



Tedlar®

polyvinyl fluoride film

Formable Film

Introduction

A family of quality *Tedlar*® polyvinyl fluoride (PVF) films has been developed for applications where enhanced elongation and texturing capabilities are required. The proven characteristics of cleanability, durability, color stability, and color reproducibility are also inherent in these formable *Tedlar*® PVF films.

Formable Type 5 films can be printed, laminated to a variety of substrates, and embossed to meet design needs. Suggested applications include deeply contoured parts requiring surface protection such as aircraft cabin interior surfaces. The greater formability of Type 5 *Tedlar*® film is obtained by extending both the elongation and ultimate tensile properties over a very broad range. Ultimate elongation is almost twice that of standard Type 3 film.

Formability

Tedlar® formable Type 5 is a versatile industrial film that can be applied over a variety of substrates including Nomex®, polycarbonate, fiberglass-reinforced polyester, ABS, and aluminum. Formable *Tedlar*® is manufactured in 1.5 and 2.0 mil thickness. Type 5 film typically draws 3 to 4 in over irregular shapes. It is recommended that film surface temperature be controlled for the depth of draw and part size. Film forming surface temperatures between 105–171°C (221–340°F) provide excellent form shapes. The elapsed time to reach the above temperature window is not important. However, it is possible to overheat the film. To avoid overheating during forming, the film or laminate surface temperature should not exceed 171°C (340°F).

Table 1
Typical Properties of *Tedlar*® PVF Formable Film

Property	2 mil Pigmented	1.5 mil Transparent
Thickness, Nominal	0.002 in	0.0015 in
Tensile, MD TD	5.0–8.5 kpsi 5.0–8.5 kpsi	6–9 kpsi 5–7 kpsi
Elongation, MD TD	130–250% 130–250%	220–320% 280–420%
Shrinkage, MD TD	5% max. at 150°C (302°F) 5% max. at 150°C (302°F)	6% max. at 150°C (302°F) 6% max. at 150°C (302°F)
Gloss 85° (Gardner)	10–20	N.S.
Haze (Gardner)	N.A.	24 max.
Color E	1.0 max.	N.A.

Color

Designers interested in the soft appearance of low gloss can select Type 5 *Tedlar*® PVF film in a palette of neutral tones that can be used alone or in accented texture color styling. Pigmented Type 5 film offers specular gloss in the 10–25 range at 85° Gardner scale, offering an excellent surface for silk-screen printing. Eight standard colors are available to provide a neutral background for a wide variety of accent color.

Transparent Type 5 *Tedlar*® is also available and can be laminated as a protective cap sheet over silk-screened base sheets to lock in their beauty. To maintain maximum draw, transparent Type 5 film is recommended on pigmented Type 5 base sheets.

Adhesion

Tedlar® is manufactured with adherable surfaces that permit bonding by adhesives to a wide variety of substrates. *Tedlar*® Type 5 surfaces have excellent compatibility with many adhesives including acrylics, polyesters, urethanes, epoxies, rubbers, silicones, and pressure-sensitive systems.

Cleanability

Tedlar® PVF films exhibit superior stain resistance and cleanability. Laboratory tests confirm that *Tedlar*® is resistant to staining agents and will not fade or streak even after heavy cleaning.

Fire and Smoke

Tedlar® is one of the safest materials designed for interiors of transportation vehicles. Tests at the University of San Francisco and Ohio State have been performed that verify the superior film performance versus all competitive products and industry standards.*

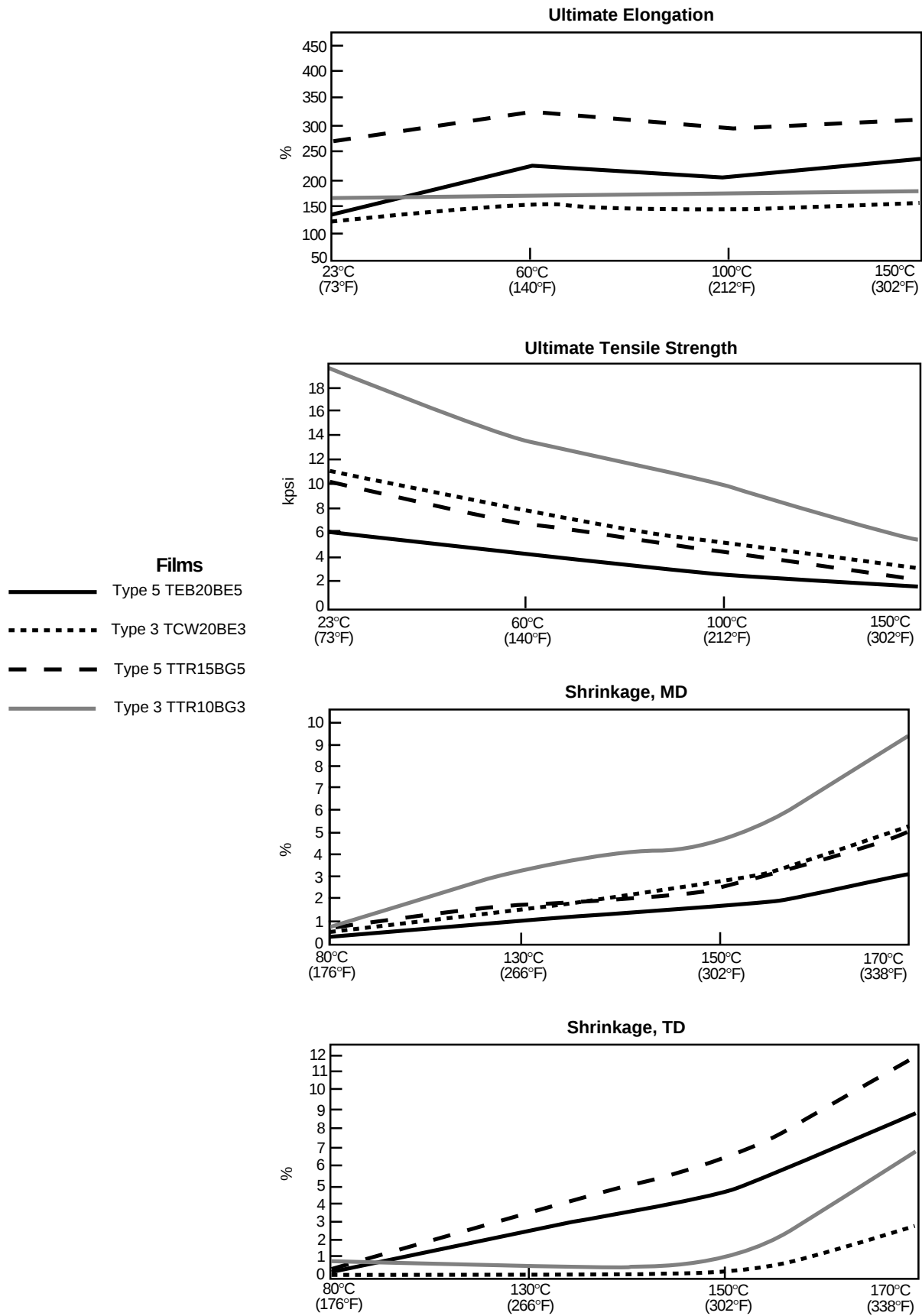
A further improvement has been made by the introduction of enhanced *Tedlar*® PVF films. These *Tedlar*® films are formulated to further reduce undesirable off-gases should decomposition temperatures accidentally be exceeded. All pigmented Type 5 films contain this enhancement (see “E” designation in “Film Designation Guide”).

Abrasion

Comparative testing of aircraft laminate materials clearly demonstrates superior abrasion resistance of *Tedlar*® over other commonly used surfacing materials. This exceptional abrasion resistance makes it possible to replace heavier coatings and components in many interior applications.

* Journal of Combustion Toxicology, Vol. 3 by Carlos Hilado and others, August 1976. Copies available on request.

Figure 1. Comparison of Properties—Formable vs. Standard Film



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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.



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