

1. IDENTIFICATION

Product Name:	QuikChek Aerosol Simulants
Chemical Name:	1,1,1,2-Tetrafluoroethane
CAS Number:	811-97-2
EC Number:	212-377-0
Catalog Numbers:	7000-168-919-01, 7000-168-920-01, 7000-168-921-01, 7000-168-922-01, 7000-168-923-01, 7000-168-924-01, 7000-168-925-01
Manufacturer:	Research International, Inc. 17161 Beaton Road S.E. Monroe, Washington 98272-1034 USA
Telephone:	01-800-927-7831
Emergency Telephone:	CHEMTREC: (800) 424-9300 (Inside Continental USA) (703) 527-3887 (Outside Continental USA)

2. HAZARD(S) IDENTIFICATION

Hazard Classification: Liquid, aerosol.
 May be irritating to skin, eyes, or mucous membranes.
 May be irritating to respiratory system.
 Contains gas under pressure; may explode if heated.
 May cause frostbite.

Signal Word: Warning



HMIS Rating:	HEALTH	1	Health:	1
	FLAMMABILITY	0	Flammability:	0
	PHYSICAL HAZARDS	1	Physical hazards:	1
	PROTECTIVE EQUIPMENT	B	Protective Equipment:	B

NFPA Rating:		Health:	1
		Flammability:	0
		Reactivity:	1

Potential Acute Health Effects: Breathing high concentrations of 1,1,1,2-Tetrafluoroethane vapor may cause lightheadedness, giddiness, shortness of breath, and may lead to narcosis, cardiac irregularities, unconsciousness, or death.

Carcinogenic Effects: Not available.

Chronic Effects of Overexposure: Not available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

- Category:** Substance
- Common Names:** Freon 134a, Dymel 134a, Forane 134a, Genetron 134a, HFA-134a, HFC-134a, R-134a, Suva 134a, Norflurane
- Description:** The formulation for this product is proprietary information. Only hazardous ingredients in concentrations of 1% or greater and/or carcinogenic ingredients in concentrations of 0.1% or greater are listed in the Chemical Composition table. Active ingredients in any concentration are listed below:

Chemical Composition			
Ingredient	CAS Number	EC Number	Per Cent
1,1,1,2-Tetrafluoroethane	811-97-2	212-377-0	> 99.5%

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and thus would require reporting in this section.

4. FIRST AID MEASURES

- Ingestion:** Do not induce vomiting unless under the direction of a qualified medical professional or Poison Control Center. IMMEDIATELY consult a physician. Do not attempt to give anything by mouth to a seizing, drowsy or unconscious person. If alert, rinse mouth and drink a glass of water.
- Skin Contact:** In case of skin contact, IMMEDIATELY flush exposed skin thoroughly with plenty of water. While wearing protective gloves, remove any contaminated clothing including shoes, and continue to wash skin thoroughly with soap and water for at least 15 minutes. Get IMMEDIATE medical attention. Treat symptomatically.
- Inhalation:** Remove to fresh air. Administer artificial respiration if breathing has ceased. IMMEDIATELY consult a physician.
- Eye Contact:** In case of eye contact, immediately rinse eyes thoroughly with plenty of water. If wearing contact lenses, remove only after initial rinse, and continue rinsing eyes for at least 15 minutes. If irritation occurs or persists, consult a physician.

5. FIRE-FIGHTING MEASURES

- Extinguishing Media:** Carbon dioxide (CO₂), extinguishing powder or water spray.
- Autoignition Temp.:** >750°C
- Flash Point:** 250 °C (482 °F; 523 K)
- Special Fire-Fighting Procedures:** Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.
- Unusual Fire and Explosion Hazards:** Containers may rupture under fire conditions. Decomposition may occur. Exposure to temperatures above 48.8° C (120° F) may cause bursting.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:	Wear appropriate personal protective equipment as specified in Section 8. Keep personnel away from the cleanup area.
Methods for Containment and Clean Up:	Always wear recommended personal protective equipment. Evacuate unprotected personnel. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low-lying areas. Spills and releases may have to be reported to Federal and/or local authorities.

7. HANDLING AND STORAGE

Handling:	Always wear recommended personal protective equipment. Avoid breathing vapors and liquid contact with eyes, skin, or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders. R-134a should not be mixed with air above atmospheric pressure for leak testing or any other purpose.
Storage:	Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.
Incompatible Materials:	Alkalis. Alkaline earth metals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:	ACGIH TLV: None OSHA PEL: None OTHER LIMIT: *1000 ppm TWA (8hr) * = Workplace Environmental Exposure Level (AIHA)
Engineering Measures:	Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.
Personal Protective Equipment:	
Eye/Face Protection:	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin/Body Protection:	No special protective equipment required.
Respiratory Protection:	No protective equipment is needed under normal use conditions.
Hygiene Measures:	Handle in accordance with good industrial hygiene and safety practice. When using do not eat, drink, or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Gas at ambient temperatures
Appearance:	Clear, colorless liquid and vapor
Odor:	Ether odor
Odor threshold:	Not available
pH:	Neutral
Boiling Point and Range:	-26.1° C (-14.98° F)
Freezing Point and Range:	-92.5°C (-141.9°F)
Melting Point:	-103.3 °C (-153.9 °F; 169.8 K)
Flash Point:	250 °C (482 °F; 523 K)
Evaporation Rate:	>1
Flammability:	Not flammable
Upper/Lower Flam. Limits:	N/A
Vapor Pressure:	85.8 psia @ 70°F 213.4 psia @ 130°F
Vapor Density:	3.5
Specific Gravity:	<1.22
Solubility:	0.15 wt%
Partition coefficient (n-octanol/water):	Log Pow = 1.06
Auto-ignition temperature:	>750°C
Decomposition Temp.:	Not available
Viscosity:	Not available
Molecular Formula:	F ₃ CCH ₂ F
Molecular Weight:	102
Additional Information:	Percent Volatile: > 99.5

10. STABILITY AND REACTIVITY

Reactivity:	No reactivity hazard other than the effects described in sub-sections below.
Chemical Stability:	The product is stable.
Conditions to Avoid:	Any source of high temperatures, such as lighted cigarettes, flames, hot spots, or welding may yield toxic and/or corrosive decomposition products. Do not mix with oxygen or air above atmospheric pressure.
Incompatible Materials:	(Under specific conditions: e.g., very high temperatures and/or appropriate pressures) – Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

Hazardous Decomposition Products:	When heated, toxic and corrosive vapors/gases may be formed. Halogenated hydrocarbons. Hydrogen fluoride (HF). Carbon monoxide (CO). Carbon dioxide (CO ₂).
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Routes of Exposure: Inhalation, ingestion, skin contact, and eye contact

Toxicity to Animals: Toxic Dose 1 - LD 50: >2085 mg/kg (oral rat)

Toxicologically Synergistic Products: Not available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation May be irritating to respiratory system, skin, eyes, or mucous membranes.

Sensitization Not available.

Carcinogenicity No known significant effects or critical hazards.

Mutagenic Effects: No known significant effects or critical hazards.

Developmental Effects: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

STOT - single exposure: Based on available data, the classification criteria are not met.

STOT - repeated exposure: Based on available data, the classification criteria are not met.

Aspiration hazard: Not available.

Symptoms/effects, both acute and delayed: Breathing high concentrations of 1,1,1,2-Tetrafluoroethane vapor may cause lightheadedness, giddiness, shortness of breath, and may lead to narcosis, cardiac irregularities, unconsciousness, or death.

Endocrine Disruptor Information: Not available.

12. ECOLOGICAL INFORMATION

Ecotoxicity: There are no data on the ecotoxicity of this product.

Persistence and Degradability: The degradability of the product has not been stated.

Bioaccumulation/ Accumulation: No data available on bioaccumulation.

Mobility: The product contains volatile substances, which may spread in the atmosphere.

Other Adverse Effects: The product contains substances which contribute to global warming (greenhouse effect).

Ecological Information on Ingredients:	LC 50, 96 Hrs, Fish mg/l 450	EC 50, 48 Hrs, Daphnia, mg/l 980
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13. DISPOSAL CONSIDERATIONS

- Waste Management:** Waste to be treated as controlled waste. Disposal to licensed waste disposal site in accordance with local Waste Disposal Authority.
- Waste Disposal Methods:** Dispose of waste and residues in accordance with local authority requirements.

14. TRANSPORT INFORMATION

General: This material is not subject to the transportation regulations of DOT, IATA, IMO, or the ADR. This material is packaged in a small gas receptacle (inhaler) which contains no more than 50 ml (1.7 oz.).

15. REGULATORY INFORMATION

United States of America Inventory

Component	CAS-No	TSCA	TSCA Inventory Notification - Active/Inactive	TSCA - EPA Regulatory Flags
1,1,1,2-Tetrafluoroethane	811-97-2	X		

TSCA 12(b) – Notices of Export Not Applicable

International Inventories

- Listed on the Canadian DSL (Domestic Substances List)
- Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
- 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)
- Listed on INSQ (Mexican National Inventory of Chemical Substances)
- Listed on CICR (Turkish Inventory and Control of Chemicals)

U.S. Federal Regulations

SARA 313	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
SARA 311/312 Hazard Categories	Sudden Release of Pressure Hazard, Chronic Health Hazard
CWA (Clean Water Act)	
Clean Air Act	
OSHA – Occupational Safety and Health Administration	
CERCLA	

California Proposition 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
1,1,1,2-Tetrafluoroethane	-	X	X	-	-

16. OTHER INFORMATION

Prepared by: Technical Communications
Research International, Inc.
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Revision Number: 2.0

Revision Date: June 14, 2023

Revision Summary: This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer: 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 a 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. Users should make independent decisions regarding completeness of the information based on all sources available. Research International, Inc. shall not be held liable for any damage resulting from handling or contact with the above product.

Safety Data Sheet

QuikChek Simulants

P/N 7000-168-9XX-01 Rev 2.0



Key to abbreviations:

ADR = Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
ACGIH = American Conference of Governmental Industrial Hygienists
AICS = Australian Inventory of Chemical Substances
CAS = Chemical Abstracts Service
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CFR = Code of Federal Regulations
CWA = Clean Water Act (U.S.)
CWCL = Chemical Weapons Convention List
DOT = Department of Transportation (U.S.)
DSL = Domestic Substances List (Canada)
EC = European Community
EINECS = European Inventory of Existing Commercial Chemical Substances
ENCS = Existing and New Chemical Substances (Japan)
EPA = Environmental Protection Agency (U.S.)
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
HMIS = Hazardous Materials Identification System
HAP = Hazardous Air Pollution
IATA = International Air Transport Association
IECSC = Inventory of Existing Chemical Substances in China
IBC = Intermediate Bulk Container
IMO = International Maritime Organization
KECL = Korea Existing Chemicals List
LD = Lethal dose
Log Pow = Logarithm of the octanol/water partition coefficient
NDSL = Non-Domestic Substance List (Canada)
NFPA = National Fire Protection Association
OSHA = Occupational Safety and Health Administration (U.S.)
PEL = Permissible Exposure Limit
PICCS = The Philippine Inventory of Chemicals and Chemical Substances
SARA = Superfund Amendments and Reauthorization Act
STOT = Specific Target Organ Toxicity
TLV = Threshold Limit value
TSCA = Toxic Substances Control Act (U.S.)
UN = United Nations