

SDS# PF-08, PF-16
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Sid Harvey item # PF-16

SDS # Z0428

Pro-Flush®

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Pro-Flush HVAC Flushing Solvent

Catalog Number: PF-08, PF-16

Manufactured by: DiversiTech Corporation
6650 Sugarloaf Parkway
Duluth, GA, 30097

Information Phone No.: 1+678.542.3600

EMERGENCY Phone No.: 1 800.255.3924 Chem-Tel (Chemical Emergencies)

PREPARED BY: V. Leone

SECTION 2. HAZARDOUS INGREDIENTS INFORMATION

GHS Classification:

Acute Toxicity Oral Category 4

Acute Toxicity Inhalation Category 4

Eye Irritation Category 2A

Hazardous to the Aquatic Environment, Chronic Hazard Category 3

Label Elements:



Signal Word Warning!

Hazard Statement(s)

H302 Harmful if swallowed.
H332 Harmful if inhaled.
H319 Causes serious eye irritation.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P102 Keep out of reach of children.
P103 Read label before use.
P261 Avoid breathing mist or vapours.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink, or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear safety goggle or a face shield.

Response

P312 Call a POISON CENTER or doctor if you feel unwell.
P301+312 IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
P330 Rinse mouth.
P304+340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + 351 + 338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + 313 If eye irritation persists: Get medical attention.
P501 Dispose of contents in accordance with the international and local regulations.

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SECTION 3. HAZARDOUS INGREDIENTS INFORMATION

INGREDIENT	CAS No.	EINECS No.	% Or Range	GHS Classification	
Acetone	67-64-1	200-662-2	10-20	H225: Highly flammable Liquid and vapour H319: Causes serious Eye irritation H401: Toxic to aquatic Life.	Category 2 Category 2A Category 2
t-Butyl Acetate	540-88-55	208-760-7	20-30	H226: Flammable Liquid and vapour H336: May cause Drowsiness or dizziness	Category 3 Category 3
trans 1,2 dichloroethane	156-60-5	205-860-2	50-60	H225: Highly flammable liquid and vapour H332: Harmful if inhaled. H412: Harmful to aquatic Life with long	Category 2 Category 4 Category 3
Ethyl Nonafluoroisobutyl Ether	163702-06-5	98-02-0209-00	10-20	H413: Aquatic Chronic	Category 4
Ethyl Nonafluorobutyl Ether	163702-05-4	98-02-0209-00	10-20	H413: Aquatic Chronic	Category 4

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation: Remove to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: DO NOT INDUCE VOMITING! Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention if you feel unwell.

Skin Contact: Wash with soap and water. Rinse with copious amounts of fresh, running water. If irritation persists, get medical attention.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if irritation occurs.

4.2. Signs and Symptoms of Exposure:

Inhalation: Components of Pro-Flush[™] are of a low order of toxicity in animals. At high levels of exposure, cardiac arrhythmia may occur. When oxygen levels are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. Effects from inhalation of mists and vapors vary from mild to moderate irritation of the upper respiratory tract, depending on severity of exposure. Abusive or excessive inhalation of vapors may cause irritation to the upper respiratory tract, dizziness, nausea and other central nervous system effects.

Ingestion: Swallowing can cause gastro-intestinal irritation, nausea, vomiting, diarrhea. Aspiration of material into the lungs can cause chemical pneumonitis.

Skin Contact: Frequent or prolonged contact may cause mild irritation. Repeated contact may cause drying or flaking of skin.

Eye Contact: Mildly irritating.

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the product.

SECTION 5. FIREFIGHTING MEASURES

Suitable and Unsuitable Extinguishing Media:

Use dry chemical, carbon dioxide, foam or other media suitable for the primary source of the fire. Exposure to temperatures above 70°C/160°F may cause containers to burst. Pro-Flush[™] is not flammable at ambient temperatures and atmospheric pressure. However, based on similar mixtures, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources. Contact with certain finely divided reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures). In the event of a liquid spill, ethyl nonafluoroisobutyl ether and ethyl nonafluorobutyl ether will evaporate from the mixture faster than the other components, leaving a mixture enriched with trans-1,2-dichloroethylene, acetone and t-butyl acetate. The enriched mixture may be flammable.

Special Equipment and Precautions for Fire-Fighters:

Firefighters should wear self-contained breathing apparatus for protection against suffocation and possible toxic decomposition products. Wear proper eye and skin protection. Use a water spray to keep fire-exposed containers cool and to knock down vapors that may result from product decomposition.

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SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment and clothing during clean-up.

Methods and Material for Containment and Clean-Up: Contain and absorb liquid with clay, vermiculite or other inert substance, sweep up and package in a container suitable for disposal. Wash away residues with water. Dispose of absorbed material in accordance with Federal, local and state regulations.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling: Keep in a tightly closed container. Protect from physical damage. Keep this and all chemicals out of the reach of children. Avoid contact with eyes and skin. Avoid inhalation of vapors and mists. Wash thoroughly after handling.

Conditions for Safe Storage, Including any Incompatibilities: Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatible materials. Observe all warnings and precautions listed for the product.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Airborne Exposure Limits:

Substance:	CAS No.	EINECS No.	OSH A PEL	ACIGHTLV	8hrTWA	UK WEL 15min STEL
Acetone	67-64-1	200-662-2	750ppm	750ppm	1210 mg/m3	3620 mg/m3
t-Butyl Acetate	540-88-5	208-760-7	200ppm	200ppm	966 mg/m3	1210 mg/m3
trans 1,2 Dichloroethene	156-60-5	205-860-2	200ppm	None	No Data	No Data
Ethyl Nonafluoroisobutyl Ether	163702-06-5	200ppm	No Data		No Data	
Ethyl Nonafluorobutyl Ether	163702-05-4	200ppm	No Data		No Data	

Appropriate Engineering Controls:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, [*Industrial Ventilation. A Manual of Recommended Practices*](#), most recent edition, for details.

Personal Respirators: Not required for normal use in accordance with label directions.

Skin Protection: Use rubber, neoprene or nitrile gloves to minimize skin contact.

Eye Protection: Use chemical safety goggles and/or a full face shield where splashing is possible. A source of running water or other eyewash provisions should be nearby.

Work Hygienic Practices: Use proper industrial hygiene practices to minimize hazardous exposure. Wash hands after handling this material, and before eating, smoking or using the bathroom.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear colorless liquid
Odor:	Sweet odor
Odor Threshold:	Not established
pH @ 25°C:	Not applicable
Melting Point (Pour Point):	175°F
Boiling Point:	41°C/106°F
Flash Point:	No Flash Point to boil
Evaporation Rate (Water = 1):	>1
Flammable Limits:	No data for mixture
LEL:	N/A
UEL:	N/A
Vapor pressure (mm Hg):	~1psig, ~16psia
Vapor Density (Air = 1):	3.8 @ 70°F
VOC Content:	0% (all components are VOC exempt)
Solubility in water:	~7 grams/liter
Octanol/Water Partition Coefficient:	Not available
Autoignition Temperature:	Not available
Decomposition Temperature:	Not available

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SECTION 10. STABILITY AND REACTIVITY

Chemical Stability: Stable under ordinary conditions of use and storage.

Possibility of Hazardous Reactions: Will not occur.

Conditions to Avoid: Heat, incompatibles.

Incompatible Materials: Avoid contact with strong oxidizing agents, strong alkalis and strong acids.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, hydrogen sulfide, phosgene.

SECTION 11. TOXICOLOGICAL INFORMATION

Potential Health Effects:

Inhalation: Components of Pro-Flush[™] are of a low order of toxicity in animals. At high levels of exposure, cardiac arrhythmia may occur. When oxygen levels are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. Effects from inhalation of mists and vapors vary from mild to moderate irritation of the upper respiratory tract, depending on severity of exposure. Abusive or excessive inhalation of vapors may cause irritation to the upper respiratory tract, dizziness, nausea and other central nervous system effects.

Ingestion: Swallowing can cause gastro-intestinal irritation, nausea, vomiting, diarrhea. Aspiration of material into the lungs can cause chemical pneumonitis.

Skin Contact: Frequent or prolonged contact may cause mild irritation. Repeated contact may cause drying or flaking of skin.

Eye Contact: Mildly irritating.

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the product.

Carcinogenic effects: Not classified

Teratogenicity/Reproductive toxicity: Not classified

Mutagenic effects: Not classified

Numerical Measures of Toxicity:

Acetone:

Inhalation, rat: LC50 = 50100 mg/m³/8H;

Oral, mouse: LD50 = 3 gm/kg Oral, rabbit: D50 = 5340 mg/kg Oral, rat: LD50 = 5800 mg/kg Skin, rabbit: LD50 = 20 gm/kg.

t-Butyl acetate:

Draize test, rabbit, eye: 100 uL Mild irritant Draize test, rabbit, skin: 500 uL/24H Mild irritant Inhalation, rat: LC50 = >2230 mg/m³/4H

Oral, rat: LD50 = 4100 mg/kg Skin, rabbit: LD50 = >2 gm/kg

trans 1,2 Dichloroethene:

Acute Dermal (rabbit) LD50: > 5,000mg/kg Acute Inhalation (rat) 4-hr. LC50: >24,100 ppm

Ethyl Nonafluoroisobutyl Ether:

Acute Oral Toxicity, LD50-Rat: >2.0 grams/KG body weight.

Acute Inhalation Toxicity, 4-hour LC50-Rat: 92,000ppm

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity: Rainbow trout LC50=5540 mg/L/96H; Sunfish (tap water), death at 14250 ppm/24H; Mosquito fish (turbid water) TLm=13000 ppm/48H

Environmental Fate: Volatilizes, leeches, and biodegrades when released to soil.

Physical/Chemical: No information available.

t-Butyl Acetate

Ecotoxicity: Bacteria: Phytobacterium phosphoreum: EC50 = 6.38-11.1 mg/L; 5, 15, 30 minutes; Microtox test; 15 degrees C Based on a log Kow of 1.38, the BCF value for tert-butyl acetate can be estimated to be 6.6 by a recommended regression-derived equation. This BCF value suggests that bioconcentration is not significant.

Environmental: Chemical hydrolysis of tert-butyl acetate in moist, very alkaline soils (pH approaching 10 or higher) may be important, but hydrolysis in soils of pH 9 or lower is not expected to be important. Based on an estimated Koc value of 134, tert-butyl acetate may be subject to significant leaching in soil. Volatilization from dry soil surfaces may be rapid.

Physical: ATMOSPHERIC FATE: tert-Butyl acetate will exist almost entirely in the vapor-phase in the ambient atmosphere due to its expected high vapor pressure. The half-life for the vapor-phase reaction of tert-butyl acetate with photochemically produced hydroxyl radicals has been estimated to be about 26 days in an average atmosphere indicating that this reaction may be the dominant atmospheric degradation mechanism. Physical removal via washout may be possible. **Other:** Do not empty into drains.

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SECTION 12. ECOLOGICAL INFORMATION (cont.)

Other: For more information, see "HANDBOOK OF ENVIRONMENTAL FATE AND EXPOSURE DATA."

Ethyl Nonafluoroisobutyl Ether
Ethyl Nonafluorobutyl Ether

Test Organism	Test Type	Result
Water flea, <i>Daphnia magna</i>	48 hours Effect Concentration 50%	>2.55 mg/l
Fathead Minnow, <i>Pimephales promelas</i>	96 hours Lethal Concentration 50%	>2.75 mg/l
Green algae, <i>Selenastrum capricornutum</i>	96 hours Effect Concentration 50%	>2.32 mg/l

SECTION 13. DISPOSAL CONSIDERATIONS

Dispose of spill-clean up and other wastes in accordance with Federal, State, and local regulations. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. All spent material must be disposed of in accordance with all applicable Federal and State RCRA Regulations. Consult with appropriate regulatory agencies before disposing of waste material. The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method. The unused product is an RCRA hazardous waste if discarded. The RCRA ID number is: U079 (1,2 dichloroethylene); U002 (Acetone, Ignitability)

SECTION 14. TRANSPORTATION INFORMATION

US DOT: Not regulated for ground transport in quantities below 5 liters.

International (Water, I.M.O.) Dangerous Goods Description: UN3082, Environmentally Hazardous Substance, Liquid, NOS (Contains trans 1,2 dichloroethylene), 9, PGIII (Ltd.QTY)

Marine Pollutant: No

SECTION 15. REGULATORY INFORMATION

US EPA

Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

RQ: 2000 pounds (1,2 dichloroethylene)

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on threshold planning quantities and release reporting based on reportable quantities in 40 CFR 355 (used for SARA 302, 304, 311, and 312) is not required.

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This material is not subject to reporting requirements.

Toxic Substances Control Act (TSCA) Status: The ingredients of this product are on the TSCA inventory.

State Right to Know

California Proposition 65: None listed

Massachusetts: Hazardous substances and extraordinarily hazardous substances must be identified.

Pennsylvania: Hazardous substances must be identified.

California SCAQMD Rule 443.1 (VOC's): 0%

SARA 311/312: Acute: **No** Chronic: **No** Fire: **No** Pressure: **Yes** Reactivity: **No**

WHMIS:

This SDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR.

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SECTION 15. REGULATORY INFORMATION (cont.)

Acetone meets the Canadian WHMIS criteria for classes: B2: Flammable and combustible material: Flammable liquid D2B- Poisonous and Infectious material-Other Effects: Toxic Foreign Inventory Status:

Ethyl Nonafluoroisobutyl Ether: Not listed

Ethyl Nonafluorobutyl Ether: Not listed

Trans-1,2-Dichloroethylene Europe: ELINCS #419 170 6 #205-860-2

Trans-1,2-Dichloroethylene Japan: MOL 2-(13)-143

Canada: Notified Listed DSL

Australia: Notified

SECTION 16. OTHER INFORMATION:

Revision Summary: All Sections: New GHS Format

SDS DATE REVISED: 10/13/2015

HMIS III Ratings

HMIS III®

Health	2
Flammability	1
Physical Hazard	1
Personal Protection	B

This information is, to the best of our knowledge and belief, accurate and reliable as of the date completed. However no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the completeness and suitability of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information, nor do we offer any warranty against patent infringement.

PF-16 Pro-Flush

MSDS# PF-16
March 2008

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Manufactured by: Specialty Chemical Manufacturing
A DiversiTech Company
1633-B High Bridge Road
Quincy, FL 32351

EMERGENCY Phone No.: 1+800.434.9300 Chem-Tel (Chemical Emergencies Only)
Phone Number for Information: 850-875-1716 Fax: 850-627-2699
Date Revised: March 2008
Prepared by: Anthony Jernigan

SECTION 2. COMPONENT INFORMATION

INGREDIENT	CAS No.	OSHA PEL	ACIGH TLV	OTHER STEL	% or Range
Acetone	67-64-1	750ppm	750ppm		10-20
t-Butyl Acetate	540-88-5	200ppm	200ppm		20-30
trans 1,2 Dichloroethene	156-60-5	200 ppm	None		50-60
1,1,1,3,3-Pentafluoropropane	460-73-1	None	None	300 ppm TWA- 8hrs. (ACIGH Biological Exposure Limit)	30-40

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At high temperatures (>250°C), decomposition products may include Hydrofluoric Acid (HF) and carbonyl halides.

Skin: Mildly irritating

Eyes: Contact with liquid or mist may cause pain and moderate irritation.

Inhalation: Components of Pro-Flush are of a low order of toxicity in animals. At high levels of exposure, cardiac arrhythmia may occur. When oxygen levels are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur.

Effects from inhalation of mists and vapors vary from mild to moderate irritation of the upper respiratory tract, depending on severity of exposure. Abusive or excessive inhalation of vapors may cause irritation to the upper respiratory tract, dizziness, nausea and other central nervous system effects.

Ingestion: Swallowing can cause gastro-intestinal irritation, nausea, vomiting, diarrhea. Aspiration of material into the lungs can cause chemical pneumonitis.

Skin Contact: Frequent or prolonged contact may cause mild irritation. Repeated contact may cause drying or flaking of skin.

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the product.

SECTION 4. FIRST AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: Call the nearest poison control center or the National Poison Control hotline at 1-800-222-1222 for advice immediately. Do not induce vomiting, unless directed to do so by a physician. If victim is conscious and alert, give 2-3 glasses of water to drink. Do not leave victim unattended. To prevent aspiration of swallowed product, lay victim on side with head lower than waist. Vomiting may occur spontaneously.

Skin Contact: Wash with soap and water. Rinse with copious amounts of fresh, running water. If irritation persists, get medical attention.

Eye Contact: Immediately flush eyes with large amounts of cool running water for at least 15 minutes while holding eyelids open. If irritation persists, get medical attention immediately.

Advice To Physician: Because of possible disturbances of cardiac rhythm, catecholamine drugs such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

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SECTION 5. FIREFIGHTING MEASURES

Flash Point: None

Fire Extinguishing Media: Foam, CO₂, Dry media or other media suitable for the surrounding fire.

Unusual Fire and Explosion Hazards: Exposure to temperature above 120°/49°C may cause containers to burst. Pro-Flush is not flammable at ambient temperatures and atmospheric pressure. However, based on similar mixtures, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources. Contact with certain finely divided reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures). In the event of a liquid spill, pentafluoropropane will evaporate from the mixture faster, leaving a mixture enriched with trans-1,2-dichloroethylene. The enriched mixture may be flammable.

Special Fire Fighting Precautions/Instructions:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against suffocation and possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool and to knock down vapors which may result from product decomposition.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Remove contaminated clothing immediately. Keep unnecessary and unprotected personnel away from area of spill. Remove all potential sources of ignition from the area if possible. Ventilate area of leak or spill. Contain and absorb liquid with clay, vermiculite or other inert substance and package in a suitable container for disposal. Dispose of absorbed material in accordance with Federal, local and state regulations.

Only personnel equipped with proper respiratory and eye/skin protection should be permitted in the area until air has been tested and determined safe, including low lying areas.

Pentafluoropropane will evaporate from the mixture faster, leaving a mixture enriched with trans-1,2-dichloroethylene. The enriched mixture may be flammable. Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

SECTION 7. HANDLING AND STORAGE

Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture. Empty containers of this material, pose no disposal hazard and may be recycled. Keep this and all chemicals out of the reach of children. Wash thoroughly after handling.

Normal Handling: (Always wear recommended personal protective equipment.)

Avoid breathing vapors or liquid contact with eyes, skin or clothing. Do not puncture or drop containers, expose them to open flame, excessive heat, or direct sunlight. Use approved containers only.

Pro-Flush should not be mixed with air above atmospheric pressure for any purpose. Use only dry nitrogen to pressurize with Pro-Flush injectors.

Storage Recommendations:

Due to low boiling properties of Pro-Flush, store in a cool, well-ventilated area of low fire risk. Protect container, injector and its fittings from physical damage.

Storage in subsurface locations should be avoided. Do not heat the container or store at a temperature above 110°F (44°C). Close container and injector valve tightly after use and when empty. If container temperature exceeds boiling point, cool the container to 80°F (27°C) before opening cans or filling injector.

SECTION 8. EXPOSURE CONTROLS

Airborne Exposure Limits:

OSHA Permissible Exposure Limit (PEL): 700ppm (Acetone)

ACGIH Threshold Limit Value (TLV): 700ppm (Acetone)

ENGINEERING CONTROLS:

Ventilation System: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

PERSONAL PROTECTIVE EQUIPMENT:

Skin Protection: Use protective, impervious gloves and clothing made of neoprene, nitrile or butyl rubber if prolonged or repeated contact with liquid is anticipated. Wash clothing promptly, if wet. Remove any non-impervious clothing and wash before re-use.

Eye Protection: For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear splash-proof goggles. Contact lenses should not be worn under such conditions.

Respiratory Protection: None required for normal work situations where adequate ventilation is provided. Use NIOSH approved self-contained, positive pressure respirators for emergencies and in situations where air may be displaced by vapors.

Additional Recommendations: High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

Personal Respirators: Not required for normal use in accordance with label directions.

Skin Protection: Use solvent resistant gloves to minimize skin contact.

Eye Protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Do not use unless a source of running water or other eyewash provisions are nearby.

Work Hygienic Practices: Use proper industrial hygiene practices and follow label instructions to minimize hazardous exposure. Wash hands after handling this material, and before eating or smoking.

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SECTION 9. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: ~75°F	Specific gravity (H ₂ O = 1): 1.086
Vapor pressure (psia @ 20°F): 18	Vapor Density (Air = 1): 3.8 @ 70°F
Evaporation Rate (Ether = 1): >1	VOC Content: 0%
Solubility in water: ~7 grams/liter	pH @ 25°C: N/A
Appearance: Clear colorless liquid	Odor: Sweet odor

SECTION 10. STABILITY AND REACTIVITY DATA

Stability: Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen sulfide, Phosgene
Hazardous Polymerization: Will not occur.
Incompatibilities: Avoid contact with strong oxidizing agents, strong alkalis and strong acids.
Conditions to Avoid: Heat, incompatibles.

SECTION 11. TOXICOLOGICAL INFORMATION

IMMEDIATE ACUTE EFFECTS:

1,1,1,3,3-Pentafluoropropane

Acute Dermal rabbit LD₅₀ : >2,000 mg/kg

Cardiac Sensitization dogs : No effects noted at 35,000 ppm, the threshold for induction of cardiac arrhythmias in the presence of injected adrenalin was 44,000 ppm.

Acute Inhalation rat : 4-hr.LC₅₀ > 200,000 ppm. No lethality at 200,000 ppm.

Evidence of transient anesthetic effect.

Acute Inhalation mouse : 4-hr. LC₅₀> 100,000 ppm. No lethality at 100,000 ppm.

Evidence of transient underactivity during exposure.

Trans-1,2-dichloroethylene

Acute Dermal rabbit LD₅₀ : > 5,000mg/kg

Acute Inhalation rat 4-hr. LC₅₀ : >24,100 ppm

DETAILED SUBCHRONIC AND CHRONIC EFFECTS:

1,1,1,3,3-Pentafluoropropane

Embryotoxicity rats : Not a teratogen at 50,000 ppm, the highest level tested.

NOEL pups : 50,000 ppm

NOEL dams : 2,000 ppm (due to decrease in bodyweight gains at 10,000 ppm and 50,000 ppm)

Generation Inhalation Toxicity rats : Exposures 6 hrs/day, 7 days/wk at 0(control), 2,000, 10,000 and 50,000ppm. Toxicity seen in dams at 10,000 and 50,000ppm and in pups at 50,000ppm. Primary effect was increased mortality late in the lactation phase of the study.

8-day Inhalation Study rats : NOAEL – 50,000 ppm and NOEL – 500 ppm

14-day Inhalation Study rats : NOAEL – 2,000 ppm

Dose levels: 0, 500, 2,000, 10,000 and 50,000 ppm

Overall, subchronic studies showed dose-related increases in urinary fluoride levels, urine volumes and water consumption. Increases were noted in hematological parameters, BUN levels and serum liver enzyme activities (GOT, GPT). These increases did not follow a dose response; however, they indicate that HFC-245fa is metabolized in the liver. Significant recovery was noted in these parameters following a 2-week, non-exposure period which followed the 28-day exposure period. No histopathological effects were noted in the 28-day study. The 90-day study noted an increase in incidence and severity (trace to moderate) of myocarditis (inflammation of the heart muscle) at 10,000 and 50,000 ppm. This was not noted at the 500 or 2,000 ppm dose levels nor was it seen in the 28-day study at 50,000 ppm.

Trans-1,2-dichloroethylene

Embryotoxicity rats : Not a teratogen. Fetal toxicity present only at maternally toxic concentrations. Dose levels: 0, 2,000, 6,000, and 12,000 ppm

NOEL pups : 12,000 ppm (decreased bodyweight, increased skeletal variations)

NOEL dams : 6,000 ppm

14-day Inhalation Study rats : NOAEL – 4,000 ppm, the highest level tested

Dose levels: 200, 1,000, 4,000 ppm

OTHER DATA:

1,1,1,3,3-Pentafluoropropane

Genetic studies: In vitro Human Lymphocyte weak positive activation without S9 at 30% v/v; not active with S9 up to 70% v/v.

In Vivo Mouse Micronucleus – Not active up to 100,000 ppm.

Ames Test: Not active up to 100% v/v with or without S9.

Trans-1,2-dichloroethylene

Genetic studies: Not mutagenic to E-coli or S. typhimurium when incubated in the presence of liver enzymes. Not mutagenic in Saccharomyces cerevisiae with or without microsomal activation.

PF-16 Pro-Flush

SECTION 1 . ECOLOGICAL INFORMATION

Environmental Fate:

No information found.

Environmental Toxicity:

1,1,1,3,3-Pentafluoropropane

Partition Coefficient: Log POW = 1.35 @ 21.5°C

Acute toxicity to Daphnia magna Limit Test : NOEC > 97.9 mg/L; 48 hr. EC50 > 97.9 mg/L

Acute toxicity to Rainbow Trout Limit Test : NOEC > 10 mg/L; 96 hr. EC50 > 81.8 mg/L

SECTION 1 . DISPOSAL CONSIDERATIONS

Dispose of spill-clean up and other wastes in accordance with Federal, State, and local regulations. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. All spent material must be disposed of in accordance with all applicable Federal and State RCRA Regulations. Consult with appropriate regulatory agencies before disposing of waste material. The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

The unused product is an RCRA hazardous waste if discarded. The RCRA ID number is: U079

SECTION 1 . TRANSPORTATION INFORMATION

US DOT: Not regulated for ground transport in quantities below 5 liters.

INTERNATIONAL

Water I.M.O.: Dangerous Goods Description: UN3082, Environmentally Hazardous Substance, Liquid, NOS (Contains trans 1,2 dichloroethylene), 9, PGIII (Ltd.QTY)

Marine Pollutant: Yes

SECTION 15. REGULATOR INFORMATION

EC Classification:

Labelling

Risk phrases:

R20 Harmful by inhalation

R22 Harmful if swallowed

Safety phrases

S2: Keep out of reach of children

S9: Keep container in a well-ventilated place.

S16: Keep away from sources of ignition - No smoking.

S23: Do not breathe fumes, vapor or spray

US EPA:

Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA): Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

RQ: 2000 pounds (1,2 dichloroethylene)

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on threshold planning quantities and release reporting based on reportable quantities in 40 CFR 355 (used for SARA 302, 304, 311, and 312) is not required.

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This material is not subject to reporting requirements.

Toxic Substances Control Act (TSCA) Status: The ingredients of this product are on the TSCA inventory.

State Right to Know

California Proposition 65:

Massachusetts: Hazardous substances and extraordinarily hazardous substances must be identified.

Pennsylvania: Hazardous substances must be identified.

California SCAQMD Rule 443.1 (VOC's): 0%

SARA 311/312: Acute: No Chronic: No Fire: No Pressure: Yes Reactivity: No

PF-16 Pro-Flush

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Acetone meets the Canadian WHMIS criteria for classes:

B2: Flammable and combustible material: Flammable liquid

D2B- Poisonous and Infectious material-Other Effects: Toxic

FOREIGN INVENTOR STATUS:

1,1,1,3,3-Pentafluoropropane trans-1,2-dichloroethylene

Europe: ELINCS #419 170 6 #205-860-2

1,1,1,3,3-Pentafluoropropane trans-1,2-dichloroethylene

apan: MOL 2-(13)-143

Canada: Notified Listed DSL

Australia: Notified

16. OTHER INFORMATION:

NFPA Ratings:

NFPA Classification: Health - 2, Flammability - 1, Reactivity - 1

HMIS Classification: Health - 2, Flammability - 1, Reactivity - 1

Label Hazard Warning: Store Pro-Flush in a cool, dry area, away from sources of ignition. Use only with adequate ventilation. Wear suitable personal protective equipment to prevent contact with skin or

eyes. Avoid breathing fumes vapors or mists. Do not take internally. May be harmful or fatal if swallowed.

Label First Aid:

For eye contact, rinse the eyes with running water for 15 minutes, lifting the eyelids occasionally to flush the area behind the lid. If irritation persists, get medical attention. For skin contact, wash the affected area with soap and water, then rinse thoroughly with water. Wash contaminated clothing before re-use. For inhalation, remove affected individual to fresh air. If the victim is not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Get medical attention.

If swallowed, do not induce

vomiting. Dilute by drinking 3-4 glasses of water or milk, and call the nearest poison control center or the National Poison Control Hotline 1-800-222-1222 for advice.

Product Use:

Flushing Solvent for air conditioning and refrigeration equipment.

17. ADDITIONAL INFORMATION:

This information is provided in accordance with the requirements of the UK Health and Safety at Work Act

1974, and specifically in order to assist users of the product to make their 'assessment of health risks' as required by the UK Control of Substances

Hazardous to Health Regulation 1988 (COSHH assessments). Provision of this information does not preclude users from seeking advice from other sources as indicated in the COSHH guides.

This information is intended to cover potential hazards at the place of work and does not detail medical uses, indications, contra-indications and precautions for the treatment of patients.

18. MANUFACTURED FOR:

Diversitech

6650 Sugarloaf Parkway, Suite 100

Duluth, GA 30097

Phone 1+678.542.3600

EMERGENC Phone No. 1 800-255-3924 Chem-Tel (Chemical Emergencies Only)

1 . REFERENCE NUMBER AND DATE OF ISSUE:

COSHH Safety Data Sheet: PF-16

Issued 03/10/2008

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