

Date: April 18, 2025 Rev. 2

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: HFE-347
 Chemical Name: 1,1,2,2-Tetrafluoroethyl-2,2,2-trifluoroethylether
 CAS No: 406-78-0
 Supplier Information: Unistar Chemical Inc.
 425 Huehl Road, Bldg 1,
 Northbrook, IL, 60062
 1-847-724-8869
 E-mail: info@unistarchemcal.com
 Emergency Contact: (800) 424-9300 CHEMTREC

2. HAZARD IDENTIFICATION

Signal word: WARNING!



HAZARDS

H336 May cause drowsiness or dizziness.

PRECAUTIONARY STATEMENTS

P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
 P264 Wash hands thoroughly after handling.
 P271 Use only outdoors or in a well-ventilated area.
 P302+P352 Wash with plenty of soap and water.
 P403+P233 Store in a well-ventilated place. Keep container tightly closed.
 P405 Store locked up.

GHS Classification(s)

GHS07: Exclamation mark
 H336 STOT Single Exp. 3

Over-exposure signs/symptoms

Eye contact: Adverse symptoms may include the following: irritation
 redness watering
 Inhalation: Adverse symptoms may include the following: dizziness/
 vertigo drowsiness/fatigue headache central nervous
 system depression unconsciousness
 Skin contact: Adverse symptoms may include the following: May
 cause allergic reactions in certain individuals. redness
 dryness cracking
 Ingestion: Adverse symptoms may include the following: Ingestion
 Seek medical attention.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS	OSHA	Weight %
1,1,2,2- Tetrafluoroethyl-2,2,2-trifluoroethylether	406-78-0	29 CFR 1910.1200	99.0-100.00

4. FIRST AID MEASURES

Inhalation :	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Skin contact:	IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/ attention.
Eye contact:	If eye irritation persists: Get medical advice/attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Ingestion:	Wash out mouth with water.

5. FIREFIGHTING MEASURES

Suitable extinguishing media:	Carbon dioxide. Dry chemical powder. Water.
Unsuitable extinguishing media:	Do not use water with a full water jet
Special Hazards arising from the substance or mixture:	In combustion toxic fumes may form. In a fire or if heated, a pressure increase will occur and the container may burst. Hazardous thermal decomposition products Specific hazards arising from the chemical decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds
Advice for Firefighters:	Wear protective clothing to prevent contact with skin and eyes. Wear self-contained breathing apparatus. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

Emergency response	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel"
Environmental precautions:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air)
Methods/materials for containment:	Large spill: Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements, or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal. Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water- soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place

7. HANDLING AND STORAGE

Precautions for safe handling:	Handle in fume hood. Wash hands immediately after contamination. Wash hands thoroughly after handling. Take off contaminated clothing and wash before reuse.
Protection Against Explosions and Fires:	Normal measures for preventative fire protection
Conditions for safe storage:	
Managing Storage Risks	Keep container tightly closed. Store in cool, well-ventilated area
Maintaining Integrity	Keep in tightly closed container in cool area away from direct sunlight or heat source.
Other advice	Store in a well-ventilated place. Keep container tightly closed

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental

Exposure Controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Hygiene Measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side shields.

Skin Protection: Chemical-resistant, impervious gloves complying with an approved standard should be always worn when handling chemical products if a risk assessment indicates this is necessary. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

	AEL:	CEC:	ECE:
1,1,2,2-Tetrafluoroethyl-2,2,2-trifluoroether	Acceptable Exposure Limit of 50 ppm (8-hr TWA) recommended by manufacturer.	Ceiling Exposure Limit (maximum concentration) of 150 ppm recommended by US EPA.	Emergency Ceiling Exposure concentration of 500 ppm recommended by manufacturer.

9. PHYSICAL AND CHEMICAL PROPERTIES (NOT A SPECIFICATION)

Physical State: liquid	Solubility: Acetone. Ether. Insoluble in water.
Appearance: clear, colorless	Vapor Pressure: NA
Odor: Ethereal	Vapor Density: NA
pH: NA	Specific Gravity/Density: 1.487 g/cm ³
Evaporation Rate: 67	% Volatile by Volume: NA
Boiling Point: > 56°C	
Freezing/Melting Point: -94°C(-137.2°F)	

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable Under normal conditions
Reactivity:	No usual reactivity
Possibility of Hazardous Reactions:	No
Conditions to Avoid:	No
Incompatible Materials:	Strong oxidizing agents
Hazardous Decomposition products:	In combustion emits toxic fumes

11. TOXICOLOGICAL INFORMATION

Acute Toxicity - Oral	Data Not Sufficient
Acute Toxicity - Dermal	Data Not Sufficient
Acute Toxicity - Inhalation	Data Not Sufficient
Skin Corrosion / Irritation	Slight Irritant
Serious Eye Damage / Eye Irritation	Slight Irritant
Respiratory Sensitization	Data Not Sufficient
Skin Sensitization	Data Not Sufficient
Reproductive Toxicity	Data Lacking
Germ cell mutagenicity	Data Not Sufficient
Specific target organ toxicity - single (STOT-SE)	STOT Single Exp. 3 , H336 , Nervous System , Inhalation
Specific target organ toxicity - repeated (STOT-RE)	Data Not Sufficient
Carcinogenicity :	Data Lacking

12. ECOLOGICAL INFORMATION

Toxicity:	not known
Persistence and degradability:	not known
Bio-Accumulative Potential:	not known
Mobility and Soil:	not known
Results of PBT & vPvB assessment:	not known
Other adverse effects:	not known

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:

Disposal Operations: Consult state, local, or national regulations for proper disposal. Hand over to authorized disposal company as hazardous waste.

Disposal of Packaging: Disposal must be made according to official regulations.

14. TRANSPORT INFORMATION

Air (ICAO): Not classified as hazardous for transport

Road (ADR): Not classified as hazardous for transport

Sea (IMDG): Not classified as hazardous for transport

DOT Classification Not regulated

TDG Classification Not regulated

LATA Classification Not regulated

IDMG Classification Not regulated

15. REGULATORY INFORMATION

U.S. Federal regulations :

TSCA 5(a)2 final significant new use rules: Ethane, 1,1,2,2-tetrafluoro-1-(2,2, 2-trifluoroethoxy)- TSCA

8(a) CDR Exempt/Partial exemption: Not determined TSCA

12(b) one-time export: Ethane, 1,1,2,2-tetrafluoro-1-(2,2,2- trifluoroethoxy)- All components are listed or exempted.

Clean Air Act Section 112

(b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

16. OTHER INFORMATION

ADR: Accord European sur le transport des marchandises Dangereuses par Route(European Agreement concerning the International Carriage of Dangerous Goods by road)

RID:Reglement International concernant le transport des marchandises dangereuses par chemin de fer (Regulations concerning the International transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the International Air Transport Association

ICAO:International Civil Aviation Organization

ICAO-TI: Technical Instructions by the ICAO

GHS: Globally Harmonized System of Classification and Labeling of Chemicals