

1. Product Overview

1.1 Product Identifier

Product Name: Ballesta® Custom Shaped Wall Panels

Product Code: CSP-[Material]-[Thickness] (e.g., CSP-AL-2.0)

Ballesta custom shaped wall panels bring any architectural vision to life. Using advanced CNC five-axis machining, precision roll forming, and hydraulic press braking, we fabricate panels in virtually any shape — from simple curved profiles to complex 3D geometric forms. Available in aluminum (AA1100, AA3003, AA5005), stainless steel (304, 316), copper, and zinc. Panel thickness: 1.0-3.0mm (aluminum); 0.8-1.5mm (stainless steel). Maximum panel size up to 2000mm x 6000mm. Our 13,000 sqm factory ensures every custom panel meets exact design specifications with consistent quality. Surface finishes include PVDF fluorocarbon, powder coating (RAL), anodizing, wood grain, brushed, and mirror polish. Tolerance: ±1mm standard; ±0.5mm precision available. Dimensional accuracy maintained throughout runs of any size through CNC-controlled fabrication processes.

2. Technical Specifications

Material Options	AA3003/AA5005 Aluminum (1.0-3.0mm), SS304/316 (0.8-1.5mm), Copper, Zinc	ASTM B209, GB/T 3880
Fabrication Methods	CNC 5-axis machining, roll forming, press braking, laser/waterjet cutting, TIG/MIG welding	Per project specification
Panel Thickness	Aluminum: 1.0-3.0 mm Stainless Steel: 0.8-1.5 mm Tolerance: ±0.1mm	ASTM D7091, ISO 16809
Max Panel Size	Up to 2000 mm x 6000 mm (flat or single-curve)	Per project specification
Bend Radius (V-bending)	Aluminum: min 1.5x material	Per project specification

	thickness Stainless steel: min 2.0x material thickness	
Bend Radius (Curved)	Continuous curves: min R100-R800 mm (panel width/length/thickness dependent)	Per project specification
Shape Capability	Flat, single/double radius curved, twisted, multi-bend folded, tapered, 3D formed, multi-plane	Per project specification
Panel Segmentation	Single-face, multi-face, wrap-around, segmented per project geometry	Per project shop drawing
Surface Finishes	PVDF (Kynar 500®), powder coating (RAL), anodizing, wood grain, brushed, mirror polish	AAMA 2605 / Qualicoat
Coating Thickness	PVDF: 25-35 µm Powder coating: 60-80 µm Anodizing: 10-25 µm	ASTM D7091
Joint Types	Open reveal (6-20 mm), butt joint, silicone sealant, gasket, seamless	AAMA 501.6
Fixing System	Concealed clip, Z-clip, hook-on bracket, through-fixed with caps, custom fabrication	AAMA 501.6
Fire Resistance	Class A1 – Non-combustible ASTM E84: Flame Spread Index ≤ 25, Smoke	ASTM E84, GB 8624 A1, EN 13501-1

	Developed ≤ 450	
Tolerance	± 1 mm standard; ± 0.5 mm precision available	Per project specification
Adhesion Strength	Cross-cut test: Grade 0 (0% removal) per ASTM D3359	ASTM D3359
Color Consistency	$\Delta E^*_{ab} \leq 2.0$ per ISO 7724-1	ISO 7724-1
Tensile Strength	145-180 MPa (AA3003 series) 515-620 MPa (SS304)	ASTM E8 / GB/T 3880

3. Manufacturing Process

3.1 Design Review & 3D Modeling:

Project-specific 3D modeling and structural analysis conducted from architectural drawings or on-site measurements. Panel segmentation optimized considering material sheet size, transport constraints, visual continuity, and installation sequence. Flat pattern development ensures accurate bending and forming. Shop drawings and installation sequence plans submitted for approval before fabrication.

3.2 Material Selection & Cutting:

Material selected per project specification: AA3003/AA5005 aluminum alloy, stainless steel 304/316, copper, or zinc. Precision cutting using CNC laser or waterjet equipment with accuracy of ± 0.5 mm. Material certifications verified against incoming batch. Dimensional tolerance per project specification.

3.3 Forming & Fabrication:

Panels formed using combination of CNC press braking, roll forming, and stretch forming. Complex geometries including single/double radius curves, twisted surfaces, multi-bend folds, tapered shapes, and 3D formed profiles. Press brake V-bending: min radius 1.5x material thickness (aluminum), 2x (stainless steel). Continuous curved profiles: min radius R100-R800mm. Edge folding: fold angle $90^\circ \pm 1^\circ$.

3.4 Welding & Assembly (if required):

Precision TIG or MIG welding for joined panel assemblies using matching filler material. Welds ground, polished, and finished to match surrounding surface texture. Hidden fasteners, lighting channels, ventilation slots, and other MEP integration features added during assembly. Assembly jigs ensure consistent geometry across multiple panel units.

3.5 Surface Finishing:

Application of specified finish: PVDF fluorocarbon coating (70% Kynar 500® resin,

25-35µm), powder coating (RAL standard colors, 60-80µm), anodizing (10-25µm), or specialty finish (brushed, mirror polish, wood grain transfer printing). Coating thickness, color consistency, and gloss level monitored in real-time. Gloss level: 15-30° (matte) or 30-60° (semi-gloss).

3.6 Inspection, Labeling & Packaging:

Each panel undergoes dimensional check ($\pm 1\text{mm}$ standard tolerance), coating thickness measurement, color consistency verification ($\Delta E^*_{ab} \leq 2.0$), adhesion test (cross-cut per ASTM D3359), and visual inspection under standard lighting. Panels labeled with project ID and installation position. Protected with PE film, bundled with foam interlayers, and packed in custom wooden crates.

4. Application Scope

Custom shaped wall panels are designed for architectural applications requiring bespoke shapes, superior flatness, and high-quality finishes. Widely used in the following environments:

- Hotel lobbies, office atriums, and corporate headquarters requiring signature architectural features
- Airport terminals, metro stations, and railway transit hubs with complex curved ceiling and wall geometries
- Retail malls, shopping centers, exhibition halls, and brand flagship stores
- Cultural venues, museums, galleries, performance halls, and civic buildings
- Hospital entrances, educational facilities, sporting arenas, and mixed-use developments

5. Compliance Standards

- **ASTM B209 — Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate**
- **ASTM E84 — Standard Test Method for Surface Burning Characteristics of Building Materials**
- **ASTM E330 — Standard Test Method for Structural Performance of Exterior Windows and Wall Systems**
- **GB 8624 A1 — Non-combustible building material classification (China Grade A)**
- **ISO 9001:2015 — Quality Management Systems (SISA certified)**
- **AAMA 2605 — Superior Performance Organic Coatings on Architectural Aluminum**
- **EN 13501-1 — Fire Classification of Construction Products and Building Elements — Class A1**
- **AS/NZS 1170 — Structural Design Actions for Wind Loading**

6. Packaging & Storage

Packaging: Each custom shaped panel is covered with protective PE film to prevent surface scratches. Panels are bundled with foam interlayers between faces.

Custom wooden crates with foam padding at corners and edges. Complex shaped panels have dedicated custom-fabricated packaging supports to prevent distortion

during transit. Each crate labeled with project ID, panel numbers, quantity, and batch number. Installation reference drawings included.

Storage: Store in a dry, ventilated and rainproof warehouse. Avoid direct sunlight, high temperature (above 50°C), and corrosive environments. Flat panels stored horizontally on level racks; curved panels on purpose-built cradles.

Avoid contact with sharp objects, chemicals and corrosive substances to prevent surface damage and coating degradation.

Stacking height shall not exceed 3 layers for flat panels. Curved and complex-shaped panels stacked per engineer-specified configuration only.

The storage site shall be far away from fire sources to meet the fire safety requirements of Grade A materials.

7. Quality Assurance

All custom shaped panels undergo strict multi-item quality inspection before delivery, including dimensional tolerance check (length, width, flatness, profile geometry per shop drawing), coating thickness measurement (magnetic induction per ASTM D7091), color consistency check ($\Delta E^*_{ab} \leq 2.0$ per ISO 7724-1), adhesion test (cross-cut/tape pull per ASTM D3359, Grade 0 requirement), visual inspection under standard lighting conditions (3m distance, 600 lux), and trial fit assembly verification for complex multi-panel assemblies.

Ballesta provides a standard warranty of 15 years for PVDF-coated aluminum panels and 10 years for powder-coated panels under normal use conditions and proper maintenance. Stainless steel panels carry a 20-year structural warranty. Warranty covers coating integrity (no peeling, cracking, or excessive fading) and structural performance (no corrosion perforation or deformation) within the warranty period, subject to correct storage, installation, and maintenance as outlined in the installation manual.
