

1. Product Overview

1.1 Product Identifier

Product Name: Ballesta® Fixed Solar Louvers

Product Code: FSL-[BladeWidth]-[Profile] (e.g., FSL-300-U)

Description: Ballesta fixed solar shading louvers are precision-engineered architectural sun control systems designed to optimize building energy performance while creating striking facade expressions. Each louver system is custom-designed based on the project's geographic location, facade orientation, and sun path analysis. The fixed blades are set at a predetermined angle calculated to admit beneficial winter sun while blocking high-angle summer rays. Available in multiple blade profiles including flat, curved, airfoil, and U-channel shapes. Constructed from AA3003 H24 aluminum alloy with premium PVDF fluorocarbon coating (70% Kynar 500 resin), achieving 25+ years design life with zero-maintenance operation.

2. Technical Specifications

Item	Specification	Test Standard
Material	AA3003 H24 Aluminum Alloy	GB/T 3190-2020, ASTM B209
Blade Thickness	0.8 mm – 1.5 mm (substrate, depending on profile and span)	ASTM D7091
Blade Width	100 mm – 800 mm (custom per project)	ISO 128, Project specification
Blade Profile Options	Flat, Curved, Airfoil, U-Channel, Custom	Project specification
Max. Blade Span	2000 mm – 5000 mm (wind load dependent)	Structural calculation per project
Blade Fixing Angle	Custom calculated per project location & facade	Sun path analysis

	orientation	
Support Structure	Aluminum/stainless steel brackets, T-section arms, or C-channel frame	AAMA 501.6
Coating Type	PVDF Fluorocarbon (70% Kynar 500® resin)	AAMA 2605
Coating Thickness	25–35 µm (standard two-coat); 35–45 µm (metallic three-coat)	ASTM D7091
Color Options	RAL standard colors, custom metallic, mica, or specified architectural finish	Visual standard
Fire Resistance	A1 – Non-combustible	EN 13501-1, GB 8624
Adhesion Strength	5B (0% removal) in cross-hatch tape test	ASTM D3359
Color Difference	$\Delta E^* ab \leq 0.5$ (batch-to-batch)	ISO 7724-1
Pencil Hardness	HB (minimum, coated surface)	ASTM D3363
Salt Spray Resistance	≥1000 h, no blistering, corrosion or creepage from scribe	ASTM B117
Tensile Strength	145–180 MPa (AA3003 series)	ASTM E8 / GB/T 3880

3. Manufacturing Process

3.1 Aluminum Substrate Cutting:

Precision cutting of AA3003/AA5005 series aluminum sheet to specified blade dimensions using CNC shearing equipment. Burr-free edges are ensured to maintain consistent profile cross-sections during subsequent forming operations.

3.2 Roll Forming & Profile Bending:

Pre-cut aluminum blanks are formed into the specified blade profile (flat, curved, airfoil, or U-channel) using precision roll forming or CNC press brake bending equipment. Each blade is formed to achieve consistent cross-section geometry, smooth surface finish, and dimensional tolerances within $\pm 0.5\text{mm}$ across the full blade length.

3.3 Surface Pretreatment:

Aluminum blades undergo thorough degreasing and chrome-free conversion coating pretreatment to remove surface oxides and enhance coating adhesion. This process ensures the PVDF coating bonds firmly to the aluminum substrate, preventing delamination and under-film corrosion over the product lifespan.

3.4 PVDF Coating Application:

High-performance PVDF fluorocarbon coating (70% Kynar 500 resin) is applied using electrostatic spray in a controlled environment. A minimum total dry film thickness of 25 microns is achieved through multiple coat layers: primer, color coat, and clear topcoat. The coating cures at controlled elevated temperatures for maximum hardness and weather resistance.

3.5 Quality Inspection & Testing:

Each coated blade undergoes comprehensive quality inspection: coating thickness measurement (25-35 μm), color consistency check ($\Delta E^*_{ab} \leq 0.5$), cross-hatch adhesion test (5B rating), pencil hardness test (HB minimum), and dimensional accuracy verification. Non-conforming blades are rejected and recycled.

3.6 Bracket & Hardware Assembly:

Support brackets (aluminum or stainless steel), T-section support arms, and mounting hardware are precision-machined and matched to the louver system design. Each bracket-and-blade assembly is test-fitted prior to packaging to ensure alignment accuracy and ease of field installation.

4. Application Scope

This fixed solar louver system is designed for exterior building facade applications requiring solar heat gain control, glare reduction, and architectural expression:

- Office building facades requiring sun control and glare reduction
- Airport terminal curtain walls, glazed facades and atria
- Government and civic building exterior shading installations
- Commercial tower facade sun control and building energy optimization
- Educational campuses, healthcare facilities, hotel exteriors, and transportation hubs

5. Compliance Standards

- **GB/T 5237: Wrought Aluminum Alloy Extrusion Profiles for Building**
- **GB/T 3190-2020: Chemical Composition of Wrought Aluminum and Aluminum Alloys**
- **ASTM B209: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate**
- **AAMA 2605: Superior Performance Organic Coatings on Architectural**

Aluminum

- **EN 13501-1: Fire Classification of Construction Products and Building Elements — Class A1**
- **GB 8624-2012: Classification for Burning Behavior of Building Materials (Grade A)**
- **ASTM B117: Standard Practice for Operating Salt Spray (Fog) Apparatus**
- **ISO 7724-1: Paints and Varnishes — Colorimetry — Part 1: Principles**

6. Packaging & Storage

Packaging: Each louver blade is interleaved with protective PE film to prevent surface scratches. Blades are bundled in groups and packed in export-grade wooden crates or steel-framed crates, with foam cushioning between layers. Brackets and hardware are packed separately in labeled boxes. Full set of installation drawings and bill of materials included with each shipment.

Storage: · Store in a dry, ventilated and rainproof warehouse, avoid direct sunlight exposure to packaging.

· Avoid contact with sharp objects, chemicals and corrosive substances that may damage the coated surface.

· Blades should be stored horizontally on flat racks to prevent distortion. Brackets and hardware stored in clean, dry conditions.

· The storage site shall be kept away from fire sources to meet fire safety regulations for aluminum product storage.

7. Quality Assurance

All louver systems undergo strict multi-item quality inspection before delivery, including material certification verification, dimensional inspection, coating quality testing (thickness, adhesion, color consistency, hardness), and assembly test-fitting. Each shipment is accompanied by material test certificates (MTC) and coating performance test reports. We provide a warranty period of not less than 15 years for the aluminum structure and 20 years for the PVDF coating finish (under normal environmental conditions). Technical support including installation supervision and on-site inspection is available upon request.
