Section 1. Identification

GHS product identifier : Bromine Trifluoride
Chemical name : bromine trifluoride
Other means of identification : BrF3; Bromine fluoride; Bromine fluoride (BrF3); UN 1746
Product type : Liquid.
Product use : Synthetic/Analytical chemistry.
Synonym : BrF3; Bromine fluoride; Bromine fluoride (BrF3); UN 1746
SDS # : 001112
Supplier's details : Airgas USA, LLC and its affiliates
                259 North Radnor-Chester Road
                Suite 100
                Radnor, PA 19087-5283
                1-610-687-5253
24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture : OXIDIZING LIQUIDS - Category 1
                                             ACUTE TOXICITY (inhalation) - Category 2
                                             SKIN CORROSION - Category 1
                                             SERIOUS EYE DAMAGE - Category 1
                                             SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

GHS label elements
Hazard pictograms :

Signal word : Danger
Hazard statements : May cause fire or explosion; strong oxidizer.
                  Causes severe skin burns and eye damage.
                  Fatal if inhaled.
                  May cause damage to organs through prolonged or repeated exposure.

Precautionary statements
General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Open valve slowly. Use only with equipment cleaned for Oxygen service.
Prevention : Wear fire resistant or flame retardant clothing. Wear protective gloves. Wear protective clothing. Wear eye or face protection. In case of inadequate ventilation wear respiratory protection. Keep away from heat. No smoking. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Use only outdoors or in a well-ventilated area. Do not breathe vapor.
Response : Get medical advice or attention if you feel unwell. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing.
Section 2. Hazards identification

- **Storage**: Store locked up.
- **Disposal**: Dispose of contents and container in accordance with all local, regional, national and international regulations.
- **Supplemental label elements**: Protect from moisture. Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only with adequate ventilation.
- **Hazard not otherwise classified**: Water reactive. Reacts with water to release toxic gas. May be fatal if inhaled.

Section 3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Substance/mixture</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>bromine trifluoride</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>BrF3; Bromine fluoride; Bromine fluoride (BrF3); UN 1746</td>
</tr>
<tr>
<td>Product code</td>
<td>001112</td>
</tr>
</tbody>
</table>

### CAS number/other identifiers

**CAS number**

- 7787-71-5

### Ingredient name

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromine Trifluoride</td>
<td>100</td>
<td>7787-71-5</td>
</tr>
</tbody>
</table>

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

**Description of necessary first aid measures**

- **Eye contact**: Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

- **Inhalation**: Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

- **Skin contact**: Get medical attention immediately. Call a poison center or physician. Rinse immediately contaminated clothing and skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

- **Ingestion**: Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician.
Section 4. First aid measures

Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

| Eye contact | Causes serious eye damage. |
| Inhalation | Fatal if inhaled. |
| Skin contact | Causes severe burns. |
| Frostbite | Try to warm up the frozen tissues and seek medical attention. |
| Ingestion | No known significant effects or critical hazards. |

Over-exposure signs/symptoms

| Eye contact | Adverse symptoms may include the following:, pain, watering, redness |
| Inhalation | No specific data. |
| Skin contact | Adverse symptoms may include the following:, pain or irritation, redness, blistering may occur |
| Ingestion | Adverse symptoms may include the following:, stomach pains |

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician

| Specific treatments | No specific treatment. |
| Protection of first-aiders | No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Gloves should be worn when removing clothing to prevent additional exposure. |

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use dry chemical or CO₂.

Unsuitable extinguishing media

Do not use water or foam.

Specific hazards arising from the chemical

| Specific hazards arising from the chemical | Strongly oxidizing material. Contact with water liberates toxic gas. May cause fire or explosion. In a fire or if heated, a pressure increase will occur and the container may burst. |

Hazardous thermal decomposition products

| Hazardous thermal decomposition products | Decomposition products may include the following materials: halogenated compounds |

Special protective actions for fire-fighters

| Special protective actions for fire-fighters | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. |

Special protective equipment for fire-fighters

| Special protective equipment for fire-fighters | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. |
## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel**

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No fires, smoking or flames in hazard area. Keep away from water. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders**

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions**

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

**Small spill**

Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid allowing the spilled material to get wet or using water to clean up spillages or residues, unless the quantity remaining is very small. Do not absorb in sawdust or other combustible material. It may lead to a fire risk when it dries out. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

**Large spill**

Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Do not absorb in sawdust or other combustible material. It may lead to a fire risk when it dries out. Avoid allowing the spilled material to get wet or using water to clean up spillages or residues, unless the quantity remaining is very small. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

**Protective measures**

Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not ingest. Empty containers retain product residue and can be hazardous. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Protect from moisture. Keep away from clothing, incompatible materials and combustible materials. Do not breathe vapor or mist. Keep away from heat. Wear fire resistant clothing.

**Advice on general occupational hygiene**

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

**Conditions for safe storage, including any incompatibilities**

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep away from water or moist air. Store locked up. Separate from reducing agents and combustible materials. Store away from grease and oil. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromine Trifluoride</td>
<td>None.</td>
</tr>
</tbody>
</table>

**Appropriate engineering controls**: Use only with adequate ventilation. Engineering controls may be required to control the primary or secondary risks associated with this product. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Environmental exposure controls**: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

#### Individual protection measures

**Hygiene measures**: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

**Skin protection**

**Hand protection**: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection**: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Other skin protection**: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection**: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

**Appearance**

**Physical state**: Liquid.

**Color**: Yellow or Gray

**Odor**: Obnoxious.

**Odor threshold**: Not available.

**pH**: Not available.

**Melting point**: 8.77°C (47.8°F)

**Boiling point**: 127°C (260.6°F)

**Critical temperature**: >20°C (>68°F)
### Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Specific Volume (ft (^3)/lb)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Gas Density (lb/ft (^3))</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>4.7</td>
</tr>
<tr>
<td>Solubility</td>
<td>Not available.</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flow time (ISO 2431)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>136.9 g/mole</td>
</tr>
</tbody>
</table>

### Section 10. Stability and reactivity

**Reactivity**: No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability**: The product is stable.

**Possibility of hazardous reactions**: Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following:
- contact with combustible materials
- contact with water
Reactions may include the following:
- risk of explosion
- liberation of toxic gas

**Conditions to avoid**: Drying on clothing or other combustible materials may cause fire.

**Incompatible materials**: Highly reactive or incompatible with the following materials:
- combustible materials
- reducing materials
- water

**Hazardous decomposition products**: Contact with water liberates toxic gas.

**Hazardous polymerization**: Under normal conditions of storage and use, hazardous polymerization will not occur.
Section 11. Toxicological information

Information on toxicological effects

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromine Trifluoride</td>
<td>LC50 Inhalation Gas.</td>
<td>Rat</td>
<td>7.5 ppm</td>
<td>4 hours</td>
</tr>
</tbody>
</table>

**Irritation/Corrosion**
Not available.

**Sensitization**
Not available.

**Mutagenicity**
Not available.

**Carcinogenicity**
Not available.

**Reproductive toxicity**
Not available.

**Teratogenicity**
Not available.

**Specific target organ toxicity (single exposure)**
Not available.

**Specific target organ toxicity (repeated exposure)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromine Trifluoride</td>
<td>Category 2</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Aspiration hazard**
Not available.

Information on the likely routes of exposure

**Potential acute health effects**

- **Eye contact**: Causes serious eye damage.
- **Inhalation**: Fatal if inhaled.
- **Skin contact**: Causes severe burns.
- **Ingestion**: No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

- **Eye contact**: Adverse symptoms may include the following:, pain, watering, redness
- **Inhalation**: No specific data.
- **Skin contact**: Adverse symptoms may include the following:, pain or irritation, redness, blistering may occur
- **Ingestion**: Adverse symptoms may include the following:, stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

**Short term exposure**

- **Potential immediate effects**: Not available.

- **Potential delayed effects**: Not available.

**Long term exposure**

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Section 11. Toxicological information

Potential immediate effects : Not available.
Potential delayed effects : Not available.
Potential chronic health effects
Not available.

General : May cause damage to organs through prolonged or repeated exposure.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation (gases)</td>
<td>100 ppm</td>
</tr>
</tbody>
</table>

Section 12. Ecological information

Toxicity
Not available.

Persistence and degradability
Not available.

Bioaccumulative potential
Not available.

Mobility in soil

| Soil/water partition coefficient ($K_{OC}$) | Not available. |

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Section 14. Transport information

<table>
<thead>
<tr>
<th>DOT</th>
<th>TDG</th>
<th>Mexico</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>UN1746</td>
<td>UN1746</td>
<td>UN1746</td>
<td>UN1746</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>BROMINE TRIFLUORIDE</td>
<td>BROMINE TRIFLUORIDE</td>
<td>BROMINE TRIFLUORIDE</td>
<td>BROMINE TRIFLUORIDE</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>5.1 (6.1, 8)</td>
<td>5.1 (6.1, 8)</td>
<td>8 (5.1, 6.1)</td>
<td>5.1 (6.1, 8)</td>
</tr>
</tbody>
</table>

Packing group: I  I  I  I  I  I


“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Additional information

DOT Classification: Toxic - Inhalation hazard Zone B

TDG Classification: Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.23-2.25 (Class 5), 2.26-2.36 (Class 6), 2.40-2.42 (Class 8).

IATA: Quantity limitation

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments: Not available.

Section 15. Regulatory information

U.S. Federal regulations: TSCA 8(a) CDR Exempt/Partial exemption: Not determined

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed

Clean Air Act Section 602 Class I Substances: Not listed

Clean Air Act Section 602 Class II Substances: Not listed

DEA List I Chemicals (Precursor Chemicals): Not listed

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Section 15. Regulatory information

**DEA List II Chemicals (Essential Chemicals)**
- Not listed

**SARA 302/304**
- Composition/information on ingredients
  - No products were found.
- SARA 304 RQ
  - Not applicable.
- SARA 311/312
  - Classification
    - Refer to Section 2: Hazards Identification of this SDS for classification of substance.

**State regulations**
- Massachusetts
  - This material is listed.
- New York
  - This material is not listed.
- New Jersey
  - This material is listed.
- Pennsylvania
  - This material is listed.
- California Prop. 65
  - This product does not require a Safe Harbor warning under California Prop. 65.

**International regulations**
- Chemical Weapon Convention List Schedules I, II & III Chemicals
  - Not applicable.
- Montreal Protocol
  - Not listed.
- Stockholm Convention on Persistent Organic Pollutants
  - Not listed.
- Rotterdam Convention on Prior Informed Consent (PIC)
  - Not listed.
- UNECE Aarhus Protocol on POPs and Heavy Metals
  - Not listed.

**Inventory list**
- Australia
  - This material is listed or exempted.
- Canada
  - This material is not listed in DSL but is listed in NDSL.
- China
  - Not determined.
- Europe
  - This material is listed or exempted.
- Japan
  - Japan inventory (ENCS): Not determined.
  - Japan inventory (ISHL): Not determined.
- New Zealand
  - Not determined.
- Philippines
  - This material is listed or exempted.
- Republic of Korea
  - This material is listed or exempted.
- Taiwan
  - Not determined.
- Thailand
  - Not determined.
- Turkey
  - Not determined.
- United States
  - This material is active or exempted.
- Viet Nam
  - Not determined.
Section 16. Other information

Hazardous Material Information System (U.S.A.)

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>OXIDIZING LIQUIDS - Category 1</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>ACUTE TOXICITY (inhalation) - Category 2</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>SKIN CORROSION - Category 1</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>SERIOUS EYE DAMAGE - Category 1</td>
<td>Expert judgment</td>
</tr>
<tr>
<td>SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2</td>
<td>Expert judgment</td>
</tr>
</tbody>
</table>

History

| Date of printing | : 1/5/2022 |
| Date of issue/Date of revision | : 1/5/2022 |
| Date of previous issue | : 9/27/2018 |
| Version | : 0.05 |

Key to abbreviations

ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
UN = United Nations

References

: Not available.

Notice to reader
Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.