

# POLYTETRAFLUOROETHYLENE (PTFE)

## KEY FEATURES

- Low Coefficient of Friction
- Chemically Inert
- FDA Approved (Virgin Grade)
- Excellent Electrical Properties
- Broad Operating Temperature Range

## DESCRIPTION

PTFE (Polytetrafluoroethylene), usually referred to as Teflon (a registered trademark of DuPont) is a semi-crystalline high performance thermoplastic that is the most chemically resistant plastic known. Its mechanical properties are low compared to other engineering plastics, however its properties remain at a useful level over a great temperature range from -400°F to 500°F. Mechanical properties can be improved by the addition of fillers such as glass fiber, carbon, graphite, molybdenum disulfide and bronze.

PTFE has excellent thermal and electrical insulation properties as well as a very low coefficient of friction.

## TYPICAL PROPERTY VALUES

|            | Properties                    | Condition           | Units             | Value    | ASTM Test |
|------------|-------------------------------|---------------------|-------------------|----------|-----------|
| Physical   | Chemical Designation          |                     |                   | PTFE     |           |
|            | Filler                        |                     |                   |          |           |
|            | Density                       |                     | g/cm <sup>3</sup> | 2.16     | D792      |
| Mechanical | Tensile Modulus               | @ 73 °F             | PSI               | 80,000   | D638      |
|            | Tensile Strength              | @ 73 °F             | PSI               | 3,900    | D638      |
|            | Elongation @ Yld              | @ 73 °F             | %                 |          | D638      |
|            | Elongation @ Brk              | @ 73 °F             | %                 | 300      | D638      |
|            | Flexural Modulus              | @ 73 °F             | PSI               | 72,000   | D790      |
|            | Flexural Strength             | @ 73 °F             | PSI               | no break | D790      |
|            | Compressive Modulus           | @ 73 °F             | PSI               | 70,000   | D695      |
|            | Compressive Strength          | @ 73 °F, 10% strain | PSI               | 3,500    | D695      |
|            | Izod (charpy) Impact Strength | @ 73 °F             | ft-lbs/in         | 3.5      | D256      |
|            | Hardness, Shore D             | @ 73 °F             |                   | D50      | D785      |

### TYPICAL PROPERTY VALUES

|                   | Properties                  | Condition           | Units                         | Value                | ASTM Test |
|-------------------|-----------------------------|---------------------|-------------------------------|----------------------|-----------|
| <b>Thermal</b>    | Vicat Softening Point       |                     | °F                            |                      |           |
|                   | Melting Temperature         |                     | °F                            | 635                  | D3418     |
|                   | Heat Deflection Temperature | @ 66                | °F                            |                      | D648      |
|                   | Heat Deflection Temperature | @ 264               | °F                            | 132                  | D648      |
|                   | Service Temperature         | Intermittent        | °F                            |                      |           |
|                   | Max Operating Temperature   |                     | °F                            | 500                  |           |
|                   | Thermal Expansion (CLTE)    |                     | in/in/°F                      | 7.5*10 <sup>-5</sup> | D696      |
|                   | Specific Heat               |                     | BTU/lb-°F                     |                      |           |
|                   | Thermal Conductivity        |                     | BTU-in/ft <sup>2</sup> -hr-°F | 1.7                  | C177      |
| <b>Electrical</b> | Surface Resistivity         |                     | ohms/square                   |                      |           |
|                   | Volume Resistivity          | @50% RH             | ohm-cm                        | >10 <sup>18</sup>    | D257      |
|                   | Dielectric Strength         |                     | V/mil                         | 285                  | D149      |
|                   | Dielectric Constant         | @1MHz               |                               | 2.1                  | D150      |
|                   | Dissipation Factor          | @1 MHz              |                               | <0,0002              | D150      |
| <b>Other</b>      | Moisture Absorption         | @ 24 hrs, 73 °F     | %                             | <0,01                | D570      |
|                   | Moisture Absorption         | @ Saturation, 73 °F | %                             |                      |           |
|                   | Flammability                | UL 94               |                               | V-O                  |           |
|                   | Food Grade                  |                     |                               |                      |           |
|                   | Relative Cost               |                     |                               |                      |           |

\*The data stated above are typical values intended for reference and comparison purposes only.

\*The data should not be used as a basis for design specifications or quality control.

\*The information is provided as a guide to the best of our knowledge and given without obligation or liability.

\*Testing under individual application circumstances is recommended.