## AAMA 2605 Finishes Comparison

70% PVDF (Polyvinylidene Fluoride) Liquid Coating vs. 100% FEVE (Fluoroethylene Vinyl Ether) Powder Coating





The tables below show the performance characteristics of both 70% PVDF (Kynar<sup>®</sup> resin) and powder coatings based upon FEVE (Fluoroethylene Vinyl Ether). The main difference of these two coatings, besides their state of phase, is that the liquid coating is a thermoplastic and the powder coating is a thermoset. Thermoplastics do not undergo a permanent, one-way, infusible reaction as do thermosets. By virtue of this, thermosets are typically much harder and more scratch resistant, resulting in a tougher film versus their thermoplastic counterparts. Both varieties display excellent weathering and corrosion resistance. PVDF (70% Kynar<sup>®</sup> resin) liquid coatings are more recognized by their commercial names such as Kynar 500<sup>®</sup>, Fluropon<sup>®</sup>, Duranar<sup>®</sup>, etc. Gordon Inc.'s AAMA 2605 powder coatings are based on FEVE technology which is an ultra-high-performance fluoropolymer molecule that is chemically crosslinked, surpassing the requirements of AAMA 2605.

Physical Properties of Coatings							
Property	Test Method	70% PVDF Liquid Coating	100% FEVE Powder Coating				
Textures	N/A	No	Yes				
Gloss Range (at 60°)	ASTM D523	20-35	20-65				
Color Range <sup>1</sup>	N/A	Wide range of solids & metallics	Wide range of solids & metallics				
Smoothness (PCI Scale) <sup>2</sup>	PCI Tech Brief #20	6-8	6-8				
Pretreatment, typ. 3	N/A	Tri/Hex Valent Chrome	Chrome-free dry-in-place				
Impact Resistance (deformation)	ASTM D2794	3.0 mm	3.0 mm				
Pencil Hardness <sup>4</sup>	ASTM D3363	F	4H				
Taber Abrasion (Wear Index) <sup>5</sup>	ASTM D4060	140	100				
Adhesion	ASTM D3359	5B	5B				
100 Double Rubs MEK	PCI Method #8	PASS	PASS				
Mandrel Bend	ASTM D522	1/"	1/4"				
Film Thickness	ASTM D7091	1.2 min	2.0 min				
South Florida UV Resistance	Per AAMA 2604- 17a	Up to 20 years, Gloss retention: $50\%$ +, Color Retention: $\Delta E < 5.0$	Up to 20 years, Gloss retention: $50\%$ +, Color Retention: $\Delta E < 5.0$				
Salt Spray Resistance (ASTM B117)	ASTM B117	3000 hrs.	3000 hrs.				
Cyclic Corrosion	ASTM G-85	2000 hrs.	2000 hrs.				
Humidity Resistance	ASTM D2247	4000 hrs.	4000 hrs.				

	Chemical Resistance Properties of Coa	tings				
Chemical Reagent 6	70% PVDF Liquid Coating	100% FEVE Powder Coating				
Sulfuric Acid 40%	5	5				
Nitric Acid 20%	5	5				
Phosphoric Acid 85%	5	5				
Hydrochloric Acid 37%	5	5				
Acetic Acid 40%	5	5				
Sodium Hydroxide 40%	5	5				
Ammonia Sol. 29%	5	5				
Ethanol 95%	5	5				
Methanol	5	5				
Diesel	5	5				
Formaldehyde	5	5				
Vegetable Oil	5	5				
Rating: 5=Unaffected	4=Color/Gloss change 3=Softens; recovers 2=S	oftens; no recovery 1=Blistered				

## Footnote:

<sup>1</sup> Color ranges can be limited by high chromaticity which could facilitate the need for a clear top coat.

- <sup>2</sup> PCI smoothness is directed by a set of 10 standard panels that vary in smoothness; 1 being the least smooth and 10 which represents nearly perfect smoothness.
- <sup>3</sup> Pretreatment chemicals for PVDF coatings typically contains either trivalent or hexavalent chrome. Chrome is a heavy metal and extremely hazardous. Gordon powder coatings are applied over chrome-free pretreated substrates and exhibit excellent performance.
- <sup>4</sup> Pencil Hardness Scale

9H 8H 7H 6H	5H 4H	3H 2H	Н	F	ΗB	В	2B	3B	4B	5B	6B	7B	8B	9B
Hardest	$\rightarrow$			Me	dium				$\rightarrow$				Sof	test

- <sup>5</sup>Taber Wear Index Indicates rate of wear, and is calculated by measuring the loss in weight (in milligrams) per thousand cycles of abrasion. <u>The lower the wear index, the better the abrasion resistance.</u>
- <sup>6</sup> Chemical Resistance Testing was carried out by an independent laboratory. Coating was exposed to 5 drops of each reagent applied to a cotton ball and placed under a watch glass for 150 hours. At the end of the test the coating was rinsed with water and evaluated.

Kynar<sup>®</sup> and Kynar 500<sup>®</sup> are registered trademarks of Arkema High Performance Polymers, Fluropon<sup>®</sup> is a registered trademark of The Valspar Corporation, and Duranar<sup>®</sup> is a registered trademark of PPG Industries.



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