatures, which could cause the cylinders to rupture or burst. Do not store the solid form of Carbon Dioxide in gas-tight containers, which could also cause over-pressurization and rupture of the container.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Carbon Dioxide is an asphyxiant gas, which has physiological effects at high concentrations. The following toxicological data are available for Carbon Dioxide.

CARBON DIOXIDE:

LCLo (Inhalation-Human) 9 pph/5 minutes
LCLo (Inhalation-Mammal-species unspecified) 90000 ppm/5 minutes

TCLo (Inhalation-Rat) 10000 ppm/24 hours/days-continuous: Blood: other changes

TCLo (Inhalation-Rat) 6 pph/24 hours: female 10 day(s) after conception: Reproductive: Specific Developmental Abnormalities: musculoskeletal system, cardiovascular (circulatory) system, respiratory system

TCLo (Inhalation-Rat) 6 pph/24 hours: female 10 day(s) after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

CARBON DIOXIDE (continued):

TCLo (Inhalation-Rabbit) 27,000 ppm/24 hours/30 days-continuous : Behavioral: somnolence (general depressed activity)

TCLo (Inhalation-Rabbit) 13 pph/4 hours: female 9-12 day(s) after conception: Reproductive: Specific Developmental Abnormalities: musculoskeletal system

TCLo (Inhalation-Mouse) 55 pph/2 hours: male 3 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

TCLo (Inhalation-Mouse) 55 pph/4 hours: male 6 day(s) pre-mating: Reproductive: Fertility: male fertility index (e.g. # males impregnating females per # males exposed to fertile non-pregnant females)

CARBON DIOXIDE (continued):

TCLo (Inhalation-Mouse) 2 pph/8 hours: female 10 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Specific Developmental Abnormalities: musculoskeletal system

SUSPECTED CANCER AGENT: Carbon Dioxide is not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC, and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases can cause frostbite and damage to exposed skin and eyes. Due to the formation of carbonic acid, this gas mixture can be slightly irritating to contaminated eyes.

SENSITIZATION OF PRODUCT: Carbon Dioxide is not a sensitizer after prolonged or repeated exposures.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Carbon Dioxide on the human reproductive system.

Mutagenicity: Carbon Dioxide is not expected to cause mutagenic effects in humans.

Embryotoxicity: Carbon Dioxide has not been reported to cause embryotoxic effects; see next paragraph for information.

Teratogenicity: Carbon Dioxide is not expected to cause teratogenic effects in humans. Clinical studies involving test animals exposed to high concentrations of Carbon Dioxide indicate teratogenic effects (e.g., cardiac and skeletal malformations, stillbirths).

Reproductive Toxicity: Carbon Dioxide is not expected to cause adverse reproductive effects in humans. Studies involving test animals exposed to high concentrations of Carbon Dioxide indicate reproductive effects (e.g. changes in testes).

*A **mutagen** is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An **embryotoxin** is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance which interferes in any way with the reproductive process.*

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Disorders involving the "Target Organs" (see Section 3, Hazard Information) may be aggravated by Carbon Dioxide overexposure.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce overexposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for Carbon Dioxide.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: Carbon Dioxide occurs naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to Carbon Dioxide.

CARBON DIOXIDE: Food chain concentration potential: None. Biological Oxygen Demand: None

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Any adverse effect on animals would be related to Carbon Dioxide overexposure and oxygen-deficient environments. No adverse effect is anticipated to occur to plant-life, except for frost produced in the presence of rapidly expanding gases.

EFFECT OF CHEMICAL ON AQUATIC LIFE: The following aquatic toxicity data are available for Carbon Dioxide.

CARBON DIOXIDE:

Aquatic toxicity: 100-200 mg/l/no time specified/various organisms/fresh water.

Waterfowl toxicity: Inhalation 5-8%, no effect.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Product removed from cylinder must be disposed of in accordance with appropriate U.S. Federal, State and local regulations or with regulations of Canada and its Provinces. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

For Carbon Dioxide Gas:

PROPER SHIPPING NAME:	Carbon dioxide
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1013
PACKING GROUP:	Not applicable.
DOT LABEL(S) REQUIRED:	Non-Flammable Gas
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):	120

For Carbon Dioxide Liquefied:

PROPER SHIPPING NAME:	Carbon dioxide, refrigerated liquid
HAZARD CLASS NUMBER and DESCRIPTION:	2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 2187
PACKING GROUP:	Not applicable.
DOT LABEL(S) REQUIRED:	Non-Flammable Gas
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):	120

For Carbon Dioxide, Solid:

PROPER SHIPPING NAME:	Carbon dioxide, solid <u>or</u> Dry ice
HAZARD CLASS NUMBER and DESCRIPTION:	9 (Miscellaneous Dangerous Goods)
UN IDENTIFICATION NUMBER:	UN 1845
PACKING GROUP:	III
DOT LABEL(S) REQUIRED:	None
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):	120

MARINE POLLUTANT: Carbon Dioxide is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Carbon Dioxide is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for Carbon Dioxide (solid, gaseous or liquid form). The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

CANADIAN DSL/NDL INVENTORY STATUS: Carbon Dioxide is listed on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Carbon Dioxide is on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Carbon Dioxide is covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Carbon Dioxide.
California - Permissible Exposure Limits for Chemical Contaminants: Carbon Dioxide.
Florida - Substance List: Carbon Dioxide.
Illinois - Toxic Substance List: Carbon Dioxide.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Carbon Dioxide.

Michigan - Critical Material Register: No.
Minnesota - List of Hazardous Substances: Carbon Dioxide.
Missouri - Employer Information/Toxic Substance List: Carbon Dioxide.
New Jersey - Right to Know Hazardous Substance List: Carbon Dioxide.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: Carbon Dioxide.
Rhode Island - Hazardous Substance List: Carbon Dioxide.
Texas - Hazardous Substance List: Carbon Dioxide.
West Virginia - Hazardous Substance List: Carbon Dioxide.
Wisconsin - Toxic and Hazardous Substances: Carbon Dioxide.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Carbon Dioxide is not on the California Proposition 65 lists.

LABELING:

CARBON DIOXIDE GAS:

CAUTION:

LIQUID AND GAS UNDER PRESSURE.
CAN CAUSE RAPID SUFFOCATION.
CAN INCREASE RESPIRATION AND HEART RATE.
MAY CAUSE FROSTBITE.

Avoid breathing gas.
Store and use with adequate ventilation.
Do not get liquid in eyes, on skin or clothing.
Cylinder temperature should not exceed 125°F (52°C).
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

NOTE:

Suck-back into cylinder may cause rupture.
Always use a back flow preventative device in piping.

FIRST-AID:

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
IN CASE OF FROSTBITE, obtain immediate medical attention.
DO NOT REMOVE THIS PRODUCT LABEL.

CARBON DIOXIDE, LIQUEFIED:

WARNING:

ALWAYS KEEP CONTAINER IN UPRIGHT POSITION.
COLD LIQUID AND GAS UNDER PRESSURE.
CAN INCREASE RESPIRATION AND HEART RATE.
MAY CAUSE FROSTBITE.

Avoid breathing gas.
Store and use with adequate ventilation.
Do not get liquid in eyes, on skin or clothing.
For liquid withdrawal, wear face shield and gloves.
Do not drop. Use hand truck for container movement.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

FIRST-AID:

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
IN CASE OF FROSTBITE, obtain medical treatment immediately.
DO NOT REMOVE THIS PRODUCT LABEL.

CARBON DIOXIDE, SOLID:

WARNING:

ALWAYS KEEP CONTAINER IN UPRIGHT POSITION.
EXTREMELY COLD SOLID THAT SUBLIMATES TO GAS RAPIDLY.
GAS CAN INCREASE RESPIRATION AND HEART RATE.
GAS CAN CAUSE RAPID SUFFOCATION.
CAN CAUSE FROSTBITE.

Avoid breathing gas.
Store and use with adequate ventilation.
Do not get solid in eyes, on skin or clothing.
For handling solid, wear face shield and gloves.
Use in accordance with the Material Safety Data Sheet.

FIRST-AID:

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
IN CASE OF FROSTBITE, obtain medical treatment immediately.
DO NOT REMOVE THIS PRODUCT LABEL.