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**Guide Specification**

Specifier Notes: This guide specification is written to advise the architecture, engineering, and construction (AEC) industry that incorporate structural thermal break products into new construction and retrofit projects.

# SECTION 07 XX XX

**STRUCTURAL THERMAL BREAK**

Specifier Notes: This Section covers Climaspec LLC “ClimaSpec TB” Structural Thermal Breaks. Consult Climaspec LLC for assistance in editing this Section as required for the Project.

Use of “ClimaSpec TB” structural thermal breaks may contribute to LEED credits. Consult Climaspec LLC for more information.

1. **GENERAL**
	* + 1. **SECTION INCLUDES**
2. Structural thermal break locations:

Specifier Notes: Select or edit the applications from the following list as required for the project. Delete locations from the following list not required.

1. Balconies.
2. Canopies.
3. Shelf angles.
4. Curtain wall mullions and anchors.
5. Façade and cladding connections.
6. Roof penetrations.
7. Fall arrest anchors.
8. Roof posts.
9. Roof equipment screen posts.
10. Wall to roof transitions.
11. Parapets.
12. Steel beam connections.
13. Steel column base/concrete footings.
14. Concrete slab to steel connections.
15. Window framing.
16. Door thresholds.
17. Foundation to wall transitions.
18. Other.
	1. **RELATED STANDARDS**

Specifier Notes:  Edit the following list of related sections as required for the Project.  Limit the list to sections with specific information that the reader might expect to find in this Section but is specified elsewhere.

1. Related Sections include the following:
2. Section 01 XX XX - PASSIVE HOUSE DESIGN REQUIREMENTS for Passive House certification.
3. Section 01 XX XX - LEED™ DOCUMENTATION for LEED™ certification.
4. Section 03 30 00 - CAST-IN-PLACE CONCRETE for coordination with concrete.
5. Section 04 XX XX - UNIT MASONRY for coordination with masonry construction.
6. Section 05 XX XX - STRUCTURAL STEEL for coordination with structural steel construction.
7. Section 05 12 00 - STRUCTURAL STEEL FRAMING for coordination with framing.
8. Section 05 12 23 - STRUCTURAL STEEL FOR BUILDING for bolted structural steel connections.
9. Section 07 42 10 - WALL CLADDING SUPPORT for exterior cladding.
	1. **REFERENCE STANDARDS**

Specifier Notes:  List reference standards used elsewhere in this Section, complete with designations and titles.  Delete reference standards from the following list not used in the edited Section.

1. American Institute of Steel Construction (AISC):
	1. AISC 360 - Specification for Structural Steel Buildings
2. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE):
	1. ASHRAE 90.1-2016 - Energy Standard for Buildings Except Low-Rise Residential Buildings.
3. ASTM International (ASTM) ([www.astm.org](http://www.astm.org/)):
	1. ASTM C 177 – Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
	2. ASTM D 638 – Standard Test Method for Tensile Properties of Plastics.
	3. ASTM D 695 – Standard Test Method for Compressive Properties of Rigid Plastics.
	4. ASTM D 696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer.
	5. ASTM D 732 – Standard Test Method for Shear Strength of Plastics by Punch Tool.
	6. ASTM D 790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
	7. ASTM D 2863 – Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index).
4. Research Council on Structural Connections (RCSC):
	1. Specification for Structural Joints Using High Strength Bolts, August 1, 2020.
5. United States Green Building Council (USGBC):
	1. LEED v4 - Leadership in Energy and Environmental Design for Building Design and Construction, January 22nd, 2019.

* 1. **SUBMITTALS**

Specifier Notes:  Edit the Submittals article as required for the Project. Delete submittals not required.

1. Submittals:  Comply with Division 01.
2. Product Data:  Submit manufacturer’s product data.
3. Manufacturer’s Certification:  Submit manufacturer’s certification that structural thermal breaks comply with specified requirements and are suitable for intended application.
4. Shop Drawings:  Submit drawings, indicating:
	1. Dimensions, locations, and quantities of structural thermal break plates, structural thermal break washers, and bushings.
	2. Size and location of holes in structural thermal break plates.
	3. OD and ID for structural thermal break washers and bushings.
	4. Connection details, including bolt/anchor and washer sizes.
5. Samples: Submit manufacturer’s samples of the following:
	1. Structural thermal break:  Minimum 2 inches by 2 inches.
	2. Thermal break washers.
	3. Thermal break bushings.
	4. **WARRANTY**
6. Warranty Documentation:  Submit manufacturer’s standard warranty.
	1. **DESIGN REQUIREMENTS**
7. Structural Design: Structural connections using structural thermal break products shall be designed to the applicable AISC, RCSC, ASCE, and local building design codes.
8. Thermal Design:  Wall or roof assembly shall meet the prescriptive R-value or performance-based U-value as given in the ASHRAE 90.1 relevant code by state and climate zone.  Wall assemblies shall meet the ASHRAE requirement for “continuous insulation” which prohibits thermal bridging.

* 1. **DELIVERY, STORAGE, AND HANDLING**
1. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers and packing, with identification labels intact.
2. Storage and Handling:
	1. Comply with manufacturer's recommendations for storage and handling.
	2. Keep materials in manufacturer’s original, unopened containers and packaging until installation.
	3. Store materials in a clean, dry area indoors.
	4. Do not store materials directly on the floor or ground.
	5. Store materials out of direct sunlight.
	6. Keep materials from freezing.
	7. Protect materials during storage, handling, and installation to prevent damage.
3. **PRODUCT**
	* + 1. **MANUFACTURERS**
4. Manufacturer:  Climaspec LLC, 650 California Street, San Francisco, CA 94108.

Toll Free: 888.376.6756.

info@climaspec.com [www.climaspec.com](http://www.climaspec.com)

Specifier Notes: Specify if substitutions will be permitted.

1. Substitutions:  [Not permitted]  [Comply with Division 01].
2. Single Source:  Provide structural thermal breaks from single manufacturer.

* + - 1. **STRUCTURAL THERMAL BREAKS**
1. Structural Thermal Break Material:  ClimaSpec TB
	1. Description:
		1. Structural thermal break material to prevent thermal bridging between building elements.
		2. Minimizing energy loss while maintaining structural integrity.
	2. Material: Reinforced laminate thermoset.

Specifier Notes:  Specify thickness of the structural thermal break here or indicate on the Drawings.

* 1. Thickness:  [1/4 inch (6.4 mm)]  [1/2 inch (12.7 mm)]  [3/4 inch (19.1 mm)]  [1 inch (25.4 mm)]  [2 inches (50.8 mm)] [Custom thickness up to 2 inches (50.8mm)]  [Indicated on the Drawings].
	2. Ultimate Mechanical Properties, Nominal:
		1. Compressive Strength,  ASTM D695: 38,900 psi (268.2 MPa).
		2. Tensile Strength, ASTM D638: 9,400 psi (64.8 MPa).
		3. Tensile Modulus, ASTM D638: 1.7 x 106 psi (11,721.0 MPa).
		4. Flexural Strength, ASTM D790: 22,300 psi (153.7 MPa).
		5. Shear Strength,  ASTM D732: 13,400 psi. (92.3 MPa).
	3. Flame Resistance, Nominal:
		1. Oxygen Index, ASTM D 2863: 21.8 percent.

* 1. Thermal Properties, Nominal:
		1. Thermal Conductivity,  ASTM C177: 1.8 BTU/hr/ft2/in/degree F (0.259 W/m\* degree K).
		2. Coefficient of Thermal Expansion, ASTM D696: 2.2 in/in/degree C x$10^{-5}$.

Specifier Notes:  “ClimaSpec TB” structural thermal break is Red List free.

* + - 1. **ACCESSORIES**

Specifier Notes:  Delete accessories not required.  Consult Climaspec LLC. for information regarding the use of thermal break washers and bushings to improve thermal break connections.

Consult ClimaSpec LLC. for standard and custom sizes of thermal break washers and bushings.

1. Thermal Break Washers: “ClimaSpec Washers”.
	1. Material: Same material as “ClimaSpec TB” structural thermal break.
	2. Thickness 1/4  inch (6.4mm).
	3. OD and ID: Determined by the bolt/anchor diameter. Refer to manufacturer’s washer and bushing size data.
2. Thermal Break Bushings: “ClimaSpec Bushings”
	1. Material: Glass-reinforced laminate
	2. Length: Determined by thickness of steel end plate.
	3. OD and ID: Determined by the bolt/anchor diameter. Refer to manufacturer’s washer and bushing size data.
3. **EXECUTION**
	* + 1. **EXAMINATION**
				1. Examine locations to secure structural thermal breaks.
				2. Confirm locations to receive structural thermal breaks are clean, dry, flat, and undamaged.
				3. Notify the Architect of conditions that would adversely affect installation or subsequent use.
				4. Do not begin installation until unacceptable conditions are corrected.
			2. **ISTALLATION**
4. General:
	1. Install structural thermal breaks in accordance with manufacturer’s instructions at locations indicated in the approved design.
	2. Identify correct structural thermal break as indicated on the Drawings.
	3. Install correct sizes of structural thermal breaks, thermal break washers, and thermal break bushings as indicated on the Drawings.
	4. When required install hardened USS Grade 8 flat washers on both sides of thermal break washers in accordance with Structural Engineer’s instructions.
	5. Steel Washer OD:  Greater than or equal to thermal break washer OD.
	6. When required install thermal break bushings into oversized building element holes to accept OD of bushings.
5. Bolted Structural Steel Connections:
	1. Install bolted structural steel connections as specified in Section 05 12 23. 1. Bolt torque values are provided by the Structural Engineer and are determined by required clamping force, proper tension of bolts, and long-term creep.
		* 1. **ADJUSTING**
				1. Remove and replace with new material, damaged components that cannot be successfully repaired, as determined by the Architect or Structural Engineer.

* + - 1. **PROTECTION**
				1. Protect installed structural thermal break connection from damage during construction.

END OF SECTION