SECTION 1. IDENTIFICATION

Product name : Converted Nafion Tubing™
Product code : TT product line; TT*

Manufacturer or supplier’s details
Company name of supplier : Perma Pure, LLC
Address : 1001 New Hampshire Avenue
Lakewood, NJ 08701
United States of America (USA)
Telephone : 1-732-244-0100

Recommended use of the chemical and restrictions on use
Recommended use : Extruded tubing used for fluid and gas, separation membrane
Restrictions on use : For industrial use only. Do not use or resell Perma Pure™ materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless agreed to by Seller in a written agreement covering such use. For further information, please contact your Perma Pure representative.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200
Not a hazardous substance or mixture.

GHS label elements
Not a hazardous substance or mixture.

Other hazards
CAUTION! PROCESSING MAY RELEASE VAPORS AND/OR FUMES WHICH CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.

Signs and symptoms of acute exposure:
The product, in the form supplied, is not expected to cause significant adverse health effects. Product contains high molecular weight polymer(s). Thermal decomposition vapors of fluorinated plastics may cause polymer fume fever with flu-like symptoms in humans, especially when smoking contaminated tobacco. Thermal decomposition vapors may also cause irritation to eyes, respiratory system, and skin.
Repeated or prolonged exposure to vapors and/or fumes may cause headaches, drowsiness, nausea, and/or weakness.
Exposure to eyes may cause reversible cornea opacity and mild conjunctivitis. Refer to first aid measures if eye contact occurs.

Remarks:
Use good industrial hygiene and safety practice during handling.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance
Substance name : Perfluorosulfonyl fluoride polymer
SECTION 4. FIRST AID MEASURES

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

In case of skin contact : Wash with water and soap as a precaution.
Get medical attention if symptoms occur.

In case of eye contact : Immediately flush eyes with plenty of water for at
least 15 minutes. Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.
Get medical attention if symptoms occur.
Rinse mouth thoroughly with water.

Most important symptoms and
effects, both acute and delayed : Polymer fume fever
Local irritation
Symptoms may be delayed

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

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : None known.

Specific hazards during fire fighting : Exposure to combustion products may be a hazard
to health.

Hazardous combustion products : Hydrogen fluoride
Carbonyl fluoride
Potentially toxic fluorinated compounds
Aerosolized particulates
Carbon oxides

Specific extinguishing methods : Use extinguishing measures that are appropriate to
local circumstances and the surrounding
environment.
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 : Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions : Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Sweep up or vacuum up spillage and collect in suitable container for disposal. 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. Consult a regulatory specialist to determine appropriate state or local reporting requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation : Use only with adequate ventilation when polymer is heated above 150C. Avoid breathing processing fumes or dust.

Advice on safe handling : Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.

Conditions for safe storage : Keep in properly labeled containers.
Store in accordance with the particular national regulations.
Store in cool dry area.

Information on storage stability : Stable under recommended storage conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits:
Contains no substances with occupational exposure limit values.

Personal Protective Equipment:
Wear eye protection as appropriate to prevent eye contact. Have eye-washing facilities readily available where eye contact can occur. Wash hands before breaks and at the end of the workday. Do not eat, drink or smoke when using.

Engineering Controls:
In the event the polymer is heated above 150C (302F), local ventilation should be used to avoid exposure to fumes. Use ventilation to avoid exposure of personnel to dust.

Occupational exposure limits of decomposition products:

<table>
<thead>
<tr>
<th>Components</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>Hydrofluoric acid</td>
<td>7664-39-3</td>
<td>TWA</td>
<td>3 ppm 2.5 mg/m³</td>
<td>NIOSH REL</td>
</tr>
</tbody>
</table>
### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Tubing</td>
</tr>
<tr>
<td>Color</td>
<td>Clear (May develop Brown-ish tint with UV exposure)</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>&gt;200 °C</td>
</tr>
<tr>
<td>Initial boiling point/boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No data available</td>
</tr>
</tbody>
</table>

### Table: Carcinogenicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>Carcinogenicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbonyl difluoride</td>
<td>353-50-4</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>124-38-9</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>630-08-0</td>
</tr>
</tbody>
</table>

### Table: Toxicological Data

<table>
<thead>
<tr>
<th>Substance</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbonyl difluoride</td>
<td>C 6 ppm 5 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA 3 ppm</td>
</tr>
<tr>
<td></td>
<td>C 0.5 ppm (Fluorine)</td>
</tr>
<tr>
<td></td>
<td>TWA 0.5 ppm (Fluorine)</td>
</tr>
<tr>
<td></td>
<td>ST 5 ppm 15 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA 2 ppm 5 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA 2 ppm</td>
</tr>
<tr>
<td></td>
<td>ST 5 ppm 15 mg/m³</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>TWA 5,000 ppm</td>
</tr>
<tr>
<td></td>
<td>STEL 30,000 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA 5,000 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA 5,000 ppm</td>
</tr>
<tr>
<td></td>
<td>ST 30,000 ppm</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>TWA 25 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA 35 ppm</td>
</tr>
<tr>
<td></td>
<td>C 200 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA 50 ppm</td>
</tr>
</tbody>
</table>

**SDS-096**

**SAFETY DATA SHEET**

**Converted Nafion Tubing**

**Version 1.0**

**Date of revision: 30 November 2018**
Vapor pressure : Not applicable
Relative vapor density : Not applicable
Solubility(ies) : No data available
Autoignition temperature : No data available
Decomposition temperature : >150°C
Viscosity, kinematic : Not applicable
Explosive properties : Not explosive
Oxidizing properties : The substance or mixture is not classified as oxidizing.
Particle size : No data available

SECTION 10. STABILITY AND REACTIVITY
Reactivity : Not classified as a reactivity hazard.
Chemical stability : Stable under normal storage conditions.
Possible hazardous reactions : Hazardous decomposition products will be formed at elevated temperatures
Conditions to avoid : Excessive heat
Incompatible materials : No data available.

Hazardous decomposition products
Thermal decomposition : Hydrofluoric acid
Carbonyl difluoride
Carbon dioxide
Carbon monoxide

SECTION 11. TOXICOLOGICAL INFORMATION
Information on likely routes of exposure
Skin contact, Ingestion, Eye contact.

Respiratory or skin sensitization
Skin sensitization
Not classified based on available information.
Respiratory sensitization
Not classified based on available information.

Germ cell mutagenicity
Not classified based on available information.

Carcinogenicity
None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

Reproductive toxicity
Not classified based on available information.
STOT-single exposure
Not classified based on available information.

STOT-repeated exposure
Not classified based on available information.

Aspiration toxicity
Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
No data available

Persistence and degradability
No data available

Bioaccumulative potential
No data available

Mobility in soil
No data available

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.
If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

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
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity
SAFETY DATA SHEET
Converted Nafion Tubing Version 1.0 Date of revision: 30 November 2018

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 : No SARA Hazards

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
Perfluorosulfonic acid polymer Trade secret

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.

SECTION 16. OTHER INFORMATION

Nafion™ and any associated logos are trademarks or copyrights of The Chemours Company FC, LLC. Perma Pure™ and the Perma Pure Logo are trademarks of Perma Pure, LLC. Before use read Perma Pure safety information. For further information contact the local Perma Pure office or nominated distributors. All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

NFPA 704:

HMIS® IV:

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

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.