



Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

- Product Name** • **PER230 - Perchloroethylene Degreasing and All-Purpose**
- Synonyms** • C2Cl4; PERC; Perchlor; Perchlorethylene; Tetrachloroethylene

1.2 Relevant identified uses of the substance or mixture and uses advised against

- Relevant identified use(s)** • Solvent, Degreasers

1.3 Details of the supplier of the safety data sheet

- Manufacturer** • Axiall, LLC
1000 Abernathy Rd. NE, Suite 1200
Atlanta, GA 30328
United States
www.axiall.com
msdsinfo@axiall.com
- Telephone (General)** • +1 225-685-1240

- Responsible Party - EU** • Intertek France
12 Rue Alfred Kastler
71530 Fragnes
France
christian.gimenez@intertek.com
- Telephone (General)** • 33 (0) 385 99 1274
- Telephone (General)** • 33 385 99 1288

1.4 Emergency telephone number

- Manufacturer** • +1 304-455-6882

Distributed by:



4621 Technology Drive, Golden, CO 80403
ph: (303) 762-0800 fax: (303) 762-1240

Part #: P1027

Section 2: Hazards Identification

EU/EEC

According to: Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to: EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

- CLP**
- Aspiration 1 - H304
 - Carcinogenicity 2 - H351
 - Hazardous to the aquatic environment Chronic 2 - H411
- DSD/DPD**
- Carcinogenic Substances - Category 3
 - Dangerous to the Environment (N)
 - R40, R51, R53

2.2 Label Elements

CLP

DANGER

- Hazard statements** • H304 - May be fatal if swallowed and enters airways
 H351 - Suspected of causing cancer.
 H411 - Toxic to aquatic life with long lasting effects

Precautionary statements

- Prevention** • P201 - Obtain special instructions before use.
 P202 - Do not handle until all safety precautions have been read and understood.
 P273 - Avoid release to the environment.
 P281 - Use personal protective equipment as required.
- Response** • P308+P313 - IF exposed or concerned: Get medical advice/attention.
 P391 - Collect spillage.
 P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
 P331 - Do NOT induce vomiting.
- Storage/Disposal** • P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
 P405 - Store locked up.
 P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD



- Risk phrases** • R40 - Limited evidence of a carcinogenic effect.
 R51 - Toxic to aquatic organisms.
 R53 - May cause long-term adverse effects in the aquatic environment.
- Safety phrases** • S36 - Wear suitable protective clothing.
 S37 - Wear suitable gloves.
 S53 - Avoid exposure - obtain special instructions before use.
 S57 - Use appropriate containment to avoid environmental contamination.

2.3 Other Hazards

- CLP** • According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.
- DSD/DPD** • This product is considered dangerous according to the European Directive 67/548/EEC.

UN GHS

According to: UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

2.1 Classification of the substance or mixture

- UN GHS**
- Acute Toxicity Oral 5
 - Aspiration 1
 - Skin Irritation 2
 - Eye Irritation 2
 - Acute Toxicity Inhalation 4
 - Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
 - Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects
 - Carcinogenicity 1B
 - Hazardous to the aquatic environment Acute 2
 - Hazardous to the aquatic environment Chronic 2

2.2 Label elements

UN GHS**DANGER**

- Hazard statements** • May be harmful if swallowed
 May be fatal if swallowed and enters airways
 Causes skin irritation
 Causes serious eye irritation
 Harmful if inhaled
 May cause respiratory irritation
 May cause drowsiness or dizziness
 May cause cancer.
 Toxic to aquatic life
 Toxic to aquatic life with long lasting effects

Precautionary statements

- Prevention** • Obtain special instructions before use.
 Do not handle until all safety precautions have been read and understood.
 Avoid breathing mist/vapours/spray.
 Wash thoroughly after handling.
 Use only outdoors or in a well-ventilated area.
 Avoid release to the environment.
 Wear protective gloves/protective clothing/eye protection/face protection.
 Use personal protective equipment as required.
- Response** • IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 Call a POISON CENTER or doctor/physician if you feel unwell.
 IF ON SKIN: Wash with plenty of soap and water.
 Take off contaminated clothing and wash before reuse.
 If skin irritation occurs: Get medical advice/attention.
 Specific treatment, see supplemental first aid information.
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 If eye irritation persists: Get medical advice/attention.
 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
 Do NOT induce vomiting.
 IF exposed or concerned: Get medical advice/attention.
 Collect spillage.
- Storage/Disposal** • Store in a well-ventilated place. Keep container tightly closed.
 Store locked up.
 Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

2.3 Other hazards**UN GHS**

- According to the Globally Harmonized System for Classification and Labeling (GHS) this product is considered hazardous.

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture**OSHA HCS 2012**

- Aspiration 1
 Skin Irritation 2
 Eye Irritation 2
 Acute Toxicity Inhalation 4
 Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
 Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects
 Carcinogenicity 1B

2.2 Label elements

OSHA HCS 2012

DANGER

- Hazard statements** • May be fatal if swallowed and enters airways
 Causes skin irritation
 Causes serious eye irritation
 Harmful if inhaled
 May cause respiratory irritation
 May cause drowsiness or dizziness
 May cause cancer.

Precautionary statements

- Prevention** • Obtain special instructions before use.
 Do not handle until all safety precautions have been read and understood.
 Avoid breathing mist/vapours/spray.
 Wash thoroughly after handling.
 Use only outdoors or in a well-ventilated area.
 Wear protective gloves/protective clothing/eye protection/face protection.
- Response** • IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 Call a POISON CENTER or doctor/physician if you feel unwell.
 If on skin: Wash with plenty of water .
 Take off contaminated clothing and wash before reuse.
 If skin irritation occurs: Get medical advice/attention.
 Specific treatment, see supplemental first aid information.
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 If eye irritation persists: Get medical advice/attention.
 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
 Do NOT induce vomiting.
 IF exposed or concerned: Get medical advice/attention.
- Storage/Disposal** • Store in a well-ventilated place. Keep container tightly closed.
 Store locked up.
 Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

2.3 Other hazards

OSHA HCS 2012

- Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to: WHMIS

2.1 Classification of the substance or mixture

WHMIS

- Toxic - D1B
 Other Toxic Effects - D2A
 Other Toxic Effects - D2B

2.2 Label elements

WHMIS



- Toxic - D1B
 Other Toxic Effects - D2A
 Other Toxic Effects - D2B

2.3 Other hazards

WHMIS

- Aspiration hazard if swallowed; can enter lungs and cause damage. In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

Composition				
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive
Ethylene, tetrachloro-	CAS:127-18-4 EC Number:204-825-9 EU Index:602-028-00-4	> 99%	Ingestion/Oral-Rat LD50 • 2629 mg/kg Inhalation-Rat LC50 • 4100 ppm 6 Hour(s)	UN GHS: Skin Irrit. 2; Eye Irrit. 2; STOT SE 3: Resp. Irrit. & Narc.; Muta. 2; Carc. 1B; Repr. 2; STOT RE 1 (Liver, Kidneys); Acute Tox. 4 (Inhl); Acute Tox. 5 (oral); Aquatic Acute 2; Aquatic Chronic 2 EU DSD/DPD: Annex VI, Table 3.2: Carc.Cat.3 R40 N R51-53 EU CLP: Annex VI, Table 3.1: Carc. 2, H351; Aquatic Chronic 2, H411 OSHA HCS 2012: Skin Irrit. 2; Eye Irrit. 2; STOT SE 3: Resp. Irrit. & Narc.; STOT SE 3: Narc; Muta. 2; Carc. 1B; Repr. 2; STOT RE 1 (Liver, Kidneys); Acute Tox. 4 (Inhl)

3.2 Mixtures

- Material does not meet the criteria of a mixture in accordance with Regulation (EC) No 1272/2008.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation

- Move victim to fresh air. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately.

Skin

- For minor skin contact, avoid spreading material on unaffected skin. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Remove contaminated clothing and shoes. If irritation develops and persists, get medical attention.

Eye

- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation develops and persists, get medical attention.

Ingestion

- If swallowed, rinse mouth with water (only if the person is conscious). Do NOT induce vomiting. Do not use mouth-to-mouth method if victim ingested the substance. Obtain medical attention immediately if ingested.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician

- Only administer adrenaline after careful consideration following overexposure. Increased sensitivity of the heart to adrenaline may be caused by overexposure to this

product. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media • Use water spray, dry chemical powder or carbon dioxide.

Unsuitable Extinguishing Media • Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards • Containers may explode when heated. Emits toxic fumes under fire conditions.

Hazardous Combustion Products • Depending on conditions, decomposition products may include the following materials: carbon oxides, halogenated compounds, carbonyl halides. When this product is involved in fires, it can decompose to hydrogen chloride and possible traces of phosgene.

5.3 Advice for firefighters

- Structural firefighters' protective clothing will only provide limited protection. Wear positive pressure self-contained breathing apparatus (SCBA). Move containers from fire area if you can do it without risk.
LARGE FIRES: Cool containers with flooding quantities of water until well after fire is out.
LARGE FIRES: Dike fire control water for later disposal; do not scatter the material.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions • Ventilate enclosed areas. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid breathing mist, vapors, spray. Avoid contact with skin, eyes, and clothing.

Emergency Procedures • As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. LARGE SPILL: Consider initial downwind evacuation for at least 300 meters (1000 feet) ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering.

6.2 Environmental precautions

- Avoid release to the environment. Avoid contamination of water supplies. Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures • Stop leak if you can do it without risk. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. A vapor suppressing foam may be used to reduce vapors.
LARGE SPILLS: Dike far ahead of liquid spill for later disposal.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Use only with adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact. Avoid breathing mist, vapors, spray. Avoid contact with skin, eyes, and clothing. Do not ingest. Depending upon conditions, this material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and possible traces of phosgene. Do not use cutting or welding torches on drums that contained this product unless properly purged and cleaned. Do not ship lightly stabilized grades in aluminum trailers. Do not ship in containers made of zinc, aluminum, or copper due to product incompatibility. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Keep container tightly closed. Keep from direct sunlight. Store in a cool, dry, well-ventilated place. Do not store above the following temperature: 35°C (95°F). Do not store or stack aluminum in contact with this product to prevent possible solvent decomposition (stacking corrosion). Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Liquid oxygen or other strong oxidants can form explosive mixtures of perchloroethylene.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines						
	Result	ACGIH	Canada British Columbia	Canada Ontario	Canada Quebec	OSHA
Ethylene, tetrachloro- (127-18-4)	STELs	100 ppm STEL	100 ppm STEL	100 ppm STEL	100 ppm STEV; 685 mg/m ³ STEV	Not established
	TWAs	25 ppm TWA	25 ppm TWA	25 ppm TWA	25 ppm TWAEV; 170 mg/m ³ TWAEV	100 ppm TWA
	Ceilings	Not established	Not established	Not established	Not established	200 ppm Ceiling

8.2 Exposure controls

Engineering Measures/Controls

- Good general ventilation 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

Respiratory

- If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Eye/Face

- Wear chemical splash goggles and face shield.

Skin/Body

- Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. HANDS: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified

by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Environmental Exposure Controls

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways. Follow best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

STEV = Short Term Exposure Value

OSHA = Occupational Safety and Health Administration

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

STEL = Short Term Exposure Limits are based on 15-minute exposures

TWAEV = Time-Weighted Average Exposure Value

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Liquid	Appearance/Description	Colorless liquid with an ethereal odor.
Color	Colorless	Odor	Ethereal odor.
Odor Threshold	No data available		
General Properties			
Boiling Point	120 to 122 C(248 to 251.6 F)	Melting Point/Freezing Point	-22.3 C(-8.14 F)
Decomposition Temperature	No data available	pH	8 to 9
Specific Gravity/Relative Density	1.623 to 1.628 @ 20 C(68 F) Water=1	Density	13.6 lbs/gal @ 20 C(68 F)
Water Solubility	Negligible < 0.1 %	Viscosity	0.88 Centipoise (cPs, cP) or mPas @ 20 C(68 F)
Explosive Properties	No data available	Oxidizing Properties:	No data available
Volatility			
Vapor Pressure	14.2 mmHg (torr) @ 20 C(68 F)	Vapor Density	5.83 Air=1
Evaporation Rate	0.09 Ether = 1	Volatiles (Wt.)	100 %
Volatiles (Vol.)	100 %		
Flammability			
Flash Point	CC (Closed Cup) None	UEL	No data available
LEL	No data available	Autoignition	No data available
Flammability (solid, gas)	Not relevant.		
Environmental			
Octanol/Water Partition coefficient	No data available		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under recommended storage and handling conditions.

10.3 Possibility of hazardous reactions

- Under normal conditions of storage and use, hazardous polymerization will not occur.

10.4 Conditions to avoid

- Keep away from heat, sparks, and flame. When exposed to high temperatures may produce hazardous decomposition products.

10.5 Incompatible materials

- Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids. Liquid oxygen or other strong oxidants can form explosive mixtures of perchloroethylene.

10.6 Hazardous decomposition products

- Depending on conditions, decomposition products may include the following materials: carbon oxides, hydrogen chloride (HCL), and phosgene gas.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components	
Ethylene, tetrachloro- (> 99%)	127-18-4
<p>Acute Toxicity: Ingestion/Oral-Rat LD50 • 2629 mg/kg; Ingestion/Oral-Dog TDLo • 306 mg/kg; Cardiac:Other changes; <i>Lungs, Thorax, or Respiration:Other changes;</i> Liver:Fatty liver degeneration; Inhalation-Rat LC50 • 4100 ppm 6 Hour (s);</p> <p>Multi-dose Toxicity: Ingestion/Oral-Rat TDLo • 7000 mg/kg 7 Day(s)-Intermittent; <i>Kidney, Ureter, and Bladder:Changes in tubules (including acute renal failure, acute tubular necrosis);</i></p> <p>Mutagen: Sperm Morphology • Inhalation-Mouse • 500 ppm; Cytogenetic analysis • Inhalation-Rat • 500 ppm;</p> <p>Reproductive: Inhalation-Mouse TCLo • 300 ppm 7 Hour(s)(6-15D preg); <i>Reproductive Effects:Effects on Embryo or Fetus:Fetotoxicity (except death, e.g., stunted fetus); Reproductive Effects:Specific Developmental Abnormalities:Musculoskeletal system; Reproductive Effects:Specific Developmental Abnormalities:Homeostasis;</i> Inhalation-Rat TCLo • 250 ppm (6-19D preg); <i>Reproductive Effects:Effects on Embryo or Fetus:Extra embryonic structures; Reproductive Effects:Effects on Embryo or Fetus:Fetotoxicity (except death, e.g., stunted fetus);</i></p> <p>Tumorigen / Carcinogen: Inhalation-Rat TCLo • 200 ppm 6 Hour(s) 2 Year(s)-Intermittent; <i>Tumorigenic:Carcinogenic by RTECS criteria; Blood:Leukemia; Reproductive Effects:Tumorigenic Effects:Testicular tumors</i></p>	

GHS Properties	Classification
Respiratory sensitization	EU/CLP • No data available OSHA HCS 2012 • No data available UN GHS • No data available
Serious eye damage/Irritation	EU/CLP • No data available OSHA HCS 2012 • Eye Irritation 2 UN GHS • Eye Irritation 2
Acute toxicity	EU/CLP • No data available OSHA HCS 2012 • Acute Toxicity - Inhalation 4 UN GHS • Acute Toxicity - Inhalation 4; Acute Toxicity - Oral 5
Aspiration Hazard	EU/CLP • Aspiration 1 OSHA HCS 2012 • Aspiration 1 UN GHS • Aspiration 1
	EU/CLP • Carcinogenicity 2

Carcinogenicity	OSHA HCS 2012 • Carcinogenicity 1B UN GHS • Carcinogenicity 1B
Skin corrosion/Irritation	EU/CLP • No data available OSHA HCS 2012 • Skin Irritation 2 UN GHS • Skin Irritation 2
Skin sensitization	EU/CLP • No data available OSHA HCS 2012 • No data available UN GHS • No data available
STOT-RE	EU/CLP • No data available OSHA HCS 2012 • No data available UN GHS • No data available
STOT-SE	EU/CLP • No data available OSHA HCS 2012 • Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation UN GHS • Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
Toxicity for Reproduction	EU/CLP • No data available OSHA HCS 2012 • No data available UN GHS • No data available
Germ Cell Mutagenicity	EU/CLP • No data available OSHA HCS 2012 • No data available UN GHS • No data available

Potential Health Effects

Inhalation

- Acute (Immediate)**
 - Harmful if inhaled. May cause respiratory irritation. May affect the central nervous system. Symptoms may include dizziness, drowsiness, lethargy, coma and death.
- Chronic (Delayed)**
 - No data available.

Skin

- Acute (Immediate)**
 - Causes skin irritation.
- Chronic (Delayed)**
 - No data available.

Eye

- Acute (Immediate)**
 - Causes serious eye irritation.
- Chronic (Delayed)**
 - No data available.

Ingestion

- Acute (Immediate)**
 - May be harmful if swallowed. Material may be aspirated into lungs during ingestion and/or subsequent vomiting. Aspiration of this material will cause severe lung injury, chemical pneumonitis, pulmonary edema or death.
- Chronic (Delayed)**
 - No data available

Other

- Chronic (Delayed)**
 - In a National Toxicology Program study, mice exposed to 400 ppm for 13 weeks were observed to have lesions in the liver including necrosis. Dose related kidney lesions were observed in rats exposed at 200 or 400 ppm and in mice exposed at 100 or 200 ppm for 6 hours/day, 5 days/week for 103 weeks. Prudent handling practices should be followed to minimize human exposure.

Carcinogenic Effects

- In a National Toxicology Program study rats were exposed to 0, 200, or 400 ppm and mice to 0, 100, or 200 ppm 6 hours/day, 5 days/week for 103 weeks. Significant increases in mononuclear cell leukemia was observed for rats and an increased incidence of hepatocellular (liver) carcinomas was observed for mice. Additionally, significant increases in renal (kidney) tubular cell tumors was found for male rats. An EPA Scientific Advisory Board which reviewed the available data urged caution in concluding from the animal studies that perchloroethylene poses a risk of human

cancer due to a substantial background incidence of at least one type of these tumors and possible differences in species specific responses. Repeated and prolonged exposure may cause cancer.

Carcinogenic Effects			
	CAS	IARC	NTP
Ethylene, tetrachloro-	127-18-4	Group 2A-Probable Carcinogen	Reasonably Anticipated to be Human Carcinogen

Reproductive Effects

- Inhalation exposure of rats at 70, 230, or 470 ppm perchloroethylene for 8 hours/day for 27 weeks resulted in no adverse effects on reproductive performance.

Key to abbreviations

LC = Lethal Concentration

LD = Lethal Dose

TC = Toxic Concentration

TD = Toxic Dose

Section 12 - Ecological Information

12.1 Toxicity

PER230 - Perchloroethylene Degreasing and All-Purpose					
Dosage	Species	Duration	Results	Exposure Conditions	Comments
3-6 mg/L	Fish: Rainbow trout, donaldson trout - Oncorhynchus mykiss	96 Hour(s)	LC50	Fresh water	Ethylene, tetrachloro-
9.8-11 mg/L	Fish: Sheepshead minnow - Cyprinodon variegatus	96 Hour(s)	LC50	Marine water	Ethylene, tetrachloro-
7500-9000 µg/L	Crustacea: Water flea - Daphnia magna	48 Hour(s)	EC50	Fresh water	Ethylene, tetrachloro-
10000 µg/L	Crustacea: Water flea - Daphnia magna	48 Hour(s)	NOEC	Fresh water	Ethylene, tetrachloro-

- Toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

- Not expected to be readily biodegradable.

12.3 Bioaccumulative potential

- This product shows a low bioaccumulation potential.

12.4 Mobility in Soil

- No data available

12.5 Results of PBT and vPvB assessment

- No PBT and vPvB assessment has been conducted.

12.6 Other adverse effects

- Water polluting material. May be harmful to the environment if released in large quantities.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN1897	Tetrachloroethylene	6.1	III	Marine Pollutant
TDG	UN1897	TETRACHLOROETHYLENE	6.1	III	Marine Pollutant
IMO/IMDG	UN1897	TETRACHLOROETHYLENE. Marine pollutant (tetrachloroethylene)	6.1	III	Marine Pollutant
IATA/ICAO	UN1897	Tetrachloroethylene	6.1	III	NDA

14.6 Special precautions for user

- Do not ship lightly stabilized grades in aluminum trailers. Do not ship in containers made of zinc, aluminum, or copper due to product incompatibility.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

- Data lacking.

Section 15 - Regulatory Information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****SARA Hazard Classifications** • Acute, Chronic

Inventory						
Component	CAS	Canada DSL	Canada NDSL	EU EINECS	EU ELNICS	TSCA
7-Oxabicyclo(4.1.0)heptane	286-20-4	No	Yes	Yes	No	Yes
Ethylene, tetrachloro-	127-18-4	Yes	No	Yes	No	Yes
Morpholine, 4-methyl-	109-02-4	Yes	No	Yes	No	Yes
Propanenitrile, 3-ethoxy-	2141-62-0	No	Yes	Yes	No	Yes

Canada**Labor****Canada - WHMIS - Classifications of Substances**

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	D1B, D2A, D2B
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

Canada - WHMIS - Ingredient Disclosure List

• Morpholine, 4-methyl-	109-02-4	1 %
• Ethylene, tetrachloro-	127-18-4	1 %
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

Environment**Canada - CEPA - Priority Substances List**

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Priority Substance List 1 (substance considered toxic)
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

United States**Labor****U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals**

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

Environment**U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants**

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	100 lb final RQ; 45.4 kg final RQ
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	0.1 % de minimis concentration
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - TSCA (Toxic Substances Control Act) - Section 12(b) - Export Notification

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

United States - California**Environment****U.S. - California - Proposition 65 - Carcinogens List**

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	carcinogen, initial date 4/1/88
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	14 µg/day NSRL
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed
• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Morpholine, 4-methyl-	109-02-4	Not Listed
• Ethylene, tetrachloro-	127-18-4	Not Listed

• 7-Oxabicyclo(4.1.0)heptane	286-20-4	Not Listed
• Propanenitrile, 3-ethoxy-	2141-62-0	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

15.3 Other Information

- WARNING: This product contains a chemical known to the State of California to cause cancer.

Section 16 - Other Information

Revision Date

- 14/August/2015

Preparation Date

- 23/December/2014

Disclaimer/Statement of Liability

- The technical data given herein is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release, and is not to be considered a warranty or quality specification. No guarantee is being given as to the end use performance. The product is sold on the basis that buyers test the product for their specific purposes. This information related to the material designated and may not be valid for such material used in combination with any other materials or in any process.

Key to abbreviations

NDA = No Data Available