

HIRAOKA's unique products



PVDF-Film series

Polymer Fabric Manufacturer
Architectural fabric products
Fluorine Film Laminating Fabric

Weldable!

PVDF-FL (Fluorine Film Laminated Fabric)

Newly developed product, PVDF-FL series have a high quality thicker fluorine layer onto the PVC coated fabric.

It provides durable protection to maintain an attractive appearance.

PVDF-FL series are suitable fabrics for structures that require a high quality appearance.

- ✓ ***Superior*** dirt resistance
- ✓ ***Excellent*** durability
- ✓ ***Weldable*** (without removing surface)
- ✓ ***Mildew*** resistance
- ✓ ***REACH*** compliance
- ✓ ***15 year*** warranty

PVDF-Film series

PVDF-FL - Lineup

		PES/PVC fabric			
Technical data	unit	102T-FL	212T-FL	313T-FL	412T-FL
Width	mm	2,040	2,040	2,040	2,040
Thickness	mm	0.60	0.75	0.92	1.2
Weight	g / m ²	800	940	1,100	1,470
Tensile Strength (ASTM D-751)	N / 5cm	W:3,100 F:3,100	W:4,500 F:4,500	W:6,100 F:5,900	W:8,300 F:7,000
Tear Strength (ASTM D-751)	N	W:180 F:180	W:400 F:400	W:610 F:600	W:950 F:900
Adhesion (ASTM D-751)	N / 5cm	80	120	140	150
Crease flex abrasion resistance (Tested after boiling, JIS K6328)		n.p. Not Particular	n.p.	n.p.	n.p.



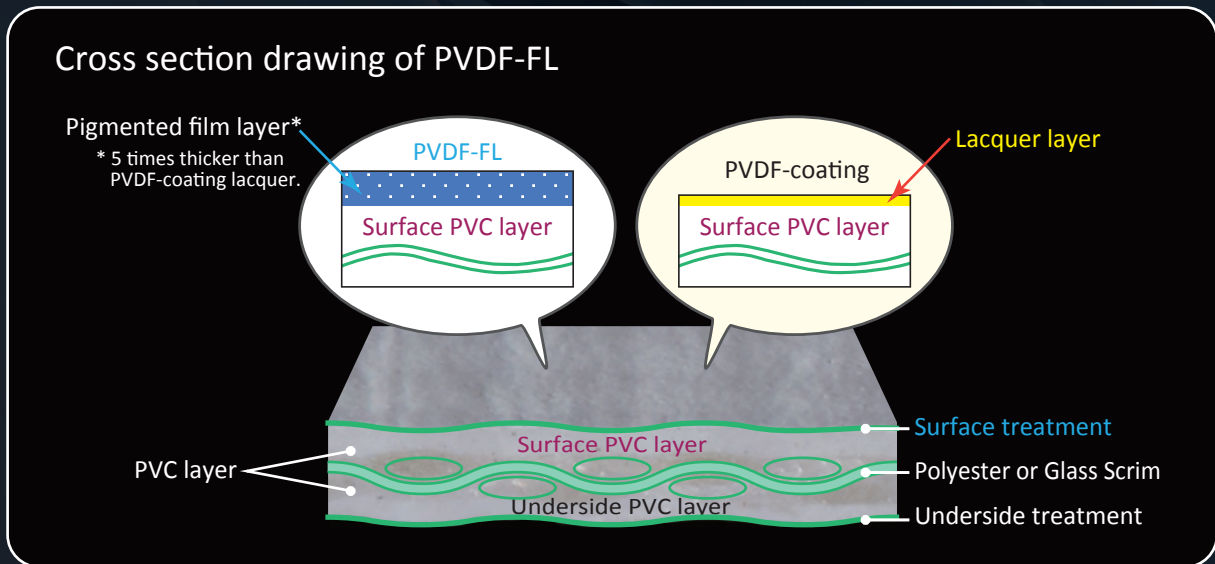
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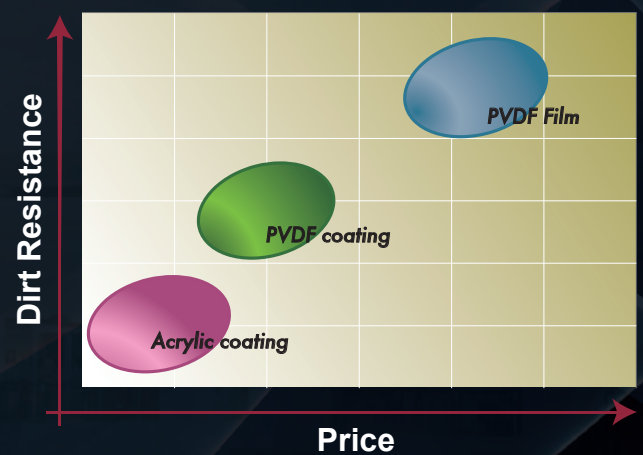
Difference of PVDF-FL and PVDF coating

PVDF-FL has a high quality fluorine top layer which is more than 5 times thicker than PVDF-coating. This top layer brings superior dirt resistance and durability of surface.



PVDF-FL is a suitable product for projects that require superior long-term dirt resistance, and is a well-balanced product than laminating fabric.

- HIRAOKA PVDF-FL**
- ☑ Weldability(HF welding)
 - ☑ Dirt resistance(for Roof)
 - ☑ Durability
 - ☑ Cost



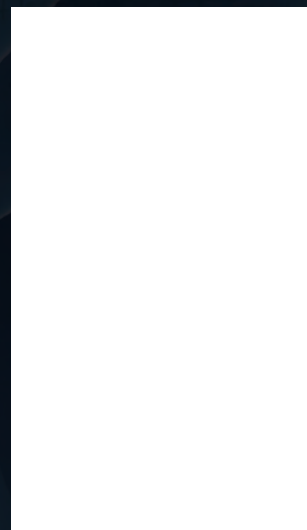
Graph showing the level of long term dirt resistance versus cost of fabric production. PVDF-FL has far superior dirt resistance.



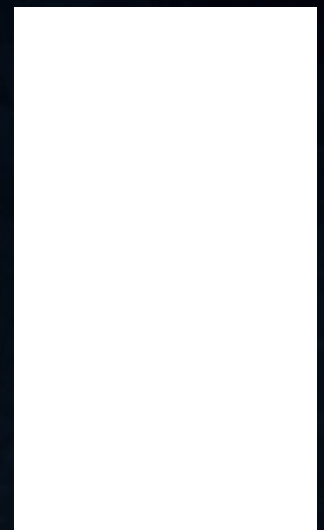
102T-FL



212T-FL



313T-FL



412T-FL

PVDF-FL - Dirt resistance of surface

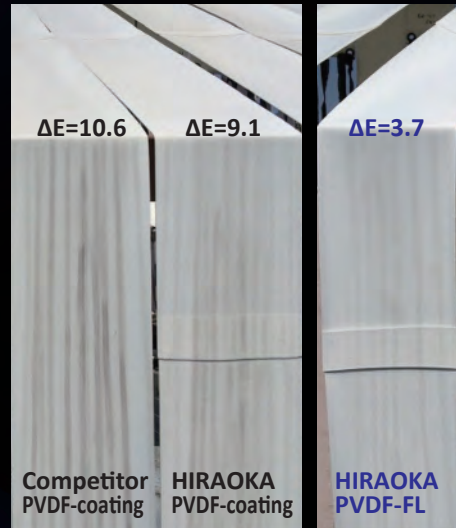
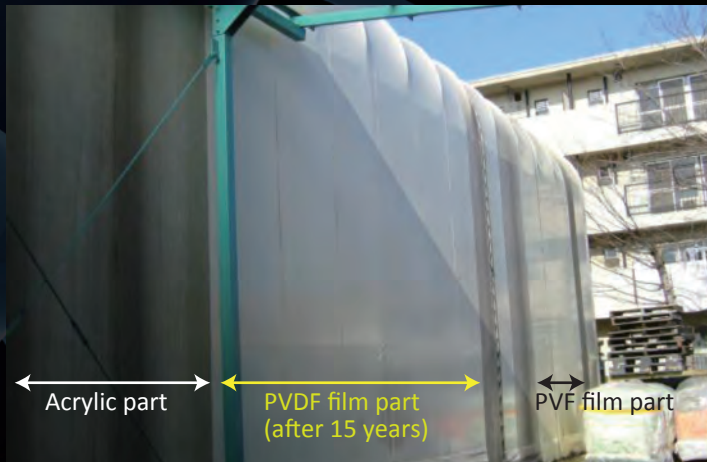
Comparison of the dirt resistance in outdoor exposure test for each sample by a color difference. Location of outdoor exposure test : Saitama Prefecture in Japan.

Finish Type	Laminated Fluorine Film PVDF-FL	PVDF coating
dirt test ΔE_{Roof} After 31 months	$\Delta E=3.4$	$\Delta E=10.3$
JIS Gray scale After 31 months	4 th class	2 nd -3 rd class

PVDF-FL - Proven dirt resistance

A below picture shows that the outer appearance of a 15-year-old warehouse had been clean condition. Dirt adhered initially had been disappearing year by year.

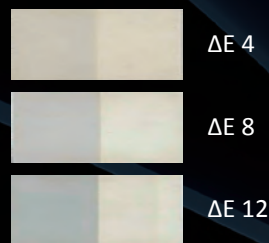
The dirt resistance of PVDF-FL fabric has been proven successful for our warehouse.



Outdoor exposure test in Japan (After 8 months).

Grey scale

About Delta E, Classification of Grey scale



PVDF-FL - Durability of surface

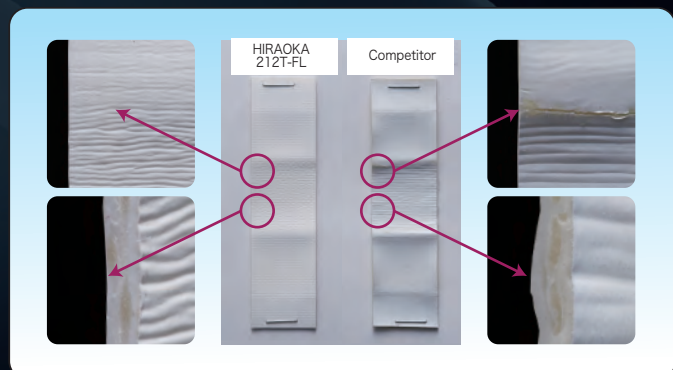
Observed surface of sample by a microscope, before and after weathering test.

Weathering test time* : 1,800h ≒ Equivalent of 18 years outdoor exposure.

*Tested by high irradiance metal halide exposure.



Magnified image of PVDF-FL fabric passing the delamination test of immersion in boiling water for 36 hours.



*2Kgf x 1000 times after soaking in the boiled water for 38hours.