

1. Product Overview

1.1 Product Identifier

Product Name: Ballesta® Clip-in System (A-Type Keel)

Product Code: [Customizable, e.g., CLP-AK-38×15×0.5]

The Ballesta Clip-in Ceiling System uses a dedicated 38-type A-shape concealed keel as the primary grid framework. Precision-formed from galvanized steel, the A-type keel features a 13.5mm panel slot that allows aluminum panels to clip into position on all four edges simultaneously. The system creates a seamless monolithic ceiling surface with no visible grid lines or fasteners. Panels can be individually removed by flexing one edge, providing easy access to overhead services. Available in standard sizes 300x300mm, 600x600mm, 300x600mm and 600x1200mm with material thicknesses from 0.5mm to 1.0mm.

2. Technical Specifications

Item	Specification	Test Standard
Keel Substrate Material	Q195 cold-rolled steel strip, continuous hot-dip galvanized Zinc coating: $\geq 120\text{g/m}^2$ both sides (Z120 class per GB/T 2518)	GB/T 11981, GB/T 2518
Keel Profile Dimension	Height: 38mm; Width: 15mm; Panel slot width: 13.5mm (inner) Straightness: $\leq 1\text{mm}/2\text{m}$, Length tolerance: $\leq \pm 0.3\text{mm}$	GB/T 11981, ISO 128
Keel / Panel Thickness	Steel keel: $\geq 0.5\text{mm}$ Aluminum panel: 0.5mm, 0.7mm, 0.8mm, 1.0mm Thickness tolerance:	GB/T 11981, ASTM B209

	±0.03mm	
Surface Finish (Panel)	Powder Coating (RAL/Pantone) / PVDF Fluorocarbon / Anodized / Wood-grain transfer Perforation available: round hole Ø1.8-3.0mm, 15-30% open area	PVDF: AAMA 2605 Powder: AAMA 2604 Anodized: AAMA 611
Coating Thickness	PVDF: ≥25µm Powder coating: ≥60µm Anodized: ≥15µm Galvanized (keel): ≥120g/m ²	ASTM D7091 (coating) GB/T 2518 (galvanizing)
Grid / Clip-in System	A-type concealed keel clip-in system Panel clips into A-type keel on all 4 edges No visible grid lines or fasteners	JG/T 450 (Metal Ceilings), GB/T 23444
Color Performance	Full RAL/Pantone color range Monochrome color difference: $\Delta E^*_{ab} \leq 1.5$ (ISO 7724-1) Custom colors for brand-matched projects	ISO 7724-1, ASTM D2244
Adhesion Strength	High adhesion: no peeling, flaking or delamination under standard tape test Cross-cut classification: ≥Class 1	ASTM D3359 Method B, GB/T 9286
Yield Strength (Keel)	Keel steel: ≥235 MPa yield strength Adequate rigidity under	GB/T 11981, ASTM A653

	standard ceiling spans No significant deflection under design load	
Fire Resistance Rating	Grade A non-combustible (aluminum panels) Steel keel: non-combustible metallic substrate No toxic fume emission in fire conditions	GB 8624 (Grade A) ASTM E84 (Class A) EN 13501-1
Panel Flatness	≤1.5mm/m panel flatness No visible wavy deformation or surface irregularities Smooth monolithic appearance after installation	JG/T 450, YS/T429.1
Acoustic Performance	NRC up to 0.75 with perforated panels + acoustic fleece backing Standard perforation: Ø1.8-3.0mm round holes, 15-30% open area	ISO 354, ASTM C423
Corrosion Resistance	Salt spray resistance: ≥1000h (ASTM B117) High temperature resistance: ≤70°C High humidity resistance: RH≥95%	ASTM B117, GB/T 10125
Panel Tensile Strength	AA3003 series: 145-180MPa AA5005 series: 145-185MPa Keel steel: ≥330MPa tensile strength	GB/T 3880, ASTM B209 Tensile per ASTM E8/E8M
Standard Panel Sizes	300×300mm / 600×600mm / 300×600mm / 600×1200mm Custom sizes available upon	GB/T 23444, JG/T 450

	request Panel access: removable by flexing one edge	
Panel Density / Weight	Aluminum panel: approx. 2.7 kg/m ² per 0.5mm thickness Steel keel: approx. 0.3 kg/m linear System weight varies by panel size and thickness	ASTM D792

3. Manufacturing Process

3.1 Aluminum Substrate Cutting:

Precision roll-forming of Q195 cold-rolled galvanized steel strip into 38mm height A-shape keel profiles with a 13.5mm panel slot opening. Steel thickness $\geq 0.5\text{mm}$. Continuous hot-dip galvanized coating $\geq 120\text{g/m}^2$ on both sides per Z120 class.

3.2 Surface Pretreatment:

Continuous hot-dip galvanizing process for the steel keel substrate. Galvanized coating must be uniform, fully covering both sides with no bare spots, peeling or pitting. All cut ends shall be treated with zinc-rich repair coating to maintain corrosion protection integrity.

3.3 Surface Finishing

Aluminum ceiling panels undergo precision shearing and edge folding. Panel surfaces finished with powder coating (RAL/Pantone colors), PVDF fluorocarbon, anodized, or wood-grain transfer printing. Perforated panels receive acoustic fleece heat-bonded to the reverse side.

3.4 Forming & Splicing Processing

Precision edge folding of aluminum panels with $\pm 0.5\text{mm}$ dimensional accuracy. Panels are formed with clip-in edge profiles that engage securely into the 13.5mm A-type keel slot. A-type keel is roll-formed to exact 38mm height and 15mm width profile dimensions.

3.5 Post-Processing:

Edge trimming, deburring and flatness calibration of finished panels. A-type keel straightness $\leq 1\text{mm}$ per 2m length. Dimensional tolerance of keel height and width $\leq \pm 0.3\text{mm}$. Multi-point inspection of panel flatness, edge alignment and surface finish quality.

3.6 Installation Accessory Matching:

Configure complete A-type concealed grid system including A-type keel main runners and cross tees, C-channel perimeter trim, hangers for A-type keel, keel connectors, hanger rods, and all necessary installation hardware. All matching components

precision-matched for seamless assembly.

4. Application Scope

The Ballesta clip-in ceiling system is designed for interior ceiling applications requiring a seamless, monolithic appearance with concealed grid support:

- Office buildings, conference rooms and corporate headquarters
- Shopping malls, retail stores and commercial atriums
- Hotel lobbies, ballrooms and hospitality spaces
- Airport terminals, railway stations and metro stations requiring clean, uninterrupted ceiling surfaces

5. Compliance Standards

- Steel Keels for Building Partitions and Ceilings
- Continuously Hot-Dip Zinc-Coated Steel Sheet and Strip
- Chemical Composition of Wrought Aluminum and Aluminum Alloys
- Aluminium and Aluminium Alloy Plates and Sheets for General Industrial Use
- **JG/T 450:** Metal Ceilings for Building Decoration
- Standard Test Method for Surface Burning Characteristics of Building Materials
- Standard Test Methods for Measuring Adhesion by Tape Test
- Fire Classification of Construction Products and Building Elements - Part 1

6. Packaging & Storage

Packaging: A-type keels are bundled in steel strapping with edge protectors. Aluminum panels are covered with PE film to prevent scratches, then packed in wooden crates with foam padding to avoid collision and deformation during transportation. Keel connectors and hardware are packaged in separate labeled cartons.

Storage: · Store in a dry, ventilated and rainproof warehouse, avoid direct sunlight, high temperature ($>70^{\circ}\text{C}$) and high humidity ($\text{RH}>95\%$) environment.

- Avoid contact with sharp objects, chemicals and corrosive substances to prevent surface damage and substrate corrosion.
- Stacking height shall not exceed 3 layers to prevent flatness damage caused by excessive pressure.
- The storage site shall be far away from fire sources to meet the fire safety requirements of Grade A fire-resistant materials.

7. Quality Assurance

All panels undergo strict multi-item quality inspection before delivery, including dimensional tolerance, thickness error, surface gloss, color difference, flatness, coating adhesion, wear resistance and fire resistance test.

We provide a warranty period of not less than 15 years for the product (under normal use conditions and compliance with installation and storage requirements). Within the warranty period, the UV printing coating shall have no obvious fading, peeling, cracking

and color loss; the aluminum substrate shall have no corrosion, deformation and other defects, and the splicing part shall remain stable and firm.
