



High Performance Films

# DuPont PFA

fluorocarbon film

## Description

DuPont PFA film is a transparent, thermoplastic film that can be heat sealed, thermoformed, vacuum formed, heat bonded, welded, metallized, laminated (combined with dozens of other materials), and used as an excellent hot-melt adhesive. This wide variety of fabrication possibilities combines with the following important properties to offer a unique balance of capabilities not available in any other plastic film.

## Chemical Compatibility

DuPont PFA film is chemically inert and solvent resistant to virtually all chemicals, except molten alkali metals, gaseous fluorine, and certain complex halogenated compounds, such as chlorine trifluoride at elevated temperatures and pressures.

- Teflon® is the most inert of all plastics.
- Low permeability to liquids, gases, moisture, and organic vapors

## Electrical Reliability

- Superior reliability and retention of properties over large areas of film
- High dielectric strength, over 260 kV/mm for 0.025-mm film (6500 V/mil for 1-mil film)
- No electric tracking, nonwetable, and noncharring
- Very low power factor and dielectric constant, only slight change over wide ranges of temperature and frequency

Teflon® is a registered trademark of DuPont.

## Wide Thermal Range

- Continuous service temperature: -240 to 260°C (-400 to 500°F)
- Melting range: 300 to 310°C (572 to 590°F)
- Heat sealable

## Mechanical Toughness

- Superior antistick and low frictional properties
- High resistance to impact and tearing
- Useful physical properties at cryogenic temperatures

## Long Time Weatherability\*

- Inert to outdoor exposure
- High transmittance of ultraviolet and all but far infrared

## Reliability

- PFA film contains no plasticizers or other foreign materials.
- Conventional equipment and techniques can be used for processing; basic composition and properties will not be influenced.
- Rigid quality control by DuPont ensures uniform gauge, void-free film.

\*Type C film not recommended for outdoor use.

The convenience of Teflon® fluorocarbon in easy-to-use film facilitates the design and fabrication of this low friction thermoplastic for all sorts of high-performance jobs. It is transparent and can be *heat sealed, thermoformed, welded, and heat bonded*. Superior antistick properties make it an ideal release film for many applications. A *cementable* type with

an invisible surface treatment is available for bonding to one or both sides with adhesives. This versatility is augmented by the superior properties of a true melt-processible fluorocarbon and by the wide choice of product dimensions available from DuPont.

**Table 1  
Types and Gauges of DuPont PFA Film**

Gauge	50	100	200	500	750LP	1000	2000	3000	6000	9000	12500
Thickness											
mil	½	1	2	5	7.5	10	20	30	60	90	125
in	0.0005	0.001	0.002	0.005	0.0075	0.010	0.020	0.030	0.060	0.090	0.125
µm	12.5	25	50	125	187	250	500	750	1500	2300	3175
Approximate Area Factor											
ft <sup>2</sup> /lb	180	90	45	18	13.5	9	4.5	3	1.5	1	0.7
in <sup>2</sup> /lb	25,000	12,900	6,450	2,580	1,935	1,290	645	430	215	136	98
m <sup>2</sup> /kg	36	18	9	4	3	2	1	0.6	0.3	0.2	0.14
Type LP—General-Purpose	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available	Available
Type CLP—One Side Cementable	—	Available	Available	Available	—	—	—	—	—	—	—

Films are available in the following widths: 50–500 gauge, ½ in to 60 in available; 750–12500 gauge, ½ in to 48 in available. See current price list for widths by specific gauge and type.

**Table 2**  
**Summary of Properties of DuPont PFA Film**

	Property	Test Method	Typical Value*	
			SI Units	English Units
<b>Mechanical</b>	Tensile Strength at Break	ASTM D-882	21 N/mm <sup>2</sup>	3000 psi
	Elongation at Break	ASTM D-882	300%	
	Yield Point	ASTM D-882	12 MPa	1700 psi
	Elastic Modulus	ASTM D-882	480 MPa	70,000 psi
	Impact Resistance	DuPont pneumatic impact tester	6.2 × 10 <sup>4</sup>	14 in.-lb/mil
	Folding Endurance (MIT)	ASTM D-2176	100,000 cycles	
	Tear Strength—Initial (Graves)	ASTM D-1004	4.90 N	500 g
	Tear Strength—Propagating (Elmendorf)	ASTM D-1922	0.74 N	75 g
<b>Thermal</b>	Melt Point	ASTM D-3418 (DTA)	302–310°C	575–590°F
	Thermal Conductivity	Cenco-Fitch	0.195 W/(m·K)	1.35 Btu·in/(h·ft <sup>2</sup> ·°F)
	Specific Heat	—	1172 J/(kg·K)	0.28 Btu/(lb·°F)
	Dimensional Stability	30 min at 150°C (302°F)	MD = 1% shrinkage TD = 1% shrinkage	
	Oxygen Index	ASTM D-2863	95%	
<b>Electrical</b>	Dielectric Strength, short-time, in air at 23°C (73°F), 6.35 mm (1/4 in) diameter electrode, 0.79 mm (1/32 in) radius, 60 Hz, 500 V/s rate of rise: 0.025 mm (1 mil) film	ASTM D-149 Method A	260 kV/mm	6500 V/mil
	Dielectric Constant, 25°C (77°F), 100 Hz to 1 MHz	ASTM D-150	2.0	
	Dissipation Factor, 25°C (77°F), 100 Hz to 1 MHz	ASTM D-150	0.0002–0.0007	
	Volume Resistivity, –40 to 240°C (–40 to 464°F)	ASTM D-257	>1 × 10 <sup>17</sup> ohm·cm	
<b>Chemical</b>	Moisture Absorption	—	<0.02%	
	Permeability, Gas:	ASTM D-1434	cm <sup>3</sup> /(m <sup>2</sup> ·24 h·atm)**	
	Carbon Dioxide		14 × 10 <sup>3</sup>	
	Nitrogen		2.0 × 10 <sup>3</sup>	
	Oxygen	6.7 × 10 <sup>3</sup>		
Permeability, Vapors:	ASTM E-96	g/(m <sup>2</sup> ·d)	g/(100 in <sup>2</sup> ·24 h)	
Water		2	0.13	
Teflon® is chemically inert and solvent resistant to virtually all chemicals, except molten alkali metals, gaseous fluorine, and certain complex halogenated compounds, such as chlorine trifluoride at elevated temperatures and pressures.				
<b>Misc.</b>	Density	ASTM D-1505	2150 kg/m <sup>3</sup>	134 lb/ft <sup>3</sup>
	Coefficient of Friction Kinetic (Film-to-Steel)	ASTM D-I 894	0.1–0.3	
	Refractive Index	ASTM D-542	1.350	
	Solar Transmission	ASTM E-424	96%	

\*For 0.050-mm (2-mil) film at 25°C (77°F), unless otherwise specified

\*\*To convert to cm<sup>3</sup>/(100 in<sup>2</sup>·24 h·atm), multiply by 0.0645

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**Caution:** Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement," H-50102.

