



Tedlar®

polyvinyl fluoride film

Chemical Properties, Optical Properties, and Weatherability Performance

Chemical Properties

Tedlar® PVF film has excellent resistance to chemicals, solvents, and stains. It retains its film form and strength, even when boiled in strong acids and bases. At ordinary temperatures, the film

is not affected by many classes of common solvents, including hydrocarbons and chlorinated solvents. It is impermeable to greases and oils. It is partially soluble in a few highly polar solvents at temperatures above 149°C (300°F). See **Tables 1** and **2**.

Table 1
Chemical Resistance of *Tedlar®* PVF Film

(After exposure to the environments, marked with an X below, *Tedlar®* showed no significant change in tensile strength, elongation to break, or pneumatic impact strength.)

	1-Year Immersion at Room Temperature	2-Hour Immersion at Boil	31-Day Immersion at 75°C (167°F)
Acids			
Acetic Acid (glacial)	X		X
Hydrochloric Acid (10% & 30%)			X
Hydrochloric Acid (10%)	X	X	
Nitric Acid (20%)	X		
Nitric Acid (10% & 40%)			X
Phosphoric Acid (20%)	X		
Sulfuric Acid (20%)	X		
Sulfuric Acid (30%)			X
Bases			
Ammonium Hydroxide (12% & 39%)	X		
Ammonium Hydroxide (10%)			X
Sodium Hydroxide (10%)	X	X	
Sodium Hydroxide (10% & 54%)			X
Solvents			
Acetone	X	X	
Benzene	X	X	
Benzyl Alcohol			X
Dioxane (14)			X
Ethyl Acetate			X
Ethyl Alcohol			X
n-Heptane	X		
Kerosene	X		
Methyl Ethyl Ketone			X
Toluene			X
Trichloroethylene			X
Miscellaneous			
Phenol	X		
Phenol (5%)			X
Sodium Chloride (10%)	X		
Sodium Sulfide (9%)			X
Tricresyl Phosphate			X

Table 2
Stain Resistance of *Tedlar*® PVF Film

Staining Agent	TTR20SG4 Glossy	TWH15BL3 Delustered
Iodine	"Lestoil" (full strength)	Dry towel
Grape Juice	Damp towel	Damp towel
Grease	"Lestoil" (full strength)	"Lestoil" (full strength)
Mercurochrome	"Lestoil" (full strength)	"409" all-purpose cleaner
Ink, Carter's Black	"409" all-purpose cleaner	Methylene chloride

Note: Staining agents were applied to the film, allowed to dry for 24 hr, and then removed. Above are the strongest methods required to completely remove these stains.

Optical Properties

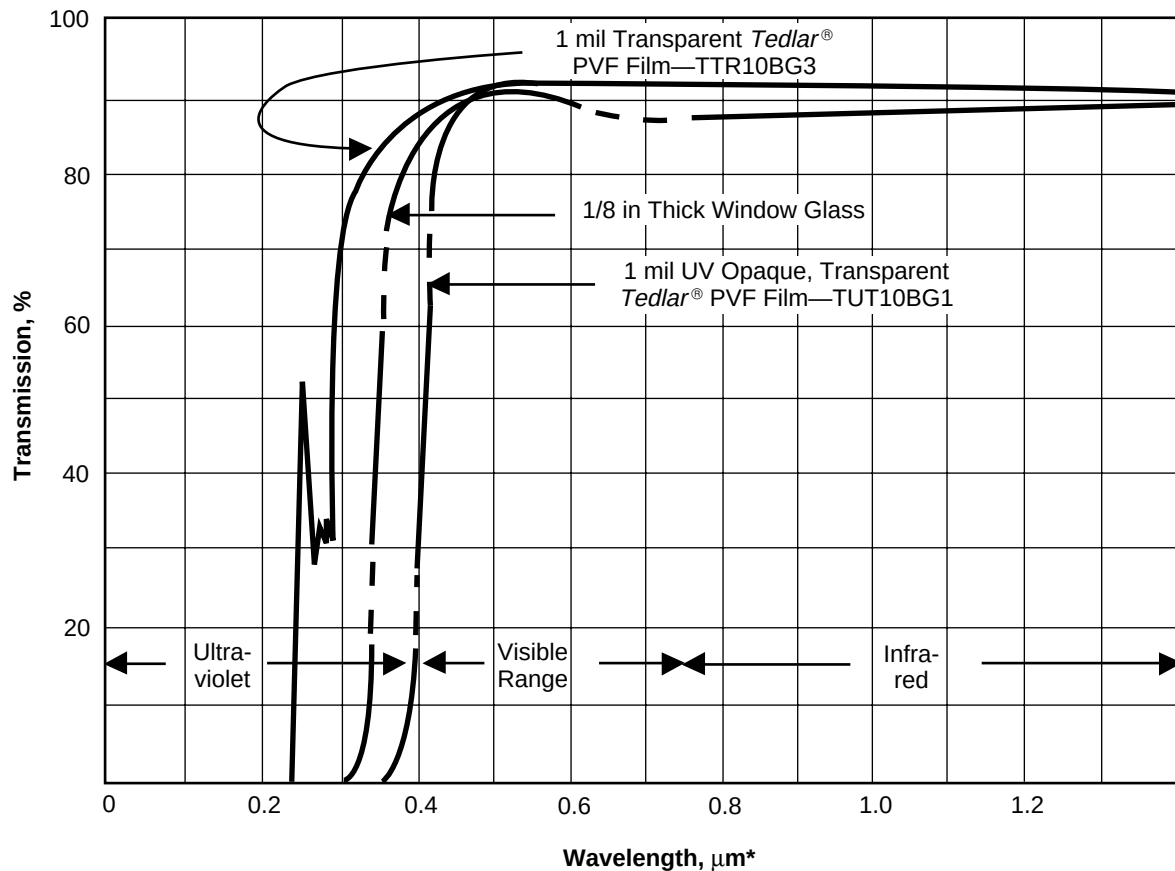
Spectral Transmission

Transparent types of *Tedlar*® PVF film are essentially transparent to solar radiation in the near ultraviolet,

visible, and near infrared regions of the spectrum. Ultra-violet absorbing types of *Tedlar*® are available for protection of various substrates against ultraviolet light attack.

Transmission spectra for *Tedlar*® are shown in **Figure 1**.

Figure 1. Spectral Transmission



*10,000 Å = 1 μm = 0.001 mm

Weatherability Performance

One of the outstanding characteristics of *Tedlar*® PVF film is its resistance to solar degradation.

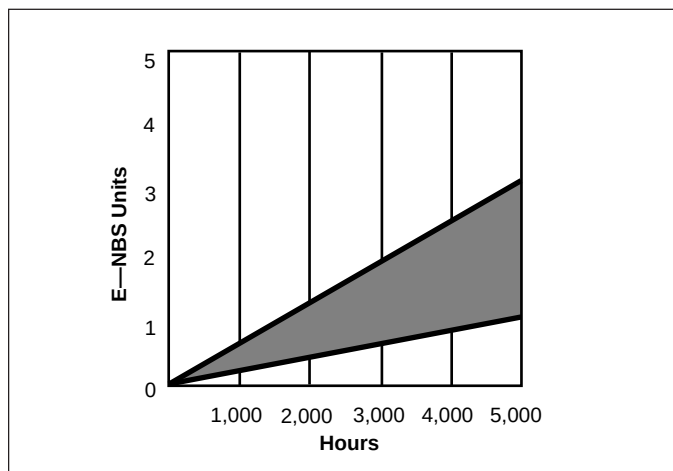
Pigmented *Tedlar*®, properly laminated to a variety of substrates, imparts a long serviceable life. Most colors exhibit no more than five NBS units (Modified Adams Color Coordinates) color change after 20 years' vertical, U.S., outdoor exposure.

Unsupported transparent *Tedlar*® has retained at least 50% of its tensile strength after ten years in Florida facing south at 45°.

Color stability, Weather-Ometer, and Florida exposure are shown in **Figures 2, 3, and 4**.

Information in this bulletin applies only to *Tedlar*® and does not reflect on the performance of any substrate.

Figure 2. Color Stability—Accelerated Exposure (Atlas Sunshine Arc Weather-Ometer)



Note: Colored films vary slightly in color retention, depending on color.

Figure 3. Accelerated Exposure (Atlas Sunshine Arc Weather-Ometer)

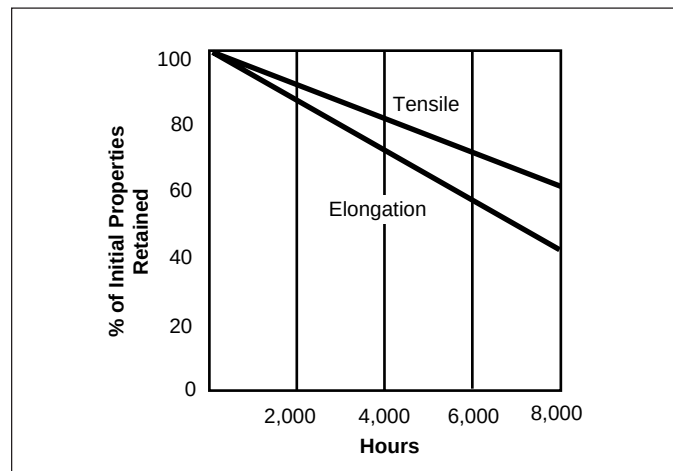
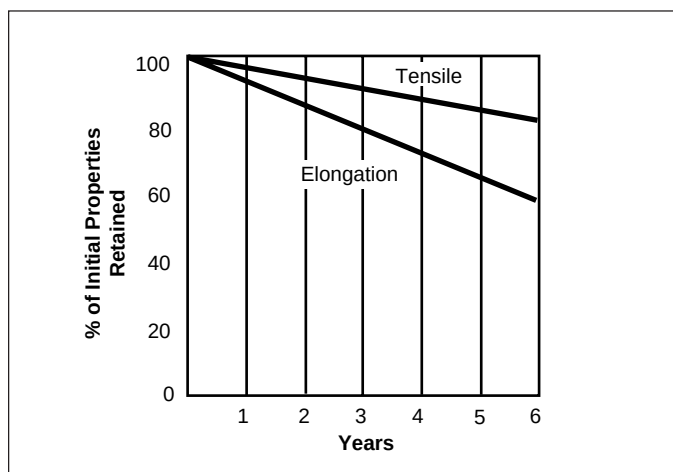


Figure 4. Physical Property Retention—Florida Exposure (45° Facing South)



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Note: We believe this information is the best currently available on the subject. It is offered as a possible helpful suggestion in experimentation you may care to undertake along these lines. It is subject to revision as additional knowledge and experience are gained. DuPont makes no guarantee of results and assumes no obligation or liability whatsoever in connection with this information. This publication is not license to operate under, or intended to suggest infringement, of any existing patents.

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.



Tedlar®
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