

FORANE® 143a

1. PRODUCT AND COMPANY IDENTIFICATION

Company

Arkema Inc.
 900 First Avenue
 King of Prussia, Pennsylvania 19406

Fluorochemicals

Customer Service Telephone Number: (800) 245-5858
 (Monday through Friday, 8:00 AM to 5:00 PM EST)

Emergency Information

Transportation: CHEMTREC: (800) 424-9300
 (24 hrs., 7 days a week)
Medical: Rocky Mountain Poison Center: (866) 767-5089
 (24 hrs., 7 days a week)

Product Information

Product name: FORANE® 143a
Synonyms: Not available
Molecular formula: C2H3F3
Chemical family: Hydrofluorocarbon
Product use: Refrigerant

2. HAZARDS IDENTIFICATION

Emergency Overview

Color: colourless
Physical state: gaseous
Form: compressed liquefied gas
Odor: ether-like

***Classification of the substance or mixture:**

Flammable Gases, Category 1, H220
 Gases under pressure, Liquefied gas, H280

*For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms:



FORANE® 143aSignal word: **Danger****Hazard statements:**

H220 : Extremely flammable gas.
H280 : Contains gas under pressure; may explode if heated.

Supplemental Hazard Statements:

Overheating or overpressurizing may cause gas release or violent cylinder bursting. May decompose on contact with flames or extremely hot metal surfaces to produce toxic and corrosive products. May cause frostbite. May cause headache, nausea, dizziness, drowsiness, loss of consciousness. May cause cardiac sensitization/cardiac arrhythmia. May displace oxygen and cause rapid suffocation.

Precautionary statements:**Prevention:**

P210 : Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Response:

P377 : Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 : Eliminate all ignition sources if safe to do so.

Storage:

P403 : Store in a well-ventilated place.
P410 : Protect from sunlight.

Supplemental information:**Potential Health Effects:**

Rapid evaporation of the liquid may cause frostbite. Vapor: Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. If inhaled: Central nervous system effects: headache, nausea, dizziness, drowsiness, loss of consciousness. Stress induced heart effects: Inhalation may cause an increase in the sensitivity of the heart to adrenaline, which could result in irregular or rapid heartbeats and reduced heart function.

Medical conditions aggravated by overexposure:

Heart disease or compromised heart function.

3. COMPOSITION/INFORMATION ON INGREDIENTS

FORANE® 143a

Chemical Name	CAS-No.	Wt/Wt	GHS Classification**
Ethane, 1,1,1-trifluoro-	420-46-2	>= 99 %	H220, H280

**For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

Inhalation:

If inhaled, remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Skin:

If on skin, flush exposed skin with lukewarm water (not hot), or use other means to warm skin slowly. Get medical attention if frostbitten by liquid or if irritation occurs. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eyes:

Immediately flush eye(s) with plenty of water.

Ingestion:

Ingestion is not applicable - product is a gas at ambient temperatures.

Notes to physician:

Do not give drugs from adrenaline-ephedrine group.

5. FIREFIGHTING MEASURES

Extinguishing media (suitable):

Water spray, Carbon dioxide (CO2), Dry chemical

Protective equipment:

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand / NIOSH approved or equivalent).

Further firefighting advice:

Fight fire with large amounts of water from a safe distance.
 Water mist should be used to reduce vapor concentrations in air.
 Cool closed containers exposed to fire with water spray.
 Closed containers of this material may explode when subjected to heat from surrounding fire.
 After a fire, wait until the material has cooled to room temperature before initiating clean-up activities.
 Fire fighting equipment should be thoroughly decontaminated after use.
 Stop the flow of gas if possible.

Fire and explosion hazards:

FORANE® 143a

May decompose on contact with flames or extremely hot metal surfaces to produce toxic and corrosive products. Liquid and gas under pressure, overheating or overpressurizing may cause gas release and/or violent cylinder bursting.

Container may explode if heated due to resulting pressure rise.

Some mixtures of HCFCs and/or HFCs, and air or oxygen may be combustible if pressurized and exposed to extreme heat or flame.

When burned, the following hazardous products of combustion can occur:

Carbon oxides

Carbonyl halides

Hydrogen fluoride

6. ACCIDENTAL RELEASE MEASURES**In case of spill or leak:**

Prevent further leakage or spillage if you can do so without risk. Evacuate area of all unnecessary personnel. Eliminate all ignition sources. Use Halogen leak detector or other suitable means to locate leaks or check atmosphere. Keep upwind. Evacuate enclosed spaces and disperse gas with floor-level forced-air ventilation. Avoid breathing leaked material. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7. HANDLING AND STORAGE**Handling****General information on handling:**

Avoid breathing gas.

Avoid contact with skin, eyes and clothing.

Keep away from heat, sparks and flames.

Wear cold-insulating gloves/face shield/eye protection.

Do not change or force fit connections.

Keep container closed.

Use only with adequate ventilation.

Use equipment rated for cylinder pressure.

Use a backflow preventative device in piping.

Wash thoroughly after handling.

Close valve after each use and when empty.

Check that all equipment is properly grounded and installed to satisfy electrical classification requirements.

Container hazardous when empty.

Follow label warnings even after container is emptied.

Do not enter confined spaces unless adequately ventilated.

RESIDUAL GASES MAY EXPLODE ON IGNITION.

DO NOT CUT, DRILL, GRIND, OR WELD ON OR NEAR THIS CONTAINER.

Emptied container retains vapor and product residue.

Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

Storage**General information on storage conditions:**

Keep away from direct sunlight. Keep cylinders restrained. Store in cool, dry, well ventilated area away from sources of ignition such as flame, sparks and static electricity. Ensure that all storage and handling equipment is properly grounded and installed to satisfy electrical classification requirements. Static electricity may accumulate when

FORANE® 143a

transferring material. All metal and groundable storage containers, including but not limited to drums, cylinders, Returnable Intermodal Bulk Containers (RIBCs) and Class C Flexible Intermodal Bulk Containers (FIBCs) must be bonded and grounded during filling and emptying operations. Observe all federal, state and local regulations and National Fire Protection Association (NFPA) Codes which pertain to the specific local conditions of storage and use, including OSHA 29 CFR 1910.106 and NFPA 30, 70, 77, and 497.

Storage stability – Remarks:

Do not apply direct flame to cylinder. Do not store cylinder in direct sun or expose it to heat above 120 F (48.9 C.). Do not drop or refill this cylinder.

Storage incompatibility – General:

Store separate from:

Strong bases

Alkali metals

Alkaline earth metals

Strong oxidizing agents

Finely divided metals (aluminium, magnesium, zinc...)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

Ethane, 1,1,1-trifluoro- (420-46-2)

US. OARS. WEELs Workplace Environmental Exposure Level Guide

Time weighted average	1,000 ppm (3,400 mg/m3)
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Remarks:	Listed
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Only those components with exposure limits are printed in this section. Limits with skin contact designation above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required. Limits with a sensitizer designation above mean that exposure to this material may cause allergic reactions.

Engineering controls:

Investigate engineering techniques to reduce exposures below airborne exposure limits or to otherwise reduce exposures. Provide ventilation if necessary to minimize exposures or to control exposure levels to below airborne exposure limits (if applicable see above). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Monitor carbon monoxide and oxygen levels in tanks and enclosed spaces. Consult ACGIH ventilation manual, NFPA Standard 91 and NFPA Standard 654 for design of exhaust system and safe handling.

Respiratory protection:

Avoid breathing gas. Where airborne exposure is likely or airborne exposure limits are exceeded (if applicable, see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components (full facepiece recommended). Consult respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure or where exposure

FORANE® 143a

limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Skin protection:

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Rinse immediately if skin is contaminated. Wash contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling.

Eye protection:

Use good industrial practice to avoid eye contact.

9. PHYSICAL AND CHEMICAL PROPERTIES
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Color:	colourless
Physical state:	gaseous
Form:	compressed liquefied gas
Odor:	ether-like
Odor threshold:	No data available
Flash point	Not applicable
Auto-ignition temperature:	1,382 °F (750 °C)
Lower flammable limit (LFL):	7.1 %(V)
Upper flammable limit (UFL):	16.1 %(V)
pH:	Not applicable
Density:	676 kg/m3 (149 °F (65 °C))
Vapor pressure:	9,465.776 mmHg (77 °F (25 °C))
Vapor density:	3.5 kg/m3 At the boiling point
Boiling point/boiling range:	-53.3 °F (-47.4 °C)
Melting point/range:	-168 °F (-111 °C)
Evaporation rate:	Not applicable
Solubility in water:	0.761 g/l 77 °F (25 °C) (Method: calculated)

FORANE® 143a

Oil/water partition coefficient:	Not applicable
Thermal decomposition	Not applicable
Flammability:	See GHS Classification in Section 2

10. STABILITY AND REACTIVITY**Stability:**

This material is chemically stable under normal and anticipated storage, handling and processing conditions.

Materials to avoid:

Alkaline earth metals
Finely divided metals (aluminium, magnesium, zinc...)
Alkali metals
Strong acids
Strong oxidizing agents

Conditions / hazards to avoid:

See HANDLING AND STORAGE section of this MSDS for specified conditions. Heat

Hazardous decomposition products:

Thermal decomposition giving toxic and corrosive products :
Carbonyl halides
Carbon oxides
Hydrogen fluoride

11. TOXICOLOGICAL INFORMATION**Data for FORANE® 143a****Acute toxicity****Inhalation:**

No deaths occurred. (Rat) 4 h LC0 > 591000 ppm.

Sensitization:

Causes cardiac sensitization. Inhalation. (Dog) Stress induced heart effects: signs: irregular heart beat, rapid heart beat, in some cases, sudden death (Reaction may occur in response to stress (natural adrenaline release) or administration of epinephrine.)

Repeated dose toxicity

Repeated inhalation administration to rat and guinea pig / affected organ(s): lung / signs: irritation, bronchitis, pneumonia

Chronic oral administration to rat / No adverse effects reported.

FORANE® 143a**Carcinogenicity**

Chronic oral administration to rat / signs: No increase in tumor incidence was reported.

Genotoxicity**Assessment in Vitro:**

No genetic changes were observed in laboratory tests using: bacteria, human cells

Assessment in Vivo:

No genetic changes were observed in laboratory tests using: mice

Developmental toxicity

Exposure during pregnancy. Inhalation (rat and rabbit) / No birth defects were observed.

12. ECOLOGICAL INFORMATION**Chemical Fate and Pathway**

Data on this material and/or a similar material are summarized below.

Data for FORANE® 143a**Biodegradation:**

Not readily biodegradable. (28 d) biodegradation 3 - 10 % / similar material

Octanol Water Partition Coefficient:

log Pow = 1.73 (calculated)

Global Warming Potential:

GWP 3,800 (Global warming potential with respect to CO₂ (time horizon 100 years))

Ozone Depletion Potential:

ODP 0 (Ozone depletion potential; ODP; (R-11 = 1))

Ecotoxicology

Data on this material and/or a similar material are summarized below.

Data for FORANE® 143a**Aquatic toxicity data:**

No adverse effects reported. Oncorhynchus mykiss (rainbow trout) 96 h LC₀ >= 175 mg/l (Nominal concentration)

Aquatic invertebrates:

Practically nontoxic. Daphnia magna (Water flea) 48 h EC₅₀ = 300 mg/l

13. DISPOSAL CONSIDERATIONS**Waste disposal:**

Do not vent the container contents, or product residuals, to the atmosphere. Recover and reclaim unused contents or residuals as appropriate. Recovered/reclaimed product can be returned to an approved certified reclaimer or back to the seller depending on the material. Completely emptied disposable containers can be disposed of as recyclable steel. Returnable cylinders must be returned to seller. Dispose of in accordance with federal, state and

FORANE® 143a

local regulations. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14. TRANSPORT INFORMATION

US Department of Transportation (DOT)

UN Number : 2035
 Proper shipping name : 1,1,1-Trifluoroethane (R143A)
 Class : 2.1
 Marine pollutant : no

International Maritime Dangerous Goods Code (IMDG)

UN Number : 2035
 Proper shipping name : 1,1,1-TRIFLUOROETHANE (REFRIGERANT GAS R 143a)
 Class : 2.1
 Marine pollutant : no

15. REGULATORY INFORMATION

Chemical Inventory Status

EU. EINECS	EINECS	Conforms to
United States TSCA Inventory	TSCA	The components of this product are all on the TSCA Inventory.
Canadian Domestic Substances List (DSL)	DSL	All components of this product are on the Canadian DSL.
China. Inventory of Existing Chemical Substances in China (IECSC)	IECSC (CN)	Conforms to
Japan. ENCS - Existing and New Chemical Substances Inventory	ENCS (JP)	Conforms to
Japan. ISHL - Inventory of Chemical Substances	ISHL (JP)	Conforms to
Korea. Korean Existing Chemicals Inventory (KECI)	KECI (KR)	Conforms to
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	PICCS (PH)	Conforms to
Australia Inventory of Chemical Substances (AICS)	AICS	Conforms to

FORANE® 143a

United States – Federal Regulations

SARA Title III – Section 302 Extremely Hazardous Chemicals:

The components in this product are either not SARA Section 302 regulated or regulated but present in negligible concentrations.

SARA Title III - Section 311/312 Hazard Categories:

Acute Health Hazard, Fire Hazard, Sudden Release of Pressure Hazard

SARA Title III – Section 313 Toxic Chemicals:

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.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - Reportable Quantity (RQ):

The components in this product are either not CERCLA regulated, regulated but present in negligible concentrations, or regulated with no assigned reportable quantity.

United States – State Regulations

New Jersey Right to Know

<u>Chemical Name</u>	<u>CAS-No.</u>
Ethane, 1,1,1-trifluoro-	420-46-2

New Jersey Right to Know – Special Health Hazard Substance(s)

<u>Chemical Name</u>	<u>CAS-No.</u>
Ethane, 1,1,1-trifluoro-	420-46-2

Pennsylvania Right to Know

<u>Chemical Name</u>	<u>CAS-No.</u>
Ethane, 1,1,1-trifluoro-	420-46-2

California Prop. 65

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

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

- H220 Extremely flammable gas.
- H280 Contains gas under pressure; may explode if heated.

Miscellaneous:

FORANE® 143a

Other information: Refer to National Fire Protection Association (NFPA) Codes 30, 70, 77, and 497 and OSHA 29 CFR 1910.106, for safe handling.

Latest Revision(s):

Reference number: 000000032236
Date of Revision: 05/09/2015
Date Printed: 05/09/2015

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