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*High Performance Films*



# Unparalleled Customer Service - High Performance Films

As the fluoropolymer experts, TCI offers a vast knowledge of diverse fluoropolymer technologies and superior customer service. Our unrivaled expertise and willingness to provide custom solutions has made us a leading supplier of the highest quality fluoropolymer films. TCI manufactures cast PTFE and melt extruded PFA, FEP, ETFE and PVDF films for use in industries that include: composite molding, chemical processing, heat sealing, welding, electrical, and medical.

Features of TCI's high performance films include:

- Extreme high & low temp capability: -425°F (-254°C) to 600°F (316°C)
- Custom thickness and color
- Chemical inertness
- Bio-compatibility
- Anti-stick / low energy surface
- Superb dielectric properties
- Good weatherability / UV resistant
- Non-flammability
- Low coefficient of friction
- High purity, no additives
- Heat Sealable / Thermoformability
- Premium grade (PG) films are produced with 100% virgin resins. Economical grades (WG) are available for heat sealing and welding applications.



## Industries Served

### Chemical Industry

Due to their excellent chemical resistance at elevated temperatures, TCI high performance films are utilized in many critical chemical industry applications, such as non-metallic expansion joints, roll covers, protective face shields, rupture discs, pump diaphragms, and thermoformed packaging.

- Extruded fluoropolymer films
- FEP, PFA, ETFE, PVDF
- Cast PTFE film (CF and Thermobondable)

### Composite Molding Process Materials

TCI MR (mold release) and VB (vacuum bagging) films cover the high end of the composite molding process temperatures range typically employed in fabrication of high performance composite parts for the aerospace industry. Complemented by PTFE coated fiberglass release fabrics and PSA tapes, this product line offers a complete range of products for the high-end composite industry.

- Cast PTFE MR films
- Cast PTFE VB films
- FEP MR films
- ETFE MR films

### Medical / Pharmaceutical Industry

Chemical & biological inertness of fluoropolymer films, combined with their bondability, is invaluable for the pharmaceutical industry in septa and vial cap liner applications.

- Cast PTFE films with bondable surface
- ETFE films

### Electrical / Electronics

TCI fluoropolymer films possess a combination of excellent dielectric properties, temperature capability, chemical resistance and weldability. These properties make them invaluable for circuit board laminates and high temperature insulation tapes for wire wrapping.

- FEP and PFA films
- Cast PTFE films CF100, CF200, Thermobondable

For more information, please contact Sales at (603) 296-2221 or [sales@textilecoated.com](mailto:sales@textilecoated.com).

| General Properties                     | Units  | Test Method | TCI Melt Extruded Films   |                      |                      |                      |                      |                      |                    |                    | TCI PTFE Cast Film            |                      |                      |                      |                      |
|--|--|-------------|---|----------------------|----------------------|----------------------|----------------------|----------------------|--------------------|--------------------|-------------------------------|----------------------|----------------------|----------------------|----------------------|
|  |  |             | FEP   |                      |                      | PFA                  |                      | ETFE                 |                    | PVDF               | PTFE                          |                      | PTFE MR              |                      | PTFE VB              |
|  |  |             | FEP PG  | FEP WG               | FEP MR               | PFA PG               | PFA WG               | ETFE PG              | ETFE MR            | PVDF KF            | CF                            | Bondable             | CF 100               | CF 200               | CF 300 LE            |
| Specific Gravity                       |  | ASTM D792   | 2.15  | 2.15                 | 2.15                 | 2.15                 | 2.15                 | 1.74                 | 1.74               | 1.78               | 2.15                          | 2.15                 | 2.15                 | 2.15                 | 2.15                 |
| Area Yield - 0.001" (25 μm) film       | ft <sup>2</sup> /lb/mil (m <sup>2</sup> /kg) |             | 90 (18.3)   | 90 (18.3)            | 90 (18.3)            | 90 (18.3)            | 90 (18.3)            | 110 (22.5)           | 110 (22.5)         | 108 (22.1)         | 90 (18.3)                     | 90 (18.3)            | 90 (18.3)            | 90 (18.3)            | 90 (18.3)            |
| Area Yield - 0.001" (25 μm) film       | lb/ft <sup>2</sup> (kg/m <sup>2</sup> )      |             | 0.011 (0.055)   | 0.011 (0.055)        | 0.011 (0.055)        | 0.011 (0.055)        | 0.011 (0.055)        | 0.009 (0.044)        | 0.009 (0.044)      | 0.009 (0.045)      | 0.011 (0.055)                 | 0.011 (0.055)        | 0.011 (0.055)        | 0.011 (0.055)        | 0.011 (0.055)        |
| Flammability                           |  | UL-94       | V-0   | V-0                  | V-0                  | V-0                  | V-0                  | V-0                  | V-0                | V-0                | V-0                           | V-0                  | V-0                  | V-0                  | V-0                  |
| Water Absorption                       | %  |             | <0.01   | <0.01                | <0.01                | <0.02                | <0.02                | <0.03                | <0.03              | <0.04              | <0.01                         | <0.01                | <0.01                | <0.01                | <0.01                |
| <b>Mechanical Properties</b>           |  |             |   |                      |                      |                      |                      |                      |                    |                    |                               |                      |                      |                      |                      |
| Tensile Strength                       | psi  | ASTM D882   | 3,500   | 3,500                | 3,500                | 3,000                | 3,000                | 7,000                | 7,000              | 5,000 - 7000       | 4,500                         | 4,300                | 4,500                | 4,500                | 4,300                |
| Elongation at Break                    | %  | ASTM D882   | 300   | 300                  | 300                  | 300                  | 300                  | 300                  | 300                | 250                | 400                           | 400                  | 400                  | 400                  | 550                  |
| Tensile Modulus                        | psi  | ASTM D882   | 70,000  | 70,000               | 70,000               | 70,000               | 70,000               | 140,000              | 140,000            | 290,000            | 55,000                        | 55,000               | 55,000               | 55,000               | 55,000               |
| Initial Tear Strength (2 mil film)     | g  | ASTM D1004  | 550   | 550                  | 550                  | 500                  | 500                  | 500                  | 500                | -                  | 500                           | 500                  | 500                  | 500                  | -                    |
| Propagation Tear Strength (2 mil film) | g  | ASTM D1922  | 250   | 250                  | 250                  | 250                  | 250                  | 250                  | 250                | -                  | -                             | -                    | -                    | -                    | -                    |
| Folding Endurance (MIT)                | cycles                                       | ASTM D2176  | 10,000  | 10,000               | 10,000               | >100,000             | >100,000             | >50,000              | >50,000            | >25,000            |                               |                      |                      |                      |                      |
| <b>Thermal Properties</b>              |  |             |   |                      |                      |                      |                      |                      |                    |                    |                               |                      |                      |                      |                      |
| Continuous Use Temp                    | °F (°C)                                      | UL-746 B    | 400 (205)   | 400 (205)            | 400 (205)            | 500 (260)            | 500 (260)            | 330 (165)            | 330 (165)          | 300 (155)          | 600 (316)                     | 500 (260)            | 600 (316)            | 600 (316)            | 500 (260)            |
| Melt Point                             | °F (°C)                                      | ASTM D3418  | 500 (260)   | 500 (260)            | 500 (260)            | 580 (305)            | 580 (305)            | 500 (260)            | 500 (260)          | 330 (165)          | 620 (327)                     | 620 (327)            | 620 (327)            | 620 (327)            | 620 (327)            |
| Coeff. of Lin. Thermal Expansion       | in/(in °F)                                   | ASTM D696   | 5.5x10 <sup>-5</sup>  | 5.5x10 <sup>-5</sup> | 5.5x10 <sup>-5</sup> | 5.5x10 <sup>-5</sup> | 5.5x10 <sup>-5</sup> | 4x10 <sup>-5</sup>   | 4x10 <sup>-5</sup> | 7x10 <sup>-5</sup> | 5.5x10 <sup>-5</sup>          | 5.5x10 <sup>-5</sup> | 5.5x10 <sup>-5</sup> | 5.5x10 <sup>-5</sup> | 5.5x10 <sup>-5</sup> |
| <b>Electrical Properties</b>           |  |             |   |                      |                      |                      |                      |                      |                    |                    |                               |                      |                      |                      |                      |
| Dielectric Strength (1mil film)        | volts / mil                                  | ASTM D149   | 6,500   | 6,500                | 6,500                | 6,500                | 6,500                | 5,500                | 5,500              | 4,000              | n/a                           | 4,200                | n/a                  | n/a                  | n/a                  |
| Dielectric Constant 1kHz               |  | ASTM D150   | 2.0   | 2.0                  | 2.0                  | 2.1                  | 2.1                  | 2.6                  | 2.6                | 7.5                | n/a                           | n/a                  | n/a                  | n/a                  | n/a                  |
| Dissipation Factor, 1kHz               |  | ASTM D150   | 0.0003  | 0.0003               | 0.0003               | 0.0005               | 0.0005               | <0.0008              | <0.0008            | -                  | n/a                           | n/a                  | n/a                  | n/a                  | n/a                  |
| Surface Resistivity                    | ohm/sq                                       | ASTM D257   | 1x10 <sup>15</sup>  | 1x10 <sup>15</sup>   | 1x10 <sup>15</sup>   | 1x10 <sup>15</sup>   | 1x10 <sup>15</sup>   | 1x10 <sup>14</sup>   | 1x10 <sup>14</sup> | -                  | n/a                           | 1x10 <sup>18</sup>   | n/a                  | n/a                  | n/a                  |
| <b>Optical Properties</b>              |  |             |   |                      |                      |                      |                      |                      |                    |                    |                               |                      |                      |                      |                      |
| Refractive Index                       |  | ASTM D542   | 1.34  | 1.34                 | 1.34                 | 1.35                 | 1.35                 | 1.4                  | 1.4                | 1.4                | n/a                           | n/a                  | n/a                  | n/a                  | n/a                  |
| Solar Transmission                     | %  | ASTM E424   | 96  | 96                   | 96                   | 96                   | 96                   | 90                   | 90                 | 90                 | n/a                           | n/a                  | n/a                  | n/a                  | n/a                  |
| <b>Product Offering</b>                |  |             |   |                      |                      |                      |                      |                      |                    |                    |                               |                      |                      |                      |                      |
| Width                                  | inches (mm)                                  |             | 0.5 - 2 mil: 1" - 60" (25-1524); 3 - 10 mil: 1" - 62" (25 - 1575) |                      |                      |                      |                      |                      |                    |                    | 1" - 56" (25 - 1422)          |                      |                      |                      |                      |
| Thickness                              | mils (μm)                                    |             | .5 - 10 (12.5 - 250)  |                      |                      | .5 - 10 (12.5 - 250) |                      | .5 - 10 (12.5 - 250) |                    | 1 - 10 (25 - 250)  | 1 - 5 (25-125)                |                      | 1 (25)               | 2 (50)               | 3 (75)               |
| Standard Colors                        |  |             | Clear   | Clear Tinted         | White, Red, Violet   | Clear                | Clear Tinted         | Clear                | Blue, Red          | Clear              | Red, blue, white, yellow, tan |                      | Red, white, blue     |                      | Yellow               |
| <b>Surface Treatments Available</b>    |  |             |   |                      |                      |                      |                      |                      |                    |                    |                               |                      |                      |                      |                      |
| Chemical Etching                       |  |             | Y   | Y                    | Y                    | Y                    | Y                    | Y                    | Y                  | Y                  | Y                             | Y                    | Y                    | Y                    | Y                    |
| <b>Applications</b>                    |  |             |   |                      |                      |                      |                      |                      |                    |                    |                               |                      |                      |                      |                      |
| Aerospace/Release or Bagging Films     |  |             |   |                      | Y                    | Y                    | Y                    | Y                    | Y                  | Y                  | Y                             | Y                    | Y                    | Y                    | Y                    |
| Chemical Process                       |  |             | Y   | Y                    |                      | Y                    | Y                    | Y                    | Y                  | Y                  | Y                             | Y                    |                      |                      |                      |
| Electrical/Electronics                 |  |             | Y   |                      |                      | Y                    |                      | Y                    |                    | Y                  | Y                             | Y                    |                      |                      |                      |
| Medical                                |  |             | Y   |                      |                      | Y                    |                      | Y                    |                    | Y                  | Y                             | Y                    |                      |                      |                      |
| Optical /Photovoltaics                 |  |             | Y   |                      |                      | Y                    |                      | Y                    |                    | Y                  |                               |                      |                      |                      |                      |