



Tedlar® SP

polyvinyl fluoride film

Performance Guide for Vinyl Wall Covering Clad with *Tedlar®* SP PVF Film

General

This guide is intended to show the stain resistance of vinyl wall covering clad with *Tedlar®* SP polyvinyl fluoride (PVF) film and assist the wall covering manufacturer and specifier in product selection, lamination, and quality control of wall coverings clad with *Tedlar®* SP.

This information is believed to be the best currently available and is offered to help in your own experimentation and evaluation. This information will be revised as additional experience and information are developed.

Cleanability

Outstanding stain resistance and cleanability are unique features of vinyl-based wall covering material protected with *Tedlar®* SP PVF film. Staining agents likely to be encountered in high-traffic areas of hospitals, schools, office buildings, hotels, and other densely populated structures will not affect the *Tedlar®* SP finish. More importantly, the stains can easily be removed with an appropriate cleaning agent.

Stain Removal

The procedures for removing stains from vinyl-based wall covering protected with *Tedlar®* SP can be divided into three categories depending upon the staining agent. In all cases cleaners should be applied generously using a soft cloth with very light pressure to avoid polishing the stained area.

1. Easy Procedures (Cloth Only, Wet or Dry)

Tedlar® SP is easier to clean than other protective materials. Thus, many staining agents can simply be wiped from the wall covering with either a wet or dry cloth.

2. Mild Procedures (Soaps, Household Detergents)

Some staining agents, such as common lipstick or ballpoint pen ink, require the use of warm, full strength solutions of standard household detergents such as Fantastik*. These stains should be removed with a soft cloth and detergent solution, and given a final rinse of clear water to effect maximum stain removal.

3. Moderate Procedures (Solvents)

Many staining agents, especially those with heavy oil or grease bases, will require the use of a solvent for removal. To remove asphalt, tar, road oil, grease, fresh paint, or caulking compounds from wall coverings protected with *Tedlar®* SP PVF film, use a good grade of mineral spirits, kerosene, naphtha, turpentine, or commercial automotive or road-oil removal agent. Follow the procedure with a detergent rinse and a clear water rinse. Commercial fabric cleaning fluids may also be used to remove stains from agents such as chewing gum or marking pen ink. Or, for the most stubborn stains, solvents such as acetone, toluene, or methyl ethyl ketone (MEK) may be used.

The stain resistance and cleanability characteristics of *Tedlar®* SP PVF film have been tested in many real life conditions, particularly those where the staining agent has been permitted to “set” on the wall covering for 24 hours or more. Laboratory tests confirm that *Tedlar®* SP PVF film is resistant to staining agents, easy to clean, and will not fade or streak even after heavy cleaning. Stain removal test results for *Tedlar®* SP PVF film are shown in **Table 1**.

*Manufactured by Texize Inc., Greenville, SC

Table 1
Stain Removal Tests for Vinyl Wall Covering Clad with *Tedlar*[®] SP PVF Film

Staining Agent*	Dry Cloth	Wet Cloth	Spray Cleaner	91% Propanol	MEK
Worcestershire Sauce	S	R			
Black Crayon			R		
Brown Shoe Polish	S	S	R		
Chocolate Syrup	S	R			
Lipstick	S	S	R		
Calamine Lotion	S	R			
Tea		R			
Iodine	S	R			
Mercurochrome		S	R		
Catsup		S	R		
Grape Juice	S	R			
Spray Paint				S	R
Brake Fluid	S	R			
Mustard	S	R			
Red Wine		R			
Asphalt			R		
Coffee	S	R			
Betadine	S	R			
Sodium Hydroxide	R				
30% Sulfuric Acid	R				
20% Hydrochloric Acid	R				
10% Nitric Acid	R				
Methyl Ethyl Ketone	R				
Gasoline	R				
Toluene	R				
Acetone	R				
Glacial Acetic Acid	R				
10% Citric Acid	R				
Ethylene Glycol	R				
Ethyl Alcohol	R				

*Staining agents were allowed to set 24 hours prior to cleaning.

S = Left Slight Shadow After Cleaning

R = Stain Completely Removed

Fire and Smoke

Tedlar[®] SP PVF film has low smoke ratings and does not readily burn or support combustion. It 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.

FDA and USDA Acceptance

Unpigmented types of *Tedlar*[®] PVF film may be used as components of food-contact coatings in compliance with FDA regulation 21 CFR 175.270.

USDA requires that FDA-compliant materials be used in contact with foods prepared under federal inspection by USDA. *Tedlar*[®] SP PVF wall covering film types that are compliant are TTRWCAM9, TTR5JAM9, and TTR10AM9.

Mold, Mildew, and Bacteria

Laboratory tests have shown that bacteria do not degrade *Tedlar*[®] SP PVF film, nor does the *Tedlar*[®] film provide nutrients to assist bacterial growth. *Tedlar*[®] SP PVF film does not contain any additive to kill mold, mildew, or bacteria. The *Tedlar*[®] surface does not help the mold to grow, but will not kill any mold that lands on the surface.

Specification Guidelines for Vinyl Wall Covering Clad with Tedlar® SP PVF Film

These guidelines are offered to assist the manufacturer and specifier in describing the performance requirements for flexible vinyl wall covering clad with *Tedlar*® SP PVF film.

The wall covering shall be as described in Federal Specification CCC-W-408D and CFFA-W-101-A and furnished in various weights, textures, colors, and designs. The overlamine of *Tedlar*® SP PVF film shall be 0.00889 mm (0.00035"), 0.0127 mm (0.0005"), or 0.0254 mm (0.0010") thick in correspondence with moderate, heavy, or extreme wear in the installation area. For best results the *Tedlar*® SP PVF film should be bonded with adhesives and procedures recommended by DuPont. The laminate should be capable of meeting the following quality control guidelines:

Bond Strength	No peel after 24 hours soak in 50°C (122°F) water.
Light Stability	No appreciable change after 200 hours exposure per Federal Standard No. 191b.
Stain Resistance	No staining that cannot be removed by standard procedures when tested in accordance with ASTM D1308b.
Chemical Resistance	Surface unaffected by common acids, bases, or solvents.

Field application of flexible wall coverings to suitable interior wall surfaces should be conducted using wall covering adhesives and application methods in strict accordance with the manufacturer's printed instructions.

Tedlar® SP PVF films intended for use on vinyl-based wall coverings are:

TTRWCAM9	General purpose. Intended for use in areas of moderate wear.
TTR5JAM9	Heavy duty. Intended for use in areas of heavy wear.
TTR10AM9	Industrial duty. Intended for use in areas of extreme wear.

Laminating *Tedlar*® SP PVF Film to Vinyl Wall Covering

Wall covering having excellent stain resistance and cleanability is possible with *Tedlar*® SP PVF film. Lamination is accomplished by combining adhesive-coated *Tedlar*® SP with preheated vinyl in heated nip rolls. The finished product is intended for interior applications only.

Film Types

Tedlar® SP type TTRWCAM9, TTR5JAM9, or TTR10AM9 coated with 5.1–7.6 µm (0.2–0.3 mil) dry 68080 flexible acrylic adhesive from DuPont.

Vinyl Wall Covering

As described in Federal Specification CCC-W-408D and CFFA-W-101A furnished in various weights, textures, and designs. Plasticizer content should not exceed 50 parts per 100 parts of resin.

Laminating

Laminating adhesive-coated *Tedlar*® SP to vinyl has been successfully demonstrated on various types of equipment common in the wall covering industry. The operation consists of combining the film with the vinyl in hot nip rolls, heating the composite to 149–177°C (300–350°F), and embossing. The unwind roll of *Tedlar*® SP PVF film should be positioned so that the film wraps the top nip roll at least 90° and tension across the sheet is uniform.

Quality Control

Vinyl-based wall coverings clad with *Tedlar*® SP PVF film should be evaluated using the following tests.

Water Soak Test

Soak samples from the beginning and end of each laminating run in 50°C (122°F) water for 24 hours. Test laminates by making two parallel cuts in the film 3.2 mm (1/8") apart. Using a razor knife, attempt to pry or peel the film from the vinyl between these parallel cuts. A satisfactory bond will exhibit no peel when tested in this manner. The usual cause of poor adhesion is a lack of heat during lamination.

Shrinkage Test

Laminate shrinkage should conform with CFFA Specification W-101-A. Soak three 254 × 254 mm (10" × 10") specimens in distilled water at room

temperature 30 minutes and dry in a circulating air oven at 93°C (200°F) for 30 minutes. Condition the specimens as described in ASTM D751 for 8 hours prior to remeasuring. Calculate percent shrinkage using the original and final dimensions. Maximum shrinkage in machine direction is 2% and 1% in the transverse direction.

Film Integrity Test

Soak samples in a solvent such as acetone until the Tedlar® SP PVF film can be separated from the vinyl. Check the free film under a microscope for damage that can result from severe embossing. Good quality laminates will exhibit no film splitting or “pinholing” when examined in this manner.

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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.



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