4,4,4-Trifluoro-1-butene

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
SDS Reference Number: 1300354
Issue date: 5/31/2016 Revision date: 10/27/2026 Version: 1.1

SECTION 1 Identification

1.1. Product identifier

Product form	:	Substance
Substance name	:	4,4,4-Trifluoro-1-butene
CAS-No.	:	1524-26-1
Product code	:	1300-3-54
Formula	:	C4H5F3

1.2. Other means of identification

Other means of identification	:	MFCD02262195

1.3. Recommended use of the chemical and restrictions on use

Use of the substance/mixture	:	Laboratory chemicals,Manufacture of substances,Scientific research and development

1.4. Supplier's details

SynQuest Laboratories, Inc.
P.O. Box 309
Alachua, FL, Alachua, 32615
United States of America
T (386) 462-0788 - F (386) 462-7097
info@synquestlabs.com - www.synquestlabs.com

1.5. Emergency phone number

Emergency number	:	(844) 523-4086 (3E Company - Account 10069)

SECTION 2 Hazard Identification

2.1. Classification of the substance or mixture

GHS US classification

Flammable gases, Category 2	H221	Flammable gas.
Gases under pressure : Liquefied gas	H280	Contains gas under pressure; may explode if heated.
Skin corrosion/irritation, Category 2	H315	Causes skin irritation.
Serious eye damage/eye irritation, Category 2A	H319	Causes serious eye irritation.
Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation	H335	May cause respiratory irritation.

Full text of H statements : see section 16

2.2. Label elements

GHS US labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Warning

Hazard statements (GHS US) : H221 - Flammable gas
H280 - Contains gas under pressure; may explode if heated
H315 - Causes skin irritation

H319 - Causes serious eye irritation
H335 - May cause respiratory irritation

Precautionary statements (GHS US) : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 - Avoid breathing fumes, gas, mist, spray, vapors.
P264 - Wash hands, forearms and face thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear protective gloves.
P302+P352 - If on skin: Wash with plenty of soap and water
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a POISON CENTER or doctor/physician if you feel unwell
P321 - Specific treatment (see supplemental first aid instruction on this label).
P332+P313 - If skin irritation occurs: Get medical advice or attention.
P337+P313 - If eye irritation persists: Get medical advice or attention.
P362+P364 - Take off contaminated clothing and wash it before reuse.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - In case of leakage, eliminate all ignition sources.
P403 - Store in a well-ventilated place.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.
P501 - Dispose of contents and/or container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulations.

2.3. Hazards associated with known or reasonably anticipated uses

No additional information available

2.4. Hazards not otherwise classified

No additional information available

2.5. Unknown acute toxicity

No additional information available

SECTION 3 Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent

Name	Product identifier	%	GHS US classification
4,4,4-Trifluoro-1-butene (Main constituent)	CAS-No.: 1524-26-1	≤ 100	Flam. Gas 2, H221 Press. Gas (Liq.), H280 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4 First aid measures

4.1. Description of necessary first-aid measures

First-aid measures general : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Move the affected personnel away from the contaminated area.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. Get immediate medical advice/attention.

First-aid measures after skin contact : Wash with plenty of soap and water. Get medical advice/attention.

First-aid measures after eye contact : Remove contact lenses, if present and easy to do. Continue rinsing. Immediately flush eyes thoroughly with water for at least 15 minutes. Get medical advice/attention.

First-aid measures after ingestion : Due to its physical form, exposure to this chemical is not likely. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention.

4.2. Most important symptoms/effects, acute and delayed

Symptoms/effects : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

Symptoms/effects after inhalation : May cause drowsiness or dizziness.

Symptoms/effects after skin contact : Contact with the liquid the may cause cold burns/frostbite.

Symptoms/effects after eye contact : Direct contact with the liquefied gas may cause severe and possibly permanent eye injury due to frostbite from rapid liquid evaporation.

4.3. Indication of immediate medical attention and special treatment needed, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Alcohol resistant foam. Carbon dioxide. Dry powder. Water spray. Use extinguishing media appropriate for surrounding fire.

5.2. Specific hazards arising from the chemical

Fire hazard : Thermal decomposition generates: Carbon oxides. Hydrogen fluoride.

Explosion hazard : Contains gas under pressure; may explode if heated. Use water spray or fog for cooling exposed containers. May form flammable/explosive vapor-air mixture.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection during firefighting : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate unnecessary personnel. Ensure adequate air ventilation. May cause suffocation by reducing oxygen available for breathing. Do not breathe gas, fumes, vapor or spray.

For non-emergency personnel

Emergency procedures : Only qualified personnel equipped with suitable protective equipment may intervene.

For emergency responders

Protective equipment	:	Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level. Consider the risk of potentially explosive atmospheres. Eliminate every possible source of ignition.
Environmental precautions	:	Avoid release to the environment. Notify authorities if product enters sewers or public waters.

6.2. Methods and materials for containment and cleaning up

For containment	:	Stop leak if safe to do so.
Methods for cleaning up	:	Ventilate area.
Other information	:	For disposal of solid materials or residues refer to section 13 : "Disposal considerations".

For further information refer to section 8: "Exposure controls/personal protection"

SECTION 7 Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Do not handle until all safety precautions have been read and understood. Ensure good ventilation of the work station. Do not breathe fumes, gas, mist, spray, vapors. Wear personal protective equipment. Avoid contact with skin and eyes. Keep away from ignition sources (including static discharges). Proper grounding procedures to avoid static electricity should be followed. Use only non-sparking tools.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety procedures. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.
Additional hazards when processed	:	Pressurized container: Do not pierce or burn, even after use. Handle empty containers with care because residual vapors are flammable. Close valve after each use and when empty.

7.2. Conditions for safe storage, including incompatibilities

Technical measures	:	Comply with applicable regulations.
Storage conditions	:	Protect from sunlight. Do not expose to temperatures exceeding 50 °C. Keep container closed when not in use. Keep away from ignition sources.
Storage area	:	Store in dry, cool, well-ventilated area.
Incompatible materials	:	Refer to Section 10 on Incompatible Materials.

SECTION 8 Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropiate engineering controls

Appropriate engineering controls	:	Ensure good ventilation of the work station. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Systems under pressure should be regularily checked for leakage. Oxygen detectors should be used when asphyxiating gases may be released.

8.3. Individual protection measures, such as personal protective equipment

Hand protection:
protective gloves. 29 CFR 1910.138: Hand Protection

Eye protection:
Chemical goggles or safety glasses. Face shield. 29 CFR 1910.133: Eye and Face Protection
Skin and body protection:
Wear suitable protective clothing
Respiratory protection:
In case of inadequate ventilation wear respiratory protection. 29 CFR 1910.134: Respiratory Protection

Personal protective equipment symbol(s):

Thermal hazard protection:

Cold insulating gloves.

Other information:

Safety shoes. 29 CFR 1910.136: Foot Protection.

SECTION 9 Physical and chemical properties

9.1. Basic physical and chemical properties

Physical state	:	Gas
Color	:	No data available
Odor	:	No data available
Odor threshold	:	No data available
pH	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	11 °C
Flash point	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	No data available
Relative vapor density at 20 °C	:	No data available
Relative density	:	No data available
Molecular mass	:	110.08 g/mol
Solubility	:	No data available
Partition coefficient n-octanol/water (Log Pow)	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Explosion limits	:	No data available
Particle characteristics	:	No data available

9.2. Data relevant with regard to physical hazard classes (supplemental)

No additional information available

SECTION 10 Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Protect from sunlight. Do not expose to temperatures exceeding 50 °C. Keep away from heat, sparks and flame.

10.5. Incompatible materials

Alkali metals. Finely divided metals (Al, Mg, Zn). Strong bases. Strong oxidizing agents.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Hazardous decomposition products in case of fire, see Section 5.

SECTION 11 Toxicological information

11.1. Likely routes of exposure

Acute toxicity (oral)	:	No data available
Acute toxicity (dermal)	:	No data available
Acute toxicity (inhalation)	:	No data available
Skin corrosion/irritation	:	Causes skin irritation.
Serious eye damage/irritation	:	Causes serious eye irritation.
Respiratory or skin sensitization	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	No data available
Reproductive toxicity	:	No data available
STOT-single exposure	:	May cause respiratory irritation.
STOT-repeated exposure	:	No data available
Aspiration hazard	:	Not applicable
Symptoms/effects	:	The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.
Symptoms/effects after inhalation	:	May cause drowsiness or dizziness.
Symptoms/effects after skin contact	:	Contact with the liquid the may cause cold burns/frostbite.
Symptoms/effects after eye contact	:	Direct contact with the liquefied gas may cause severe and possibly permanent eye injury due to frostbite from rapid liquid evaporation.

SECTION 12 Ecological information

12.1. Ecotoxicity

Hazardous to the aquatic environment, short–term (acute)	:	No data available
Hazardous to the aquatic environment, long–term (chronic)	:	No data available

12.2. Persistence and degradability

4,4,4-Trifluoro-1-butene (1524-26-1)	
Persistence and degradability	Rapidly degradable

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Ozone : No data available
Fluorinated greenhouse gases : No

SECTION 13 Disposal considerations

Waste treatment methods : Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber.
Product/Packaging disposal recommendations : Dispose of contents/container in accordance with licensed collector's sorting instructions.
Additional information : Recycle the material as far as possible.

SECTION 14 Transport information

14.1. UN number

UN-No.(DOT) : UN3161
UN-No. (TDG) : UN3161
UN-No. (IMDG) : 3161
UN-No. (IATA) : 3161

14.2. UN Proper Shipping Name

Proper Shipping Name (DOT) : Liquefied gas, flammable, n.o.s.
Proper Shipping Name (TDG) : LIQUEFIED GAS, FLAMMABLE, N.O.S.
Proper Shipping Name (IMDG) : LIQUEFIED GAS, FLAMMABLE, N.O.S.
Proper Shipping Name (IATA) : Liquefied gas, flammable, n.o.s.

14.3. Transport hazard class(es)

DOT
Transport hazard class(es) (DOT) : 2.1
Hazard labels (DOT) : 2.1

TDG
Transport hazard class(es) (TDG) : 2.1
Hazard labels (TDG) : 2.1

IMDG

Transport hazard class(es) (IMDG) : 2.1

Hazard labels (IMDG) : 2.1

IATA

Transport hazard class(es) (IATA) : 2.1

Hazard labels (IATA) : 2.1

14.4. Packing group

Packing group (DOT) : Not applicable

Packing group (TDG) : Not applicable

Packing group (IMDG) : Not applicable

Packing group (IATA) : Not applicable

14.5. Environmental hazards

Other information : No supplementary information available.

14.6. Transport in bulk

Not applicable

14.7. Special precautions for user

DOT

UN-No.(DOT) : UN3161

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

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

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : Forbidden

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg

DOT Vessel Stowage Location : D - The material must be stowed ‘‘on deck only’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other : 40 - Stow ‘‘clear of living quarters’’

TDG

UN-No. (TDG) : UN3161

TDG Special Provisions	:	16 - 1) The technical name of the most dangerous substance related to the primary class must be shown, in parentheses, on the shipping document following the shipping name in accordance with clause 3.5(1)(c)(i)(A) of Part 3, Documentation. The technical name must also be shown, in parentheses, on a small means of containment or on a tag following the shipping name in accordance with subsections 4.11(2) and (3) of Part 4, Dangerous Goods Safety Marks. 2) subsection (1), the technical name for the following dangerous goods is not required to be shown on a shipping document or on a small means of containment when Canadian law for domestic transport or an international convention for international transport prohibits the disclosure of the technical: a) UN1544, ALKALOID SALTS, SOLID, N.O.S. or ALKALOIDS, SOLID, N.O.S; b) UN1851, MEDICINE, LIQUID, TOXIC, N.O.S; c) UN3140, ALKALOID SALTS, LIQUID, N.O.S. or ALKALOIDS, LIQUID, N.O.S; d) UN3248, MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S; or e) UN3249, MEDICINE, SOLID, TOXIC, N.O.S. An example in Canada is the "Food and Drugs Act".
ERAP Index	:	3000
Explosive Limit and Limited Quantity Index	:	0.125 L
Excepted quantities (TDG)	:	E0
Passenger Carrying Vessel Index	:	Forbidden
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	:	Forbidden
Emergency Response Guide (ERG) Number	:	115

IMDG

Special provision (IMDG)	:	274
Limited quantities (IMDG)	:	0
Excepted quantities (IMDG)	:	E0
Packing instructions (IMDG)	:	P200
Tank instructions (IMDG)	:	T50
EmS-No. (Fire)	:	F-D - FIRE SCHEDULE Delta - FLAMMABLE GASES
EmS-No. (Spillage)	:	S-U - SPILLAGE SCHEDULE Uniform - GASES (FLAMMABLE, TOXIC OR CORROSIVE)
Stowage category (IMDG)	:	D
Stowage and handling (IMDG)	:	SW2

IATA

Special provision (IATA)	:	A1, A807
PCA Excepted quantities (IATA)	:	E0
PCA Limited quantities (IATA)	:	Forbidden
PCA limited quantity max net quantity (IATA)	:	Forbidden
PCA packing instructions (IATA)	:	Forbidden
PCA max net quantity (IATA)	:	Forbidden
CAO packing instructions (IATA)	:	200
CAO max net quantity (IATA)	:	150kg
ERG code (IATA)	:	10L

SECTION 15 Regulatory information

15.1. Federal regulations

All components of this product are present and listed as Active on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory, except for:

4,4,4-Trifluoro-1-butene	CAS-No. 1524-26-1	100%

15.2. International regulations

CANADA

No additional information available

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16 Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date : 10/27/2026

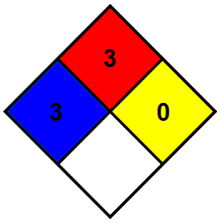
Issue date : 5/31/2016

Full text of hazard classes and H-statements	
H221	Flammable gas
H280	Contains gas under pressure; may explode if heated
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation

NFPA health hazard : 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA fire hazard : 3 - Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating

Health : 2 Moderate Hazard - Temporary or minor injury may occur

Flammability : 3 Serious Hazard - Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 F and boiling points above 100 F. as well as liquids with flash points between 73 F and 100 F. (Classes IB IC)

Physical : 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

Safety Data Sheet (SDS), USA

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is offered solely for your consideration, investigation, and verification. It does not represent any guarantee of the properties of the product nor that the hazard precautions or procedures described are the only ones which exist. SynQuest shall not be held liable or any damage resulting from handling or from contact with the above product.