

07 2100

DuPont™ Ultra SL Wall System (UWS-SL)

Insulation + Air + Water Barrier Wall System

Guide Specification

DISCLAIMER: The manufacturer has reviewed the product information contained in this short form specification. The information is organized and presented to assist the specification writer working on a construction project to select the appropriate products and to save time in writing the project specification Section. The specification writer is responsible for product selection as well as the use and application of this information, and should contact the manufacturer to ensure that all options are available and that the associated specification information is valid and correct.

SPEC NOTE: Insert the required paragraphs into the Section under the noted Articles, and make any required selections. Where selection is indicated with an [OR] statement, select the appropriate paragraph and delete the inappropriate statement. Delete all SPEC NOTEs and [OR] statements prior to final printing.

*01 4100: CONTINUOUS ENVELOPE AIR SEALING*

*PART 1 GENERAL*

*1.01 SECTION INCLUDES*

*A. Administrative and procedural requirements to create an airtight building enclosure that controls infiltration / exfiltration of air.*

1. *The Prime Contractor shall ensure that the continuous air barrier around the building enclosure is achieved with the following characteristics:*
	1. *It must be continuous, with all joints, penetrations, and air paths sealed.*
	2. *It must be structurally supported.*
	3. *It must be connected and continuous between foundation & walls, walls & windows/doors, different wall systems, wall & roof.*

*1.02 RESPONSIBILITIES*

*A. Prime Contractor Responsibilities: Unless otherwise indicated, the Prime Contractor shall provide coordination of the trades, and the sequence of construction to ensure continuity of the air barrier system joints, junctures and transitions between materials and assemblies of materials and products, from substructure to walls to roof.*

*PART 2 – PRODUCTS – [not used]*

*PART 3 – EXECUTION – [not used]*

*END OF SECTION*

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ULTRA WALL INSULATION AND AIR BARRIER SYSTEM *WITH ULTRA SL*

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. DuPont™ Ultra SL Wall System (UWS-SL)\*; extruded polystyrene (XPS) board insulation.

1. Shiplap edge cavity wall continuous insulation (ci); DuPont™ Styrofoam™ Brand Ultra SL Extruded Polystyrene Foam Insulation\*.

1.02 RELATED REQUIREMENTS

A. Section 04 2000 - Unit Masonry: Cavity wall veneers.

B. Section 04 2723 - Cavity Wall Unit Masonry: Cavity wall veneers.

C. Section 09 2116 - Gypsum Board Assemblies: Gypsum wall sheathing substrate in cavity.

D. [Continue as appropriate for project]

1.03 REFERENCE STANDARDS

A. ASTM C272 - Standard Test Method for Water Absorption of Core Materials for Sandwich Constructions; 2018.

B. [ASTM C578](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20C578) - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2016.

C. [ASTM C954](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20C954) - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.

D. [ASTM E84](https://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20E84) - Standard Test Method for Surface Burning Characteristics of Building Materials; 2016.

E. [ASTM E331](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20E331) - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

F. [ASTM E2357](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20E2357) - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies; 2011.

G. [NFPA 285](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=NFPA%20285) - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; 2012.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics for each type of product indicated.

C. NFPA 285 Compliance: Submit third party documentation showing wall assembly compliance with NFPA 285.

D. Warranty: Provide Manufacturer’s Limited Thermal Warranty for extruded polystyrene insulation.

1.05 QUALITY ASSURANCE

A. Thermal Insulation: Not produced with, or contain, any of U.S. EPA regulated chlorofluorocarbon (CFC) compounds listed in Montreal Protocol of United Nations Environmental Program.

B. Surface Burning Characteristics: As determined by testing identical products according to ASTM E84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

C. Air Barrier Performance: Provide insulation and related materials with information from manufacturer indicating insulation has passed testing with ASTM E2178-13 “Standard Test Method for determining Air Leakage for building materials and/or the assembly has passed testing in accordance with ASTM E2357-05, “Standard Test Method for Determining Air Leakage of Air Barrier Assemblies”.

D. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.

1.06 MOCK-UP

A. Provide mock-up of specified system illustrating proper installation of specified wall assembly in compliance with manufacturer's recommendations.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect thermal insulation materials from physical damage and from deterioration due to moisture, soiling and other sources; store in dry interior location.

1. Do not expose to direct sunlight. Exposure limit 90 days.

2. Protect against ignition at all times.

3. Quickly complete installation and concealment of foam plastic board installation in each area of construction.

B. Comply with manufacturer’s recommendations for delivery, storage, and handling.

1.08 FIELD CONDITIONS

A. Installation Temperatures: Comply with manufacturer’s recommendations for temperatures during product installation.

B. Environmental Requirements: Install this work in compliance with manufacturer’s environmental requirements, and during conditions in accordance with manufacturer’s recommended minimum surface temperatures.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. DuPont™ Ultra SL Wall System (UWS-SL)\*: Provide 50 Year Thermal Limited Warranty in United States for DuPont™ Styrofoam™ Brand insulation products 1-1/2 inch (38 mm) thick and greater.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Air Barrier: Tested in accordance with [ASTM E2357](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20E2357) at pressure of 6.24 psf (300 Pa) or greater, with air infiltration less than 0.04 cfm/sq ft (0.2 L/sq m) of fixed wall area.

1. Conduct testing at positive and negative sustained wind loading of 12.5 psf (0.6 kPa) for one-hour duration in each direction.

2. Provide pressure cycling of wall at 2000 cycles in both positive and negative directions, ending with wind gust loading at 25 psf (1.2 kPa).

B. Water Penetration: Tested in accordance with [ASTM E331](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20E331), with minimum pressure differential of 6.24 psf (300 Pa) for at least two-hour test duration without any uncontrolled water penetration.

1. All joints, penetrations, and gaps of the thermal (and air) layer wall system shall be made water and air tight.

C. Mold Resistance: Provide system components that are non-food source for fungal growth.

2.02 ULTRA SL - WALL INSULATION SYSTEM

A. Extruded Polystyrene (XPS) Board Insulation: Complies with [ASTM C578](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20C578), Type IV with patented carbon-black technology wall insulation system placed over wall board sheathing or wall substrates of masonry veneer cavity walls and with seam treatment to form a continuous thermal, air, and water barrier system.

1. Basis of Design:

a. DuPont de Nemours Inc.; DuPont™ Styrofoam™ Brand Ultra SL Extruded Polystyrene Foam Insulation\*: building.dupont.com/commercial

2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with [ASTM E84](https://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20E84).

3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with [ASTM E84](https://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20E84).

4. Compressive Resistance: At least 25 psi (173 kPa).

5. Density: At least 1.45 lbs/cu ft (23 kg/cu m).

6. Water Vapor Permeance: Maximum of 1.5 perms (86 ng/Pa sec sq m) per 1 inch (25.4 mm) thickness.

7. Board Overall Dimensions: 48 inches (1.22 m) wide by 96 inches (2.44 m) long.

8. Board Thickness: Nominal thickness of 1-3/4 inch (44 mm), **[OR]** 2.125" **[OR]** 2.5" **[OR]** 3" with shiplap edge treatment along long edge.

9. Thermal Resistance (R-value): R-5.6/inch at 75 degrees F (24 degrees C).

10. Water Absorption: ASTM C272, 0.1% max, by volume.

2.03 ACCESSORIES

A. Gypsum Sheathing: Provide moisture and mold-resistant glass mat gypsum wall board in accordance with Section 09 2116.

B. Foam Sealant Penetration Filler: Provide single component spray polyurethane foam (SPF) for sealing wall penetrations through board insulation.

1. Products: DuPont™ Great Stuff Pro™ Gaps and Cracks\* single component polyurethane low-pressure sealant or DuPont™ Great Stuff Pro™ Window and Door\* single component polyurethane low-pressure foam sealant as manufactured by DuPont de Nemours Inc..

C. Foam Sealant Penetration Filler: Provide two component spray polyurethane foam (SPF) for sealing wall penetrations through board insulation.

1. Product: DuPont™ Froth-Pak Foam Sealant\*, two-component as manufactured by DuPont de Nemours Inc..

D. Facer Repair Flashing: Provide board insulation manufacturer's recommended flashing for repair of damaged board insulation facer.

1. Products:

1. DuPont™ LiquidArmor™ CM Spray Flashing and Sealant\* as manufactured by DuPont de Nemours Inc..
2. DuPont™ LiquidArmor™ LT Flexible Single Component Silicone Flashing\* as manufactured by DuPont de Nemours Inc..
3. DuPont™ LiquidArmor™ QS Spray Flashing and Sealant as manufactured by DuPont de Nemours Inc..

E. Flashing and Sealant: Provide for sealing joints, seams and veneer tie penetrations through board insulation.

1. Spray applied elastomeric liquid flashing and sealant, grey-blue color.

a. Product: DuPont™ LiquidArmor™ CM Flashing and Sealant\* as manufactured by DuPont de Nemours Inc..

b. Product: DuPont™ LiquidArmor™ QS Flashing and Sealant\* as manufactured by DuPont de Nemours Inc.

2. Trowel applied single component silicone flashing and sealant, grey color.

a. Product: DuPont™ LiquidArmor™ LT Flashing and Sealant\* as manufactured by DuPont de Nemours Inc..

F. Board Insulation Anchors: Board insulation manufacturer's recommended polymer or other corrosion protected steel screw with EPDM washer for thermally broken anchorage of exterior veneer to concrete masonry unit (CMU) substrate through board insulation; [ASTM C954](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20C954).

1. Provide anchor length and size as required for board insulation and wall sheathing thickness.

2. Locate fastener from edge of board insulation a maximum of 8 inch (203 mm) and in compliance with fastening pattern.

3. Pre-drill substrate prior to installation of wall anchor, sleeve and thermal-clip.

4. Product: Pos-i-tie ThermalClip and barrel screw for concrete/CMU backup wall application by Heckmann Building Products, Inc.

G. Fasteners: Board insulation manufacturer's recommended polymer or other corrosion protected steel screw with washer for fastening insulation sheathing to CMU substrate; [ASTM C954](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20C954).

1. Provide fastener length and size as required for board insulation sheathing thickness.

2. Provide fastener along placement of base flashing as necessary.

3. Product: Grip-Deck Self-Drilling Ceramic Coated Screws by Rodenhouse, Inc.

H. Washer: Provide 2 inch (51 mm) diameter plastic washers for each screw fastener.

1. Product: Thermal-Grip ci prong washer by Rodenhouse, Inc.

I. Sill Plate Seal: Provide flexible polyethylene foam gasketing strip between top of foundation and sill plate.

1. Product: DuPont™ Styrofoam™ Brand Sill Seal Foam Gasket\* as manufactured by DuPont de Nemours Inc..

J. Roof/Wall Juncture Sealing

1. Maintain continuity of air barrier by sealing the roof/wall juncture.

2. Acceptable Products:

a. DuPont de Nemours Inc.; DuPont™ Froth-Pak™ Foam Insulation\* (Class A).

K. Self-Adhering Transition Flashing: Provide for through-wall flashing, roof-to-wall transitions, parapet transitions, above window kick-outs, wall to below-grade transitions, wall offsets, rough window openings, balcony transitions.

1. Product: DuPont™ DuraGard™ CM Transition Flashing as manufactured by DuPont de Nemours Inc..

PART 3 - EXECUTION

3.01 INSTALLATION, ULTRA SL WALL INSULATION SYSTEM

A. Comply with extruded polystyrene (XPS) board insulation manufacturer’s installation instructions for applications indicated.

B. Install board insulation panels tightly to each other and around openings and penetrations.

1. Fasten to exterior face of CMU or concrete wall framing using board insulation manufacturer’s recommended screw fastener type and length with washers.

2. Install board insulation sheathing panels with length of boards oriented horizontally or vertically with shiplapped long edges.

a. To allow for staggering of joints cut first insulation board in half to a 2 feet by 8 feet (0.61 m by 2.44 m) or 4 feet by 4 feet (1.22 m by 1.22 m) dimension depending on orientation selected.

b. Use maximum lengths to minimize number of joints.

c. Along first or bottom course of board insulation provide a continuous 1 inch (25.4 mm) wide bead of penetration filler so that bottom edge will set atop foundation and create a seal along bottom edge.

d. If installing base flashing use fasteners for base flashing and washer for along first row up from bottom to provide for flush mounting of base flashing.

e. Provide continuous square cut edges of board insulation without interruptions for full height and width of installation; use motorized saw when cutting insulation.

3. Fasten insulation panels to CMU or concrete substrate using a mixture of wall fasteners and anchors.

a. Use a minimum number of wall fasteners to hold insulation in place until anchors are installed.

b. Drill pilot holes into substrate for installation of wall anchors using a drill adapter, and screw anchors into pilot holes until EPDM washers are firmly seated against board insulation.

c. Base wall anchor installation pattern on horizontal and vertical spacing of 16 inch (406 mm) on center to comply with [ASTM E2357](http://global.ihs.com/doc_detail.cfm?rid=BSD&document_name=ASTM%20E2357) air barrier testing requirements.

d. When noted fastening pattern for wall anchors cannot be adhered to, add additional wall fasteners with washer to assembly to ensure that board edges have an anchor or fastener within 8 inch (203 mm) of board edges.

e. Do not countersink perimeter wall fasteners, as they can be detailed to bridge gap of abutting board insulation with washer used to fasten board insulation to substrate.

f. Maximum of two board joints may be bridged per wall fastener.

4. Install fluid applied flashing at end and edge joints.

5. Seal sheathing joints and penetrations in accordance with insulation sheathing manufacturer's instructions.

6. Install board insulation panels tightly against substrate at center of board and along perimeter edges.

a. Fill any gaps with single or two component foam sealant.

b. Fill openings greater than 2 inch (51 mm) wide with piece of rigid foam insulation and fasten to substrate in accordance with standard attachment methodology.

c. Install fluid applied flashing and sealant as counter flashing at locations where through-wall flashing is installed behind board insulation.

d. Install bead of penetration filler at top of counter flashing to ensure continuous air and water barrier.

C. Install board insulation to cover entire insulated area, cut and fit insulation tightly around obstructions, and properly remove projections that interfere with insulation placement.

3.02 INSTALLATION, GENERAL

A. Flashing and Sealant:

1. Apply material within application limits of product manufacturer.

2. Do not apply product on surfaces with standing water or frost.

3. Avoid installing on days with a high probability of significant rainfall.

4. Seal gaps greater than 1/4 inch (6.4 mm) in width with penetration filler prior to applying flashing and sealant.

a. If facer on board insulation is damaged, make note of affected area and apply additional spray over damaged area.

b. Replace damaged insulation, or repair facer flaws with appropriate flashing as recommended by insulation panel manufacturer.

5. Apply flashing and sealant to board joints, penetrations and other fenestration openings as required at material required application thickness.

a. Apply flashing 3 inches (76 mm), plus or minus 1 inch (25.4 mm) wide over board insulation joints, with at least 1 inch (25.4 mm) of spray covers each side of joint.

b. Apply flashing over fasteners and washers along board insulation joints.

c. Install façade attachment system after flashing has been applied.

6. Rough Openings: Apply flashing and sealant at least 3 inches (76 mm) onto face of insulation panel sheathing, and completely cover edge of insulation board; also spray at least 3 inch (76 mm) back onto rough opening substrate.

a. It is recommended to cover back onto rough opening at least 1 inch past the interior weatherseal.

7. Board Insulation or Substrate Penetrations: Apply flashing and sealant at least 2 inches (51 mm) onto face of insulation sheathing and at least 2 inches (51 mm) onto penetration or primary flashing substrate.

8. Use wet mil thickness gauge to ensure proper installation thickness.

a. Where consistently below minimum thickness, apply another layer to achieve proper thickness requirements.

9. Visually inspect for any areas missed and trowel on sealant as necessary.

3.03 PROTECTION

A. Protect board insulation from excess moisture, mechanical damage, and exposure to open flame.

B. Repair damage caused to board insulation in a manner that retains integrity and continuity of insulation and facer materials.

C. Keep board insulation dry and above water on jobsite, and cover with tarp until ready for installation.

D. Promptly cover board insulation with cladding.

**END OF SECTION**

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**DuPont™ Styrofoam™ Brand Spray Polyurethane Foam\*** contains isocyanate, hydrofluorocarbon blowing agent and polyol. Read the instructions and (Material) Safety Data Sheet ((M)SDS) carefully before use. Wear protective clothing (including long sleeves), gloves, goggles and proper respiratory protection. Supplied air or an approved air-purifying respirator equipped with an organic vapor sorbent and a P100 particulate filter is required to maintain exposure levels below ACGIH, OSHA, WEEL or other applicable limits. Provide adequate ventilation. Contents under pressure. Styrofoam™ Brand SPF should be installed by a trained SPF applicator.
**CAUTION**: When cured, these products are combustible and will burn if exposed to open flame or sparks from high-energy sources. Do not expose to temperatures above 240ºF (116ºC). For more information, consult (Material) Safety Data Sheet ((M)SDS), call DuPont at 1-866-583-2583 or contact your local building inspector. In an emergency, call 1-989-636-4400 in the U.S. or 1-519-339-3711 in Canada.

**DuPont™ Great Stuff Pro™ Polyurethane Foam Sealants and Adhesives\*** contain isocyanate and a flammable blowing agent. Read all instructions and (Material) Safety Data Sheet ((M)SDS), carefully before use. Eliminate all sources of ignition before use. Cover all skin. Wear long sleeves, gloves, and safety glasses or goggles. Not for use in aviation, or food/beverage contact, or as structural support in marine applications. Provide adequate ventilation or wear proper respiratory protection. Contents under pressure. Not to be used for filling closed cavities or voids such as behind walls and under tub surrounds.
**CAUTION**: When cured, these products are combustible and will burn if exposed to open flame or sparks from high-energy sources. Do not expose to temperatures above 240ºF (116ºC). For more information, consult (Material) Safety Data Sheet ((M)SDS), call DuPont at 1-866-583-2583 or contact your local building inspector. In an emergency, call 1-989-636-4400 in the U.S. or 1-519-339-3711 in Canada.

**DuPont Polyurethane Foam Insulation and Sealant\***
**CAUTION**: When cured, these products are combustible and will burn if exposed to open flame or sparks from high-energy sources. Do not expose to temperatures above 240ºF (116ºC). For more information, consult (Material) Safety Data Sheet ((M)SDS), call DuPont at 1-866-583-2583 or contact your local building inspector. In an emergency, call 1-989-636-4400 in the U.S. or 1-519-339-3711 in Canada.
**CAUTION**: This product is combustible and shall only be used as specified by the local building code with respect to flame spread classification and to the use of a suitable thermal barrier. For more information, consult (Material) Safety Data Sheet ((M)SDS), call DuPont at 1-866-583-2583 or contact your local building inspector. In an emergency, call 1-989-636-4400 in the U.S. or 1-519-339-3711 in Canada.

**DuPont™ LiquidArmor™ Flashing and Sealant\***Read the instructions and (Material) Safety Data Sheets ((M)SDS) carefully before use. It is recommended that spray applicators and those working in the spray area wear eye protection. Contact with exposed skin may cause skin discoloration and dryness. Gloves are recommended for prolonged exposures. Ensure adequate ventilation during spray applications.

**DuPont™ ThermaxTM Brand Polyisocyanurate Insulation\*
CAUTION**: This product is combustible and shall only be used as specified by the local building code with respect to flame spread classification and to the use of a suitable thermal barrier. For more information, consult (Material) Safety Data Sheet ((M)SDS), call DuPont at 1-866-583-2583, or contact your local building inspector. In an emergency, call 1-989-636-4400.

**DuPont™ StyrofoamTM Extruded Polystyrene Foam Insulation\*
CAUTION**: This product is combustible. Protect from high heat sources. A protective barrier or thermal barrier may be required as specified in the appropriate building code. For more information, consult (Material) Safety Data Sheet ((M)SDS), call DuPont at 1-866-583-2583 or contact your local building inspector. In an emergency, call 1-989-636-4400 in the U.S. or 1-519-339-3711 in Canada.

**WARNING**: Rigid foam insulation does not constitute a working walkable surface or qualify as a fall protection product.

Building and/or construction practices unrelated to building materials could greatly affect moisture and the potential for mold formation. No material supplier including DuPont can give assurance that mold will not develop in any specific system.

\*A former product of The Dow Chemical Company

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