

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

---

### SECTION 1. IDENTIFICATION

Product name : Freon™ NU-22B™ Refrigerant (R-422B)

Product code : D15440181

SDS-Identcode : 130000144665

#### Manufacturer or supplier's details

Company name of supplier : The Chemours Company FC, LLC

Address : 1007 Market Street  
Wilmington, DE 19801 United States of America (USA)

Telephone : 1-844-773-CHEM (outside the U.S. 1-302-773-1000)

Emergency telephone : Medical emergency: 1-866-595-1473 (outside the U.S. 1-302-773-2000) ; Transport emergency: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

#### Recommended use of the chemical and restrictions on use

Recommended use : Refrigerant

---

### SECTION 2. HAZARDS IDENTIFICATION

#### GHS classification in accordance with the OSHA Hazard Communication Standard (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

Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardi-

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

Version 4.4      Revision Date: 10/10/2020      SDS Number: 2767323-00010      Date of last issue: 03/30/2020  
Date of first issue: 05/04/2018

ac effects.  
Rapid evaporation of the product may cause frostbite.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

#### Components

| Chemical name              | CAS-No.  | Concentration (% w/w) |
|----------------------------|----------|-----------------------|
| Pentafluoroethane#         | 354-33-6 | 55                    |
| 1,1,1,2-Tetrafluoroethane# | 811-97-2 | 42                    |
| Isobutane                  | 75-28-5  | 2.9642                |

# 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 : Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

### SECTION 5. FIRE-FIGHTING MEASURES

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|                |                              |                              |                                                                   |
|----------------|------------------------------|------------------------------|-------------------------------------------------------------------|
| Version<br>4.4 | Revision Date:<br>10/10/2020 | SDS Number:<br>2767323-00010 | Date of last issue: 03/30/2020<br>Date of first issue: 05/04/2018 |
|----------------|------------------------------|------------------------------|-------------------------------------------------------------------|

- 
- |                                                |                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suitable extinguishing media                   | : Water spray<br>Alcohol-resistant foam<br>Carbon dioxide (CO2)<br>Dry chemical                                                                                                                                                                                                                        |
| Unsuitable extinguishing media                 | : None known.                                                                                                                                                                                                                                                                                          |
| 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<br>Carbon oxides<br>Hydrogen fluoride<br>carbonyl fluoride                                                                                                                                                                                                                        |
| Specific extinguishing methods                 | : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.<br>Fight fire remotely due to the risk of explosion.<br>Use water spray to cool unopened containers.<br>Remove undamaged containers from fire area if it is safe to do so.<br>Evacuate area. |
| Special protective equipment for fire-fighters | : Wear self-contained breathing apparatus for firefighting if necessary.<br>Use personal protective equipment.                                                                                                                                                                                         |
- 

### SECTION 6. ACCIDENTAL RELEASE MEASURES

- |                                                                     |                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Personal precautions, protective equipment and emergency procedures | : Evacuate personnel to safe areas.<br>Avoid skin contact with leaking liquid (danger of frostbite).<br>Ventilate the area.<br>Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).                                                                                                              |
| Environmental precautions                                           | : Avoid release to the environment.<br>Prevent further leakage or spillage if safe to do so.<br>Retain and dispose of contaminated wash water.                                                                                                                                                                                                             |
| Methods and materials for containment and cleaning up               | : Ventilate the area.<br>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.<br>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 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------|

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

- when empty.
- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Do not breathe gas.  
Avoid breathing 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 tem- : < 126 °F / < 52 °C

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

Version 4.4      Revision Date: 10/10/2020      SDS Number: 2767323-00010      Date of last issue: 03/30/2020  
Date of first issue: 05/04/2018

perature

Storage period : > 10 y

Further information on storage stability : The product has an indefinite shelf life when stored properly.

Keep container tightly closed in a dry and well-ventilated place.

Stable under recommended storage conditions.

Keep away from direct sunlight.

### SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Ingredients with workplace control parameters

| Components                | CAS-No.  | Value type<br>(Form of exposure) | Control parameters / Permissible concentration | Basis     |
|---------------------------|----------|----------------------------------|------------------------------------------------|-----------|
| Pentafluoroethane         | 354-33-6 | TWA                              | 1,000 ppm                                      | US WEEL   |
| 1,1,1,2-Tetrafluoroethane | 811-97-2 | TWA                              | 1,000 ppm                                      | US WEEL   |
| Isobutane                 | 75-28-5  | TWA                              | 800 ppm<br>1,900 mg/m <sup>3</sup>             | NIOSH REL |
|                           |          | STEL                             | 1,000 ppm                                      | ACGIH     |

**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**

**Remarks** : Take note that the product is extremely cold, which may impact the selection of hand protection. Wash hands before breaks and at the end of workday.

**Eye protection** : Wear the following personal protective equipment:  
Chemical resistant goggles must be worn.  
Face-shield

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|                |                              |                              |                                                                   |
|----------------|------------------------------|------------------------------|-------------------------------------------------------------------|
| Version<br>4.4 | Revision Date:<br>10/10/2020 | SDS Number:<br>2767323-00010 | Date of last issue: 03/30/2020<br>Date of first issue: 05/04/2018 |
|----------------|------------------------------|------------------------------|-------------------------------------------------------------------|

|                          |                                                                                                                                                                                                                            |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Skin and body protection | : Skin should be washed after contact.                                                                                                                                                                                     |
| Protective measures      | : Wear cold insulating gloves/ face shield/ eye protection.                                                                                                                                                                |
| Hygiene measures         | : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.<br>When using do not eat, drink or smoke.<br>Wash contaminated clothing before re-use. |

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

|                                                  |                                                            |
|--------------------------------------------------|------------------------------------------------------------|
| Appearance                                       | : Liquefied gas                                            |
| Color                                            | : colorless                                                |
| Odor                                             | : slight, ether-like                                       |
| Odor Threshold                                   | : No data available                                        |
| pH                                               | : 7                                                        |
| Melting point/freezing point                     | : No data available                                        |
| Initial boiling point and boiling range          | : -32.6 °F / -35.9 °C                                      |
| Flash point                                      | : Not applicable                                           |
| Evaporation rate                                 | : Not applicable                                           |
| Flammability (solid, gas)                        | : No data available                                        |
| Upper explosion limit / Upper flammability limit | : Upper flammability limit<br>No data available            |
| Lower explosion limit / Lower flammability limit | : Lower flammability limit<br>No data available            |
| Vapor pressure                                   | : 8,300 hPa (68 °F / 20 °C)<br>23,460 hPa (140 °F / 60 °C) |
| Relative vapor density                           | : No data available                                        |
| Relative density                                 | : No data available                                        |
| Density                                          | : 0.0058 g/cm <sup>3</sup><br>(as liquid)                  |

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|                |                              |                              |                                                                   |
|----------------|------------------------------|------------------------------|-------------------------------------------------------------------|
| Version<br>4.4 | Revision Date:<br>10/10/2020 | SDS Number:<br>2767323-00010 | Date of last issue: 03/30/2020<br>Date of first issue: 05/04/2018 |
|----------------|------------------------------|------------------------------|-------------------------------------------------------------------|

|                                        |                                                            |
|----------------------------------------|------------------------------------------------------------|
| Solubility(ies)<br>Water solubility    | : No data available                                        |
| Partition coefficient: n-octanol/water | : Not applicable                                           |
| Autoignition temperature               | : > 1022 °F / > 550 °C                                     |
| Decomposition temperature              | : No data available                                        |
| Viscosity<br>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                | : This substance is not flammable in air at temperatures up to 100 °C (212 °F) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. This substance can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing this substance and air, or this substance in an oxygen enriched atmosphere become combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, this substance should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example this substance should NOT be mixed with air under pressure for leak testing or other purposes.<br>Heat, flames and sparks. |
| Incompatible materials             | : Oxidizing agents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Hazardous decomposition products   | : No hazardous decomposition products are known.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

### SECTION 11. TOXICOLOGICAL INFORMATION

#### Information on likely routes of exposure

Inhalation  
Skin contact  
Eye contact

#### Acute toxicity

Not classified based on available information.

#### Components:

##### **Pentafluoroethane:**

Acute inhalation toxicity : LC50 (Rat): > 800000 ppm  
Exposure time: 4 h  
Test atmosphere: gas  
Method: OECD Test Guideline 403

No observed adverse effect concentration (Dog): 75000 ppm  
Remarks: Cardiac sensitization

Cardiac sensitisation threshold limit (Dog): 368.159 mg/m<sup>3</sup>  
Remarks: Cardiac sensitization

##### **1,1,1,2-Tetrafluoroethane:**

Acute oral toxicity : Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 567000 ppm  
Exposure time: 4 h  
Test atmosphere: gas  
Method: OECD Test Guideline 403

No observed adverse effect concentration (Dog): 40000 ppm  
Test atmosphere: gas  
Remarks: Cardiac sensitization

Lowest observed adverse effect concentration (Dog): 80000 ppm  
Test atmosphere: gas  
Symptoms: May cause cardiac arrhythmia.

Cardiac sensitisation threshold limit (Dog): 334,000 mg/m<sup>3</sup>  
Test atmosphere: gas  
Symptoms: May cause cardiac arrhythmia.

Acute dermal toxicity : Assessment: The substance or mixture has no acute dermal toxicity

##### **Isobutane:**

Acute inhalation toxicity : LC50 (Rat): 570000 ppm  
Exposure time: 15 min  
Test atmosphere: gas

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

---

### Skin corrosion/irritation

Not classified based on available information.

#### Components:

##### **1,1,1,2-Tetrafluoroethane:**

Result : No skin irritation

### Serious eye damage/eye irritation

Not classified based on available information.

#### Components:

##### **1,1,1,2-Tetrafluoroethane:**

Result : No eye irritation

### Respiratory or skin sensitization

#### **Skin sensitization**

Not classified based on available information.

#### **Respiratory sensitization**

Not classified based on available information.

#### Components:

##### **1,1,1,2-Tetrafluoroethane:**

Routes of exposure : Skin contact  
Result : negative

Routes of exposure : Inhalation  
Species : Rat  
Result : negative

Routes of exposure : Inhalation  
Species : Humans  
Result : negative

### Germ cell mutagenicity

Not classified based on available information.

#### Components:

##### **Pentafluoroethane:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Test Type: In vitro mammalian cell gene mutation test  
Result: negative  
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|                |                              |                              |                                                                   |
|----------------|------------------------------|------------------------------|-------------------------------------------------------------------|
| Version<br>4.4 | Revision Date:<br>10/10/2020 | SDS Number:<br>2767323-00010 | Date of last issue: 03/30/2020<br>Date of first issue: 05/04/2018 |
|----------------|------------------------------|------------------------------|-------------------------------------------------------------------|

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

### 1,1,1,2-Tetrafluoroethane:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

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

Test Type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo  
Species: Rat  
Application Route: inhalation (gas)  
Method: OECD Test Guideline 486  
Result: negative

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

### Isobutane:

Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative  
Remarks: Based on data from similar materials

Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative  
Remarks: Based on data from similar materials

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  
Remarks: Based on data from similar materials

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

---

### Carcinogenicity

Not classified based on available information.

### Components:

#### **1,1,1,2-Tetrafluoroethane:**

|                   |                           |
|-------------------|---------------------------|
| Species           | : Rat                     |
| Application Route | : inhalation (gas)        |
| Exposure time     | : 2 Years                 |
| Method            | : OECD Test Guideline 453 |
| Result            | : negative                |

|                              |                                                                      |
|------------------------------|----------------------------------------------------------------------|
| 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.

### Components:

#### **Pentafluoroethane:**

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

|                              |                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Effects on fetal development | : Test Type: Embryo-fetal development<br>Species: Rat<br>Application Route: inhalation (gas)<br>Method: OECD Test Guideline 414<br>Result: negative |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|

#### **1,1,1,2-Tetrafluoroethane:**

|                      |                                                                       |
|----------------------|-----------------------------------------------------------------------|
| Effects on fertility | : Species: Mouse<br>Application Route: Inhalation<br>Result: negative |
|----------------------|-----------------------------------------------------------------------|

|                              |                                                                                                                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Effects on fetal development | : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test<br>Species: Rabbit<br>Application Route: inhalation (gas)<br>Method: OECD Test Guideline 414<br>Result: negative |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

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

### Isobutane:

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.

#### Components:

##### 1,1,1,2-Tetrafluoroethane:

Routes of exposure : inhalation (gas)  
Assessment : No significant health effects observed in animals at concentrations of 20000 ppmV/4h or less

### Isobutane:

Assessment : May cause drowsiness or dizziness.

### STOT-repeated exposure

Not classified based on available information.

#### Components:

##### 1,1,1,2-Tetrafluoroethane:

Routes of exposure : inhalation (gas)  
Assessment : No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

### Repeated dose toxicity

#### Components:

##### Pentafluoroethane:

Species : Rat  
NOAEL :  $\geq 50000$  ppm  
Application Route : inhalation (gas)  
Exposure time : 13 Weeks  
Method : OECD Test Guideline 413

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

### 1,1,1,2-Tetrafluoroethane:

|                   |                           |
|-------------------|---------------------------|
| Species           | : Rat, male and female    |
| NOAEL             | : 50000 ppm               |
| LOAEL             | : >50000 ppm              |
| Application Route | : inhalation (gas)        |
| Exposure time     | : 2 y                     |
| Method            | : OECD Test Guideline 453 |

### Isobutane:

|                   |                           |
|-------------------|---------------------------|
| Species           | : Rat                     |
| NOAEL             | : >= 9000 ppm             |
| Application Route | : inhalation (gas)        |
| Exposure time     | : 6 Weeks                 |
| Method            | : OECD Test Guideline 422 |

### Aspiration toxicity

Not classified based on available information.

### Components:

#### 1,1,1,2-Tetrafluoroethane:

No aspiration toxicity classification

## SECTION 12. ECOLOGICAL INFORMATION

### Ecotoxicity

#### Components:

##### Pentafluoroethane:

|                  |                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Toxicity to fish | : LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l<br>Exposure time: 96 h<br>Remarks: Based on data from similar materials |
|------------------|----------------------------------------------------------------------------------------------------------------------------------|

|                                                     |                                                                                                                         |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Toxicity to daphnia and other aquatic invertebrates | : EC50 (Daphnia magna (Water flea)): > 100 mg/l<br>Exposure time: 48 h<br>Remarks: Based on data from similar materials |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|

|                                  |                                                                                                                                                                                |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toxicity to algae/aquatic plants | : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201<br>Remarks: Based on data from similar materials |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

NOEC (Pseudokirchneriella subcapitata (green algae)): > 1 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: Based on data from similar materials

##### 1,1,1,2-Tetrafluoroethane:

|                  |                                                        |
|------------------|--------------------------------------------------------|
| Toxicity to fish | : LC50 (Oncorhynchus mykiss (rainbow trout)): 450 mg/l |
|------------------|--------------------------------------------------------|

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

---

|                                                     |                                                                                                                          |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|                                                     | Exposure time: 96 h<br>Method: Regulation (EC) No. 440/2008, Annex, C.1                                                  |
| Toxicity to daphnia and other aquatic invertebrates | : EC50 (Daphnia magna (Water flea)): 980 mg/l<br>Exposure time: 48 h<br>Method: Regulation (EC) No. 440/2008, Annex, C.2 |
| Toxicity to algae/aquatic plants                    | : ErC50 (green algae): > 100 mg/l<br>Exposure time: 96 h<br>Remarks: Based on data from similar materials                |

### Persistence and degradability

#### Components:

##### **Pentafluoroethane:**

|                  |                                                                                                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------|
| Biodegradability | : Result: Not readily biodegradable.<br>Biodegradation: 5 %<br>Exposure time: 28 d<br>Method: OECD Test Guideline 301D |
|------------------|------------------------------------------------------------------------------------------------------------------------|

##### **1,1,1,2-Tetrafluoroethane:**

|                  |                                                                          |
|------------------|--------------------------------------------------------------------------|
| Biodegradability | : Result: Not readily biodegradable.<br>Method: OECD Test Guideline 301D |
|------------------|--------------------------------------------------------------------------|

##### **Isobutane:**

|                  |                                                                                   |
|------------------|-----------------------------------------------------------------------------------|
| Biodegradability | : Result: Readily biodegradable.<br>Remarks: Based on data from similar materials |
|------------------|-----------------------------------------------------------------------------------|

### Bioaccumulative potential

#### Components:

##### **Pentafluoroethane:**

|                                        |                                                |
|----------------------------------------|------------------------------------------------|
| Partition coefficient: n-octanol/water | : Pow: 1.48<br>Method: OECD Test Guideline 107 |
|----------------------------------------|------------------------------------------------|

##### **1,1,1,2-Tetrafluoroethane:**

|                                        |                                         |
|----------------------------------------|-----------------------------------------|
| Bioaccumulation                        | : Remarks: Bioaccumulation is unlikely. |
| Partition coefficient: n-octanol/water | : log Pow: 1.06                         |

##### **Isobutane:**

|                                        |                |
|----------------------------------------|----------------|
| Partition coefficient: n-octanol/water | : log Pow: 2.8 |
|----------------------------------------|----------------|

### Mobility in soil

No data available

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

### Other adverse effects

No data available

## 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

#### UNRTDG

UN number : UN 3163

Proper shipping name : LIQUEFIED GAS, N.O.S.  
(Pentafluoroethane, 1,1,1,2-Tetrafluoroethane)

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, 1,1,1,2-Tetrafluoroethane)

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, 1,1,1,2-Tetrafluoroethane)

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.

### Domestic regulation

#### 49 CFR

UN/ID/NA number : UN 3163

Proper shipping name : Liquefied gas, n.o.s.

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

(Pentafluoroethane, 1,1,1,2-Tetrafluoroethane)

|                  |   |                            |
|------------------|---|----------------------------|
| Class            | : | 2.2                        |
| Packing group    | : | Not assigned by regulation |
| Labels           | : | NON-FLAMMABLE GAS          |
| ERG Code         | : | 126                        |
| Marine pollutant | : | no                         |

### Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

## SECTION 15. REGULATORY INFORMATION

### 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** : 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.

### US State Regulations

#### Pennsylvania Right To Know

|                           |          |
|---------------------------|----------|
| Pentafluoroethane         | 354-33-6 |
| 1,1,1,2-Tetrafluoroethane | 811-97-2 |
| Isobutane                 | 75-28-5  |

### International Regulations

Montreal Protocol : Pentafluoroethane  
1,1,1,2-Tetrafluoroethane

## SECTION 16. OTHER INFORMATION

### Further information

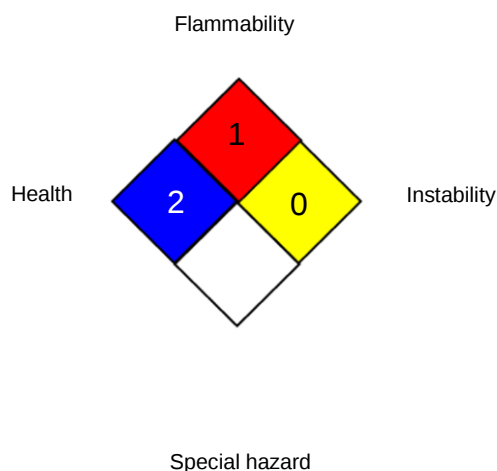
# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

Version 4.4      Revision Date: 10/10/2020      SDS Number: 2767323-00010      Date of last issue: 03/30/2020  
Date of first issue: 05/04/2018

### NFPA 704:



### HMIS® IV:

|                 |   |   |
|-----------------|---|---|
| HEALTH          | / | 0 |
| FLAMMABILITY    |   | 1 |
| 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.

Freon™ and any associated logos are trademarks or copyrights of The Chemours Company FC, LLC.

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.

### Full text of other abbreviations

|                 |   |                                                                                           |
|-----------------|---|-------------------------------------------------------------------------------------------|
| ACGIH           | : | USA. ACGIH Threshold Limit Values (TLV)                                                   |
| NIOSH REL       | : | USA. NIOSH Recommended Exposure Limits                                                    |
| US WEEL         | : | USA. Workplace Environmental Exposure Levels (WEEL)                                       |
| ACGIH / STEL    | : | Short-term exposure limit                                                                 |
| NIOSH REL / TWA | : | Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek |
| US WEEL / TWA   | : | 8-hr TWA                                                                                  |

AIIC - Australian Inventory of Industrial Chemicals; 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 System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse)

# SAFETY DATA SHEET



## Freon™ NU-22B™ Refrigerant (R-422B)

|         |                |               |                                 |
|---------|----------------|---------------|---------------------------------|
| Version | Revision Date: | SDS Number:   | Date of last issue: 03/30/2020  |
| 4.4     | 10/10/2020     | 2767323-00010 | Date of first issue: 05/04/2018 |

---

Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Revision Date : 10/10/2020

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