

DUPONT™ TEDLAR® POLYVINYL FLUORIDE (PVF) FILMS

COMPOSITE RELEASE FILM APPLICATIONS



INTRODUCTION

DuPont™ Tedlar® polyvinyl fluoride (PVF) films provide an ideal release for fiber-reinforced polymer (FRP) and carbon-fiber-reinforced polymer (CFRP) composites. With Tedlar®, the molds of parts and linings are protected and have the ability to stay in place during curing and processing under high temperature and pressure.

EXPANDED SUPPLY CAPABILITY

DuPont has recently more than doubled production capacity for Tedlar® PVF films. With this expansion, *Tedlar® is readily available to meet the anticipated long term needs for composites and other industrial applications.*

TEDLAR® PVF FILM ATTRIBUTES

DuPont™ Tedlar® PVF films have outstanding mechanical properties; inertness to a variety of chemicals and solvents; and anti-stick properties that make it an excellent release film for molded parts. The films do not contain silicones, which can cause adhesion and delamination problems in finished parts.

With the ability to withstand curing temperatures up to 204°C (400°F) and allow heat to easily pass through to the part that is being processed, these films yield faster curing, annealing and forming of the part. Also, by imparting a consistent matte surface finish and a high level of surface quality to the part, Tedlar® may reduce or eliminate the need for additional processing and finishing steps, such as sanding and painting, thereby lowering manufacturing costs.

Tedlar® release films can be customized by pigmenting and tailoring elongation properties to meet your specific application needs. With its unique balance of properties, these films are durable enough to be re-used for multiple parts in some applications.

TEDLAR® FILM TYPES

Aircraft manufacturers and their subcontractors now have a choice of materials to use. Tedlar® TTR10SG3, TTR20SG4 and TMR10SM3 release films are recommended for use in hand lay-up and vacuum bagging operations for curing epoxy and polyester prepreg parts, where inspection of the part before or after application of heat and pressure is desirable.

The industry has found transparent TTR10SG3 to be a good processing aid in the preparation of composites. For applications where conformability, toughness, and inertness to bonding adhesives are essential, TTR20SG4 is the recommended film. If a rougher surface texture is desired for the composite part, choose TMR10SM3. In addition to the added surface texture, it also provides a broader operating range due to its higher thermal stability.

When it is essential to be able to tell if all the release film has been stripped from the part, a pigmented film may be preferred, such as TWH10SS3 or TWH20SS3.

All DuPont™ Tedlar® films can also be obtained with one side treated to accept adhesives or other bonding materials for the fabrication of specialty release laminates. Tapes and perforated Tedlar® are available from converters for special applications.

Tedlar® release films are available in 25 and 51µm (1 and 2 mil) thicknesses as clear, translucent, or opaque white film and in several surface finishes, as shown in **Table 1**.

TABLE 1
PHYSICAL PROPERTIES OF DUPONT™ TEDLAR® PVF RELEASE FILMS

Property	TTR10SG3	TMR10SM3	TWH10SS3	TWH20SS3	TTR20SG4
Nominal Thickness, µm (mil)	25 (1.0)	25 (1.0)	25 (1.0)	51 (2.0)	51 (2.0)
Gloss	High	Medium	Satin	Satin	High
Color	Clear	Translucent	White	White	Clear
Specular Gloss 60°	65	8	15	22	65
Surface Roughness min, avg, µm (µin)	0.18 (7)	0.64 (25)	0.25 (10)	0.21 (8)	0.25 (10)
Tenacity, min* MPa kpsi	90 13	62 9	83 12	62 9	62 9
Web Strength* N/m, width lb/in, width	2275 13	1575 9	2100 12	3150 18	3150 18
Elongation (MD) min, %*	95	100	75	110	125
Approximate Yield m ² /kg ft ² /lb	28.6 140	28.6 140	24.4 119	12.2 60	14.3 70

*Room temperature

PRECAUTIONS

STATIC

In unwinding, sheeting, or handling operations on thin plastic films, static charges can build up. Static discharges across the film result in surface “etching”, making it susceptible to sticking in those areas. It may be necessary to add commercial static eliminator bars or grounded metallic tinsel to the handling equipment for control of static discharge. TMR10SM3 has the least tendency towards static buildup.

THERMAL DEGRADATION

Thermal degradation of Tedlar® PVF film results in embrittlement, browning, and finally, charring of the film. Acidic conditions catalyze the degradation. If press plates become contaminated with charred Tedlar®, repeated use will cause repeated charring. If char-

ring occurs, press plates should be cleaned thoroughly and given an alkaline rinse of a dilute water solution of sodium carbonate or sodium bicarbonate.

CATALYSTS AND RESINS

Tedlar® is being successfully used with a wide variety of epoxy resins. However, the presence of boron fluoride type complex catalysts in the final cure cycle can cause sticking and, at higher temperature conditions, decomposition of the film.

DISPOSAL

Reference a current Safety Data Sheet or Article Information Sheet for guidance on the appropriate measures for disposal.

For more information on DuPont™ Tedlar® PVF films, please give us a call or visit our website:

US (Toll-Free):	1-888-387-8337
Europe, Middle East & Africa:	+34-985-12-3773
Taiwan:	+886-3-377-3528
China (Toll-Free):	+86-400-8851-888
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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-50102-4.