



Safety Data Sheet

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This Safety Data Sheet has been prepared in accordance with the Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice (Safe Work Australia, December 2011)

SECTION 1: Identification

1.1. Product identifier

3M Steri-Gas Sterilisation Cartridges

Product Identification Numbers

70-2007-4132-3 70-2007-4134-9 70-2007-8377-0 70-2007-8383-8

1.2. Recommended use and restrictions on use

Recommended use

Gas to sterilize in a 3M Steri-Vac(TM) Ethylene Oxide Sterilizer

For Industrial or Professional use only.

1.3. Supplier's details

Address: 3M Australia - Building A, 1 Rivett Road, North Ryde NSW 2113
Telephone: 136 136
E Mail: productinfo.au@mmm.com
Website: www.3m.com.au

1.4. Emergency telephone number

EMERGENCY: 1800 097 146 (Australia only)

SECTION 2: Hazard identification

This product is classified as a hazardous chemical according to the Model Work Health and Safety Regulations, 2011.

Refer to Section 14 of this Safety Data Sheets for product Dangerous Goods Classification.

2.1. Classification of the substance or mixture

Flammable gas: Category 1.
Gas under pressure: Liquefied gas.
Acute Toxicity (inhalation): Category 3.
Serious Eye Damage/Irritation: Category 2.
Skin Corrosion/Irritation: Category 2.
Reproductive Toxicity: Category 2.
Carcinogenicity: Category 1A.

Germ Cell Mutagenicity: Category 1B.
Specific Target Organ Toxicity (single exposure): Category 1.
Specific Target Organ Toxicity (single exposure): Category 3.
Specific Target Organ Toxicity (repeated exposure): Category 1.

2.2. Label elements

The label elements below were prepared in accordance with the Code of Practice on Preparation of Safety Data Sheets for Hazardous Chemicals (Safe Work Australia, December 2011). This information may be different from the actual product label.

Signal word

DANGER!

Symbols

Flame | Gas cylinder | Skull and Crossbones | Health Hazard |

Pictograms



Hazard statements

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H331	Toxic if inhaled.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging fertility or the unborn child.
H350	May cause cancer.
H340	May cause genetic defects.
H370	Causes damage to organs: respiratory system
H372	Causes damage to organs through prolonged or repeated exposure: nervous system
H373	May cause damage to organs through prolonged or repeated exposure: kidney/urinary tract sensory organs

Precautionary statements

Prevention:

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P271	Use only outdoors or in a well-ventilated area.
P280B	Wear protective gloves and eye/face protection.
P281	Use personal protective equipment as required.

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P270 Do not eat, drink or smoke when using this product.
P264 Wash thoroughly after handling.

Response:

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P307 + P311 IF exposed: Call a POISON CENTRE or doctor/physician.
P312 Call a POISON CENTRE or doctor/physician if you feel unwell.
P314 Get medical advice/attention if you feel unwell.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 Eliminate all ignition sources if safe to do so.

Storage:

P410 + P403 Protect from sunlight. Store in a well-ventilated place.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P233 Keep container tightly closed.
P405 Store locked up.

Disposal:

P501 Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

2.3. Other assigned/identified product hazards

May cause frostbite.

2.4. Other hazards which do not result in classification

Harmful to aquatic life.

SECTION 3: Composition/information on ingredients

This material is a mixture.

Ingredient	CAS Nbr	% by Weight
Ethylene oxide	75-21-8	100

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation

Remove person to fresh air. Get medical attention.

Skin contact

Immediately wash with soap and water. Remove contaminated clothing and wash before reuse. If signs/symptoms develop, get medical attention.

Eye contact

Immediately flush with large amounts of water for at least 15 minutes. Remove contact lenses if easy to do. Continue rinsing. Immediately get medical attention.

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If swallowed

Rinse mouth. Do not induce vomiting. Get immediate medical attention.

4.2. Most important symptoms and effects, both acute and delayed

See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required

Not applicable

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

In case of fire: Use a water spray or fog to extinguish, do not use straight streams. If water is not available use dry chemical, CO₂, or foam to extinguish. Use a fire fighting agent suitable for the surrounding fire. Refer to other precautionary advice in SDS section 5.

5.2. Special hazards arising from the substance or mixture

Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

<u>Substance</u>	<u>Condition</u>
Carbon monoxide.	During combustion.
Carbon dioxide.	During combustion.

5.3. Special protective actions for fire-fighters

Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Hazchem Code: 2PE

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate area. Eliminate all ignition sources if safe to do so. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Ventilate the area with fresh air. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

If possible, seal leaking container. Place leaking containers in a well-ventilated area, preferably an operating exhaust hood, or if necessary outdoors on an impermeable surface until appropriate packaging for the leaking container or its contents is available. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

For industrial or professional use only. Do not use in a confined area with minimal air exchange. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Eliminate all ignition sources if safe to do so. Avoid contact with oxidising agents (eg. chlorine, chromic acid etc.) Use personal protective equipment (eg. gloves, respirators...) as required. Recommendations

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for storing Steri-Gas cartridges are stringent. Check your local fire protection codes for additional requirements. Keep all sources of ignition such as matches, lighted cigarettes, sparks and static discharge away from the sterilizer and cartridges. Store cartridges in an upright position. Keep only one day's requirement or a maximum of twelve(12) cartridges (one box) in the immediate sterilizer area. This area needs to have at least ten air changes per hour. Additional Steri-Gas cartridges should be stored in an approved flammable liquid storage cabinet vented to the outside atmosphere, or in an area suitable for storage of flammable liquids appropriately vented to the outside atmosphere, or into a non-recirculating, continuously operating, dedicated exhaust system.

7.2. Conditions for safe storage including any incompatibilities

Store in a well-ventilated place. Keep container tightly closed. Protect from sunlight. Store away from heat. Store away from acids. Store away from oxidising agents. Store away from areas where product may come into contact with food or pharmaceuticals.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	CAS Nbr	Agency	Limit type	Additional comments
Ethylene oxide	75-21-8	Australia OELs	TWA(8 hours): 1.8 mg/m ³ (1 ppm)	
Ethylene oxide	75-21-8	Manufacturer determined	STEL:5 ppm	
Ethylene oxide	75-21-8	ACGIH	TWA:1 ppm	A2: Suspected human carcin.

ACGIH : American Conference of Governmental Industrial Hygienists

AIHA : American Industrial Hygiene Association

Australia OELs : Australia. Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment

CMRG : Chemical Manufacturer's Recommended Guidelines

TWA: Time-Weighted-Average

STEL: Short Term Exposure Limit

CEIL: Ceiling

Sen: Sensitiser

Sk: Absorption through the skin may be a significant source of exposure.

8.2. Exposure controls

8.2.1. Engineering controls

Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapours/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:

Indirect vented goggles.

Select and use eye protection in accordance with AS/NZS 1336. Eye protection should comply with the performance specifications of AS/NZS 1337.

Skin/hand protection

Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the

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substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.

Gloves made from the following material(s) are recommended: Butyl rubber.

Select and use gloves according to AS/NZ 2161.

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:

Full facepiece supplied-air respirator

For questions about suitability for a specific application, consult with your respirator manufacturer.

Select and use respirators according to AS/NZS 1715. Respirators should comply with AS/NZS 1716 performance specifications. For information about respirators, call 3M on 1800 024 464.

Thermal hazards

Wear cold insulating gloves/face shield/eye protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Gas.
Specific Physical Form:	Compressed gas.
Appearance/Odour	Colourless in normal use; Sweet odour at 500-750 ppm.
Odour threshold	<i>No data available.</i>
pH	7
Melting point/Freezing point	<i>Not applicable.</i>
Boiling point/Initial boiling point/Boiling range	10.6 °C
Flash point	-20 °C [<i>Test Method:</i> Tagliabue closed cup]
Evaporation rate	<i>Not applicable.</i>
Flammability (solid, gas)	Flammable gas: Category 1.
Flammable Limits(LEL)	3 % volume
Flammable Limits(UEL)	100 % volume
Vapour pressure	145,854.3 Pa [<i>@ 20 °C</i>]
Vapour density	1.5 [<i>Ref Std:</i> AIR=1]
Density	<i>Not applicable.</i>
Relative density	0.87 [<i>Ref Std:</i> WATER=1] [<i>Details:</i> @ 20 °C]
Water solubility	Complete
Solubility- non-water	<i>No data available.</i>
Partition coefficient: n-octanol/water	<i>No data available.</i>
Autoignition temperature	428.9 °C [<i>Details:</i> CONDITIONS: Burns in the absence of air]
Decomposition temperature	<i>Not applicable.</i>
Viscosity	<i>Not applicable.</i>
Molecular weight	<i>No data available.</i>
Volatile organic compounds (VOC)	100 %
Percent volatile	100 %
VOC less H ₂ O & exempt solvents	100 %

SECTION 10: Stability and reactivity

10.1 Reactivity

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This material is considered to be non reactive under normal use conditions

10.2 Chemical stability

Stable.

10.3. Conditions to avoid

Heat.

10.4. Possibility of hazardous reactions

Hazardous polymerisation may occur.

10.5 Incompatible materials

None known.

10.6 Hazardous decomposition products

<u>Substance</u>	<u>Condition</u>
None known.	

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labelling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1 Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation

Toxic if inhaled.

Respiratory tract irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. May cause additional health effects (see below).

Skin contact

Frostbite: Signs/symptoms may include intense pain, discoloration of skin, and tissue destruction. Skin Irritation:

Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.

Eye contact

Frostbite: Signs/symptoms may include intense pain, clouding of the cornea, redness, swelling, and blindness. Severe eye irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Ingestion

Gastrointestinal irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhoea.

Additional Health Effects:

Single exposure may cause target organ effects:

Central nervous system (CNS) depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination,

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nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness. Respiratory effects: Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish coloured skin (cyanosis), sputum production, changes in lung function tests, and respiratory failure.

Prolonged or repeated exposure may cause target organ effects:

Ocular effects: Signs/symptoms may include blurred or significantly impaired vision. Peripheral neuropathy: Signs/symptoms may include tingling or numbness of the extremities, incoordination, weakness of the hands and feet, tremors and muscle atrophy. Kidney/Bladder effects: Signs/symptoms may include changes in urine production, abdominal or lower back pain, increased protein in urine, increased blood urea nitrogen (BUN), blood in urine, and painful urination.

Reproductive/Developmental Toxicity:

Contains a chemical or chemicals which can cause birth defects or other reproductive harm.

Genotoxicity:

Genotoxicity and Mutagenicity: May interact with genetic material and possibly alter gene expression.

Carcinogenicity:

Contains a chemical or chemicals which can cause cancer.

Toxicological Data

If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Ethylene oxide	Inhalation-Gas (4 hours)	Rat	LC50 1,460 ppm
Ethylene oxide	Ingestion	Rat	LD50 330 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Ethylene oxide	Rabbit	Irritant

Serious Eye Damage/Irritation

Name	Species	Value
Ethylene oxide	official classification	Severe irritant

Skin Sensitisation

Name	Species	Value
Ethylene oxide	Human and animal	Some positive data exist, but the data are not sufficient for classification

Respiratory Sensitisation

Name	Species	Value
Ethylene oxide	Human	Some positive data exist, but the data are not sufficient for classification

Germ Cell Mutagenicity

Name	Route	Value
Ethylene oxide	In vivo	Mutagenic

3M Steri-Gas Sterilisation Cartridges**Carcinogenicity**

Name	Route	Species	Value
Ethylene oxide	Inhalation	Multiple animal species	Carcinogenic.

Reproductive Toxicity**Reproductive and/or Developmental Effects**

Name	Route	Value	Species	Test result	Exposure Duration
Ethylene oxide	Inhalation	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 33 ppm	during organogenesis
Ethylene oxide	Inhalation	Toxic to female reproduction	Rat	NOAEL 33 ppm	1 generation
Ethylene oxide	Inhalation	Toxic to male reproduction	Monkey	LOAEL 50 ppm	2 years

Target Organ(s)**Specific Target Organ Toxicity - single exposure**

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
Ethylene oxide	Inhalation	respiratory system	Causes damage to organs	Human and animal	NOAEL Not available	
Ethylene oxide	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Ethylene oxide	Inhalation	respiratory irritation	May cause respiratory irritation		NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
Ethylene oxide	Inhalation	peripheral nervous system	Causes damage to organs through prolonged or repeated exposure	Human and animal	NOAEL Not available	
Ethylene oxide	Inhalation	kidney and/or bladder	May cause damage to organs through prolonged or repeated exposure	Mouse	LOAEL 100 ppm	14 weeks
Ethylene oxide	Inhalation	eyes	May cause damage to organs through prolonged or repeated exposure	Human and animal	NOAEL Not available	
Ethylene oxide	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Mouse	LOAEL 200 ppm	14 weeks
Ethylene oxide	Inhalation	endocrine system	Some positive data exist, but the data are not	Rat	NOAEL 100 ppm	2 years

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			sufficient for classification			
Ethylene oxide	Inhalation	liver	Some positive data exist, but the data are not sufficient for classification	Multiple animal species	NOAEL 841 ppm	not available
Ethylene oxide	Inhalation	hematopoietic system	Some positive data exist, but the data are not sufficient for classification	Mouse	NOAEL 250 ppm	10 weeks
Ethylene oxide	Inhalation	immune system	Some positive data exist, but the data are not sufficient for classification	Mouse	LOAEL 200 ppm	14 weeks
Ethylene oxide	Inhalation	heart	All data are negative	Monkey	NOAEL 100 ppm	2 years

Aspiration Hazard

For the component/components, either no data are currently available or the data are not sufficient for classification.

Exposure Levels

Refer Section 8.1 Control Parameters of this Safety Data Sheet.

Interactive Effects

Not determined.

SECTION 12: Ecological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. Additional information leading to material classification in Section 2 is available upon request. In addition, environmental fate and effects data on ingredients may not be reflected in this section because an ingredient is present below the threshold for labelling, an ingredient is not expected to be available for exposure, or the data is considered not relevant to the material as a whole.

12.1. Toxicity

Acute aquatic hazard:

GHS Acute 3: Harmful to aquatic life.

Chronic aquatic hazard:

Not chronically toxic to aquatic life by GHS criteria.

No component test data available.

Material	Organism	Type	Exposure	Test endpoint	Test result
3M Steri-Gas Sterilisation Cartridges	Water flea	Laboratory	48 hours		137 mg/l
3M Steri-Gas Sterilisation Cartridges	Fathead minnow	Laboratory	96 hours		84 mg/l
3M Steri-Gas Sterilisation Cartridges	Goldfish	Laboratory	24 hours		90 mg/l

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12.2. Persistence and degradability

Material	CAS Number	Test type	Duration	Study Type	Test result	Protocol
Ethylene oxide	75-21-8	Experimental Hydrolysis		Hydrolytic half-life	12.9 days (t _{1/2})	Other methods
Ethylene oxide	75-21-8	Experimental Biodegradation	28 days	BOD	107 % weight	OECD 301C - MITI test (I)

12.3 : Bioaccumulative potential

Material	CAS Number	Test type	Duration	Study Type	Test result	Protocol
Ethylene oxide	75-21-8	Experimental Bioaccumulation		Log Kow	-0.30	Other methods

12.4. Mobility in soil

Please contact manufacturer for more details

12.5 Other adverse effects

No information available.

SECTION 13: Disposal considerations

13.1. Disposal methods

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. The facility should be equipped to handle gaseous waste.

SECTION 14: Transport Information

Australian Dangerous Goods Code (ADG) - Road/Rail Transport

UN No.: UN1040

Proper shipping name: ETHYLENE OXIDE

Class/Division: 2.3

Sub Risk: 2.1

Packing Group: Not applicable.

Hazchem Code: 2PE

IERG: OSP

International Air Transport Association (IATA) - Air Transport

UN No.: UN1040

Proper shipping name: ETHYLENE OXIDE

Class/Division: 2.3

Sub Risk: 2.1

Packing Group: Not applicable.

Special Instructions: FORBIDDEN NOT ALLOWED BY THE REGULATORY AGENT

International Maritime Dangerous Goods Code (IMDG)- Marine Transport

UN No.: UN1040

Proper shipping name: ETHYLENE OXIDE

Class/Division: 2.3

Sub Risk: 2.1

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Packing Group: Not applicable.

Marine Pollutant: Not applicable.

Special Instructions: TOXIC-INHALATION HAZARD, ZONE D, VENTILATE FREIGHT CONTAINER 30 MINUTES PRIOR TO UNLOADING

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Australian Inventory Status:

This product is regulated by the Therapeutics Goods Administration and is exempt from compliance with the Industrial Chemicals (Notification and Assessment) Act 1989 as amended.

Poison Schedule: This product is intended for Industrial or Professional Use only and therefore is not packaged and labelled in accordance with the requirements of the Standard for the Uniform Scheduling of Medicines and Poisons.

SECTION 16: Other information

Revision information:

Update to product identification numbers.

DISCLAIMER: The information on this Safety Data Sheet is based on our experience and is correct to the best of our knowledge at the date of publication, but we do not accept any liability for any loss, damage or injury resulting from its use (except as required by law). The information may not be valid for any use not referred to in this Safety Data Sheet or use of the product in combination with other materials. For these reasons, it is important that customers carry out their own test to satisfy themselves as to the suitability of the product for their own intended applications.

Greenguard® is a United States based program. The 'Low VOC' reference related to United States Federal and State regulations exemptions for some solvents.

3M Australia SDSs are available at www.3m.com.au