

MATERIAL SAFETY DATA SHEET

PRODUCT NAME : POLYTETRAFLUOROETHYLENE

1. Product and Company Identification

Product name: Polytetrafluoroethylene
Synonyms: PTFE
Item Numbers: C10516494, C10516497, C10517087

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2. Hazards Identification

EMERGENCY OVERVIEW

This material when properly handled according to good working and hygienic practices is not dangerous to human health and the environment. Toxic gases may be released at temperatures of 400 °C (752 °F) and above.

For short and long term exposure effects see Section 11 Toxicological data.

Eye Effects: No effects requiring first aid are expected during normal use.
Eye contact with thermal decomposition products causes redness, irritation, burns.

Skin Effects: No effects requiring first aid are expected during normal use.
Skin contact with thermal decomposition products causes redness, irritation, burns.
Skin contact with molten product can cause burns.

Ingestion/Oral Effects: No effects requiring first aid are expected during normal use.

Inhalation Effects: No effects requiring first aid are expected during normal use.
Slight inhalation of thermal decomposition products or smoking contaminated tobacco can cause 'fluorine polymer fever' after 2 - 6 hours (allergenic alveolitis with influenza-like symptoms: high temperature, shivering, chest pains, cough, increased pulse).
Treatment is generally not necessary, symptoms disappear after 48 hours.
The result of massive inhalation of thermal decomposition products (in temperatures > 450 °C) is that after a time without symptoms (4 - 24 hours), pulmonary oedema starts with the danger of suffocation.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None anticipated during normal use. Fumes produced at elevated temperatures may aggravate pre-existing eye, skin, and respiratory conditions.

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NFPA Hazard codes		HMIS Hazard codes		Rating System
Health	1	Health	0	0 = No Hazard
Flammability	0	Flammability	0	1 = Slight Hazard
Instability	0	Reactivity	0	2 = Moderate Hazard
				3 = Serious Hazard
				4 = Severe Hazard

3. Composition/Information on Ingredients

Ingredient	% Weight	CAS No	Hazard class*	Risk phrase*
Polytetrafluoroethylene	100	9002-84-0	Not applicable	Not applicable

*Hazard class & Risk phrase. These columns are only completed for ingredients which are classified as hazardous under EU Directive No 1272/2008 (as amended) and are present in sufficient concentration to make the overall substance hazardous. In all other situations, the column will be completed as "Not applicable".

4. First Aid Measures

- Eyes:** If a foreign body (splinter, chip) enters the eye, do not rub. Rinse immediately with plenty of water. Seek medical attention.
In the case of contact with thermal decomposition products, flush the eyes immediately and continuously with cold running water. Seek immediate medical assistance*.
- Skin:** For skin irritation caused by glass fibre thoroughly wash the affected area with water. **Do not rub!**
In the case of contact with molten polymer or thermal decomposition products, immediately flush the skin with cold running water to cool it and continue to flush for a prolonged time. Seek immediate medical assistance*
Remove contaminated clothing. Do not attempt to remove molten polymer from the skin. Cover burns with sterile dressings.
- Ingestion/Oral:** In case of ingestion/oral contact with thermal decomposition products, give several glasses of water to drink. Do not induce vomiting. Seek immediate medical assistance*.
- Inhalation:** In the case of inhalation of thermal decomposition, fire fighters must wear breathing apparatus, remove the patient to fresh air and keep the patient warm. If breathing problems occur, a qualified individual should administer oxygen or artificial respiration. Seek immediate medical assistance*.
- Other Information:** * In all cases of exposure to the thermal decomposition products of PTFE, seek immediate medical assistance, indicating that hydrofluoric acid and toxic gases are decomposition products. Note that symptoms may not appear until some hours after inhalation of decomposition products.

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5. Fire Fighting Measures

- Extinguishing Media: Water, foam, dry powder or carbon dioxide. Extinguishing materials and fire remnants must be safely disposed of: see Section 13 - Disposal Considerations.
- Fire and Explosion Hazard: When exposed to temperatures above 400 °C (752 °F) PTFE can decompose to produce toxic and corrosive substances: see Section 10.
- Special Protective Equipment for Fire Fighters: Fire fighters should wear a self contained breathing apparatus (SCBA) which meets appropriate standards operated in positive pressure mode, and full turn out gear. Wear eye/skin protection adequate to protect from thermal decomposition products. Use acid resistant protective clothing (capable of resisting hydrofluoric acid) to handle cool parts containing decomposed PTFE.
- Additional Information This product is difficult to ignite and is auto extinguishing. But in case of fire, with thermal decomposition toxic, acidic and combustible gasses and steam are released.

For Flammability Properties - see Section 9.

6. Accidental Release Measures

No material specific actions are required. Collect the spilled material and reuse or dispose as in Section 13.

7. Handling and Storage

- Handling: Avoid overheating of material by improper handling. Avoid dust generation.
- Storage: Store in a cool, well ventilated space away from direct sunlight, inflammable materials and sources of ignition. Store in original packaging showing code numbers.

8. Exposure Controls/Personal Protection

Exposure Limits:

Ingredient	ACGIH - TLV -	OSHA - PEL	Occupational Exposure Limits EH40 (UK)
PTFE	None *	None	Inhalable dust: 10 mg/m ³ Respirable dust: 6 mg/m ³ Thermal decomposition products - maximum exposure - 2.6 mg/m ³

* ACGIH recommends PTFE decomposition products be quantitatively determined in air as fluoride to provide an index of exposure. Although no TLV is recommended, ACGIH states "air concentration should be controlled as low as possible".

Threshold Limits of Decomposition products: (ACGIH 1999/00):

Hydrogen fluoride: 3 ppm (Ceiling) ACGIH TLV; 3 ppm OSHA PEL.

Carbonyl fluoride: 2 ppm (TWA) ACGIH TLV; 5 ppm (Ceiling).

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Personal Protection:

- Engineering Measures: For mechanical operations local extraction / ventilation is recommended to ensure that the exposure limits are not exceeded. Where dust is produced, measures must be taken to avoid static electricity discharge.
- Respiratory Protection: None required under normal conditions of use. During dusty operations use respiratory protection (dust mask P2).
- Hand/Skin Protection: Skin protection should be used (barrier cream). Persons sensitive to glass fibre should wear leather protective gloves. For mechanical processing of glass fibre reinforced products loose fitting, tight work clothes should be worn.
- Eye/Face Protection: For mechanical operations wear safety glasses with side pieces.
- Hygiene Measures: Practise good workplace hygiene. Do not eat or smoke when handling. Wash hands after handling and before eating and smoking.
- Other/General Protection: None required under normal conditions of use.

9. Physical and Chemical Properties

Appearance and Odour	White solid, no odour	Boiling point	No data available	°C/°F
pH (as supplied)	No data available	Melting Point	327 / 620	°C/°F
Solubility in Water	Insoluble	Auto Ignition	> 500 / 932	°C/°F
Volatile Content by Volume	No data available	Flash Point	No data available	°C/°F
Specific Gravity	2.18 - 2.21 (at 20 °C)			
Vapour Pressure (mbar)	No data available	Vapour Pressure (Torr)	No data available	

10. Stability and Reactivity

- Stability: Stable in normal conditions.
- Material/Conditions to Avoid: Flames and high temperatures.
- Hazardous Decomposition: When exposed to temperatures above 400 °C (752 °F) PTFE can be decomposed to produce toxic gases, predominantly carbon dioxide, carbon monoxide, hydrofluoric acid, tetrafluoroethylene, hexafluoropropylene, perfluoro-isobutylene, carbonyl fluoride and other low-molecular fluorohydrocarbons.
- Hazardous Polymerisation: Will not occur.

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11. Toxicological Information

For a comprehensive description for the various toxicological (health) effects which may arise if the user comes into contact with the substance or preparation refer to Section 2 Hazards Identification.

Animal data:

LD50 value: No data available.

LC50 value: 3500 mg/m³ at 626 °C or 2700 mg/m³ at 800 °C. Refer to pyrolysis products of PTFE.

Carcinogenicity:

No known carcinogenic effects.

Toxicity Information for PTFE Decomposition Products:

Inhalation: PTFE decomposition products vary widely in toxicity in experimental animals. Four hour LC50s (inhalation) for decomposition products range from 0.76 ppm (perfluoroisobutane) to 40,000 ppm (tetrafluoroethylene monomer). Workers exposed to PTFE fumes produced at 350-380 °C (temperatures associated with liberation of hexafluoroethane, perfluoroisobutylene and octafluorocyclobutene) exhibited symptoms consistent with polymer fume fever at workplace air concentrations of 3.5 mg/m³ compounds containing fluorine.

Chronic: Repeated episodes of polymer fume fever may damage the lungs.

12. Ecological Information

The ecological effects of the product have not been established. The product is not expected to be substantially biodegradable. The material contains no chlorofluorocarbons (CFC).

13. Disposal Considerations

Uncontaminated material can be recycled. The material must be properly contained. Dispose of at approved land fill sites, or by high temperature incineration, using licensed contractors. Disposal must be in accordance with local authority and national regulations.

Water or other substances used to extinguish a fire containing the materials, together with the fire remains, must be collected and be suitably disposed of. Contaminated waste material should be mechanically cleaned of product remainders before disposal.

14. Transport Information

This product is not classified as dangerous under transport regulations.

PARAMETER	EUROPEAN	CANADIAN TDG	UNITED STATES DOT
Proper Shipping Name	Not applicable	Not applicable	Not applicable
Hazard Class	Not applicable	Not applicable	Not applicable
Identification Number	Not applicable	Not applicable	Not applicable
Shipping Label	Not applicable	Not applicable	Not applicable

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15. Regulatory Information

European Regulatory Information

This product has been classified in accordance with EU Regulation No 1272/2008 (as amended) on the Classification, Labelling and Packaging of Substances and Mixtures.

Classified as dangerous to supply: No.

Risk Phrases: Not applicable.

Safety Phrases: Not applicable.

Symbols: None.

United States Regulatory Information

All materials contained in this product are listed on the U.S. Toxic Substances Control Act (TSCA).

SARA TITLE III SECTION 313 SUPPLIER INFORMATION:

This product does not contain toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and 40 CFR Part 372.

California Proposition 65: This product does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

Canadian Regulatory Information

WHMIS Classification: Not applicable.

All ingredients contained in this product are included on the Canadian DSL.

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16. Other Information

This MSDS is compiled in accordance with ANSI Z400.1 and Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Sources of information for this data sheet:

- ENSINGER GmbH "TECAFLON PTFE" EU-MATERIAL SAFETY DATA SHEET, Issue 745/00, from 04.08.2009.
- National Library of Medicine (NLM) electronic databases (HSDB, RTECS).

Glossary:

ACGIH - American Conference of Governmental Industrial Hygienists; **ANSI** - American National Standards Institute; **Canadian TDG** - Canadian Transportation of Dangerous Goods; **CAS** - Chemical Abstracts Service; **Chemtrec** - Chemical Transportation Emergency Center (US); **DSL** - Domestic Substances List; **EH40 (UK)** - HSE Guidance Note EH40 Occupational exposure limits; **EPCRA** - Emergency Planning and Community Right-to-Know Act; **HMIS** - Hazardous Material Information Service; **HSDB** - Hazardous Substances Data Base; **LC** - Lethal Concentration; **LD** - Lethal Dose; **NFPA** - National Fire Protection Association; **NLM** - National Library of Medicine; **OSHA** - Occupational Safety and Health Administration, US department of Labour; **PEL** - Permissible exposure limit; **RTECS** - Registry of Toxic Effects of Chemical Substances; **SARA (Title III)** - Superfund Amendments and Reauthorization Act; **SARA 313** - Superfund Amendments and Reauthorization Act, Section 313; **SCBA** - Self-Contained Breathing Apparatus; **TLV** - threshold limit value; **TSCA** - Toxic Substances Control Act Public Law 94-469; **TWA** - Time Weighted Average; **US DOT** - US Department of Transportation; **WHMIS** - Workplace Hazardous Materials Information System.

Revisions:

October 2010 - Data Sheet updated to reflect the latest regulatory and supplier safety information.

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