SECTION 1. IDENTIFICATION

Product name : Freon™ HP80 (R-402A) Refrigerant

SDS-Identcode : 130000050991

Manufacturer or supplier's details
Company name of supplier : The Chemours Company FC, LLC
Address : 1007 Market Street
          Wilmington, DE 19899 United States of America (USA)
Telephone : 1-844-773-CHEM (outside the U.S. 1-302-773-1000)

Recommended use of the chemical and restrictions on use
Recommended use : Refrigerant
Restrictions on use : For professional users only.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200
Gases under pressure : Liquefied gas
Simple Asphyxiant

GHS label elements
Hazard pictograms :

Signal Word : Warning
Hazard Statements : H280 Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.
Precautionary Statements :
Storage: P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Other hazards
Dangerous for the ozone layer.
SAFETY DATA SHEET

Freon™ HP80 (R-402A) Refrigerant

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Hazardous ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chemical name</td>
</tr>
<tr>
<td>Mixture</td>
<td>Pentafluoroethane*</td>
</tr>
<tr>
<td></td>
<td>Chlorodifluoromethane</td>
</tr>
<tr>
<td></td>
<td>Propane</td>
</tr>
</tbody>
</table>

* Voluntarily-disclosed non-hazardous substance

SECTION 4. FIRST AID MEASURES

General advice: In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.

If inhaled: If inhaled, remove to fresh air. Get medical attention if symptoms occur.

In case of skin contact: Thaw frosted parts with lukewarm water. Do not rub affected area. Get medical attention immediately.

In case of eye contact: Get medical attention immediately.

If swallowed: Ingestion is not considered a potential route of exposure.

Most important symptoms and effects, both acute and delayed: May cause cardiac arrhythmia. Other symptoms potentially related to misuse or inhalation abuse are Cardiac sensitization Anaesthetic effects Light-headedness Dizziness confusion Lack of coordination Drowsiness Unconsciousness Contact with liquid or refrigerated gas can cause cold burns and frostbite.

Protection of first-aiders: No special precautions are necessary for first aid responders.

Notes to physician: Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES
SAFETY DATA SHEET

Freon™ HP80 (R-402A) Refrigerant

Version 5.0  Revision Date: 10/17/2017  SDS Number: 1336454-00034  Date of last issue: 06/30/2017
Date of first issue: 02/27/2017

Suitable extinguishing media: Not applicable
Will not burn

Unsuitable extinguishing media: Not applicable
Will not burn

Specific hazards during fire fighting:
Exposure to combustion products may be a hazard to health.
If the temperature rises there is danger of the vessels bursting
due to the high vapor pressure.

Hazardous combustion products:
Fluorine compounds
Carbon oxides

Specific extinguishing methods:
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Fight fire remotely due to the risk of explosion.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.

Special protective equipment for fire-fighters:
Wear self-contained breathing apparatus for firefighting if necessary.
Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
Evacuate personnel to safe areas.
Avoid skin contact with leaking liquid (danger of frostbite).
Ventilate the area.
Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions:
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.

Methods and materials for containment and cleaning up:
Ventilate the area.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures:
Use equipment rated for cylinder pressure. Use a backflow preventative device in piping. Close valve after each use and when empty.

Local/Total ventilation:
Use only with adequate ventilation.

Advice on safe handling:
Do not breathe gas.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.

Wear cold insulating gloves/ face shield/ eye protection.

Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point.

Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

Prevent backflow into the gas tank.

Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems.

Close valve after each use and when empty. Do NOT change or force fit connections.

Prevent the intrusion of water into the gas tank.

Never attempt to lift cylinder by its cap.

Do not drag, slide or roll cylinders.

Use a suitable hand truck for cylinder movement.

Keep away from heat and sources of ignition.

Take precautionary measures against static discharges.

Take care to prevent spills, waste and minimize release to the environment.

Conditions for safe storage:

Cylinders should be stored upright and firmly secured to prevent falling or being knocked over.

Separate full containers from empty containers.

Do not store near combustible materials.

Avoid area where salt or other corrosive materials are present.

Keep in properly labeled containers.

Keep in a cool, well-ventilated place.

Keep away from direct sunlight.

Store in accordance with the particular national regulations.

Materials to avoid:

Do not store with the following product types:

Self-reactive substances and mixtures

Organic peroxides

Oxidizing agents

Flammable liquids

Flammable solids

Pyrophoric liquids

Pyrophoric solids

Self-heating substances and mixtures

Substances and mixtures which in contact with water emit flammable gases

Explosives

Acutely toxic substances and mixtures

Substances and mixtures with chronic toxicity

Recommended storage temperature:

< 52 °C

Storage period:

> 10 y

Further information on storage stability:

The product has an indefinite shelf life when stored properly.
SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentafluoroethane</td>
<td>354-33-6</td>
<td>TWA</td>
<td>1,000 ppm</td>
<td>US WEEL</td>
</tr>
<tr>
<td>Chlorodifluoromethane</td>
<td>75-45-6</td>
<td>TWA</td>
<td>1,000 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ST</td>
<td>1,250 ppm</td>
<td>NIOSH REL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4,375 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1,000 ppm</td>
<td>3,500 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1,000 ppm</td>
<td>NIOSH REL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1,800 mg/m³</td>
<td>NIOSH REL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1,800 mg/m³</td>
<td>OSHA Z-1</td>
</tr>
</tbody>
</table>

Engineering measures : Ensure adequate ventilation, especially in confined areas. Minimize workplace exposure concentrations.

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material : Low temperature resistant gloves

Remarks : Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often!

Eye protection : Wear the following personal protective equipment: Chemical resistant goggles must be worn. Face-shield
Skin and body protection: Skin should be washed after contact.

Protective measures: Wear cold insulating gloves/ face shield/ eye protection.

Hygiene measures: Ensure that eye flushing systems and safety showers are located close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquefied gas

Color: clear, colorless

Odor: slight, ether-like

Odor Threshold: No data available

pH: No data available

Melting point/freezing point: No data available

Initial boiling point and boiling range: 48.9 °C (1,013 hPa)

Flash point: Not applicable

Evaporation rate: > 1 (CCL4=1.0)

Flammability (solid, gas): Will not burn


Lower explosion limit / Lower flammability limit: Lower flammability limit Method: ASTM E681 None.

Vapor pressure: 13,480 hPa (25 °C)

24,500 hPa (50 °C)

Relative vapor density: No data available

Relative density: 1.15 (25 °C)

Density: 1.13 - 1.15 g/cm³ (25 °C) (as liquid)

Solubility(ies)

Water solubility: No data available
Partition coefficient: n-octanol/water : Not applicable
Autoignition temperature : 723 °C
Decomposition temperature : No data available
Viscosity
  Viscosity, kinematic : Not applicable
Explosive properties : Not explosive
Oxidizing properties : The substance or mixture is not classified as oxidizing.
Particle size : Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.
Chemical stability : Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.
Possibility of hazardous reactions : Can react with strong oxidizing agents.
Conditions to avoid : Heat, flames and sparks.
Incompatible materials : Oxidizing agents
Hazardous decomposition products : No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Inhalation
Skin contact
Eye contact

Acute toxicity
Not classified based on available information.

Ingredients:

Pentafluoroethane:
  Acute inhalation toxicity : LC0 (Rat): > 80000 ppm
  Exposure time: 4 h
  Test atmosphere: gas
  Method: OECD Test Guideline 403

Chlorodifluoromethane:
  Acute inhalation toxicity : LC50 (Mouse): > 150000 ppm
Exposure time: 4 h
Test atmosphere: gas

Lowest observed adverse effect concentration (Dog): 50000 ppm
Test atmosphere: gas
Symptoms: Cardiac sensitization

No observed adverse effect concentration (Dog): 25000 ppm
Test atmosphere: gas
Symptoms: Cardiac sensitization

Cardiac sensitisation threshold limit (Dog): 175,000 mg/m³
Test atmosphere: gas
Symptoms: Cardiac sensitization

**Propane:**

Acute inhalation toxicity: LC50 (Rat): > 800000 ppm
Exposure time: 15 min
Test atmosphere: gas

**Skin corrosion/irritation**
Not classified based on available information.

**Serious eye damage/eye irritation**
Not classified based on available information.

**Respiratory or skin sensitization**

**Skin sensitization**
Not classified based on available information.

**Respiratory sensitization**
Not classified based on available information.

**Ingredients:**

**Chlorodifluoromethane:**
Routes of exposure: Skin contact
Species: Not tested on animals
Result: negative

**Germ cell mutagenicity**
Not classified based on available information.

**Ingredients:**

**Pentafluoroethane:**
Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: inhalation (gas)
Method: OECD Test Guideline 474
Result: negative

Chlorodifluoromethane:

Germ cell mutagenicity - Assessment: Weight of evidence does not support classification as a germ cell mutagen.

Propane:

Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (gas)
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity
Not classified based on available information.

Ingredients:

Chlorodifluoromethane:

Carcinogenicity - Assessment: Weight of evidence does not support classification as a carcinogen

IARC
No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA
No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

NTP
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity
Not classified based on available information.

Ingredients:

Pentafluoroethane:

Effects on fertility: Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: inhalation (vapor)
Result: negative
Remarks: Based on data from similar materials

Effects on fetal development: Test Type: Embryo-fetal development
Species: Rat
Chlorodifluoromethane:

Reproductive toxicity - Assessment: Weight of evidence does not support classification for reproductive toxicity

Propane:

Effects on fertility: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: inhalation (gas)
Method: OECD Test Guideline 422
Result: negative

Effects on fetal development: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: inhalation (gas)
Method: OECD Test Guideline 422
Result: negative

STOT-single exposure
Not classified based on available information.

Ingredients:

Propane:
Assessment: May cause drowsiness or dizziness.

STOT-repeated exposure
Not classified based on available information.

Ingredients:

Chlorodifluoromethane:
Assessment: No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

Repeated dose toxicity

Ingredients:

Pentafluoroethane:
Species: Rat
NOAEL: >= 50000 ppm
Application Route: inhalation (gas)
Exposure time: 13 Weeks
Method: OECD Test Guideline 413
Chlorodifluoromethane:
Species: Mouse
NOAEL: 10000 ppm
LOAEL: 50000 ppm
Application Route: inhalation (gas)
Exposure time: 581 d
Remarks: No significant adverse effects were reported

Propane:
Species: Rat
NOAEL: 7.214 mg/l
Application Route: inhalation (gas)
Exposure time: 6 Weeks
Method: OECD Test Guideline 422

Aspiration toxicity
Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Ingredients:
Pentafluoroethane:
Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 980 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Toxicity to algae : EC50 (Pseudokirchneriella subcapitata (green algae)): > 114 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Chlorodifluoromethane:
Toxicity to fish : LC50 (Zebrafish): 777 mg/l
Exposure time: 96 h

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 433 mg/l
aquatic invertebrates Exposure time: 48 h
Toxicity to algae EC50 (algae): 250 mg/l Exposure time: 96 h

Persistence and degradability

Ingredients:

Pentafluoroethane:
Biodegradability Result: Not readily biodegradable. Biodegradation: 5 % Exposure time: 28 d Method: OECD Test Guideline 301D

Chlorodifluoromethane:
Biodegradability Result: Not readily biodegradable.

Propane:
Biodegradability Result: Readily biodegradable. Biodegradation: 100 % Exposure time: 385.5 h Remarks: Based on data from similar materials

Bioaccumulative potential

Ingredients:

Pentafluoroethane:
Partition coefficient: n-octanol/water Pow: 1.48 (25 °C)

Mobility in soil
No data available

Other adverse effects

Ingredients:

Chlorodifluoromethane:
Ozone-Depletion Potential 0.055
Where a range of ODPs is indicated, the highest value in that range shall be used for the purposes of the Protocol. The ODPs listed as a single value have been determined from calculations based on laboratory measurements. Those listed as a range are based on estimates and are less certain. The range pertains to an isomeric group. The upper value is the estimate of the ODP of the isomer with the highest ODP, and the lower value is the estimate of the ODP of the isomer with the lowest ODP.
Regulation: UNEP - Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer (Update: 2006-10-01)
Group: Annex C - Group I: HCFCs (consumption and production)

0.055
Includes all isomers of the substance, regardless of whether the isomer is explicitly listed on its own.

Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class II Substances (Update: 2014-10-28)

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
- Waste from residues: Dispose of in accordance with local regulations.
- Contaminated packaging:
  - Empty containers should be taken to an approved waste handling site for recycling or disposal.
  - Empty pressure vessels should be returned to the supplier.
  - If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

**UN/RTDG**
- UN number: UN 3163
- Proper shipping name: LIQUEFIED GAS, N.O.S.
  - (Pentafluoroethane, Chlorodifluoromethane)
- Class: 2.2
- Packing group: Not assigned by regulation
- Labels: 2.2

**IATA-DGR**
- UN/ID No.: UN 3163
- Proper shipping name: Liquefied gas, n.o.s.
  - (Pentafluoroethane, Chlorodifluoromethane)
- Class: 2.2
- Packing group: Not assigned by regulation
- Labels: Non-flammable, non-toxic Gas
- Packing instruction (cargo aircraft): 200
- Packing instruction (passenger aircraft): 200

**IMDG-Code**
- UN number: UN 3163
- Proper shipping name: LIQUEFIED GAS, N.O.S.
  - (Pentafluoroethane, Chlorodifluoromethane)
- Class: 2.2
- Packing group: Not assigned by regulation
- Labels: 2.2
- EmS Code: F-C, S-V
- Marine pollutant: no
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know
CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.
SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.
SARA 302 Extremely Hazardous Substances Threshold Planning Quantity
This material does not contain any components with a section 302 EHS TPQ.
SARA 311/312 Hazards
- Gases under pressure
- Simple Asphyxiant

SARA 313
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>Reporting Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorodifluoromethane</td>
<td>75-45-6</td>
</tr>
<tr>
<td></td>
<td>38 %</td>
</tr>
</tbody>
</table>

US State Regulations
Pennsylvania Right To Know
- Pentfluoroethane: 354-33-6
- Chlorodifluoromethane: 75-45-6
- Propane: 74-98-6

California Prop. 65
This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

California List of Hazardous Substances
- Chlorodifluoromethane: 75-45-6

California Permissible Exposure Limits for Chemical Contaminants
- Chlorodifluoromethane: 75-45-6
- Propane: 74-98-6

International Regulations
Montreal Protocol (Ozone Depleting Substances): Chlorodifluoromethane
SECTION 16. OTHER INFORMATION

Further information

NFPA:

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Health</th>
<th>Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Special hazard.

HMIS® IV:

- **HEALTH** / 0
- **FLAMMABILITY** 0
- **PHYSICAL HAZARD** 3

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

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Chemours™ and the Chemours Logo are trademarks of The Chemours Company.
Before use read Chemours safety information.
For further information contact the local Chemours office or nominated distributors.
All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

Full text of other abbreviations

- **ACGIH**: USA. ACGIH Threshold Limit Values (TLV)
- **NIOSH REL**: USA. NIOSH Recommended Exposure Limits
- **OSHA Z-1**: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
- **US WEEL**: USA. Workplace Environmental Exposure Levels (WEEL)
- **ACGIH / TWA**: 8-hour, time-weighted average
- **NIOSH REL / TWA**: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
- **NIOSH REL / ST**: STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
- **OSHA Z-1 / TWA**: 8-hour time weighted average
- **US WEEL / TWA**: 8-hr TWA

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized Sys-
SAFETY DATA SHEET

Freon™ HP80 (R-402A) Refrigerant

Version: 5.0  Revision Date: 10/17/2017  SDS Number: 1336454-00034  Date of last issue: 06/30/2017  Date of first issue: 02/27/2017


Revision Date: 10/17/2017

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user’s end product, if applicable.

US / Z8