

SOTA – “THERMO 3” SERIES SPECIFICATION FOR PREGLAZED & UNITIZED “THERMO 3” CURTAINWALL SYSTEM

1. General

1.1 Description of Work

- a. Furnish the labour, materials and other services to complete the fabrication and installation of Thermo 3 Series framing, including all materials and fitments required for a complete wall system in the manner, direction and performance shown on the shop drawings and as specified herein.
- b. Provide items not specifically mentioned but necessary to complete the work, items include:
 1. Reinforcement of framing members to support forces applied by work of this section.
 2. Glass & Glazing in conjunction with the work of this Section.
 3. Interior aluminum trims and closures.
 4. Exterior aluminum trim, closures, caps, covers and copings.
 5. Thermal break system as required to satisfy specified performance requirements.
 6. Sealants within work of this section and at boundaries connecting to building structure and other building envelope components.
 7. Thermal insulation with continuous vapor/airseal barrier at non-vision areas.
 8. Finish of all exposed metal surfaces.
 9. Test and visual mock-ups as required.
 10. Fire separation insulation and smoke seal integral with the work of this Section.
 11. Anchor inserts and setting diagrams as required for the work of this Section.

1.2 References

Except as otherwise specified, comply with:

1. Specifications for aluminum structures allowable stress design, 6th Edition, October 1994
2. AISC M-016 Manual of steel construction allowable stress design, 9th Edition
3. AWS D1.1-96 Structural steel welding code
4. GANA Glazing Manual 1997
5. AAMA 501.1-94 Test Method for Water Penetration using Dynamic Pressure

1.3 Quality Assurance

The work of this Section shall be performed by a Contractor who is regularly engaged in the engineering, manufacture, fabrication, assembly, glazing and installation of pre-glazed unitized curtain wall and Thermo 3 Series systems. Contractor shall demonstrate to the satisfaction of the Owner, Architect, CM, GC and Curtain Wall Consultant that they have successfully performed on comparable projects over the previous 10 years. All fabricating, assembly and glazing shall be done in the Contractor's own plant under clean room conditions. It is imperative that panels are pre-glazed and unitized as a complete system and shipped to the site as a finished product, ready for installation.

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2.0 Performance and Design

The work, as erected, shall meet or exceed the following structural, weather resistance and other performance requirements. Curtain Wall and Thermo 3 Series systems shall be designed in accordance with the standards of the “Rain Screen Principle” and will meet or exceed required standards and codes.

1. Design and make **provision for thermal movement** for such expansion and contraction of component materials, as will be caused by exterior and interior temperature differences and fluctuations.
2. The amount of such movement that is accommodated in the Contractor’s design shall be identified on the shop drawings and accompanied by thermal calculations.
3. The work shall be designed to accommodate **dead load and live load deflections**, thermal expansion, elastic shortening and/or sway, drift and torsion of the building frame and resist seismic forces as required.
The horizontal expansion assembly at the floor slabs should be designed using extruded gaskets in male/female connections in order to guarantee continuous airseal and long term performance.
4. The work shall be designed to the **design wind pressures** as described in the applicable Building Code or wind tunnel study.
5. **Uniform Load Deflection** shall be in accordance with ASTM 330-96, 1/175 of its clear span or 3/4” whichever is less.
6. No **uncontrolled water penetration** shall occur when tested in accordance with ASTM E-331 at positive **static pressure** differential of 15 psf.
7. No **uncontrolled water penetration** shall occur when tested in accordance with AAMA 501.1-83 at positive **dynamic pressure** differential of 15 psf.
8. **Air leakage** through the work shall not exceed 0.06 CFM per square foot of fixed wall area at a positive and negative test pressure differential of 6.24 psf.
9. **The thermal break system should be designed to prevent condensation on the indoor face of the framing system under the following wintertime conditions:**
Outdoor: Ambient temperature of **- 5°F** at 15 miles per hour
Indoor: Ambient temperature of **70°F** and relative humidity of **50%**
Submit computer analysis / thermographic diagrams showing compliance with the above requirements or, alternatively, by submission of data demonstrating that the curtain wall system provides a Condensation Resistance Factor (**CRF**) of **74 min.**
10. Fully captured **framing system** shall be designed to perform at 0.7 Btu/hr-ft²-°F - U-Value
Butt joint siliconed **framing system** shall be designed to perform at 0.8 Btu/hr-ft²-°F – U-Value
The weighted system (**50% vision glass , 50% spandrel glass & frame**) shall be designed to perform at 0.25 Btu/hr-ft²-°F – U-Value

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3.0 Variations in Structure

The system and anchoring should be designed to accommodate variations in building structure/slab locations of up to ± 1 ” in all directions.

4.0 Field Water Tests

If required by the contract documents contractor shall perform field water test in accordance with AAMA 501.2.

5.0 Mock-ups

If required by the contract documents contractor shall furnish labour and materials to build and test a mock-up of sufficient size and configuration to perform in accordance with above performance criteria.

6.0 Code Requirements

All work shall be performed in accordance with the applicable Building Codes, requirements of governmental authorities have in jurisdiction or the requirements of the Specification, whichever are more stringent.

7.0 Guarantee / Warranty

All work shall be guaranteed in accordance with the shop drawings and specification free from defects in materials, workmanship and weathertight for a period of five (5) years from date of substantial completion of the project.

8.0 Submittals

Submit 2 glass samples 12” x 12” of each type.
Submit 4 paint finish samples of each color type.

9.0 Products and Materials

1. Typical extrusions shall be 6063-T5 or T6 alloy as required.
2. Structural anchor extrusions shall be 6061-T6 alloy.
3. Interior finish shall be applied in accordance with manufacturer standards and AAMA603.8, color to later selection:
 - PPG Duracron or Polycron or
 - Clear Anodized 0.0004”

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Exterior finish shall be applied in accordance with manufacturer standards and AAMA603.8, color to later selection:

- PPG Duranar 2-coat Kynar 500 finish or equal by Valspar or
 - PPG DuranarXL 3-coat Kynar 500 finish or equal by Valspar or
 - Clear Anodized 0.0007”
4. Glass shall be of the types and thickness as shown on the drawings and separate glass schedule. All glass shall be manufactured in accordance with manufacturer standard procedures as well as the following standards:
- ASTM E773-88 (1995)
 - ASTM E774-88 (1995)
 - ASTM E546-88 (1995)
 - ASTM E576-88 (1995)
 - ASTM C-1036-91
 - ASTM C-1048-92
 - ANSI Z9.1-1984
 - ASTM C-1172-91
5. All gaskets/weather-stripping shall be virgin silicone compound, EPDM or Santoprene material and to be selected by the contractor depending on the performance criteria, location in the system and appearance requirements.
6. Dow Corning 791 silicone shall be used for all framing joints and air seal applications.
7. Dow Corning 983, 2-part silicone shall be used for all structural silicone applications. Contractor shall be certified by Dow Corning to use and apply the structural silicone in accordance with DC stringent surface preparation and testing procedures.
8. Glazing blocks shall be made of silicone rubber with a 70 Durometer, Shore A.
9. Contractor to provide and install thermal insulation in the spandrel areas using mineral fibre board material manufactured by Roxul or equal with a min. density of 4 lbs/ft³ and thickness as required and shown on the drawing details.
- 10. *All external, extruded aluminum components (caps, pressure plates etc.) shall be separated from the interior mullions by means of extruded high performance polyamide thermal breaks reinforced with multi-directional glass fiber (INSULBAR™) as manufactured by Ensinger Inc. 365 Meadowlands Blvd., Washington, PA 15301. These structural thermal breaks shall be located at the glass line and mechanically separate the interior portion of mullions from the exterior. The polyamide thermal break INSULBAR™ has to be inserted and rolled/crimped into the custom designed aluminum extrusions using roll-forming equipment as recommended by Ensinger Inc. Under no circumstance shall the thermal break system be interrupted or compromised by using drill through pressure plate screws.***

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Rolled-in PVC thermal breaks with conventional pressure plate attachments or pour and debridged Urethane thermal break systems will not be acceptable.

11. Parapet copings shall be made from formed aluminum sheets of 1/8” min. thickness.
12. Embed anchors shall be made from prime painted structural steel angles with nelson studs or Halfen type inserts of sufficient size to support design loads.
13. Mullion anchors shall be made from extruded structural aluminum sections with serrated surfaces and washers and allow adjustment in three directions to comply with building variations set out above.
14. Exterior fasteners exposed to weather conditions shall be stainless steel Type 304. Interior or hidden fasteners shall be ASTM A449 Grade B5 steel double cadmium plated. Anchor and mullion bolts and nuts shall be ASTM A193 Grade B5 steel in electrogalvanized zinc finish.
15. Flat aluminum sheet, Aluminum composite panels, Stone and monolithic glass spandrel areas shall be backed up with insulated 22Ga. galvanized steel backpans fastened and sealed to surrounding framing members.

10.0 Fabrication + Assembly

1. Methods of fabrication and assembly shall be performed in accordance with the contractors standard procedures and general industry practices.
2. All work shall be done by competent and skilled workmen.
3. All fitting and assembly/glazing work shall be done in the shop under controlled conditions.
4. Curtain wall system will need to be shipped to site as a fully assembled and unitized system.

11.0 Installation

All work shall be performed by skilled workmen, trained and experienced in the handling and installation of unitized curtain wall and Thermo 3 Series systems.

12.0 Operable Vents and Balcony Doors

Operable vents and balcony doors complete with manufacturers standard multi point concealed hardware shall be incorporated into the works and perform in accordance with AAMA – AW-40