Dynatemp 422D

Safety Data Sheet

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SECTION 1: Identification

1.1. Identification

Product form : Mixture

Product name : Dynatemp 422D

Other means of identification : Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Isobutane

1.2. Recommended use and restrictions on use

Use of the substance/mixture : Refrigerant

1.3. Supplier

Dynatemp Refrigerants Company
P.O. Box 1206
Clayton, NC 27528-1206

Phone: 1-800-791-9232, (outside the U.S.: +1-717-249-0157)

Fax: 717-249-9043

www.Dynatempintl.com

Email: info@dynatempintl.com

1.4. Emergency telephone number

Emergency number : Contact Chemtrec at 800-424-9300 (24 hours)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Gases under pressure Liquefied gas	H280	Contains gas under pressure; may explode if heated

2.2. GHS Label elements, including precautionary statements

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

Precautionary statements (GHS-US) : P410+P403 - Protect from sunlight. Store in a well-ventilated place

2.3. Other hazards which do not result in classification

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 such as phosgene. Rapid evaporation of the liquid may cause frostbite.

2.4. Unknown acute toxicity (GHS US)

None of the ingredients are of unknown toxicity.

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable – this product is a mixture.

3.2. Mixtures

Name	Product identifier	%	GHS-US classification
Ethane, pentafluoro-	(CAS No) 354-33-6	65.1	Liquefied gas, H280
1,1,1,2-Tetrafluoroethane	(CAS No) 811-97-2	31.5	Compressed gas, H280
Isobutane	(CAS No) 75-28-5	3.4	Not classified

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Allow victim to breathe fresh air. Allow the victim to rest.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

First-aid measures after eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

Notes to physician: Because of the possible disturbances of cardiac rhythm, catecholamine drugs such as epinephrine should be used with special caution and only insituations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand. Use agent that is most appropriate for type of surrounding fire.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Cylinders are equipped with pressure and temperature relief devices but may still rupture under fire conditions. Decomposition may occur. This substance is not flammable in air at temperatures up to 100ºC (212ºF) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	:	Keep only in the original container in a cool, well ventilated place. Keep container closed when not in use.
Incompatible products	:	Strong bases. Strong acids.
Incompatible materials	:	Sources of ignition. Direct sunlight.
Storage area	:	Store in a well-ventilated place. Protect cylinder and its fittings from physical damage. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Ethane, pentafluoro- (354-33-6)		
WEEL (AIHA)	Workplace Environmental Exposure Level (WEEL) Guide TWA (ppm)	1000 ppm

1,1,1,2-Tetrafluoroethane (811-97-2)		
WEEL (AIHA)	Workplace Environmental Exposure Level (WEEL) Guide TWA (ppm)	1000 ppm

Isobutane (75-28-5)		
ACGIH	ACGIH STEL (ppm)	1000 ppm (explosion hazard)
NIOSH	NIOSH REL (TWA) (mg/m³)	1900 mg/m³
NIOSH	NIOSH REL (TWA) (ppm)	800 ppm

8.2. Exposure controls

Personal protective equipment	:	Avoid all unnecessary exposure.
Hand protection	:	Wear protective gloves.
Eye protection	:	Chemical goggles or safety glasses.
Respiratory protection	:	Not required under normal conditions. If concentrations exceed exposure limits, use NIOSH approved respirator.
Other information	:	Do not eat, drink or smoke during use.
Engineering Controls	:	Ensure adequate ventilation, especially in confined areas. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	Clear, colorless liquid or gas at ambient temperatures.
Color	:	Clear, Colorless
Odor	:	Mild ether-like
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	-43 °C
Flash point	:	No data available
Relative evaporation rate (butyl acetate=1)	:	> 1
Flammability (solid, gas)	:	Non flammable.
Vapor pressure	:	1015.18 kPa
Relative vapor density at 20 °C	:	3
Relative density	:	1.16
Molecular mass	:	108.53 g/mol
Solubility	:	No data available
Log Pow	:	No data available
Auto-ignition temperature	:	> °C

Decomposition temperature	:	> 250 °C
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosion limits	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2. Other information

VOC content	:	0
Gas group	:	Liquefied gas

SECTION 10: Stability and reactivity

10.1. Reactivity

Decomposes on heating

10.2. Chemical stability

Stable at normal temperatures and storage conditions

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

Fumes. Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Ethane, pentafluoro- (354-33-6)	
LC50 inhalation rat (mg/l)	2910 g/m³ (Exposure time: 4 h)
ATE US (vapors)	2910 mg/l/4h
ATE US (dust, mist)	2910 mg/l/4h

1,1,1,2-Tetrafluoroethane (811-97-2)	
LC50 inhalation rat (mg/l)	1500 g/m³ (Exposure time: 4 h)
ATE US (vapors)	1500 mg/l/4h
ATE US (dust, mist)	1500 mg/l/4h

Isobutane (75-28-5)	
LC50 inhalation rat (mg/l)	57
ATE US (vapors)	57 mg/l/4h
ATE US (dust, mist)	57 mg/l/4h

Skin corrosion/irritation	:	Not classified
Serious eye damage/irritation	:	Not classified
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity – single exposure	:	Not classified
Specific target organ toxicity – repeated exposure	:	Not classified
Aspiration hazard	:	Not classified

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

Dynatemp R-422D	
Persistence and degradability	Not established.

Ethane, pentafluoro- (354-33-6)	
Persistence and degradability	Not established.

1,1,1,2-Tetrafluoroethane (811-97-2)	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

Dynatemp R-422D	
Bioaccumulative potential	Not established.

Ethane, pentafluoro- (354-33-6)	
Bioaccumulative potential	Not established.

1,1,1,2-Tetrafluoroethane (811-97-2)	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Disposal methods

Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local, state and federal regulations. Cylinder can be re-used after re-conditioning. Recover, reclaim by distillation or remove to a permitted waste disposal facility. Empty pressure vessels should be returned to the supplier.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN1078 Refrigerant gas, n.o.s. (1,1,1,2,2-Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Isobutane) 2.2

UN-No.(DOT) : UN1078

Proper Shipping Name (DOT) : Refrigerant gas, n.o.s.

Class (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas

DOT Packaging Non Bulk (49 CFR 173.xxx) : 304

DOT Packaging Bulk (49 CFR 173.xxx) : 314;315

DOT Special Provisions (49 CFR 172.102)	:	T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	306
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	75 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	150 kg
DOT Vessel Stowage Location	:	A - The material may be stowed ''on deck'' or ''under deck'' on a cargo vessel and on a passenger vessel.
Other information	:	No supplementary information available.

TDG

No additional information available

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

Dynatemp R-422D	
SARA Section 311/312 Hazard Classes	Gas under pressure

Ethane, pentafluoro- (354-33-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

1,1,1,2-Tetrafluoroethane (811-97-2)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Ethane, pentafluoro- (354-33-6)
Listed on the Canadian DSL (Domestic Substances List)

1,1,1,2-Tetrafluoroethane (811-97-2)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Ethane, pentafluoro- (354-33-6)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

1,1,1,2-Tetrafluoroethane (811-97-2)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Classification according to Regulation (EC) No. 1272/2008 [CLP]

No additional information available

National regulations

Ethane, pentafluoro- (354-33-6)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Japanese ISHL (Industrial Safety and Health Law) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

1,1,1,2-Tetrafluoroethane (811-97-2)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

⚠ **WARNING**: This product can expose you to chloroform, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.p65warnings.ca.gov.

SECTION 16: Other information

Other information : None.

Full text of H-phrases:

H280	Contains gas under pressure; may explode if heated

SDS US (GHS HazCom 2012)

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.