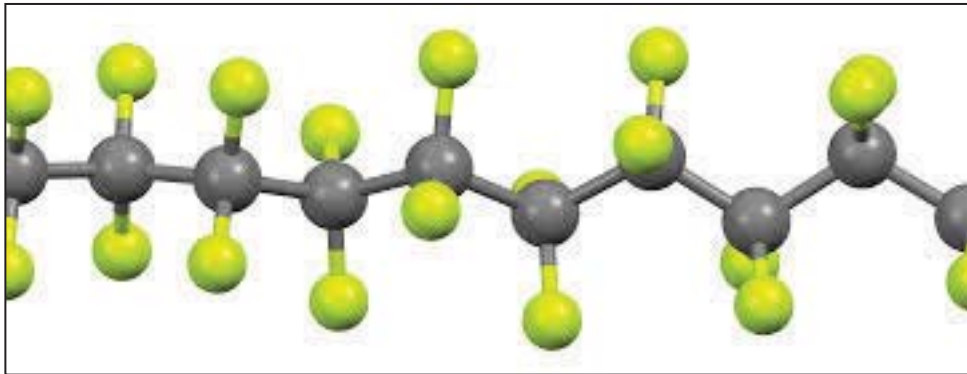


## PTFE Fluoropolymer at High Temperature & Cutting Method

*\*The Information provided within this document is as outlined by the manufacturer.*

Along with its great chemical resistance another important property of PTFE fluoropolymer is its wide range of working temperatures and its ability to resist heat.

Very few plastics are capable of service temperatures above 148°C (300°F). PTFE however, withstands temperatures inside baking ovens and inside engine compartments of jet aircraft up to 232°C (450°F) and can withstand intermittent temperature excursions to 260°C (500°F). While these temperatures are maximum ratings for reduced pressure service,



PTFE Molecule

PTFE hose will retain a great deal of its strength, flexibility and dielectric properties. As temperature increases the PTFE will soften to some degree.

While most inorganic engineering materials such as metals or ceramics lose strength and soften when overheated, plastics undergo some molecular breakdown of their chemical structure reducing the chain length of the polymer. Some of the products formed by this breakdown are gases. This decomposition accounts for a weight loss of 0.0001 percent to 0.0002 percent at 232°C (450°F) up to 0.0006 weight loss percent at 260°C (500°F). However weight loss rarely exceeds 1% at these temperatures as the rate of decomposition decreases with extended exposure. For applications of extreme high purity at temperatures above 204° (400°F) consult the manufacturer.

The thermal decomposition vapours of fluorinated polymers may cause polymer fume fever with flu-like symptoms in humans, especially when smoking contaminated tobacco. Symptoms usually appear after several hours and resolve within 1 to 2 days. Repeated episodes of polymer fume fever may result in persistent lung effects. Some operation such as abrasive saw cutting for fabrication may generate localized excessive heat. *See the section on abrasive cutting below.*

PTFE may extensively decompose if severely overheated or burned. Inhalation of fluorinated decomposition products may cause lung irritation and pulmonary Edema. Such symptoms may be delayed for several hours. Symptoms may be severe or life-threatening. Products of decomposition from severe over heating or fire at temperatures from 482°C (900°F) to 760°C (1400°F), can include the following; Carbonyl Fluoride (COF<sub>2</sub>) which hydrolyze very rapidly to Hafnium (HF) and Carbon Dioxide (CO<sub>2</sub>). Products Heated above 760°C (1400°F) can include; Tetrafluoromethane (CF<sub>4</sub>), Hafnium (HF) and Carbon Monoxide (CO).

### Abrasive Cutting of PTFE Hose

When cutting stainless steel braided PTFE hose with an abrasive saw, the PTFE inner core will heat up. The heat generated by the cut causes a localized decomposition of the PTFE in contact with the abrasive wheel and carbonyl fluoride gas is given off. This gas has caused a temporary flu like condition called polymer fume fever. The symptoms do



not occur until several hours after exposure and resolve within 1 to 2 days. Chronic exposure should be avoided.

**These steps should be taken to avoid this situation:**

1. Keep your work area ventilated.
2. Wear appropriate personal protective equipment (PPE), gloves, protective clothing, eye and face protection and if needed a respirator depending on ventilation.
3. Wash your hands when finished and before smoking. Do not store smoking material in area. The heat of a cigarette or cigar can react with PTFE powder to cause polymer fume fever.
4. Keep the area clean and well swept of debris.

**Other Safe Work Practices**

When handling cut length of hose fine particles of PTFE may be present. Blow out ends or use a soft bristle nylon brush to clear the ends.

*For more Information on Care & Maintenance of Hose Products go to [NEW-LINE.com/resources](http://NEW-LINE.com/resources)*