Grady Management Inc.

Refrigerant Management Program

Section 15
GMI Maintenance Manual



Originated May 7, 2013

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Section 15.1 Purpose and Scope

The purpose of the Grady Management Inc. Refrigerant Maintenance Program (RMP) is to:

- Maximize the recycling of ozone depleting substances (ODS) and to minimize the release of ODS to the ambient air from the servicing, repairing, maintaining and disposing of refrigeration appliances on our communities.
- Utilize certified technicians for the servicing, repairing, maintaining and disposing of refrigeration appliances on our communities.
- Maintain proper records of refrigerant consumption, technician training and recycling and recovery equipment certification;
- Ensure proper repairs are made for units with significant leak rates; and
- To ensure GMI is in compliance with Section 608 of the Clean Air Act Amendments and the replacements of 40 CFR Part 82, Subpart F.

To achieve the objectives stated above, GMI will require all employees and contractors whose job duties require the handling, ordering, repairing, servicing, maintaining or disposing of refrigerant or refrigeration appliances to review and comply with this written program.

Section 15.2 Responsibilities

Refrigerant Technician

The Refrigerant Technician will be responsible for compliance with Section 608 of the Clean Air Act Amendments, the requirement of 40 CRF Part 82, Subpart F and GMI Refrigerant Management Program. The Refrigerant Technician will comply specifically with the following:

- Complete required records for all refrigerant related activities in **Refrigerant Use Logs;**
- Ensure recovery units meet evacuation requirements as detailed in EPA regulations;
- Follow procedures to eliminate refrigerant contamination and mixing;
- Perform proper refrigerant recovery procedures as required;
- Perform initial leak tests using an acceptable method prior to charging refrigerant into a system;
- Notify their Department Coordinator if a contractor is observed violating regulatory requirements;
- Maintain refrigerant recovery equipment certification. (attachment A)

Regional Property Managers (RPM) and Community Managers (CM)

The RPM and CM will have responsibility for following the GMI RMP, specifically the following:

- Ensure all technicians at their communities follow the requirements of the RMP;
- Ensure entry of all data from refrigerant work done in a timely manner into the **Refrigerant Use Log**;
- Report any violation in writing of the RMP by technicians or contractors to the Director of Maintenance; and
- Assure that anytime a new air conditioner or refrigerant containing appliance is installed on a GMI community the size, manufacturer, date of installation, type of and amount of refrigerant is entered into inventory asset in OneSite.

Director of Maintenance

The Director of Maintenance shall delegate the responsibility of implementing the RMP including:

- Auditing RMP and Recordkeeping each April and October.
- Reviewing regulatory updates for changes; and
- Ensuring proper reporting to the Environmental Protection Agency

Section 15.3 Best Management Practices

To meet the objectives set forth in Section I or this RMP, GMI and its contractors shall comply with the following best management practices:

A. When any work is conducted on a refrigerant containing appliance, GMI will complete a work order in OneSite documenting all information pertaining to the work completed, including but not limited to the individual or contractor, location, type and amount of refrigerant collected, charged, results of leak tests and date work was performed.

B. Prior to the disposal of any appliance owned and/or operated by GMI except small appliances, motor vehicle air conditioners (MVAC) and MVAC-like appliances, the unit and all associated piping shall be entirely evacuated to a certified recovery or recycling machine. GMI personnel or contractors opening appliances for repair or servicing will evacuate the entire unit or the part of the unit to be serviced to a certified recovery or recycling machine. A certified technician must verify the level of evacuation has been reached. All appliances except small appliances, motor vehicle air conditioners (MVAC) and MVAC-like appliances must be evacuated to the following level prior to opening the device.

Table I

Type of appliance	Inches of Hg Vacuum (related to standard atmospheric pressure of 29.9 inches Hg)	
	Using recovery or recycling equipment manufactured or imported before Nov. 15, 1993	Using recovery or recycling equipment manufactured or imported on or after Nov. 15, 1993
HCFC-22 appliances *, or isolated component of such appliance, normally containing less than 200 pounds of refrigerant.	0	0
HCFC-22 appliance *, or isolated component of such appliance, normally containing 200 pounds or more of refrigerant.	4	10
Other high-pressure appliance *, or isolated component of such appliance, normally containing less than 200 pounds of refrigerant (CFC-12, -500, -502, 114)	4	10
Other high-pressure appliance *, or isolated component of such appliance, normally containing 200 pounds or more of refrigerant (CFC-12,-500-502-114)	4	15
Very High pressure appliance (CFC-13,-503)	**0**	0
Low-pressure appliance (CFC-11,HCFC-123)	25	25mm Hg absolute

* Or isolated component of such an appliance.
Exceptions to evacuation levels
Not to be performed after the completion of maintenance, service or repairs;
Due to leaks in the appliance, evacuation levels listed above are not attainable or would significantly contaminate the refrigerant being recovered.

C. Prior to disposal of appliances, GMI personnel and contractors shall evacuate to the levels included in the table above, unless due to leaks in the appliance such levels are not attainable or would significantly contaminate the refrigerant being recovered. In such cases, GMI personnel or contractors will:

1. Isolate leaking from non-leaking components when possible;
2. Evacuate non-leaking components to the levels listed in Table 1, Section 15.3
3. Evacuate leaking components to the lowest level attainable without significantly contaminating the refrigerant begin recovered (such level shall not exceed 0 psig).

D. Prior to opening small appliances, GMI and it's contractors will:

- Recover at least 80% of the refrigerant in the appliance when using recycling and recovery equipment manufactured before November 15, 1993; or
- Recover at least 90% of the refrigerant in the appliance when the compressor is operating or 80% of the refrigerant in the appliance when the compressor is not operating using recycling and recovery equipment manufactured on or after November 15, 1993; or
- Evacuate the small appliance to four inches of mercury vacuum.

E. GMI and its contractors shall use all recycling and recovery equipment in accordance with manufacturer's directions, unless such directions do not comply with the requirements of 40 CFR Part 82.

F. GMI personnel and/or contractors may return refrigerant to the appliance it was removed from or to another appliance under ownership, without being recycled or reclaimed.

G. Disposing of Refrigerant Appliances, Equipment, Oils and Parts

1. Using EPA certified recycling and recovery unit GMI and its contractors will attached proper recovery equipment to container making sure that all connections are tight and then removed refrigerant from appliance to the evacuation levels as listed in Table I of Section 15.3 transferring refrigerant to a DOT certified cylinder.

2. Record the amount of refrigerant recovered on the work order tickets and onto **Refrigerant Use Log** by technician.

Procedures for Leak Testing Appliances

3. High or Very High Pressure Appliances:

   A. Visual inspection of entire system
      1. oil trace
      2. broken lines or fittings
      3. liquid indicator/moisture sight glass
      4. heavy frost of ice on components
      5. temperature readings or indications
      6. general run conditions

   B. Audible
      1. listen for leaks or abnormal run conditions

   C. Touch
      1. check temperature of lines
      2. feel for oil on valves or refrigerant lines

   D. Procedures for Leak Testing Appliances

   E. Leak Test
      1. soap bubbles
      2. electronic
      3. audible
      4. visual
      5. dye

4. If a leak is determined to be present:

   A. Install charging manifold on refrigerant system. (Install on both high and low side of system, if possible).
   B. Isolate portion of system where leak is determined, if possible. If not possible, recover refrigerant from entire system into DOT certified cylinder to evacuation levels specified in Table 1 Section 15.3.
   C. Repair leak per refrigerant safe practices.
   D. Re-charge the system with nitrogen to 5 -30lbs. and leak test the entire system. If no leaks are found, pressurized to, at or above refrigerant pressure for refrigerant used;

If no leaks are found, move to triple vacuum procedure in accordance with evacuation levels specified in Table 1 Section 15.3, using micron gauge on third evacuation.

If repair is not effective, repeat Step 2.

If repair is effective, re-charge to proper operation conditions. Document all required refrigerant management forms and turn in to supervisor by end of the work day.

A. Refrigerant Safety

The following are general safety considerations concerning fluorocarbon refrigerants. Before using or handling any refrigerant, personnel should be familiar with safety concerns for then specific product. Specific product safety information is available from the manufacturer.

Health Hazards – Although the toxicity of fluorocarbon refrigerants is low, the probability of injury or death exists in unusual situation or if they are deliberately misused. The vapors are several times heavier than air. Good ventilation must be provided in areas where high concentrations of the heavy vapors might accumulate and exclude oxygen.

Inhalation of concentrated refrigerant vapor is dangerous and can be fatal. Exposure to levels of fluorocarbons above the recommended exposure levels can result in loss of concentration and drowsiness. There have been reported cases of fatal cardiac arrhythmia in humans accidentally exposed to high levels. Sink or eye contact can result in irritation and frostbite.

First Aid – If inhaled, remove the victim to fresh air and call 911. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Avoid stimulants.

In case of eye contact, flush eyes promptly with plenty of water for at least 15 minutes. Call a physician. Flush exposed skin with water (not hot) – or use other means to warm skin slowly.

Other Hazards – Most halogenated compounds will decompose at high temperatures such as those associated with gas flames or electric heaters. The chemicals that result under these circumstances always include hydrochloric acid. If the product contains chlorine, hydrochloric acid will also be formed and if a source of water (or oxygen) is present a smaller amount of phosgene. Fortunately, the halogen acids have a very sharp, stinging effect on the nose and can be detected by odor at concentrations below their toxic level. These acids serve as warming agents that decomposition has occurred. If they are detected, the area should be evacuated until the air has been cleared of decomposition products.

Precautions

a. Always read the product label and the Material Safety Data Sheet.
b. Always use with adequate ventilation.
c. Never expose these products to flames, sparks or hot surfaces.
d. Only fill containers which are currently DOT approved for fluorocarbon refrigerants.
e. Always inspect the container for pressure rating and latest hydrostatic test date.
f. Be sure to thoroughly check each container for dents, gouges, bulges, cuts or any other imperfections which may render it unsafe to hold refrigerant for storage or transportation.
g. Always use a scale when filling any container. **DO NOT OVER FILL.**

Safety Equipment - Personnel handling refrigerants should wear side-shield safety glasses, impervious gloves and other protective equipment or clothing as required by the GMI Safety Manual. Showers and eye wash fountains of the deluge type should be readily accessible in case of contact with the skin or eyes.

B. Storage

It is recommended to store in a cool, well-ventilated area of low fire risk and away from other sources of direct heat. Protect cylinder and its fittings from physical damage.

All refrigerant is required to be kept in a secure location (e.g.in a locked cabinet or chained and locked).

Section 15.4 Recycling and Recovery Equipment

GMI and its contractors will comply with EPA's certification program for refrigerant recovery and recycling equipment. Under this program, EPA requires that manufacturers or importers of refrigerant recovery and recycling equipment manufactured on or after November 15, 1993 have their equipment tested by an EPA – approved testing organization to ensure that it meets EPA requirements. All GMI equipment intended for use with air-conditioning and refrigeration appliances has been tested under EPA requirements based upon the ARI 740 test protocol (i.e., EPA Appendices B and to 40 CFR 82 subpart F).

All equipment including gauges, DOT tanks and hoses must be labeled and designated for the type of refrigerant being used.

All new recovery equipment purchased must have the following information sent to the Director of Maintenance: Make, model number, serial number and type of refrigerant

Certification of Refrigerant Recovery Equipment – EPA requires that persons servicing, disposing or recycling air-conditioning and refrigeration equipment certify to the appropriate EPA Regional Office that they have acquired (built, bought or leased) refrigerant recovery or recycling equipment and that they are complying with the applicable requirements of this rule. This certification must be signed by the owner of the equipment or other responsible officer and sent to the appropriate EPA Regional Office. **Attachment A** of this RMP contains a sample form for this certification. Owners do not have to send in a new form each time they add recycling or recovery equipment to their inventory. Any community acquired after the published date of RMP will have to submit a certification form.

All outside contractors engaged in any HVAC work that requires evacuation of refrigerant are required to comply with Refrigerant Management Program

GMI certified technicians and contractors will be responsible for the proper use, operation and preventative maintenance of the refrigerant recovery equipment as recommended by equipment manufacture.

Section 15.5 Technician Certification/Training

Any GMI employee or outside contractor that performs repair, maintenance, service or disposal to any appliance that could reasonably be expected to have the potential to release refrigerants to the ambient air must be an EPA approved certified technician prior to conducting such work.

For the purpose of GMI refrigerant management program, a technician is someone who:

- Attaches and detaches hoses and/or gauges to an appliance for the purpose of measuring internal pressure of the appliance;
- Adds or removes, refrigerant from an appliance;
- Conducts any other activity that may compromise the integrity of the appliance

HVAC apprentice technicians are exempt from these certification requirements provided the apprentice is supervised at all times by a certified technician whenever maintaining, servicing, repairing or disposing of an appliance.

The Human Resource Department will maintain a current inventory of GMI certified technicians. This inventory will identify what type of certification and training each technician holds. GMI Air Conditioning and Heat Pump Certification Policy & Procedures can be found in HR Manual-27.

Section 15.6 Recordkeeping

In order to meet EPA requirements governing refrigerants uses and disposal, GMI has developed the **Refrigerant Use Log** which is to be maintained by all communities with individual HAVC systems. All HVAC units in which the refrigerant system is accessed are to be noted on this form. It is important to note the total quantity for each type of refrigerant on hand at all times so that cumulative losses (from leaks or reclaiming) can be determined.

Completed logs must be sent to Director of Maintenance no later than the 5th of every month April through October.

In addition to the refrigerant use logs, the Air Conditioning/Heat Pump work order includes.

a. Refrigerant Purchased (lbs. & oz.)
b. Refrigerant added (lbs. or oz)
c. Refrigerant Recovered and stored (lbs. & oz.)
d. Refrigerant turned in for Reclaiming (lbs. & oz.)
e. Basis for leak and repair action.

NOTE: Only those work orders that pertain to refrigerant usage shall be recoded on the **Refrigerate Use Log**.

All documentation for purchasing and reclaiming of refrigerant shall be attached to the **Refrigerant Use Log**.

For a period of at least 6 years, GMI will maintain and possess the following records on-site of Class I or Class II refrigerant.

Copies of the EPA Certification (Attachment A) for each recycling and recovery unit on-site will be maintained on file with:

- Director of Maintenance will maintain the current inventory of all recycling and recovery equipment in use.

Attachment A

GMI REFRIGERANT USE LOG

Refrigerant: _____

Refrigerant on Hand Beginning of Month _____ **lb** **0** **oz** **Month:** _____

Community:_____

				Refrigerant Purchased		Refrigerant Used		Refrigerant Recovered & Stored		Refrigerant Turned in for Reclaiming		Balance of Refrigerant		
Date	**Bldg**	**Apt**	**Serviced By**	**Pounds (lb)**	**Ounces (oz)**	**Pounds (lb)**	**Ounces (oz)**	**Pounds (lb)**	**Ounces (oz)**	**Pounds (lb)**	**Ounces (oz)**	**Pounds (lb)**	**Ounces (oz)**	**Basis For Leak and Repair Action**
												0	0	
												0	0	
												0	0

Form Approved 11/04/2011
OMB No. 2060-0256
Expires: 11/30/2014

ENVIRONMENTAL PROTECTION AGENCY
REFRIGERANT RECOVERY OR RECYCLING DEVICE
ACQUISITION CERTIFICATION FORM

EPA regulations require establishments that service or dispose of refrigeration or air-conditioning equipment to certify that they have acquired recovery or recycling devices that meet EPA standards for such devices. To certify that you have acquired equipment, please complete this form according to the instructions and **mail it to the appropriate EPA Regional Office. BOTH THE INSTRUCTIONS AND MAILING ADDRESSES CAN BE FOUND ON THE REVERSE SIDE OF THIS FORM.**

PART 1: ESTABLISHMENT INFORMATION

Name of Establishment

Street

(Area Code) Telephone Number

City State Zip Code

Number of Service Equipment Based at Establishment

Country

PART 2: REGULATORY CLASSIFICATION

Identify the type of work performed by the establishment. **Check all boxes that apply.**

- ☐ Type A - Service small appliances
- ☐ Type B - Service refrigeration or air-conditioning equipment other that small appliances
- ☐ Type C- Dispose of small appliances
- ☐ Type D - Dispose of refrigeration or air-conditioning equipment other than small appliances

PART 3: DEVICE IDENTIFICATION

	Name of Device(s) Manufacturer	Model Number	Year	Serial Number (if any)	Check Box if Self-Contained
1.					☐
2.					☐
3.					☐
4.					☐
5.					☐

PART 4: CERTIFICATION SIGNATURE

I certify that the establishment in Part 1 has acquired the refrigerant recovery or recycling device(s) listed in Part 2, that the establishment is complying with Section 608 regulations, and that the information gives is true and correct.

Signature of Owner/Responsible Officer Date Name (Please Print) Title

Form Approved 11/04/2011
OMB No. 2060-0256
Expires: 11/30/2014

INSTRUCTIONS

Part 1: Please provide the name, address, and telephone number of the establishment where the refrigerant recovery or recycling device(s) is (are) located. Please complete one form for each location. State the number of vehicles based at this location that are used to transport technicians and equipment to and from service sites.

Part 2: Check the appropriate boxes for the type of work performed by technicians who are employees of the establishment. The term "small appliance" refers to any of the following products tat are fully manufactured, charged, and hermetically sealed in a factory with five pounds or less of refrigerant: refrigerators, and freezers designed for home use, room air conditioners (including window air conditioners and packaged terminal air conditioners), packaged terminal heat pumps, dehumidifiers, under-the-counter ice makers, vending machines, and drinking water coolers.

Part 3: For each recovery or recycling device acquired, please list the name of the manufacturer of the device, and (if applicable) its model number and serial number.

If more that seven devices have been acquired, please fill out an additional form and attach it to this one. Recovery devices that are self-contained should be listed first and should be identified by checking the box in the last column on the right. Self-contained recovery equipment means refrigerant recovery or recycling equipment that is capable of removing the refrigerant from an appliance without the assistance of components contained in the appliance. On the other hand, system-dependent recovery equipment means refrigerant recovery equipment that requires the assistance of components contained in an appliance to remove the refrigerant from the appliance.

If the establishment has been listed as Type B and/or Type D in Part 2, then the first device listed in Part # must be a self-contained device and identifies as such by checking the box in the last column on the right.

If any of the devices are homemade, they should be identified by writing "homemade" in the column provided for listing the name of the device manufacturer. Type A or Type B establishments can use homemade devices manufactured before November 15, 1993. Type C or Type D establishments can use homemade manufactured anytime. If, however, a Type C or Type D establishment is using homemade equipment manufactured after November 15, 1993, then it must <u>not</u> use these devices for service jobs.

Form Approved
OMB No. 2060-0256
Expires: 11/30/2014

EPA REGIONAL OFFICES

Send your form to the EPA office listed under the state or territory in which the establishment is located.

Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

> CAA 608 Enforcement Contact: EPA Region I; Mail Code OES04-2; 5 Post Office Square; Boston, MA 02109

New York, New Jersey, Puerto Rico, Virgin Islands

> CAA 608 Enforcement Contact: EPA Region II; Mail Code 2DECA-AC; 290 Broadway; New York, NY 10007-1866

Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia

> CAA 608 Enforcement Contact: EPA Region III-Wheeling Office; Mail Code 3AP20; 1060 Chapline Street, Suite 303 Wheeling, WV 26003-2995

Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

> CAA 608 Enforcement Contact: EPA Region IV; Mail Code APT-AE; 61 Forsyth Street, SW; Atlanta, GA 30303-8960

Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin

> CAA 608 Enforcement Contact: EPA Region V; Mail Code AE-17J; 77 West Jackson Blvd.; Chicago, IL 60604-3507

Arkansas, Louisiana, New Mexico, Oklahoma, Texas

> CAA 608 Enforcement Contact: EPA Region VI; Mail Code 6EN-HM; 1445 Ross Ave., Suite 1200; Dallas, TX 75202

Iowa, Kansas, Missouri, Nebraska

> CAA 608 Enforcement Contact: EPA Region VII; Mail Code APCOAWMD; 901 11201 Renner Boulevard
> Lenexa, Kansas 66219

Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming

> CAA 608 Enforcement Contact: EPA Region VIII; Mail Code 8ENE-AT; 1595 Wynkoop Street, Denver, CO 80202

American Samoa, Arizona, California, Guam, Hawaii, Nevada

> CAA 608 Enforcement Contact: EPA Region IX; Mail Code AIR-5; 75 Hawthorne Street; San Francisco, CA 94105

Alaska, Idaho, Oregon, Washington

> CAA 608 Enforcement Contact: EPA Region X; Mail Code OAQ-107; 1200 Sixth Ave.; Seattle, WA 98101

Form Approved
OMB No. 2060-0256
Expires: 11/30/2014

PUBLIC BURDEN

The purpose and need of this renewed collection request is to facilitate compliance with and enforcement of Section 608 of the Act by reducing emissions of class I and class II ozone-depleting refrigerants to the lowest achievable level during the service, maintenance, repair, and disposal of appliances. EPA has used and will continue to use these records and reports to ensure that refrigerant releases are minimized during the recovery and recycling of ozone-depleting refrigerants during the service, maintenance, repair, and disposal of appliances. Collection of this information is mandated by EPA regulations, in accordance with 40 CFR 82.162. This information is not shared with parties outside of the Federal government. EPA's confidentiality regulations (40 CFR 2.201 et seq.) assure computer data security, disclosure prevention, proper handling, proper storage, and proper disposal of the submitted information.

The public reporting and recordkeeping burden for this collection of information is estimated to average one (1) hour per response per respondent annually. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques, EPA has established a public docket for this ICR under Docket ID No. OAR-2003-0018, which is available for public viewing at the Air and Radiation Docket and Information Center in the EPA Docket Center (EPA/DC), EPA West, Room B102, 1301 Constitution Ave., NW, Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Reading Room is (202) 566-1744, and the telephone number for the OAR Docket is (202) 566-1742. An electronic version of the public docket is available through EPA Dockets (EDOCKET) at http://www.epa.gov/edocket. Use EDOCKET to submit or view public comments, access the index listing of the contents of the public docket, and to access those documents in the public docket that are available electronically. Once in the system, select “search,” then key in the docket ID number identified above. Also, you can send comments to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW, Washington, DC 20503, Attention: Desk Office for EPA. Please include the EPA Docket ID No. (OAR-2003-0018) and OMB control number (2060-0256) in any correspondence.

NATIONAL REFRIGERANTS™

Material Safety Data Sheet

R-410A

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-410A
DISTRIBUTOR: National Refrigerants, Inc.
661 Kenyon Avenue
Bridgeton, New Jersey 08302

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-262-0012

IN CASE OF EMERGENCY CALL:
CHEMTREC: 1-800-424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Difluoromethane	75-10-5	50
Pentafluoroethane	354-33-6	50

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

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 higher temperatures, (>250°C), decomposition products may include Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH HAZARDS

SKIN: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

EYES: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

INHALATION: R-410A is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

DELAYED EFFECTS: None known.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
No ingredients listed in this section			

4. FIRST AID MEASURES

SKIN: Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

EYES: Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

INHALATION: Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention. Do not give epinephrine (adrenaline).

INGESTION: Ingestion is unlikely because of the physical properties and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician.

ADVICE TO PHYSICIAN: Because of the 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.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Gas, not applicable per DOT regulations
FLASH POINT METHOD:	Not applicable
AUTOIGNITION TEMPERATURE:	>750°C
UPPER FLAME LIMIT (volume % in air):	None by ASTM D-56-82
LOWER FLAME LIMIT (volume % in air):	None by ASTM E-681
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable)

UNUSUAL FIRE AND EXPLOSION HAZARDS:

R-410A is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources.
Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

Evacuate unprotected personnel. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low-lying areas.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

R-410A should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

STORAGE RECOMMENDATIONS:

Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with the liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

EYE PROTECTION:

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH-approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH-approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. 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.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Difluoromethane	None	None	None
Pentafluoroethane	None	None	*1000 ppm TWA (8hr)

* = Workplace Environmental Exposure Level (AIHA)

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV: 3 ppm ceiling

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid and vapor
PHYSICAL STATE:	Gas at ambient temperatures
MOLECULAR WEIGHT:	72.6
CHEMICAL FORMULA:	CH_2F_2, CHF_2CF_3
ODOR:	Faint ethereal odor
SPECIFIC GRAVITY (water = 1.0):	1.08 @ 21.1°C (70°F)
SOLUBILITY IN WATER (weight %):	Unknown
pH:	Neutral
BOILING POINT:	-48.5°C (-55.4°F)
FREEZING POINT:	Not determined
VAPOR PRESSURE:	215.3 psia @ 70°F 490.2 psia @ 130°F
VAPOR DENSITY (air = 1.0):	3.0
EVAPORATION RATE:	>1 **COMPARED TO:** $CC1_4$ = 1
% VOLATILES:	100
FLASH POINT:	Not applicable

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

The product is stable.
Do not mix with oxygen or air above atmospheric pressure. Any source of high temperature, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.

INCOMPATIBILITIES:

(Under specific conditions: e.g. very high temperatures and/or appropriate pressures) – Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically active metals: potassium, calcium, powdered aluminum, magnesium and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS:

Halogens, halogen acids and possibly carbonyl halides.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Difluoromethane:	LC_{50} : 4 hr. (rat) - $\geq$ 520,000 ppm
Pentafluoroethane:	Cardiac Sensitization threshold (dog) $\geq$ 100,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Teratology – negative
Subchronic inhalation (rat) NOEL – 50,000 ppm

OTHER DATA:

Not active in four genetic studies

12. ECOLOGICAL INFORMATION

Degradability (BOD): R-410A is a gas at room temperature; therefore, it is unlikely to remain in water.
Octanol Water Partition Coefficient: Log P_{ow} = 1.48 (pentafluoroethane), 0.21 (difluoromethane)

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded? Not a hazardous waste.
If yes, the RCRA ID number is: Not applicable.

OTHER DISPOSAL CONSIDERATIONS:

Disposal must comply with federal, state, and local disposal or discharge laws. R-410A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

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.

14. TRANSPORT INFORMATION

US DOT PROPER SHIPPING NAME: Liquefied gas, n.o.s., (Pentafluoroethane, Difluoromethane)
US DOT HAZARD CLASS: 2.2
US DOT PACKING GROUP: Not applicable
US DOT ID NUMBER: UN3163

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Components listed on the TSCA inventory
OTHER TSCA ISSUES: None

SARA TITLE III / CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA / CERCLA RQ (lb.)	SARA EHS TPQ (lb.)
No ingredients listed in this section		

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.

SECTION 311 HAZARD CLASS: IMMEDIATE PRESSURE

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
No ingredients listed in this section	

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients listed in this section		

ADDITIONAL REGULATORY INFORMATION:

R-410A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.

WARNING: Do not vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. **Contains Pentafluoroethane (HFC-125) and Difluoromethane (HFC-32),** greenhouse gases which may contribute to global warming.

WHMIS CLASSIFICATION (CANADA):

This product has been evaluated in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

FOREIGN INVENTORY STATUS:

EU – EINECS # 2065578 – HFC-125

16. OTHER INFORMATION

CURRENT ISSUE DATE: December, 2008
PREVIOUS ISSUE DATE: August, 2007

OTHER INFORMATION:

HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0
NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0
ANSI / ASHRAE 34 Safety Group – A1

Regulatory Standards:

1. OSHA regulations for compressed gases: 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101

Toxicity information per PAFT Testing

17. DISCLAIMER

National Refrigerants, Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other methods or use of the product and of the information referred to herein are beyond the control of National Refrigerants. National Refrigerants expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.

NATIONAL REFRIGERANTS™

Material Safety Data Sheet

R-22

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-22
DISTRIBUTOR: National Refrigerants, Inc.
661 Kenyon Avenue
Bridgeton, New Jersey 08302

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-262-0012

IN CASE OF EMERGENCY CALL:
CHEMTREC: 1-800-424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Chlorodifluoromethane	75-45-6	100

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

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 higher temperatures, (>250°C), decomposition products may include Hydrochloric Acid (HCl), Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH HAZARDS

SKIN: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

EYES: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

INHALATION: R-22 is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

DELAYED EFFECTS: None Known

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
No ingredients listed in this section			

4. FIRST AID MEASURES

SKIN: Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

EYES: Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite, water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

INHALATION: Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. DO NOT give epinephrine (adrenaline).

INGESTION: Ingestion is unlikely because of the physical properties and is not expected to be hazardous. DO NOT induce vomiting unless instructed to do so by a physician.

ADVICE TO PHYSICIAN: Because of the 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.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Gas, not applicable per DOT regulations
FLASH POINT METHOD:	Not applicable
AUTOIGNITION TEMPERATURE:	Unknown
UPPER FLAME LIMIT (volume % in air):	None*
LOWER FLAME LIMIT (volume % in air):	None*
	*Based on ASHRAE Standard 34 with match ignition
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable)

UNUSUAL FIRE AND EXPLOSION HAZARDS:

R-22 is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources.
Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

Evacuate unprotected personnel. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low-lying areas.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

R-22 should not be mixed with air above atmospheric pressure for leak testing or any other purpose. See Section 5: Unusual Fire and Explosion Hazards

STORAGE RECOMMENDATIONS:

Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

EYE PROTECTION:

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. 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.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Chlorodifluoromethane	1000 ppm TWA (8hr)	1000 ppm TWA (8hr)	None

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV = 3ppm ceiling

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid and vapor
PHYSICAL STATE:	Gas at ambient temperatures
MOLECULAR WEIGHT:	86.45
CHEMICAL FORMULA:	$CHC1F_2$
ODOR:	Faint ethereal odor
SPECIFIC GRAVITY (water = 1.0):	1.21 @ 21.1°C (70°F)
SOLUBILITY IN WATER (weight %):	0.3 wt% @ 25°C and 1 atmosphere
pH:	Neutral
BOILING POINT:	-40.8°C (-41.40°F)
FREEZING POINT:	-160°C (-256°F)
VAPOR PRESSURE:	136.1 psia @ 70°F 311.4 psia @ 130°F
VAPOR DENSITY (air = 1.0):	3.0
EVAPORATION RATE:	>1 **COMPARED TO:** $CC1_4$ = 1
% VOLATILES:	100
FLASH POINT:	Not applicable

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

The product is stable.
Do not mix with oxygen or air above atmospheric pressure. Any source of high temperatures, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.

INCOMPATIBILITIES:

(Under specific conditions: e.g. very high temperatures and/or appropriate pressures) – Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS:

Halogens, halogen acids and possibly carbonyl halides.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

LC_{50} : 4 hr. (rat) - $\geq$ 300,000 ppm / Cardiac Sensitization threshold (dog) - 50,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Subchronic inhalation (rat) NOEL – 10,000 ppm
Not mutagenic in *in-vitro* or *in-vivo* tests
Not teratogenic

OTHER DATA:

Lifetime exposure of male rats was associated with a small increase in salivary gland fibrosarcomas.

12. ECOLOGICAL INFORMATION

Degradability (BOD): R-22 is a gas at room temperature; therefore, it is unlikely to remain in water.
Octanol Water Partition Coefficient: Unknown

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded?	Not a hazardous waste
If yes, the RCRA ID number is:	Not applicable

OTHER DISPOSAL CONSIDERATIONS:

Disposal must comply with federal, state, and local disposal or discharge laws. R-22 is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

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.

14. TRANSPORT INFORMATION

US DOT PROPER SHIPPING NAME: Chlorodifluoromethane
US DOT HAZARD CLASS: 2.2
US DOT PACKING GROUP: Not applicable
US DOT ID NUMBER: UN1018

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Listed on the TSCA inventory
OTHER TSCA ISSUES: None

SARA TITLE III / CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA / CERCLA RQ (lb.)	SARA EHS TPQ (lb.)
No ingredients listed in this section		

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.

SECTION 311 HAZARD CLASS: IMMEDIATE
PRESSURE

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
Chlorodifluoromethane (HCFC-22)	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients listed in this section		