

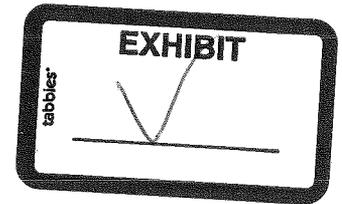
# ADVANCED GEOTHERMAL TECHNOLOGY

by ECR Industries, Inc. makers of  
*The Great Aire Comfort System™*

P.O. BOX 6469, READING, PENNSYLVANIA 19610

610-736-0570 • 610-796-1450 • Fax 610-736-0571 • www.advgeo.com  
April 22, 2008

Mr. Jerry Farrell, Jr.  
Commissioner  
Department of Consumer Protection  
Room 103  
State Office Building  
165 Capitol Avenue  
Hartford, CT 06106



Re: Notice to Amend Regulations

Dear Mr. Farrell:

This letter is in response to the State of Connecticut's Department of Consumer Protection's intention to amend the regulations of the Connecticut State Agencies relating to water supply wells and incorporating all geothermal activities into a collective Connecticut Well Drilling Code. In our opinion, it appears that these regulations are placing the geothermal industry in the State of Connecticut in the control of the Water Well Industry. Please be advised that we are not against the Water Well industry but direct exchange geothermal systems are different than water based geothermal systems and the Water Well industry is not familiar with our installation requirements.

Our company, ECR Industries Inc. d/b/a Advanced Geothermal Technology, was founded in the late 1980's as a company dedicated to developing better products for the emerging geothermal heating and cooling market. After considerable review of the available options, the company selected direct exchange technology because of its potential for extremely high efficiencies over the life of the equipment, significantly improved customer comfort, reduced impact on the environment, and lower installation costs making it available to the general public.

After several years of development, innovation, and improvement, a product has emerged to meet the performance and economic demands of the competitive market. Our current product line, The Great Aire Comfort System™, features the most advanced direct exchange geothermal technology available at a price that is extremely cost-competitive.

The Great Aire Comfort System™ is a direct exchange ground coupled system designed to eliminate many of the drawbacks experienced by conventional water based geothermal heat pump systems. This system uses copper tubes placed in angled holes drilled into the ground to utilize the constant temperature of the earth as a heat source or sink for the circulating refrigerant. Depending upon the direction of flow of the refrigerant, the system can be used to heat or cool air or to heat water.

We installed our first system in the State of Connecticut in West Simsbury way back in 1995, and it is still in operation today. Since then, we have continued to install systems in the State of Connecticut. We have drilled over 500 holes using rock drills provided by the rock drilling and

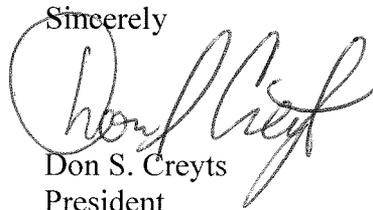
blasting industry. Tens of thousands of holes have also been drilled for our systems throughout the United States. These angled holes are 3 inch diameter about 70 feet long and less than a vertical depth of 60 feet. The only materials we use are non toxic as determined by the USEPA that can come in contact with the ground/ground water. To date, no one has ever informed us that any of these systems have ever contributed to or been a source of any ground and/or ground water pollution.

We therefore question whether the State of Connecticut should even issue special regulations regarding drilling requirements for installation of geothermal systems. It is our perspective that sufficient regulations already exist regarding air and water quality standards that the industry has to follow and that additional regulations would only serve to increase the installed costs of geothermal systems to the consumers in the State of Connecticut at a time when it is critical that we reduce our use of fossil fuels and the greenhouse gases created by their use.

Should the State of Connecticut decide that it is necessary to regulate the geothermal industry, it would be our recommendation that the regulations be general in nature and that all trades including HVAC, electrical, plumbing, drilling (water and rock drillers), sheet metal, etc. be required to install geothermal systems in accordance with the respective manufacturer's recommendations. If the decision is reached to proceed with this proposed regulation, we would recommend that performance related specifications be used instead of specific product specifications. Technology is moving too fast to require the use of materials and products that were developed yesterday and to not allow new material and products that are being developed today to be installed tomorrow.

Attached to this letter are many documents supporting the general information contained in this letter. We trust that you will carefully evaluate that information and revise the proposed regulation so that all of the consumers in the State of Connecticut can continue to choose the benefits of any geothermal heating and cooling system at the lowest installed cost possible.

Sincerely

A handwritten signature in black ink, appearing to read "Don S. Creyts", written over a circular stamp or mark.

Don S. Creyts  
President

W/enclosures

## **Requested Modifications to the Draft Regulations**

### **Sec. 25-128-39a Geoexchange bore holes**

We do not see a need to specify or have in place the minimum bore hole size of 4 inches. With our DX loop we currently use a 3 inch bore hole, and we get exceptional geothermal heat transfer. A 3" borehole is 44% smaller than a 4" borehole. That relates to a significant reduction in costs for drilling, backfilling, and overall total system costs for the consumer. Concerning our carbon footprint, the drilling of a 3 inch borehole's energy requirements are almost ½ that of a 4 inch borehole, and 4 times less than a 6 inch borehole. The environmental impact is significantly less. Therefore, smaller boreholes should be the preferred direction.

### **Sec. 25-128-39b Closed-loop geoexchange system fluid**

This section is drafted based on only one type of geothermal system fluid. Our DX system fluid is significantly different. Our system does not use water, propylene glycols, or potassium acetates. We use a Refrigerant. Please see "Exhibit 1" for the Material Safety Data Sheet. It is safe, clean, and the volumes are substantially less than other geoexchange system fluids. Its efficiencies are well documented and is the preferred refrigerant throughout the other cooling and, in recent times, heating industry. To get "other heat transfer fluids approved by the Department of Consumer Protection in consultation with the Department of Public Health" would prove costly, time consuming, market restrictive, and an unfair competitive advantage to other heating and cooling industries. Again, in our opinion, the Connecticut consumer will suffer with limited choices and non competitive pricing.

### **Sec. 25-128-39c Closed-loop geoexchange system piping**

"The only acceptable materials for the underground portion of a closed loop geoexchange system are as follows:

1. High density, polyethylene extrusion compound ..." is creating an unfair advantage to the Well Drillers, the plastics industry, and companies that use those products. Our system uses a refrigeration grade copper tubing and copper is not an approved material. The option to get it approved after the regulation goes into effect is really not an option. Again, to get "Those materials approved by the Department of Consumer Protection in consultation with the Department of Public Health and the Department of Environmental Protection" would prove costly, time consuming, market restrictive, and an unfair competitive advantage to other heating and cooling industries, and contractors using polyethylene. The loser would be the Connecticut consumer, the DX geothermal companies, and the carbon footprint.

All our refrigeration grade tubing connections are brazed and the joints are as strong as the tubing itself. Our Field Pressure Test is a stringent Quality Control process that ensures that our joints are strong and leak-proof. We pressure test with an inert gas, nitrogen, to 450 PSI, test for at least 1 ½ hours, and utilize no less than 5 critical testing

aspects. We do not place any system into service before it passes all our Quality Control parameters.

Concerning the idea of corrosion, most of our geothermal systems are installed with anodes for cathodic protection. It is a technique used to control corrosion. The history of controlling copper corrosion dates back to 1824 when Sir Humphrey Davy successfully protected copper against corrosion by using iron anodes.

#### **Sec. 25-128-48(a) Annular space**

Subsection (c) dictates that all closed loop geexchange bore holes are to be grouted with a high grade bentonite or thermally enhanced bentonite compounds. This water well procedure is typically used because water wells are normally 6 inches or greater in diameter and at least 200 feet deep. Subsection (g) dictates that the geexchange boreholes shall be filled using a tremie and filled from the bottom up.

Our DX Geothermal boreholes are 3 inches in diameter and less than 60 feet deep. These holes are shallow and small in comparison to a water well hole in excess of six inches in diameter and hundreds of feet deep. The comparisons are extreme. A 3 inch diameter hole 60 feet deep has an annular space of 2.89 cubic feet. A 6 inch borehole 200 feet deep has an annular opening of 39.25 cubic feet. The 6" hole 200 feet deep is 13.6 times larger than our 3 inch hole.

Concerning a tremie, backfilling a hole less than 60' deep is far less difficult than backfilling a 200 foot plus borehole. A 60 foot bore hole is less than the length of a normal tractor trailer on our roads today.

#### **Sec. 25-128-49(a) Geexchange bore hole termination**

We are assuming the purpose of this is to keep the water based geothermal systems below the frost level. Our refrigerant will not freeze and break the piping. Our pit depths are normally 3 feet deep and we never have any problems with freezing. For detection our loops, manifolds, and line sets are copper which are detectable with today's detection devices. We also encapsulate all our piping in a layer of masonry sand for detection and sound construction practices.

#### **Sec. 25-128-58d Contractor limited to geexchange bore hole drilling**

This particular section requiring the registration of well drilling contractors is, in theory, understandable but should not be applicable for the installation of DX systems. A borehole driller is only necessary as the scope of drilling is not nearly as complex as that of a water well driller. The DX technical installation falls under the scope of a HVAC contractor. It is he who designs and installs the electrical components, refrigerant system, air handlers, and compressor assemblies. We are not sure as to why or how a registered well driller could attest to the knowledge or integrity of a HVAC contractor or installer.

### **Section. 25-128-60d. Driller limited to geexchange borehole drilling W-8**

This section is addressing the registration requirements for an apprentice driller. Again, this section seems to cross HVAC contractors, drillers, and field installers.

#### **In Conclusion**

We agree that there should be requirements and standards for all industries. The consumer has a right to have his public health, safety, and welfare protected. The Department of Consumer Protection is expected to provide this oversight and ensure the public of their rights as designated by the State of Connecticut.

We also believe that one industry has the right to be protected and not regulated by another. The DX Geothermal industry should have the right and opportunity to market their technology to the consumers in Connecticut. The drilling of boreholes, loop and manifold installations, HVAC procedures and processes have nothing in common with water well drillers.

By having water well regulations governing the DX Geothermal Industry the consumer will suffer as a result of limited competition, unnecessary and costly installation practices, biased technologies, and a continued higher carbon footprint. We will continue to be a less green society and continue our foreign and fossil fuel dependence.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

July 10, 1997

Jack Womack, Chairman and CEO  
American Geothermal DX  
1037 Old Salem Road  
Murfreesboro, TN 37129

OFFICE OF  
AIR AND RADIATION

Dear Mr. Womack:

I understand that your company, American Geothermal DX, is a manufacturer of Direct-Exchange (DX) geothermal heat pumps (GHPs). I also understand that you often encounter confusion about environmental issues related to this technology. I hope this letter will help to clarify some of these issues.

As you may know, EPA recognized GHPs as the most cost-effective and environmentally friendly technology for heating and cooling homes in most climates in its 1993 report, Space Conditioning: The Next Frontier. We at the Atmospheric Pollution Prevention Division (APPD) at the Environmental Protection Agency (EPA) look quite positively on the potential of DX GHPs. The use of refrigerant in copper pipes as a heat exchanger appears to have an inherent efficiency advantage over antifreeze solutions in plastic pipe, making them even more attractive from an energy-efficiency standpoint than traditional GHPs.

Our only potential concern with DX GHPs is that they use R-22, as do virtually all other large-scale heat pump technologies on the market. Since R-22 contributes to ozone depletion, it is being phased out over the next three decades in accordance with the Montreal Protocol. DX GHPs do not appear to use appreciably more R-22 than air-source heat pumps, and EPA is not discouraging their use either. One of the key reasons R-22 has been such a widely used refrigerant for more than 50 years is that it is a nontoxic, inert gas that poses no direct health dangers to humans, and therefore could be used with confidence by HVAC manufacturers and installers. Since R-22 poses no direct health threat to humans—nor to ground water—there is no reason why it cannot also be used with confidence in underground heat exchangers as part of a DX system.

EPA does regulate the use of R-22, however. Only licensed persons may install and service systems that use the refrigerant, and they must follow EPA guidelines regarding reclamation and recycling of the refrigerant. For more information about R-22 regulations, please call 1-800-296-1996.

I hope this information is helpful to you. Please call me if you have any questions or if I can be of any further assistance.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen J. Offutt".

Stephen J. Offutt

Atmospheric Pollution Prevention Division

# 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

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
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

# NATIONAL REFRIGERANTS™

R-22

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

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

# NATIONAL REFRIGERANTS™

R-22

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## 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.

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## 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.

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## 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.

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## 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.

# NATIONAL REFRIGERANTS™

**R-22**

**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**

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

- \* = Limit established by National Refrigerants, Inc.
- \*\* = Workplace Environmental Exposure Level (AIHA)
- \*\*\* = Biological Exposure Index (ACGIH)

**OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:**

Hydrogen Fluoride: ACGIH TLV = 3ppm ceiling

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>APPEARANCE:</b>	Clear, colorless liquid and vapor	
<b>PHYSICAL STATE:</b>	Gas at ambient temperatures	
<b>MOLECULAR WEIGHT:</b>	86.45	
<b>CHEMICAL FORMULA:</b>	CHClF <sub>2</sub>	
<b>ODOR:</b>	Faint ethereal odor	
<b>SPECIFIC GRAVITY (water = 1.0):</b>	1.21 @ 21.1°C (70°F)	
<b>SOLUBILITY IN WATER (weight %):</b>	0.3 wt% @ 25°C and 1 atmosphere	
<b>pH:</b>	Neutral	
<b>BOILING POINT:</b>	-40.8°C (-41.40°F)	
<b>FREEZING POINT:</b>	-160°C (-256°F)	
<b>VAPOR PRESSURE:</b>	136.1 psia @ 70°F 311.4 psia @ 130°F	
<b>VAPOR DENSITY (air = 1.0):</b>	3.0	
<b>EVAPORATION RATE:</b>	>1	<b>COMPARED TO:</b> CCl <sub>4</sub> = 1
<b>% VOLATILES:</b>	100	
<b>FLASH POINT:</b>	Not applicable	

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

# NATIONAL REFRIGERANTS™

R-22

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## 10. STABILITY AND REACTIVITY

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### 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.

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## 11. TOXICOLOGICAL INFORMATION

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### IMMEDIATE (ACUTE) EFFECTS:

LC<sub>50</sub> : 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.

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## 12. ECOLOGICAL INFORMATION

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### Degradability (BOD):

R-22 is a gas at room temperature; therefore, it is unlikely to remain in water.

Octanol Water Partition Coefficient: Unknown

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## 13. DISPOSAL CONSIDERATIONS

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### RCRA

Is the unused product a RCRA hazardous waste if discarded?  
If yes, the RCRA ID number is:

Not a hazardous waste  
Not applicable

# NATIONAL REFRIGERANTS™

R-22

## 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.

<u>INGREDIENT NAME</u>	<u>SARA / CERCLA RQ (lb.)</u>	<u>SARA EHS TPO (lb.)</u>
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.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
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.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
No ingredients listed in this section		



R-22

**ADDITIONAL REGULATORY INFORMATION:**

R-22 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 Chlorodifluoromethane**, an HCFC substance which harms public health and the environment by destroying ozone in the upper atmosphere. Destruction of the ozone layer can lead to increased ultraviolet radiation which, with excess exposure to sunlight, can lead to an increase in skin cancer and eye cataracts.

**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:**

Canada – Listed on DSL  
EU - EINECS # 2008719

**16. OTHER INFORMATION**

**CURRENT ISSUE DATE:** August, 2007  
**PREVIOUS ISSUE DATE:** October, 2006

**OTHER INFORMATION:** HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0  
NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0  
ANSI/ASHRAE 34 Safety Group – A1  
UL Classified

Regulatory Standards:

1. OSHA regulations for compressed gases: 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101
3. Clean Air Act Class II Substance

**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 of 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.