DuPont™ Tedlar® PVF Surface for Interiors in Healthcare Environment

DuPont™ Tedlar®
PVF Surface for Interiors
30+ years Proven in Healthcare Environment

Since 1960s

Over 30 years in healthcare environment

To resist stains and solvents, wall covering with "Tedlar" was used in corridors, stairwells of Ciba Chemical and Dye Corp.'s new product laboratory.

Widely known as a low-maintenance exterior finish, "Tedlar" moves inside to provide

Walls that Clean in a Whisk

Walls that Clean in a Whisk

Wilmington quickly produced sample strips of "Tedlar" polyvinyl fluoride film, well-known in the building industry as a durable, low-maintenance exterior finish. Josephson surfaced conventional vinyl wall covering with the samples of "Tedlar" and tested them for stain resistance and cleanability.

"The results were even better than I expected," he says, "We must have tried to spot or discolor the 'Tedlar' a hundred different ways. Happily, the material just wouldn't stain. And cleaning required little or no effort." Josephson repeated the tests for the hotel manager. Shortly afterwards, the new material, later to be marketed by Josephson as "Flexar", was installed.

The success at the St. Moritz came as no surprise to Thomas C. Gibson, marketing manager for "Tedlar". "The application did, however, help to verify the results of our survey of the institutional market. We found that flexible wall covering materials are now being used in about half of all new construction where decoration and low maintenance are important factors."

According to Gibson, vinyl wall covering surfaced with "Tedlar" offers a number of advantages in institutional applications. "Most important are ease of cleaning and stain resistance. In addition, 'Tedlar' offers protection against scuffing."

"Tedlar" is chemically inert; any cleaner or solvent can be used without damage to the surface. Tests also indicate that wall coverings with "Tedlar" are highly resistant to fading and yellowing and less expensive to install than many conventional materials. Says Jack Josephson: "The price charged by a paperhanger depends largely on the weight of the material he has to install. 'Flexar' is generally much lighter than conventional vinyl wall covering for institutional applications. Because of 'Tedlar', we are able to use a lighter substrate, hence savings to the end user are considerable."

On the market for less than a year, Josephson's new wall covering is already being used in a number of hospitals, banks, laboratories and schools.

One of the first installations of "Flexar" came at the technical applications product

Dirt, grime and stains are common in heavy traffic areas like this stairway at Cayuga Federal Savings and Loan in Philadelphia. Marks wash off "Flexar" wall covering with soap and water.

杜邦™ Tedlar® 内饰面材 医疗行业应用案例（美国）

Omega Medical Center	Delaware
VA Medical Center	Arizona
The Queens Medical Center	Hawaii
Southeast Medical Center	Alabama
Sanford Medical Center	South Dakota
Multi Medical Center	Maryland
Allwood Medical Arts	New Jersey
Clinton Medical Center	North Carolina
Comfort Inn Medical	North Carolina
Medical Arts Building	Minnesota
Medical Center	California
Atlantic Hospital	Florida
Baptist Hospital East	Kentucky
Baptist Hospital Of	Tennessee
Callaway Community	Missouri
Candler General Hospital	Georgia
Cape Canaveral Hospital	Florida
Dekalb General Hospital	Georgia
Hartford Hospital	Connecticut
Hutchinson Hospital	Kansas
Mercy Hospital	Minnesota
Morris Hospital	Illinois
New York Methodist Hosp	New York
Shea Conv. Hospital	California
St. Vincent Hospital	Wisconsin
Tallahassee Memorial	Florida
Memorial Hospital	West Virginia
Western Baptist Hospital	Kentucky

Tedlar® cases in Healthcare environment cover 10 states in US for the past 30+ years

What is DuPont™ Tedlar® PVF?

Attributes of Tedlar® Film

Tedlar® film is a highly versatile polyvinyl fluoride film (PVF) that can provide a long-lasting finish to a wide variety of surfaces exposed to harsh environments, while its inert, non-stick properties can make it an excellent release film for parts processed under high-temperature and pressure.

Chemically inert & low surface energy
- Stain and graffiti resistant
- Nonstick
- Cleanable
- Does not support the growth of mold or bacteria

UV resistant
- Outstanding resistance against fading, cracking and corrosion

Thermally stable
- Can withstand high temperatures for several hours in most applications

Low toxicity & low volatiles
- Safety in transit interiors and coatings without VOC's

FABs of Tedlar® films for exterior and interior environment

Long-term Protection

- Long-lasting UV, color and gloss
- Better resists air pollution, prevents dust buildup, corrosion and bubbling
- Strong resistance to acid, alkali and solvents. Can be used on chemical storage containers

Safe for Important Environments

- Nonflammable and low smoke toxicity, passes Federal Aviation Administration (FAA) standard; used in aircrafts
- High-level of cleanliness; does not support the growth of bacteria, applied in hospitals

Aesthetics

- Prevents color fade
- Consistent surface finish, available in a variety of gloss levels
- Matte finish on the surface, prevent glare
- Excellent formability

Easy to Clean

- Dirt can easily be washed away by rainwater
- Stain resistant and able to withstand all types of dirt, such as bird droppings, watermarks, paint, cooking fumes, grease, dust and acid rain, etc.
- Chemically inert. A wide variety of cleansers can be used to remove stains such as pitch, tar, asphalt, grease, paint and sealant, etc.

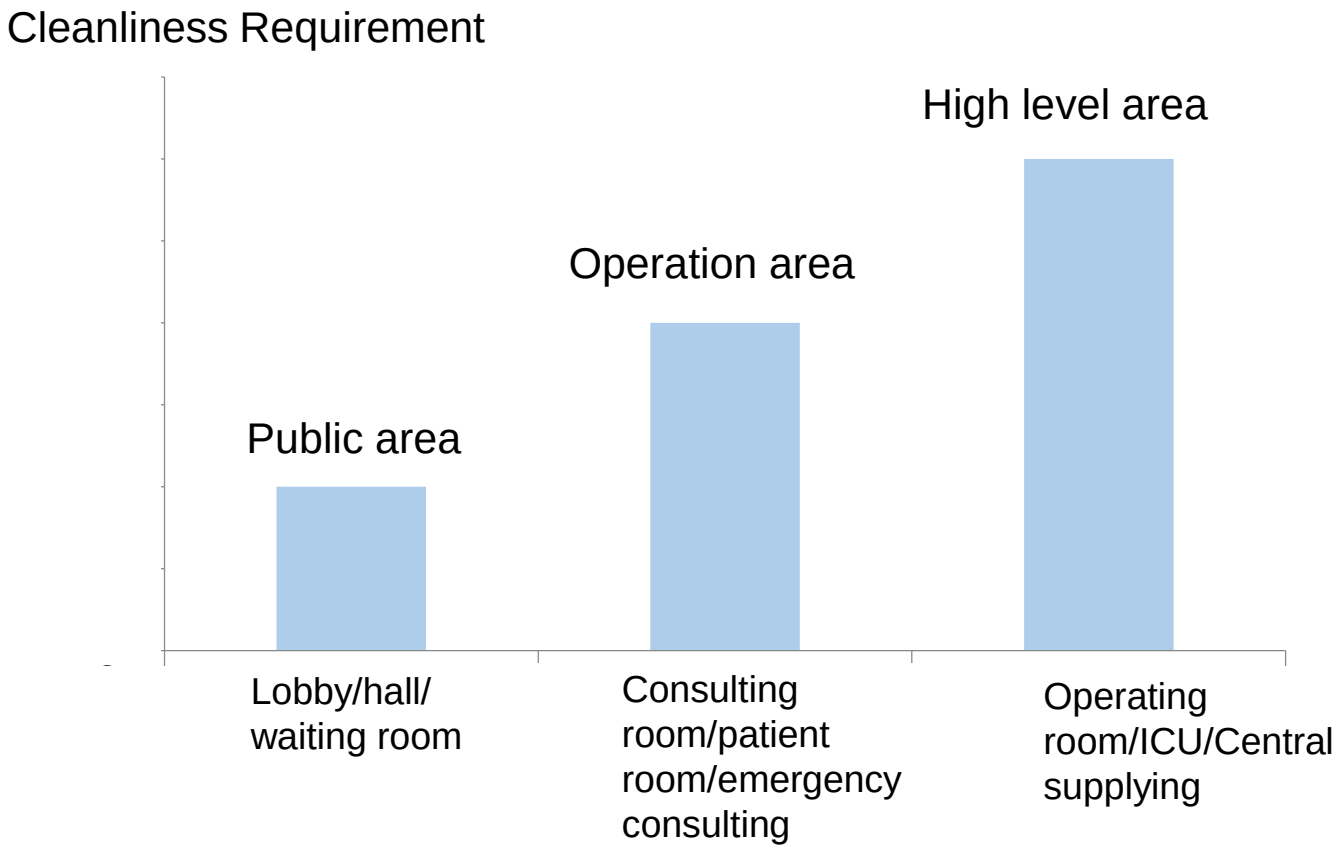
Various applications of Tedlar®

Why Tedlar® ?

Healthcare Environment

Long-term Protection & Easy to clean

Cleanliness requirement by functional area



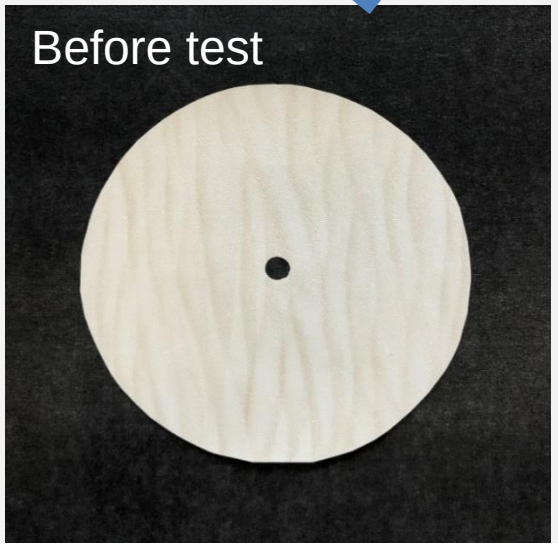
Easy to Clean
(Public area)

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

Durable — Abrasion test



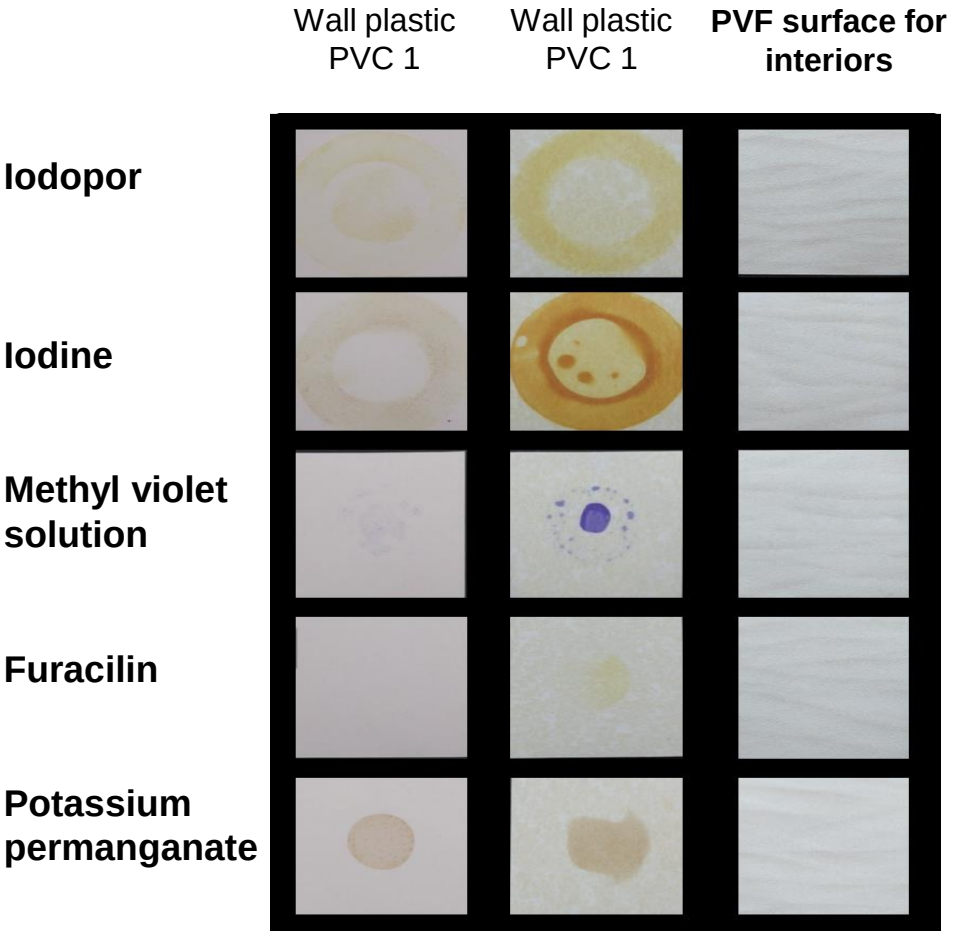
Cleansability testing
(Operation area)

Before aging

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 aging

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

Chemical resistance (high level area)

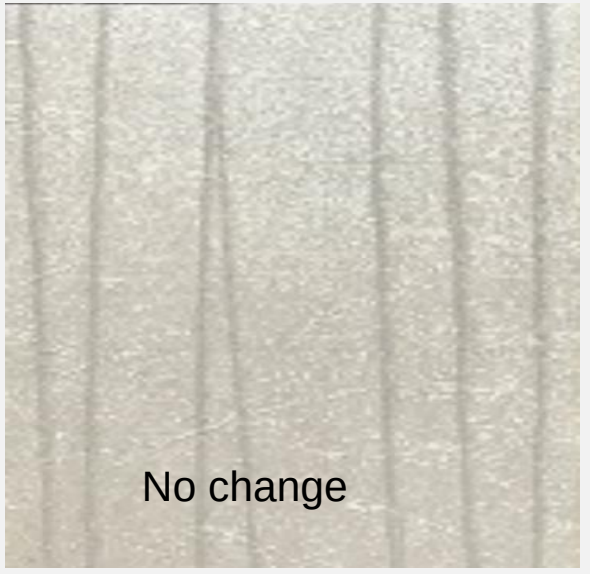
Composition of disinfectant :

Peracetic Acid, Sodium hypochlorite, Glutaraldehyde

PVC plastic 1

PVC plastic 2

PVF surface for interiors



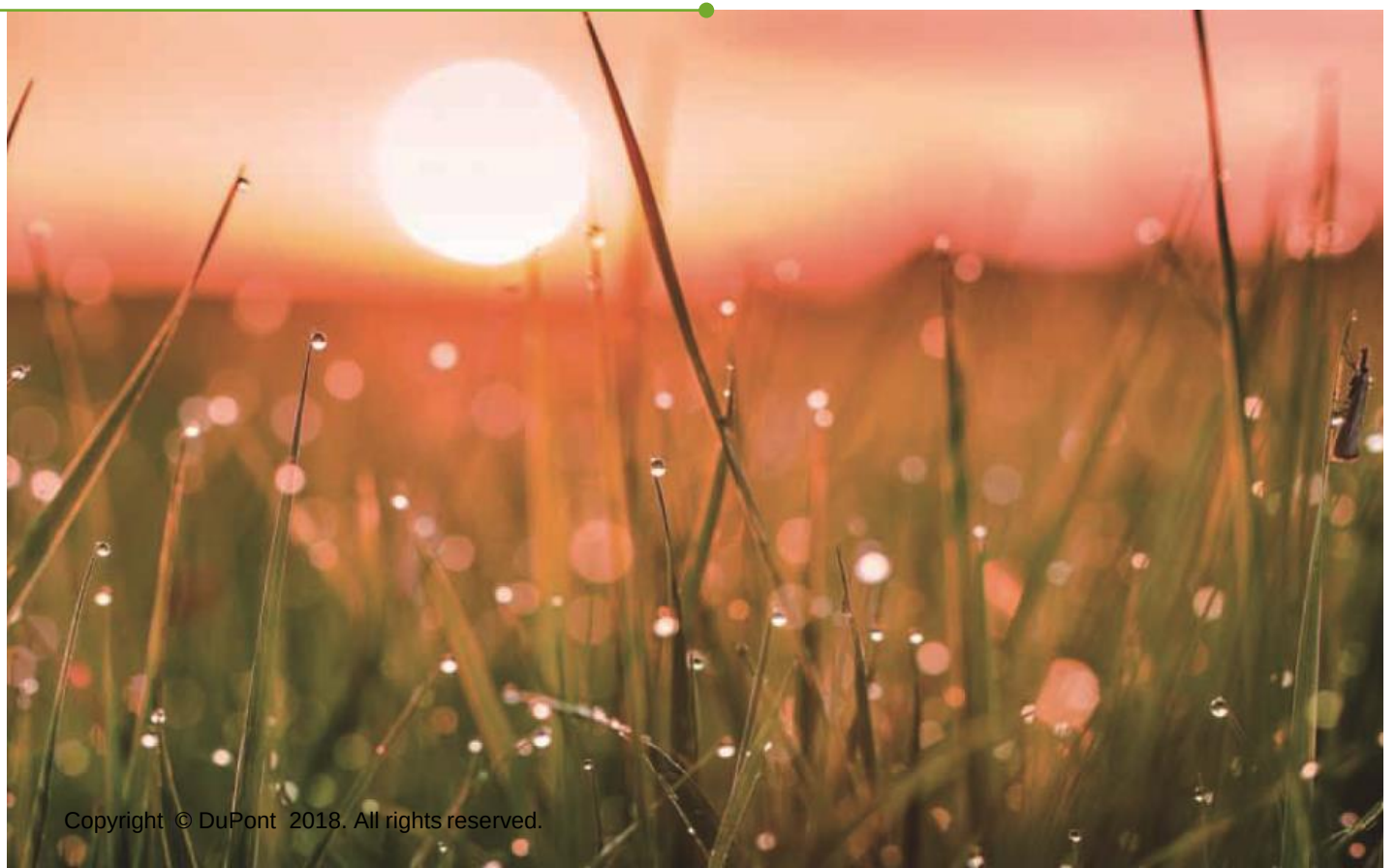
24 hours test in 37% HCl

Chemical resistance

(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.)

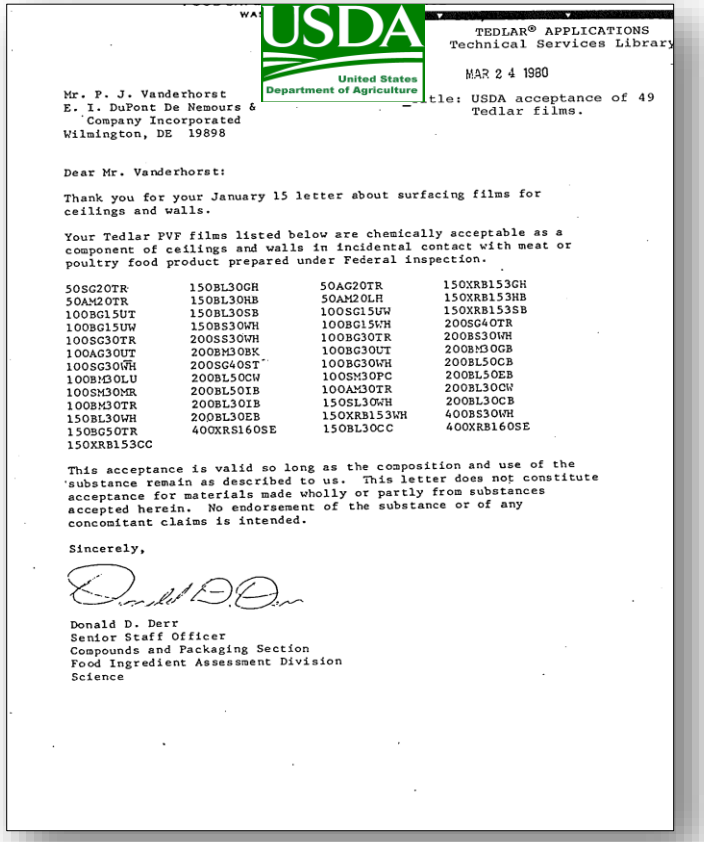
	1-Year Immersion at Room Temperature	2-Hour Immersion at Boil	31-Day Immersion at 75°C (167°F)
Acids			
Acetic Acid (glacial)	X		X
Hydrochloric Acid (10% & 30%)			X
Hydrochloric Acid (10%)	X	X	
Nitric Acid (20%)	X		
Nitric Acid (10% & 40%)			X
Phosphoric Acid (20%)	X		
Sulfuric Acid (20%)	X		
Sulfuric 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

Safe for Important Environments



Safe

USDA and FDA Acceptance



USDA
United States Department of Agriculture

TEDLAR® APPLICATIONS
Technical Services Library

MAR 2 4 1980

Mr. P. J. Vanderhorst
E. I. DuPont De Nemours &
Company Incorporated
Wilmington, DE 19898

Subject: USDA acceptance of 49 Tedlar films.

Dear Mr. Vanderhorst:

Thank you for your January 15 letter about surfacing films for ceilings and walls.

Your Tedlar PVF films listed below are chemically acceptable as a component of ceilings and walls in incidental contact with meat or poultry food product prepared under Federal inspection.

50SG20TR	150BL30GH	50AG20TR	150XRB153GH
50AM20TR	150BL30HB	50AM20LH	150XRB153HB
100BG15UT	150BL30SB	100SG15UW	150XRB153SB
100BG15UW	150BS30WH	100BG15WH	200SG40TR
100SG30TR	200SS30WH	100BG30TR	200BS30WH
100AG30UT	200BM30BK	100BG30UT	200BM30GB
100SG30WH	200SG40ST	100BG30WH	200BL50CB
100BM30LU	200BL50CW	100SM30PC	200BL50EB
100SM30MR	200BL50IB	100AM30TR	200BL30CW
100BM30TR	200BL30IB	150SL30WH	200BL30CB
150BL30WH	200BL30EB	150XRB153WH	400BS30WH
150BG50TR	400XRS160SE	150BL30CC	400XRB160SE
150XRB153CC			

This acceptance is valid so long as the composition and use of the substance remain as described to us. This letter does not constitute acceptance for materials made wholly or partly from substances accepted herein. No endorsement of the substance or of any concomitant claims is intended.

Sincerely,

Donald D. Derr
Senior Staff Officer
Compounds and Packaging Section
Food Ingredient Assessment Division
Science

SGS

RoHS Compliant

测试报告 No. SHAMLP1808010402 日期: 2018年04月26日 第1页,共4页

杜邦（中国）研发管理有限公司
上海浦东新区张江高科技园区蔡伦路600号

以下测试之样品是由申请者所提供及确认：杜邦™ Tedlar® PVF 科技面材

SGS工作编号：	SHIN1804025470PC - SH
样品接收日期：	2018年04月20日
测试周期：	2018年04月20日 - 2018年04月26日
测试要求：	根据客户要求测试
测试方法：	请参见下一页
测试结果：	请参见下一页
结论：	基于所送样品进行的测试，镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯 (DBP)、邻苯二甲酸丁苄酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP))的测试结果符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

通标标准技术服务（上海）有限公司
授权签名

Halery Han韩婧
批准签署人

本报告是编号为SHAMLP1808010401 报告的中文版本

SGS

GB-18585

测试报告 No. SHAMLP1507879702 日期: 2015年05月08日 第1页,共3页

杜邦贸易（上海）有限公司
上海浦东新区张江高科技园区科苑路399号11号楼

以下测试之样品是由申请者所提供及确认：特能®墙布

SGS工作编号：	SHIN1504018462PC - SH
批号：	FWC1
样品接收日期：	2015年05月04日
测试周期：	2015年05月04日 - 2015年05月08日
测试要求：	根据客户要求测试
测试方法：	请参见下一页
测试结果：	请参见下一页

测试结果概要：

测试要求	结论
GB18585-2001-重金属(或其他)元素	符合
GB18585-2001-甲醛	符合
GB 18586: 2001-氯乙烯单体	符合

通标标准技术服务（上海）有限公司
授权签名

Shelly Li李娜
批准签署人

Fire resistance

SGS

测试报告

编号 ： SHIN1506028839PS_CN
日期 ： 2015-07-29
页码 ： 3 of 7

III. 测试结果

试验方法	参数	样品数量	试验结果
GB/T 20284	火焰增长速率指数FIGRA（W/s）	3	10.2
	火焰横向蔓延 < 试样长翼边缘		是
	600s的总放热量THR_{600s}（MJ）		1.3
	SMOGRA（m^2/s^2）		3.4
	TSP_{600s}（m^2）		12.7
	燃烧滴落物/微粒		否
GB/T 8626 点火时间 = 30 s	60s内焰尖高度 ≤ 150 mm	6	是
	60s内燃烧滴落物是否引燃滤纸		否

IV. 分级和直接应用领域

以下试验制品燃烧性能等级按照GB 8624-2012第5.1的相关条款判定；分级参数参见附录A。

a) 燃烧分级

该制品，特能® 墙布，分级满足：

B

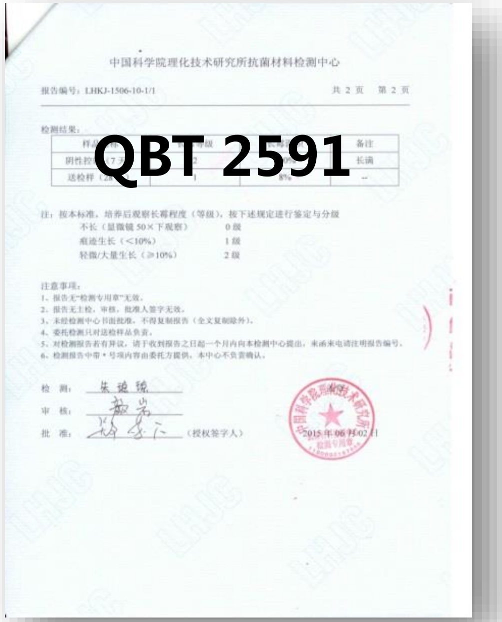
即：

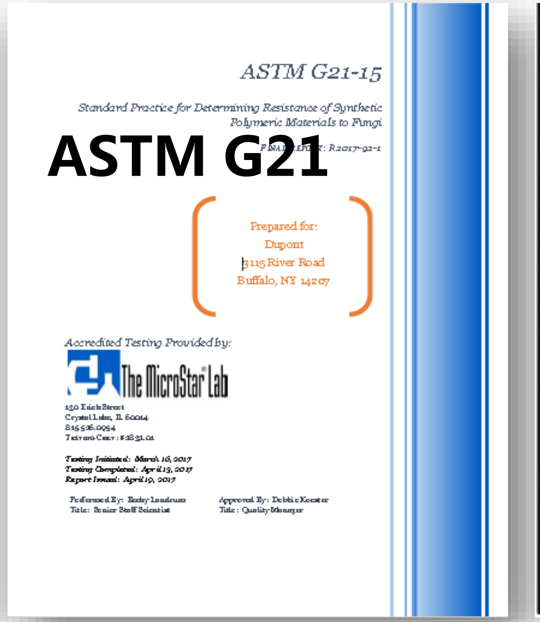
燃烧性能等级：GB 8624 B_1 (B-S_1, d0)

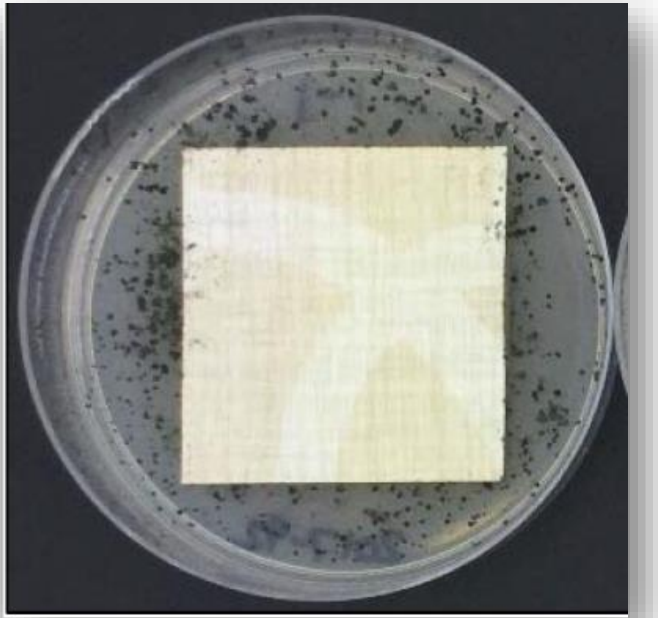
Meet Grade B1, GB8624-2012, Chinese regulation

Mold resistance

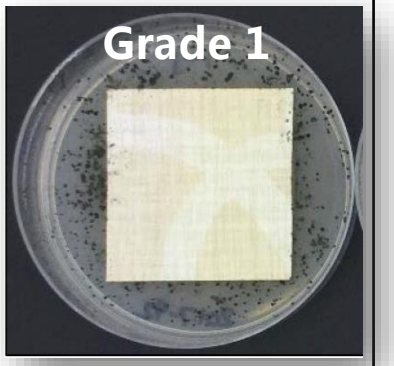
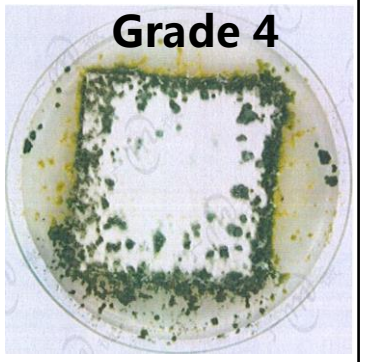
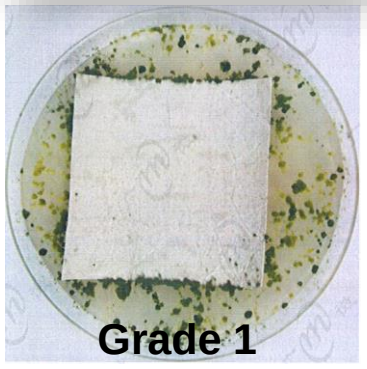
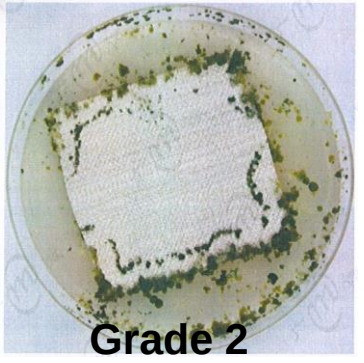
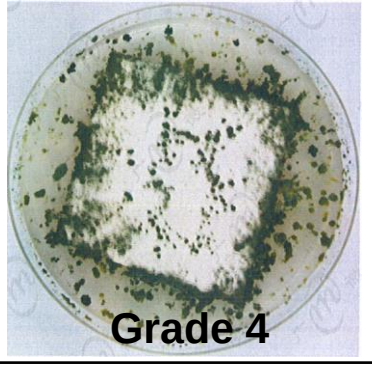
ASTM G21, Classification 1







Mold resistance

	PVF	EVOH	PP	PVC
Before aging	 Grade 1	Grade 0	Grade 0	 Grade 4
After aging	 Grade 1	 Grade 2	 Grade 4	N/A

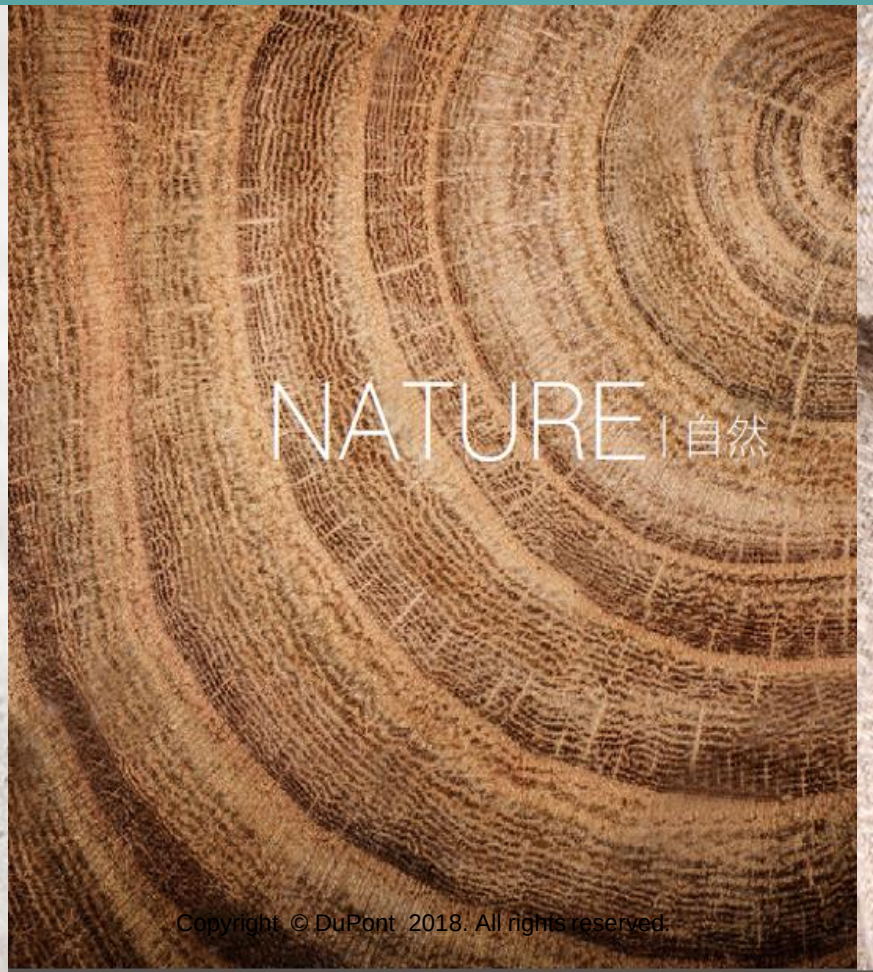
Aging condition: 85℃/85% humidity , 1000 hours

Aesthetics

Competing to different materials

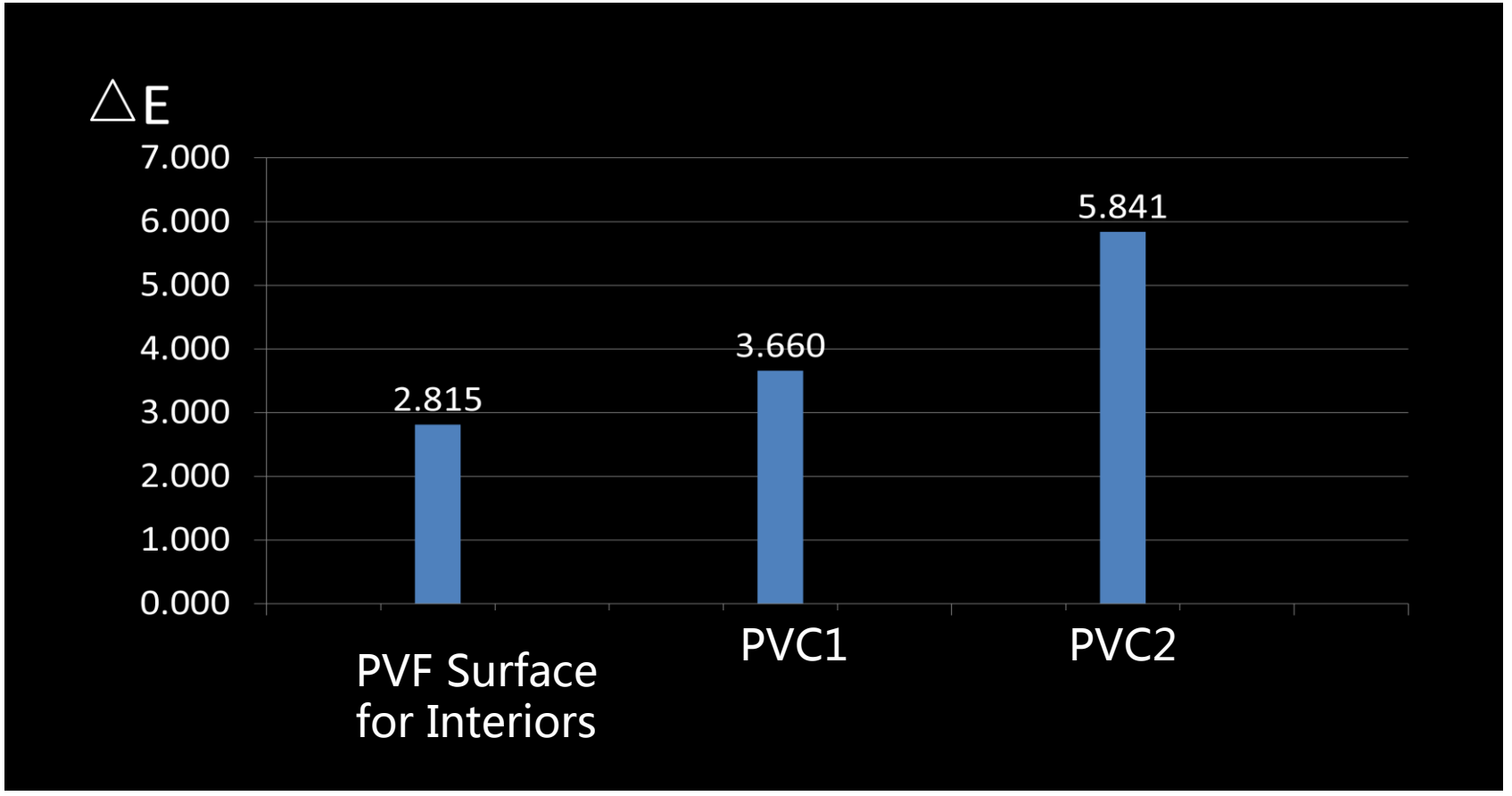
	Paint	PVC	Tile	Composite/plasterboard/metal panel	Tedlar® PVF
Color	+++++	+++	+	++	++++
Pattern	-	+++	+	++	+++++
Texture	-	+++	+	++	+++++
Gloss	+	+++	+	+	+++++

Three themes satisfying interior design style



Color enduring

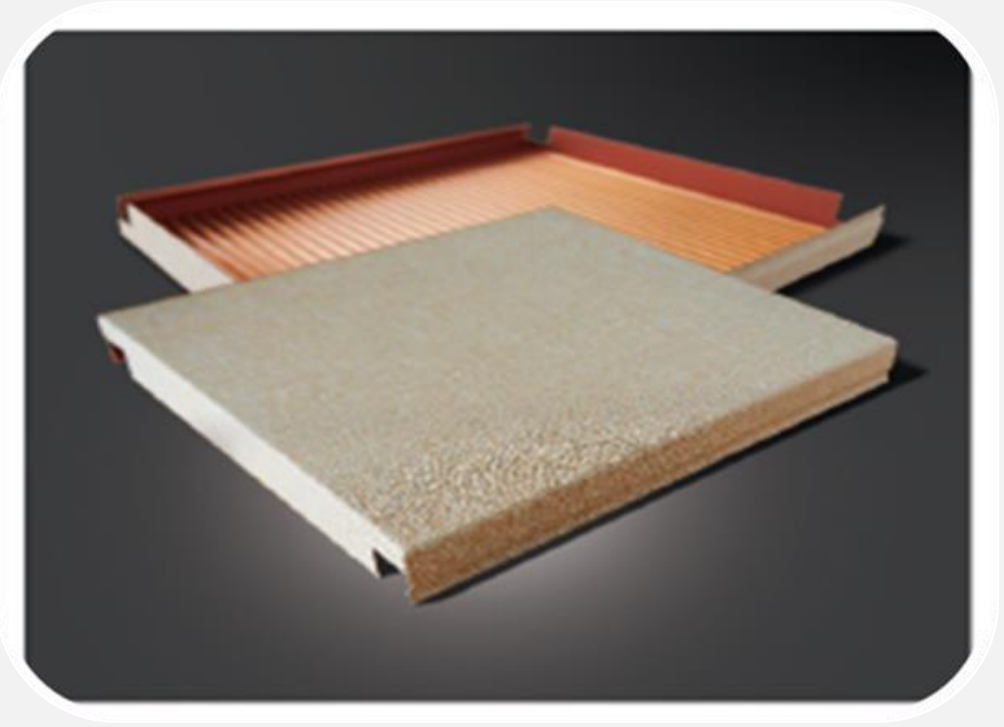
Color comparison before and after aging



Aging condition: 85℃/85% humidity , 1000 hours

Product Portfolio

Tedlar® PVF Surface for Interiors

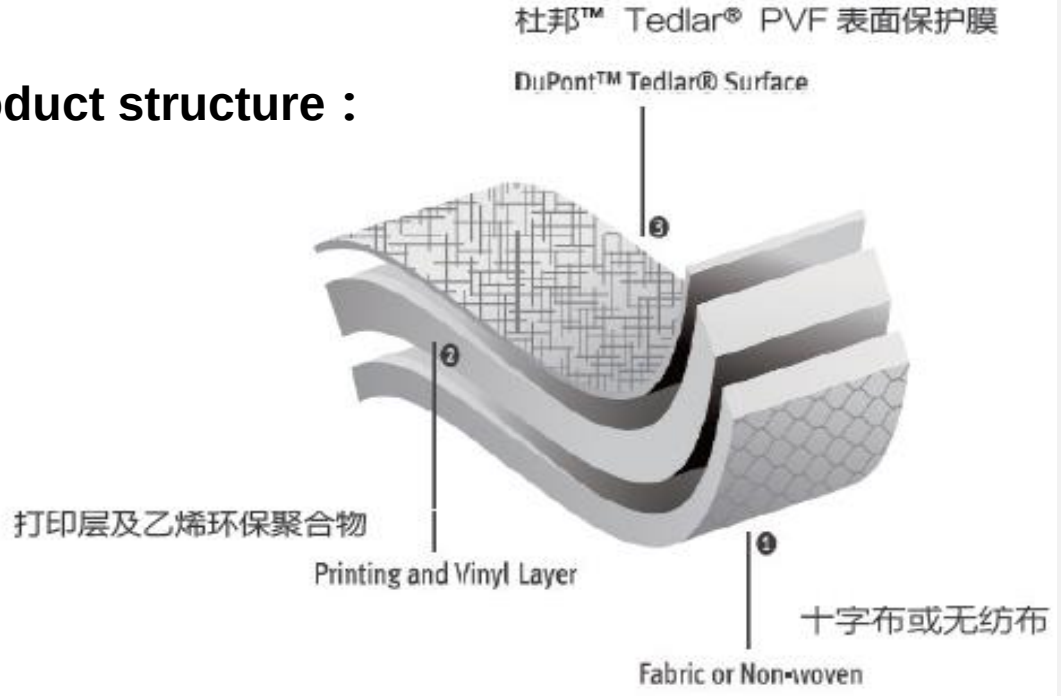


Metal lamination with Tedlar® PVF Surface for Interiors

* manufactured and commercialized by Simon China

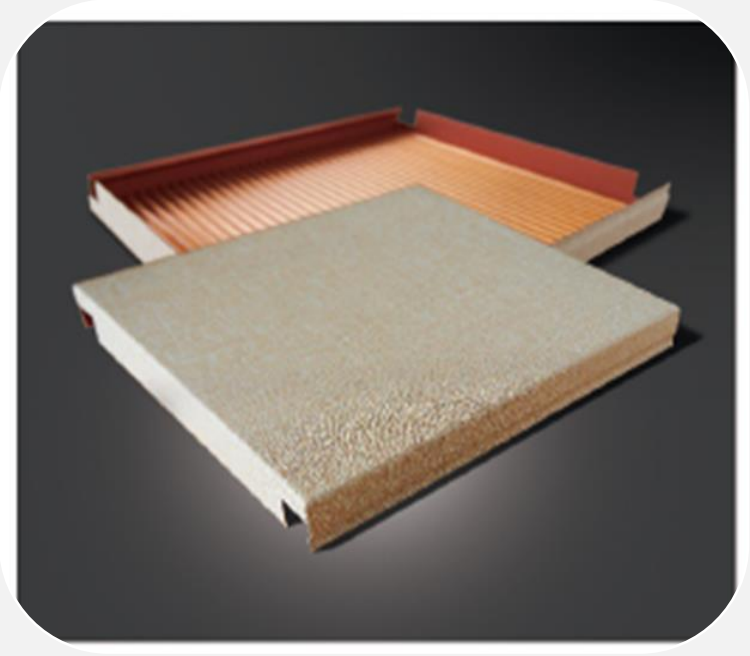
Tedlar® PVF Surface for Interiors

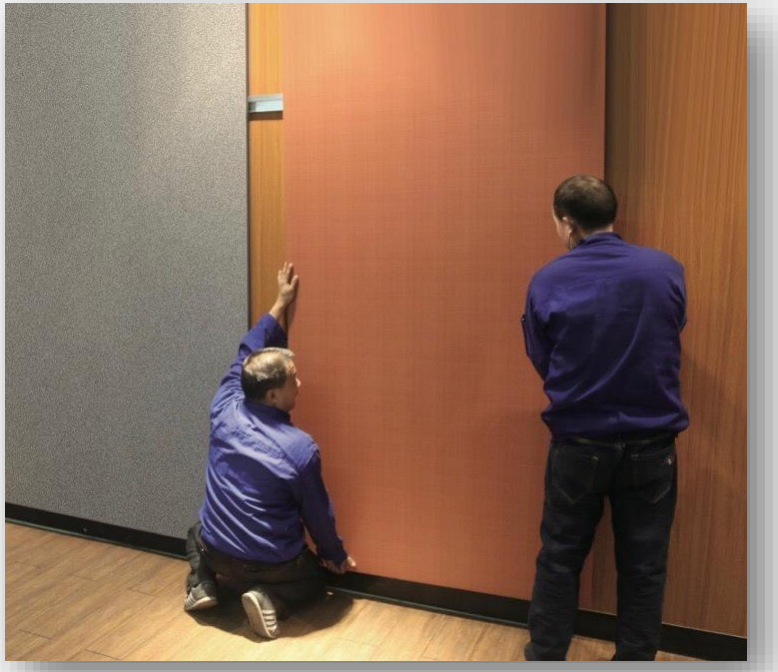
Product structure：



Main application areas: patient room, consulting room, corridor

Metal lamination with Tedlar® PVF Surface for Interiors





Main application areas: corridor, waiting area

*manufactured and commercialized by Simon China

Case study

Healthcare environment

Still going strong: DuPont™ Tedlar® protected wallcoverings at Omega Medical Center delivering durability and style for 30+ years

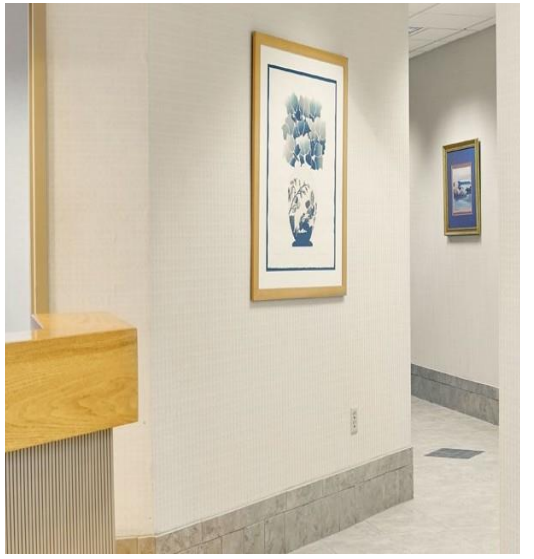
For the **Omega Medical Center**, the premier resource for occupational health and on-the-job Workers' Compensation injury care in Delaware and the mid-Atlantic region, a choice made more than 30 years ago is still delivering value: the decision to use Fidelity wallcoverings protected with DuPont™ Tedlar® film in all high-use areas across its 14,500 square foot premises.

While the painted sections of this state-of-the-art medical facility have had to be re-painted multiple times over the past three decades, the walls protected by Tedlar® are as durable, easy to clean and attractive as they were when the Center first opened, back in 1985.

Siobhan Hawkins, Director of Operations, Omega Medical Center

“ The Tedlar® based wallcoverings have lasted a long time – better, in fact, than any other wallcovering used elsewhere in the building. It’s a heavy-duty product that is aesthetically pleasing.”

In addition to the durability and cleansability of the Tedlar® laminated wallcoverings, they also offer aesthetic appeal. The texture of the wallcoverings adds dimension and interest to the walls, and the Center chose a timeless pattern and color that would match the interior design 30 years ago, and still look
attractive today as design styles evolved.



Results

For Deirdre O’Connell, Executive Director at the Omega Medical Center, the choice for the Tedlar® laminated wallcoverings has proven to be a sound one. “Back then, when we made the decision, our concern was durability and wear-and-tear in our high traffic areas,” she said. “The Tedlar® based wallcoverings have lasted a long time – better, in fact, than any other wallcovering used elsewhere in the building. It’s a heavy-duty product that is aesthetically pleasing.” This compares to the sections of the building where paint was used, for example, which require re-painting every three years.

Premium Wallcovering Delivers Best Value for Busy Emergency Room

- Mississippi Baptist Medical Center in Jackson

Facility managers at the Mississippi Baptist Medical Center in Jackson weren't guessing when choosing wallcoverings for a renovated emergency room area. Relying on more than 20 years of experience with wallcoverings protected with DuPont *Tedlar*® PVF film, they confidently selected LSI's Versa vinyl wallcovering with *Tedlar*®. The job used 2,500 sq yd (2,090 sq m) of wallcovering in waiting rooms, treatment areas, corridors, restrooms and other high-traffic areas.

Benefits Gained

Lower lifetime costs. Studies conducted by Mississippi Baptist Medical Center's management show that wallcovering protected with *Tedlar*® is the most economical solution for heavily used hospital areas because it minimizes the need for repair.

Lasting good looks. In the busy emergency room, with 30,000 patient visits annually, *Tedlar*® helps wallcovering resist abrasion, scuffing and staining.

Easy maintenance. Most soil wipes off *Tedlar*® with mild cleaners. More stubborn materials can be removed with strong solvents without damage to wallcoverings.

Material Chosen and Why

Wallcovering protected with *Tedlar*® meet rigorous requirements for resistance to staining, abrasion and scuffing, easy cleanability and low lifetime costs.

Tedlar® PVF Surface for Interiors Brings Endure Style and Cleanness to Healthcare Environment
- Changsha Guangxiu Hospital, Hunan China

DuPont Advanced Materials China team partner with local laminator, Simon, to address the highly growing healthcare construction industry in China.

The new Tedlar® PVF Interior Surface perfectly combine Tedlar® wallcoverings' superior functionalities and durable metal board that enables enduring style and extreme cleanliness. The modular parts with installation steps that can meet all the requirements for the healthcare environment construction.

The 1st successful case, Changsha Guangxiu Hospital was completed in Hunan Province on May 2018.