

FM4882 Approved Low-Smoke PVC Interior Wall Material

TAKIRON “IVY-ONE®”

TAKIRON “IVY-ONE®” is a brand-new FM (*1) approved PVC (polyvinyl chloride) fire retardant (*2) sheet developed by TAKIRON.

“IVY-ONE®” conforms to critical requirements such as fire retardant and chemical resistance for the highly sensitive interior walls in clean room of pharmaceutical or food processing industries, those critical requirements are required to implement cleaning and sterilization with chemical solutions at frequent intervals.

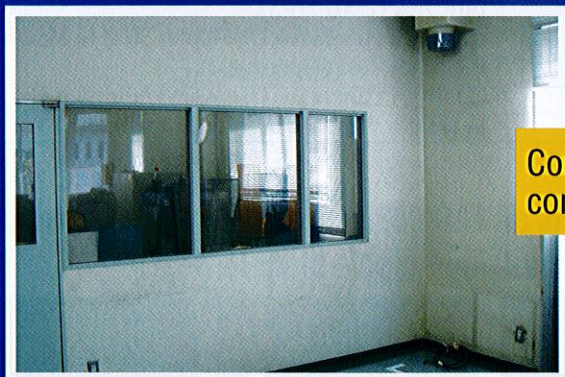
“IVY-ONE®” is a first approved material that conforms to the FM4882. This standard was designed specifically for the interior walls application for the clean room. This interior wall in clean room requires not only fire retardant concerns but also requires excellent surface smoothness, total seamless and easy installations to minimize shutdown period of the manufacturing operations in critical production areas.

Takiron offers “IVY-ONE®” as a material conforming to specific criteria to meet with users expectations.

*1: Factory Mutual (FM Approvals)

*2: FM 4882 standard

*3: IVY 573 doesn't conform to semiconductor's interior wall application of FM 4882 standard.



Completion of
construction



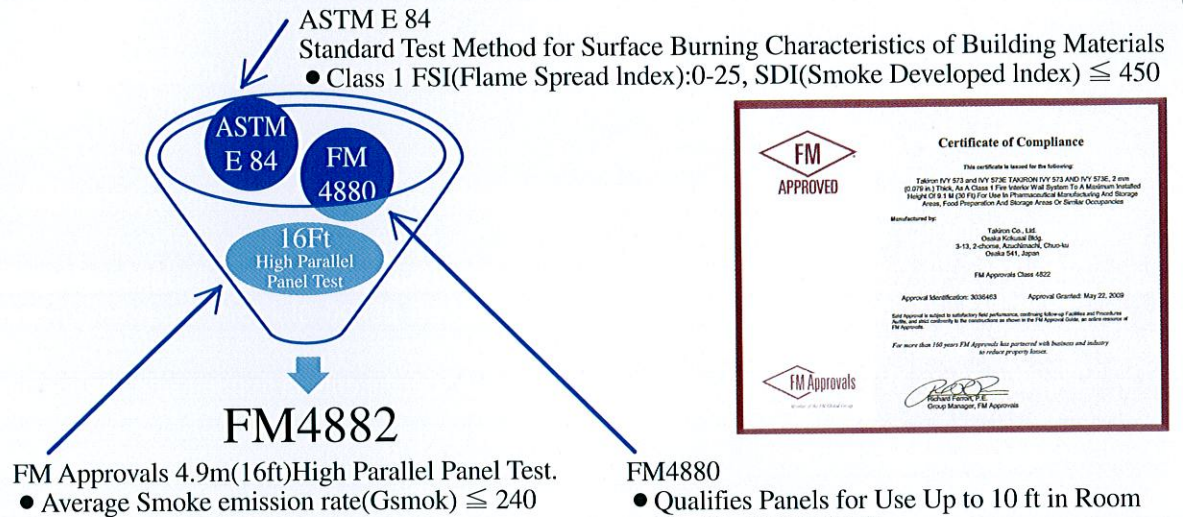
TAKIRON "IVY-ONE"

1. What's FM4882 Standard.

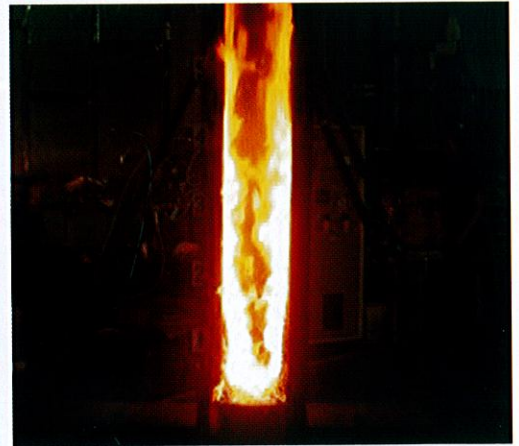
What is FM4882?

FM4882 is a new standard of interior wall materials for clean room, wall materials, developed by FM Global and the current FM4880 standard, "Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, and Wall Systems." Additionally, Class 1 is required on ASTM E84 standard which is "Standard Test Method for Surface Burning Characteristics of Building Materials".

FM 4882 is applied to products usable as interior wall materials for clean rooms in the pharmaceutical and food processing plants, and this standard intend to minimize the possible safety hazards and risks, in the event of an unexpected fire-related accident (to suppress the spread of fire and minimize possible damage due to smoke generation).



*** TAKIRON "IVY-ONE" IVY573 is an FM4882 standard approved product for interior wall applications involving heights of up to 30 ft.**



TAKIRON "IVY-ONE"

Non FM Plastic Sheet

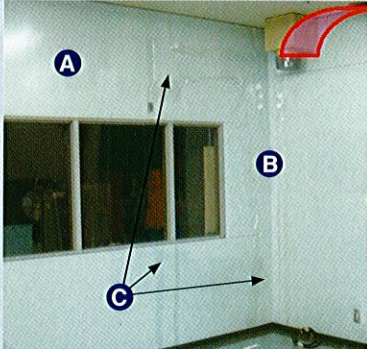
2. Product specifications and typical to interia walls for clean room.

Product type	Product code	Color	Size/Thickness
IVY	573	White	Thickness 2mm, 4ft. x 8ft. (1220mm×2440mm)

* Please consult us regarding lengths, color and the minimum possible lot.

Related materials and structural member specifications

Type	Product code	Color	Size
90-degree corner panel	7L952	White	Thickness 2mm, 90-degree R=5/32inch, 3 3/4inch×3 3/4inch×8ft (R=4mm,95mm×95mm×2440mm)
	7R952		Thickness 2mm, 90-degree R=1 5/8inch, 3 3/4inch×3 3/4inch×8ft (R=41mm,95mm×95mm×2440mm)
In corner	INRR	White	Thickness 2mm, Inside Corner Features, R=1 5/8inch, 3 3/4inch×3 3/4inch×3 3/4inch, (R=4mm, 95mm×95mm×95mm)
	INRL		Thickness 2mm, Inside Corner Features, R=5/32inch and 1 5/8inch, 3 3/4inch×3 3/4inch×3 3/4inch, (R=4mm, 95mm×95mm×95mm)
Out corner	OUTRL	White	Thickness 2mm, Outside Corner Features, R=5/32inch and 1 5/8inch, 7 13/32inch×7 13/32inch×3 3/4inch, (R=4mm, 188mm×188mm×95mm)
Welding rod	6171	White	Diameter 0.16inch×1,000ft (Diameter 4mm×300m) 5kg
Double-sided adhesive tape "Takitape"	47	—	Wide 25/32inch×33ft (Wide 20mm×10m)
Adhesive "Takibond"	47	—	11FL oz (330ml)



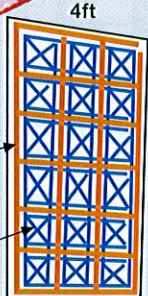
A IVY573
(PVC FM4882 Approved material)

B PVC
90-degree "L" shape corner transition 7L952

C PVC
welding rod 6171

D Takitape 47
(Double-sided adhesive tape)

E Takibond 47
(Adhesive)




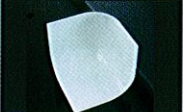
4ft


8ft

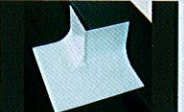
Description of products

- PVC
90-degree "R" shape corner transition 7R952


- PVC
Inside Corner transition INRR


- PVC
Inside Corner transition INRL


- PVC
Outside Corner transition OUTRL



3. Chemical resistance

Evaluation results

No.	Chemical	Concentration	IVY 573	Welding	
1	Acid & Alkali	Hydrochloric acid (HCl)	1%	VG	
2		0.5%	VG		
3		Sulfuric acid (H ₂ SO ₄)	1%	VG	
4		Nitric acid (HNO ₃)	1%	VG	
5		Phosphoric acid (H ₃ PO ₄)	1%	VG	
6		Acetic acid (CH ₃ COOH)	1%	VG	
7		Hydrogen fluoride (HF)	1%	VG	
8			0.5%	VG	
9			1%	VG	
10			Hydrogen peroxide solution (H ₂ O ₂)	1%	VG
11			Sodium hydroxide (NaOH)	1%	VG
12		Ammonia solution (NH ₃)	1%	VG	
13		Sodium hypochlorite (NaClO)	1%	VG	
14	Solvent	METHANOL (Methyl alcohol)	100%	VG	
15		ETHANOL (Ethyl alcohol)	100%	VG	
16		ISOPROPANOL (Propan-2-ol)	100%	VG	
17		BUTANOL (Butyl alcohol)	100%	VG	
18		ETHYLENE GLYCOL (Ethylene glycol)	100%	VG	
19		ACETONE (Acetone)	100%	BAD / MELTED	
20		TOLUENE (Toluene)	100%	BAD / MELTED	
21	Others	Sodium chloride (NaCl)	1%	VG	
22		Ammonia fluoride (NH ₄ F)	1%	VG	
23		Potassium chloride (KCl)	1%	VG	
24		Detergent	1%	VG	
25	Sterile Liquid	Sodium Dioxochlorate Detergent Solution (C ₁₈ H ₂₉ SO ₃ Na+NaClO ₂)	0.1%+0.5%	VG	
26		Lactic Acid (CH ₃ CH (OH) COOH)	1%	VG	
27		Paracetic Acid Preparation (CH ₃ COOOH+H ₂ O ₂ +CH ₃ COOH)	0.5%	VG	

* The above data are a series of test results and given here without guarantee.
Evaluation method: JIS A5705 Staining Resistance for Plastic Floor Coatings

4. Physical properties

In U.S. units

Evaluation item	Unit	IVY 573	Testing method
Tensile stress at yield	psi	7,200	ASTM D-638
Nominal tensile strain at break	psi	10,000	ASTM D-790
Tensile modulus of elasticity	psi	435,000	ASTM D-790
Charpy impact strength	ft·lbs/in	2	ASTM D-256
Vicat softening temperature	°F	210	JIS K 7206 B method (MOD ISO 306)
Dimensional change when heated	°F	200	ASTM D-648

The above data are a series of test results and given here without guarantee.

SI units

Evaluation item	Unit	IVY 573	Testing method
Tensile stress at yield	MPa	50	JIS K 7162-1B/50 (IDT ISO 527-2)
Flexural strength	MPa	75	
Flexural modulus of elasticity	MPa	3,000	JIS K 7162-1B/1 (IDT ISO 527-2)
Charpy impact strength	kJ/m ²	4	JIS K 7111-1epA (MOD ISO 179)
Vicat softening temperature	°C	100	JIS K 7206 B method (MOD ISO 306)
Heat Deflection Temperature (HDT) 1.8MPa(264psi)	°C	95	JIS K 7191

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Precautions

Precautions when handling TAKIRON "IVY-ONE®"

- ① **"IVY-ONE®" is C-PVC with glass fiber.**
 - When cutting or drilling, always wear protective glasses or goggles and a face mask which covers the face and mouth.
 - Itching due to glass fibers may be avoided by the use of barrier creams on exposed skin areas.
- ② **Precautions when using TAKIRON "IVY-ONE®".**
 - When using "TAKIRON IVY-ONE®" identify the temperature requirements, type of cleaning solution, irradiation settings for ultraviolet rays, external stress such as furring, and other service conditions, and implement proper design and panel cutting adequately.
 - For design and panel cutting, take into consideration the empirical approaches for fabrication.
 - The physical properties, chemical resistances, and other evaluation data contained in this site are typical test measurement values and given here without guarantee. Apply the data giving careful consideration to the actual application and service requirements.
 - Keep TAKIRON "IVY-ONE®" away from contact with any plasticizer-containing soft PVC, rubber materials, thinner, or other materials with the capability to dissolve PVC, to prevent possible dissolved contact surfaces, roughened surface conditions, and other defects.
- ③ **Precautions when fabricating TAKIRON "IVY-ONE®".**
 - TAKIRON "IVY-ONE®" contains PE (polyethylene) protective film attached to both sides. Remember to remove the protective film prior to construction or use.
 - For fabrication of TAKIRON "IVY-ONE®" wear proper gloves, safety goggles, and other protective equipment as required, and use proper machinery and tools.
 - TAKIRON "IVY-ONE®" is a C-PVC product. C-PVC emits HCl gas when heated. Although this HCl does not attain a concentration that can affect the human body during normal welding work, HCl gas concentration can vary greatly with working space and hours, when the work is performed in an enclosed space. In particular, pay special attention when the work is performed in a confined environment. For welding processes involving C-PVC, secure safety by ensuring proper ventilation on a regular basis, and wearing a proper mask and other protective equipment.
- ④ **Precautions when storing and transporting TAKIRON "IVY-ONE®".**
 - TAKIRON "IVY-ONE®" can become curved or otherwise deformed when left tilted. Be sure to place wall panels on a horizontal surface for storage and transportation.
 - Remember that masking tape for TAKIRON "IVY-ONE®" cannot be completely removed when they get wet in the rain or with water.
 - Avoid storing or transporting TAKIRON "IVY-ONE®" and its fabricated products under direct sunlight or at elevated temperatures.
- ⑤ **Precautions when disposing of TAKIRON "IVY-ONE®".**
 - TAKIRON "IVY-ONE®" can emit harmful gases when incinerated. Refer to a designated industrial waste treatment company for the disposition of waste wall panels as industrial waste, in accordance with applicable laws and regulations.
 - * An FM Label is required to provide evidence that the concerned product is FM certified, and to ensure traceability in the event of any problem. Remember to keep FM Labels at hand.

The data presented here are a series of test results of specific specimen and given here without guarantee. Comments made within this text is knowledge obtained by Takiron Co., Ltd. through the research and development of its products but given here without any warranty either expressed or implied including but not limited to any warranty of merchantability or fitness for particular purpose.

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