

Safety Data Sheet according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations Revision Date: 12/15/2014 Date of issue: 12/15/2014

Version: 1.0

SECTION 1: IDENTIFICATION

Product Identifier

Product Form: Mixture Product Name: HOT SHOT[®] (R-414B)

Intended Use of the Product

Refrigerant

Name, Address, and Telephone of the Responsible Party

Company

ICOR International 10640 E 59th St. Indianapolis, IN 46236 800-497-6805 (Monday-Friday, 7:30 am-4:30 pm ET)

Emergency Telephone Number

Emergency number : CHEMTREC 800-424-9300 (24 Hours/Day, 7 Days/Week)

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US)Simple AsphyxiantLiquefied gasH280Ozone 1H420Label ElementsGHS-US LabelingHazard Pictograms (GHS-US)



		GHS04 GHS07
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
		H420 - Harms public health and the environment by destroying ozone in the upper
		atmosphere
Precautionary Statements (GHS-US)	:	P410+P403 - Protect from sunlight. Store in a well-ventilated place
		P502 - Refer to manufacturer/supplier for information on recovery/recycling

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

<u>Substances</u>

Name	Product identifier	% (w/w)	Classification (GHS-US)
Chlorodifluoromethane (HCFC-22)	(CAS No) 75-45-6	50	Liquefied gas, H280
			Ozone 1, H420
1-Chloro-1,2,2,2-tetrafluoroethane (HCFC-	(CAS No) 2837-89-0	39	Simple Asphyxiant
124)			Liquefied gas, H280
1-Chloro-1,1-difluoroethane (HCFC-142b)	(CAS No) 75-68-3	9.5	Flam. Gas 1, H220
			Liquefied gas, H280
			Aquatic Chronic 3, H412
			Ozone 1, H420

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Isobutane (HC-600a)	(CAS No) 75-28-5	1.5	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

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible). **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 Asphyxiantxia 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: Hot Shot is not flammable at atmospheric pressure and in air at temperatures up to 100 °C (212 °F). Hot shot should not exist with air/excess oxygen at elevated pressures and high temperatures. Hot Shot can become combustible with high concentrations of air at elevated pressure and/or temperature and in the presence of an ignition source. Theis substance can also become combustible in an oxygen enriched environment (oxygen concentrations greater tha that in air). For example, do not mix Hot Shot 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, CO₂). 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 vapor, gas.

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. Eliminate ignition sources. Ventilate area.

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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.

Storage Area: Store in a well-ventilated place.

Specific End Use(s)

Refrigerant.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Isobutane (75-28-5)		
USA ACGIH	ACGIH STEL (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1900 mg/m ³
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
Chlorodifluoromethane (HC	FC-22) (75-45-6)	
Mexico	OEL TWA (mg/m³)	3500 mg/m ³
Mexico	OEL TWA (ppm)	1000 ppm
Mexico	OEL STEL (mg/m ³)	4375 mg/m ³
Mexico	OEL STEL (ppm)	1250 ppm
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	3500 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	1000 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m ³)	4375 mg/m ³
USA NIOSH	NIOSH REL (STEL) (ppm)	1250 ppm
Alberta	OEL TWA (mg/m³)	3500 mg/m ³
Alberta	OEL TWA (ppm)	1000 ppm
British Columbia	OEL STEL (ppm)	1250 ppm
British Columbia	OEL TWA (ppm)	500 ppm
Manitoba	OEL TWA (ppm)	1000 ppm
New Brunswick	OEL TWA (mg/m³)	3540 mg/m ³
New Brunswick	OEL TWA (ppm)	1000 ppm

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Newfoundland & Labrador	OEL TWA (ppm)	1000 ppm
Nova Scotia	OEL TWA (ppm)	1000 ppm
Nunavut	OEL STEL (mg/m³)	4400 mg/m ³
Nunavut	OEL STEL (ppm)	1250 ppm
Nunavut	OEL TWA (mg/m³)	3520 mg/m ³
Nunavut	OEL TWA (ppm)	1000 ppm
Northwest Territories	OEL STEL (mg/m ³)	4400 mg/m ³
Northwest Territories	OEL STEL (ppm)	1250 ppm
Northwest Territories	OEL TWA (mg/m³)	3520 mg/m ³
Northwest Territories	OEL TWA (ppm)	1000 ppm
Ontario	OEL TWA (ppm)	1000 ppm
Prince Edward Island	OEL TWA (ppm)	1000 ppm
Québec	VEMP (mg/m³)	3540 mg/m ³
Québec	VEMP (ppm)	1000 ppm
Saskatchewan	OEL STEL (ppm)	1250 ppm
Saskatchewan	OEL TWA (ppm)	1000 ppm
Yukon	OEL STEL (mg/m³)	4375 mg/m ³
Yukon	OEL STEL (ppm)	1250 ppm
Yukon	OEL TWA (mg/m³)	3500 mg/m ³
Yukon	OEL TWA (ppm)	1000 ppm
ICOR AEL*	OEL 8 & 12 hr TWA (ppm)	1000 ppm
AIHA WEEL	OEL 8 hr TWA	1000 ppm, 4900 mg/m ³
1-Chloro-1,2,2,2-tetrafluoro	ethane (HCFC-124)(2837-89-0)	
British Columbia	OEL TWA (ppm)	1000 ppm
ICOR AEL*	OEL 8 & 12 hr TWA (ppm)	1000 ppm
AIHA WEEL	OEL 8 hr TWA	1000 ppm, 4900 mg/m ³
1-Chloro-1,1-difluoroethane	(HCFC-142b) (75-68-3)	-
British Columbia	OEL TWA (ppm)	1000 ppm
ICOR AEL*	OEL 8 & 12 hr TWA (ppm)	1000 ppm
AIHA WEEL	OEL 8 hr TWA	1000 ppm, 4900 mg/m ³

* ICOR acceptable Exposure Limit. ICOR reviews industry standards and recommendations in consideration of acceptable exposure limitations. Where regulated exposure limits are lower than ICOR's recommended AEL, those limits shall supersede.

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

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES Information on Basic Physical and Chemical Properties **Physical State** Liquefied Gas Appearance Colorless Odor Slightly ethereal **Odor Threshold** Not available рΗ Not available **Relative Evaporation Rate (butylacetate=1)** Not available **Melting Point** Not available **Freezing Point** Not available **Boiling Point** Dew @ 1 atm. -24.3 °C (-11.8 °F) ٠ Bubble @ 1 atm. -32.8 °C (-27.1 °F) **Flash Point** Not available **Auto-ignition Temperature** 635 °C (1175 °F) **Decomposition Temperature** ٠ Not available Flammability (solid, gas) Not available **Lower Flammable Limit** Not available **Upper Flammable Limit** Not available Vapor Pressure @ 21.1 °C (70 °F) 78.9 psia @ 54.4 °C (130 °F) 195.3 psia Relative Vapor Density at 20 °C Not available **Relative Density** Not available Liquid @ 1 atm. 86.97 lb/ft³ Density Vapor @ 1 atm. .3223 lb/ft³ **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: Carbon oxides (CO, CO₂). 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

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Specific Target Organ Toxicity (Single Exposure): Not classifie	Specific Target Organ	Toxicity (Single Ex	xposure): Not classified
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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:

Isobutane (75-28-5)	
LC50 Inhalation Rat	658 mg/l/4h
ATE US (vapors)	658.00 mg/l/4h
ATE US (dust, mist)	658.00 mg/l/4h
Chlorodifluoromethane (HCFC-22) (75-45-6)	
LC50 Inhalation Rat	220000 ppm/4h
ATE US (gases)	220,000.00 ppmV/4h
IARC Group	3
1-Chloro-1,1-difluoroethane (HCFC-142b) (75-68-3)	
LC50 Inhalation Rat	2050 g/m³ (Exposure time: 4 h)
ATE US (vapors)	2,050.00 mg/l/4h
ATE US (dust, mist)	2,050.00 mg/l/4h

SECTION 12: ECOLOGICAL INFORMATION

Toxicity Not classified

1-Chloro-1,1-difluoroethane (HCFC-142b) (75-68-3)	
LC50 Fish 1	220 mg/l (Exposure time: 96 h - Species: Poecilia reticulata [static])
EC50 Daphnia 1	160 mg/l (Exposure time: 48 h - Species: Daphnia magna)

Persistence and Degradability Not available

Bioaccumulative Potential

Isobutane (75-28-5)	
BCF fish 1	1.57 - 1.97
Log Pow	2.88 (at 20 °C)
Chlorodifluoromethane (HCFC-22) (75-4	5-6)
BCF fish 1	(no significant bioaccumulation)
Log Pow	1.08
1-Chloro-1,1-difluoroethane (HCFC-142b) (75-68-3)
BCF fish 1	42
Log Pow	1.6 - 1.75

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/reclaimtion 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. (Chlorodifluoromethane, 1-Chloro-1,1-difluoroethane)

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Hazard Class	: 2.2
Identification Number	: UN3163
Label Codes	: 2.2
ERG Number	: 126
14.2 In Accordance with	IMDG
Proper Shipping Name Hazard Class Identification Number	 LIQUEFIED GAS, N.O.S. (Chlorodifluoromethane, 1-Chloro-1,1-difluoroethane) 2.2 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. (Chlorodifluoromethane, 1-Chloro-1,1-difluoroethane)
Identification Number	: UN3163
Hazard Class	: 2.2
Label Codes	: 2.2
ERG Code (IATA) 14.4 In Accordance with	
Proper Shipping Name Hazard Class Identification Number Label Codes	 LIQUEFIED GAS, N.O.S. (Chlorodifluoromethane, 1-Chloro-1,1-difluoroethane) 2.2 UN3163 2.2

SECTION 15: REGULATORY INFORMATION

US Federal Regulations	
HOT SHOT [®] (R-414B)	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard
HOT SHOT [®] (R-414B)	
EPA Clean Air Act	This product is subject to U.S. Environmental Protection Agency
	Clean Air Act Regulations Section 608 in 40 CFR Part 82
Isobutane (75-28-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Chlorodifluoromethane (HCFC-22) (75-45-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1.0 %
1-Chloro-1,2,2,2-tetrafluoroethane (HCFC-124)(2837-89-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1.0 %
1-Chloro-1,1-difluoroethane (HCFC-142b) (75-68-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1.0 %
US State Regulations	

Isobutane (75-28-5)

U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List

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U.S. - Pennsylvania - RTK (Right to Know) List

Chlorodifluoromethane (HCFC-22) (75-45-6)

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

1-Chloro-1,2,2,2-tetrafluoroethane (HCFC-124)(2837-89-0)

U.S. - New Jersey - Right to Know Hazardous Substance List

1-Chloro-1,1-difluoroethane (HCFC-142b) (75-68-3)

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

HOT SHOT® (R-414B)
WHMIS Classification

Class A - Compressed Gas



Isobutane (75-28-5)

Listed on the Canadian DSL (Domestic Substances List) inventory.		
WHMIS Classification	Class A - Compressed Gas	
	Class B Division 1 - Flammable Gas	
Chlone diffuse norm other no. (UCEC 22) (75.45.5)		

Chlorodifluoromethane (HCFC-22) (75-45-6)

Listed on the Canadian DSL (Domestic Substances List) inventory.

Listed on the Canadian Ingredient Disclosure List

IDL Concentration 1 %

WHMIS Classification Class A - Compressed Gas

1-Chloro-1,2,2,2-tetrafluoroethane (HCFC-124)(2837-89-0)

Listed on the Canadian DSL (Domestic Substances List) inventory.

WHMIS Classification Class A - Compressed Gas

1-Chloro-1,1-difluoroethane (HCFC-142b) (75-68-3)

Listed on the Canadian DSL (Domestic Substances List) inventory.

Listed on the Canadian Ingredient Disclosure List

IDL Concentration 1 %

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

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

Revision date		
Other Information		

: 12/15/2014

: 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:

Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3	
Flam. Gas 1	Flammable gases Category 1	
Liquefied gas	Gases under pressure Liquefied gas	
Ozone 1	Hazardous to the ozone layer Category 1	
Simple Asphyxiant	Simple Asphyxiantxiant	
H220	Extremely flammable gas	
H280	Contains gas under pressure; may explode if heated	

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H412	Harmful to aquatic life with long lasting effects
H420	Harms public health and the environment by destroying ozone in the upper atmosphere

Party Responsible for the Preparation of This Document

ICOR International 10640 E 59th St. Indianapolis, IN 46236 800-497-6805

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 2