# (E)-1,3,3,3-Tetrafluoropropene

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
SDS Reference Number: 1300333
Issue date: 10/28/2015 Revision date: 7/16/2026 Version: 1.1

## SECTION 1 Identification

### 1.1. Product identifier

| | | |
|---|---|---|
| Product form | : | Substance |
| Substance name | : | (E)-1,3,3,3-Tetrafluoropropene |
| CAS-No. | : | 29118-24-9 |
| Product code | : | 1300-3-33 |
| Formula | : | C3H2F4 |

### 1.2. Other means of identification

| | | |
|---|---|---|
| Synonyms | : | trans-1,3,3,3-Tetrafluoroprop-1-ene; R-1234ze |
| Other means of identification | : | MFCD03094118 |

### 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

| | | |
|---|---|---|
| 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, Narcosis | H336 | May cause drowsiness or dizziness. |
| 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) : H280 - Contains gas under pressure; may explode if heated
H315 - Causes skin irritation
H319 - Causes serious eye irritation

| | | |
|---|---|---|
| Precautionary statements (GHS US) | : | H335 - May cause respiratory irritation<br>H336 - May cause drowsiness or dizziness<br>P261 - Avoid breathing dust, fume, gas, mist, vapours, spray.<br>P264 - Wash hands, forearms and face thoroughly after handling.<br>P271 - Use only outdoors or in a well-ventilated area.<br>P280 - Wear protective gloves.<br>P302+P352 - If on skin: Wash with plenty of soap and water<br>P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.<br>P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing<br>P312 - Call a POISON CENTER or doctor/physician if you feel unwell<br>P321 - Specific treatment (see supplemental first aid instruction on this label).<br>P332+P313 - If skin irritation occurs: Get medical advice or attention.<br>P337+P313 - If eye irritation persists: Get medical advice or attention.<br>P362+P364 - Take off contaminated clothing and wash it before reuse.<br>P403+P233 - Store in a well-ventilated place. Keep container tightly closed.<br>P405 - Store locked up.<br>P410+P403 - Protect from sunlight. Store in a well-ventilated place.<br>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

Other hazards which do not result in classification : May cause frostbite.

### 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 |
|---|---|---|---|
| (E)-1,3,3,3-Tetrafluoropropene<br>(Main constituent) | CAS-No.: 29118-24-9 | ≤ 100 | Press. Gas (Liq.), H280<br>Skin Irrit. 2, H315<br>Eye Irrit. 2A, H319<br>STOT SE 3, H336<br>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 : Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate 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 immediate 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 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.

### 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.

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.
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. 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.
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 | : | -19 °C |
| Flash point | : | No data available |
| Flammability (solid, gas) | : | No data available |
| Vapor pressure | : | 61.9 psia (@ 20 °C) |
| Relative vapor density at 20 °C | : | No data available |
| Relative density | : | No data available |
| Density | : | 1.17 g/ml (@ 21.1 °C) |
| Molecular mass | : | 114.04 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

May polymerize.

### 10.4. Conditions to avoid

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

### 10.5. Incompatible materials

Alkali metals. Finely divided metals (Al, Mg, Zn). 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) : Not classified.

| (E)-1,3,3,3-Tetrafluoropropene (29118-24-9) | |
|---|---|
| LC50 Inhalation - Rat [ppm] | > 207000 ppm/4h |

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 drowsiness or dizziness. 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 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

| (E)-1,3,3,3-Tetrafluoropropene (29118-24-9) | |
|---|---|
| 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) : UN3163
UN-No. (TDG) : UN3163
UN-No. (IMDG) : 3163
UN-No. (IATA) : 3163

### 14.2. UN Proper Shipping Name

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

### 14.3. Transport hazard class(es)

**DOT**
Transport hazard class(es) (DOT) : 2.2
Hazard labels (DOT) : 2.2

**TDG**
Transport hazard class(es) (TDG) : 2.2
Hazard labels (TDG) : 2.2

**IMDG**
Transport hazard class(es) (IMDG) : 2.2
Hazard labels (IMDG) : 2.2

### IATA

Transport hazard class(es) (IATA) : 2.2
Hazard labels (IATA) : 2.2

## 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) : UN3163
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) : 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.

### TDG

UN-No. (TDG) : UN3163
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”.
Explosive Limit and Limited Quantity Index : 0.125 L
Excepted quantities (TDG) : E1
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 75 L
Emergency Response Guide (ERG) Number : 126

### IMDG

| | | |
|---|---|---|
| Special provision (IMDG) | : | 274 |
| Limited quantities (IMDG) | : | 120 ml |
| Excepted quantities (IMDG) | : | E1 |
| Packing instructions (IMDG) | : | P200 |
| Tank instructions (IMDG) | : | T50 |
| EmS-No. (Fire) | : | F-C - FIRE SCHEDULE Charlie - NON-FLAMMABLE GASES |
| EmS-No. (Spillage) | : | S-V - SPILLAGE SCHEDULE Victor - GASES (NON-FLAMMABLE, NON-TOXIC) |
| Stowage category (IMDG) | : | A |

### IATA

| | | |
|---|---|---|
| PCA Excepted quantities (IATA) | : | E1 |
| PCA Limited quantities (IATA) | : | Forbidden |
| PCA limited quantity max net quantity (IATA) | : | Forbidden |
| PCA packing instructions (IATA) | : | 200 |
| PCA max net quantity (IATA) | : | 75kg |
| CAO packing instructions (IATA) | : | 200 |
| CAO max net quantity (IATA) | : | 150kg |
| ERG code (IATA) | : | 2L |

## 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

### 15.2. International regulations

#### CANADA

**(E)-1,3,3,3-Tetrafluoropropene (29118-24-9)**

Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

No additional information available

#### National regulations

**(E)-1,3,3,3-Tetrafluoropropene (29118-24-9)**

Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on the Japanese ENCS (Existing  New Chemical Substances) inventory
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the TCSI (Taiwan Chemical Substance Inventory)
Listed on the NCI (Vietnam - National Chemical Inventory)
Listed on TECI (Thailand Existing Chemicals Inventory)

### 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 : 7/16/2026

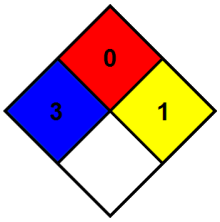
Issue date : 10/28/2015

| Full text of hazard classes and H-statements | |
|---|---|
| H280 | Contains gas under pressure; may explode if heated |
| H315 | Causes skin irritation |
| H319 | Causes serious eye irritation |
| H335 | May cause respiratory irritation |
| H336 | May cause drowsiness or dizziness |

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

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity : 1 - Materials that in themselves are normally stable but can become unstable at elevated temperatures and pressures.




Hazard Rating

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

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

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.