The benefits of DuPont Tedlar PVF films for healthcare applications

DuPont Tedlar PVF films offer unique, durable surface protection with exceptional chemical resistance and cleanability

Easy-cleaning Test I

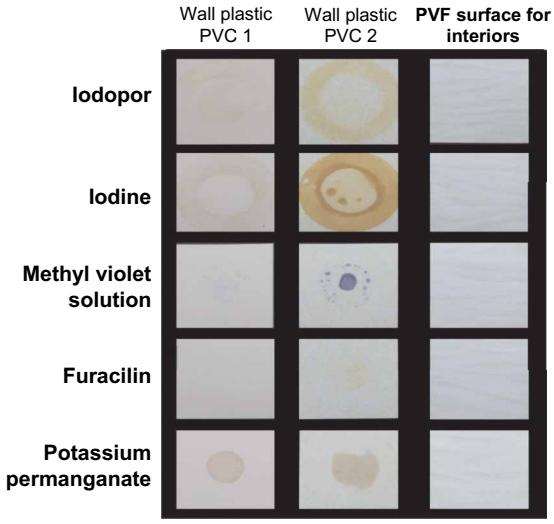
For critical areas: Clinic/Patient room/Emergency point etc.

Before ageing

Stains	PVF	Wall plastic PVC 1	Wall plastic PVC 2	EVOH	PP	Melamine panel
	Alcohol	Alcohol	Alcohol	Alcohol	Alcohol	Alcohol
iodophor	5	1	1	4	2	5
iodine	3	1	1	2	2	5
Methyl violet solution	5	1	1	4	4	4
Furacilin	5	5	1	-	-	-
potassium permanganate	5	1	1	2	5	3

After ageing

Stains	PVF	Wall plastic PVC 1	Wall plastic PVC 2	EVOH	PP
	Alcohol	Alcohol	Alcohol	Alcohol	Alcohol
Iodophor	5	1	1	2	2
iodine	3	1	1	2	2
methyl violet solution	4	1	1	2	4
Furacilin	5	3	1	-	-
potassium permanganate	5	1	1	2	3



Note：leaving stains 24hours before cleaning 5 = completely clean up ; 4 = slight stains left 3 = trace left ; 2 = obvious stains left ; 1 = can not be cleaned up at all
Aging test：15days aging test in 85℃ temperature and 85% humidity

Fig. 1: Demonstration of exceptional cleanability and compatibility of Tedlar PVF films

The global healthcare sector is one of the largest and most complex industries, with an evolving need to design spaces capable of optimising cleanliness and hygiene to protect patients and healthcare workers. DuPont™ Tedlar® polyvinyl fluoride (PVF) films offer unique protection for surfaces which must be highly durable because they are in environments with rigorous cleaning protocols.

Tedlar PVF film background

DuPont Tedlar is a versatile film made with a PVF polymer. DuPont invented PVF polymer in the 1940s, and by the 1950s began developing products based on this material. DuPont Tedlar provides durable, long-lasting protection and decoration to many types of surfaces in a variety of industries including transportation, aerospace, building and construction, graphics and signage, and photovoltaics. Tedlar PVF film is strong and flexible, has excellent resistance to chemicals, aggressive cleaning agents, resists stains and graffiti, is easy to clean, and slows the growth of mould and mildew.

For more than 60 years, Tedlar PVF film has been recognised as the high-performance standard in the wide range of industries it serves, due to its demonstrated durability in harsh operating environments. Tedlar is the only film with decades of proven field performance, from protecting buildings' exteriors to providing long-term reliability in solar panels.

This vast range of Tedlar film applications means that many people have interacted with the film unknowingly. Because Tedlar can be produced in coloured or clear film, passengers on an aeroplane could be resting their head on a cabin interior wall or window which is protected by Tedlar or see a bus stop sign protected by the anti-graffiti Tedlar PVF Graphics Protection film.

Staining agent	Dry cloth	Wet cloth	Soaps and household detergents	Moderate household solvents	Commercial cleaning solutions and stronger solvents
Food and drink					
Butter	S	R			
Ketchup	NG	S	R		
Chocolate syrup	S	R			
Coffee	S	R			
Grape juice	S	R			
Mustard	S	R			
Orange juice	S	R			
Red wine	S	R			
Tea	S	R			
Worcestershire sauce	S	R			
Household items					
Ballpoint pen	NG	NG	S	S	R
Black crayon	S	R			
Brown shoe polish	NG	NG	R		
Calamine lotion	S	R			
Lipstick	S	S	R		
Oily pen	NG	S	R		
Permanent marker	NG	NG	S	S	R
Spray paint	NG	NG	NG	S	R
Chemicals					
Acetic Acid, Glacial	R				
Acetone	R				
Asphalt	NG	NG	S	R	
Betadine	S	R			
Bleach	R				
Brake Fluid	S	R			
Citric Acid, 10%	R				
Ethyl Alcohol	R				
Ethylene Glycol	R				
Gasoline	R				
Hydrochloric Acid, 20%	R				
Iodine	R				
Mercurochrome	NG	S	R		
Methyl Ethyl Ketone	R				
Nitric Acid, 10%	R				
Sodium Hydroxide	R				
Sulfuric Acid, 30%	R				
Stomach Acid		R			
Human Sweat		R			
Urine		R			

Fig. 2: Each item in the table is marked if the stain was fully removed (R) with no trace, partially removed with slight shadow (S) after cleaning, or if the stain was not removed (NG)

Fig. 3: John R. Oishei Children's Hospital, Buffalo, NY, US: graphic signage laminated with Tedlar protective film

They could be in a hospital waiting room, hotel lobby, or restaurant and be surrounded by the trendy patterns of Tedlar Wallcoverings. Tedlar has been quietly protecting exterior surfaces on numerous projects throughout the globe and the applications are truly endless.

Why Tedlar PVF films for healthcare?

The use of Tedlar PVF films in the healthcare industry dates back to the 1980s, primarily as an integral protective barrier film in commercial wallcoverings.

Tedlar PVF films bring a unique value to healthcare surfaces for many reasons:

Superior chemical resistance

Tedlar PVF films have demonstrated exceptional resistance to harsh chemicals without degradation of their aesthetic and mechanical properties. This is very important to ensure the protected walls, furniture and other surfaces are able to maintain their original appearance and integrity throughout their useful lifetime. Tedlar retains its form and strength when exposed to a large variety of chemicals, even under extreme conditions. At ordinary temperatures, the film is not affected by most common solvents, including hydrocarbons and chlorinated solvents. It is impermeable to greases and oils.

Exceptional cleanability

Tedlar PVF films have also demonstrated excellent chemical compatibility with many of the top cleaners and disinfectants used in healthcare today, including bleach and peroxides. Additionally, Tedlar films have demonstrated resistance to many of the toughest staining agents which are commonly found in the healthcare environment. In hospital and healthcare settings, there are various stains which are persistent and difficult to remove. Testing of these stains commonly found in critical areas of healthcare settings, on Tedlar PVF, wall plastic PVC materials, ethylene vinyl alcohol (EVOH), polypropylene and melanine panels, showed that difficult stains could be either completely removed or mostly removed from Tedlar PVF surface even after ageing for 15 days.

A further cleanability test of Tedlar PVF films is shown in Figure 2. In this test, a variety of potential staining agents were placed on the surface of Tedlar film for 24 hours prior to cleaning. The residue was then wiped first with a dry cloth, followed by a wet cloth, then mild detergent (bleach or liquid soap), moderate household solvents (isopropyl alcohol), and finally, if needed, stronger solvents (acetone, toluene, MEK, soy-based cleaners). Each item in the table is marked if the stain was fully removed (R) with no trace, partially removed with slight shadow (S) after cleaning, or if the stain was not removed (NG).

Minimises growth of mould and mildew

Since – unlike some competitor materials – Tedlar PVF films do not contain additives such as plasticisers, which can act as a nutrient source for fungi and microorganisms, studies have demonstrated that Tedlar PVF films do not support the growth of mould and mildew. In fact, the DuPont Tedlar Wallcoverings product line has demonstrated UL Environmental Claim Validation for Mould Resistance as tested to ASTM G21, UL 2824.

Minimises bacterial growth

As detailed above, Tedlar films do not produce nutrients which may be conducive to bacterial growth. PVF films do not support the growth of bacteria according to ISO846 - Part C-2019.

Durability factors important to overall performance

Surfaces protected by Tedlar do not fade in colour or show signs of wear and tear, even with aggressive cleaning and scrubbing. Tedlar PVF

Fig. 4: Vinyl wallcovering protected with DuPont Tedlar film is used in all high-traffic areas at Omega Medical Center, Newark, Delaware, US

films have demonstrated years of real-life application performance standing up to some of the toughest of environments. A surface's ability to withstand occasional events, such as a hospital bed or a patient trolley hitting the side of a protected wall or nurse's station, is very important to a product's performance. Tedlar PVF films are used in laminate composite structures and these structures become an integral part of the final product, whether this is a piece of furniture or wallcovering.

Using Tedlar PVF films in healthcare environments

Tedlar PVF films can be used with several applications in healthcare settings to protect caregivers and patients sharing the space. Tedlar can be used on ceiling tiles, wall panels or on bleach-cleanable Tedlar Wallcoverings. Tedlar helps protect and preserve the surfaces which are most important to maintaining high quality hygiene in areas where people interact the most. Tedlar PVF films help preserve these surfaces from breaking down over time with constant cleaning. DuPont is passionate about collaborating with partners to provide new solutions for the healthcare industry, especially during times of heightened cleaning efforts. In responding to the most immediate market needs, Tedlar PVF film product concepts are being adapted to include curtain walls, roller shades and patient tabletops.

Tedlar in action

Buffalo Children's Hospital, Buffalo, NY

Clear DuPont Tedlar film was recently selected to protect inspirational and uplifting art installations for the new Buffalo Children's Hospital. Thanks to the surface protection provided by Tedlar, these special walls will stay beautiful and safe for years to come.

Omega Medical Center, Newark, Delaware

The challenge 30 years ago for the Omega Medical Center was to outfit its new premises in Newark, Delaware, for the long term. Maximising return on investment by choosing medical and office equipment that would deliver value and performance over many years was an important part of the business plan; and selecting wallcoverings that could deliver the same long-term value was just as important. In the more than 30 years since the Tedlar protected wallcovering was installed, the Center has not experienced any problems such as staining, delamination, peeling or cracking as seen in some other wallcoverings.

In closing, Tedlar PVF film has unique properties that make it the ideal surface protection material for healthcare interiors. No other surface protective film can offer what Tedlar PVF films can offer: superior chemical resistance, exceptional cleanability, and compatibility with cleaning agents and disinfectants; while minimising and slowing the growth of bacteria, mould and mildew.

For more information on Tedlar PVF films, please visit tedlar.com.

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