

FORANE® 32**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® 32
Synonyms: Not available
Molecular formula: CH₂F₂
Chemical family: Hydrofluorocarbon
Molecular weight: 52.02 g/mol
Product use: Refrigerant

2. HAZARDS IDENTIFICATION**Emergency Overview**

Color: Clear - colourless
Physical state: gaseous
Form: Liquefied gas
Odor: Ether-like (slightly)

***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:



Signal 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 displace oxygen and cause rapid suffocation. May cause headache, nausea, dizziness, drowsiness, loss of consciousness. May cause cardiac sensitization/cardiac arrhythmia.

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:

Liquid : Contact with liquid or refrigerated gas can cause cold burns and 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.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Wt/Wt	GHS Classification**
Methane, difluoro-	75-10-5	100 %	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.
 Stop the flow of gas if possible.
 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.

FORANE® 32**Fire and explosion hazards:**

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

Hydrogen fluoride

Carbonyl halides

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.

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.

Do not change or force fit connections.

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.

Improper disposal or reuse of this container may be dangerous and/or illegal.

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

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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 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:

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

Strong bases

Alkali metals

Alkaline earth metals

Strong oxidizing agents

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

Methane, difluoro- (75-10-5)

US. OARS. WEELs Workplace Environmental Exposure Level Guide

Time weighted average	1,000 ppm (2,200 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

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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 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 thoroughly after handling. Wash contaminated clothing and clean protective equipment before reuse.

Eye protection:

Use good industrial practice to avoid eye contact.

9. PHYSICAL AND CHEMICAL PROPERTIES
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Color:	Clear - colourless
Physical state:	gaseous
Form:	Liquefied gas
Odor:	Ether-like (slightly)
Odor threshold:	No data available
Flash point	Not applicable
Auto-ignition temperature:	not determined
Lower flammable limit (LFL):	14.4 %(V)
Upper flammable limit (UFL):	31.0 %(V)
pH:	Not applicable
Density:	0.96 g/cm ³ (77 °F (25 °C))
Vapor pressure:	11,429 mmHg (70.0 °F (21.1 °C))
Vapor density:	1.81 kg/m ³
Boiling point/boiling range:	-61.1 °F (-51.7 °C)
Freezing point:	-213 °F (-136 °C)
Evaporation rate:	No data available

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Solubility in water:	not determined
% Volatiles:	100 %
Molecular weight:	52.02 g/mol
Oil/water partition coefficient:	No data available
Thermal decomposition	No data available
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:

Heat

Hazardous decomposition products:

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

11. TOXICOLOGICAL INFORMATION

Data on this material and/or its components are summarized below.

Data for FORANE® 32

Acute toxicity

Inhalation:

Practically nontoxic. (Rat) 4 h LC50 > 520000 ppm. signs: anesthetic effects, central nervous system depression

Sensitization:

Cardiac sensitization not observed. inhalation. (Dog) signs: tremors

FORANE® 32**Repeated dose toxicity**

Subchronic inhalation administration to Rat / No adverse effects reported.

Genotoxicity**Assessment in Vitro:**

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

Assessment in Vivo:

No genetic changes were observed in a laboratory test 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 its components are summarized below.

Data for FORANE® 32**Biodegradation:**

Not readily biodegradable. (28 d) biodegradation 5 %

Octanol Water Partition Coefficient:

log Pow = 0.21

Global Warming Potential:

GWP 543 (Global warming potential with respect to CO₂ (time horizon 100 years))

Ozone Depletion Potential:

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

Ecotoxicology

No data are available.

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 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.

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14. TRANSPORT INFORMATION

US Department of Transportation (DOT)

UN Number : 3252
 Proper shipping name : Difluoromethane
 Class : 2.1
 Marine pollutant : no

International Maritime Dangerous Goods Code (IMDG)

UN Number : 3252
 Proper shipping name : DIFLUOROMETHANE (REFRIGERANT GAS R 32)
 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

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, Sudden Release of Pressure Hazard, Fire Hazard

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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

No components are subject to the New Jersey Right to Know Act.

Pennsylvania Right to Know

<u>Chemical Name</u>	<u>CAS-No.</u>
Methane, difluoro-	75-10-5

Pennsylvania Right to Know – Environmentally Hazardous Substance(s)

<u>Chemical Name</u>	<u>CAS-No.</u>
Methane, difluoro-	75-10-5

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:

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: 000000057858
 Date of Revision: 05/09/2015
 Date Printed: 05/09/2015

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