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### Pentafluoroethane (HFC-125)
(Pressurized with Nitrogen)

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<td>P. ANDERSON</td>
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</table>
1. IDENTIFICATION

Product Name Pentafluoroethane (HFC-125) (Pressurized with Nitrogen)
Other Names FE-25™

Recommended use of the chemical and restrictions on use
Identified uses Fire Extinguishing Agent
Restrictions on Use Consult applicable fire protection codes

Company Identification UTC Aerospace Systems
4200 Airport Drive, NW
Wilson, NC 27896

Customer Information Number (253) 237-7004
Emergency Telephone Number 1-800-451-8386 Site Code: 33067
3E Company

Issue Date June 16, 2015
Supersedes Date July 10, 2013 Rev A

Safety Data Sheet prepared in accordance with OSHA’s Hazard Communication Standard (29 CFR 1910.1200) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

2. HAZARD IDENTIFICATION

Hazard Classification
Gas under pressure – Liquefied gas
Simple Asphyxiant

Label Elements
Hazard Symbols

Signal Word: Warning

Hazard Statements
Contents under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary Statements
Prevention
Do not enter confined space unless adequately ventilated.
In case of inadequate ventilation wear respiratory protection.

Response
None

Storage
Protect from sunlight and store in well-ventilated place.
Keep container tightly closed.
2. HAZARD IDENTIFICATION

Disposal
None

Other Hazards
Direct contact with the cold gas or liquid can cause freezing of exposed tissues.

Specific Concentration Limits
The values listed below represent the percentages of ingredients of unknown toxicity.
- Acute oral toxicity 0%
- Acute dermal toxicity 0%
- Acute inhalation toxicity 0%
- Acute aquatic toxicity 0%

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms:
This product is a substance.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentafluoroethane</td>
<td>354-33-6</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note: This product uses nitrogen as the expellant and also contains a small amount of helium.

4. FIRST-AID MEASURES

Description of necessary first-aid measures

Eyes
Immediately flood the eye with plenty of warm water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Skin
Flush with water. Obtain medical attention if frostbite or blistering occurs or redness persists.

Ingestion
Ingestion is not considered a potential route of exposure.

Inhalation
Remove from exposure. If there is difficulty in breathing, give oxygen. Obtain medical attention immediately.

Most important symptoms/effects, acute and delayed
Aside from the information found under Description of necessary first aid measures (above) and Indication of immediate medical attention and special treatment needed, no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

Notes to Physicians
Do not give adrenaline or similar drugs. Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.
5. FIRE - FIGHTING MEASURES

Suitable Extinguishing Media
This preparation is used as an extinguishing agent and therefore is not a problem when trying to control a fire. Use extinguishing agent appropriate to other materials involved. Keep pressurized containers and surroundings cool with water spray as they may rupture or burst in the heat of a fire.

Specific hazards arising from the chemical
Pressurized containers may explode in heat of fire. Predominant decomposition product is hydrogen fluoride in fire situations. Products are irritants and potentially toxic if fire extinguishment is delayed.

Special Protective Actions for Fire-Fighters
Wear full protective clothing and self-contained breathing apparatus as appropriate for specific fire conditions.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Remove leaking cylinder to a safe place. Ventilate the area. Leaks inside confined spaces may cause suffocation as oxygen is displaced and should not be entered without a self-contained breathing apparatus.

Environmental Precautions
None

Methods and materials for containment and cleaning up
None

7. HANDLING AND STORAGE

Precautions for safe handling
Wear appropriate protective clothing. Do not breathe gas. Prevent skin and eye contact.

Conditions for safe storage
Pressurized containers should be properly stored and secured to prevent falling or being knocked over. Do not drag, slide or roll pressurized containers. Do not drop pressurized containers or permit them to strike against each other. Never apply flame or localized heat directly to any part of the pressurized or plastic container. Store pressurized containers away from high heat sources. Storage area should be: cool - dry - well ventilated - under cover - out of direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below, if they exist.

Pentafluoroethane
DuPont AEL: 1000 ppm, 8 and 12 hr TWA

Appropriate engineering controls
Use with adequate ventilation. There should be local procedures for the selection, training, inspection and maintenance of this equipment. When used in large volumes, use local exhaust ventilation.
8. **EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Individual protection measures**

**Respiratory Protection**
Not normally required. In oxygen deficient atmospheres, use a self-contained breathing apparatus, as an air purifying respirator will not provide protection.

**Skin Protection**
Gloves

**Eye/Face Protection**
Chemical goggles or safety glasses with side shields.

**Body Protection**
Normal work wear.

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9. **PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Pentafluoroethane</th>
<th>Nitrogen and Helium</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Compressed gas</td>
</tr>
<tr>
<td><strong>Physical State</strong></td>
<td>Liquefied gas under pressure</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Colorless</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>Slight ether-like</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
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<tr>
<td><strong>pH</strong></td>
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<tr>
<td><strong>Specific Gravity</strong></td>
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<tr>
<td><strong>Boiling Range/Point (°C/F)</strong></td>
<td>-48.1°C/-54.6°F at 1013 hPa</td>
</tr>
<tr>
<td><strong>Melting Point (°C/F)</strong></td>
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</tr>
<tr>
<td><strong>Flash Point (PMCC) (°C/F)</strong></td>
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<tr>
<td><strong>Vapor Pressure</strong></td>
<td>13,779 hPa @ 77°F(25°C)</td>
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<tr>
<td><strong>Evaporation Rate (BuAc=1)</strong></td>
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<tr>
<td><strong>Solubility in Water</strong></td>
<td>0.9 g/l @ 77°F(25°C) and 1013 hPa</td>
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<tr>
<td><strong>Vapor Density (Air = 1)</strong></td>
<td>4.2</td>
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<tr>
<td><strong>VOC (%)</strong></td>
<td>No data available</td>
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<tr>
<td><strong>Partition coefficient (n-octanol/water)</strong></td>
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<tr>
<td><strong>Viscosity</strong></td>
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<tr>
<td><strong>Auto-ignition Temperature</strong></td>
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<tr>
<td><strong>Decomposition Temperature</strong></td>
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<tr>
<td><strong>Upper explosive limit</strong></td>
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<td><strong>Lower explosive limit</strong></td>
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</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
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9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tr>
<td>Vapor Pressure</td>
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<tr>
<td>Evaporation Rate (BuAc=1)</td>
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<tr>
<td>Solubility in Water</td>
<td>No data available</td>
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<tr>
<td>Vapor Density (Air = 1)</td>
<td>Not applicable</td>
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<tr>
<td>VOC (g/l)</td>
<td>None</td>
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<tr>
<td>VOC (%)</td>
<td>None</td>
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<tr>
<td>Partition coefficient (n-octanol/water)</td>
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<td>Lower explosive limit</td>
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</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not flammable</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Reactivity
Pressurized containers may rupture or explode if exposed to heat.

Chemical Stability
Stable under normal conditions.

Possibility of hazardous reactions
Hazardous polymerization will not occur.

Conditions to Avoid
The product is not flammable in air under ambient conditions of temperature and pressure. When pressurized with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.

Incompatible Materials
Alkali metals - alkaline earth metals - powdered metals - powdered metal salts

Hazardous Decomposition Products
Oxides of carbon - hydrogen fluoride - carbonyl fluoride

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
Pentafluoroethane
Inhalation LC50 (Rat) >800,000 ppm 4hr

Specific Target Organ Toxicity (STOT) – single exposure
Pentafluoroethane
Cardiac sensitization (canine) Inhalation: LOAEC 75,000 ppm; NOAEC 100,000 ppm
Cardiac sensitization threshold limit : > 245,400 mg/m³
Anesthetic effects threshold limit : 490,800 mg/m³
11. TOXICOLOGICAL INFORMATION

Specific Target Organ Toxicity (STOT) – repeat exposure
Pentafluoroethane: Inhalation (rat) NOAEC: 50,000 ppm, 28 days (6 hours/day, 5 days/week).

Serious Eye damage/Irritation
No relevant studies identified. Direct contact with the cold gas or liquid can cause freezing of exposed tissues.

Skin Corrosion/Irritation
No relevant studies identified. Direct contact with the cold gas or liquid can cause freezing of exposed tissues.

Respiratory or Skin Sensitization
Pentafluoroethane: Does not cause respiratory sensitization (human)

Carcinogenicity
Not considered carcinogenic by NTP, IARC, and OSHA.

Germ Cell Mutagenicity
Pentafluoroethane: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Animal testing did not show any mutagenic effects.

Reproductive Toxicity
Pentafluoroethane: Animal testing showed no developmental or reproductive toxicity.

Aspiration Hazard
Not an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity
LC50 (rainbow trout) 450 mg/l 96h
EC50 (Daphnia magna) 980 mg/l 48h
ErC50 (Algae) 142 mg/l 96h
Based on data from similar substances.

Mobility in soil
No relevant studies identified.

Persistence/Degradability
No relevant studies identified.

Bioaccumulative Potential
No relevant studies identified.

Other adverse effects
No relevant studies identified.
13. DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose of container in accordance with all applicable local and national regulations. Do not cut, puncture or weld on or near to the pressurized container. If spilled, expellant will vaporize to the atmosphere.

14. TRANSPORT INFORMATION

<table>
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Containers must be shipped with the appropriate safety caps.

15. REGULATORY INFORMATION

United States TSCA Inventory
All components of this product are in compliance with the inventory listing requirements of the US Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Canada DSL Inventory
All ingredients in this product have been verified for inclusion on the Domestic Substance List (DSL).

SARA Title III Sect. 311/312 Categorization
Immediate (Acute) Health Hazard - Pressure Hazard

SARA Title III Sect. 313
This product contains a chemical which is listed in Section 313 at or above de minimis concentrations:
None

California Proposition 65
This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

NFPA Ratings
NFPA Code for Health - 1
NFPA Code for Flammability - 0
NFPA Code for Reactivity - 0
NFPA Code for Special Hazards - None

HMIS Ratings
HMIS Code for Health - 1
HMIS Code for Flammability - 0
HMIS Code for Physical Hazard - 1
HMIS Code for Personal Protection - See Section 8
*Chronic
16. OTHER INFORMATION

Legend
ACGIH: American Conference of Governmental Industrial Hygienists
AEL: Acceptable Exposure Limits
CAS#: Chemical Abstracts Service Number
EC50: Effect Concentration 50%
IARC: International Agency for Research on Cancer
LC50: Lethal Concentration 50%
LD50: Lethal Dose 50%
N/A: Denotes no applicable information found or available
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
RQ: Reportable Quantity
STEL: Short Term Exposure Limit
TLV: Threshold Limit Value
TSCA: Toxic Substance Control Act

Revision Date: June 16, 2015
Changes made: Updated to GHS Classification.

Information Source and References
This SDS is prepared by Hazard Communication Specialists based on information provided by internal company references.

Prepared By: EnviroNet LLC.
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