TECHNICAL
DATA SHEET

M87

NON-FLAM
NON-MECL
CONTACT ADHESIVE

Tensorgrip®

As part of our **MARINE** range, M87 is a web spray adhesive designed for use in applications using the substrates listed.

FRP/GRP
Foam
Metal / Aluminum Sheeting
Plywood
Carpet
Web Spray
ZERO-FLAM Technology
HAPs Free
Heat Resistance up to 200F/94C

PRODUCT DESCRIPTION

Tensorgrip® M87 is a marine grade completely non-flammable, non-methylene chloride contact adhesive in a pre-pressurized canister. Multipurpose adhesive with excellent bonding capabilities for applications like carpet, seating foam and many other applications.

ADVANTAGES

- Non-Flammable
- Non-Methylene Chloride
- High Heat Resistance
- 100% Adhesive Transfer to the substrate
- Fully portable system

DIRECTIONS FOR USE

Tensorgrip® M87 is designed as a portable, self-contained spray system for field or shop applications.

- Apply adhesive to both surfaces to be mated, at 80% to 100% coverage.
- Allow enough time (2-4 minutes or until dry to the touch) for the adhesive to become tacky before bonding.
- Parts should be mated with as much pressure as practical.
- Normal coverage required with web spray pattern is approximately 80%; however, porous surfaces may need a second coat. Initial bond is strong enough to allow cutting or trimming immediately, although ultimate strength is achieved in 1-3 days.
- Canister system will spray adequately above 60° F. Canister system should be kept in warm area. In the event that the canister gets abnormally chilled, freezes or gives poor or sputtering spray, it should be warmed up before continued usage. Warming canister by immersion in warm water is recommended.
- Notice!!! Do not store at temperatures over 120° F.

CANISTER STORAGE/CHANGE OVER

- If you choose to leave the hose and spray gun on the canister, leave the canister valve in the open position. Do not disconnect the hose/gun from the canister. Close and lock the spray gun.
- To change or disconnect canister: Turn canister valve to the off position, spray out remaining adhesive from the hose, disconnect the hose and spray gun from the canister.
- Reconnect the hose and spray gun to a new canister of adhesive and turn the canister valve to re-pressurize. Or if you are NOT connecting to a new canister, connect hose to canister of cleaner (sold separately) and spray out until liquid is clear as the indication the hose/gun is clean.

TECHNICAL
DATA SHEET

M87

NON-FLAM
NON-MECL
CONTACT ADHESIVE

Tensorgrip®

TYPICAL PROPERTIES	
Total Solids	23-29%
VOC Content	345g/L
Color	Clear or Blue
System Flammability	Non-Flammable Blend
Solvent System	Non-Flammable Blend
Dry time	2–4 mins dependent on temp & humidity
Open time	Long (1+ hours)
Shelf Life	18 months from date of manufacture

PACKAGING	
7L	Disposable Canister
22L	Disposable Canister
108L	Returnable Canister
216L	Returnable Canister

APPLICATION TOOLS

TOOL	PART NUMBER	CANISTER SIZES			
		7 LITER	22 LITER	108 LITER	216 LITER
Hoses	M180-8 (8')	x			
	M180-12 (12')		x	x	x
	M180-18 (18')		x	x	x
	M180-25 (25')			x	x
Spray Gun	M120 (standard gun)	x	x	x	x
Spray Tip	UniJet® 11001B (2"-12" Med. Build Spray Pattern)	x	x	x	x
Hose Splitter	M300 (2 way Splitter with 1 cap)			x	x

HANDLING AND STORAGE

- Consult Safety Data Sheet prior to use.
- Do not store at temperatures over 120°F/50°C.
- Avoid exposure to direct sunlight.
- Do not store directly on concrete floor.
- Always store above 60°F/15°C
- When connected, keep valve open and hose pressurized at all times
- Always test product to determine suitability for your particular application prior to use in production.

Tensorgrip M87 Non-Flam, Non MECL Contact Adhesive Canister

QUIN GLOBAL US, inc.

Chemwatch Hazard Alert Code: **4**

Version No: **1.1**
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: **21/08/2023**
Print Date: **21/08/2023**
S.GHS.USA.EN

SECTION 1 Identification

Product Identifier

Product name	Tensorgrip M87 Non-Flam, Non MECL Contact Adhesive Canister
Chemical Name	Not Applicable
Synonyms	Not Available
Proper shipping name	Chemical under pressure, n.o.s. Air, Compressed
Chemical formula	Not Applicable
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation.

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	**QUIN GLOBAL US, inc.**
Address	5510 F Street OMAHA, NE 68117 United States
Telephone	402 731 3636
Fax	Not Available
Website	www.quinglobal.com
Email	marketing.us@quin-global.com

Emergency phone number

Association / Organisation	**CHEMWATCH EMERGENCY RESPONSE (24/7)**
Emergency telephone numbers	+1 855-237-5573
Other emergency telephone numbers	+61 3 9573 3188

Once connected and if the message is not in your preferred language then please dial 01

Una vez conectado y si el mensaje no está en su idioma preferido, por favor marque 02

SECTION 2 Hazard(s) identification

Classification of the substance or mixture

NFPA 704 diamond

Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Gases Under Pressure (Dissolved Gas), Acute Toxicity (Oral) Category 4, Serious Eye Damage/Eye Irritation Category 2B, Acute Toxicity (Inhalation) Category 4, Specific Target Organ Toxicity - Single Exposure (Narcotic Effects) Category 3, Hazardous to the Aquatic Environment Long-Term Hazard Category 3

Label elements

Hazard pictogram(s)	
Signal word	**Warning**

Hazard statement(s)

H280	Contains gas under pressure; may explode if heated.
H302	Harmful if swallowed.
H320	Causes eye irritation.
H332	Harmful if inhaled.
H336	May cause drowsiness or dizziness.
H412	Harmful to aquatic life with long lasting effects.

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

P271	Use in a well-ventilated area.
P261	Avoid breathing gas.
P264	Wash all exposed external body areas thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.

Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P330	Rinse mouth.

Precautionary statement(s) Storage

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

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
156-60-5	60-90	trans-acetylene dichloride
102687-65-0	3-9	1'-chloro-3,3,3-trifluoropropene

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 First-aid measures

Description of first aid measures

Eye Contact	‣ If product comes in contact with eyes remove the patient from gas source or contaminated area. ‣ Take the patient to the nearest eye wash, shower or other source of clean water. ‣ Open the eyelid(s) wide to allow the material to evaporate. ‣ Gently rinse the affected eye(s) with clean, cool water for at least 15 minutes. Have the patient lie or sit down and tilt the head back. Hold the eyelid(s) open and pour water slowly over the eyeball(s) at the inner corners, letting the water run out of the outer corners. ‣ The patient may be in great pain and wish to keep the eyes closed. It is important that the material is rinsed from the eyes to prevent further damage. ‣ Ensure that the patient looks up, and side to side as the eye is rinsed in order to better reach all parts of the eye(s) ‣ Transport to hospital or doctor. ‣ Even when no pain persists and vision is good, a doctor should examine the eye as delayed damage may occur. ‣ If the patient cannot tolerate light, protect the eyes with a clean, loosely tied bandage.

Continued...

	- Ensure verbal communication and physical contact with the patient. **DO NOT** allow the patient to rub the eyes **DO NOT** allow the patient to tightly shut the eyes **DO NOT** introduce oil or ointment into the eye(s) without medical advice **DO NOT** use hot or tepid water.
Skin Contact	If skin or hair contact occurs: - Quickly but gently, wipe material off skin with a dry, clean cloth. - Immediately remove all contaminated clothing, including footwear. - Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. - Transport to hospital, or doctor.
Inhalation	- Following exposure to gas, remove the patient from the gas source or contaminated area. - NOTE: Personal Protective Equipment (PPE), including positive pressure self-contained breathing apparatus may be required to assure the safety of the rescuer. - Prostheses such as false teeth, which may block the airway, should be removed, where possible, prior to initiating first aid procedures. - If the patient is not breathing spontaneously, administer rescue breathing. - If the patient does not have a pulse, administer CPR. - If medical oxygen and appropriately trained personnel are available, administer 100% oxygen. - Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or Poison Control Centre for further instruction. - Keep the patient warm, comfortable and at rest while awaiting medical care. - **MONITOR THE BREATHING AND PULSE, CONTINUOUSLY.** - Administer rescue breathing (preferably with a demand-valve resuscitator, bag-valve mask-device, or pocket mask as trained) or CPR if necessary.
Ingestion	Not considered a normal route of entry. If poisoning occurs, contact a doctor or Poisons Information Centre. - Avoid giving milk or oils. - Avoid giving alcohol.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

for intoxication due to Freons/ Halons;
A: Emergency and Supportive Measures
- Maintain an open airway and assist ventilation if necessary
- Treat coma and arrhythmias if they occur. Avoid (adrenaline) epinephrine or other sympathomimetic amines that may precipitate ventricular arrhythmias. Tachyarrhythmias caused by increased myocardial sensitisation may be treated with propranolol, 1-2 mg IV or esmolol 25-100 microgm/kg/min IV.
- Monitor the ECG for 4-6 hours

B: Specific drugs and antidotes:
- There is no specific antidote

C: Decontamination
- Inhalation; remove victim from exposure, and give supplemental oxygen if available.
- Ingestion; (a) Prehospital: Administer activated charcoal, if available. **DO NOT** induce vomiting because of rapid absorption and the risk of abrupt onset CNS depression. (b) Hospital: Administer activated charcoal, although the efficacy of charcoal is unknown. Perform gastric lavage only if the ingestion was very large and recent (less than 30 minutes)

D: Enhanced elimination:
- There is no documented efficacy for diuresis, haemodialysis, haemoperfusion, or repeat-dose charcoal.

POISONING and DRUG OVERDOSE, Californian Poison Control System Ed. Kent R Olson; 3rd Edition
- Do not administer sympathomimetic drugs unless absolutely necessary as material may increase myocardial irritability.
- No specific antidote.
- Because rapid absorption may occur through lungs if aspirated and cause systematic effects, the decision of whether to induce vomiting or not should be made by an attending physician.
- If lavage is performed, suggest endotracheal and/or esophageal control.
- Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach.
- Treatment based on judgment of the physician in response to reactions of the patient
- Acute exposures to carbon tetrachloride present, initially, with CNS depression followed by hepatic and renal dysfunction.
- Respiratory depression and cardiac dysrhythmias are an immediate threat to life.
- Since a major fraction of absorbed carbon tetrachloride is exhaled in the first hour, good tidal volumes should be maintained in severely poisoned patients; hyperventilation may be an additional therapeutic modality.
- Ipecac syrup, lavage, activated charcoal or catharsis may all be used in the first 4 hours.
- Since reactive metabolites may cause hepatorenal toxicity, administration of N-acetyl-L-cysteine may reduce complications. Experience with this therapy is limited. [Ellenhorn and Barceloux: Medical Toxicology]

For gas exposures:

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for pulmonary oedema .
- Monitor and treat, where necessary, for shock.
- Anticipate seizures.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive-pressure ventilation using a bag-valve mask might be of use.
- Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Treat seizures with diazepam.
- Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.
EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

Continued...

SECTION 5 Fire-fighting measures

Extinguishing media

SMALL FIRE: Use extinguishing agent suitable for type of surrounding fire.
LARGE FIRE: Cool cylinder.
DO NOT direct water at source of leak or venting safety devices as icing may occur.

Special hazards arising from the substrate or mixture

Fire Incompatibility	‣ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Special protective equipment and precautions for fire-fighters

Fire Fighting	-- GENERAL -- ‣ Alert Fire Brigade and tell them location and nature of hazard. ‣ Wear breathing apparatus and protective gloves. ‣ Fight fire from a safe distance, with adequate cover. ‣ Use water delivered as a fine spray to control fire and cool adjacent area. ‣ **DO NOT** approach cylinders suspected to be hot. ‣ Cool fire exposed cylinders with water spray from a protected location. ‣ If safe to do so, remove cylinders from path of fire. -- SPECIAL REQUIREMENTS: -- ‣ Excessive pressures may develop in a gas cylinder exposed in a fire; this may result in explosion. ‣ Cylinders with pressure relief devices may release their contents as a result of fire and the released gas may constitute a further source of hazard for the fire-fighter. ‣ Cylinders without pressure-relief valves have no provision for controlled release and are therefore more likely to explode if exposed to fire. -- FIRE FIGHTING REQUIREMENTS: -- The need for proximity, entry and special protective clothing should be determined for each incident, by a competent fire-fighting safety professional.
Fire/Explosion Hazard	**WARNING:** In use may form flammable/ explosive vapour-air mixtures. **WARNING**: ‣ Can become highly flammable in use. ‣ Avoid evaporation. ‣ Containers may explode when heated - Ruptured cylinders may rocket ‣ Fire exposed containers may vent contents through pressure relief devices. ‣ High concentrations of gas may cause asphyxiation without warning. ‣ May decompose explosively when heated or involved in fire. ‣ Contact with gas may cause burns, severe injury and/ or frostbite. Decomposition may produce toxic fumes of: , carbon monoxide (CO) Combustion products include: , carbon dioxide (CO2) , hydrogen chloride , phosgene , other pyrolysis products typical of burning organic material.

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	‣ Avoid breathing vapour and any contact with liquid or gas. Protective equipment including respirator should be used. ‣ **DO NOT** enter confined spaces where gas may have accumulated. ‣ Increase ventilation. ‣ Clear area of personnel. ‣ Stop leak only if safe to so do. ‣ Remove leaking cylinders to safe place. Release pressure under safe controlled conditions by opening valve. ‣ Do not exert excessive pressure on the valve; do not attempt to operate a damaged valve ‣ Orientate cylinder so that the leak is gas, not liquid, to minimise rate of leakage ‣ Keep area clear of personnel until gas has dispersed.
Major Spills	‣ Clear area of all unprotected personnel and move upwind. ‣ Alert Emergency Authority and advise them of the location and nature of hazard. ‣ Wear breathing apparatus and protective gloves. ‣ Prevent by any means available, spillage from entering drains and water-courses. ‣ Consider evacuation. ‣ Increase ventilation. ‣ No smoking or naked lights within area. ‣ Stop leak only if safe to so do.

Continued...

	▸ Water spray or fog may be used to disperse vapour. ▸ **DO NOT** enter confined space where gas may have collected. ▸ Keep area clear until gas has dispersed. ▸ Remove leaking cylinders to a safe place. ▸ Fit vent pipes. Release pressure under safe, controlled conditions ▸ Burn issuing gas at vent pipes. ▸ **DO NOT** exert excessive pressure on valve; **DO NOT** attempt to operate damaged valve.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	· Consider use in closed pressurised systems, fitted with temperature, pressure and safety relief valves which are vented for safe dispersal. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature · The tubing network design connecting gas cylinders to the delivery system should include appropriate pressure indicators and vacuum or suction lines. · Fully-welded types of pressure gauges, where the bourdon tube sensing element is welded to the gauge body, are recommended. · Before connecting gas cylinders, ensure manifold is mechanically secure and does not containing another gas. Before disconnecting gas cylinder, isolate supply line segment proximal to cylinder, remove trapped gas in supply line with aid of vacuum pump · When connecting or replacing cylinders take care to avoid airborne particulates violently ejected when system pressurises. · Consider the use of doubly-contained piping; diaphragm or bellows sealed, soft seat valves; backflow prevention devices; flash arrestors; and flow monitoring or limiting devices. Gas cabinets, with appropriate exhaust treatment, are recommended, as is automatic monitoring of the secondary enclosures and work areas for release. · Use a pressure reducing regulator when connecting cylinder to lower pressure (<100 psig) piping or systems · Use a check valve or trap in the discharge line to prevent hazardous back-flow into the cylinder · Check regularly for spills or leaks. Keep valves tightly closed but do not apply extra leverage to hand wheels or cylinder keys. · Open valve slowly. If valve is resistant to opening then contact your supervisor · Valve protection caps must remain in place must remain in place unless container is secured with valve outlet piped to use point. · Never insert a pointed object (e.g hooks) into cylinder cap openings as a means to open cap or move cylinder. Such action can inadvertently turn the valve and gas a gas leak. Use an adjustable strap instead of wrench to free an over-tight or rusted cap. · A bubble of gas may buildup behind the outlet dust cap during transportation, after prolonged storage, due to defective cylinder valve or if a dust cap is inserted without adequate evacuation of gas from the line. When loosening dust cap, preferably stand cylinder in a suitable enclosure and take cap off slowly. Never face the dust cap directly when removing it; point cap away from any personnel or any object that may pose a hazard. under negative pressure (relative to atmospheric gas) · Suck back of water into the container must be prevented. Do not allow backfeed into the container. · Do NOT drag, slide or roll cylinders - use a suitable hand truck for cylinder movement · Test for leakage with brush and detergent - **NEVER** use a naked flame. · Do NOT heat cylinder by any means to increase the discharge rate of product from cylinder. · Leaking gland nuts may be tightened if necessary. · If a cylinder valve will not close completely, remove the cylinder to a well ventilated location (e.g. outside) and, when empty, tag as FAULTY and return to supplier. · Obtain a work permit before attempting any repairs. · DO NOT attempt repair work on lines, vessels under pressure. · Atmospheres must be tested and O.K. before work resumes after leakage. ▸ **DO NOT** transfer gas from one cylinder to another.
Other information	· Do NOT store halogenated aliphatics in areas containing alkali or alkaline earth metals such as powdered aluminum, zinc, or beryllium ▸ Cylinders should be stored in a purpose-built compound with good ventilation, preferably in the open. ▸ Such compounds should be sited and built in accordance with statutory requirements. ▸ The storage compound should be kept clear and access restricted to authorised personnel only. ▸ Cylinders stored in the open should be protected against rust and extremes of weather. ▸ Cylinders in storage should be properly secured to prevent toppling or rolling. ▸ Cylinder valves should be closed when not in use. ▸ Where cylinders are fitted with valve protection this should be in place and properly secured. ▸ Gas cylinders should be segregated according to the requirements of the Dangerous Goods Act. ▸ Preferably store full and empty cylinders separately. ▸ Check storage areas for hazardous concentrations of gases prior to entry. ▸ Full cylinders should be arranged so that the oldest stock is used first. ▸ Cylinders in storage should be checked periodically for general condition and leakage. ▸ Protect cylinders against physical damage. Move and store cylinders correctly as instructed for their manual handling. **NOTE:** A 'G' size cylinder is usually too heavy for an inexperienced operator to raise or lower.

Conditions for safe storage, including any incompatibilities

Suitable container	▸ **DO NOT** use aluminium or galvanised containers ▸ Cylinder: ▸ Ensure the use of equipment rated for cylinder pressure. ▸ Ensure the use of compatible materials of construction. ▸ Valve protection cap to be in place until cylinder is secured, connected. ▸ Cylinder must be properly secured either in use or in storage. ▸ Cylinder valve must be closed when not in use or when empty. ▸ Segregate full from empty cylinders. **WARNING:** Suckback into cylinder may result in rupture. Use back-flow preventive device in piping.
Storage incompatibility	Dichloroethylene: ▸ requires inhibition (typically with monomethyl ether or hydroquinone) to prevent polymerisation ▸ readily forms explosive peroxides with air or contaminants (a white deposit) may indicate the presence of explodable peroxides) ▸ polymerises violently on heating or on contact with oxidisers, chlorosulfonic acid, nitric acid, or oleum; or under the influence of oxygen, sunlight, copper or aluminium ▸ reacts violently with alkaline metals (lithium, sodium, potassium, rubidium, caesium, and francium) and nitrogen tetroxide ▸ is incompatible with ozone, strong bases, difluoromethylene ▸ may react explosively with trifluoroethylene above 180 C. perchloryl fluoride above 100 C ▸ may be corrosive or unstable in the presence of steel ▸ attacks iron, aluminium, plastics and coatings

Continued...

1,2-Dichloroethylene in contact with solid caustic alkalies or their concentrated solutions will form chloroacetylene which ignites in air.
Distillation of ethanol containing 0.25% of the halocarbon with aqueous sodium hydroxide gave a product which ignited in air.

- Haloacetylenes should be used with exceptional precautions.
- Explosions may occur during distillation when bath temperatures are too high or if air is admitted to a hot vacuum-distillation as evidenced by experience with bromoacetylenes.

BRETHERICK L.: Handbook of Reactive Chemical Hazards
Acetylene dichloride:

- in contact with solid caustic alkalies or their concentrated solutions, sulfuric acid, or copper and its alloys, will form chloroacetylene which ignites in air
- may ignite in contact with with strong oxidising agents, ozone or nitrogen tetraoxide (explosively)
- forms unstable peroxides in air
- may polymerise unless inhibited - polymerisation may be caused by peroxides, strong sunlight, elevated temperatures, contact with oxidisers
- is incompatible with strong bases, amines, alkali metals, aluminium and its alloys, strong reducing agents such as sodium, magnesium, zinc, , difluoromethylene and dihypofluoride
- attacks iron, aluminium, plastics and coatings.

Distillation of ethanol containing 0.25% of the halocarbon, with aqueous sodium hydroxide, gave a product which ignited in air.

- Haloalkenes are highly reactive.
- Some of the more lightly substituted lower members are highly flammable; many members of the group are peroxidisable and polymerisable.
- Avoid reaction or contact with potassium or its alloys - although apparently stable on contact with a wide rage of halocarbons, reaction products may be shock-sensitive and may explode with great violence on light impact. Severity generally increases with the degree of halocarbon substitution and potassium-sodium alloys give extremely sensitive mixtures.

BRETHERICK L.: Handbook of Reactive Chemical Hazards

- Avoid reaction with metal halides and active metals, eg. sodium (Na), potassium (K), calcium (Ca), zinc (Zn), powdered aluminium (Al), magnesium (Mg) and magnesium alloys.
- Avoid contact with rubber, and plastics such as methacrylate polymers, polyethylene and polystyrene
- Segregate from alcohol, water.
- Compressed gases may contain a large amount of kinetic energy over and above that potentially available from the energy of reaction produced by the gas in chemical reaction with other substances

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
trans-acetylene dichloride	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
trans-acetylene dichloride	Not Available	Not Available
1'-chloro-3,3,3-trifluoropropene	Not Available	Not Available

Exposure controls

Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

- Areas where cylinders are stored require good ventilation and, if enclosed, need discrete/controlled exhaust ventilation.
- Secondary containment and exhaust gas treatment may be required by certain jurisdictions.
- Local exhaust ventilation may be required in work areas.
- Consideration should be given to the use of diaphragm or bellows-sealed, soft-seat valves; backflow prevention devices and flow-monitoring or limiting devices.
- Automated alerting systems with automatic shutdown of gas-flow may be appropriate and may in fact be mandatory in certain jurisdictions.
- Respiratory protection in the form of air-supplied or self-contained breathing equipment must be worn if the oxygen concentration in the workplace air is less than 19%.
- Cartridge respirators do NOT give protection and may result in rapid suffocation.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2.5 m/s (200-500 f/min.) for extraction of gases discharged 2 meters distant from the extraction point. Other mechanical considerations,

Continued...

	producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.
Individual protection measures, such as personal protective equipment	
Eye and face protection	▸ Safety glasses with side shields. ▸ Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent] ▸ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].
Skin protection	See Hand protection below
Hands/feet protection	▸ Butyl rubber gloves · Butyl rubber gloves should be used when handling halogenated aliphatics . · Nitrile, PVC-coated nitrile, and PVC protective equipment are not recommended ▸ Neoprene gloves ▸ When handling sealed and suitably insulated cylinders wear cloth or leather gloves.
Body protection	See Other protection below
Other protection	· Halogen-selective detectors use a specialized sensor that allows the monitor to detect compounds containing fluorine, chlorine, bromine, and iodine with-out interference from other species.These detectors are typically easy to use, feature higher sensitivity than the nonselective detectors (detection limits are typically <5 ppm when used as an area monitor and <1.4 gm/yr [<0.05 oz/yr] when used as a leak pinpointer). · Compound-Specific Detectors are typically capable of detecting the presence of a single compound without interference from other compounds. ▸ Protective overalls, closely fitted at neck and wrist. ▸ Eye-wash unit. ▸ Ensure availability of lifeline in confined spaces. ▸ Staff should be trained in all aspects of rescue work. ▸ Rescue gear: Two sets of SCBA breathing apparatus Rescue Harness, lines etc.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".
The effect(s) of the following substance(s) are taken into account in the ***computer-generated*** selection:
Tensorgrip M87 Non-Flam, Non MECL Contact Adhesive Canister

Material	CPI
VITON	C

* CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Respiratory protection

Type AX Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Required minimum protection factor	Maximum gas/vapour concentration present in air p.p.m. (by volume)	Half-face Respirator	Full-Face Respirator
up to 10	1000	AX-AUS / Class1	-
up to 50	1000	-	AX-AUS / Class 1
up to 50	5000	Airline *	-
up to 100	5000	-	AX-2
up to 100	10000	-	AX-3
100+			Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO_2), G = Agricultural chemicals, K = Ammonia(NH_3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.
- The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used
- Positive pressure, full face, air-supplied breathing apparatus should be used for work in enclosed spaces if a leak is suspected or the primary containment is to be opened (e.g. for a cylinder change)
- Air-supplied breathing apparatus is required where release of gas from primary containment is either suspected or demonstrated.

SECTION 9 Physical and chemical properties

Continued...

Information on basic physical and chemical properties

Appearance	Not Available

Physical state	Dissolved Gas	**Relative density (Water = 1)**	1.16
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Available	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	Not Applicable	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Applicable	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Applicable	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Applicable	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water	Not Available	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	345.1

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	‣ Unstable in the presence of incompatible materials. ‣ Product is considered stable. ‣ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. There is strong evidence to suggest that this material can cause, if inhaled once, serious, irreversible damage of organs. Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo. Acetylene chloride can cause unconsciousness and irritation of the central nervous system. Repeated doses can damage the liver. Exposure to the vapour may produce central nervous system depression; in milder doses, nausea, vomiting, weakness, tremor and cramps in the upper abdomen occur. One fatal case occurred when a person inhaled the vapour in a small enclosure. Animal testing has also shown damage to the lung. Inhalation of non-toxic gases may cause: ‣ CNS effects: headache, confusion, dizziness, stupor, seizures and coma; ‣ respiratory: shortness of breath and rapid breathing; ‣ cardiovascular: collapse and irregular heart beats; ‣ gastrointestinal: mucous membrane irritation, nausea and vomiting. Acute intoxication by halogenated aliphatic hydrocarbons appears to take place over two stages. Signs of a reversible narcosis are evident in the first stage and in the second stage signs of injury to organs may become evident, a single organ alone is (almost) never involved. Depression of the central nervous system is the most outstanding effect of most halogenated aliphatic hydrocarbons. Inebriation and excitation, passing into narcosis, is a typical reaction. In severe acute exposures there is always a danger of death from respiratory failure or cardiac arrest due to a tendency to make the heart more susceptible to catecholamines (adrenalin)
Ingestion	Strong evidence exists that exposure to the material may cause irreversible damage (other than cancer, mutations and birth defects) following a single exposure by swallowing. Not normally a hazard due to physical form of product. Considered an unlikely route of entry in commercial/industrial environments Central nervous system (CNS) depression may include general discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in respiratory depression and may be fatal. Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
Skin Contact	There is strong evidence to suggest that this material, on a single contact with skin, can cause serious, irreversible damage of organs. The material may accentuate any pre-existing dermatitis condition Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Continued...

	There is some evidence to suggest that the material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.
Eye	Not considered to be a risk because of the extreme volatility of the gas. Exposure to isomer acetylene dichloride at 2200 ppm caused burning of the eyes, dizziness and nausea. Reversible corneal clouding also has been described. The vapour when concentrated has pronounced eye irritation effects and this gives some warning of high vapour concentrations. If eye irritation occurs seek to reduce exposure with available control measures, or evacuate area. There is some evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Moderate inflammation may be expected with redness; conjunctivitis may occur with prolonged exposure.
Chronic	Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course. The reactivity of an epoxide intermediate may be the reason for the cancer-causing properties of halogenated oxiranes. It is reported that 1,1-dichloroethyne, vinyl chloride, trichloroethylene, tetrachloroethylene and chloroprene all cause cancer. Generally speaking, substances with one halogen substitution show higher potential to cause cancer compared to substances with two. Main route of exposure to the gas in the workplace is by inhalation. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.

	TOXICITY	IRRITATION
Tensorgrip M87 Non-Flam, Non MECL Contact Adhesive Canister	Not Available	Not Available
trans-acetylene dichloride	Dermal (rabbit) LD50: >5000 mg/kg[1]	Eye (rabbit): 10 mg - moderate
	Inhalation(Rat) LC50: 24100 ppm4h[1]	SKIN (RABBIT): 500 MG/24H - moderate
	Oral (Rat) LD50: 1235 mg/kg[2]	
1'-chloro-3,3,3-trifluoropropene	Inhalation(Rat) LC50: 120000 ppm4h[1]	Skin (rabbit) : Not irritating *4 hours OECD 404

Legend: *1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

Tensorgrip M87 Non-Flam, Non MECL Contact Adhesive Canister	Disinfection byproducts (DBPs) are formed when disinfectants such as chlorine, chloramines and ozone react with organic and inorganic matter in water. Animal studies have shown that some DBPs cause cancer. To date, several hundred DBPs have been identified. Numerous haloalkanes and haloalkenes have been tested for cancer-causing and mutation-causing activities. In general, the potential to cause genetic toxicity is dependent on the nature, number and position of halogen(s) and the size of the molecule. Haloalkenes are of concern because of the potential to generate genetically toxic intermediates after epoxidation. The concern for haloalkenes may be diminished if the double bond is internal or sterically hindered. The cancer concern levels of the 14 haloalkenes and haloalkanes, have been rated, based on available screening cancer bioassays and data on genetic toxicity. Some individuals may be genetically more susceptible to brominated THMs than others. Six, two and one haloalkanes/haloalkenes have been given low-moderate, marginal and low concern, respectively.
TRANS-ACETYLENE DICHLORIDE	Hamster lung cell mutagen in vitro The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
1'-CHLORO-3,3,3-TRIFLUOROPROPENE	Overall results from a series of genetic studies indicate that substance is nonmutagenic and non-teratogenic Sensitisation : Result: Does not cause skin sensitisation. Classification: Patch test on human volunteers did not demonstrate sensitisation properties. Cardiac sensitization Species: dogs Note: Cardiac sensitisation threshold (dog): 25000 ppm. Repeated dose toxicity : Species: rat Application Route: Inhalation Exposure time: 4 Weeks NOEL: 4500 ppm Subacute toxicity Genotoxicity in vitro : Test Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay) Genotoxicity in vivo : Species: rat Genotoxicity in vivo : Test Method: Unscheduled DNA synthesis Genotoxicity in vivo : Species: mouse Reproductive toxicity : Species: rabbit Note: No-observed-effect level - 10,000 ppm Teratogenicity : Species: rabbit No-observed-effect level - 10,000 ppm Further information : Note: Excessive exposure may cause central nervous system effects including drowsiness and dizziness. Excessive exposure may also cause cardiac arrhythmia
Tensorgrip M87 Non-Flam, Non MECL Contact Adhesive Canister & TRANS-ACETYLENE DICHLORIDE	Studies have shown that trans-1,2-dichloroethylene shows low levels of acute toxicity. Animal testing did not show evidence of genetic damage or reproductive or developmental toxicity.
1'-CHLORO-3,3,3-TRIFLUOROPROPENE	Result: negative Cell type: Bone marrow Method: Mutagenicity (micronucleus test) Species: rat No-observed-effect level - 15,000 ppm

Acute Toxicity	✓	**Carcinogenicity**	✗
Skin Irritation/Corrosion	✗	**Reproductivity**	✗
Serious Eye Damage/Irritation	✓	**STOT - Single Exposure**	✓
Respiratory or Skin sensitisation	✗	**STOT - Repeated Exposure**	✗
Mutagenicity	✗	**Aspiration Hazard**	✗

Legend: ✗ *– Data either not available or does not fill the criteria for classification*
✓ *– Data available to make classification*

SECTION 12 Ecological information

Toxicity

	Endpoint	Test Duration (hr)	Species	Value	Source
Tensorgrip M87 Non-Flam, Non MECL Contact Adhesive Canister					

Continued...

	Not Available	Not Available	Not Available	Not Available	Not Available
trans-acetylene dichloride	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50	48h	Crustacea	220mg/l	2
	LC50	96h	Fish	135mg/l	2
	EC50(ECx)	48h	Algae or other aquatic plants	36.36mg/l	4
1'-chloro-3,3,3-trifluoropropene	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50	72h	Algae or other aquatic plants	201mg/l	Not Available
	EC50	48h	Crustacea	82mg/l	Not Available
	LC50	96h	Fish	38mg/l	Not Available
	EC50(ECx)	48h	Crustacea	82mg/l	Not Available
Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*				

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
Environmental Fate: Study shows that trans-1,2-dichloroethylene is moderately biodegradable in the environment. Level III fugacity modeling shows that the compound prefers to partition in water, followed by air, and then soil with low potential to partition in sediments.
Ecotoxicity: Chronic toxicity test conducted on fathead minnow and freshwater alga show that trans-1,2-dichloroethylene has no adverse effects
Fish LC50 (96h): bluegill sunfish (Lepomis macrochirus) 135 mg/l (trans-1,2-isomer); 73.9mg/l (trans-1,1-isomer)
Chronic toxicity Fish (for 1,1-dichloroethylene): fathead minnow 2800 mg/l; freshwater alga 798 mg/l
LC50 and EC50 saltwater species: mysid shrimp, sheepshead minnow, tidewater silversides, and alga 224,000-712,000 mg/l (for 1,1-dichloroethylene)
Substances containing unsaturated carbons are ubiquitous in indoor environments. They result from many sources (see below). Most are reactive with environmental ozone and many produce stable products which are thought to adversely affect human health.The potential for surfaces in an enclosed space to facilitate reactions should be considered.

Source of unsaturated substances	Unsaturated substances (Reactive Emissions)	Major Stable Products produced following reaction with ozone.
Occupants (exhaled breath, ski oils, personal care products)	Isoprene, nitric oxide, squalene, unsaturated sterols, oleic acid and other unsaturated fatty acids, unsaturated oxidation products	Methacrolein, methyl vinyl ketone, nitrogen dioxide, acetone, 6MHQ, geranyl acetone, 4OPA, formaldehyde, nonanol, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid.
Soft woods, wood flooring, including cypress, cedar and silver fir boards, houseplants	Isoprene, limonene, alpha-pinene, other terpenes and sesquiterpenes	Formaldehyde, 4-AMC, pinoaldehyde, pinic acid, pinonic acid, formic acid, methacrolein, methyl vinyl ketone, SOAs including ultrafine particles
Carpets and carpet backing	4-Phenylcyclohexene, 4-vinylcyclohexene, styrene, 2-ethylhexyl acrylate, unsaturated fatty acids and esters	Formaldehyde, acetaldehyde, benzaldehyde, hexanal, nonanal, 2-nonenal
Linoleum and paints/polishes containing linseed oil	Linoleic acid, linolenic acid	Propanal, hexanal, nonanal, 2-heptenal, 2-nonenal, 2-decenal, 1-pentene-3-one, propionic acid, n-butyric acid
Latex paint	Residual monomers	Formaldehyde
Certain cleaning products, polishes, waxes, air fresheners	Limonene, alpha-pinene, terpinolene, alpha-terpineol, linalool, linalyl acetate and other terpenoids, longifolene and other sesquiterpenes	Formaldehyde, acetaldehyde, glycoaldehyde, formic acid, acetic acid, hydrogen and organic peroxides, acetone, benzaldehyde, 4-hydroxy-4-methyl-5-hexen-1-al, 5-ethenyl-dihydro-5-methyl-2(3H)-furanone, 4-AMC, SOAs including ultrafine particles
Natural rubber adhesive	Isoprene, terpenes	Formaldehyde, methacrolein, methyl vinyl ketone
Photocopier toner, printed paper, styrene polymers	Styrene	Formaldehyde, benzaldehyde
Environmental tobacco smoke	Styrene, acrolein, nicotine	Formaldehyde, benzaldehyde, hexanal, glyoxal, N-methylformamide, nicotinaldehyde, cotinine
Soiled clothing, fabrics, bedding	Squalene, unsaturated sterols, oleic acid and other saturated fatty acids	Acetone, geranyl acetone, 6MHO, 40PA, formaldehyde, nonanal, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid
Soiled particle filters	Unsaturated fatty acids from plant waxes, leaf litter, and other vegetative debris; soot; diesel particles	Formaldehyde, nonanal, and other aldehydes; azelaic acid; nonanoic acid; 9-oxo-nonanoic acid and other oxo-acids; compounds with mixed functional groups (=O, -OH, and -COOH)
Ventilation ducts and duct liners	Unsaturated fatty acids and esters, unsaturated oils, neoprene	C5 to C10 aldehydes
"Urban grime"	Polycyclic aromatic hydrocarbons	Oxidized polycyclic aromatic hydrocarbons
Perfumes, colognes, essential oils (e.g. lavender, eucalyptus, tea tree)	Limonene, alpha-pinene, linalool, linalyl acetate, terpinene-4-ol, gamma-terpinene	Formaldehyde, 4-AMC, acetone, 4-hydroxy-4-methyl-5-hexen-1-al, 5-ethenyl-dihydro-5-methyl-2(3H) furanone, SOAs including ultrafine particles
Overall home emissions	Limonene, alpha-pinene, styrene	Formaldehyde, 4-AMC, pinonaldehyde, acetone, pinic acid, pinonic acid, formic acid, benzaldehyde, SOAs including ultrafine particles

Abbreviations: 4-AMC, 4-acetyl-1-methylcyclohexene; 6MHQ, 6-methyl-5-heptene-2-one, 4OPA, 4-oxopentanal, SOA, Secondary Organic Aerosols
Reference: Charles J Weschler; Environmental Helath Perspectives, Vol 114, October 2006
For Haloalkanes:
Atmospheric Fate: Fully, or partially, fluorinated haloalkanes released to the air can restrict heat loss from the Earth's atmosphere by absorbing infrared emissions from the surface. The major fate of haloalkanes in the atmosphere is via breakdown by hydroxyl radicals. These substances react with atmospheric ozone and nitrates, which also causes them to change, (transform). Chlorofluorocarbons, (CFC), haloalkanes can break down into chlorine atoms in the air, which also contribute to ozone destruction.
Terrestrial Fate: Biological breakdown of these substances is expected to be faster than non-biological breakdown, provided that there are sufficient substrates, nutrients and microbial populations. However, because haloalkane-degrading microorganisms are not easily found, biological breakdown of these substances is rare. Several methane-utilizing bacteria have been identified that may use haloalkanes. Biological breakdown may occur through various pathways.
Aquatic Fate: Haloalkanes do not easily break down in water. Biological breakdown of these substances is expected to be faster than non-biological breakdown, provided that there are sufficient substrates, nutrients and microbial populations. In general, alpha- and alpha, omega-chlorinated haloalkanes are de-halogenated by water. Alpha- and alpha, omega-haloalkanes with longer chains, may be de-halogenated by the addition of oxygen, (oxidized). Haloalkanes may break down in water, if certain sulfur ions are present, such as bisulfide ions.
Ecotoxicity: Haloparaffins C12 to C18 may be incorporated into fatty acids in bacteria, yeasts, and fungi, resulting in their build up in the food chain. Haloalkanes are persistent and toxic to fish and wildlife.

For Acetylene Dichlorides (1,2-dichloroethylene)- Vapor Pressure: 200 mm Hg at 25 C. Koc ~ 250. Log Kow: 1.86. Henry's Law Constant of 4.1X10-3 atm.m3/mole. Vapor Pressure - 200 mm Hg.

Continued...

Environmental Fate: The environmental properties of this product present a very low order of hazard; however, these compounds are highly volatile.
Atmospheric Fate: Acetylene dichlorides have an atmospheric half-life of only about 6 days based on its reactivity with hydroxyl radicals and is expected to have an ozone depletion potential of zero and global warming potential of zero. Vaporization from water and soil to the air is expected. Acetylene dichloride is expected to exist only as a vapor in the atmosphere.
Terrestrial Fate: Acetylene dichloride is expected to be moderately mobile in soil. Volatilization of acetylene dichloride from moist soil surfaces is expected to be an important fate process and the potential for volatilization from dry soil surfaces may exist. Acetylene dichloride biodegrades in soils in low oxygen environments and the half-life of these chemicals, under these conditions, ranges from 0.14 to 9.9 yrs.
Aquatic Fate: Acetylene dichloride is expected to adsorb to suspended solids and sediment and volatilization from water surfaces is expected with volatilization half-lives for a model river of 1 hour and a model lake of 95 hours. The potential for bioconcentration in aquatic organisms is low.
Ecotoxicity: Acetylene dichloride has low toxicity and it is unlikely that this substance will bioconcentrate in the presence of oxygen. Acetylene dichloride is moderately toxic to bluegill sunfish.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
trans-acetylene dichloride	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
trans-acetylene dichloride	LOW (LogKOW = 2.09)

Mobility in soil

Ingredient	Mobility
trans-acetylene dichloride	LOW (KOC = 43.79)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	‣ **DO NOT** allow wash water from cleaning or process equipment to enter drains. ‣ It may be necessary to collect all wash water for treatment before disposal. ‣ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ‣ Where in doubt contact the responsible authority. ‣ Evaporate residue at an approved site. ‣ Return empty containers to supplier. If containers are marked non-returnable establish means of disposal with manufacturer prior to purchase. ‣ Ensure damaged or non-returnable cylinders are gas-free before disposal.

SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO

Shipping container and transport vehicle placarding and labeling may vary from the below information. Products that are regulated for transport will be packaged and marked as Dangerous Goods in Limited Quantities according to US DOT, IATA and IMDG regulations. In case of reshipment, it is the responsibility of the shipper to determine the appropriate labels and markings in accordance with applicable transport regulations.

Land transport (DOT)

<table>
<tr><td>UN number or ID number</td><td>3500</td></tr>
<tr><td>UN proper shipping name</td><td>Chemical under pressure, n.o.s. Air, Compressed</td></tr>
<tr><td>Transport hazard class(es)</td><td><table><tr><td>Class</td><td>2.2</td></tr><tr><td>Subsidiary risk</td><td>Not Applicable</td></tr></table></td></tr>
<tr><td>Packing group</td><td>Not Applicable</td></tr>
<tr><td>Environmental hazard</td><td>Not Applicable</td></tr>
<tr><td>Special precautions for user</td><td><table><tr><td>Hazard Label</td><td>2.2</td></tr><tr><td>Special provisions</td><td>362, T50, TP40</td></tr></table></td></tr>
</table>

Air transport (ICAO-IATA / DGR)

<table>
<tr><td>UN number</td><td>3500</td></tr>
<tr><td>UN proper shipping name</td><td>Chemical under pressure, n.o.s. * Air, Compressed</td></tr>
<tr><td>Transport hazard class(es)</td><td><table><tr><td>ICAO/IATA Class</td><td>2.2</td></tr><tr><td>ICAO / IATA Subsidiary Hazard</td><td>Not Applicable</td></tr><tr><td>ERG Code</td><td>2L</td></tr></table></td></tr>
</table>

Continued...

Packing group	Not Applicable
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: A187 Cargo Only Packing Instructions: 218 Cargo Only Maximum Qty / Pack: 150 kg Passenger and Cargo Packing Instructions: 218 Passenger and Cargo Maximum Qty / Pack: 75 kg Passenger and Cargo Limited Quantity Packing Instructions: Forbidden Passenger and Cargo Limited Maximum Qty / Pack: Forbidden

Sea transport (IMDG-Code / GGVSee)

UN number	3500
UN proper shipping name	CHEMICAL UNDER PRESSURE, N.O.S. Air, Compressed
Transport hazard class(es)	IMDG Class: 2.2 IMDG Subrisk: Not Applicable
Packing group	Not Applicable
Environmental hazard	Not Applicable
Special precautions for user	EMS Number: F-C, S-V Special provisions: 274 362 Limited Quantities: 0

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
trans-acetylene dichloride	Not Available
1'-chloro-3,3,3-trifluoropropene	Not Available

Transport in bulk in accordance with the IGC Code

Product name	Ship Type
trans-acetylene dichloride	Not Available
1'-chloro-3,3,3-trifluoropropene	Not Available

SECTION 15 Regulatory information

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

trans-acetylene dichloride is found on the following regulatory lists

US - Massachusetts - Right To Know Listed Chemicals
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US DOE Temporary Emergency Exposure Limits (TEELs)
US EPA Integrated Risk Information System (IRIS)
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

1'-chloro-3,3,3-trifluoropropene is found on the following regulatory lists

US AIHA Workplace Environmental Exposure Levels (WEELs)
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US Toxicology Excellence for Risk Assessment (TERA) Workplace Environmental Exposure Levels (WEEL)

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 311/312 hazard categories

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	Yes
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No

Continued...

In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	No
Acute toxicity (any route of exposure)	Yes
Reproductive toxicity	No
Skin Corrosion or Irritation	No
Respiratory or Skin Sensitization	No
Serious eye damage or eye irritation	No
Specific target organ toxicity (single or repeated exposure)	Yes
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No
Hazards Not Otherwise Classified	No

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

None Reported

State Regulations

US. California Proposition 65

None Reported

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (trans-acetylene dichloride; 1'-chloro-3,3,3-trifluoropropene)
China - IECSC	No (1'-chloro-3,3,3-trifluoropropene)
Europe - EINEC / ELINCS / NLP	No (1'-chloro-3,3,3-trifluoropropene)
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (1'-chloro-3,3,3-trifluoropropene)
Vietnam - NCI	Yes
Russia - FBEPH	No (1'-chloro-3,3,3-trifluoropropene)
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.*

SECTION 16 Other information

Revision Date	21/08/2023
Initial Date	22/06/2022

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC－TWA: Permissible Concentration-Time Weighted Average
PC－STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

Continued...

AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

Powered by AuthorITe, from Chemwatch.

end of SDS