Specification

Refrigerant R508b

R508 is a PFC-based refrigerant, is the industry standard replacement for R-13 and R-503 in very low temperature applications [below -40°F to -150°F (-40°C to -101°C)] such as medical freezers and environmental chambers. It offers advantages over R-23, including significantly lower compressor discharge temperatures, making it the best choice to ensure optimum systems reliability for critical applications.

Properties：

	Unit	R508b
Chemical formula		R-116/R-23
Molecular weight	g/mol	95.39
Boiling point	℃	-87.4
Critical temperature	℃	14.0
Critical pressure	MPa	3.93
Saturated Vapor Pressure	Mpa (20℃)	3.72
ODP		0
GWP		2.608

Quality Specification：

Index	Excellent Grade
Purity %≥	99.8
Moisture %≤	0.002
Acidity(as HCL) %≤	0.00001
Evaporation residue %≤	0.01
Chlorides(Cl^-) test %≤	0.0003
No condensable gas (V/V) %≤	1.5

Packing：8KG, 9KG, 30KG and 400KG Cylinder.

It must be kept in cool, dry and well-ventilated places, away from sunshine and rainfall.

Material Safety Data Sheet

R-508B

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-508B

2. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Trifluoromethane	75-46-7	46
Hexafluoroethane	76-16-4	54

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

POTENTIAL HEALTH HAZARDS

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse can be fatal. Vapor reduces oxygen available for breathing and is heavier than air. Liquid contact can cause frostbite.

HUMAN HEALTH EFFECTS:

Human health effects of overexposure by inhalation may include nonspecific discomfort such as nausea, headache, or weakness; temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness; or with gross overexposure, possibly temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Individuals with preexisting diseases of the central nervous or cardiovascular system may have increased susceptibility to the toxicity of excessive exposure. Eye or skin contact with the liquid may cause frostbite.

CARCINOGENICITY INFORMATION:

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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).

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA:

Use any standard agent – choose the one most appropriate for type of surrounding fire.

FIRE FIGHTING INSTRUCTIONS:

Self-contained, NIOSH-approved breathing apparatus is required if cylinders rupture or release under fire conditions. Water runoff should be contained and neutralized prior to release.

6. ACCIDENTAL RELEASE MEASURES

SAFEGUARDS (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

ACCIDENTAL RELEASE MEASURES

Material evaporates at atmospheric pressure (vaporizes). Ventilate area – especially low places where heavy vapors might collect. Remove open flames.

7. HANDLING AND STORAGE

HANDLING (Personnel):

Avoid contact with liquid with eyes and prolonged skin exposure. Use with sufficient ventilation to keep employee exposure below recommended limits.

STORAGE:

Clean, dry area. Do not heat above 51.7°C (124 °F)

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low places.

PERSONAL PROTECTIVE EQUIPMENT

Neoprene rubber or leather gloves should be used when handling liquid. Chemical splash goggles should be worn when handling liquid. Under normal manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large spill or release occurs.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Trifluoromethane	None	None	*1000 ppm TWA (8 & 12hr)
Hexafluoroethane	None	None	*1000 ppm TWA (8 & 12hr)

* = Workplace Environmental Exposure Level (AIHA)

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

COLOR:	Clear, colorless
FORM:	Gas at ambient temperatures
ODOR:	Slight ethereal
BOILING POINT:	-88°C (-126°F)
VAPOR DENSITY:	(Air = 1.0)
% VOLATILES:	100

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY:

Material is stable. However, avoid open flames and high temperatures.

DECOMPOSITION:

This product can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming HF, COF2 or CO. These materials are toxic and irritating. Contact should be avoided.

POLYMERIZATION:

Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

ANIMAL DATA

TRIFLUOROMETHANE: Inhalation LC_{50} : 4 hr. (rat) - > 663,000 ppm

Material is untested for skin and eye irritancy, and for animal sensitization.
Effects from single high inhalation exposure to Trifluoroemethane include anaesthetic effects, and nonspecific effects such as weight loss were observed at concentrations >22%. No cardiac sensitization was observed in dogs after breathing 800,000 ppm for periods of 5-10 minutes following epinephrine challenge. In another test, dogs exposed to up to 30% or up to 50% (with additional oxygen), had no positive responses. No cardiac sensitization occurred in baboons exposed by inhalation to 10%, 30%, 50%, 70% Trifluoromethane before or after an epinephrine challenge; there was a dose-related decrease in heart rates and differences in respiratory rates during exposure.

No animal tests are available to define the carcinogenic hazards of Trifluoromethane. The maternal and developmental NOAEL was 50,000 ppm. Trifluoromethane is not considered a unique developmental hazard to the conceptus. There were no developmental or reproductive effects.

Tests have shown that Trifluoromethane does not produce genetic damage in bacterial or mammalian cell cultures. It has not produced genetic damage in tests on animals.

HEXAFLUOROETHANE: Inhalation LC_{50} : 4 hr. (rat) - > 800,000 ppm

Effects observed in animals by inhalation include decreased growth rate, pulmonary changes, irregular respiration, increased urine volume and creatinine, reversible pathological changes in the kidneys, and increased urinary fluoride concentration. One study showed no arrhythmogenic effects in dogs at a concentration of 20%, while another study did show some arrhythmogenic effects in both guinea pigs and dogs. Long-term inhalation exposures resulted in an initial decrease in growth rate, but no other adverse changes were noted. No animal test reports are available to define carcinogenic, developmental, or reproductive hazards. The compound does not produce genetic damage in bacterial cell cultures but has not been tested in animals.

12. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

Reclaim by distillation or remove to a permitted waste disposal facility. Dispose in accordance with all Federal, State and local regulations.

13. TRANSPORT INFORMATION

SHIPPING INFORMATION

DOT/IMO
PROPER SHIPPING NAME: Compressed Gas, N.O.S. (Trifluoromethane, Hexafluoroethane)
HAZARD CLASS: 2.2
UN NUMBER: UN1956
DOT/IMO Label: Nonflammable Gas

Shipping Containers
Cylinders and ton tanks.

14. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA INVENTORY STATUS: Reported/Included

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute: **Yes**
Chronic: **No**
Fire: **No**
Reactivity: **No**
Pressure: **Yes**

LISTS:
SARA Extremely Hazardous Substance - No
CERCLA Hazardous Substance - No
SARA Toxic Chemicals - No

15. OTHER INFORMATION

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

The information in this Material Safety Data Sheet only concerns the above-mentioned product and does not relate to use with other product(s) or in any process. This information is to our best present knowledge correct and complete and is given in good faith but without warranty. It remains the user's own responsibility to ensure that the information is appropriate and correct for his special use of this product.