

# Alumanate

## Aluminum Composite Material

### Alumanate PE Core

Alumanate Architectural PE consists of two sheets of smooth 0.020" nominal aluminum thermobonded to a unbreakable polyethylene core in a continuous process. Alumanate Architectural PE delivers unparalleled flatness, formability, resistance to wear and simple processing. Alumanate Architectural PE will bring durability paired with pristine looks for years to come.



### Technical Properties

- Nominal Thickness: 3mm, 4mm, 6mm
- Weight: 0.92 lb/ft<sup>2</sup>, 1.12 lb/ft<sup>2</sup>, 1.49 lb/ft<sup>2</sup>
- Moment of Inertia: .000108 in<sup>4</sup>/in  
.000212 in<sup>4</sup>/in .000525 in<sup>4</sup>/in
- Section Modulus: .00196 in<sup>3</sup>/in .00275 in<sup>3</sup>/in .00432 in<sup>3</sup>/in
- Rigidity: 1091 lb-in<sup>2</sup>/in 2143 lb-in<sup>2</sup>/in 5299 lb-in<sup>2</sup>/in

### Temperature Resistance

- Withstands environmental temperature changes from -55°F to +175°F
- Coefficient of linear expansion is governed by the aluminum sheet

### Material Composition

- Aluminum interior and exterior facings ranging from 0.008" to 0.020" nominal thickness to ensure flatness
- Panel thicknesses available in 3mm, 4mm and 6mm nominal thickness

#### Sheet Widths

- Standard coil coated widths include 48", 60" and 62"
- Custom widths up to 5.175'

#### Sheet Lengths

- Standard lengths include 96", 120" and 196"
- Custom lengths for coil coating up to a maximum of 360"

To download PDF or AutoCAD details and specifications, visit our website at [www.alumanate.com](http://www.alumanate.com).

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### Alumante PE & FR Engineering Properties - U.S. & Metric Equivalent

Property	Units	PE-3mm	PE-4mm	PE-6mm	FR-4mm	FR-6mm
Thickness	in	0.118	0.157	0.236	0.157	0.236
	mm	3.0	4.0	6.0	4.0	6.0
Weight	lb/ft <sup>2</sup>	0.94	1.12	1.49	1.53	2.10
	kg/m <sup>2</sup>	4.59	5.47	7.28	7.48	10.25
BOND INTEGRITY Min. Bond Strength ASTM D1781	in-lb/in	40	40	40	22.5	22.5
	Nm/m	178	178	178	100	100
Flatwise Shear ASTM D1002	lb/in <sup>2</sup>	1,297	1,221	2,055	92.8	70.8
	MPa	8.94	8.42	14.7	6.4	4.8
Allowable Bending Stress	lb/in <sup>2</sup>	11,500	11,500	11,500	11,500	11,500
	MPa	79.3	79.3	79.3	79.3	79.3
Coeff. of Expansion ASTM E228	in/in/°F	1.31x10 <sup>-5</sup>	1.31x10 <sup>-5</sup>	1.31x10 <sup>-5</sup>	1.31x10 <sup>-5</sup>	1.31x10 <sup>-5</sup>
	mm/mm/°C	2.36x10 <sup>-5</sup>	2.36x10 <sup>-5</sup>	2.36x10 <sup>-5</sup>	2.36x10 <sup>-5</sup>	2.36x10 <sup>-5</sup>
Stiffness (EI) ASTM D393	lb-in <sup>2</sup> /in	807	1,140	1,896	1,262	2,450
	MPa-cm <sup>4</sup> /m	9.1x10 <sup>3</sup>	1.3x10 <sup>4</sup>	2.1x10 <sup>4</sup>	1.4x10 <sup>4</sup>	2,450
Flexural Modulus ASTM C393	lb/in <sup>2</sup>	8.3x10 <sup>6</sup>	6.0 x10 <sup>6</sup>	4.0 x10 <sup>6</sup>	6.7 x10 <sup>6</sup>	3.0x10 <sup>7</sup>
	MPa	5.7 x10 <sup>4</sup>	4.1 x10 <sup>4</sup>	2.8 x10 <sup>4</sup>	4.6 x10 <sup>4</sup>	2.6x10 <sup>5</sup>
Moment of Inertia	in <sup>4</sup> /in	0.97x10 <sup>4</sup>	1.89 x10 <sup>4</sup>	4.58 x10 <sup>4</sup>	1.89 x10 <sup>4</sup>	4.58 x10 <sup>4</sup>
	cm <sup>4</sup> /m	0.159	0.310	0.751	0.310	0.751
Section Modulus	in <sup>3</sup> /in	1.65x10 <sup>-3</sup>	2.41x10 <sup>-3</sup>	3.88 x10 <sup>-3</sup>	2.41x10 <sup>-3</sup>	3.88 x10 <sup>-3</sup>
	cm <sup>3</sup> /m	1.065	1.555	2.503	1.555	2.503
Tensile Yield	lb/in <sup>2</sup>	8,300	6,405	5,314	6,367	6,010
	MPa	57.23	44.16	36.64	43.90	41.44
Flatwise Tensile ASTM C297	lb/in <sup>2</sup>	1,483	1,371	1,099	961	
	MPa	10.22	9.45	7.58	6.62	
"R" Thermal Resistance	ft <sup>2</sup> hr <sup>2</sup> F/BTU	0.034	0.051	0.086	0.026	0.04
	m <sup>2</sup> K/w	6.0x10 <sup>-3</sup>	9.0 x10 <sup>-3</sup>	1.5x10 <sup>-2</sup>	4.5x10 <sup>-3</sup>	7.0x10 <sup>-3</sup>
Maximum Width	in	62	62	62	62	62
	mm	1,575	1,575	1,575	1,575	1,575
Maximum Length	in	243	243	243	243	243
	mm	6,172	6,172	6,172	6,172	6,172
Sound Transmission Coefficient ASTM E90			26			
Fire Performance <sup>(2)</sup> ASTM E84 & NFPA 285	ASTM E84 NFPA 285	Class A Untested	Class A Untested	Class A Untested	Class A Pass	Class A Pass

### Paint Finish Performance for Kynar 500 / FEVE Coatings

Property	Test Method	Matte	Mica	Metallic
Specular Gloss (60%)	ASTM D523	25-35	25-35	25-35
Pencil Hardness	ASTM D3363	F-2H	F-2H	F-2H
Flexibility (T-bend)	ASTM D4145	1-2 T-bend; No pick off	1-2 T-bend; No pick off	1-2 T-bend; No pick off
Reverse Impact	ASTM D2794	No cracking or adhesion loss	No cracking or adhesion loss	No cracking or adhesion loss
Salt Spray Resistance 5% Salt Fog @ 95° F	ASTM B117	Passes 4000 hrs	Passes 4000 hrs	Passes 4000 hrs
Humidity Resistance 100% RH @ 95° F	ASTM D2247	Passes 4000 hrs	Passes 4000 hrs	Passes 4000 hrs
Color Retention 10 yrs @ 45°, South Florida	ASTM D2244	Max 5 fade	Max 5 fade	Max 5 fade
Chalk Resistance 10 yrs @ 45°, South Florida	ASTM D4214	Max 8 chalk	Max 8 chalk	Max 8 chalk



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### Alumanate Architectural PE Engineering Properties

Standard Test Method*	Description	Category	3mm	4mm	6mm
ASTM D-635	Rate of Burning	Fire Performance Properties	–	Classified CC1	–
ASTM D-1929	Ignition Temperature-Self	Fire Performance Properties	–	716°F	–
ASTM D-1929	Ignition Temperature-Flash	Fire Performance Properties	–	716°F	–
ASTM E-84	Surface Burning Characteristics (Flame Spread)	Fire Performance Properties	0	5	5
ASTM E-84	Surface Burning Characteristics (Smoke Development)	Fire Performance Properties	0	0	5
ASTM E-162	Surface Flammability Using Radiant Energy Source	Fire Performance Properties	0	0	0
ASTM C-365	Flatwise Compression Strength	Mechanical Properties	–	6258 psi	–
ASTM C-393	Flexural Stiffness	Mechanical Properties	1330 lbs-in <sup>2</sup>	2565 lbs-in <sup>2</sup>	4380 lbs-in <sup>2</sup>
ASTM D-297	Flatwise Tensile Strength	Mechanical Properties	1945 psi	1615 psi	1435 psi
ASTM D-790	Flexural Strength	Mechanical Properties	18,250 psi	14,500 psi	10,475 psi
ASTM D-790	Flexural Modulus	Mechanical Properties	1675 ksi	1655 ksi	1515 ksi
ASTM D-638	Modulus of Elasticity	Mechanical Properties	1.98 psi x 10 <sup>6</sup>	1.38 psi x 10 <sup>6</sup>	0.87 psi x 10 <sup>6</sup>
ASTM D-638	Elongation @ Yield	Mechanical Properties	5.6%	8.8%	10.9%
ASTM D-638	Tensile Strength (Ultimate)	Mechanical Properties	7805 psi	6890 psi	4580 psi
ASTM D-638	Tensile Yield	Mechanical Properties	7805 psi	5270 psi	4580 psi
ASTM C-177	Thermal Conductivity	Thermal Properties	2.86 Btu-in/hr ft <sup>2</sup>	3.21 Btu-in/hr ft <sup>2</sup>	2.46 Btu-in/hr ft <sup>2</sup>
ASTM C-177	Thermal Resistance	Thermal Properties	°F	°F	°F
ASTM C-177	Thermal Conductance	Thermal Properties	0.0412 hr ft <sup>2</sup>	0.0489 hr ft <sup>2</sup>	0.096 hr ft <sup>2</sup>
ASTM D-648	Deflection Temperature - Perpendicular	Thermal Properties	°F/Btu	°F/Btu	°F/Btu
ASTM D-648	Deflection Temperature	Thermal Properties	24.3 Btu/hr ft <sup>2</sup>	20.5 Btu/hr ft <sup>2</sup>	10.5 Btu/hr ft <sup>2</sup> °F
ASTM C-273	Shear Test in Flatwise Plane	Bond Integrity Properties	°F	°F	–
ASTM C-297	Tensile Bond Strength Test in Flatwise Plane	Bond Integrity Properties	–	327°F	>450°F
ASTM D-1781	Bond Integrity	Bond Integrity Properties	>380°F	380°F	880 psi
ASTM E-90	Sound Transmission (STC)	Acoustical Properties	985 psi	915 psi	1438 psi
ASTM C-272	Water Absorption	Physical Properties	1961 psi	1615 psi	177.31 N mm/mm
ASTM D-696	Coefficient of Linear Thermal Expansion	Physical Properties	–	172.38 N mm/mm	28

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**Other Available information**

CAD Panel Specs

LEED Calculations

Material Safety Data Sheets

Fabrication Guidelines

Cleaning & Maintenance Guidelines

Color Charts

Product and Finish Warranties

Project Photos & Portfolio

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