



**SECTION 1: IDENTIFICATION**

**Product identifier**

**Product Form:** Mixture

**Product Name:** In USA as RS44B (R453A)

**Alternate Names:** Blended Formula

**Intended Use of the Product**  
Refrigerant

**Name, Address, and Telephone of the Responsible Party**

**Company**

ComStar International Inc.

20-45 128th Street,

College Point, NY 11356

Emergency Telephone Number

Emergency number : (800) 328-0142, (718) 445-7900

**SECTION 2: HAZARDS IDENTIFICATION**

Classification of the Substance or Mixture

Classification (GHS-US)

Simple Asphyxiant

Liquefied gas H280

**Label Elements**

GHS-US Labeling

**Hazard Pictograms (GHS-US)** :



**Signal Word (GHS-US)**

: Warning

**Hazard Statements (GHS-US)**

: H280 - Contains gas under pressure; may explode if heated

May displace oxygen and cause rapid suffocation

**Precautionary Statements (GHS-US)**

: P410+P403 - Protect from sunlight. Store in a well-ventilated place

Skin Irritation. 2; H315

May Cause skin irritation.

**Other Hazards**

**Other Hazards Not Contributing to the Classification:** Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Liquid contact with eyes or skin may cause frostbite.

**Unknown Acute Toxicity (GHS-US)** Not available

**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

Substances-Name	Product identifier	% (w/W)	Classification (GHS-US)
1,1,1,2,3,3,3 Heptafluoropropane (HFC 227)	(CAS No) 431-89-0	5	Simple Asphyxiant Liquefied gas, H280
Pentafluoroethane (HFC125)	(CAS No) 354-33-6	20	Simple Asphyxiant Liquefied gas, H280
1,1,1,2-Tetrafluoroethane (HFC-134a)	(CAS No) 811-97-2	53.8	Simple Asphyxiant Liquefied gas, H280
Difluoromethane (HFC-32)	(CAS No) 75-10-5	20	Simple Asphyxiant Flam. Gas 1, H220 Liquefied gas, H280
Butane (HC-R600)	(CAS No) 106-97-8	0.6	Simple Asphyxiant Flam. Gas 1, H220 Liquefied gas, H280
Isopentane (HC-R601a)	(CAS No) 78-78-4	0.6	Simple Asphyxiant Flam. Gas 1, H220 Liquefied gas, H280

Full text of H-phrases: see section 16

**SECTION 4: FIRST AID MEASURES**

**Description of First Aid Measures**

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**General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

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**Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

**Skin Contact:** Rinse immediately with plenty of water. Obtain medical attention if irritation develops or persists.

**Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

**Ingestion:** Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

### **Most Important Symptoms and Effects Both Acute and Delayed**

**General:** Vapors are heavier than air and may cause asphyxia by reduction of the oxygen content.

**Inhalation:** May cause respiratory irritation.

**Skin Contact:** May cause skin irritation. Liquid contact may cause frostbite.

**Eye Contact:** May cause eye irritation.

**Ingestion:** Ingestion is likely to be harmful or have adverse effects.

**Chronic Symptoms:** None expected under normal conditions of use.

### **Indication of Any Immediate Medical Attention and Special Treatment Needed**

If you feel unwell, seek medical advice (show the label where possible).

## **SECTION 5: FIRE-FIGHTING MEASURES**

### **Extinguishing Media**

**Suitable Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

**Unsuitable Extinguishing Media:** None known.

### **Special Hazards Arising from the Substance or Mixture**

**Fire Hazard:** RS - 44 is not flammable at atmospheric pressure and in air at temperatures up to 100 °C (212 °F). RS - 44 should not exist with air/excess oxygen at elevated pressures and high temperatures. RS - 44 Can become combustible with high concentrations of air at elevated pressure and/or temperature and in the presence of an ignition source. These substances can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). For example, do not mix RS - 44 with air under pressure for leak detection purposes.

**Explosion Hazard:** Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries.

**Reactivity:** Hazardous reactions will not occur under normal conditions.

### **Advice for Firefighters**

**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire.

**Firefighting Instructions:** Use water spray or fog for cooling exposed containers.

**Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection.

**Hazardous Combustion Products:** Carbon oxides (CO, CO<sub>2</sub>). Halogenated hydrocarbons. Hydrogen Fluoride (HF).

### **Reference to Other Sections**

Refer to section 9 for flammability properties.

## **SECTION 6: ACCIDENTAL RELEASE MEASURES**

### **Personal Precautions, Protective Equipment and Emergency Procedures**

**General Measures:** Avoid all contact with skin, eyes, or clothing. Avoid breathing vapors.

### **For Non-Emergency Personnel**

**Protective Equipment:** Use appropriate personal protection equipment (PPE).

**Emergency Procedures:** Evacuate unnecessary personnel.

### **For Emergency Personnel**

**Protective Equipment:** Equip cleanup crew with proper protection.

**Emergency Procedures:** Stop leak if safe to do so. Ventilate area.

### **Environmental Precautions**

Avoid release to the environment.

### **Methods and Material for Containment and Cleaning Up**

**For Containment:** Ventilate area.

**Methods for Cleaning Up:** Isolate area until gas has dispersed.

### **Reference to Other Sections**

See Heading 8. Exposure controls and personal protection.

## **SECTION 7: HANDLING AND STORAGE**

### **Precautions for Safe Handling**

**Additional Hazards When Processed:** Ruptured cylinders may rocket.

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

### **Conditions for Safe Storage, Including Any Incompatibilities**

**Technical Measures:** Comply with applicable regulations.

**Storage Conditions:** Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

**Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers. Chlorine.

**Storage Area:** Store in a well-ventilated place.

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### Specific End Use(s)

Refrigerant.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control Parameters

Butane (HC-R600) (106-97-8) / Isopentane (HC-R601a) (78-78-4) / Difluoromethane (HFC-32) (75-10-5)		
USA ACGIH	ACGIH STEL (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m3)	1900 mg/m3
USA NIOSH	NIOSH REL (TWA) (ppm)	800 ppm
Manitoba	OEL STEL (ppm)	1000 ppm
Newfoundland & Labrador	OEL STEL (ppm)	1000 ppm
Nova Scotia	OEL STEL (ppm)	1000 ppm
Ontario	OEL TWA (ppm)	800 ppm
Prince Edward Island	OEL STEL (ppm)	1000 ppm
Saskatchewan	OEL STEL (ppm)	1250 ppm
Saskatchewan	OEL TWA (ppm)	1000 ppm
Pentafluoroethane (HFC125 (354-33-6) / 1,1,1,2,3,3,3 Heptafluoropropane (HFC 227) (431-89-0)		
AEL*	OEL 8 & 12 hr. TWA (ppm)	1000 ppm
AIHA WEEL	OEL 8 hr. TWA	1000 ppm, 4900 mg/m3
1,1,1,2-Tetrafluoroethane (HFC-134a) (811-97-2)		
AEL*	OEL 8 & 12 hr. TWA (ppm)	1000 ppm
AIHA WEEL	OEL 8 hr. TWA	1000 ppm, 4900 mg/m3

### Exposure Controls

**Appropriate Engineering Controls:** Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

**Personal Protective Equipment:** Protective goggles. Gloves. Protective clothing.



**Materials for Protective Clothing:** Chemically resistant materials and fabrics.

**Hand Protection:** Impervious butyl rubber gloves.

**Eye Protection:** Chemical goggles or safety glasses.

**Skin and Body Protection:** Wear suitable protective clothing.

**Respiratory Protection:** Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

**Environmental Exposure Controls:** Do not allow the product to be released into the environment.

**Consumer Exposure Controls:** Do not eat, drink or smoke during use

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State	: Liquefied Gas
Appearance	: Colorless
Odor	: Slightly ethereal
Odor Threshold	: Not available
pH	: Neutral
Relative Evaporation Rate (butylacetate=1)	: Not available
Melting Point	: Not available
Freezing Point	: Not available
Boiling Point	: Dew @ 1 atm. -35.9 °C (-32.6 °F) Bubble @ 1 atm. -41.3 °C (-42.4 °F)
Flash Point	: Not available
Auto-ignition Temperature	: > 550 °C (1022 °F)
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not available
Lower Flammable Limit	: Not available
Upper Flammable Limit	: Not available
Vapor Pressure	: @ 20 °C (68 °F) 120.6 psia @ 60 °C (140 °F) 340.3psia

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Relative Vapor Density at 20 °C	: Not available
Relative Density	: Not available
Density	: Liquid @ 1 atm. 87.25 lb./ft <sup>3</sup> Vapor @ 1 atm. .3633 lb./ft <sup>3</sup>
Specific Gravity	: Not available
Solubility	: Not available
Partition coefficient	: n-octanol/water Not available
Viscosity	: Not available
Explosion Data - Sensitivity to Mechanical Impact	: Not expected to present an explosion hazard due to mechanical impact.
Explosion Data - Sensitivity to Static Discharge	: Not expected to present an explosion hazard due to static discharge.

### SECTION 10: STABILITY AND REACTIVITY

**Reactivity:** Hazardous reactions will not occur under normal conditions.  
**Chemical Stability:** Stable under recommended handling and storage conditions (see section 7).  
**Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.  
**Conditions to Avoid:** Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials.  
**Incompatible Materials:** Strong acids. Strong bases. Strong oxidizers.  
**Hazardous Decomposition Products:** Halogenated hydrocarbons. Hydrogen Fluoride (HF).

### SECTION 11: TOXICOLOGICAL INFORMATION

#### Information on Toxicological Effects - Product

**Acute Toxicity:** Not classified  
**LD50 and LC50 Data:** Not available  
**Skin Corrosion/Irritation:** Not classified  
**Serious Eye Damage/Irritation:** Not classified  
**Respiratory or Skin Sensitization:** Not classified  
**Germ Cell Mutagenicity:** Not classified  
**Teratogenicity:** Not available  
**Carcinogenicity:** Not classified  
**Specific Target Organ Toxicity (Repeated Exposure):** Not classified  
**Reproductive Toxicity:** Not classified

**Specific Target Organ Toxicity (Single Exposure):** Not classified  
**Aspiration Hazard:** Not classified  
**Symptoms/Injuries After Inhalation:** May cause respiratory irritation.  
**Symptoms/Injuries After Skin Contact:** May cause skin irritation. Liquid contact may cause frostbite.  
**Symptoms/Injuries After Eye Contact:** May cause eye irritation.  
**Symptoms/Injuries After Ingestion:** Ingestion is likely to be harmful or have adverse effects.  
**Chronic Symptoms:** None expected under normal conditions of use.

#### Information on Toxicological Effects - Ingredient(s)

##### **LD50 and LC50 Data:**

<b>Pentafluoroethane (HFC125) (354-33-6) / Difluoromethane (HFC-32) (75-10-5)</b>	
LC50 Inhalation Rat	2910 g/m <sup>3</sup> (Exposure time: 4 h)
ATE US (vapors)	2,910.00 mg/l/4h
ATE US (dust, mist)	2,910.00 mg/l/4h
<b>Butane (HC-R600) (106-97-8) / Isopentane (HC-R601a) (78-78-4) / 1,1,1,2,3,3,3 Heptafluoropropane (HFC 227) (431-89-0)</b>	
LC50 Inhalation Rat	658 mg/l/4h
ATE US (vapors)	658.00 mg/l/4h
ATE US (dust, mist)	658.00 mg/l/4h
<b>1,1,1,2-Tetrafluoroethane (HFC-134a) (811-97-2)</b>	
LC50 Inhalation Rat	1500 g/m <sup>3</sup> (Exposure time: 4 h)
ATE US (vapors)	1,500.00 mg/l/4h
ATE US (dust, mist)	1,500.00 mg/l/4h

### SECTION 12: ECOLOGICAL INFORMATION

**Toxicity** Not classified  
**Persistence and Degradability** Not available  
**Bioaccumulative Potential**

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<b>Butane (HC-R600) (106-97-8) / Isopentane (HC-R601a) (78-78-4)</b>	
BCF fish 1	1.57 - 1.97
Log Pow	2.88 (at 20 °C)

Mobility in Soil Not available

Other Adverse Effects

**Other Information:** Avoid release to the environment.

### SECTION 13: DISPOSAL CONSIDERATIONS

**Waste Disposal Recommendations:** Recover, reclaim or recycle when practical. Dispose of waste material in accordance with all local, regional, national, and international regulations. This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling. Contact a certified reclaimer for recovery/reclamation of this product.

**Ecology - Waste Materials:** Avoid release to the environment.

### SECTION 14: TRANSPORT INFORMATION

#### 14.1 In Accordance with DOT

**Proper Shipping Name** : LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane)  
**Hazard Class** : 2.2  
**Identification Number** : UN3163  
**Label Codes** : 2.2  
**ERG Number** : 126



#### 14.2 In Accordance with IMDG

**Proper Shipping Name** : LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2- Tetrafluoroethane)  
**Hazard Class** : 2.2  
**Identification Number** : UN3163  
**Label Codes** : 2.2  
**EmS-No. (Fire)** : F-C  
**EmS-No. (Spillage)** : S-V



#### 14.3 In Accordance with IATA

**Proper Shipping Name** : LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane)  
**Identification Number** : UN3163  
**Hazard Class** : 2.2  
**Label Codes** : 2.2  
**ERG Code (IATA)** : 2L



#### 14.4 In Accordance with TDG

**Proper Shipping Name** : LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2- Tetrafluoroethane)  
**Hazard Class** : 2.2  
**Identification Number** : UN3163  
**Label Codes** : 2.2



### SECTION 15: REGULATORY INFORMATION

#### US Federal Regulations

<b>RS44B (R453A)</b>	
<b>SARA Section 311/312 Hazard Classes</b>	Sudden release of pressure hazard
<b>RS44B (R453A)</b>	
<b>EPA Clean Air Act</b>	This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82

#### Pentafluoroethane (HFC125) (354-33-6) / Difluoromethane (HFC-32) (75-10-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### Butane (HC-R600) (106-97-8) / Isopentane (HC-R601a) (78-78-4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### 1,1,1,2-Tetrafluoroethane (HFC-134a) (811-97-2) / 1,1,1,2,3,3,3 Heptafluoropropane (HFC 227) (431-89-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

#### US State Regulations


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<b>Difluoromethane (HFC-32) (75-10-5)</b>
U.S. - Massachusetts - Right to Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

### Canadian Regulations

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WHMIS Classification	Class A - Compressed Gas
	

<b>Pentafluoroethane (HFC125) (354-33-6) / Difluoromethane (HFC-32) (75-10-5)</b>	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

<b>Butane (HC-R600) (106-97-8) / Isopentane (HC-R601a) (78-78-4)</b>	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas

<b>1,1,1,2,3,3,3 Heptafluoropropane (HFC 227) (431-89-0)</b>	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Class A - Compressed Gas

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by CPR.

### SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

**Revision date** : 05/01/2015  
**Other Information** : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

#### GHS Full Text Phrases:

Compressed gas	Gases under pressure Compressed gas
Flam. Gas 1	Flammable gases Category 1
Liquefied gas	Gases under pressure Liquefied gas
Simple Asphyxiant	Simple Asphyxiantxiant
H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated

#### Party Responsible for the Preparation of This Document

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*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

North America GHS US 2012 & WHMIS