

LUMIFLON® Product Data Sheet

LUMIFLON FD-1000



LUMIFLON fluoropolymer resins were developed in 1982 as the first solvent-soluble fluoropolymers in the world. LUMIFLON polymers consist of alternating fluoroethylene and alkyl vinyl ether segments (FEVE). The fluorinated segments provide outstanding UV stability, weather resistance, and chemical resistance, while the vinyl ether segments provide solvent compatibility and cross-linking sites. LUMIFLON resins are used to make ultra-weatherable coatings for architectural, aerospace, automotive, and industrial maintenance markets.

LUMIFLON FD-1000 is a new water-based dispersion. FD-1000 can be crosslinked with water-dispersible isocyanates yielding coatings with high gloss and excellent durability and corrosion resistance.

Product Characteristics

- High OH functionality
- Excellent weatherability, chemical resistance, and water resistance
- Good adhesion to primers
- Curable at both ambient and elevated temperatures
- Suitable for field applied coatings

Typical Physical Properties¹

Physical Property	Value
Appearance	Milky White Liquid
Solids, wt. %	40%
pH	7-9
Ionic Characteristic	Anionic
Particle Diameter	0.05-0.15µm
Minimum Film Forming Temperature, °C	29° C
Hydroxyl Value, mg KOH/g-polymer	85

¹LUMIFLON FD-1000 is a commercial development product. Final product specifications may differ from physical properties shown above.

The data given in this product bulletin is for information purposes only. It is given in good faith and based on the best knowledge and experience of the company. This product should be used only in applications for which it was intended. This product is not designed for special applications such as pharmaceutical or other medical use. The company makes no warranties and undertakes no responsibilities regarding this product except as stated in contract documents for its supply.





Standard Formulation for Two-Component Coating With LUMIFLON FD-1000 Resin

Pigment Paste

Ingredient	Ingredient Function	Parts By Weight
Demi Water	Diluent	21
Disperbyk 190 ¹	Dispersant	7.0
BYK28 ¹	Defoamer	1
DF75 ²	Defoamer	1
TiPure R706 ³	Pigment	70.0
Total		100.0

¹Byk Chemie

²Air Products

³Dupont

Let Down

Ingredient	Ingredient Function	Parts By Weight
LUMIFLON FD-1000 Resin	Resin	71.0
Pigment Paste	Described Above	28.0
Rheolate® 288 ⁴	Thickener	0.5
Byk 348 ⁵	Leveling Additive	0.5
Total		100.0

⁴Elementis

⁵Byk Chemie

Paint Formulation

Ingredient	Ingredient Function	Parts By Weight
Main Pack	Described Above	100
Bayhydur® 3100 ⁶	Hardener	10.8

⁶Bayer Corp.





Comparative Properties of Fluorourethane from LUMIFLON FD-1000

Table 1 below shows comparative properties for three fluoropolymer coatings: The first is a coating based on LUMIFLON FD-1000 resin, the second a two component coating based on a fluoropolymer emulsion, and the third a single component emulsion.

Table 1: Coating Properties of Fluoropolymer Coatings

Property	Test Method		LUMIFLON FD-1000 2K	Emulsion 2K	Emulsion 1K
Gloss	ISO 2813	20°	80	58	65
		60°	88	84	82
Pencil Hardness	ISO 15184	Gouge Scratch	4H F	4H 2B	4B <4B
Pendulum Hardness	ISO 1522		79	75	19
Impact Resistance	ISO 6272 (Diameter=0.5")	Intrusion 0.5 kg	1.0 m	1.0 m	0.3 m
		Extrusion 0.5 kg	1.0 m	1.0 m	0.3 m
Cross Cut Adhesion	ISO 2409		0	0	5
Water Resistance	ISO 2812 40° C, 24 hrs. 1. Cross Cut Adhesion, ISO 2409 2. Blistering, ISO 4628		1	2	5
			No Blistering	Density: 3 Size: 1	Density: 5 Size: 5

Cure cycle: 80° C, 1 hr.

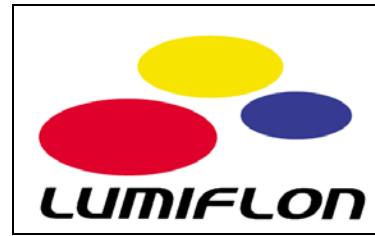
Substrate: Aluminum chromated aluminum panels

Film Thickness: 30-40 µm

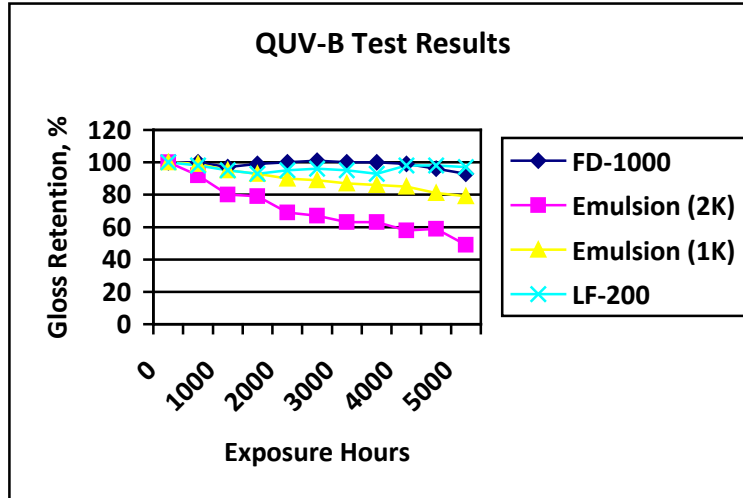
Discussion of Test Results

Results in the table show that the coating made with LUMIFLON FD-1000 has superior properties compared to those prepared with fluoropolymer emulsions. In particular, water resistance is substantially improved. Hardness, impact resistance, and gloss are excellent as well.



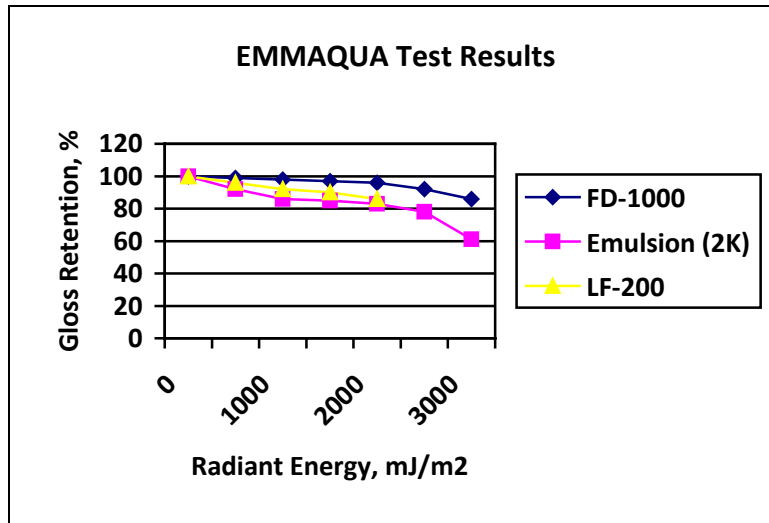


Accelerated Weathering of LUMIFLON FD-1000: QUV-B Test



UV / Condensation Cabinet Cycle : 8 hours UV at 70° C and 4 hours condensation at 50° C

Accelerated Weathering of LUMIFLON FD-1000: EMMAQUA Test



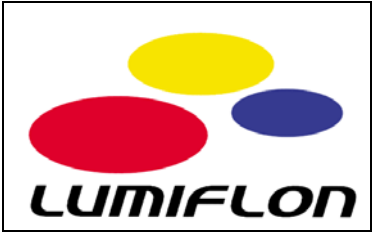
Location: New River, AZ

Radiant Energy Total: FD-1000 and FE-4400: 2,673,399 Langley's, 3,000 mJ/m2 (295-385 nm)







LF-200: 1,723,423 Langley's, 2,000 mJ/m2 (295-385 nm)

White Enamel, PWC=33%





Corrosion Resistance of LUMIFLON FD-1000: Salt Fog Test

Product (NCO Index)	FD-1000 (1.0)	Polyurethane Dispersion ¹	
		(1.0)	(1.5)
Coating System	Primer ² /Topcoat/Topcoat		
Salt Spray, 1000 hours	Good (Rating 0)	Good (Rating 0)	Very Slight Blisters, 1mm (Rating 1)
			
Salt Spray, 1500 hours	Good (Rating 0)	Slight Blisters, 1mm (Rating 2)	Slight Blisters, 2mm (Rating 2)
			
¹ Bayhydrol 145 (Bayer Corp.) ² Waterborne 2K epoxy primer			

