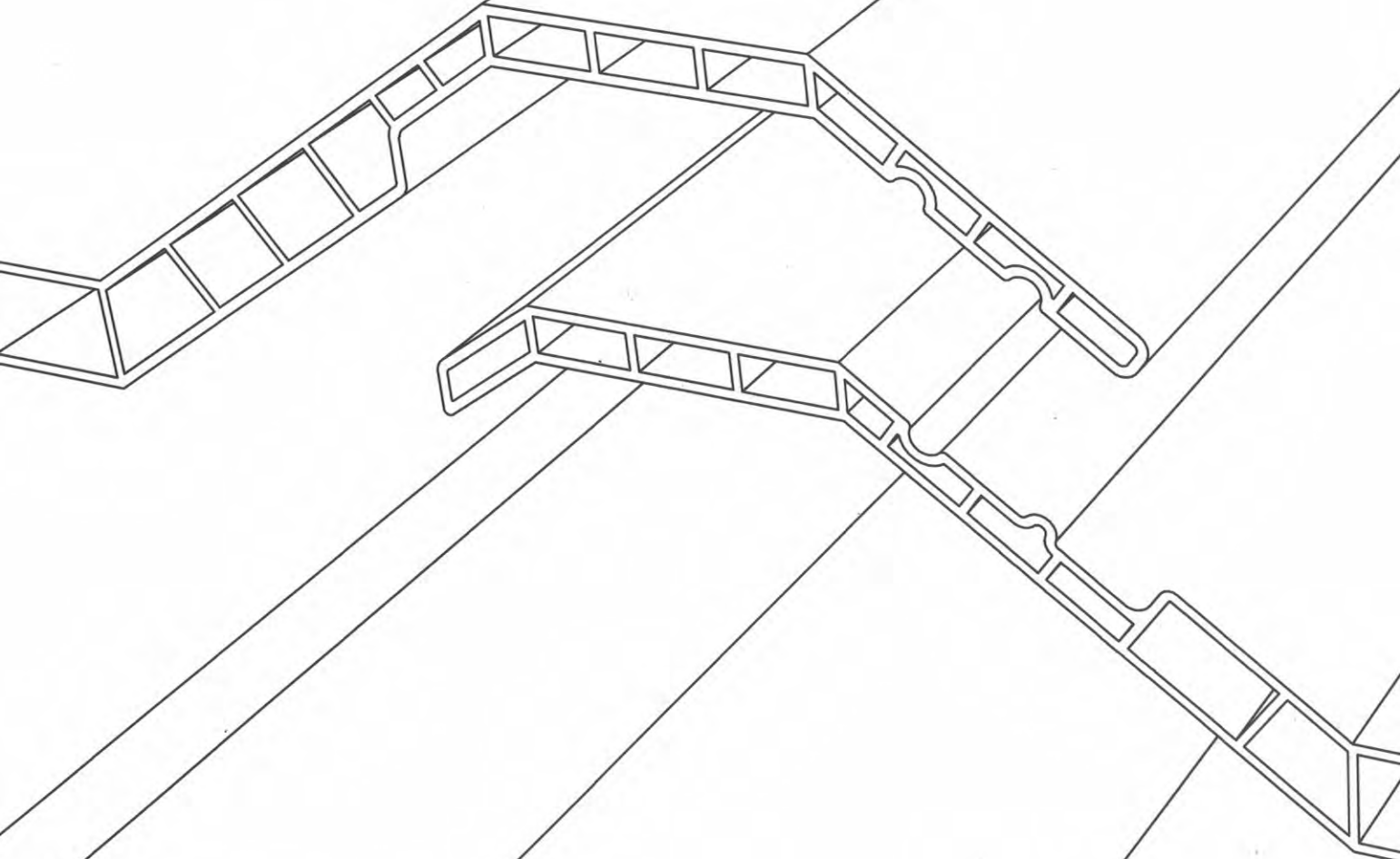




TECHNICAL DATA SHEET

Vinyl Composite Twin Wall Corrugated Panel Roofing

Manufactured by PT Unipack Plasindo a subsidiary of PT IMPACK PRATAMA INDUSTRI, TBK, innovative building material company.
Established 1982, listed in Jakarta Stock Exchange.

ALDERON-Vinyl Composite Twin Wall Corrugated Panel Roofing

Premium quality and appearance, excellent thermal and sound insulation, excellent chemical resistance, Non-corrosive, good weather ability, easy cleaning, low maintenance, lower costs vs metal & other insulation products.

TECHNICAL DATA SHEET – ALDERON Opaque Color

1. INTRODUCTION

ALDERON is an innovative panel and roofing product that provides multiple solutions to reducing or preserving heat, corrosive environment etc that traditional roofing cannot resolve at a feasible cost.

It is a cost effective roofing product and is also used as cladding and fencing where its rigidity and insulation properties is preferred.

Examples of ALDERON Roofing & Cladding applications:

- Labour intensive low ceiling shoes, garments etc. assembling factories.
- Coastal buildings
- Chemical Processing plants including Fertilizer
- Rubber processing plants including rubber gloves
- Metal refining, galvanizing & process
- Animal & machinery sheds/houses/pens
- Greenhouse & plant nurseries
- Agricultural products
- Food industries/clean factories.
- Outdoor parking cover, patio, pool sheds

And where corrosiveness, high heat transfer, low softening temperature (of single layer polymer roofing/panel), high maintenance costs, difficulties in cleaning, high total costs etc. Need to be avoided.

With good insulation properties which negate the need for an additional layer of insulating material under the roof for most cases, ALDERON roofing is easily cleaned, can be visually inspected for cleanliness and maintained .. for buildings where the high level of cleanliness is a pre requisite.

ALDERON with its twin wall structure offers better rigidity and double the protection from environmental factors.

2. MATERIAL COMPOSITION

ALDERON is made from a proprietary material formulation of Vinyl polymers and mineral powder... It contains stabilizing additives processed into a composite matrix which is water and rust proof.

3. PHYSICAL PROPERTIES

1.	Products	Weight	Effective/Gross Width	Flat Thickness
	ALDERON ID 830	approx. 4.5Kg/LM	830/892mm	10mm
	ALDERON ID 860	approx. 4.4Kg/LM	860/922mm	10mm

2. Thermal Conductivity K Value	: 0.24 W/mK	ASTM E1530-11
Thermal Resistance R Value	: 4.27E-2 m ² K/W	ASTM E1530-11
Solar Reflectance	: 75.7%	ASTM C1549-09
Emittance Value	: 0.84	ASTM C1371-04a
Solar Reflectance Index:	: 91.64 to 92.90	ASTM E1980-11

Tested by TUV Singapore

With its twin wall profile and special composite material, ALDERON (white) has one of the highest insulating properties and Solar Reflectance Index of all type of roofing. It reduces the temperature under the roof (and preserve heat in cold weather) without need of additional costly insulation layer.

Coefficient of linear thermal expansion : 6.2x10(-5) cm/cm degree Celsius

Service Temperature : -20 to 60 degree Celsius

Recommended Purlin spacing is 1.2 meter to 1.5 meter depending on maximum temperature range.

3. Sound transmission loss (ASTM E90): 27%.

- Thickness : 10mm

As a hollow sandwiched profile, ALDERON has good sound insulating properties.

4. Mechanical properties of new panel.

	Unit	ALDERON
Tensile strength at yield (ASTM D638)	N/mm ²	30
Tensile strength at break (ASTM D638)	N/mm ²	26
Elongation at yield (ASTM D638)	%	7
Elongation at break (ASTM D638)	%	13
Flexural Strength at yield (ASTM D790)	N/mm ²	23
Modulus of Elasticity (ASTM D790)	N/mm ²	250

When delivered new to site ALDERON can be walked on whilst installing with purlin spacing no more than 1.2 meters. However for safety perspective, the installer must evaluate based on the above mechanical properties and its calculation versus the weight of their installers. (Assuming 80kg per person in weight 1 square feet using a 3 point bending model calculation the Flexural yield is at 16.4N/mm²).

Mechanical strength would reduce over time and it is not recommended after some years (depending on the location environment) that workers walk beyond purlin supports when inspecting or working on the roof top.

5. Wind Load – not less than 900 N/M² on roofing. ASTM E 330. Installed between supports, deflections shall not exceed 20mm, maximum panel deflections shall not exceed L/60 of the full span. At 150% times designed pressure, deflection shall not exceed L/100 of span length.

6. Product tolerance

- Width : ± 4.0 mm
- Length : ± 6.0 mm for length below 4m, ± 10.0 mm for length above 4m
- Thickness : ± 0.5 mm in 10 mm thickness
- Weight/LM : ± 7%

- Bow : Maximum 1.0% (10mm/m) of the length or width
- Diagonal differences : Maximum 5.0 mm
- Surface defect : No irregularities such as roughness, buckling and other imperfections observable in accordance with 10x armlength visual inspection rules.

4. FLAMMABILITY

ALDERON is self-extinguishing and conforms to the highest rating of plastic & composite roofing material.

Under UL94 Flammability Test, its classification is V-0 low flammability.

5. CORROSION and CHEMICAL RESISTANCE

ALDERON being of inert composite material vs electrolytic action on metals does not rust or suffer gradual loss of surface material. It has a high resistance against seawater and salt spray. Being of Vinyl material ALDERON has one of the highest chemical resistance grades of polymers in particular for rubber.. chemicals, paper making chemicals, animal & waste farms' methane & ammonia gas and vapour, fertilizer chemicals, galvanizing fumes just to name a few.

The table below show a sampling of chemical resistance tests.

Chemical Resistance	Test Method	Criteria
Sulphuric acid, 40%, 60 degree Celsius 168hrs	ASTM D543-06	No Change
Nitric Acid, 40%, 60 degree Celsius 168hrs	ASTM D543-06	No Change
Ammonia gas, room temperature 168hrs	ASTM D543-06	No Change

A detail chemical compatibility as attached is for informational purposes only and was developed from information sources other than PT Unipack Plasindo.

The information is consider reliable however the purchaser should make its own determination of compatibility before using any ALDERON products. It is important to note that ALDERON is generally not recommended for exposure to acetones, ketones, esters, aromatic and chlorinated hydrocarbons.

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