

## POLYTETRAFLUOROETHYLENE

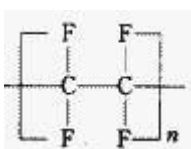
### 1. IDENTIFICATION OF THE SUBSTANCE/COMPOUND AND COMPANY

#### 1.1. Product identifier Name:

Chemical name Polytetrafluoroethylene (PTFE)  
IUPAC name: polytetrafluoroethylene  
Trade name PTFE

Synonyms Teflon, polytetrafluoroethylene  
Chemical formula  $[C_2F_4]_n$

#### Structural formula



Molecular weight  $10^5$ - $10^7$  g/mol

EC number 618-337-2  
REACH Registration None assigned. Reference number of monomer (tetrafluoroethylene):  
01-2119487991-221-0001  
C&L bulk notification Reference number 02-2119708816-33-0000  
CAS number 9002-84-0

#### 1.2. Use of substance/ compound

The product is used for producing articles, films that have highly dielectric properties, are resistant to highly corrosive media and have working temperatures up to + 260 °C (500 °F)

#### Uses advised against

For industrial or professional use only

#### 1.3. Details of the supplier of the safety data sheet

Manufacturer Enflo LLC  
315 Lake Ave.  
Bristol, CT 06010  
Phone: 860-589-0014  
[www.enflo.com](http://www.enflo.com)

1.4 Emergency telephone: (860) 589-0014

### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance

2.1.1 Regulation (EC) Not classified as hazardous  
No 1272/2008 [CLP/GHS]  
2.1.2. Directive 67/548/EEC Not classified as hazardous

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### 2.2 Other hazards:

2.2.1 General characteristic: Finished product is inert in normal condition

#### 2.2.2 Potential health hazards:

Arise from Inhalation of fumes consisting of

- ultra-fine, low-molecular-weight fluoropolymer particles
- carbonyl fluoride COF<sub>2</sub> (CAS 353-50-4) [500 °C (932 °F) - 600 °C (1110° F)]
- hydrogen fluoride HF (CAS 7664-39-3) [400 °C (752 °F)]
- carbon dioxide CO<sub>2</sub> (CAS 124-38-9) [> 650 °C (1200 °F)]
- carbon monoxide CO (CAS 630-08-0) [> 650 °C (1200 °F)]
- perfluoroisobutylene C<sub>4</sub>F<sub>8</sub> (CAS 382-21-8) [475 °C (887 °F)]
- hexafluoropropylene C<sub>3</sub>F<sub>6</sub> (CAS 116-15-4) [460 °C (860 °F)] –
- tetrafluoroethylene C<sub>2</sub>F<sub>4</sub> (CAS 116-14-3) [450 °C (842 °F)] from overheating [> 260 °C (500 °F)] or burning

#### 2.2.3 Symptoms:

If inhaled:

Inhalation of ultra-fine, low-molecular-weight fluoropolymer particles provokes signs/symptoms of <Polymer Fume Fever = PFF> of 24 hours duration: chest pain or tightness, shortness of breath, cough, malaise, muscle aches, increased heart rate, fever, chills, sweats, nausea and headache. Inhalation of low concentrations of Hydrogen Fluoride HF and Carbonyl fluoride COF<sub>2</sub> can initially include symptoms of choking, lung irritation effects with coughing, nose and throat irritation. After a symptom less period of 1 to 2 days they are followed by fever, chills, difficulty in breathing, cyanosis and pulmonary edema. Acute or chronic overexposure to HF can injure liver and kidneys. Inhalation of Perfluoroisobutylene PFIB causes severe symptoms of pulmonary edema with wheezing, difficulty in breathing, coughing up sputum and bluish discoloration of the skin. Coughing and chest pain may occur initially. Overexposure may cause death [LC<sub>50</sub>, (Oral-Rat) = 1,05 ppm/2hrs]

On contact with eyes:

Vapors from heated material may cause eye irritation. Signs/symptoms may include redness, swelling, pain and blurred or hazy vision. Eye contact with Carbonyl fluoride COF<sub>2</sub> leads to eye corrosion with corneal ulceration

On skin contact:

Carbonyl fluoride COF<sub>2</sub> provokes skin irritation or rash. Thermal burns : Signs/symptoms may include severe pain, redness and swelling, tissue destruction

If ingestion:

Not expected to be a hazard in normal industrial use and if ingested. Data about human body sensibilization are not available. The product is not classified as a human carcinogen. General rating: Group 3. In case of spill, the material forms a dangerously slippery surface

#### 2.2.4 Environmental effects:

Does not require environmental protection at normal practice. Not harmful to water in accordance with VwVwS dd. 17.05.99 (General Administrative Regulation under the Federal Water Act on the Classification of Substances Hazardous to Water in Water Hazard Classes)

### 2.3 For further information please refer to section 11 of this MSDS



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### 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Composition

Chemical name	CAS number	EC number	Weight % content
Polytetrafluoroethylene	9002-84-0	618-337-2	100

The product contains no hazardous components and impurities that influence its classification.

### 4. FIRST AID MEASURE

#### 4.1 Description of first aid

##### measures Inhalation:

If exposed to fumes from overheating or combustion, remove person to fresh air. Get immediate medical attention if breathing becomes difficult or short. If inhaled dust remove victim to fresh air and keep at rest in a position comfortable for breathing

##### Eyes contact:

Wash affected eyes with plenty of water for 15 minutes and seek medical advice of ophthalmologist if irritation persists. If eye contact with hot material occurs, do not attempt to remove molten material. Immediately flush affected area with plenty of cold water and cover with clean dressing. Treat burn by a physician

##### Skin contact:

The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable. Remove affected clothing. If signs / symptoms develop, get medical attention.

If skin contact with hot material occurs, do not attempt to remove molten material. Immediately flush affected area with cold water for a prolonged time. Cover burns with sterile dressings. Get immediate medical attention

##### Ingestion:

If irritation persists or other symptoms develop, seek medical attention.

### 5. FIRE-FIGHTING MEASURES

#### 5.1 Product does not burn without external flame. Polymer ignites because of the formation of gaseous decomposition products. However, if the flame is removed, combustion ceases. During the combustion of fluoropolymer, little or no smoke is produced

##### Suitable extinguishing media:

Because fluoropolymer, in essence, do not burn, firefighters should fight fires with firefighting techniques and extinguishing agents which are appropriate for the materials that are providing fuel for the fire. All commonly-used fire extinguishing agents, i.e. carbon dioxide, <alcohol> foam, dry chemical and water spray/water fog extinguishers may be used if fluoropolymer is being burned in fires fueled by other substances. For established fires, water is the preferred extinguishing agent. Water used to extinguish the fire and fire remainders must be collected and disposed in accordance with local regulations.

##### Unsuitable extinguishing media:

None known

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### Exposure hazards:

Hazardous products of

decomposition at elevated

[>260 °C (500 °F)] temperatures:

Exposure to extreme heat can give rise to thermal decomposition

- ultra-fine, low-molecular-weight fluoropolymer particles

- carbonyl fluoride COF<sub>2</sub> (CAS 353-50-4)

[500 °C (932 °F) - 600 °C (1110°F)]

- hydrogen fluoride HF (CAS 7664-39-3) [400 °C (752 °F)]

- carbon dioxide CO<sub>2</sub> (CAS 124-38-9) [>650 °C (1200 °F)]

- carbon monoxide CO (CAS 630-08-0) [>650 °C (1200 °F)]

- perfluoroisobutylene C<sub>4</sub>F<sub>8</sub> (CAS 382-21-8) [(475 °C (887 °F)]

- hexafluoropropylene C<sub>3</sub>F<sub>6</sub> (CAS 116-15-4) [460 °C (860 °F)]

- tetrafluoroethylene C<sub>2</sub>F<sub>4</sub> (CAS 116-14-3) [450 °C (842 °F)].

Carbonyl fluoride hydrolyzes rapidly in the presence of moist air to hydrogen fluoride and carbon dioxide. Fumes containing these chemicals are very toxic and may be immediately harmful if inhaled in sufficient amounts.

Protective equipment for firefighters:

Fire-fighters should wear self-contained breathing apparatus (SCBA) and heat-resistant suits and gloves to protect their skin, eyes and respiratory system from contact with HF and other toxic fumes.

**HYDROGEN FLUORIDE FUMES REACT WITH WATER TO FORM HYDROFLUORIC ACID.**

It is imperative that firefighters and their equipment are thoroughly decontaminated with a water wash-down after fire and smoke exposure. Machinery and equipment that is involved in a fire must also be decontaminated prior to commencing repair or salvage operation.

Other information:

Material is hard to burn as indicated by its Limiting Oxygen Index (LOI) measured in accordance with ASTM D2863. LOI is the minimum concentration of oxygen in mixture of oxygen and nitrogen that will support flaming combustion of a material.

For FEP LOI is > 95 %. Exposure to extreme heat [>260 °C (500 °F)] can give rise to thermal decomposition.

Very intensive thermal decomposition starts at 415 °C (779 °F).

This product is difficult to ignite and is self-extinguishing. There is no evidence that fluoropolymer form flammable or explosive dust clouds. But in case of fire, with thermal decomposition, toxic, acidic and combustible gases and steam are released.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions:

For personal protection see Sections 5 and 8.

Avoid dust generation. Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel.

Sweep up to avoid slipping hazard. Ventilate the area with fresh air.

### 6.2 Environmental precautions:

Keep out of drains and water courses.

### 6.3 Methods for cleaning up:

Collect as much as possible of the spilled material in a clean container for reuse or disposal. Use wet sweeping compound or water to avoid dusting.

Sweep up. Clean up residue.

Refer to Section 13 for disposal information.



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### 7. HANDLING AND STORAGE

#### 7.1 Handling:

General recommendations:	For industrial or professional use only. Usual safety precautions for handling chemicals should be observed: avoid inhalation of dust, avoid ingestion and contact with eyes and skin, keep container tightly closed. Store work clothes separately from other clothing, food and tobacco products. Avoid overheating of material by improper handling. Avoid skin contact with hot material. Do not use a torch to clean this material from equipment without local exhaust ventilation and respirator. No smoking: smoking while using this product can result in contamination of the tobacco and/or smoke and lead to Polymer Fume Fever caused by the formation of the hazardous decomposition products mentioned in Section 2 of this MSDS.
Technical measures:	Closed design equipment for product handling and exhaust ventilation should be applied to insure limits set up in Section 8 of this MSDS
Fire prevention measures:	Prevention of flammable medium development, absence of ignition sources, prohibition of open flame usage

#### 7.2 Storage:

Conditions of storage:	Containers sealing, storage in dry place, at 1 m distance from heating facilities.
Incompatible materials:	Guaranteed shelf life - 2 years from the date of manufacturing Alkali and alkaline earth metals. Reactions with metals in powder form occur from 350 °C (662 °F) onwards. Large amounts of product should not be stored with inflammable materials. In fire product causes relatively toxic gases
Prevention of static electricity:	Ground all equipment (especially where dust is produced) containing material. To decrease accumulation of static charged relative humidity (RH) in the working area should be more than 50 %
Packing materials:	Double PE bags sealed with plastic lock and stacked into board boxes or plastic drums that are protected with adhesive band

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

#### 8.1 Exposure limit values:

Maximum allowable concentration:	10,0 mg/m <sup>3</sup> (CIS states) 6,0 mg/m <sup>3</sup> [TRGS 900 (Technical Rules for Hazardous Substances), Standard 2000], Germany
Airborne exposure limits (AEL):	<b>U.S. Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs):</b> TOTAL DUST: OSHA PEL/8-Hr TWA = 15 mg/m <sup>3</sup> RESPIRABLE DUST: OSHA PEL/8Hr TWA = 5,0 mg/m <sup>3</sup> <b>The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs):</b> INHALABLE DUST: ACGIH TLV/8-Hr TWA = 10 mg/m <sup>3</sup> RESPIRABLE DUST: ACGIH TLV/8-Hr TWA = 3 mg/m <sup>3</sup> <b>Time Weighted Average (TWA)</b> <b>Chemical Manufacturer Recommended Guideline (CMRG):</b> TOTAL DUST: CMRG TWA = 10 mg/m <sup>3</sup> RESPIRABLE DUST: CMRG TWA = 5,0 mg/m <sup>3</sup>

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**8.2 Exposure limits of decomposition products:**

OCCUPATIONAL EXPOSURE GUIDELINES						
PRODUCT NAME	Formula	CAS No.	REGIONS			
			USA			UK
			ACGIH, TLV	OSHA, PEL	NIOSH, REL	EH40, TLV/TWA
Hydrogen Fluoride	HF	7664-39-3	3 ppm 2,6 mg/m <sup>3</sup>	3 ppm 2,6 mg/m <sup>3</sup>	3 ppm 2,5 mg/m <sup>3</sup>	1,8 ppm 1,5 mg/m <sup>3</sup>
Carbonyl Fluoride	COF <sub>2</sub>	353-50-4	2 ppm 5,4 mg/m <sup>3</sup>	none	2 ppm 5,4 mg/m <sup>3</sup>	None
Hexafluoropropylene	C <sub>3</sub> F <sub>6</sub>	116-15-4	0,1 ppm	None	None	None
Tetrafluoroethylene	C <sub>2</sub> F <sub>4</sub>	116-14-3	2 ppm 5,4 mg/m <sup>3</sup>	None	None	None
Perfluoroisobutylene	C <sub>4</sub> F <sub>8</sub>	382-21-8	0,01 ppm 0,082 mg/m <sup>3</sup>	None	None	none
Carbon Monoxide	CO	630-08-0	25 ppm 29 mg/m <sup>3</sup>	50 ppm 55 mg/m <sup>3</sup>	35 ppm 40 mg/m <sup>3</sup>	30 ppm 35 mg/m <sup>3</sup>
Carbon Dioxide	CO <sub>2</sub>	124-38-9	5000 ppm 9000 mg/m <sup>3</sup>	5000 ppm 9000 mg/m <sup>3</sup>	5000 ppm 9000mg/m <sup>3</sup>	5000 ppm 9150 mg/m <sup>3</sup>

MAC = Maximum Allowable Concentration

TLV = Threshold Limit Value

REL = Recommended Exposure Limit

PEL = Permissible Exposure Limit

TLV/TWA= Threshold Limit Value / Time Weighted Average

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### 8.3 Exposure controls:

#### Technical measures:

Avoid dust generation. Provide either general, or local exhaust ventilation to minimize exposure, closed design equipment and regular cleaning of production rooms. If air is to be recirculated, it must be filtered properly. Vapors / fumes liberated during hot processing should be exhausted completely from working area to maintain above occupational exposure limits

#### Monitoring procedures:

Monthly gravimetric monitoring of occupational air

### 8.4 Personal protection:

#### Respiratory protection:



Avoid breathing dust. A respirator is not required if local exhaust ventilation is adequate. During heating: avoid breathing of vapors. For typical handling tasks at processing temperatures less than 260 °C (500 °F) half face piece or full face air-purifying respirator with N95 particulate filters (NIOSH approved) or filter mask with P2 filter (EU members) may provide protection from airborne particulates which cause <Polymer Fume Fever>. At higher processing temperatures, if there is a potential for exposure from an uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection, apply a positive pressure supplied-air respirator.

#### Hand protection:



Wear protective gloves as a standard industrial handling procedure. Avoid hand skin contact with hot material. Wear appropriate gloves, such as Nomex gloves (Polyamide fiber: meta-aramid, protect against heat up to 220 °C (428 °F); neoprene gloves [protect against heat up to 204 °C (400 °F)], when handling this material to prevent thermal burns.

#### Eye protection:



Use good industrial practice to avoid eye contact. Tightly fitting safety goggles with side shields or indirect vented goggles are optional.

#### Skin protection:



Wear normal work coveralls. Launder contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling. Have safety shower available at locations where skin contact can occur. Avoid skin contact with hot material. Barrier cream may be applied. If there is a possibility of contact with hot/molten material, wear heat resistant clothing and footwear.

#### Hygiene measures:

General industrial hygiene regulations are to be observed. Wash hands before breaks and at the end of working day. Tobacco should not be kept in the workplace. Eating, drinking and smoking should be prohibited in the working area.

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### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1 General information:

Appearance	Powder
Color	White
Odour	Odourless
Odour Threshold (ppm)	Not established

#### 9.2 Important health, safety and environmental information:

pH value of an aqueous dispersion:	Not applicable
Boiling point / Boiling range:	Not applicable
Melting / freezing point	320° - 346° [ASTM D 4894]
Flash point:	Not applicable
Flammability:	Non- flammable
Explosive properties:	Not applicable
Oxidizing properties:	Not applicable
Vapour pressure:	Not applicable
Density 23 °C (73 °F):	2,19-2,21 g/cm <sup>3</sup>
Bulk density:	350-600 kg/m <sup>3</sup>
Water solubility:	Insoluble
Solubility in other solvents, %:	Insoluble
Partition coefficient (n-octanol / water)	Not applicable
Viscosity:	Not applicable
Vapour density:	Not applicable
Evaporation rate:	Not applicable
Auto Ignition Temperature (°C)	Not applicable
Decomposition Temperature (°C)	> 260 °C

#### 9.3 Other information:

Volatiles loss, max:	0,2 % [3 hrs @ 420 °C (788 °F)]
Melting range :	320 °C (608 °F) - 346 °C (655 °F) [ASTM D 4894, DSC]
Self-ignition temperature:	In a layer, 520 °C (968 °F) [ASTM D 1929]
Tensile strength, min:	15 MPa – depending on the brand [9]
Ultimate elongation, min:	250 % - depending on the brand [9]
Temperature of decomposition:	Above 415 °C (779 °F)
Limiting Oxygen Index (LOI):	> 95 % [ASTM D 2863]
Liquid Oxygen Compatibility:	Excellent

**NOTE** - These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product

### 10. STABILITY AND REACTIVITY

<b>10.1 Stability:</b>	Stable under recommended storage and handling conditions indicated in Section No.7
<b>10.2 Hazardous polymerization:</b>	Does not occur.
<b>10.3 Conditions to avoid:</b>	Avoid the beginning of thermal decomposition at elevated temperature [> 260 °C (500 °F)].



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- 10.4 Materials to avoid:** Finely divided metal powders (aluminum and magnesium) and potent oxidizers like fluorine (F<sub>2</sub>), chlorine trifluoride (ClF<sub>3</sub>). Contact with incompatibles can cause an explosion, fire. When used for 20 AWG wire insulation, the product ignites at 704 °C (1300 °F) in a pure oxygen atmosphere under atmospheric pressure. Sealing tape, produced from Teflon, burned intensively in a helium atmosphere upon contact with sodium-potassium alloy.
- 10.5 Hazardous decomposition products:** Thermal decomposition products: ultra-fine, low-molecular-weight fluoropolymer particles [ $>260$  °C (500 °F)], carbonyl fluoride COF<sub>2</sub> (CAS 353-50-4) [500 °C (932 °F) - 600 °C (1110 °F)], hydrogen fluoride HF (CAS 7664-39-3) [400 °C (752 °F)], carbon dioxide CO<sub>2</sub> (CAS 124-38-9) [ $>650$  °C (1200 °F)], carbon monoxide CO (CAS 630-08-0) [ $>650$  °C (1200 °F)], perfluoroisobutylene C<sub>4</sub>F<sub>8</sub> (CAS 382-21-8) [475 °C (887 °F)], hexafluoropropylene C<sub>3</sub>F<sub>6</sub> (CAS 116-15-4) [460 °C (860 °F)], tetrafluoroethylene C<sub>2</sub>F<sub>4</sub> (CAS 116-14-3) [450 °C (842 °F)]

## 11. TOXICOLOGICAL INFORMATION

THERE ARE NO DANGERS TO HEALTH WITH PROPER USE AND IN ACCORDANCE WITH REGULATIONS 11.1

### Routes of exposure:

- Eyes contact:** With mechanical operations dust may be slightly irritating to mucous membranes of eyes. Not sufficient for classification.  
**During heating** vapors can cause eyes irritation with signs / symptoms as follows: redness, swelling, pain, tearing, blurred or hazy vision.  
**Thermal burns:** signs/symptoms may include severe pain, redness, swelling and tissue destruction.
- Inhalation:** Dust may be slightly irritating to upper respiratory tract. Slight inhalation of thermal decomposition products or smoking contaminated tobacco can provoke <Fluorine Polymer Fever> after 2-6 hours with influenza-like symptoms: high temperature, shivering, chest pain or tightness, cough, increased pulse, malaise, muscle aches, nausea, shortness of breath, sweats, headaches. Treatment is generally not necessary, symptoms disappear after 48 hours. Vapors from heated material may cause irritation of the respiratory system. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.
- Skin contact:** Non - irritating to skin. Contact with molten product can cause thermal burns.
- Ingestion:** Not expected to be a hazard in normal industrial use.
- 11.2 Chronic effects from long-term exposure:** The result of massive inhalation of thermal decomposition products [at temperatures 400 °C (752 °F)] is that after a symptomless period of time (4 - 24 hours) pulmonary edema starts with danger of suffocation.
- 11.3 Sensitization:** Not applicable.
- 11.4 Carcinogenicity:** None of the components available in this material at concentrations equal to or greater than 0, 1% is listed by IARC, NTP, OSHA or ACGIH as a carcinogen.
- 11.5 Mutagenicity:** Not applicable.
- 11.6 Reproductive toxicity:** Not applicable.

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### 12. ECOLOGICAL INFORMATION

<b>12.1 Ecotoxicity:</b>	Not determined. Expected to be low based on insolubility in water.
<b>12.2 Mobility:</b>	Not determined.
<b>12.3 Persistence and degradability:</b>	Because of insolubility in water separation by filtration or sedimentation is possible.
<b>12.4 Biological oxygen demand (BOD):</b>	Not determined.
<b>12.5 Chemical oxygen demand (COD):</b>	Not determined.
<b>12.6 Biodegradability:</b>	Not determined.
<b>12.7 Bioaccumulative potential:</b>	Not determined.

### 13. DISPOSAL CONSIDERATIONS

**13.1 Disposal considerations:** Uncontaminated product can be recycled. If no use is possible, product waste must follow applicable federal, state and local regulations. Waste must not be mixed with domestic or industrial waste that will be incinerated unless the facilities are equipped and permitted to handle acidic combustion products and scrub out hydrogen fluoride.

**13.2 Packing disposal:** Empty packing should be handled in a manner not to cause dusting during collection, transportation and disposal.

Contaminated packs should be emptied as far as possible and sent to incineration according to national or local regulations. Reclaim if feasible.

Local, state, provincial, and national disposal regulations may be more or less stringent. Consult your attorney or appropriate regulatory officials for information on such disposal.

US RCRA Status: This material is not a hazardous waste as that term is defined by the Resource, Conservation and Recovery Act (RCRA).

Waste product Code No. for uncontaminated product (European Waste Catalogue): 20 01 06, other plastics.

### 14. TRANSPORT INFORMATION

NOT CLASSIFIED AS DANGEROUS IN THE MEANING OF TRANSPORT REGULATIONS.

#### 14.1 Land transport:

ADR/RID class:	Not classified as dangerous goods.
ADR/RID packing group:	Not relevant.
DOT(USA) / TDG(Canada) class:	Not regulated.
UN number:	None.
Shipping name (by truck):	Plastic Materials
Shipping name (by rail):	Plastics, Synthetic, O.T.L., N.O.I.B.N.

#### 14.2 Sea transport:

IMO/IMDG code:	Not classified as dangerous goods.
IMO/IMDG packing group:	Not relevant.
EMS:	Not relevant.
Marine pollutant :	No.
Subsidiary risk:	Not relevant.
UN number:	None.

Proper shipping name: Plastic Materials

#### 14.3 Air transport:

ICAO/IATA class:	Not Restricted as IATA DGR 56Edition.
ICAO/IATA packing group:	Not classified as dangerous goods.
	Not relevant.

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UN number: None.  
Proper shipping name: Plastics, Synthetic, O.T.L. (Fluoroplast-4, mark)  
The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation  
**14.4 Special precautions:** Avoid humidity. Do not transport with food and feedstuffs.

### 15. OTHER INFORMATION

- 15.1 Risk phrases:** Vapors liberated during processing above 260 °C (500 °F) are harmful if inhaled and provoke an irritation of eyes, mucous membrane of respiratory track and, in high concentration, and an oedema of lungs. Avoid spills, the soil may become extremely slippery if the product is spilled
- 15.2 Suggested NFPA Rating:**
- |  |        |
|--|--------|
|  | Health |
|  | 1      |
- 15.3 Suggested HMIS Rating:**
- |  |        |
|--|--------|
|  | Health |
|  | 1      |
- 15.4 Recommended restrictions on use:** For industrial or professional use only.
- 15.5 Main applications:** For producing electrical articles and other articles of advanced reliability; electroinsulation, insulation and sealing tape; compression moulding and ram extrusion.

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**15.6 List of informational sources used in the preparation of the Safety Data Sheet:**

IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man. Geneva: World Health Organization, International Agency for Research on Cancer, 1972 – PRESENT. (Multivolume work)., p. S7 70 (1987), p. V19 290  
 Rumack BH POISINDEX ® Information System Micromedex, Inc., Englewood, CO, 2008\$ CCIS Volume 138, edition expires Nov, 2008. Hall AH & Rumack BH (Eds): TOMES ® Information System Micromedex, Inc., Englewood, CO, 2008; CCIS Volume 138, edition expires Nov, 2008.  
 The Merck Index. 9<sup>th</sup> ed. Rahway, New Jersey: Merck & Co., Inc., 1976. p. 986

Regulation № 1907/2006 concerning Registration, Evaluation, Authorisation and Restriction of Chemicals  
 The Merck Index. 9<sup>th</sup> ed. Rahway, New Jersey: Merck & Co., Inc., 1976. p. 985, 986  
 Lefaux, R. Practical Toxicology of Plastics. Cleveland: CRC Press Inc., 1968. p. 15  
 GOST 11262-80 Plastics. Tensile test method  
 National Fire Protection Association. Fire Protection Guide on Hazardous Materials. 7<sup>th</sup> ed. Boston, Mass.: National Fire Protection Association, 1978. p. 491M – 294

**16.7 Further information:** Compiled in conformity with Annex II of EC Regulation 1907/2006 dd. 18.12.2006. Meets U.S. OSHA Hazard Communication Standard, 29CFR 19.10.1200.

The information contained herein is based on the present state of our knowledge and does not therefore guarantee certain properties. Recipients of our product must take responsibility for observing existing laws and regulations.

**ANNEX  
Exposure Scenario**

Information item	Proposed ES1
<b>Product Identification</b>	
<b>Product name as it appears on SDS</b>	PTFE
<b>Short title exposure scenario</b>	
<b>Internal name</b>	PTFE
<b>Sector(s) of Use (SU)</b>	SU 3 Industrial Manufacturing (all) SU 12 Manufacture of plastics products, including compounding and conversion
<b>Process Category(ies) (PROC)</b>	PROC 2 Use in closed, continuous PROC ess with occasional controlled exposure (e.g. sampling), Industrial setting;
<b>Product OR Article category</b>	
	PC_32_n PC 32 Polymer Preparations and Compounds

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<b>Product Category(ies). (PC)</b>	
<b>Article Category(ies). (AC)</b>	
<b>Environmental Release Category(ies) (ERC)</b>	ERC2 Formulation of preparations ERC3 Formulation in articles ERC7 Industrial use of substances in closed systems

<b>Processes and activities</b>	
<b>Life Cycle Stage</b>	Manufacturing
<b>Optional: Provide additional information on processes and activities if needed</b>	Usual safety precautions for handling chemicals should be observed
<b>Max. Process temperature.</b>	Processing temperature is 380°C, service temperature is 260°C
<b>Human health - Workers</b>	
<b>Type of use</b>	Industrial
<b>Physical form under conditions of use</b>	Solid
<b>Dustiness category for solid substances.</b>	Low
<b>Max. Duration of inhalatory exposure.</b>	> 4 hours
<b>Outdoor or indoor operation and application of Local Exhaust Ventilation (LEV)</b>	Indoor with LEV
<b>Use of respiratory protection equipment (RPE).</b>	>90%
<b>Use of dermal protective clothes and gloves.</b>	Yes
<b>Dilution factor of the product.</b>	1
<b>Consumer exposure</b>	
<b>Product Sub-category(ies)</b>	
<b>Article Sub-category(ies)</b>	
<b>Is the Product a spray?</b>	No
<b>Maximum fraction of the product in the consumer product used per consumer per event</b>	1
<b>Max. dermal contact area with skin</b>	3 hands
<b>Max. oral contact area with mouth</b>	3 inside one hand - all fingers
<b>Maximum amount used per consumer per event</b>	0,1

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Optional : provide risk management measures if needed	Avoid spraying directly into eyes or nose
<b>Environmental exposure</b>	
Maximum amount of product used per year. If the amount used is variable, use the higher value as the maximum tonnage to be covered.	10000
Use of sewage/waste water treatment plant (STP) for selected ERC	Onsite
Max. number of emission days per year	300
Industry sector for spERC	
<b>Industry sector spERC - will overwrite ERC in risk assessment</b>	
Treatment of waste air	None
Treatment of waste solids	3rd party disposal
Treatment of waste liquids (not for waste water - see 6.2.4)	Other
Treatment of waste water	It is not required
Pre-treatment	Sand filtration
<b>Sewage/waste water treatment plant (STP) description:</b>	
- give flow rates and describe capacity of STP	
- elimination rate in STP	
- dry weather river flow rate	
- describe sludge solids disposal	
<b>Waste Management Measures</b>	
Information on measures to control risk during production and use stages of substance, preparation or article	This material and its container must be disposed of in a safe way
Information on measures to control risk at the end of service life of substance, preparation or article	This material and its container must be disposed of in a safe way
<b>Exposure prediction</b>	

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<b>Do you have relevant measurement data available (Worker exposure, environmental release, consumer safety) for the applicable PROC's, ERC's and PC's/AC's.</b>	Yes
<b>If yes, please attach this information. Please indicate the conditions under which the measurements have been taken.</b>	OSHA PEL/8-Hr TWA = 15 mg/m <sup>3</sup> OSHA PEL/8Hr TWA = 5,0 mg/m <sup>3</sup> ACGIH TLV/8-Hr TWA = 10 mg/m <sup>3</sup> ACGIH TLV/8-Hr TWA = 3 mg/m <sup>3</sup> CMRG TWA = 10 mg/m <sup>3</sup> CMRG TWA = 5,0 mg/m <sup>3</sup> (MAC): 10,0 mg/m <sup>3</sup> (CIS states); 6,0 mg/m <sup>3</sup> [TRGS 900 (Technical Rules for Hazardous Sub-stances), Standard 2000], Germany
<b>Boundaries set by Exposure Scenario</b>	
<b>Please provide additional information that you deem relevant for this use, Operational Conditions and Risk Management Measures</b>	Avoid inhalation of dust, avoid ingestion and contact with eyes and skin, keep container tightly closed. Store work clothes separately from other clothing, food and tobacco products. Avoid overheating of material by improper handling. Avoid skin contact with hot material. Do not use a torch to clean this material from equipment without local exhaust ventilation and respirator. No smoking: smoking while using this product can result in contamination of the tobacco and/or smoke and lead to Polymer Fume Fever caused by the formation of the hazardous decomposition products. Use personal protective equipment.