SAFETY DATA SHEET

Kidde Aerospace & Defense

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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name of the substance	Heptafluoropropane
Trade name of the substance	Heptafluoropropane in a pressurized container
Identification number	207-079-2 (EC number)
Registration number	-
Synonyms	HFC-227ea
Product code	KA008EU

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Fire Extinguishing Agent.
Uses advised against	Consult applicable fire protection codes.

1.3. Details of the supplier of the safety data sheet

Non-EU Manufacturer

Company name	Kidde Aerospace, a part of Collins Aerospace
Address	4200 Airport Dr NW Wilson, NC 27896 USA
Telephone	+1 252 237-7004

Only Representative

Company name	L'Hotellier, a part of Collins Aerospace
Address	4 rue Henri Poincaré 92167 Antony cedex, France
Telephone	+33 1 46 66 08 08
e-mail	Thibaut.Rollot@Collins.com
Contact person	Thibaut Rollot

1.4. Emergency telephone number

(US) +1 760 476 3961

TF (UK) 0 800 680 0425
(GB) +44 20 35147487
(Access code: 334509)

General in EU	112 (Available 24 hours a day. SDS/Product information may not be available for the Emergency Service.)
National Poisons Control Centre	ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (Available 24 hours a day. SDS/Product information may not be available for the Emergency Service.)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Physical hazards

Gases under pressure	Liquefied gas	H280 - Contains gas under pressure; may explode if heated.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains: Heptafluoropropane

Hazard pictograms

Signal word Warning

Hazard statements

H280 Contains gas under pressure; may explode if heated.

Precautionary statements

Prevention Not assigned.

Response Not assigned.

Storage

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

Disposal Not assigned.

Supplemental information on the label Direct contact with the cold gas or liquid can cause freezing of exposed tissues.

2.3. Other hazards May displace oxygen and cause rapid suffocation.

This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII. The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties. The substance is not considered to have endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Heptafluoropropane	>99		-	-	
Classification: Press. Gas;H280					

Composition comments Gas concentrations are in percent by volume.

SECTION 4: First aid measures

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

4.1. Description of first aid measures

Inhalation Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory tract irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Skin contact In case of contact with liquefied gas, thaw frosted parts with lukewarm water. Obtain medical attention if frostbite or blistering occurs or redness persists.

Eye contact Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. If burning, redness, itching, pain, or other symptoms develop or persist get medical attention.

Ingestion Ingestion is not a typical route of exposure for gases or liquefied gases.

4.2. Most important symptoms and effects, both acute and delayed Convulsions. Headache. Dizziness. Fatigue. Nausea, vomiting. Very high exposure can cause suffocation from lack of oxygen. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themself. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

4.3. Indication of any immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. In case of frostbite, place the frostbitten part in warm water. If warm water is not available or impractical to use, wrap the affected parts gently in blankets. DO NOT USE HOT WATER.

SECTION 5: Firefighting measures

General fire hazards Contents under pressure.

5.1. Extinguishing media

Suitable extinguishing media This preparation is used as an extinguishing agent and therefore is not a problem when trying to control a fire. Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media	No restrictions known.
5.2. Special hazards arising from the substance or mixture	Pressurised container may explode when exposed to heat or flame. During fire, gases hazardous to health may be formed.
5.3. Advice for firefighters	
Special protective equipment for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Special fire fighting procedures	In case of fire and/or explosion do not breathe fumes. Cool containers exposed to heat with water spray and remove container, if no risk is involved.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Wear appropriate protective equipment and clothing during clean-up.
For emergency responders	Remove leaking cylinder to a safe place. In the event of a leak evacuate all personnel until ventilation can restore oxygen concentrations to safe levels. In confined spaces, make sure the area is well-ventilated and sufficient oxygen (19.5%) exists before entry. Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Wear appropriate protective equipment and clothing during clean-up. Use personal protection recommended in Section 8 of the SDS. Emergency personnel need self-contained breathing equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained.
6.2. Environmental precautions	Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases.
6.3. Methods and material for containment and cleaning up	Allow gas to evaporate. Isolate area until gas has dispersed.
6.4. Reference to other sections	For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Never apply flame or localized heat directly to any part of the containers. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Purge air from system before introducing gas. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid breathing gas. Avoid prolonged exposure. Do not enter storage areas or confined spaces unless adequately ventilated. Use only outdoors or in a well-ventilated area. Oxygen concentration should not fall below 19.5 % at sea level (pO2 = 135 mmHg). Mechanical ventilation or local exhaust ventilation may be required. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices.
7.2. Conditions for safe storage, including any incompatibilities	Store in a cool, dry place out of direct sunlight. Store in tightly closed container. Store in a well-ventilated place. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Stored containers should be periodically checked for general condition and leakage. Store away from incompatible materials (see section 10 of the SDS).
7.3. Specific end use(s)	Observe industrial sector guidance on best practices.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).
Recommended monitoring procedures	Follow standard monitoring procedures.
Derived no effect levels (DNELs)	Not available.
Predicted no effect concentrations (PNECs)	Not available.

8.2. Exposure controls

Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

General information	Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.
Eye/face protection	Wear safety glasses with side shields (or goggles). Eye protection should meet standard EN 166.
Skin protection	
- Hand protection	Wear appropriate chemical resistant gloves. Glove material: Nitrile rubber. Use gloves with breakthrough time of 480 minutes. Minimum glove thickness 0.2 mm. The protective gloves to be used must comply with the specifications of Regulation (EU) 2016/425 and the related standard EN374.
- Other	Wear suitable protective clothing.
Respiratory protection	In oxygen deficient atmospheres, use a self contained breathing apparatus, as an air purifying respirator will not provide protection. Check with respiratory protective equipment suppliers to select the appropriate protection. Follow guidance on selection, use, care and maintenance in accordance with EN 529.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
Hygiene measures	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquefied gas under pressure.
Form	Liquefied gas.
Colour	Clear, colourless.
Odour	Odourless.
Odour threshold	Property has not been measured.
Melting point/freezing point	-204 °C (-335,2 °F)
Boiling point or initial boiling point and boiling range	-16,4 °C (2,48 °F)
Flammability	Non flammable.
Upper/lower flammability or explosive limits	
Explosive limit - lower (%)	Not explosive.
Explosive limit – upper (%)	Not explosive.
Flash point	Not applicable, material is a gas.
Auto-ignition temperature	Property has not been measured.
Decomposition temperature	Property has not been measured.
pH	Not applicable, material is a gas.
Kinematic viscosity	Not applicable, material is a gas.
Solubility	
Solubility (water)	260 mg/l (25 °C (77 °F))
Partition coefficient (n-octanol/water) (log value)	Not applicable (material is insoluble in water).
Vapour pressure	28,8 psi (21,11 °C (70 °F))
Density and/or relative density	
Density	1,394 g/cm3 (25 °C (77 °F))
Relative density	1,46
Vapour density	6,04 (Air=1) (21,11 °C (70 °F))
Particle characteristics	Not applicable, material is a gas.

9.2. Other information

9.2.1. Information with regard to physical hazard classes	No relevant additional information available.
9.2.2. Other safety characteristics	No relevant additional information available.

SECTION 10: Stability and reactivity

10.1. Reactivity	Decomposes on heating. Containers may rupture or explode if exposed to heat.
10.2. Chemical stability	Material is stable under normal conditions.
10.3. Possibility of hazardous reactions	Hazardous polymerisation will not occur.
10.4. Conditions to avoid	High temperatures. Exposure to sunlight. Contact with incompatible materials.
10.5. Incompatible materials	Powdered metals (ex. aluminum, zinc, etc.). Strong bases. Oxidizers. Reducing Agents.
10.6. Hazardous decomposition products	Hydrofluoric acid. Carbon monoxide. Carbon dioxide. Various hydrocarbons.

SECTION 11: Toxicological information

General information Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Prolonged inhalation may be harmful.
Skin contact	Contact with liquefied gas may cause frostbite.
Eye contact	Contact with liquefied gas may cause frostbite.
Ingestion	Ingestion is not a typical route of exposure for gases.

Symptoms Convulsions. Headache. Dizziness. Fatigue. Nausea, vomiting. Very high exposure can cause suffocation from lack of oxygen. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themself. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.
Skin corrosion/irritation	Contact with liquefied gas may cause frostbite.
Serious eye damage/eye irritation	Contact with liquefied gas may cause frostbite.
Respiratory sensitisation	Due to partial or complete lack of data the classification is not possible.
Skin sensitisation	Due to partial or complete lack of data the classification is not possible.
Germ cell mutagenicity	Due to partial or complete lack of data the classification is not possible.
Carcinogenicity	Due to partial or complete lack of data the classification is not possible.
Reproductive toxicity	Due to partial or complete lack of data the classification is not possible.
Specific target organ toxicity - single exposure	Due to partial or complete lack of data the classification is not possible.
Specific target organ toxicity - repeated exposure	Due to partial or complete lack of data the classification is not possible.
Aspiration hazard	Due to partial or complete lack of data the classification is not possible.
Mixture versus substance information	No information available.

11.2. Information on other hazards

Endocrine disrupting properties	The substance is not included in the list established in accordance with REACH Article 59(1) for having endocrine disrupting properties.
Other information	Prolonged inhalation may be harmful.

SECTION 12: Ecological information

12.1. Toxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
12.2. Persistence and degradability	No data is available on the degradability of this product.
12.3. Bioaccumulative potential	Not expected to bioconcentrate or bioaccumulate.

Partition coefficient n-octanol/water (log Kow)	Not applicable (material is insoluble in water).
Bioconcentration factor (BCF)	Not available.
12.4. Mobility in soil	The gas will disperse in the air.
12.5. Results of PBT and vPvB assessment	This substance does not meet vPvB / PBT criteria of Regulation (EC) No 1907/2006, Annex XIII.
12.6. Endocrine disrupting properties	This substance does not have endocrine disrupting properties with respect to the environment, as it does not meet the assessment criteria laid out in Regulations (EC) No 1907/2006, (EU) No 2017/2100 and (EU) 2018/605.
12.7. Other adverse effects	Not established.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
EU waste code	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations. Do not cut, puncture or weld on or near to the pressurized container. If spilled, expellant will vaporize to the atmosphere.
Special precautions	Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. UN number	UN1956
14.2. UN proper shipping name	COMPRESSED GAS, N.O.S. (Heptafluoropropane, Nitrogen)
14.3. Transport hazard class(es)	
Class	2.2
Subsidiary risk	-
Label(s)	2.2
Hazard No. (ADR)	20
Tunnel restriction code	E
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

RID

14.1. UN number	UN1956
14.2. UN proper shipping name	COMPRESSED GAS, N.O.S. (Heptafluoropropane, Nitrogen)
14.3. Transport hazard class(es)	
Class	2.2
Subsidiary risk	-
Label(s)	2.2(+13)
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

ADN

14.1. UN number	UN1956
14.2. UN proper shipping name	COMPRESSED GAS, N.O.S. (Heptafluoropropane, Nitrogen)
14.3. Transport hazard class(es)	
Class	2.2
Subsidiary risk	-
Label(s)	2.2
14.4. Packing group	Not assigned.
14.5. Environmental hazards	No.

14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

14.1. UN number	UN1956
14.2. UN proper shipping name	Compressed gas, n.o.s. (Heptafluoropropane, Nitrogen)
14.3. Transport hazard class(es)	
Class	2.2
Subsidiary risk	-
14.4. Packing group	-
14.5. Environmental hazards	No.
ERG Code	2L
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

14.1. UN number	UN1956
14.2. UN proper shipping name	COMPRESSED GAS, N.O.S. (Heptafluoropropane, Nitrogen)
14.3. Transport hazard class(es)	
Class	2.2
Subsidiary risk	-
14.4. Packing group	-
14.5. Environmental hazards	
Marine pollutant	No.
EmS	F-C, S-V
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
14.7. Maritime transport in bulk according to IMO instruments	Not applicable.
General information	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: Ensure that containers are firmly secured. Ensure cylinder valve is closed and not leaking. Ensure valve outlet cap nut or plug (where provided) is correctly fitted. Ensure valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

Not listed.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Not listed.

Other regulations	The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.
National regulations	Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended.
France regulations	The product does not contain any substances covered by the table of work-related illnesses (Les Maladies Professionnelles).
15.2. Chemical safety assessment	No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

ADN: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways.
ADR: Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS: Chemical Abstract Service.
CEN: European Committee for Standardization.
IATA: International Air Transport Association.
IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.
IMDG: International Maritime Dangerous Goods.
MARPOL: International Convention for the Prevention of Pollution from Ships.
PBT: Persistent, bioaccumulative and toxic.
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail.
vPvB: Very persistent and very bioaccumulative.

References	ECHA: European Chemical Agency. IARC: International Agency for Research on Cancer. ACGIH: American Conference of Governmental and Industrial Hygienists.
Information on evaluation method leading to the classification of mixture	Not applicable.
Full text of any statements, which are not written out in full under sections 2 to 15	H280 Contains gas under pressure; may explode if heated.
Training information	Follow training instructions when handling this material.
Disclaimer	Collins Aerospace cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.