1. Product Overview

1.1 Product Identifier

Product Name: Ballesta® Tonerlis Custom Baffle System
Product Code: [Customizable, e.g., TT-CB-150x200x3000-1.5]
This Tonerlis custom baffle ceiling system is a fully welded rectangular-section baffle fabricated from AA3003/AA5005 series aluminum sheet (1.2–2.0mm wall thickness). Each baffle blade is constructed as a fully enclosed rectangular box section with continuous TIG/MIG welded seams, ground and polished for a seamless appearance on all four sides. Unlike standard folded profiles, this system provides superior structural rigidity, longer spanning capability (up to 4000mm), and the ability to create continuous ceiling-to-wall transitions without visible profile changes. Available in custom section dimensions, variable blade heights within the same project, and a wide range of surface finishes including powder coating (RAL), heat-transfer wood grain, and film wrapping.

2. Technical Specifications

Item	Specification	Test Standard
Aluminum Substrate Material	Indoor: AA 3003 (H24 Temper) Outdoor: AA 5005 (H24 Temper)	YS/T429.1, GB/T3190-2020
Baffle Section Size	Width (A): Custom, typical 30–200mm Height (B): Custom, typical 60–300mm Length: ≤4000mm Tolerance: ±1.0mm	ISO 2768-m, Project Drawing
Panel Thickness	1.2–2.0mm (Substrate) Tolerance: ±0.05mm (≤1.5mm) ±0.08mm (> 1.5mm)	YS/T429.2, ASTM B209

Surface Treatment	Polyester powder coating (RAL colors) Heat-transfer wood grain Film wrapping (PVC/PET) Custom metallic finishes available	Qualicoat / GSB Standards
Coating Thickness	Powder coating: 60–80μm Wood grain: 50–70μm (base + transfer) Film wrapping: 120–180μm	ASTM D7091
Installation Method	Clip fixation to custom keel Ceiling, wall, or continuous transition Reversible clip design for individual removal	Project-specific engineering
Color Performance	All RAL colors available Monochrome ΔE*ab ≤1.0 Batch-to-batch ΔE*ab ≤1.5 Wood grain: custom pattern matching	ISO 7724-1
Adhesion Strength	Cross-cut test: Classification ≥4B (No peeling along cut edges)	ASTM D3359
Coating Hardness	Pencil hardness: ≥HB (No permanent indentation at 1kg load)	ASTM D3363
Fire Resistance Rating	Class A1 (non-combustible) Flame spread index ≤25 Smoke developed index ≤450	EN 13501-1, ASTM E84
Flatness	≤1.5mm/m (any direction) No visible waviness at 3m	YS/T429.1, Project Spec

	viewing distance	
Wear Resistance	No visible wear/color loss after 500 cycles (Taber abraser, CS-10 wheel, 1000g load)	ASTM D4060
Corrosion Resistance	Salt spray: ≥1000h (ASTM B117) No blistering/creepage >2mm from scribe Humidity: ≥1000h @ 38℃/100% RH	ASTM B117, ASTM D2247
Tensile Strength	3003-H24: 145–180 MPa 5005-H24: 145–180 MPa Elongation: ≥4%	GB/T3880, ASTM E8
Wind Load Resistance	Custom-engineered per project Typical: up to 1.5 kPa (indoor) Up to 3.0 kPa (semi-outdoor) with reinforced anchorage	ASCE 7, Project Engineering
Density	2.70 g/cm³	ASTM D792

3. Manufacturing Process

3.1 Material Cutting & Preparation:

Precision cutting and deburring of AA3003/AA5005 series aluminum sheet to specified blank dimensions according to project section size and wall thickness (1.2–2.0mm), ensuring edge squareness within ±0.5° and dimensional accuracy within ±1.0mm. All blanks are inspected for burr-free edges before proceeding to forming.

3.2 Sheet Metal Forming & Welding:

The rectangular box section is formed through precision sheet metal bending followed by continuous TIG/MIG welding along the longitudinal seam. Welding parameters (current, travel speed, shielding gas flow) are controlled to ensure full penetration and consistent bead quality. For complex transitions or variable-height profiles, segmented welding with

dedicated jig fixturing is employed. Weld samples are destructively tested on a batch basis to verify weld strength.

3.3 Surface Grinding & Polishing:

The welded seams are ground flush with the parent material using progressive grit abrasives (80 → 180 → 320 grit), followed by surface polishing to achieve a uniform surface finish ready for coating. Edge burrs are removed, and all four faces are visually inspected for smoothness and surface consistency at a 3m viewing distance.

3.4 Surface Pretreatment:

Degreasing, chemical etching, and chromate-free conversion coating (Cr(VI)-free) treatment on all aluminum surfaces to enhance coating adhesion and corrosion resistance. The pretreatment process follows the six-tank immersion sequence: alkaline degrease → water rinse → acid etch → water rinse → conversion coating → DI water rinse → drying. Surface cleanliness is verified by the water break test before coating.

3.5 Coating Application:

Application of polyester powder coating (60–80μm) or specialized finishes per project specification. Powder coating is cured in a controlled convection oven at 180–200°C for 10–15 minutes. Heat-transfer wood grain uses sublimation film applied at 190–220°C under vacuum. Film wrapping uses UV-stabilized decorative PVC/PET films applied via vacuum lamination. All coated surfaces are inspected for uniformity, pinhole defects, and gloss consistency.

3.6 Quality Inspection & Packing:

Each finished baffle undergoes multi-point inspection: dimensional tolerance (±1.0mm), flatness (≤1.5mm/m), coating thickness (60–80μm), color difference (ΔE*ab ≤1.0), adhesion (cross-cut, ASTM D3359, ≥4B), and pencil hardness (≥HB). Welded seam integrity is verified by visual inspection and dye penetrant testing on a sampling basis. Accepted baffles are individually wrapped in PE film, packed with foam spacers in wooden crates, and labeled with project reference and installation orientation.

4. Application Scope

This Tonerlis custom baffle system is widely used in architectural ceiling, wall cladding and continuous transition applications, including but not limited to:

- Airport terminals, metro stations and railway stations with large-span ceiling requirements
- Commercial office atriums and lobbies requiring premium visual appearance on all sides
- Exhibition halls, conference centers and shopping malls with high architectural standards
- Semi-outdoor and outdoor installations such as parking garages, canopies and covered walkways
- Ceiling-to-wall continuous transitions where standard open-section profiles cannot provide finished edges on all four sides

5. Compliance Standards

- **GB/T3190-2020: Chemical Composition of Wrought Aluminum and Aluminum**

Alloys

- **GB/T3880: Aluminium and Aluminium Alloy Plates and Sheets for General Industrial Use**
- **EN 13501-1: Fire Classification of Construction Products and Building Elements (Class A1)**
- **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 D3359: Standard Test Methods for Measuring Adhesion by Tape Test**
- **ASTM D7091: Standard Practice for Nondestructive Measurement of Dry Film Thickness**
- **ISO 7724-1: Paints and Varnishes — Colorimetry — Part 1: Principles**

6. Packaging & Storage

Packaging: Each Tonerlis baffle is individually wrapped in PE film to prevent scratches, then packed in wooden crates with foam padding between layers to avoid contact damage. Corner protectors are applied at all exposed edges. Each crate is labeled with product specifications, batch number and installation orientation. For outdoor projects, additional waterproof wrapping is applied.
Storage: · Store in a dry, ventilated and rainproof warehouse, avoid direct sunlight, high temperature (＞70℃) and high humidity (RH＞85%).
· Avoid contact with sharp objects, chemicals and corrosive substances to prevent surface damage and substrate corrosion.
· Stacking height shall not exceed 2 layers for coated baffles to prevent deformation and coating damage.
· The storage site shall be far away from fire sources to meet the fire safety requirements of Grade A1 fire-resistant materials.

7. Quality Assurance

All Tonerlis baffles undergo strict multi-item quality inspection before delivery, including dimensional tolerance, welded seam integrity (visual + dye penetrant sampling), surface finish uniformity, color difference (ΔE*ab ≤1.0), coating thickness (60–80μm), adhesion strength (ASTM D3359, ≥4B), and flatness (≤1.5mm/m). A sampling inspection report is provided with each shipment.
Ballesta provides a warranty period of not less than 15 years for the product coating system (under normal use conditions and compliance with installation and maintenance guidelines). Welded construction integrity is warranted against manufacturing defects for a period of 5 years.