SECTION 088000.00

GLAZING SPECIFICATION w/ INSULATED GLAZING PANELS

NOTE: The following specification information is not comprehensive and is intended to be selectively incorporated into Division 088000.00 Glazing Specification.

TIP: To view non-printing Editor's Notes that provide guidance for editing, click on the “Show/Hide ¶” button above.

PART 1 – GENERAL

1.01 SUMMARY

1. Section Includes:

Note that Laminators Inc. insulated glazing panels consist of InfernoShield, Thermolite, Thermolite WE, Thermolite SE, Thermolite U-MAX, and Omega Foam-Ply panels.

1. Exterior installation and performance of insulated glazing panels for building window, glazing, and curtain wall systems.

1.02 REFERENCES

1. Aluminum Association (AA):
2. Aluminum Design Manual (ADM)
3. AA-M12C23A31: Anodized – Clear Coating

AA – Aluminum Association Designation

M12 – Mechanical finish (M) / As Fabricated (1) / Nonspecular as fabricated (2)

C23 – Chemical finish (C) / Etched (2) / Coarse matte (3)

A31 – Anodic Coatings (A) / Architectural Class II 0.4 to 0.7 mil (3) / Clear (1)

1. AA-M12C23A34: Anodized – Color Coating

AA – Aluminum Association Designation

M12 – Mechanical finish (M) / As Fabricated (1) / Nonspecular as fabricated (2)

C23 – Chemical finish (C) / Etched (2) / Coarse matte (3)

A34 – Anodic Coatings (A) / Architectural Class II 0.4 to 0.7 mil (3) / Electrolytically deposited color (4)

1. American Architectural Manufacturers Association (AAMA):
2. AAMA 609 & 610 Cleaning and Maintenance Guide for Architecturally Finished Aluminum
3. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels
4. American Society of Civil Engineers (ASCE):
5. ASCE/SEI 7 Minimum Design Loads for Buildings and Other Structures
6. ASTM International:
7. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
8. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
9. ASTM C920 Standard Specification for Elastomeric Joint Sealants
10. ASTM D2244 Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
11. ASTM D4214 Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
12. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
13. ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
14. International Code Council (ICC):
15. 2018 International Building Code (IBC)

1.03 SUBMITTALS

1. Product Data: Submit material descriptions, dimensions of individual components and profiles, and finishes for insulated glazing panels.
2. Product Design: Submit design data including, but not limited to, material properties, section properties, and capacities for insulated glazing panels. Design data shall be supported by a qualified Design Professional licensed in the state of primary research and development, design, and manufacturing of insulated glazing panels.
3. Selected Samples: Submit Manufacturer’s color charts or chips illustrating full range of colors, finishes, patterns, and textures available for insulated glazing panels with factory-applied finishes. Custom color selection requires color sample to be submitted for approval. Approval signature(s) are required by [**Owner**] [**Architect**].
4. Verification Samples:
5. Submit one sample in thickness specified that measures approximately 3 inches x 5 inches, minimum. Sample need not be provided in the specified color.
6. Submit two samples of each color or finish selected that measure approximately 3 inches x 4 inches, minimum.
7. Custom color samples may contain drawdown lines. Sizes for custom color samples may vary.
8. Quality Assurance Submittals:
9. Insulated Glazing Panel Material Certification: Submit an official written statement from the Manufacturer documenting that product raw materials meet specified standards. Certification shall be backed by test reports and/or material certificates.
10. Insulated Glazing Panel Product Certification: Submit an official written statement from the Manufacturer documenting that product complies with specified tested standards indicated in this specification. Certification shall be backed by test reports.
11. Closeout Submittals:
12. Warranty: Submit Manufacturer and Installer warranty documents as specified within the Warranty section of this specification.
13. Maintenance: Submit Manufacturer’s recommendations document for Cleaning and Maintenance of the insulated glazing panels.

1.04 QUALITY ASSURANCE

1. Qualifications:
2. Manufacturer Qualifications: Company with a minimum of 20 years of continuous experience manufacturing insulated glazing panels in the United States of America:
3. Able to provide specified warranty on finish.
4. Able to provide a list of other projects of similar size including approximate date of installation for each.
5. Installer Qualifications:
6. The Installer shall have:
	1. Been in business of a similar trade and under the present company name for at least five (5) years prior to the start of this project, and
	2. Experience with similar-sized insulated glazing panel projects, and
	3. Installed at least three (3) successful projects of the specified insulated glazing panels within the last five (5) years
		1. Acceptable, varying combinations of successful projects and/or years of experience shall be determined at the discretion of the Manufacturer.
7. The Installer must be capable of providing field service representation during installation.
8. Regulatory Code Agencies Requirements: Provide insulated glazing panels that have been evaluated and are in compliance with the following, where required:
9. International Code Council (ICC)
10. [**Other required regulatory code agency**]

1.05 DELIVERY AND STORAGE

1. Upon receipt, perform visual inspection of insulated glazing panels and inventory to identify any damages that may have occurred during shipping or any missing insulated glazing panels.
2. Storage:
3. Store insulated glazing panels horizontally on pallets in a dry, well-ventilated environment under the protection of a temporary or permanent structure. If required to be stored in an exterior area, insulated glazing panels must be placed under a well-ventilated, waterproof covering.
4. Store insulated glazing panels a minimum of 4” above ground level to avoid contact with standing moisture (e.g. water, snow, etc.).
5. Store insulated glazing panels in an area protected from other construction activities and associated debris.
6. Storage temperatures are not to exceed 120°F. Protect insulated glazing panels from moisture and direct sunlight while on the job-site.
7. Do not stack more than 1500 pounds of insulated glazing panels on one pallet. Other materials shall not be stacked on, or placed in contact with, insulated glazing panels to prevent staining, denting, or other damages.

1.06 PROJECT CONDITIONS

1. Field/Shop Measurements: Verify locations of framing members and glazing dimensions by field/shop measurements prior to the preparation of the insulated glazing panels.

1.07 WARRANTY

1. Insulated Glazing Panel Manufacturer’s Material Warranty: Submit, to the Owner, the Manufacturer’s standard warranty.
2. Warranty Period:
3. Material and Product Integrity: Five (5) years against delamination at any manufactured bond line
4. Coil-Coated PVDF/Kynar 500 Painted Finish: Thirty (30) years against:

Note that ASTM D4214 replaced ASTM D659.

1. Chalking in excess of a numerical rating of eight (8) when measured in accordance with ASTM D4214, Method A
2. Fading or change color in excess of five (5) E units (NBS) when calculated in accordance with ASTM D2244, paragraph 6.3
3. Cracking, chipping, splitting, blistering, peeling, or loss of adhesion. Minute fracturing (i.e. crazing or cracking) as a result of routing and bending of the insulated glazing panels shall be excluded.
4. Spray-Applied PVDF/Kynar 500 Painted Finish: Five to Twenty (5-20) years against:

Note that ASTM D4214 replaced ASTM D659.

1. Chalking in excess of a numerical rating of eight (8) when measured in accordance with ASTM D4214, Method A
2. Fading or change color in excess of five (5) E units (NBS) when calculated in accordance with ASTM D2244, paragraph 6.3
3. Cracking, chipping, splitting, blistering, peeling, or loss of adhesion. Minute fracturing (i.e. crazing or cracking) as a result of routing and bending of the insulated glazing panels shall be excluded.
4. Polyester Painted Finish: Ten (10) years against:

Note that ASTM D4214 replaced ASTM D659.

1. Chalking in excess of a numerical rating of eight (8) when measured in accordance with ASTM D4214, Method A
2. Fading or change color in excess of five (5) E units (NBS) when calculated in accordance with ASTM D2244, paragraph 6.3
3. Cracking, chipping, splitting, blistering, peeling, or loss of adhesion. Minute fracturing (i.e. crazing or cracking) as a result of routing and bending of the insulated glazing panels shall be excluded.
4. Anodized Aluminum Finish:
5. Ten (10) years against fading or change color in excess of six (6) E units (NBS) when calculated in accordance with ASTM D2244, paragraph 6.3
6. Twenty (20) years against cracking, chipping, splitting, blistering, peeling, or loss of adhesion. Minute fracturing (i.e. crazing or cracking) as a result of routing and bending of the insulated glazing panels shall be excluded.
7. Installation Warranty: Installer shall submit to the Owner a standard warranty document executed by an authorized company official. The warranty shall be in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.
8. Warranty Period:
9. Workmanship: **[One (1) year]** **[Other]** warranty period commencing on Date of Substantial Completion.

PART 2 – PRODUCTS

2.01 INSULATED GLAZING PANEL MANUFACTURERS

1. Insulated Glazing Panel Manufacturers:
2. [**InfernoShield**] [**Thermolite**] [**Thermolite WE**] [**Thermolite SE**] [**Thermolite U-MAX**] [**Omega Foam-Ply**] insulated glazing panels manufactured by Laminators Inc. – [www.laminatorsinc.com](http://www.laminatorsinc.com)

Contact a local Laminators Inc. Architectural Sales Representative for assistance with additional listings.

1. [**Other insulated glazing panel manufacturer who meets the requirements of this specification**]
2. [**Other insulated glazing panel manufacturer who meets the requirements of this specification**]

2.02 INSULATED GLAZING PANELS

1. Insulated Glazing Panel Description
2. Construction:

Retain for InfernoShield

1. [**InfernoShield consists of a calcium silicate core bonded on both sides to a thermoplastic stabilizer with a** **texture/color finished sheet of aluminum on each face and is manufactured in a laminated batch (i.e. discontinuous) process using adhesive(s) between dissimilar materials.**]

Retain for Thermolite

1. [**Thermolite consists of a foam plastic core bonded on both sides to a thermoplastic stabilizer with a texture/color finished sheet of aluminum on each face and is manufactured in a laminated batch (i.e. discontinuous) process using adhesive(s) between dissimilar materials.**]

Retain for Thermolite WE

1. [**Thermolite WE consists of a foam plastic core bonded on both sides to a thermoplastic stabilizer with a texture/color finished sheet of aluminum on each face that encapsulate the edges for metal-to-metal hairline joints in butt-glazed applications and is manufactured in a laminated batch (i.e. discontinuous) process using adhesive(s) between dissimilar materials.**]

Retain for Thermolite SE

1. [**Thermolite SE consists of a fabricated Laminators Omega-Lite ACM panel bonded on the exterior face of a standard Thermolite panel to create stepped edges and is manufactured in a laminated batch (i.e. discontinuous) process using adhesive(s) between dissimilar materials.**]

Retain for Thermolite U-MAX

1. [**Thermolite U-MAX consists of two foam plastic cores bonded to three thermoplastic stabilizers with a texture/color finished sheet of aluminum on each face and is manufactured in a laminated batch (i.e. discontinuous) process using adhesive(s) between dissimilar materials.**]

Retain for Omega Foam-Ply

1. [**Omega Foam-Ply consists of a foam plastic core bonded on both sides to a hardboard stabilizer with a texture/color finished sheet of aluminum on each face and is manufactured in a laminated batch (i.e. discontinuous) process using adhesive(s) between dissimilar materials.**]
2. Core:
	1. [**Calcium Silicate: 18.0 pcf density**] (Retain for InfernoShield) [**Expanded Polystyrene (EPS): 2.0 pcf density (Type IX)**] [**Polyisocyanurate (ISO): 2.0 pcf density (Type I)**] (Retain for Thermolite, Thermolite WE, Thermolite SE, Thermolite U-MAX, and Omega Foam-Ply)
3. Stabilizers:
4. [**Extruded Profile Polypropylene**] (Retain for InfernoShield) [**Extruded Corrugated Polypropylene**] (Retain for Thermolite, Thermolite WE, Thermolite SE, and Thermolite U-MAX) [**Exterior-Grade Hardboard**] (Retain for Omega Foam-Ply)
5. Aluminum Sheets (in accordance with ASTM B209):
6. Face Thickness: 0.015 inch nominal or thicker
7. Backer Thickness: 0.0125 inch nominal or thicker
8. Thickness / R-Value (hr °F ft2 / BTU) (tested in accordance with ASTM C518):

Retain for InfernoShield

1. [**InfernoShield**]
	1. 1 inch / R-2.14

Retain for Thermolite

1. [**Thermolite**]
	1. [**1 inch / R-3.3 (EPS)**] [**1 inch / R-3.9 (ISO)**] [**Other thickness / R-Value (Core)**]

Retain for Thermolite WE

1. [**Thermolite WE**]
	1. [**1 inch / R-3.3 (EPS)**] [**1 inch / R-3.9 (ISO)**] [**Other thickness / R-Value (Core)**]

Retain for Thermolite SE

1. [**Thermolite SE**]
	1. [**2 inch / R-7.0 (EPS)**] [**2 inch / R-7.6 (ISO)**] [**Other thickness / R-Value (Core)**]

Retain for Thermolite U-MAX

1. [**Thermolite U-MAX**]
2. [**2-1/2 inch / R-9.5 (EPS)**] [**2-1/2 inch / R-11.5 (ISO)**] [**Other thickness / R-Value (Core)**]

Retain for Omega Foam-Ply

1. [**Omega Foam-Ply**]
	1. [**1 inch / R-3.3 (EPS)**] [**1 inch / R-4.0 (ISO)**] [**Other thickness / R-Value (Core)**]
2. Thermal Movement: Allow for free and noiseless horizontal and vertical thermal movement due to expansion and contraction of insulated glazing panels over a temperature range of -20°F to +180°F at the material surface.
	1. Buckling, opening of joints, failure of sealants, or any other detrimental effects of thermal movement are not permitted.
	2. Installation procedures shall consider the ambient temperature range at the time of the respective operation.
3. Fire Performance: [**Noncombustible Material per IBC as tested in accordance with the following:**] (Retain for InfernoShield)

Retain for InfernoShield

1. [**Elementary materials (i.e. core) tested in accordance with ASTM E136**]
2. Composite materials (i.e. insulated glazing panel) tested in accordance with ASTM E84: Class A Material
	1. Insulated glazing panels shall have a Flame Spread Index (FSI) of not more than 25 in the maximum thickness as intended for use.
	2. Insulated glazing panels shall have a Smoke Developed Index (SDI) of not more than 450 in the maximum thickness as intended for use.

2.03 FINISH

1. Exterior Finish: Finish shall meet the performance criteria of AAMA 2605.

Choose one – If multiple finishes are needed, be sure to properly label each color and the locations on all applicable drawings.

Referred to as Laminators “PVDF/Kynar 500”, “Polyester”, “Designer Series”, and “Natural Series”.

1. Standard and Standard Metallic Finishes:
2. Selected from a Manufacturer’s standard color chart

Referred to as Laminators “PVDF/Kynar 500”, “Polyester”, “Designer Series”, and “Natural Series”.

1. Custom Finish:
2. Selected by the [**Owner**] [**Architect**] and coordinated with Manufacturer

Referred to as Laminators “PVDF/Kynar 500”, “Polyester”, “Designer Series”, and “Natural Series”.

1. Standard Specialty Finish:
2. Selected from a Manufacturer’s standard color chart
3. Exterior Finish: Finish shall meet the performance criteria of the AA.

Referred to as Laminators “Natural Series”.

1. Anodized:

Choose one – If multiple coatings are needed, be sure to properly label each color and the locations on all applicable drawings.

1. Clear Coating: AA-M12C23A31 Architectural Class

AA – Aluminum Association Designation

M12 – Mechanical finish (M) / As Fabricated (1) / Nonspecular as fabricated (2)

C23 – Chemical finish (C) / Etched (2) / Coarse matte (3)

A31 – Anodic Coatings (A) / Architectural Class II 0.4 to 0.7 mil (3) / Clear (1)

1. Color Coating: AA-M12C23A34 Architectural Class

AA – Aluminum Association Designation

M12 – Mechanical finish (M) / As Fabricated (1) / Nonspecular as fabricated (2)

C23 – Chemical finish (C) / Etched (2) / Coarse matte (3)

A34 – Anodic Coatings (A) / Architectural Class II 0.4 to 0.7 mil (3) / Electrolytically deposited color (4)

2.04 RELATED MATERIALS

1. General: Refer to Related Sections specified herein for other materials, including joint sealants, windows, glazing, and/or curtain walls.

PART 3 – EXECUTION

3.01 PREPARATION

1. Site Verification of Conditions: Verify that conditions of window, glazing, and curtain wall systems previously installed under other sections are acceptable for the insulated glazing panels installation. Documentation should be provided indicating any conditions detrimental to the performance of the insulated glazing panels.

3.02 INSTALLATION

1. Fabricate insulated glazing panels with sharply cut edges and no displacement of face or backer sheets or protrusion of stabilizers or core. When applicable, form insulated glazing panel panned edges to be sharp, true, and free of buckle and/or warp.
2. Fabrication Tolerances:
3. Width: +/- 1/16 inch
4. Length: +/- 1/16 inch
5. Squareness: +/- 1/16 inch
6. Insulated Glazing Panel Installation:
7. Handling:
8. Protective masking should be left on the field of each insulated glazing panel during installation to minimize potential damages from construction activities. Note that all masking must be removed within 2 weeks of installation.
9. Handle insulated glazing panels with clean work gloves to avoid hand injury from any sharp edges and to prevent staining of surfaces with contaminants.
10. When removing individual insulated glazing panels from stacks, always lift one insulated glazing panel completely off the next to prevent surface scratches from construction debris. Do not slide one insulated glazing panel across another. Glazing suction cups are recommended to handle insulated glazing panels whenever possible.
11. Install the insulated glazing panels plumb, level, and true in accordance with the glazing systems requirements. Install insulated glazing panels such that all edges are fully encapsulated and restrained from movement forward, backward, and side-to-side while allowing for thermal expansion.
12. Comply with Manufacturer’s instructions for provisions of Section 079200 and recommendations for installation of joint sealants.
13. Separate contact of dissimilar metals with approved methods as defined by the Manufacturer in order to eliminate the possibility of corrosive or electrolytic action between metals.

3.03 REMEDIATION AND CLEANING

1. Remediation:
2. Remove and replace insulated glazing panels damaged as a direct result of activities in the insulated glazing panel Installation section.
3. Remove protective masking immediately after installation of insulated glazing panels. Masking intentionally left in place after insulated glazing panel Installation on an elevation at the direction of the General Contractor shall become the responsibility of the General Contractor.
4. Insulated glazing panel Installation completion shall be agreed-upon between the Installer and the General Contractor.
5. Following insulated glazing panel Installation completion, any determination of repair or replacement of insulated glazing panels is at the discretion of the Architect. Such repair or replacement shall become the responsibility of the General Contractor.
6. At the discretion of the Architect, repair damaged insulated glazing panels such that repairs are not discernible at a distance of 10 feet from the surface at a 90° angle per AAMA 2605.
7. Removal and replacement of insulated glazing panels damaged by other trades shall be the responsibility of the General Contractor.
8. If required after insulated glazing panel Installation, any additional protection of the insulated glazing panels shall be the responsibility of the General Contractor.
9. Remove from project site damaged insulated glazing panels, protective masking, and other debris attributable to work of this section.
10. Cleaning:
11. Final Cleaning shall not be part of the work of this section.
12. Cleaning and Maintenance of the insulated glazing panels shall be performed at least once a year in accordance with AAMA 609 & 610.

END OF SECTION