

1. Product Overview

1.1 Product Identifier

Product Name: Ballesta® Aluminum Composite Panel

Product Code: [Customizable, e.g., ACP-1220x2440-4mm-PVDF]

Description: Ballesta aluminum composite panels (ACP) are engineered multi-layer architectural cladding panels consisting of two pre-painted aluminum skin sheets (AA3003/AA5005) bonded to a polyethylene (PE) or fire-retardant (FR) mineral core. This three-layer composite structure delivers exceptional flatness, impact resistance, and weatherability for exterior facade applications. Available in panel thicknesses of 3mm, 4mm, and 5mm with standard size 1220mm x 2440mm. Coating options include PVDF fluorocarbon (70% resin, 25-35µm), FEVE, and nanol self-cleaning finishes.

2. Technical Specifications

Item	Specification	Test Standard
Aluminum Skin Material	AA3003 H14 / AA5005 H24 (Indoor/Outdoor)	GB/T 3880, ASTM B209
Panel Dimension	Standard: 1220mm x 2440mm (4'x8') Custom: up to 1500mm x 4000mm Length Tolerance: ±2mm, Width Tolerance: ±1mm	GB/T 17748, ISO 128
Panel Thickness	3mm / 4mm / 5mm Thickness Tolerance: ±0.2mm	GB/T 17748, ASTM D7091
Aluminum Skin Thickness	0.08mm - 0.50mm (standard) Up to 1.0mm (heavy duty)	ASTM B209
Core Material Options	PE (Polyethylene) - Standard FR (Mineral Fire-Retardant) A2 Core (Non-combustible)	EN 13501-1

Coating System	PVDF Fluorocarbon (70% resin, 25-35μm) FEVE (20-30μm) PE Polyester (20-25μm)	ASTM D2244, AAMA 2605
Surface Finish	Gloss 30-80%, Matte 10-20% Metallic, Brushed, Stone/Wood Grain	Gloss Meter (ASTM D523)
Color Consistency	Monochrome Delta E*ab ≤ 1.5 No significant color variation between batches	ISO 7724-1, ASTM D2244
Peel Strength (Adhesion)	≥ 30 N/cm (90° peel test)	ASTM D1781, GB/T 17748
Flatness	≤ 2mm per 1m panel length	GB/T 17748
Fire Performance	PE Core: B2 (Euroclass D-s2,d0) FR Core: B1 (Euroclass B-s2,d0) A2 Core: A2-s1,d0	EN 13501-1, ASTM E84
Salt Spray Resistance	≥ 3000 hours (PVDF coating)	ASTM B117
UV Resistance (PVDF)	Delta E < 5 after 10 years (QUV-A)	ASTM G154
Tensile Strength	AA3003: 155-205 MPa AA5005: 145-185 MPa	ASTM E8, GB/T 3880
Operating Temperature	-40°C to +80°C continuous exposure	In-house thermal test
Thermal Expansion	~23 x 10 ⁻⁶ /°C	ASTM E831
Density	~2.7 g/cm ³ (core dependent) Weight: 4.2-6.8 kg/m ² (3-5mm)	ASTM D792

3. Manufacturing Process

3.1 Aluminum Skins Cutting:

Precision cutting of AA3003/AA5005 aluminum coil into specified panel sizes. Edges are trimmed to achieve accurate dimensions within ±1mm tolerance.

3.2 Surface Pretreatment & Coating:

Aluminum skins undergo chromate/phosphate conversion coating and degreasing treatment to enhance adhesion. PVDF/FEVE/PE coating is applied via roll-coating line (25-35µm for PVDF).

3.3 Core Bonding (Laminating):

Coated aluminum skins are bonded to the PE or FR mineral core under controlled heat and pressure using high-strength adhesive film. The composite panel undergoes cooling and flatness calibration.

3.4 Trimming & Cutting to Size:

The laminated panel is trimmed to final dimensions using CNC cutting equipment. Edges are deburred, and corner notches for folding are precision-cut as required.

3.5 Protection Film Application:

A protective PE film is applied to both surfaces of the finished panel to prevent scratches during transportation and installation.

3.6 Quality Inspection & Packaging:

Each panel undergoes dimensional, flatness, color, adhesion, and coating thickness inspection. Approved panels are bundled with protective corner guards and packed in plywood crates.

4. Application Scope

Aluminum composite panels are widely used in architectural cladding applications, including but not limited to:

- Curtain wall facades for commercial buildings, office towers, hotels, and airports
- Column wrapping and architectural feature cladding for interior and exterior applications
- Building renovation and recladding projects requiring lightweight, durable facade materials
- Signage, corporate identity panels, and large-scale advertising hoardings
- Canopy soffits, fascia, eaves lining, and industrial building cladding systems

5. Compliance Standards

- **GB/T 17748-2008: Aluminum Composite Panels - General Technical Specifications (China National Standard)**
- **GB/T 3880: Aluminium and Aluminium Alloy Plates and Sheets for General Industrial Use**
- **EN 13501-1: Fire Classification of Construction Products and Building Elements (Euroclass)**
- **ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials**
- **ASTM B209: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate**
- **ASTM D2244: Standard Practice for Calculation of Color Tolerances and Color Differences**

- **ASTM B117: Standard Practice for Operating Salt Spray (Fog) Apparatus**
- **ISO 9001:2015: Quality Management Systems (Manufacturing & Supply)**

6. Packaging & Storage

Packaging: Each panel is covered with protective PE film to prevent surface scratches, then packed in plywood crates with foam corner protectors. Panels are interleaved with kraft paper.

Storage: Store in a dry, ventilated and rainproof warehouse at a temperature of 5°C to 40°C. Avoid direct sunlight exposure during storage to prevent UV degradation of the protective film.

Avoid contact with sharp objects, chemicals and abrasive materials. Do not drag panels across each other during handling.

Stacking height shall not exceed 5 layers for 3mm panels and 3 layers for 4mm+ panels.

Ensure even support across the full panel width to maintain flatness.

The storage site shall be clean, dry and free from corrosive atmospheres. Remove protective film within 30 days of installation.

7. Quality Assurance

All panels undergo strict multi-item quality inspection before delivery, including dimensional accuracy, flatness, peel strength, coating thickness, color consistency (Delta E < 1.5), and fire performance testing as per applicable standards.

We provide a warranty period of up to 20 years for PVDF-coated panels and up to 10 years for PE-coated panels (under normal service conditions). Custom engineering support and project-specific testing reports available upon request.
