Double Wall Terra-Cotta Cladding with Mineral Fiber Continuous Insulation and Metal Stud Backup

Item	Component	Thickness	Manufacturer	Product
1	Interior Finish *(vapor permeable)*	0”	-	-
2	Interior Gypsum Board	5/8”	-	Type X
3	Metal Stud *(18 GA. Min. @16” O.C.)*	6”	-	-
3A[2]	Stud Cavity Insulation *(Optional)*	2”	Dow	Styrofoam SPF CM-2045
4[1]	Exterior Gypsum Sheathing	5/8”	-	-
5[2]	Self-Adhered Air/Water/Vapor Barrier	40mils	Carlisle	705 FR-A
6[2]	Continuous Insulation	3”	-	Mineral Fiber
7	Cladding Attachment System	1 1/2”	Knight Wall	MFI S-Rail
8[2]	Double Wall Terra-Cotta Cladding	1 1/2”	TerrealNA	Piterak Slim 30
	Total	**13 1/4”**		

[1] *For a 1-hour fire rating change Exterior Gypsum Sheathing to Fire Rated Exterior Gypsum Sheathing.*
[2] *Product recommendations are based on Type I-IV construction requiring NFPA 285 assembly acceptance criteria compliance per IBC 2015 Section 1403.5.*

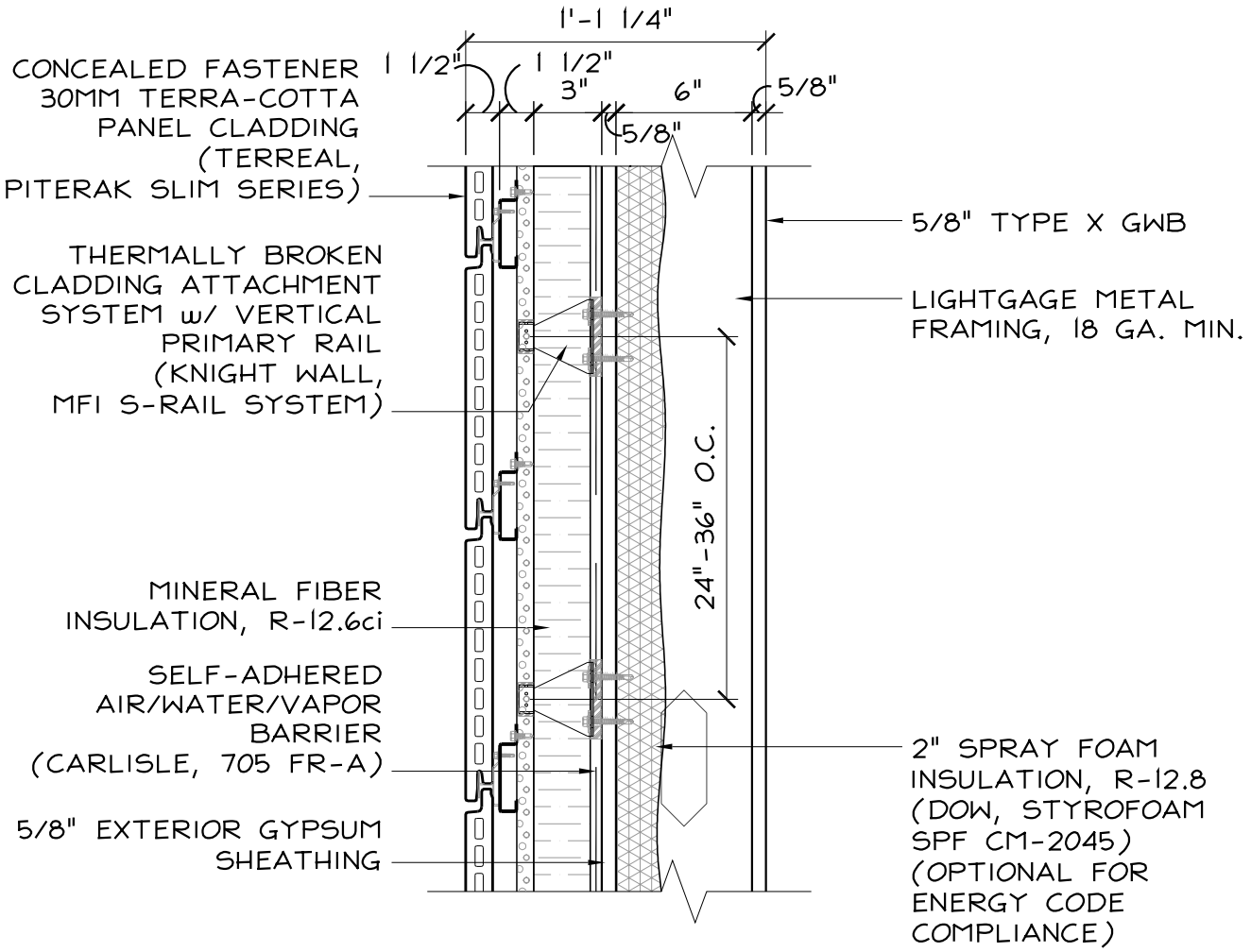
Assembly Performance: *(proposed assembly U-Factors are approximately 0%|23% better than code and have 81%|72% thermal effectiveness)*

	Code Requirement *(IECC 2015 – Metal Framed)*	**Project Requirement** *(if different)*	**Proposed**
Design R-Value: [a]	R-13 + R-7.5ci	N/A	R-12.6ci | R-12.8 + R-12.6ci
Total R-Value:	N/A	N/A	R-17.07 | R-29.87
Effective R-Value: [c]	N/A	N/A	R-13.88 | R-21.56
Design U-Factor: [a, b]	U-0.064	N/A	U-0.064 | U-0.049
Effective U-Factor: [c]	N/A	N/A	U-0.072 | U-0.046
Assembly Air Permeability	0.04 cfm/ft^2 @75Pa	N/A	0.0014 cfm/ft^2 @75Pa

[a] *Wall assembly meets energy code and project thermal requirements without stud cavity insulation.*
[b] *Assembly U-Factor is based on the stud size & spacing noted above and is calculated per IECC 2015 & ASHRAE 90.1-2013 Appendix A.*
[c] *Effective assembly thermal performance is based on stud size & spacing above, manufacturer literature and industry studies on the thermal performance of façades.*

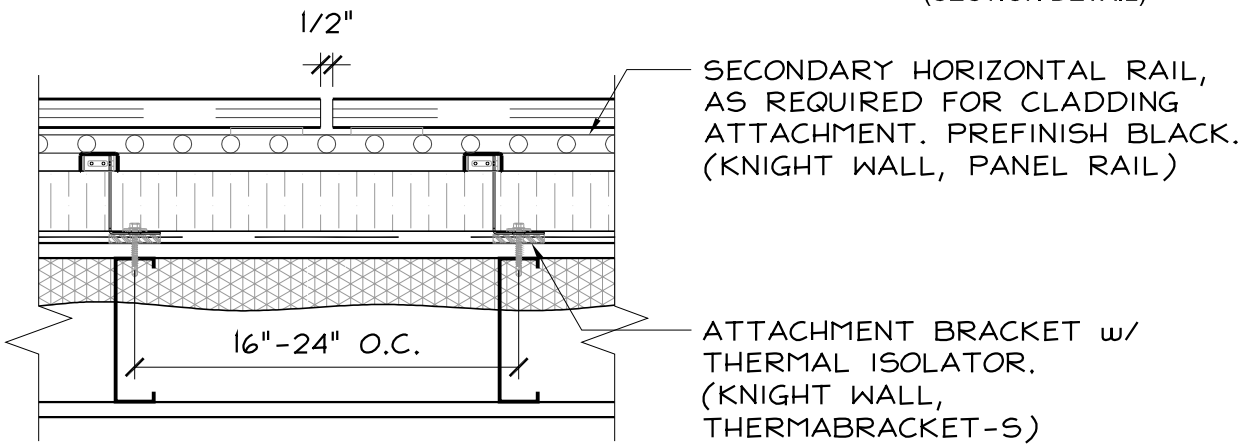
Attachments:

- Typical Clear Wall Detail
- Assembly Dew Point Calculation(s)
- Product Literature



TYPICAL TERRA-COTTA WALL ASSEMBLY

SCALE: 1 1/2" = 1'-0" (SECTION DETAIL)



TYPICAL TERRA-COTTA WALL ASSEMBLY

SCALE: 1 1/2" = 1'-0" (PLAN DETAIL)

PACE BUILDING ENVELOPE REPRESENTATIVES
One Rockdale Street
Braintree, MA 02184
781-541-5060
www.pacerepresentatives.com

Contents: DOUBLE WALL TERRA-COTTA CLADDING w/ THERMALLY BROKEN RAINSCREEN ATTCHMENT SYSTEM, MINERAL FIBER CONTINUOUS INSULATION & METAL STUD BACK-UP

Sketch #:

SK-01

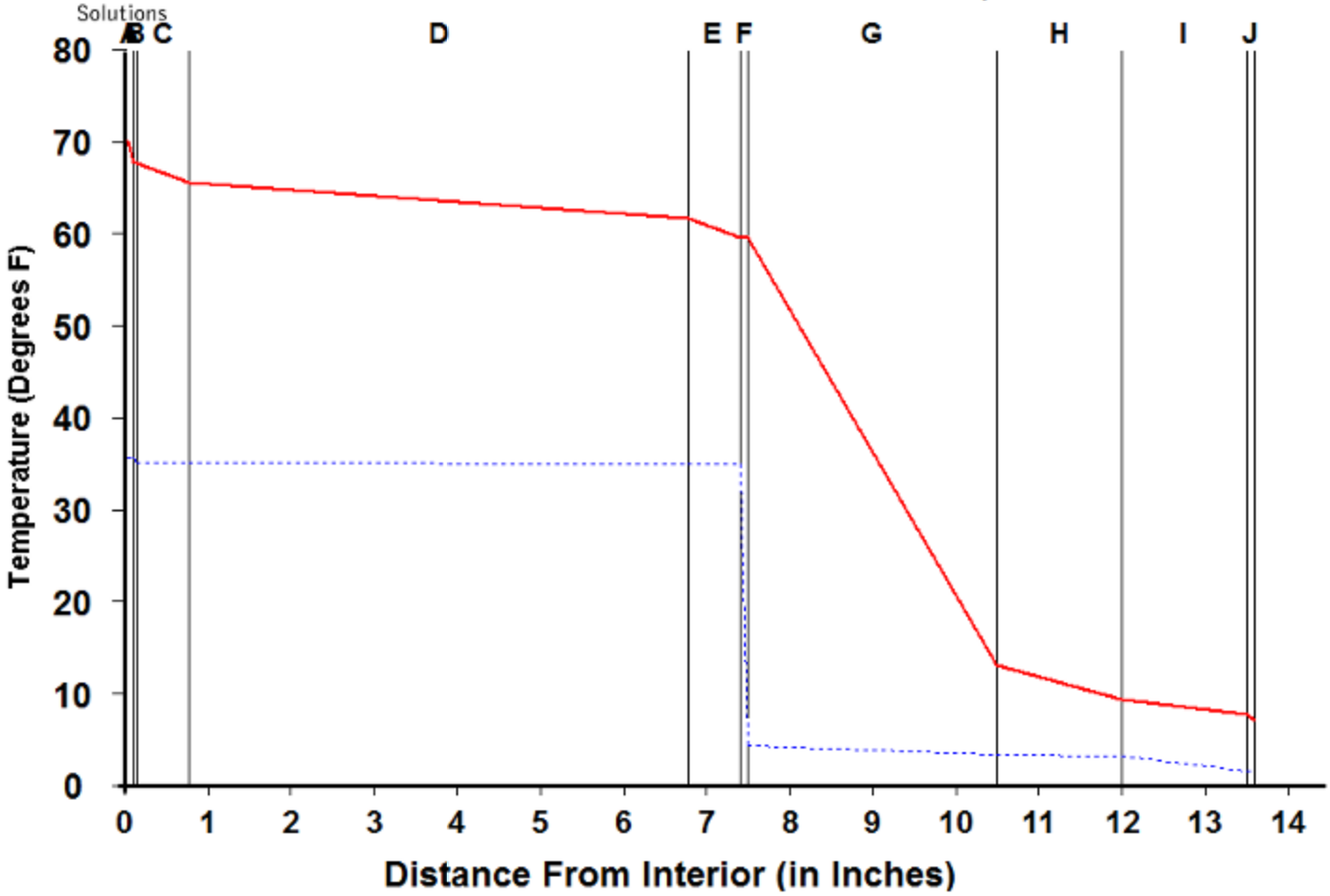
Sheet 1 of 1

Reference detail. Registered professional in responsible charge to review prior to use.

Dewpoint Analysis - Dow Chemical

Building Solutions

Terra-Cotta w/ Mineral Fiber & Metal Stud Backup



Legend
Actual Temperature
Dewpoint Temperature

Dewpoint Theory predicts condensation in a system at any point where the actual and dewpoint temperature lines cross.

Conditions:	Interior	Exterior
Temperature	70.0	7.0
Humidity	28.0	75.0

	Component Name	Thickness	R-Value	Rep
A	Interior Air Film	0.100	0.68	0.001
B	Latex Paint 2 Coat	0.050	0.01	0.500
C	Gypsum Wall Board	0.625	0.56	0.023
D	Wall Air Space NonRefl	6.000	1.05	0.028
E	Exterior Gypsum Sheathing	0.625	0.56	0.027
F	Carlisle 705 FR-A	0.100	0.01	20.000
G	Mineral Fiber	3.000	12.60	0.300
H	Wall Air Space NonRefl	1.500	1.01	0.028
I	Terra-Cotta Cladding	1.500	0.42	0.488
J	Out Air Film Winter	0.100	0.17	0.001
K				
L				
	TOTAL	13.600	17.07	21.396

Interface	Temperature Actual	Temperature Dewpnt	Accum (oz/day-sqft)
-A	70.00	35.43	0.000
AB	67.49	35.43	0.000
BC	67.45	34.94	0.000
CD	65.39	34.92	0.000
DE	61.51	34.89	0.000
EF	59.44	34.87	0.000
FG	59.41	4.21	0.000
GH	12.91	3.23	0.000
HI	9.18	3.13	0.000
IJ	7.63	1.41	0.000
JK	7.00	1.41	0.000
KL			
L-			

NOTICE: This calculation is based on the theory of Water Vapor Migration presented in the ASHRAE 1993 Fundamentals Handbook. Actual performance may vary depending upon air infiltration. workmanship, and building materials. Since the information is provided without charge, The Dow Chemical Company assumes **no obligation or liability** for its use.

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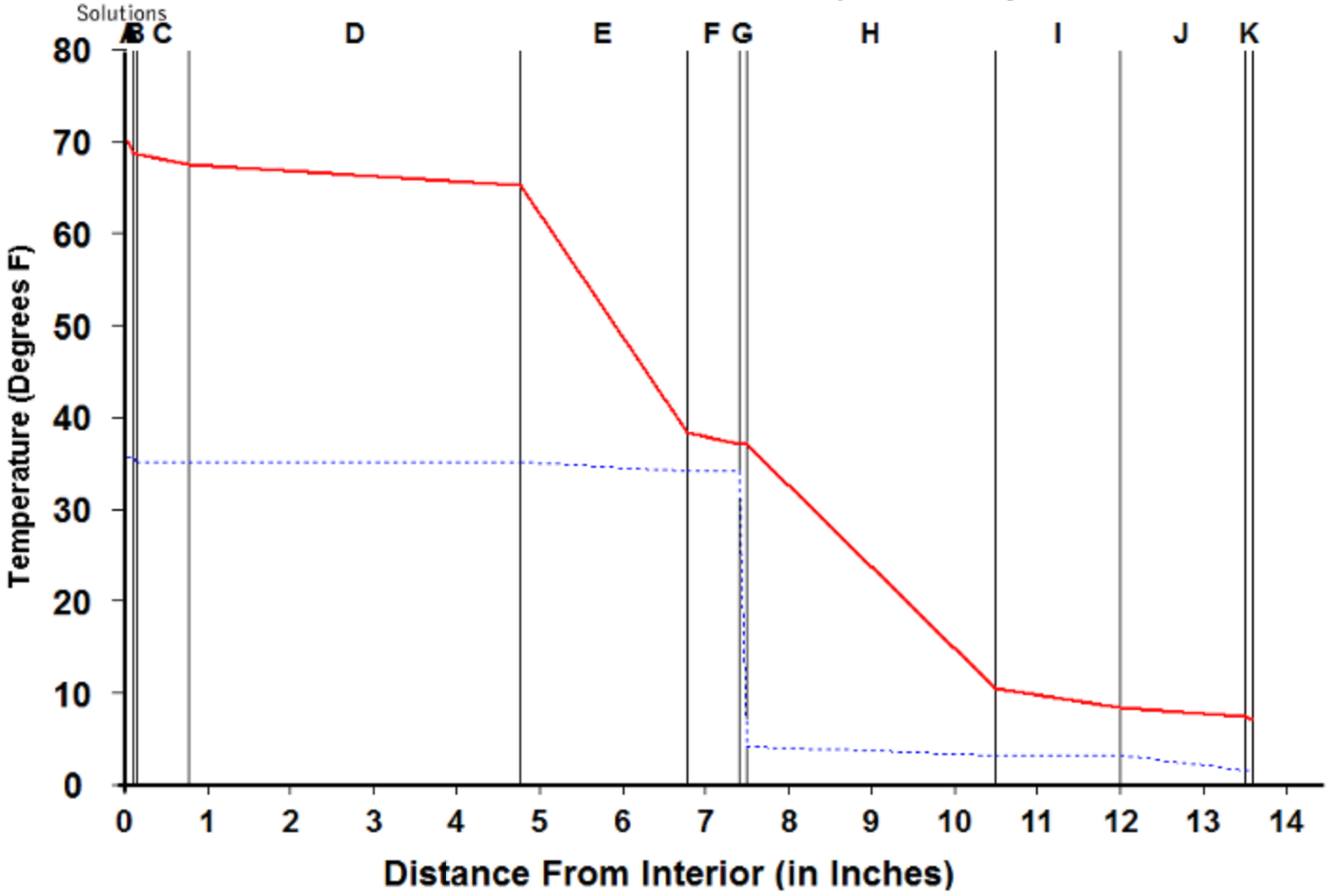
Dewpoint Analysis - Dow Chemical

Building Solutions

Terra-Cotta w/ Mineral Fiber & Metal Stud Backup w/ Stud Cavity Insulation



Legend
Actual Temperature
Dewpoint Temperature

Dewpoint Theory predicts condensation in a system at any point where the actual and dewpoint temperature lines cross.

Conditions:	Interior	Exterior
Temperature	70.0	7.0
Humidity	28.0	75.0

	Component Name	Thickness	R-Value	Rep
A	Interior Air Film	0.100	0.68	0.001
B	Latex Paint 2 Coat	0.050	0.01	0.500
C	Gypsum Wall Board	0.625	0.56	0.023
D	Wall Air Space NonRefl	4.000	1.05	0.028
E	STYROFOAM SPF CM-2045	2.000	12.80	0.910
F	Exterior Gypsum Sheathing	0.625	0.56	0.027
G	Carlisle 705 FR-A	0.100	0.01	20.000
H	Mineral Fiber	3.000	12.60	0.300
I	Wall Air Space NonRefl	1.500	1.01	0.028
J	Terra-Cotta Cladding	1.500	0.42	0.488
K	Out Air Film Winter	0.100	0.17	0.001
L				
	TOTAL	13.600	29.87	22.306

Interface	Temperature Actual	Temperature Dewpnt	Accum (oz/day-sqft)
-A	70.00	35.43	0.000
AB	68.57	35.43	0.000
BC	68.54	34.96	0.000
CD	67.36	34.94	0.000
DE	65.15	34.92	0.000
EF	38.15	34.07	0.000
FG	36.97	34.05	0.000
GH	36.95	4.10	0.000
HI	10.37	3.15	0.000
IJ	8.24	3.06	0.000
JK	7.36	1.41	0.000
KL	7.00	1.41	0.000
L-			

NOTICE: This calculation is based on the theory of Water Vapor Migration presented in the ASHRAE 1993 Fundamentals Handbook. Actual performance may vary depending upon air infiltration. workmanship, and building materials. Since the information is provided without charge, The Dow Chemical Company assumes **no obligation or liability** for its use.

January 5 2016 9:34:06 AM

STYROFOAM™ Brand Spray

Polyurethane Foam (CM Series)

1. PRODUCT NAME

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series)

2. MANUFACTURER

The Dow Chemical Company
Dow Building Solutions
200 Larkin Center, 1605 Joseph Drive
Midland, MI 48674
1-866-583-BLUE (2583)
Fax 1-989-832-1465
www.dowbuildingsolutions.com

3. PRODUCT DESCRIPTION

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) is a two-component, spray-applied polyurethane foam that creates a seamless, monolithic barrier for protection against water vapor and air on the interior of steel stud walls. This closed-cell, 2-pcf spray foam successfully incorporates an advanced blowing agent with zero ozone depleting potential.

STYROFOAM™ Brand SPF (CM Series) is available in three formulas:

CM 2030
30°F – 70°F Ambient Processing
30°F – 60°F Substrate Processing

CM 2045
45°F – 95°F Ambient Processing
45°F – 100°F Substrate Processing

CM 2060
60°F – 100°F Ambient Processing
60°F – 120°F Substrate Processing

Basic Use

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) is designed as a water vapor and air barrier for the THERMAX™ Wall System. STYROFOAM™ Brand SPF (CM Series) expands during installation to fill cavities, cracks and penetrations, preventing uncontrolled air leakage in steel stud cavity walls. The spray foam also provides additional insulation to a wall system.

Sizes

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) is sold in sets of 55 gallon drums (one A isocyanate and one B polyol blend). Contact your Dow sales representative with questions.

4. TECHNICAL DATA

Applicable Standards

Applicable test methods include:

- ASTM C1029 – Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation
- ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM D1622 – Standard Test Method for Apparent Density of Rigid Cellular Plastics
- ASTM D6226 – Standard Test Method for Open Cell Content of Rigid Cellular Plastics

Code Compliances

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) complies with:

- ICC ESR-2670
- Underwriters Laboratories, Inc. (UL) Classified Class A (ASTM E84/UL 723)
- Southwest Research Institute (SwRI) Classified Class A (ASTM E84)

TABLE 1: Typical physical properties[1] of STYROFOAM™ Brand Spray Polyurethane Foam (CM Series)

Property and Test Method	Value		
	CM 2030	CM 2045	CM 2060
Ambient (Substrate) Temperature Range, °F	30–70 (30–60)	45–95 (45–100)	60–100 (60–120)
Core Density, ASTM D1622, lb/ft^3	2.5	2.5	2.2
Compressive Strength, ASTM D1621, lb/in^2, parallel	25	25	20
Tensile Strength, ASTM D1623, lb/in^2, parallel	60	60	60
Closed-cell Content, ASTM D6226, %	>95	>95	>95
Thermal Resistance, ASTM C518, 75°F mean temp., R-value, ft^2•h•°F/Btu, Aged Value (90 days @ 140°F)			
@ 1"	6.0	6.4	6.5
@ 4"	25	24	24
Water Vapor Permeability, ASTM E96, perm-inch	2.2	2.2	2.2
Water Absorption, ASTM D2842, % by volume	1.2	2.5	1.5
Dimensional Stability, ASTM D2126, max. % linear change			
At -20°F, ambient R.H., 7 days	-0.1	0.4	0.1
At 158°F, ambient R.H., 7 days	-2.0	2.2	3.0
At 158°F, 97% R.H., 7 days	Pass[2]	Pass[2]	Pass[2]
Surface Burning Characteristics[3], ASTM E84	Class A	Class A	Class A

(1) Not to be considered sales specifications.Properties determined by processing foam with Gusmer H2O/35 primary heater at 120°F (A,B), hose temperature of 120°F with GX7 gun; .028 drilled module with 70 PCD; dynamic pressures at 600 psi-1,000 psi.
(2) Pass AC 377
(3) Flammability values for this or any other material are not intended to represent hazards that may be present under actual fire conditions.

When used in conjunction with the THERMAX™ Wall System, STYROFOAM™ Brand SPF (CM Series) (up to 1-1/2" thickness), complies with the following codes:

- NFPA 285-[06]: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components, Using Intermediate-Scale, Multistory Test Apparatus
- ASTM E331-[00]: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference
- ASTM E2357-[05]: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

Contact your Dow sales representative or local authorities for state/provincial and local building code requirements and related acceptances.

PHYSICAL PROPERTIES

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) exhibits typical physical properties indicated in Table 1 when tested as represented.

ENVIRONMENTAL DATA

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) is chlorofluorocarbon (CFC) free and uses the Enovate 3000 blowing agent from Honeywell, which is a zero-ozone depleting product.

Fire information

STYROFOAM™ Brand Spray Polyurethane Foam is combustible and may constitute a fire hazard. Do not expose foam to flame or temperatures above 240°F.

5. INSTALLATION

SAFETY AND CONDITIONS OF USE

- Read the instructions and Material Safety Data Sheets carefully before use. MSDSs for STYROFOAM™ Brand SPF products are available at: www.dowbuildingsolutions.com/na.
- Visit www.spraypolyurethane.com for further details and supporting information covering a wide range of topics including an overview of SPF health and safety guidelines, suggested personal protective equipment (PPE), typical first-aid treatment, and regulations and information about "green" marketing.
- STYROFOAM™ Brand Spray Polyurethane Foam contains isocyanate, hydrofluorocarbon blowing agent and polyol. Do not breathe vapor or spray. Use only with a NIOSH-approved supplied air respirator (SAR) in accordance with your company's respiratory protection program.Supplied air respirator or an approved airpurifying respirator equipped with an organic vapor sorbent and a particle filter (P100) is required to maintain exposure levels below ACGIH, OSHA, WEEL or other applicable limits. For situations where the atmospheric levels may exceed the level for which an air-purifying respirator is effective, use a positive-pressure, air-supplying respirator (air line or self-contained breathing apparatus).
- Isocyanate is irritating to the eyes, skin and respiratory system and may cause sensitizationby inhalation or skin contact.Sensitization, or the development of asthma, can lead to permanent respiratory problems.
- STYROFOAM™ Brand SPF will adhere to most surfaces and skin. Do not get foam on skin. When spraying polyurethane foam, wear MDI-resistant chemical gloves (e.g., nitrile) or fabric gloves coated in nitrile, neoprene, butyl or PVC. Spray applicators should wear chemically resistant coveralls or full body suits with hoods and MDI-resistant fitted boots or booties. Professional judgment is necessary to determine the appropriate PPE necessary for secondary activities such as cleaning and trimming of the cured foam. Cured foam must be mechanically removed or allowed to wear off in time.
- The contents are under pressure. STYROFOAM™ Brand SPF should be installed by a trained SPF applicator.

Ambient and substrate temperatures should be within the range stated in Table 1. Substrate must be at least 5 degrees above dew point, with best processing results when ambient humidity is below 80 percent.

Substrate must also be free of moisture (dew or frost), grease, oil, solvents and other materials that would adversely affect the adhesion of the spray polyurethane foam.

Spray equipment must be capable of delivering the proper ratio (1:1 by volume) of polymeric isocyanate and polyol blend at adequate temperatures and spray pressures. Primary and hose heaters should be set between 115°F and 130°F. Dynamic pressures should range between 600 psi and 1200 psi, and should not exceed a difference of 200 psi between the isocyanate and the polyol sides.

It is recommended that STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) be applied to the stud cavity once all insulation board and veneer fasteners have been installed. Apply spray polyurethane foam in the stud cavity and the inside of the stud flanges to ensure that all fastener penetrations are covered. Apply in consecutive layers of no less than 1/2" and no more than 1-1/2" to achieve a maximum thickness of 1-1/2". If multiple layers are used, allow foam to cool completely before applying successive layers.

For more specific instructions, consult "Installation Procedures for THERMAX™ Wall System" (Form No. 179-04074).

6. AVAILABILITY

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) is distributed through an extensive network. For more information, call 1-800-232-2436.and is distributed through an extensive network. For more information, call:

1-800-232-2436 (English)
1-800-565-1255 (French)

7. WARRANTY

See THERMAX™ Wall System Limited Warranties for details (Form No. 179-04493).

8. MAINTENANCE

STYROFOAM™ Brand Spray Polyurethane Foam (CM Series) has a shelf life of six months when stored dry between 60°F and 90°F. Artificial warming of drums is not recommended. Caution should be exercised when opening containers as pressure may be present when material has been exposed to elevated temperatures. Ensure drums are capped after use. Empty drums are nonreturnable and should be disposed of by using current industrial practices in accordance with federal, state or local regulations.

9. TECHNICAL SERVICES

Dow can provide technical information to help address questions when using STYROFOAM™ Brand Spray Polyurethane Foam (CM Series). Technical personnel are available to assist with any insulation project. Call 1-866-583-BLUE (2583).

10. FILING SYSTEMS

- www.thermaxwallsystem.com
- www.dowbuildingsolutions.com
- www.sweets.com

The Dow Chemical Company
Dow Building Solutions
200 Larkin • Midland, MI 48674

US
Technical Information: 1-866-583-BLUE (2583)
Sales Information: 1-800-232-2436

dowbuildingsolutions.com

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Dow Polyurethane Foam Insulation and Sealants
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 240°F (116°C). For more information, consult (Material) Safety Data Sheet ((M)SDS) call Dow at 1-866-583-BLUE (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. When air sealing buildings, ensure that combustion appliances, such as furnaces, water heaters, wood burning stoves, gas stoves and gas dryers are properly vented to the outside. See website: http://www.epa.gov/iaq/homes/hip-ventilation.html. In Canada visit: http://archive.nrc-cnrc.gc.ca/eng/ibp/irc/bsi/83-house-ventilation.html.

STYROFOAM™ Brand Spray Polyurethane Foam contains isocyanate, hydrofluorocarbon blowing agent and polyol. Read all the instructions and (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.

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

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Form No. 179-04063X-0715 CDP

SCIENCE. SERVICE. SOLUTIONS.

CARLISLE COATINGS & WATERPROOFING

AIR & VAPOR BARRIER
Fire Resist 705FR-A

Description

Fire Resist 705FR-A Air & Vapor Barrier is a 40-mil-thick (0.040 inch) self-adhered sheet air and vapor barrier composite membrane consisting of a rubberized-asphalt adhesive laminated to fire resistant aluminum foil/HDPE composite facer. In addition to being tough and dimensionally stable, the facer provides heat reflectivity and fire resistance. Fire Resist 705FR-A is provided in rolls of various widths lined with disposable silicone-coated release paper. The release paper is removed to expose the adhesive as the membrane is pressed in place. Fire Resist 705FR-A provides a complete barrier to moisture and air when adhered to an above-grade substrate. Cut sizes are also useful for other above-grade wall flashing applications. Fire Resist 705FR-A is cold applied and will adhere firmly when pressed against the substrate.

Typical Use

Fire Resist 705FR-A is designed for use in above-grade wall assemblies to function as an air, vapor and water barrier. Fire Resist 705FR-A can be applied over many common building materials including gypsum sheathing, concrete masonry unit (CMU), concrete, wood, structural steel, metal flashings, aluminum extrusions and rigid PVC (i.e. pipe/conduit, window frames). All substrates shall be prepared with a CCW contact adhesive to provide consistent adhesion of Fire Resist 705FR-A in jobsite conditions. Fire Resist 705FR-A can be used in many commercial wall assemblies that are required to pass NFPA 285.

Features and Benefits

- Fire-resistant composition permits use in many NFPA 285 wall assemblies.
- Toughness and 180-day UV resistance allows long exposure time and flexibility in schedule.
- Factory-controlled composition provides uniform coverage and instant rain resistance after installation.
- Self-adhering membrane provides easy, reliable installation. No spray equipment or mil-thickness measurements required.
- Membrane seals around fasteners and bridges cracks, providing an air- and water-tight assembly.
- Fire Resist 705FR-A is a warranted air & vapor barrier system from Carlisle Coatings & Waterproofing.

Project Conditions

Building codes and project specifications require continuity of the air barrier installation. It is the installer's responsibility to understand the extent and sequencing of air barrier installation on the project. Do not proceed with installation until substrate and project conditions conform to requirements specified in this document. All surfaces accepting Fire Resist 705FR-A shall be clean, dry, frost free and of sound condition. Verify that wall assemblies are dried in so that water intrusion will not occur from above, behind or around the membrane installation. Gaps and cracks exceeding ¼" across shall be filled with materials and technique approved by CCW. As Fire Resist 705FR-A cannot span any gap in excess of ¼", electrical/mechanical penetrations, structural steel penetrations, columns/beams, expansion/seismic joints, shelf angles, tie-ins to fenestration and transitions to other building assemblies may require extra work and materials to provide suitable surfaces for continuous installation of Fire Resist 705FR-A. Please consult the Fire Resist 705FR-A details for guidance.

Substrate Inspection

Concrete

Concrete shall be cured in place 7 days minimum. It shall be smooth, with sharp protrusions such as cold joints ground flush. Honeycomb and holes/cracks exceeding ¼" across shall be filled with grout or mortar.

Concrete Masonry Unit (CMU)

Mortar joints shall be struck flush and shall be free of voids exceeding ¼" across. Mortar droppings shall be removed from brick ties and all

Carlisle Coatings & Waterproofing
900 Hensley Lane | Wylie, TX 75098 | 800.527.7092 | **www.carlisleccw.com**

FIRE RESIST

AIR & VAPOR BARRIER
Fire Resist 705FR-A

other surfaces accepting Fire Resist 705FR-A and CCW accessories. Allow mortar joints to dry a minimum of 3 days prior to installation of Fire Resist 705FR-A and CCW accessories.

Gypsum Sheathing

Sheathing boards shall be flush at joints, with gap between boards according to building code and sheathing manufacturer's requirements. Sheathing boards shall also be securely fastened to the structure with proper fastener type, technique and spacing according to building code and sheathing manufacturer's requirements. Sheathing boards shall be repaired or replaced if inspection reveals moisture damage, mechanical damage or if sheathing boards have exceeded the exposure duration or exposure conditions as required by the sheathing manufacturer.

When installing CCW sheet membranes and sheet flashings over gyp-sheathing with glass-mat facers, coverage rates for contact adhesives and primers will depend on the porosity and texture of the sheathing and will vary substantially by gypsum-sheathing brand and manufacturer. To achieve consistent contact adhesive and/or primer coverage with adequate tack, it may be necessary to decrease the coverage rate (i.e. Increase the amount applied) of the contact adhesive and/or primer and/or the application of multiple coats. CCW contact adhesives and primers shall be allowed to dry completely (lower temperatures will extend drying time) before additional coats are applied or membranes installed. Caution should be taken as contact adhesives and/or primers applied to gyp-sheathings with glass-mat facers will take longer to dry than other substrates. Multiple adhesion tests should be performed randomly to verify proper application of primer and ensure a successful application.

OSB, Plywood, Lumber, Pressure-Treated Wood

Wood sheathing inspection carries the same protocol given for gypsum sheathing. Also, moisture content, measured with a wood moisture meter in the core of the substrate, shall be below 20%. Do not cover any wooden materials with Fire Resist 705FR-A or CCW accessories if moisture content is 20% or above. Do not encapsulate wood (such as nailers) with membrane, as this will cause premature rot. In most cases fire- and pressure-treated wood must be kiln dried to accommodate the less than 20% moisture content requirement.

Surface Preparation

Apply CCW contact adhesive to ALL surfaces accepting Fire Resist 705FR-A. CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, CAV-GRIP™ and TRAVEL-TACK™ are all acceptable for this application. Follow the application instructions on the respective contact adhesive technical data sheet.

Installation

Fire Resist CCW-705FR-A is available with either standard or low-temperature adhesive formula. Product label on box will indicate which adhesive is used. Also, product bearing low temperature adhesive has the letters "LT" printed next to the lot number on the facer. Use the LT formula when ambient or substrate temperature is below 40°F. Fire Resist 705FR-A bearing the LT adhesive formula can be used down to 25°F ambient and substrate temperature. Fire Resist 705FR-A with LT adhesive formula becomes difficult to handle at installation temperatures above 80°F. Before starting installation, select the better Fire Resist 705FR-A adhesive choice for the project conditions.

Install Fire Resist 705FR-A in horizontal rows or in vertical runs. Wipe dust or debris from film side of product with a clean, dry rag to assist in forming tight laps. Avoid forming wrinkles and air pockets. Press membrane firmly to substrate with a hand roller, especially at laps, corners and terminations. Overlap adjoining pieces of Fire Resist 705FR-A a minimum of 2". Use narrower cut sizes for detailing. Sequence the installation to provide shingled laps. Membrane shall bear minimum 3" onto each side of transitions such as joints, angle changes and substrate changes. Membrane shall bear 6 inches minimum onto adjacent membrane systems such as foundation waterproofing or roofing. Apply Sure-Seal® Lap Sealant, CCW-201 or other approved sealant to non-water-shedding laps and terminations. After Fire Resist 705FR-A installation, Pressure-Sensitive Elastoform may be used to detail expansion joints and window/wall transitions. Consult Fire Resist 705FR-A details for more information.

Figure 1: Installation in Horizontal Rows

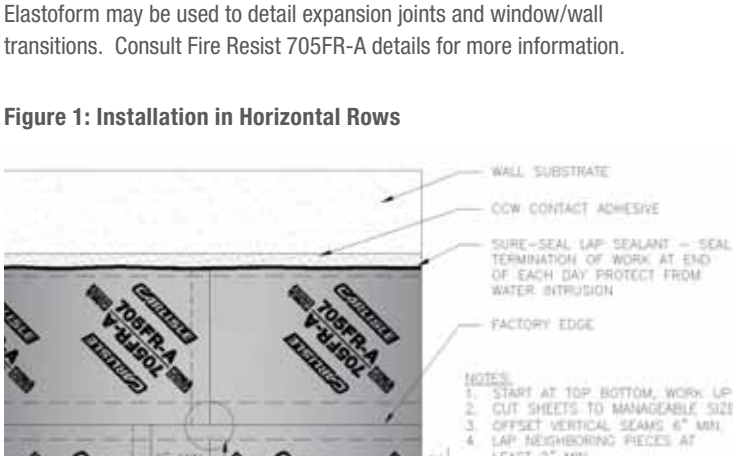
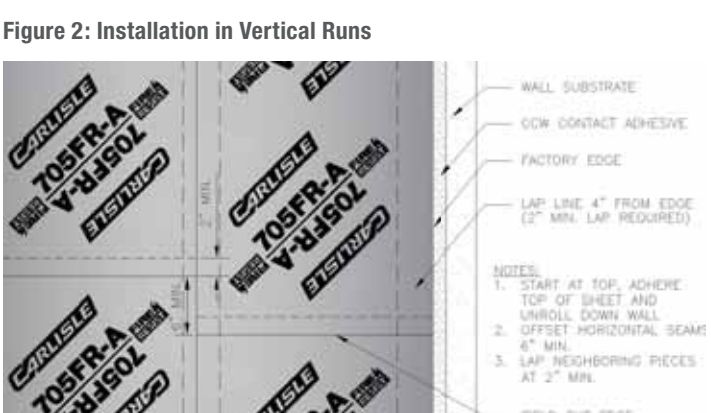


Figure 2: Installation in Vertical Runs



Inspection, Repair And Schedule

Protect membrane from damage by other trades. Do not cover work until it has been inspected according to project requirements. Cover Fire Resist 705FR-A with cladding system as soon as schedule permits. In cold climates, once Fire Resist 705FR-A is installed, avoid heating the building until the exterior insulation is installed. Fire Resist 705FR-A can be left exposed to UV for a maximum of 180 days. Repair damage to membrane by removing loosely adhered material and re-covering with Fire Resist 705FR-A patch, extending beyond the damage by at least 3". Where Fire Resist 705FR-A patch or re-cover is installed, clean debris from surfaces of the old Fire Resist 705FR-A and prepare with CCW contact adhesive. Travel-Tack, a CCW contact adhesive provided in convenient aerosol cans, can be used for this and similar touch-up applications. Seal terminations of repair patch with Sure-Seal Lap Sealant or other approved sealant. If multiple sheets are used in Fire Resist 705FR-A repair/re-cover, offset seams of new installation 12" minimum versus underlying Fire Resist 705FR-A.

Limitations

- Do not install over damp, frosty or contaminated surfaces.
- Do not proceed with installation unless ambient and substrate temperatures are 25ºF or above.
- Do not install in areas expected to reach 180°F or higher.
- Fire Resist 705FR-A is a vapor barrier. The design professional shall determine appropriate use in project wall assemblies.
- Do not install over foam insulation as flashing tape. Use Aluma-Grip 701 or Foil-Grip 1402 for this application.
- Maximum permitted exposure time of Fire Resist 705FR-A on an un-insulated, vertical wall is 180 days.
- Not intended for traffic resistance or as a wearing surface.
- Do not install on roofs.
- Do not install over flexible PVC membrane, silicone, un-cured sealants or other incompatible materials. Consult Fire Resist 705FR-A details for more information.
- Keep edge of membrane ½" minimum back from finished exterior.

Packaging

Fire Resist 705FR-A

36" x 75' roll: (225 ft²/roll) 1 roll/box
24" X 100' roll: (200 ft²/ roll) 1 roll/box
18" X 100' roll: (150 ft²/ roll) 1 roll/box
12" X 100' roll: (100 ft²/ roll) 2 roll/box
9" X 100' roll: (75 ft²/ roll), 2 roll/box
6" X 100' roll: (50 ft²/ roll) 4 roll/box
4" X 100' roll: (33.3 ft²/ roll) 6 roll/box

Fire Resist 705FR-A is available with standard or low temperature (LT) adhesive formulas.

CCW Contact Adhesives

CCW-702 (solvent based, 5-gal pail)
CCW-702LV (solvent based, VOC compliant, 5-gal pail)
CCW-702WB (water based, 5-gal pail)
CCW-715 (solvent based for green concrete, 5-gal pail)
CAV-GRIP #40 Aerosol Cylinder
CAV-GRIP gun
CAV-GRIP 18' hose
CAV-GRIP 12' hose
CAV-GRIP 6' hose
TRAVEL-TACK (12-oz aerosol cans, 12/carton)

CCW Sealants

CCW-201 (2-part Polyurethane, 1.5-gal kit)
CCW Universal Single Ply Sealant, 10.1 fl-oz cartidges, 24 per case
Sure-Seal Lap Sealant (10.3-fl-oz tubes, 25/carton)

Other Approved Sealants

Certain silicone and polyurethane sealants have adequate adhesion to the facer of Fire Resist 705FR-A and are suitable for use over the membrane. A few polyurethane sealants are also chemically compatible with the rubberized-asphalt adhesive. Consult the Fire Resist 705FR-A details for the most current list of approved sealants provided by others.

SCIENCE. SERVICE. SOLUTIONS.

AIR & VAPOR BARRIER

Fire Resist 705FR-A

Typical Properties

Property	Method	Results
Thickness	—	40 mils
Elongation*	ASTM D412	300%
Water Vapor Permeance	ASTM E96 A (desiccant method) ASTM E96 B (water method)	0.01 perm 0.01 perm
Pliability	ASTM D146	Passes @ -25°F 0.063" mandrel
Peel Strength	ASTM D903	7.5 lb/in width
Tear Initiation and Propagation (Film)	ASTM D4073	32 lbf
Puncture Resistance	ASTM E154	80 lbf
Tensile Strength	ASTM D882	44 lbf/in
Water Resistance to Hydrostatic Pressure Head	AATCC 127, mod. 22" [55 cm] column of water for 5 hours	No leaking through membrane or 2" bonded lap
Lap Adhesion	ASTM D1876	5 lbf/in (average)
Water Absorption	ASTM D570	0.12% by wt
Air Permeance	ASTM E2178	0.0010 L/s*m² @ 75 Pa
Air Leakage through Assembly	ASTM E2357	0.007 L/s*m² @ 75 Pa [0.0014 CFM/ft² @ 1.57 PSF], max infiltration/exfiltration after load cycling
Installation Temperature	—	STD formula: Minimum 40°F, ambient & substrate LT adhesive formula: 25°F ambient & substrate
Service Temperature	—	-25°F to 180°F
Nail Sealability	ASTM D1970	No water leakage
Pull-off Adhesion	ASTM D4541, modified 3.75" wood puck, surface prepped with any approved CCW Contact Adhesive	18 PSI (average - on glass mat faced gypsum sheathing)
Burn Performance – Wall Assemblies	NFPA 285	Pass–various exterior wall assemblies with R2+ and other insulations**
Surface Burning	ASTM E 84, membrane applied at full coverage to cement board, foil side facing fire	Flame Spread Index 15, Smoke Generation Index 200
Measurement of Heat Release by Cone Calorimeter	ASTM E 1354, 50 kW/m² heat flux	Peak Heat Release Rate: 6.67 kW/m² Total Heat Release: 1.1 MJ/m² Effective Heat of Combustion: -0.57 MJ/kg

* Elongation of rubberized asphalt adhesive ** Ref – CCW Wall Assembly Design Guide

Warnings and Hazards

Wear gloves suitable for cut protection while installing product. The facer of Fire Resist 705 FR-A is highly reflective. Exposed product on walls can produce glare and can cause significant temperature rise of adjacent landscaping, surfaces or objects. Cover installation as soon as possible if reflectivity will cause problems.

CCW-702, CCW-702LV and Sure-Seal Lap Sealant contain flammable and combustible solvents. Avoid exposure to open flame. Avoid breathing vapors. Use only in areas with adequate ventilation. Refer to MSDS for important warnings and product information.

CAV-GRIP, Travel-Tack: USE IN WELL-VENTILATED AREA. Do not puncture or incinerate container. Do not expose to heat or store at temperatures over 120°F. In case of eye contact, flush thoroughly with running water for at least 15 minutes and get medical attention. REFER TO PRODUCT DATA SHEET FOR PERFORMANCE CAPABILITIES.

Storage

Fire Resist 705FR-A rolls should be stored on-end, under cover, and in areas where the temperature is between 40° and 100°F (4.4° and 38°C). Do not double-stack pallets. Shelf life in original, un-opened packaging is 1 year.

Limited Warranty

Carlisle Coatings & Waterproofing Incorporated (Carlisle) warrants this product to be free of defects in workmanship and materials only at the time of shipment from our factory. If any Carlisle materials prove to contain manufacturing defects that substantially affect their performance, Carlisle will, at its option, replace the materials or refund its purchase price. This limited warranty is the only warranty extended by Carlisle with respect to its materials. There are no other warranties, including the implied warranties of merchantability and fitness for a particular purpose. Carlisle specifically disclaims liability for any incidental, consequential, or other damages, including but not limited to, loss of profits or damages to a structure or its contents, arising under any theory of law whatsoever. The dollar value of Carlisle's liability and buyer's remedy under this limited warranty shall not exceed the purchase price of the Carlisle material in question.

Carlisle Coatings & Waterproofing
900 Hensley Lane | Wylie, TX 75098 | 800.527.7092 | **www.carlisleccw.com**

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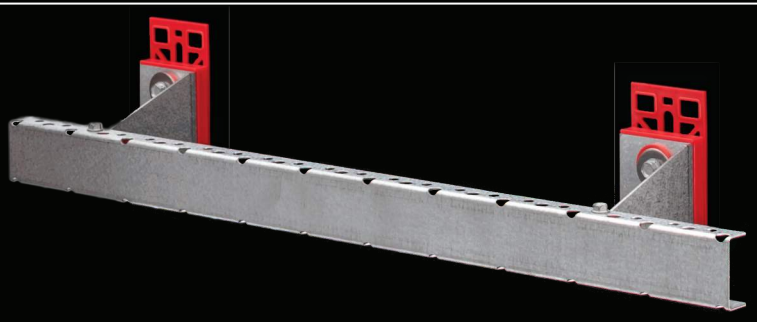
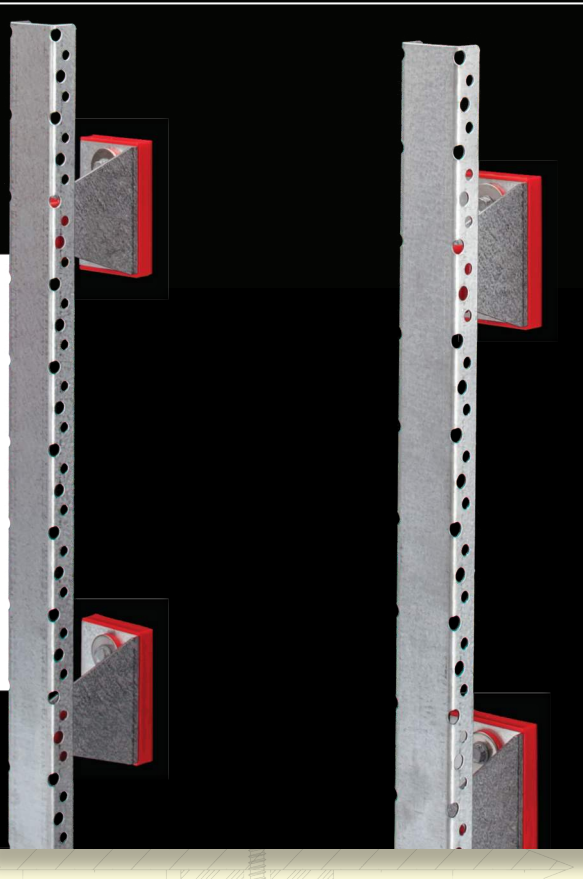
KNIGHT WALL SYSTEMS

MFI-SYSTEM: EASILY MEET & EXCEED ENERGY CODE REQUIREMENTS WITH LESS EXTERIOR MINERAL FIBER INSULATION & MAXIMUM VERSATILITY.



INSTALL RAILS HORIZONTALLY *OR* VERTICALLY

KNIGHT WALL SYSTEMS' THERMALLY ISOLATED BRACKET ATTACHMENT SYSTEM DRAMATICALLY DECREASES THE THERMAL BRIDGING FOUND WITHIN RAIN SCREEN SYSTEMS, WHILE PROVIDING LIMITLESS DESIGN OPTIONS FOR BUILDING FACADES; COMBINING ENERGY EFFICIENCY, FACADE VERSATILITY, MOISTURE CONTROL AND SUSTAINABILITY.



ADVANTAGES TO KNIGHT WALL SYSTEMS' MFI-SYSTEM™:

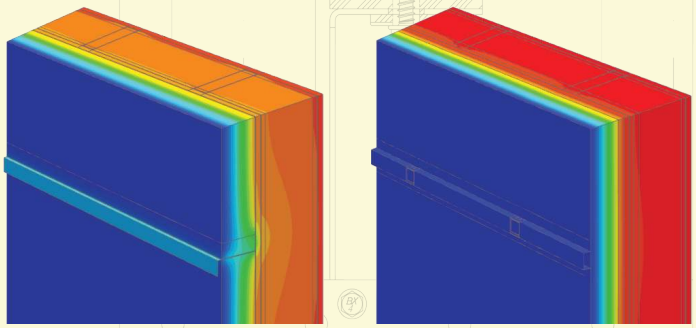
- Easily attain code compliance with exterior mineral fiber insulation
- Brackets can be spaced up to 30" O.C. vertically or every other stud (32" O.C.)
- High corrosive-resistant Zn-Al-Mg ZM40 coating for a long service life vs typical Galvanized steel
- Exterior insulation fits tight around brackets *without* trimming unlike other bracket systems
- Attach nearly any cladding - supplied by any manufacturer
- All components are pre-engineered and third party tested for proven performance and durability
- Excellent ventilation with a constant 3/4-inch, or optional 1 1/2-inch, continuous rain screen cavity
- Easily straighten façades with an integrated adjustment feature *or* specific purpose built shims

ASHRAE 90.1 PRESCRIPTIVE REQUIREMENT*: R_{EFF}-15.6 (U-0.064)

***MFI-SYSTEM™* + 3.5"of mineral fiber+: R_{EFF}-15.7** U-0.0637

EXTERIOR INSULATION EFFECTIVENESS AS COMPARED TO ITS RATED R-VALUE WITH+...

...Vertical Z-Girts:	~40%
...Horizontal Z-Girts:	~52%
...Aluminum Brackets:	~62%
...the MFI-SYSTEM:	~82%



Horizontal Z-Girts | Knight MFI-System

* ASHRAE 90.1 prescriptive requirement for steel frame walls, all R-values units are $ft^2 \cdot {}^{o}F \cdot hr/Btu$

+ Base wall assembly: brackets or girts spaced at 24" O.C., mineral fiber insulation: R-4.2/in, A/W barrier, exterior gypsum board, empty steel stud cavity (16" O.C.), interior gypsum board

NEARLY ELIMINATE ATTACHMENT SYSTEM THERMAL BRIDGES:

Knight's *MFI-System™* uses intermitent brackets – called ThermaBrackets – that can be spaced up to 32" O.C. and uses a unique thermal isolation assembly creating one of the most thermally efficent mineral fiber attachment systems on the market today. This drop-in attachment system is supplied with the correct wall anchors for attaching to the stud sub-structure, ThermaStop isolators pre-assembled on the metal bracket, as well as associated rails and rail fasteners for a complete cladding attachment solution.

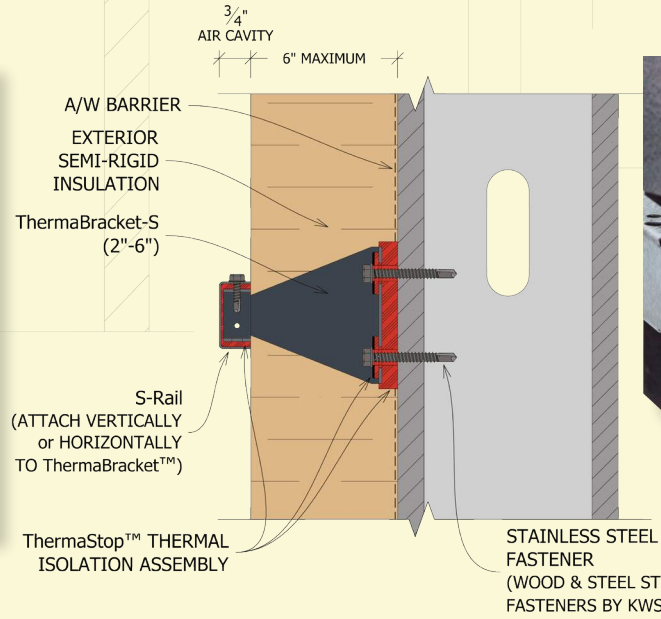
THERMABRACKET™ WITH THERMASTOP™ THERMAL ISOLATION ASSEMBLY

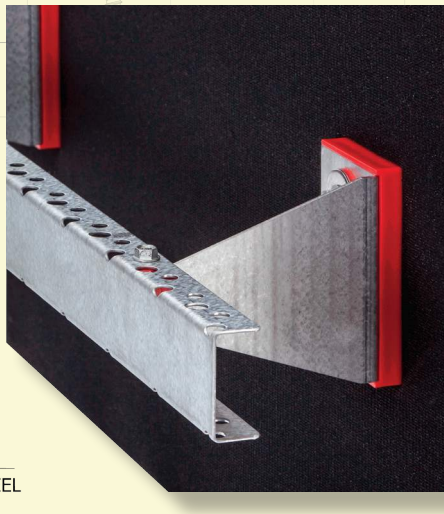
S-Series (Static) - 3/4-inch Deep Rail

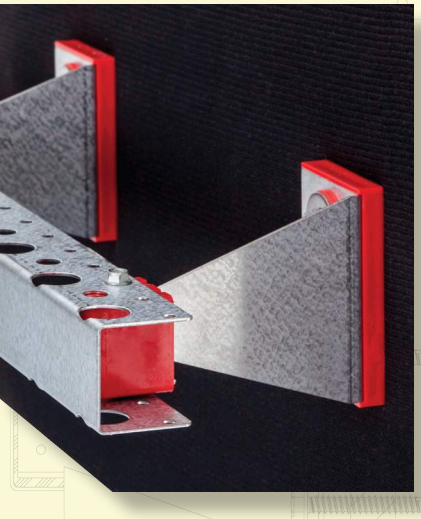
¤ The S-Rail to ThermaBracket-S connection is fixed.

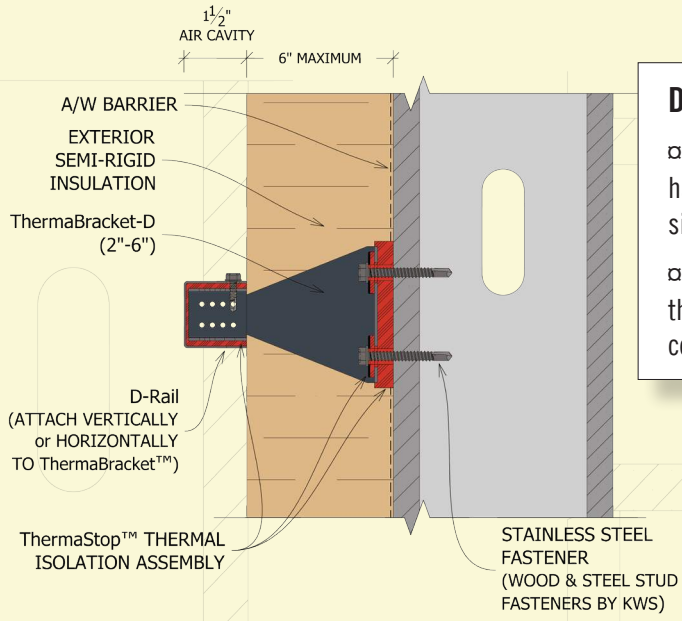
¤ Adjustments are made on an out-of-plumb or out-of-plane substrates by Knight's supplied isolator shim without sacrficing thermal performance.

¤ Self-aligning shim fits square, straight and flat to the back of the isolator by means of raised edges that securely lock the shim inplace for maximum structural integrity.









D-Series (Dynamic) - 1 1/2-inch Deep Rail

¤ The D-Rail to ThermaBracket-D connection has built in adjustability of 7/8" for a quick, simple and precise installation.

¤ Adjustments are made in the field by sliding the D-Rail in, or out, at the ThermaBracket-D connection.

KNIGHT WALL CAN CONTRIBUTE TO THE FOLLOWING USGBC LEED CREDITS:

¤ Energy & Atmosphere (EA) Prequisite and Credit 1

¤ Materials & Resources (MR) Credits 4 and 5

ALL KNIGHT WALL SYSTEMS COMPONENTS ARE MANUFACTURED IN THE USA. (PATENT PENDING)

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KNIGHT
WALL SYSTEMS
28308 N Cedar Road, Deer Park, WA 99006
www.knightwallsystems.com
1-855-597-9255 (KWS-WALL)
509.262.0104

MFI-System, ThermaBracket, ThermaStop and PanelRail are trademarks of Knight Wall Systems. Patent US 8,429,866 B2 and others pending

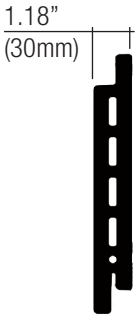
TERREAL NORTH AMERICA

A Subsidiary of LUDOWICI ROOF TILE

Terra Cotta Cladding

P.O. Box 309 - New Lexington, OH 43764
888-582-9052

PITERAK SLIM 30™



Piterak Slim 30™ is a 30mm thick, double-skin terra cotta rainscreen cladding product with overlapping horizontal reveals. The product is a large module terra cotta panel available in four standard sizes and a multitude of made-to-order sizes with a maximum height of 2'-0" and length of 6'-0". All sizes may be cut by the installation contractor for specific field conditions. Piterak Slim 30™ provides excellent structural load performance that is equivalent to thicker terra cotta panels while providing a slender profile and minimal material weight. Our product provides a high wind resistance and the highest (Q4) impact resistance rating under French CSTB standards. The terra cotta cladding panels are supported by our engineered rainscreen support framing system and stainless steel installation clips. Piterak Slim 30™ is a terra cotta cladding product that provides structural versatility and superior aesthetics in an economical rainscreen solution.

Terreal Overview:

- Oldest terra cotta manufacturer in Europe
- Millions of square feet installed worldwide
- Substantial capacity due to large automated factories
- Over 1,000 projects completed
- A variety of complete, engineered rainscreen systems offered
- 26 terra cotta factories around the world including 3 terra cotta cladding manufacturing facilities
- Factory representation in the United States (not distributors or independent brokers)

Rainscreen Installation Benefits:

- Improves structure life expectancy by protecting primary wall with second skin
- Energy savings due to thermal benefits from reduction in heat transfer into the building
- Low maintenance costs
- Lightweight and can be installed year round in all weather conditions
- Pressure equalized cavity and air space ensure a more weather tight structure

10 Year Warranty

FROST RESISTANT

Terra Cotta Panel Attributes:

- A modern use of the most traditional building material – CLAY
- Superior aesthetics due to terra cotta's warm, beautiful, earth-tone colors
- Very versatile with many different colors, textures and sizes
- A color permanent facade that will not fade
- A 100% natural facade made from the earth
- Class A fire rated – does not burn
- A sustainable wall material that will last 100 years
- Technically proven manufacturing process with centuries of success
- Maintenance free and durable makes terra cotta cost effective due to low life cycle costs

Testing

ASTM C67-07A Breaking Load Test (passed)
ASTM C67-07A Efflorescence Test (passed)
ASTM C67-07A Freeze & Thaw Test (passed)
ASTM C67-07A Water Absorption Test (passed)

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PITERAK SLIM 30™

Standard Size Physical Characteristics - Imperial Modules*

Size (in) Size (mm)	**Center to Center Module (in)** Center to Center Module (mm)	**Quantity per Sq Ft** Quantity per Sq M^2	**Unit Weight (lbs)** Unit Weight (kg)	**Weight (lbs) per Sq Ft** Weight (kg) per M^2
8.55" x 59.5" x 1.18" 217 x 1511 x 30	**8" x 60"** 203 x 1524	**.3** 3.23	**33.1** 15.01	**9.94** 48.5
12.55" x 59.5" x 1.18" 319 x 1511 x 30	**12" x 60"** 305 x 1524	**.2** 2.15	**49.7** 22.54	**9.94** 48.5
18.55" x 59.5" x 1.18" 471 x 1511 x 30	**18" x 60"** 457 x 1524	**.133** 1.44	**74.55** 33.81	**9.94** 48.5
24.55" x 59.5" x 1.18" 624 x 1511 x 30	**24" x 60"** 609 x 1524	**.1** 1.08	**99.4** 45.09	**9.94** 48.5

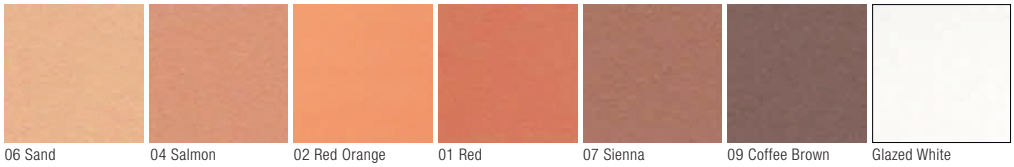
*Available in exact United States Imperial modules for ease of construction layout and installation

Standard Size Physical Characteristics - Metric Modules

Size (mm) Size (in)	**Center to Center Module (mm)** Center to Center Module (in)	**Quantity per Sq M^2** Quantity per Sq Ft	**Unit Weight (kg)** Unit Weight (lbs)	**Weight (kg) per M^2** Weight (lbs) per Sq Ft
214 x 1520 x 30 8.43" x 59.84" x 1.18"	**200 x 1530** 7.87" x 60.24"	**3.3** .307	**14.6** 32.2	**48.5** 9.94
264 x 1520 x 30 10.39" x 59.84" x 1.18"	**250 x 1530** 9.84" x 60.24"	**2.6** .242	**18.2** 40.1	**48.5** 9.94
314 x 1520 x 30 12.36" x 59.84" x 1.18"	**300 x 1530** 11.81" x 60.24"	**2.2** .204	**21.8** 48.1	**48.5** 9.94
414 x 1520 x 30 16.30" x 59.84" x 1.18"	**400 x 1530** 15.75" x 60.24"	**1.6** .149	**29.5** 65.0	**48.5** 9.94

Standard Colors

10 Chalk White | 03 Champagne | 11 Sahara Beige | 12 Light Grey | 13 Storm Grey | 15 Slate Grey



06 Sand | 04 Salmon | 02 Red Orange | 01 Red | 07 Sienna | 09 Coffee Brown

Glazed Colors*

Glazed Grey

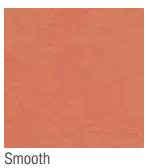
Glazed White

Custom Colors*

Terreal can produce an infinite range of custom colors with a matte, semi gloss, gloss or metallic finish.

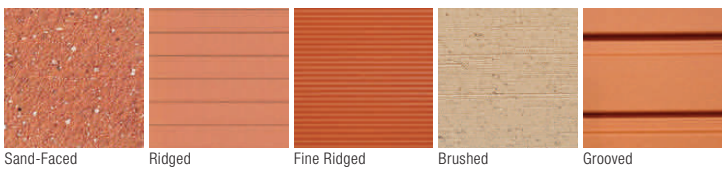
* Special shapes, glazed colors and custom color offerings vary by order and are based on order size and current plant production volumes.

Standard Surface



Smooth

Custom Surfaces



Sand-Faced | Ridged | Fine Ridged | Brushed | Grooved

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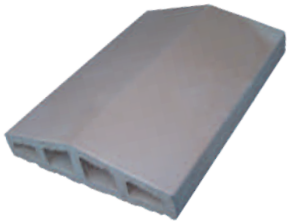
PITERAK SLIM 30™

Special Shapes

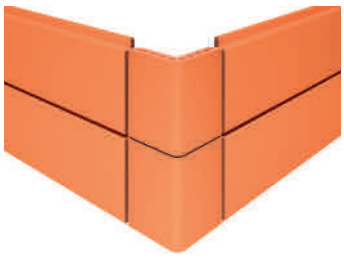
Special shaped panels for both Piterak Slim 40™ and Piterak Slim 30™ can add texture and drama. Ribs, bars, chevrons, rounded ribs or gentle rolling curves are some of the possibilities. Special shapes, glazed colors and custom color offerings vary by project scope and are based on order size and current plant production volumes. Contact Terreal for assistance in designing a shape to fit your architectural vision.

Window Sill

Copings



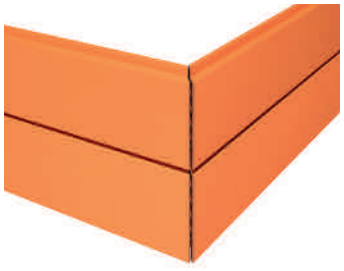
Corners



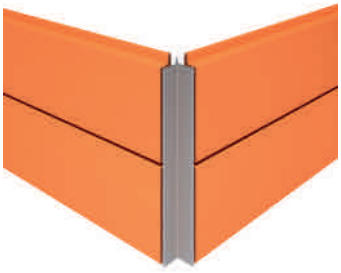
Factory made corner units

90º Bullnose corner

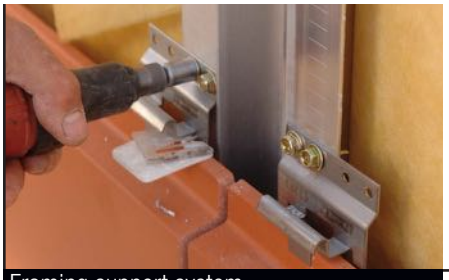
Custom angle bullnose corner



Factory or field mitered corner

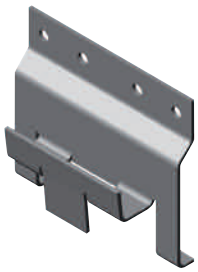


Metal accent trim corner



Framing support system

Vertical support profile



Piterak Slim 30™ regular clip

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