HOLOGIC®

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**Carbon Dioxide (CO2) Cartridge**
Version #	01
Issue date	04-11-2013
Revision date	-
Supersedes date	-
CAS #	N/A
Manufacturer information	
Supplier	Hologic Inc 250 Campus Drive Marlborough, Massachusetts 01752 USA
Email:	sds@hologic.com
Telephone:	(800) 442-9892
Emergency telephone:	(3E): 1-866-519-4752 CODE: 333605
Manufacturer	Liss Patrongyártó, Töltő és Forgalmazó Kft (Liss Ltd.) Carl von Linde út 1. H-9653 Répcelak
Telephone:	+06 (95) 588 100
Fax:	+06 (95) 588 114
Emergency telephone:	+36 1 476 6464

2. Hazards Identification

Physical state	Gas.
Appearance	Colorless gas.
Emergency overview	CAUTION Contents under pressure. Gas reduces oxygen available for breathing. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.
OSHA regulatory status	This product is hazardous according to OSHA 29 CFR 1910.1200.
Potential health effects	
Routes of exposure	Inhalation. Skin contact. Eye contact.
Eyes	Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").
Skin	Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").
Inhalation	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.
Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely.
Target organs	Heart. Respiratory system. Central nervous system. Eye. Skin.
Chronic effects	May affect the nervous system and cause headache, nausea, vomiting, and narcosis.
Potential environmental effects	This material is not expected to be harmful to aquatic life. Emissions of gas affecting global warming.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Carbon dioxide	124-38-9	>99

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

First aid procedures

Eye contact
GAS: Flush thoroughly with water for at least 15 minutes. Make sure to remove any contact lenses from the eyes before rinsing. LIQUEFIED GAS: If frostbite occurs, immediately flush eyes with plenty of warm water (not exceeding 105°F/41°C) for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention if irritation develops or persists.

Skin contact
GAS: Remove contaminated clothing immediately and wash skin with soap and water. LIQUEFIED GAS: If frostbite occurs, immerse involved area in warm water (between 100 F/38 C and 110 F/43 C, not exceeding 112 F/44 C). Keep immersed for 20 to 40 minutes. Seek medical assistance.

Inhalation
Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory tract irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation. Get medical attention.

Ingestion
Seek medical advice.

General advice
First aid personnel must be aware of own risk during rescue.

5. Fire Fighting Measures

Flammable properties
The product is not flammable.

Extinguishing media

Suitable extinguishing media
Dry chemical. Carbon Dioxide. Halon.

Large Fires: Foam, water spray or fog.
Use fire-extinguishing media appropriate for surrounding materials.

Protection of firefighters

Specific hazards arising from the chemical
The product itself does not burn. Closed containers can burst violently when heated, due to excess pressure build-up.

Protective equipment and precautions for firefighters
Self-contained breathing apparatus, operated in positive pressure mode and full protective clothing must be worn in case of fire. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.

Fire fighting equipment/instructions
Evacuate area. Stop flow of gas. Remove pressurized gas cylinders from the immediate vicinity. Cool material exposed to heat with water spray and remove it if no risk is involved.

Hazardous combustion products
Carbon oxides. Nitrogen oxides.

6. Accidental Release Measures

Personal precautions
Avoid inhalation and contact with skin and eyes. Ensure adequate ventilation. Wear appropriate personal protective equipment (See Section 8). Stay upwind. Ventilate closed spaces before entering them.

Environmental precautions
Avoid release to the environment.

Methods for cleaning up
Ventilate well, stop flow of gas or liquid if possible.

7. Handling and Storage

Handling
Avoid breathing gas. Avoid contact with eyes, skin, and clothing. Keep container closed. Use only with adequate ventilation. Contents under pressure. Do not puncture. Close valve after each use and when empty. Do not attempt to refill spent cartridges. Wear appropriate personal protective equipment. Wash thoroughly after handling.

Storage
Keep container tightly closed. Store in a cool, dry place with adequate ventilation. Keep away from incompatible materials, open flames, and high temperatures. Keep out of the reach of children.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
Carbon dioxide (CAS 124-38-9)	STEL	30000 ppm
	TWA	5000 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Carbon dioxide (CAS 124-38-9)	PEL	9000 mg/m3
		5000 ppm

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Carbon dioxide (CAS 124-38-9)	STEL	54000 mg/m3
		30000 ppm
	TWA	9000 mg/m3
		5000 ppm

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
Carbon dioxide (CAS 124-38-9)	STEL	15000 ppm
	TWA	5000 ppm

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
Carbon dioxide (CAS 124-38-9)	STEL	30000 ppm
	TWA	5000 ppm

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Carbon dioxide (CAS 124-38-9)	STEL	54000 mg/m3
		30000 ppm
	TWA	9000 mg/m3
		5000 ppm

Mexico. Occupational Exposure Limit Values

Components	Type	Value
Carbon dioxide (CAS 124-38-9)	STEL	27000 mg/m3
		15000 ppm
	TWA	9000 mg/m3
		5000 ppm

Engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye / face protection Wear safety glasses with side shields (or goggles).

Skin protection Wear appropriate clothing to prevent skin contamination or freezing.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134. Respirator type: Wear air supplied respiratory protection.

General hygiene considerations Do not eat, drink or smoke when using the product. Observe good industrial hygiene practices.

9. Physical & Chemical Properties

Appearance Colorless gas.

Physical state Gas.

Form	Compressed gas.
Color	Colorless
Odor	Odorless.
Odor threshold	Not available.
pH	Not available.
Vapor pressure	43700 mm Hg (21.1°C / 70°F)
Vapor density	1.5
Boiling point	-109 °F (-78.33 °C)
Melting point/Freezing point	Not available.
Solubility (water)	Soluble in water.
Specific gravity	Not available.
Flash point	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Auto-ignition temperature	Not available.
Molecular weight	44.01 g/mol
Molecular formula	C-O2

10. Chemical Stability & Reactivity Information

Chemical stability	This product is stable under expected conditions of use.
Conditions to avoid	Heat and direct sunlight.
Incompatible materials	Metals. Acids. Oxidizers.
Hazardous decomposition products	Temperatures above 1700° C may cause decomposition and the release of oxygen and highly toxic carbon monoxide.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Sensitization	Not a skin sensitizer.
Acute effects	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. Carbon dioxide when inhaled in elevated concentrations may act to produce mild narcotic effects, stimulation of the respiratory center, and asphyxiation depending on the concentrartion present and duration of exposure. Low concentrations (3-5%) cause increased respiration and headache. Concentrations at 8% or higher cause headache, nausea and vomiting which may lead to unconsciousness if not moved to open air or given oxygen promptly. At concentrations of 10% or higher, carbon dioxide causes rapid circulatoty insufficirncy leading to coma and death.
Local effects	Contact with compressed gas can cause damage (frostbite) due to rapid evaporative cooling.
Chronic effects	May cause central nervous system effects.
Carcinogenicity	No data recorded.
Mutagenicity	No data recorded.
Neurological effects	May cause drowsiness or dizziness.
Reproductive effects	No data available.

12. Ecological Information

Ecotoxicity	This material is not expected to be harmful to aquatic life. Emissions of gas affecting global warming.
Persistence and degradability	Not available.
Bioaccumulation / Accumulation	Not available.

Mobility in environmental media	The product is a volatile substance, which may spread in the atmosphere.

13. Disposal Considerations

Waste codes	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal instructions	Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Dispose in accordance with all local, State and Federal regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

DOT

Basic shipping requirements:

UN number	UN2037
Proper shipping name	Receptacles, small, containing gas or gas cartridges
Hazard class	2.2
Subsidiary hazard class	5.1

Additional information:

Special provisions	A14
Packaging exceptions	306
Packaging non bulk	304
Packaging bulk	None

DOT

BULK

Basic shipping requirements:

UN number	UN2037
Proper shipping name	Receptacles, small, containing gas or gas cartridges
Hazard class	2.2
Subsidiary hazard class	5.1

Additional information:

Special provisions	A14
Packaging exceptions	306
Packaging non bulk	304
Packaging bulk	None

IATA

UN number	UN2037
UN proper shipping name	Receptacles, small, containing gas or gas cartridges
Transport hazard class(es)	2.2
Subsidiary class(es)	5.1
Labels required	2.2, 5.1

IMDG

UN number	UN2037
UN proper shipping name	Receptacles, small, containing gas or gas cartridges
Transport hazard class(es)	2.2
Subsidiary class(es)	5.1
Labels required	2.2, 5.1

TDG

UN number	UN2037
Proper shipping name	Receptacles, small, containing gas or gas cartridges
Hazard class	2.2
Subsidiary hazard class	5.1
Special provisions	A14
Labels required	2.2, 5.1
Packaging exceptions	306
Packaging non bulk	304
Packaging bulk	None

15. Regulatory Information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - No
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - Yes
Reactivity Hazard - No

Section 302 extremely hazardous substance (40 CFR 355, Appendix A) No

SARA 311/312 Hazardous chemical No

Drug Enforcement Administration (DEA) (21 CFR 1308.11-15) Not controlled

Food and Drug Administration (FDA)
Total food additive
Direct food additive
GRAS food additive

Canadian regulations 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.

WHMIS status Controlled

WHMIS classification A - Compressed Gas

WHMIS labeling

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

State regulations

US - California Hazardous Substances (Director's): Listed substance

Carbon dioxide (CAS 124-38-9) Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

US - New Jersey RTK - Substances: Listed substance

Carbon dioxide (CAS 124-38-9)	Listed.

US. Massachusetts RTK - Substance List

Carbon dioxide (CAS 124-38-9)	Listed.

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania RTK - Hazardous Substances

Carbon dioxide (CAS 124-38-9)	Listed.

Mexico regulations This safety data sheet was prepared in accordance with the Official Mexican Standard (NOM-018-STPS-2000).

16. Other Information

HMIS® ratings

Health: 1
Flammability: 0
Physical hazard: 0

NFPA ratings

Health: 1
Flammability: 0
Instability: 0

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