ALUCLAD

ALUMINIUM COMPOSITE PANEL

madar مدار

Authorized Distributor in Egypt

ALUCLAD (A2) TECHNICAL SUMMARY					
Property	**Standard**	**Tolerance**	**Result**		**Unit**
Panel Thickness	Screw Gauge/Vernier Caliper	(±) 0.2mm	4mm	6mm	mm
Aluminum Skin thickness	Screw Gauge/Vernier Caliper	(±) 0.02mm	0.5	0.5	mm
Weight of the Panel	Weighing Scale	(±) 0.5 kg/m2	8.50	11.00	kg/m2
Standard Width	Measuring Tape	(±) 2mm	1000, 1250, 1500		mm
Length	Measuring Tape	(±) 2mm	up to 6000		mm
Diagonal Difference (Squareness)	Measuring Tape	Max 5mm	Max 0.5% (5mm/m) of Length or Width		mm
Alloy Temper	EN 485-2:2016		3003 - H16		
MECHANICAL PROPERTIES OF ALUMINUM					
2% Proof Stress		Mpa or N/mm2	157		Mpa
Tensile Strngth		Mpa or N/mm2	182		Mpa
Elongation			6.1		%
FIRE PERFORMANCE					
Inner Core (Non-Combustible mineral Core)	EN13501-1	3.2mm thick CLAD-CORE		5.1mm thick CLAD-CORE	
		Class A2-s1, d0 (Tested Core 3mm thick Wide Test Report No: VL079-4			
PHYCICAL, MECHNICAL & THERMAL PROPERTIES					
Shear Strength (Mpa)	ASTM C393/C393M-16	≥22 N/mm2	23.30		(N/mm2)
180° peel Strength	ISO 8510-2:2006	≥10 N/mm	12.78		N/mm
Drum Peel	ASTM D1781-21	>100N.mm/mm	124.30		N.mm/mm
Tensile Strength	ASTM D 638-14	Mpa or N/mm2	46.5		Mpa
Tensile Strength at Yield	ASTM D 638-14	Mpa or N/mm2	40.9		Mpa
Flexural Bending Strength	ASTM D 790-17	Mpa or N/mm2	109.20		N/mm2
Elongation		%	2		%
Bend Strength & Modulus	C393/C393-16	N/mm2	73,089		(N/mm2)
Heat Deflection Temperature °C	ASTM D 638-14	≥85 °C	102		°C
Linear Thermal Expansion	ASTM D696-16	≤200 µm/m°c	112.60		µm/m°c
Thermal Resistance	ASTM C518-21	≥0. 06m2.k/W	0.0955		m2.k/w
Thermal Conductivity	ASTM C518-21	≤4.5W/mk	0.1391		w/mk
COATING PROPERTIES AND PERFORMANCE					
Surface coating	PVDF /FEVE/HDPE				
Coating Thickness	ASTM D1400	(±) 2µm	≥25		µm
Adhesion	ISO 2409:2014	Grade 1	Grade-1: Dry Adhesion - no removal of film		
Impact Resistance	ISO6272-2:2014	≥1kg,100cm, no peel off, no cracks	Pass: No Removal of Film		
T-Bend Test	ISO 17132: 2010		2 T (No Cracks)		
Pencil Hardness	GSO ISO 15184:2015	≥HB	4 H		
Abrasion Resistance	ASTM D968 - 17	≥2L/µm	8 L/µm		
Boiling Water Test (99°C - 100°C @ 20mins)	ISO 2812 - 2		No Change - Excellent		
Brush Resistance Stain	ISO 11988	No change at 10,000 cycle ≥ 5%	100% Pass		
Corrosion Resistance (Humidity Resistance & Salt Spray	Humidity Resistance @2000 hrs Exposure and Salt spray 240 hrs		No Formation of blister		
Chemical Resistance		Acid Resistance	No Change		
		Alkali Resistance	No Change		
		Oil Resistance	No Change		
		Solvent Resistance	No Change		

ALUCLAD FR

ALUCLAD FR is manufactured using fire retardant core as per Class B-s1, d0 and EN 13501-1 and supplies the construction and advertising markets.

ALUCLAD-FR TECHNICAL SHEETS

Property	Standard	Tolerance	Result	Unit
Panel Thickness	Screw Gauge/ Vernier Caliper	(±) 0.2mm	4	mm
Aluminum Skin thickness (Top & Bottom)	Screw Gauge/ Vernier Caliper	(±) 0.02mm	0.3 / 0.5	mm
Weight of the Panel	Weighing Scale	(±) 0.5 kg/m²	6.60 - 7.80	kg/m2
Standard Width	Measuring Tape	(±) 2mm	1250, 1500	mm
Length	Measuring Tape	(±) 2mm	up to 5800	mm
Diagonal Difference (Square-ness)	Measuring Tape	Max 5mm	Max 0.5% (5mm/m) of Length or Width	mm
Bow (Length and /or Width)			Maximum 0.8%	
Alloy Temper	EN 485-2:2016		1100 or 3003- H16	
COIL SPECIFICATION				
2% Proof Stress		Mpa or N/mm²	157	Mpa
Tensile Strength		Mpa or N/mm²	182	Mpa
Elongation			6.1	%
INNER CORE: Fire Rated Mineral Filled Core		BS EN-13501:2018- B-s1, d0		
180° peel Strength	ISO 8510-2:2006		Min. 9	N/mm
COATING PROPERTIES AND PERFORMANCE				
Surface coating	PVDF /FEVE/HDPE			
Coating Thickness	ASTM D1400	(±) 2µm	≥25	µm
Color Difference	ASTM D 2244	ΔE≤2.0 (Reference to the master sample)	ΔE≤2.0 (Reference to the master sample)	
Adhesion	ISO 2409:2013		Dry Adhesion - no removal of film	
Impact Resistance	AAMA 2605 (Test 50 kg-cm)		No Crack and Paint Peel-off	
T-Bend Test	ISO 17132: 2010		2 T (No Cracks)	
Pencil Hardness	GSO ISO 15184		≥ H	
Abrasion Resistance	ASTM D968 - 17		9 L /mm	
Boiling Water Test (99°C - 100°C @ 20mins)	ISO 2812 - 2		No Change - Excellent	
Brush Resistance Stain	ISO 11988	No change at 10,000 cycle ≥ 5%	100% Pass	
Solvent Resistance Test (MEK Test)			No Removal of paint @50 DBR	
Chemical Resistance		Acid Resistance	No Change	
		Alkali Resistance	No Change	
		Oil Resistance	No Change	
		Solvent Resistance	No Change	

ALUCLAD TECHNICAL SUMMARY

PROPERTIES	STANDARD	TOLERANCE	RESULTS		UNIT
PANEL THICKNESS	Screw Gauge/Vernier Caliper	(±) 0.2mm	4	4	mm
SKIN THICKNESS	Screw Gauge/Vernier Caliper	(±) 0.02mm	0.3	0.5	mm
PANELS WEIGHT	Weighing Scale	(±) 0.5 kg/m2	6.0 to 6.80	7.50 to 8.50	Kg/m3
STANDARD WIDTH	Measuring Tape	(±) 2mm	1000, 1250, 1500		mm
LENGTH	Measuring Tape	(±) 2mm	Up to 6000		mm
COIL SPECIFICATIONS					
ALLOY / TEMPER	ASTM B209		3003 H -16		
TENSILE STRENGTH	ASTM E8		196 N/mm ^{2}		
YIELD STRENGTH	ASTM E8		190 N/mm ^{2}		
ELONGATION	ASTM E8		4.2 %		
MECHANICAL PROPERTIES					
Shear Strength	ASTM C393/C393M -16		32.8	33	Mpa (N/mm2)
180° Peel Strength	ISO 8510 -2:2006		12.00	16.70	N/mm
Bending Strength	ASTM C393/C396 -16		151	152.80	Mpa (N/mm2)
Bend Modulus	ASTM C393/C396 -16		2.36x10 ^{4}	2.4x10 ^{4}	Mpa (N/mm2)
THERMAL PROPERTIES					
Heat Deflection Temperature	ISO 75 -2:201 4		100	118	°C
Linear Thermal Expansion	ASTM D 696 -16		116	116.3	µm/m °C
Thermal Resistance "R" Value	ASTM C518 -17		1.38	0.0641	m^2. k/w
Thermal Conductivity " µ" Value	ASTM C518 -17		1.85	0.0608	w/mk
FIRE PERFORMANCE					
Reaction to Fire Classification	EN -13501 -1	CLASS B, s1 -d0 (FR -B)		CLASS A2 -s1, d0 (FR -A2)	
Surface Burning characteristics	ASTM E -84	Flame Spread Index (FSI) -5 Smoke Developed Index (SDI) -5			CLASS A
SELF IGNITION TEMP (FIT)	361.3 (For B -s1, d0) and 509 (For A2 -s1, d0)				C m^2. k/w
COATING PROPERTIES AND PERFORMANCE					
COATING THICKNESS	(ASTM D 1400) (PVDF, FEVE, HDPE)			≥25	
GLOSS DEVIATION	ISO 2813:2014 (≤10mm)			7.1	
SPECULAR GLOSS	ASTM D523 (15 -35)			32.2	
COATING ADHESION	ISO: 2409:2013 (No Removal)			Excellent / Grade 1 No Removal	
PENCIL HARDNESS	GSO ISO 15184 :2015			3 H	
T -BEND (COATING FLEXIBILITY)	ISO 17132:2010 (≤2 without any cracks or damages)			No Cracks in coating	
IMPACT RESISTANCE	ISO 6272 -1 (1kg weight dropped from 100cm height)			No Cracks in Coating	
BOILING WATER TEST	ISO2812 -2:2014 (No change)			Excellent	
ABRASION RESISTANCE	ASTM D968 -17 (≥2L/ µm)			8 L/ µm	
BRUSH STAIN RESISTANCE	ISO 11988 (No Change at 10,000 cycle ≤5%)			1.2 %	
ACID RESISTACNE	ISO 2812 -1:2017 (No Blister and Visual Change)			Pass no Change	
ALKALI	ISO 2812 -1:2017 (No Adhesion Loss or Visual Change)			Pass No Change	
OIL RESISTANCE	ISO 2812 -1:2017 (No Change)			Pass no Change	
SOLVENT RESISTANCE	ISO:2812 -1:2017 (No Adhesion loss or Visual change)			Pass no Visual change	
SALT SPRAY 240 hours 50g/1	ISO 11997 (Blister, Flaking Chalking, corrosion)			Pass No Change	
2000 hours Xenon Arc Lamp	ISO 16474 (Blister, Flaking Chalking, Delamination Rusting, Gloss change, Colour Change.)			No Change	

REMARKS: COATING PERFORMANCE RESULTS ARE COMPLYING WITH AAMA 2605 - 13 REQUIREMENTS.

Property	Standard	Tolerance	Result	Unit
Panel Thickness	Screw Gauge/Vernier Caliper	(±) 0.2mm	4	mm
Aluminum Skin thickness	Screw Gauge/Vernier Caliper	(±) 0.02mm	(0.3-0.3) & (0.5-0.5)	mm
Weight of the Panel	Weighing Scale	(±) 0.5 kg/m2	5.20- 6.20	kg/m2
Standard Width	Measuring Tape	(±) 2mm	1250, 1500	mm
Length	Measuring Tape	(±) 2mm	up to 4500	mm
Diagonal Difference (Square-ness)	Measuring Tape	Max 5mm	Max 0.5% (5mm/m) of Length or Width	mm
Alloy Temper	EN 485-2:2016		3003 - H16	
MECHANICAL PROPERTIES OF ALUMINUM				
2% Proof Stress		Mpa or N/mm2	157	Mpa
Tensile Strength		Mpa or N/mm2	182	Mpa
Elongation			6.1	%
Flexural Elasticity of Aluminum	ASTM C393/C393-M	Kg/mm2	18.62	Kg/mm2
INNER CORE: LOW DENSITY POLYETHYLENE (NFR) Color: Black Density: 1,100-1,250 kg/m3				
PHYCICAL & MECHNICAL PROPERTIES				
Shear Strength	ASTM C393/C393M-16	22.7		(N/mm2)
180° peel Strength	ISO 8510-2:2008	13.2		N/mm
Drum Peel Test	ASTM D1781	110.1		N.mm/mm
Bend Strength & Modulus	C393/C393-16	129.40 (23,360)		(N/mm2)
COATING PROPERTIES AND PERFORMANCE				
Surface coating	PVDF (POLYVINYLIDENE FLUORIDE / HDPE (HIGE DURABLE POLYSTER)			
Coating Thickness	ASTM D1400	(±) 2µm	≥25:2 Coat ≥ 38:3 Coat	µm
Adhesion	ISO 2409:2014	Grade 1: Dry Adhesion - no removal of film		
Impact Resistance	ISO 6272-2:2014 (Test 1kg-cm)	PASS – No Peel off or Crack observed when 1 kg weight is dropped at a height of 100 cm		

T-Bend Test	ISO 17132: 2010	2 T (No Cracks)	
Pencil Hardness	GSO ISO 15184:2015	3 H	
Abrasion Resistance	ASTM D968 - 17	8 L /mm	
Boiling Water Test (99°C - 100°C @ 20mins)	ISO 2812 – 2:2014	No Change - Excellent	
Brush Resistance Stain	ISO 11988	No change at 10,000 cycle ≥ 5%	100% Pass
Chemical Resistance	ISO 2812:2014	Acid Resistance	No Change
		Alkali Resistance	No Change
		Oil Resistance	No Change
		Solvent Resistance	No Change