



AKPA[®]

30 year

PRIMEBOND[®]
Plus

PRIMEBOND[®]

DURABOND[®]

RALLBOND[®]

**TECHNICAL
DATA SHEET**

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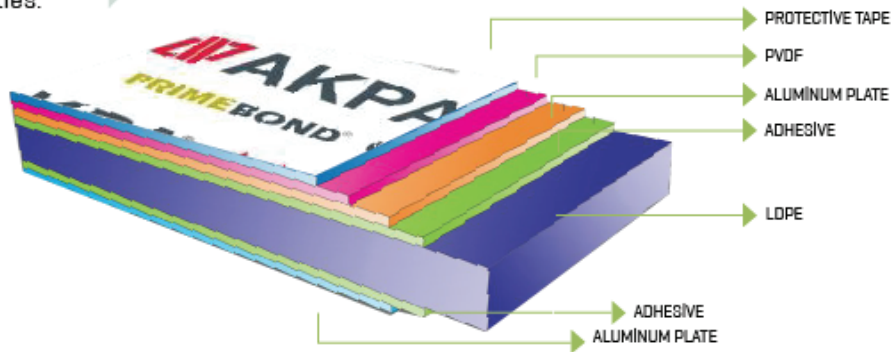
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1. Aluminum Composite Panel

AKPA® Composite Panel is a construction material which consists of two aluminum plates, coated after being pretreated, on both sides of a low density polyurethane plate in between. Those three plates are adhered to each other by means of cutting edge technology.

Although AKPA® Composite Panel is made of lightweight aluminum, it still exhibits superior metallic attributes such as smoothness, vibration observance, extreme strength-durability & easy maintenance.

AKPA® Composite Panel, which plays a significant role in coming about of unique, innovative & pleasant contemporary designs today, is manufactured with updated advanced technology aiming at customer full satisfaction at Sakarya Hendek production facilities.



- Alloy : EN AW 3005 [Al Mn1 Mg 0.5] / H42 - H46
- Topcoat Surface : PVDF / HDPE / PE
- Backcoat Surface : Protective Primer
- Core : Low Density PE

2. AKPA® Composite Panel's Advantages

- Even though our Composite Panel is lighter in weight & thinner in comparison with other alternative facade products, it still offers metallic durability.
- Our Production Facility's capacity is 15 000 m² per day
- Our Panels' surfaces are perfectly smooth.
- We produce double faceted panels too.
- There is a wide variety of color & design in our products.
- A2, B1 & B2 productions are involved in our range
- Our products are easy to carry
- They hide defects on the facade
- It is reliable construction element against earthquakes doesn't add extra weight to the construction.
- All the raw materials used in our products are 100 % recyclable.
- Mounting period is short.
- Economic because of its long term benefits.

3. AKPA® Composite Panel Warranty Provision

WARRANTY CONDITIONS						
Product Code	Warranty Period	Plate+Coating Thickness	Backcoat Thickness	Glossiness Conservation	Tonality change	Chalking
Primebond Plus Primebond	20 Year	47+PVDF 40+PVDF	0,47 0,40	>60%	ΔE< 5-7	5%
Durabond	15 Year	30+HDP	0,30	>50%	ΔE< 6-7	8%
Rallbond		20+PE	0,20	>50%	ΔE< 7-10	10%

4. AKPA® Composite Panel Size, Tolerance & Weight Measures

DIMENSIONS		TOLERANCE VALUES	
Standard Size	4 mm x 1250 mm x 3200 mm	Thickness	± 0.2 mm
Thickness	2 mm - 8 mm	Width	+2 / 0 mm
Width	1000 mm - 1600 mm	Length	+4 / 0 mm
Length	Special sizes from 1000 mm to 7000 mm	Diagonal Difference	Max. 3 mm

WEIGHT VALUES	per m ²	per m ²	per m ²	per m ²
Thickness	Primebond Plus	Primebond	Durabond	Rallbond
4 mm	5,5 Kg	5,3 Kg	5 Kg	4,7 Kg
3 mm	4,8 Kg	4,7 Kg	4,1 Kg	3,8 Kg
2 mm	4,1 Kg	4 Kg	3,4 Kg	2,9 Kg

WEIGHT VALUES FR	per m ²	per m ²	per m ²	per m ²
Thickness	Primebond Plus	Primebond	Durabond	Rallbond
4 mm	7,32 Kg	7,10 Kg	-	-
3 mm	5,76 Kg	5,63 Kg	-	-
2 mm	4,40 Kg	4,16 Kg	-	-

WEIGHT VALUES A2	per m ²	per m ²	per m ²	per m ²
Thickness	Primebond Plus	Primebond	Durabond	Rallbond
4 mm	11,10 Kg	10,9 Kg	-	-
3 mm	8,43 Kg	8,24 Kg	-	-
2 mm	5,72 Kg	5,58 Kg	-	-

5. EN AW 3005 Aluminum Chemical & Mechanical Specifications

ALUMINUM PLATE CHEMICAL SPECIFICATIONS									
Element	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	
Minimum	-	-	-	1	0,2	-	-	-	
Maximum	0,7	0,8	0,3	1,5	0,6	0,1	0,4	0,01	

EN AW 3005 MECHANICAL SPECIFICATIONS

Tensile Strength(Rm) Mpa	140-195	[EN 1002]
Yield endurance[Rp0.2] Mpa	≥160	[EN 1002]
Elongation [A50] %	≥5	[EN 1002]
Modulus of Elasticity Mpa	70.000	
Thickness Tolerance mm	±0.02	[EN 485/4]
Width Tolerance mm	+2/0	[EN 485/4]
Smoothness [Edge corrugation] mm	d≤6 max. d/f≤1 %	[EN 485/4]
Smoothness [Curling] mm	d≤6 max. d/f≤1 %	[EN 485/4]
Smoothness [diagonal deflection] mm	d≤6 max.	[EN 485/4]

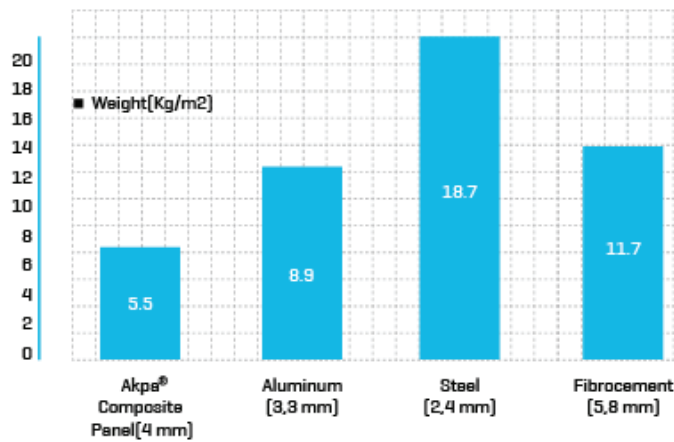
6 . Test Results of Coating Used On AKPA® Composite Panel

TYPE	PVDF	HDPE	PE	BACKCOAT	METHOD
Primer Thickness	5 ± 2µm	5 ± 2µm	5 ± 2µm	7 ± 2µm	[EN 13523-1]
Top coat Thickness	25 ± 2µm	20 ± 2µm	20 ± 2µm	-	[EN 13523-1]
Total Coating Thickness	25 ± 3µm	25 ± 3µm	25 ± 3µm	-	[EN 13523-3]
Gloss [60]	10-40	10-80	10-80	20-50	[EN 13523-2]
Coating Color Deviation	ΔE≤ 1 [Solid] ΔE≤2 [Metallic]	ΔE≤ 1 [Solid] ΔE≤2 [Metallic]	ΔE≤ 1 [Solid] ΔE≤2 [Metallic]	-	[EN 13523-3]
Scratch Resistance	Min. F [Hi-Uni]	Min. F [Hi-Uni]	Min. F [Hi-Uni]	-	[EN 13523-4]
T- Bending	Max. 2.5T	Max. 2.5T	Max. 2.5T	-	[EN 13523-7]
Acid Resistance	500 Hour	500 Hour	500 Hour	-	[EN 13523-8]
Acid Resistance Class	RC3	RC3	RC3		[EN 1396]
Methyl- Ethyl Ketone Resistance[MEK]	>100[Solid] ≥50[Metallic]	>100[Solid] ≥50[Metallic]	>100[Solid] ≥50[Metallic]	≥40	[EN 13523-11]
UV Resistance[UVA]	2000 Hour	2000 Hour	2000 Hour	-	[EN 13523-10]
UV Resistance Class	RUV4	RUV4	RUV2	-	[EN 1396]
Water Resistance [1000hour]	Watertight	Watertight	Watertight	-	[EN 13523-9]
Moisture Resistance[1000hour]	No difference	No difference	No difference	-	[EN 13523-25]

7. Akpa® Composite Panel Major Characteristics

7.1 Rigidity

AKPA® Composite Panel has a major advantage over Aluminum Plates, because it has the same rigidity with Aluminum Plates which are 40 % heavier than that.



7.2 Test Data

0,2 Stress - Strain Endurance	41,43 N/ mm2
Buckling stress endurance	150 N/mm2
Tensile strength	47,80 N/mm2
Moment of Inertia , I	1580 mm4/m
Bending Elasticity	49000 N/mm2
Modulus Cross-section , Z	1060 mm3/m
Loss of Sound Conductivity	26 db
Modulus of Elasticity	7792,64 N/mm2
% 50 Elongation	28,58

7.3 Elongation

Stress : $Ax \text{ rx } l^2 / m$

l : Short side length of panel

A : Coefficient which depends on Panel's width/Length Ratio

r : Wind Pressure

m : 6.33 mm^2 (%0.2 Strain Endurance: 110 N/mm^2)

Taking above formula into consideration, stress falling on plates shouldn't exceed 100 N/mm^2 , in case of excess stress there will occur permanent deformation on plates.

7.4 Subcarrier Structure Strength

The following criteria should be paid close attention to calculate subcarrier structure properly.

- Maximum deflection shouldn't be higher than $L/200$.
- It shouldn't exceed maximum stress allowed.

For This Reason Stress should be as follows :

Stress;

$$S > R \times L^2 / [8 \times \text{Stress}_{0.2}]$$

Deflection Should be as follows;

$$5 \times R \times L^4 / 384 \times E \times M < [L/200]$$

S : Subcarrier structure cross-section modulus [mm³]

R : Wind Pressure Impacts Upon Subcarrier Structure [N/mm]

L : Subcarrier Structure Reinforcements [mm]

Stress_{0.2} : %0.2 Subcarrier Structure Endurance [N/mm²]

E : Subcarrier Structure Modulus of Elasticity [N/mm²]

M : Subcarrier Structure Inertia Moment [mm⁴]

7.5 Wind Pressure Load

When the wind speed is known, wind pressure load falling on m² can be calculated.

$$P_w = k \cdot q$$

k : Aerodynamic factor (it is taken between 1.2-1.6 in accordance with weight)

$$q : v^2 / 16$$

v : Wind speed [m/sn]

P_w : Wind force [kg/m²]

7.6 Maximum Stress

r, kPa	l	a [length]								
[kg/b ²]	[Width]	900	1200	1500	1800	2100	2400	2700	3000	>3000
0.5 (5.1)	600	13	14	14	14	14	14	14	14	14
	900	20	27	30	32	32	32	32	32	32
	1200	27	35	45	51	55	57	57	57	57
1.0 (102)	1500	30	45	55	68	77	83	87	88	89
	600	26	28	28	28	28	28	28	28	28
	900	39	53	61	64	64	64	64	64	64
1.5 (153)	1200	53	70	90	103	110*	113*	114*	114*	114*
	1500	61	90	109	136*	115*	166*	173*	177*	178*
	600	39	42	43	43	43	43	43	43	43
	900	59	80	91	95	96	96	96	96	96
	1200	80	105	135*	154*	165*	170*	171*	171*	171*
1500	91	135*	164*	204*	232*	250*	260*	265*	267*	

Panels marked by "*" should be mounted with reinforcement only.

7.7 Stress Force

Tension calculations of Composite Panels is done by taking only aluminum components in to consideration.

Coefficient table determined according to evenly distributed surface impact area & panel edge ratio can be seen below.

$$\sigma_{max} = \beta \times w \times b^2 / t^2$$

$$t^2 = (\text{Thickness}^3 - \text{polyethylene thickness}^3) / \text{Thickness}$$

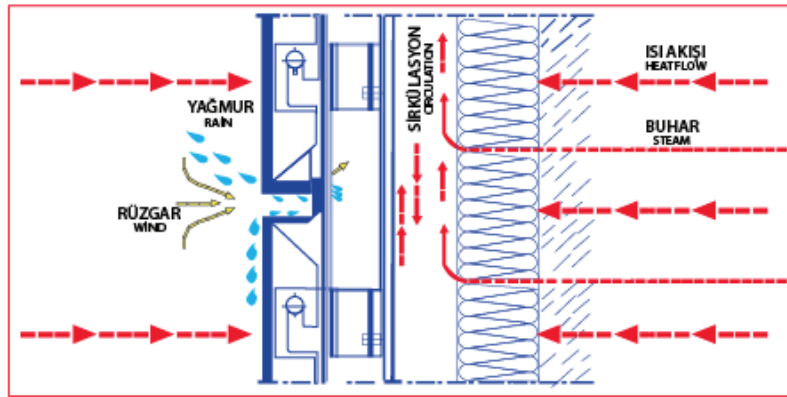
β : Coefficient in accordance with Panel's width, length & mounting position.

W : Wind pressure [N/mm²]

b : Short edge length of panel [mm]

7.8 Water Insulation

The purpose of insulation is to secure sealant on the points of superimposed edges, joints & mounting holes. This application can be made with silicon, polysulfide & polyurethane. There might be observed a slight contraction in those materials following application. In comparison with other two, silicon has got advantages for its durability & endurance to heat without being deformed.



8. The Purpose of Using Protective Tape & Panel mounting



The protective foil used on AKPA[®] Composite Panel ensures conveyance of the end products without their physical appearances being damaged to the mounting site. It is highly UV resistant & easy to strip off. Doesn't leave traces or stains after being stripped off. It is compatible with ROHS standards. After mounting is completed, tape should be stripped at 180 angle. It is not recommended to strip tape off for protective reasons until mounting is completed.

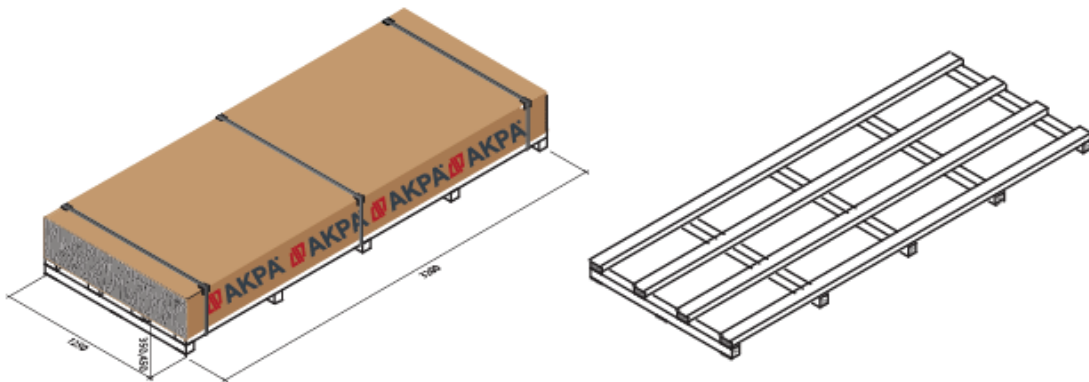
One another point to be paid close attention during installation is that the arrows on protective folio should be pointing the same direction. The arrows indicate the direction which the coils were coated and produced. installing the plates while they are pointing different directions is not recommended.

9. Akpa® Composite Panel Palletizing, Delivery & Storage

Composite Panels are carefully palletized and packaged after being meticulously processed and assembled. The measures shown in the figure below should be taken for continuity of the same protection during transportation and in the stock area.

Loading is done quite quickly and easily in our facilities with the help of a special apparatus of our forklifts. Also loading to 20 & 40 inch containers is easy to do. Panels are to be stored in clean & dry storage spaces without humidity. Cardboards, gusset panels etc. should be used in order to protect Composite Panels from being damaged. Storage duration shouldn't be longer than 6 months. Composite Panels can be stored up to 8 over one another.

If there isn't a specific customer demand, AKPA® Composite Panels are palletized & packaged in standard numbers 50 & 100.



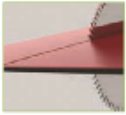
9.1 Main Properties of Padding Insulators Used in Mounting

Polyurethane, silicone and polysulfide are used as filling material.

Main Characteristics	Polyurethane	Silicone	Polysulfide
Ability to bond	Good	Excellent	Good
Deformation out of aging	Middle	Very little	Middle
Deformation due to heat	Very little	Very little	Middle- Very
Shrinkage after application	Little	Little	Little
Endurance to wearing out	Excellent- Good	Excellent	Good
Effectively usable heat intervals	-20/70 C	-40/120 C	-20/80 C
Endurance against weather conditions	Good	Excellent	Excellent - Good

10. Akpa® Composite Panel Processing Techniques & Padding Materials

10.1 Processing Techniques



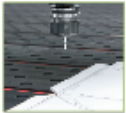
10.1.1 Cutting Works

Cutting Works can be done with a saw & fret saw



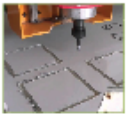
10.1.2 Grooving

For turning a 90-degree angle, it is advised grooving a 110-degree angle with an end knife. It is to be noticed to leave 02-04 mm inner layer outside



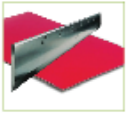
10.1.3 Perforation

Perforation can be done with a boring machine



10.1.4 Contour

This work can be done with contour saw, fret saw or shaping machine.



10.1.5 Sawing

This work is done with a guillotine.



10.1.6 Drilling

Drilling is done with drilling machine



10.1.7 Bending

This work can be done with brake equipped press on doubling frame.

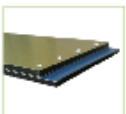
For 3-4 mm plates, bending radius is 40 mm for singles & 50 mm for parallel ones.

For 6 mm, minimum radius is 55 for singles & 80 mm for parallel ones.



10.1.8 Bonding

Bonding can be done with metallic adhesives.



10.1.9 Riveting

This work can be done with rivet.



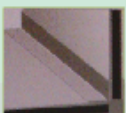
10.1.10 Screwing

This work can be made with metallic screws.



10.1.11 Welding

This job can be done with a hot air welding machine.



10.1.12 Clinching

Angle jointing profiles can be used.

11. Akpa® Composite Panel, Cleaning & Maintenance

AKPA Composite Panel should be cleaned at least once a year with warm water & soft cleaning towel. All the cleaning supplies must have ph degree between 5-8 intervals. After washing, panels should be rinsed with abundant water.

Keep away From Doing:

- Strongly alkaline cleansing supplies mustn't used. [Such as Potassium Hydroxide, Sodium Carbonate, Caustic Soda...]
- Likewise, strongly acidic & abrasive supplies mustn't be used either.
- Temperature of washing water mustn't exceed 40 C degree. Hot air may damage surface coating.
- Any kind of abrasives, emeries, or rubbers mustn't be used in cleansing in order not to scratch & give permanent damage to the surface.
- Don't use sea water either.



AKPA®

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