

PERM-A-BARRIER® Air Barriers NFPA Compliant Wall Assemblies Data Sheet

Special Notes and Alternate Allowances:

- Mineral Wool Allowance- NFPA 285 tables for mineral wool are not available. For any listed insulation, mineral wool may be used as a replacement for combustible insulation.
- No Insulation Allowance - NFPA 285 tables for no insulation are not available. Where the WRB is allowed over combustible insulation, those WRB's allowed over the insulation may be used on the base-wall with no insulation.
 - It is not permitted to remove insulation from a table – unless the table allows WRB over the insulation. In this case, when the insulation is removed, then that WRB over the insulation is to be used on the base wall surface.
 - Do not use the WRB as listed on the base wall surface when removing the insulation to allow the WRB over the insulation.
 - Adhere to the maximum air gap as stated within the approval when performing this process.
- WRB Allowance - GCP PERM-A-BARRIER® Aluminum Wall Membrane or PERM-A-BARRIER® Ultra may replace any WRB shown since these WRBs are less combustible than the WRBs listed in the approvals.
- WRBs may not be used under and over insulation.
- Where an approval does not list “None” for WRB, None may be used to comply with the point above.
- Where an approval does not list air gaps for specific claddings, use the air gap tested for brick (usually 2 inches) as a maximum.
- Each approval listed is for specific code years. See the tables below for the applicable code years.
- When 2 in. thick (min.), 4 pcf density (min.) mineral wool (non-combustible per ASTM E136) covers the WRB, any GCP WRB may be used on the base wall under the mineral wool.

For walls containing mineral wool insulation

Based on DrJ TER 1306-03 (NFPA 285-23 for code years up to 2024). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System Use any of these items No Sheathing is needed for 1 and 2	1	Cast concrete walls (1 in. minimum)
	2	CMU Concrete Walls (1 in. minimum)
	3	20-gauge (minimum) 3 5/8 in. (minimum) steel studs with 5/8 in. thick Type X gypsum wallboard on interior
	4	Fire-Retardant Treated (FRT) wood studs spaced 24 in. o.c. (maximum) with 5/8 in. thick Type X gypsum wallboard on interior
Floorline Firestopping Use any of these items	1	None - only with exterior sheathing option 1, 3, 4, or 5 (gypsum wallboard, concrete, DensElement® or Securock® ExoAir® 430)
	2	4 in. thick, 4-pcf mineral fiber (wool) safing insulation installed with Z-clips or equivalent
	3	1 1/2 in. FRT lumber for use with FRT studs
Cavity Insulation Use any of these items	1	None
	2	Any noncombustible insulation per ASTM E136
	3	Any mineral fiber (Board Type Class A ASTM E84 faced or unfaced)
	4	Any fiberglass (Batt Type Class A ASTM E84 faced or unfaced)
Exterior Sheathing Use any of these items Note: When Items 4 or 5 (integrated sheathing WRB) are used, WRB listed below may not be added on top of the sheathing. Sheathings 1-7 are only used for stud base walls No sheathing is needed for Base Walls 1 or 2	1	1/2 in. or thicker exterior type gypsum sheathing
	2	None - only when cavity SPF insulation is not used and a special opening perimeter is used (see the last entry in this table).
	3	2 in. thick precast concrete panels attached to structural elements of building
	4	1/2 in. or thicker GP DensElement® sheathing with integrated WRB
	5	1/2 in. or 5/8 in. thick USG Securock® ExoAir® 430
	6	7/16 in. (minimum) FRT plywood panels complying with IBC Section 2303.2 and installed following code allowances for Types I, II, III, or IV construction
	7	NexGen MAXTERRA® MgO 12 mm, 16 mm, or 20 mm
	Note	When SPF is used in the cavity, exterior sheathing must be used. See specific sheathing thicknesses above
WRB Over Base Wall	1	Any GCP WRB
Exterior Insulation Mineral wool (2" min. thick, unfaced, mechanically attached and meets ASTM C612)	1	The mineral wool shall not have any type of facer on either side
	2	The mineral wool shall be noncombustible via ASTM E136 testing. The density of the mineral wool shall range from 4.0 to 12.0 lbs/ft ³ . The R-value/inch of the mineral wool shall range from 3.5 to 4.5
	3	The mineral wool insulation must be mechanically attached
	4	The mineral wool must completely cover the air barrier
Exterior Cladding Use any of these items Note: Important: Maximum air	1	Brick – Nominal 4 in. clay brick or CMU veneer (hollow or solid) with maximum 2 1/4 in. air gap behind the brick or CMU. Brick ties/anchors 24 in. o.c. (maximum)

gap 2 1/4 in. (distance from cladding inner face to insulation) Note: Diamond Furr TT-4 (manufactured by Brand X Metals) may be used to install 3-coat stucco item 2 in the cladding list. Cladding may be attached with Knight Wall Systems ThermaZee® or other metallic Z girt	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath. An optional secondary WRB (WRB allowed OVER insulation over first WRB) can be installed between the insulation and lath. The optional second WRB may be any mechanically attached sheet product, asphalt, or butyl-based building paper (stapled or other mechanical attachment) with no adhesive. The second WRB may not be self-adhering full coverage asphalt or self-adhering full coverage butyl-based membranes. See note for Diamond Furr TT-4 installation. For example, the secondary WRB may be paper backing attached to lath meeting Federal Specification UUB790A: Type 1, Grade D, Style 2, or Fortifiber / Henry Jumbo Tex 60 Minute
	3	Limestone – Minimum 2 in. thick
	4	Natural stone veneer – Minimum 2 in. thick
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51
	6	Terracotta cladding – Minimum 1 1/4 in. thick
	7	Any ACM or MCM that has passed NFPA 285
	8	Uninsulated sheet metal building panels including aluminum, steel, copper, or zinc
	9	Uninsulated fiber-cement cladding or siding minimum 1/4 in. thick. Must be 8 mm when Strongirt® is used
	10	Stone/aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria
	11	Autoclaved-aerated-concrete (AAC) panels (minimum 1 1/2 in. thick)
	12	Reynobond® ZCM zinc metal composite panel
	13	Terreal Zephir® Evolution Rainscreen System (terra cotta), minimum 9/16 in. thick
	14	User note - reserved for FunderMax m.look cladding with maximum 1 1/2 in. airspace, cladding manufacturer no longer supports use of this cladding in U.S. exterior walls
	15	CERACLAD using the manufacturer standard installation technique, air gap not to exceed 15mm
	16	CUPACLAD Slate: 101 Logic, 101 Random, 101 Parallel, 210 Vanguard. Must be 8mm minimum when Strongirt® is used
	17	Glen-Gery Thin Tech® Masonry Veneer (only with optional noncombustible mortar)
	18	Glen-Gery Tru-Brix (only with optional noncombustible mortar)
	19	Telling Corium Thin Brick System (only with steel or aluminum brick tray and optional noncombustible mortar)

	20	Thin brick or stone (minimum 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer-modified) to the base wall. A secondary WRB can be installed between the exterior sheathing and the brick. The secondary WRB shall not be full-coverage asphalt or butyl-based self-adhered membranes. See cladding #2 for examples
	21	Telluride Stone (minimum 1 in.) applied to the base wall (with approved WRB or WRB in Cladding #20) using plaster/lath
	22	5/8 in. Nichiha Architectural Wall Panels (AWP 3030), Nichiha Cladding 5/16 in. per Intertek CCRR 0258. Nichiha Cladding must be 8mm minimum when Strongirt® is used
	23	Ceramic or Porcelain Tile. Must be 8mm minimum when Strongirt® is used
		a. 1/4 in. minimum generic Ceramic or Porcelain tile - mechanically attached
		b. Ceramic or Porcelain tile- 3/8 in. thick (minimum) bonded using noncombustible mortar adhesive to a 1/2 in. thick (minimum) cement board or gypsum sheathing
		c. 12 mm Porcelanosa XTone per ESR 4555
	24	Any one coat stucco (3/8 in. to 1/2 in. min) that meets any of the following:
		a. AC11 acceptance criteria for one coat stucco; or
		b. is approved for use in Type I-IV construction; or
		c. has been tested per NFPA285; or
		d. stays in place when tested per ASTM E119 (stucco exposed to fire) for at least 30 minutes
	25	Any noncombustible cement board adhered to the exterior side or mechanically attached to framing through the mineral wool. The cement board is covered with NFPA 285 approved EIFS lamina (mesh, base coat, and finish coat) WITHOUT the EIFS Expanded Polystyrene (EPS) board. Adhered cement board may be installed over the mineral wool with construction adhesive of 2 in. D dabs spaced 18 in. apart or, 1 ft. long 1/4 in. wide ribbons spaced 1 ft. apart. EIFS Approval Examples: MasterWall (IAPMO ER0433), Dryvit (ESR 1543), STO (ESR 2536), and other accredited 3rd party EIFS approvals.
	26	8 mm (min) or 5/16 in. (min) SwissPearl® Fiber Cement Cladding
	27	Thin Brick with SpeedyMason Brick Lath and Brick Lath Rainscreen - minimum 9/16 in. thick
		a. May be used without exterior stud sheathing
		b. All screws must penetrate through to studs, where the system can attach directly to the FRT plywood

		c. Must use Spec Mix Adhered Veneer Thin Veneer Adhesion Mortar XP500 or cementitious mortar (standard or polymer modified)
		d. Must use header as test
Special Claddings Use the base walls listed above. When gypsum sheathing is not used on stud exterior, do not use spray foam in stud cavity. ONLY use WRBs over 5/8 in. gypsum that are explicitly approved together with the Special Claddings	1	When 5/8 in. gypsum sheathing is used over mineral wool with or without exterior sheathing on the exterior of studs (and the window opening is lined with 5/8 in. gypsum board over 16-gauge steel), the following claddings may be used.
		a. High Pressure Laminate (HPL) exterior veneers are allowed for use when the HPL veneer and the water resistive barrier proposed for use have been successfully tested / approved together per NFPA 285. The installation requirements outbound from the 5/8 in. gypsum layer in the approval report must be followed, including all exterior layers, furring, attachment depth, and maximum air gap behind the cladding.
		b. Exterior veneers of NFPA 285-compliant combustible materials are allowed for use when the combustible veneer and the WRB contemplated for use have been successfully tested/approved together per NFPA 285. The installation requirements outbound from the 5/8 in. gypsum layer in the approval report must be followed, including all exterior layers, furring, attachment depth, and maximum air gap behind the cladding. As an example, Parklex Prodema Naturclad-B F wood laminate panel system installed over DuPont™ Tyvek® Firecurb HDPE Membrane water-resistive barrier per Intertek Design PUI/CWP 30-05.
Z Girts Use any of these items for claddings requiring girts	1	Metallic Z Girts
	2	Horizontal Smart Ci-GreenGirt
	3	Horizontal Armatherm™ FRR Z Girt
	4	Knight Wall ThermaZee®
	5	Strongirt® (Horizontal only) - Claddings must be 8 mm minimum thickness, and not for use with Claddings 7, 8, 10, or 12
	6	SFS NH3 (horizontal only)
	7	Cascadia Clip (horizontal only)
	Note	Girt spacing should be to comply with wind load per manufacturer instructions.
Flashing of Opening Perimeter (Windows, Doors, etc.) Use items 1 or 2	1	There is no restriction on flashings of openings for wall designs referencing compliance with NFPA 285-12, when using gypsum sheathing on the exterior of studs or Base Wall 1 or 2.
	2	For wall designs referencing NFPA 285-23 or older editions of NFPA 285 with gypsum sheathing on the stud exterior, or for Base Wall 1 or 2, use the following: Header 24-gauge Steel w/ 0.040 aluminum surrounding the steel.

Please note that NFPA 285 compliant assemblies with mineral wool insulation are not limited to the table above. For any listed insulation below, mineral wool may be used as a replacement for combustible insulation.

For exterior walls where the air barrier is the only combustible component

Per 2021 IBC section 1402.5, exception 2

Wall Component	Materials	
Base Wall System Use any of these items	1	Concrete wall (1 in. minimum)
	2	Concrete masonry wall (1 in. minimum)
	3	Standard clay brick wall
	4	Adobe block wall
	5	1 layer – 5/8” thick, Type X, gypsum wallboard on interior, installed over steel studs: minimum 3 5/8” depth, minimum 20-gauge at a maximum of 16” OC with lateral bracing every 4 ft. vertically
Cavity Insulation Use any of these items	1	None
	2	Any noncombustible insulation per ASTM E136
	4	Any fiberglass (Batt Type Class A ASTM E84 faced or unfaced)
Exterior Sheathing Use any of these items	1	None
	2	1/2 in. thick, exterior type gypsum sheathing
	3	5/8 in. thick, Type X, exterior type gypsum sheathing
WRB applied to gypsum sheathing Use any of these items	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
Exterior Veneer	Brick, concrete, stone, terra cotta, stucco or steel with minimum thickness listed in accordance with Table 1404.2 in chapter 14 of IBC	

Please note that NFPA 285 compliant assemblies without exterior insulation are not limited to the table above. For any WRB that is allowed over combustible insulation, those WRB's may be used on the base-wall with no insulation.

Walls containing up to 3 in. Kingspan GreenGuard® XPS Insulation

Based on DrJ TER 1407-05 (NFPA 285-23 for code years up to 2024). Please refer to the original evaluation report and XPS manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System Use any of these options	1	Concrete Wall
	2	Concrete Masonry Wall
	3	20-gauge (min) 3 5/8 in. depth (min.) steel studs spaced at a maximum of 16 in. o.c. with lateral bracing every 4 ft. vertically
		a. 1 layer - 5/8 in. thick Type X or 1/2 in. thick Type X gypsum wallboard on interior
Floorline Firestopping	1	4 lb/cu ft mineral wool (i.e., Thermafiber®) in each stud cavity at each floor line, attached with Z-clips or equivalent
Cavity Insulation Use any of these options	1	None
	2	Any noncombustible insulation per ASTM E136
	3	Fiberglass (Batt type Class A ASTM E84 faced or unfaced)
Exterior Sheathing Use any of these options	1	None
	2	Minimum 1/2 in. thick, exterior type gypsum sheathing
	3	Minimum 5/8 in. thick, Type X, exterior type gypsum sheathing
Air Barrier or Weather-Resistive Barrier Applied to Exterior Sheathing	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® NPL 10
	5	PERM-A-BARRIER® Ultra
	6	PERM-A-BARRIER® NPS
	7	PERM-A-BARRIER® VPL 50RS UV
	8	PERM-A-BARRIER® VPS 30
	Note	All WRB to be installed at the indicated or recommended application rates and per the manufacturer installation instructions
Exterior Insulation	1	Kingspan GreenGuard® XPS - 1/2 in. minimum and 3 in. maximum
	Note	Seal all insulation joints with maximum 4 in. wide asphalt or Butyl based flashing tape
Exterior Veneer Use any of these options	1	Brick
		a. Standard nominal 4 in. thick, clay brick
		b. Brick veneer anchors - standard types - installed maximum 24 in. o.c. vertically on each stud
		c. Maximum 2 in. air gap between exterior insulation and brick
	2	Concrete
		a. Minimum 2 in. thick
		b. Maximum 2 in. air gap between exterior insulation and concrete.

3	CMU - Concrete Masonry Units
	a. Minimum 4 in. thick
	b. Maximum 2 in. air gap between exterior insulation and CMU
4	Stone Veneer
	a. Minimum 2 in. thick limestone or natural stone veneer
	b. Minimum 1 1/2 in. thick cast artificial stone veneer
	c. Any standard non-open joint technique may be used (such as shiplap, etc.)
5	Terracotta Cladding
	a. Minimum 1 1/4 in. thick
	b. Any standard joint installation technique may be used (such as shiplap, etc.)
6	Portland cement-sand plaster (Stucco) over metal lath
	a. Minimum 3/4 in. thick
	b. 2 or 3-coat application
	c. No air gap between Stucco veneer and exterior insulation

Walls containing up to 4 in. Kingspan GreenGuard® XPS Insulation

Based on DrJ TER 1407-05 (NFPA 285-23 for code years up to 2024). Please refer to the original evaluation report and XPS manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System	1	18-gauge 3 5/8 in. depth (min.) galvanized steel studs spaced at a maximum 24 in. o.c.
		a. 1 layer - 5/8 in. thick gypsum wallboard on interior
Cavity Insulation	1	Unfaced fiberglass batt insulation
Exterior Sheathing	1	One (1) layer 1/2 in. thick exterior type gypsum
Air Barrier or Weather-Resistive Barrier Applied to Exterior Sheathing Use any of these options	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
Exterior Insulation	1	Kingspan GreenGuard® XPS Insulation Board- 4 in. thickness
WRB Over Exterior Insulation	1	10mm Keene Building Products Driwall™ Rainscreen drainage mat
Exterior Veneer	1	Glen-Gery Thin Veneer Brick
		a. First a layer of 1/2 in. thick PermaBASE® cement board
		b. Laticrete MVIS™ Thin Brick Mortar applied to full surface of PermaBASE®
		c. Thin Veneer Brick applied with Glen-Gery Mortar Blend Portland cement-line mortar as grout

Walls containing Dow Styrofoam™ XPS Insulation

Based on Jensen Hughes Report 1JJB05306.011 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and XPS manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System Use either 1, 2, 3, or 4	1	Concrete Wall
	2	Concrete Masonry Unit (CMU) Wall
	3	Steel studs: minimum 3 5/8 in. depth, minimum 20-gauge at a maximum spacing of 24 in. OC. One layer of 5/8 in. thick Type X gypsum wallboard on interior face of studs. Gypsum wallboard joints shall receive at a minimum a Level 2 finish with all fasteners covered with joint compound.
	4	Wood studs: Minimum 2-inch x 4-inch FRTW wood studs spaced at a maximum of 24-inch OC. One layer of 5/8 in. thick Type X gypsum wallboard installed on interior face of wood studs. One layer of 5/8 in. thick Type X exterior gypsum sheathing installed on exterior face of wood studs. Minimum two top plates at floorlines. As an option, any thickness of plywood or OSB may be installed on exterior face of wood studs under exterior gypsum sheathing.
Floorline Firestopping Required in curtain-wall construction	4 lb/cu ft mineral wool friction fit in each stud cavity, at each floor line	
Cavity Insulation Use either 1, 2, or 3	1	None
	2	Fiberglass blown-in or batt insulation (faced or unfaced)
	3	Mineral wool blown-in or batt insulation (faced or unfaced)
Exterior Sheathing Use either 1, 2, 3, or 4	1	None (only applicable for use with Base Wall Systems 1 or 2)
	2	1/2 in. thick exterior gypsum sheathing complying with ASTM C1177 (May be used on Base Wall System 3 only)
	3	5/8 in. thick Type X exterior gypsum sheathing complying with ASTM C1177 (required for Base Wall System 4, may be used on Base Wall System 3)
	4	5/8 in. thick DensElement® sheathing - The joints of the DensElement® sheathing may be sealed with R-Guard FastFlash Liquid Flashing or approved equivalent
WRB Materials Applied to Exterior Gypsum Sheathing Use either 1, 2, 3, 4, 5, 6, 7, or 8	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	6	PERM-A-BARRIER® NPL 10
	7	PERM-A-BARRIER® VPS 30
	8	PERM-A-BARRIER® VPL 50RS UV

	Note	Any WRB shown above can be applied over Base Wall System 1 or 2 above, where able.
Exterior Insulation		DuPont™ Styrofoam™ Type IV per ASTM C578 or DuPont™ Styrofoam™ XENERGY™ or DuPont™ Styrofoam™ Panel Code 20 rigid insulation. Total thickness to be minimum 1/2 in. to maximum 3 in. when installed using Special Conditions (see below). XPS products include the Blue Styrofoam™, Grey Styrofoam™ (covered in ICC-ESR 2142), and Grey Styrofoam™ brand ST-100 Series (LIMS-274901) Styrofoam™ (covered in ICC-ESR 4755).
Exterior Insulation Joint Flashing Use either 1 or 2	1	None
	2	Seal all exterior insulation joints, and as an option, veneer tie penetrations with:
		a. DuPont™ LiquidArmor™ - CM Flashing and Sealant-max. 50-mil wet thickness, max. 4 in. width
		b. DuPont™ LiquidArmor™ - LT Flashing and Sealant-max. 35-mil wet thickness, max. 4 in. width.
		c. Asphalt, acrylic, or butyl-based flashing tape - max. 4 in. width
		d. DuPont™ Great Stuff PRO™- Use on joints that are ≤ 1/4 in. width, vertical joints must be staggered & remove significant excess from the face of the Thermax
Exterior Veneer	1	Brick - Standard nominal 4 in. thick, clay brick with standard type brick veneer anchors, installed maximum 24 in. OC vertically on each stud. Air gap between exterior insulation and brick to be a maximum of 2 in.
	2	Concrete or precast concrete panels - Minimum 2 in. thick panel with a maximum 2 in. air gap between exterior insulation and concrete panel. Any standard non-open joint installation technique can be used.
	3	Concrete Masonry Units - Minimum 4 in. thick CMU (minimum 2 in. equivalent thickness), with a maximum 2 in. air gap between exterior insulation and the interior face of the exterior CMU. Any standard non-open-joint installation technique can be used
	4	Minimum 2 in. thick natural stone or minimum 1 1/2 in. thick artificial cast stone veneer. Any standard non-open jointed installation technique can be used.
	5	Stucco - Minimum 3/4 in. thick 2-or 3-coat cementitious stucco system on metal lath.
	6	StoTherm®ci XPS System
	7	Dryvit Outsulation® X System
Flashing of Windows, Doors, and Other Exterior Wall Penetrations		As an option, flash window, door and other exterior penetrations with either.
	1	DuPont™ LiquidArmor™ - CM Flashing and Sealant - max. 50-mil wet thickness, max. 12 in. width.

	2	DuPont™ LiquidArmor™ - LT Flashing and Sealant - max. 35-mil wet thickness, max. 12 in. width.
	3	DuPont™ DuraGard™ CM Transition Flashing - max. 12 in. width
	4	Limited amounts of acrylic, asphalt or butyl-based flashing tape - max. 12 in. width.
	Note	Flashing tape used in wall openings may extend the wall width plus extend up to a maximum of 4 in. onto the exterior face of the sheathing. Flashing tape may be used on sheathing exterior corners where the flashing tape may extend a maximum of 4 in. onto the sheathing face on either side of the corner

Walls containing Stucco and Styrofoam™ XPS Insulation

Based on Jensen Hughes Report 1JJB05306.011 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and XPS manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System Use either 1, 2, 3, or 4	1	Concrete Wall
	2	Concrete Masonry Unit (CMU) Wall
	3	Steel studs: minimum 3 5/8 in. depth, minimum 20-gauge at a maximum spacing of 24 in. OC. One layer of 5/8 in. thick Type X gypsum wallboard on interior face of studs. Gypsum wallboard joints shall receive at a minimum a Level 2 finish with all fasteners covered with joint compound.
	4	Wood studs: Minimum 2-inch x 4-inch FRTW wood studs spaced at a maximum of 24-inch OC. One layer of 5/8 in. thick Type X gypsum wallboard installed on interior face of wood studs. One layer of 5/8 in. thick Type X exterior gypsum sheathing installed on exterior face of wood studs. Minimum two top plates at floorlines. As an option, any thickness of plywood or OSB may be installed on exterior face of wood studs under exterior gypsum sheathing.
Floorline Firestopping Required in curtain-wall construction	4 lb/cu ft mineral wool friction fit in each stud cavity, at each floorline	
Stud Cavity Insulation Use either 1, 2, 3, or 4	1	None
	2	Fiberglass batt insulation (faced or unfaced)
	3	Mineral wool blown-in or batt insulation (faced or unfaced)
	4	Any noncombustible material
Exterior Sheathing Use either 1, 2, 3, or 4	1	5/8 in. thick Type X glass mat gypsum sheathing
	2	1/2 in. thick glass mat gypsum sheathing
	3	5/8 in. thick DensElement® sheathing - The joints of the DensElement® sheathing may be sealed with R-Guard FastFlash Liquid Flashing or approved equivalent
	Note	Exterior sheathing is optional for Base wall systems 1 and 2 above
WRB Materials Applied to Exterior Sheathing Use either 1, 2, 3, 4, 5, 6, 7, or 8	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	6	PERM-A-BARRIER® NPL 10
	7	PERM-A-BARRIER® VPS 30
	8	PERM-A-BARRIER® VPL 50RS UV
	Note	Any WRB shown above can be applied over Base Wall System 1 or 2 above, where able.
	1	None

Continuous insulation adhesive Use either 1, 2, 3, or 4	2	Sto TurboStick Adhesive
	3	Sto ExtraSeal®
	4	DuPont™ Insta Stik™ quick set polyurethane adhesive
Continuous insulation	DuPont™ Styrofoam™ Type IV per ASTM C578. Total thickness to be minimum 1/2 in. to maximum 3 in. XPS products include the Blue Styrofoam™, Grey Styrofoam™ (covered in ICC-ESR 2142), and Grey Styrofoam™ brand ST-100 Series (LIMS-274901) Styrofoam™ (covered in ICC-ESR 4755).	
Sealing of exterior insulation Use either 1 or 2	1	None
	2	Seal all exterior insulation joints, and as an option, veneer tie penetrations with:
		a. DuPont™ LiquidArmor™ - CM Flashing and Sealant-max. 50-mil wet thickness, max. 4 in. width
		b. DuPont™ LiquidArmor™ - LT Flashing and Sealant-max. 35-mil wet thickness, max. 4 in. width.
		c. Asphalt, acrylic, or butyl-based flashing tape - max. 4 in. width
		d. DuPont™ Great Stuff PRO™- Use on joints that are ≤ 1/4 in. width, vertical joints must be staggered & remove significant excess from the face of the XPS
Secondary WRB material Use either 1, 2, or 3	1	None
	2	No. 15 Grade D building paper
	3	Asphalt felt in compliance with ASTM D226
Drainage Mat Use either 1 or 2	1	None
	2	Sto DrainScreen® - installed over Air Barrier and water-resistive barrier membrane or over continuous insulation
Exterior Veneer	Stucco - Minimum 3/4 in. thick 2 - or 3-coat stucco complying with ASTM C926 applied over 2 1/2 -lb/yd ² galvanized steel diamond mesh lath complying with ASTM C1063/C847. As an option, adhered masonry veneer, such as: Thin brick, manufactured stone, ceramic or porcelain tile may be installed over the Stucco	

Walls containing a maximum 4.25-inch thick Thermax™ insulation board

Based on Jensen Hughes Report 1JJB05306.011 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System Use either 1, 2, 3, 4, 5, or 6	1	Concrete Wall
	2	Concrete Masonry Unit (CMU) Wall
	3	Standard clay brick wall
	4	Adobe block wall
	5	Wood studs: nominal 2-in. x 4-in. or greater FRTW wood studs spaced at a maximum of 24-in. OC. Wall cavity empty (no insulation) or filled with fiberglass batt insulation (faced or unfaced) or mineral wool insulation (faced or unfaced). One layer of 5/8 in. thick Type X gypsum wallboard installed on interior face of wood studs. One layer of 5/8 in. thick Type X exterior gypsum sheathing installed on exterior face of wood studs. Minimum two top plates at floorlines. As an option, any thickness of plywood or OSB may be installed on exterior face of wood studs under exterior gypsum sheathing.
	6	Steel studs: minimum 3 5/8 in. depth, minimum 20-gauge at a maximum spacing of 24 in. OC with lateral bracing every 4 ft. vertically with:
		a. One layer of 5/8 in. thick Type X gypsum wallboard on interior face of studs. Gypsum wallboard joints shall receive at a minimum a Level 2 finish with all fasteners covered with joint compound, or
		b. MONOKOTE® Z-3306 installed at a minimum 3/8 in. thickness over Thermax, or
		c. International Cellulose Corporation's Ure-K® Thermal Barrier System installed at a minimum of 1 1/4 in. thickness over Thermax
Floorline Firestopping Required in curtain-wall construction	4 lb/cu ft mineral wool (e.g., Thermafiber) in each stud cavity and at each floor line - friction fit cavity, attached with Z-clips, or equivalent	
Interior Vapor / Moisture barrier for use with Base Wall 5 or 6	1	None
	2	Any 6-mil thick polyethylene film
Cavity Insulation Use either 1, 2, or 3 or combination of 2 and 3	1	None - Screw end of fasteners that protrude into the stud cavity can be covered with a maximum of 1 1/2 in. diameter plug of DuPont™ Froth-Pak™ Class A rated per ASTM E84

	2	Maximum 2 in. thickness of BASF SPRAYTITE® 81206 SPF (covered in Intertek CCRR-1031) or BASF WALLTITE® LWP (covered in Intertek CCRR-0374) applied using sheathing or insulation as substrate and covering the width of the cavity and inside the stud flange. Must cover the SPRAYTITE® 81206 or WALLTITE® LWP above any window, louver or door opening with minimum 2 in. thickness of mineral wool insulation (1 1/2 in. mineral wool cover in 3 1.2 in. deep studs). The mineral wool insulation must be installed from top of opening to bottom of floor deck above. Additionally, a special construction of the header must be used.
	3	Fiberglass blown-in or batt insulation (faced or unfaced) or mineral wool blown-in or batt insulation (faced or unfaced)
Exterior Sheathing Use either 1, 2, or 3 OR	1	None
	2	1/2 in. thick exterior gypsum sheathing
	3	5/8 in. thick Type X exterior gypsum sheathing
	Note	Exterior sheathing is not required for Base wall systems 1 through 4 above
Multi-Function Sheathing & WRB Products	1	USG Securock® ExoAir® 430 System
	Note	This item replaces the exterior sheathings above. When this item is used the exterior sheathings are not required and WRBs below (Layer IV) shall not be used.
WRB Materials Applied to Exterior Sheathing 2 or 3 Use either 1, 2, 3, 4, 5, 6, 7, or 8	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® NPL 10
	5	PERM-A-BARRIER® Ultra
	6	PERM-A-BARRIER® NPS
	7	PERM-A-BARRIER® VPS 30
	8	PERM-A-BARRIER® VPL 50RS UV
	Note	Any WRB material shown above can be applied over Base Wall System 1 through 4 above, where able.
Drainage Mat Use either 1 or 2	1	None
	2	DuPont™ Tyvek® DrainVent™ Rainscreen - Limited to use as:
		Must be used in conjunction with any WRB shown above Exterior veneers #1 thru #6 in Layer VIII below when no air gap is present between the veneer and the DrainVent™ Exterior veneers #2 thru #15, #16b thru 16m, #17 and #19 in Layer VIII below when no air gap is present between the veneer and the DrainVent™
Exterior Insulation Use either 1 or 2	1	None (Exterior sheathing must be Item 2 or 3 listed in exterior sheathings above)

	2	DuPont Thermax™ Brand Rigid Insulation - Total thickness to be a minimum of 5/8 in. to maximum of 4 1/4 in.
Exterior Insulation Joint Flashing Use either 1 or 2	1	None - Only when a water-resistive barrier is applied to the exterior sheathing or when a water-resistive barrier is applied to the exterior insulation
	2	Flash all exterior insulation joints and veneer tie penetrations with one of the following:
		a. DuPont LiquidArmor™ - CM Flashing and Sealant-max. 60-mil wet thickness, max. 5 in. width
		b. DuPont LiquidArmor™ - LT Flashing and Sealant-max. 35-mil wet thickness, max. 5 in. width.
		c. DuPont LiquidArmor™ - QS Flashing and Sealant-max. 60-mil wet thickness, max. 5 in. width
		d. DuPont Tyvek® Fluid Applied Flashing & Joint Compound -max. 25-mil wet thickness, max. 3 in. width
		e. DuPont WeatherMate™ Flashing - max. 4 in. width
		f. Asphalt, acrylic, or butyl-based flashing tape - max. 4 in. width
		g. DuPont Great Stuff Pro- Use on joints that are ≤ 1/4 in. width, vertical joints must be staggered & remove significant excess from the face of the Thermax
		h. DOWSIL DEFENDAIR™ 200 or DOWSIL DEFENDAIR™ 200C
	Note	With either e) or f), a small amount of spray primer may be used to aid in adhesion; maximum 4 in. width
Exterior Veneer Use either 1, 2, 3, 4, 5, or 6	1	Brick - Standard type brick veneer anchors, installed a maximum of 24-inches OC vertically on each stud. A maximum 2-inch air gap between the exterior insulation and the brick. Use standard nominal 4-inch thick clay bricks.
	2	Stucco - Minimum 3/4 in. thick, exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier can be 1 or 2 layers of asphalt building paper but shall not be full-coverage asphalt or butyl-based self-adhered membranes.
	3	Minimum 2 in. thick limestone or natural stone veneer or minimum 1 1/2 in. thick artificial cast stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc., can be used.
	4	Terracotta cladding - minimum 1 1/4 in. thick terracotta cladding system. Any non-open-joint installation technique such as ship-lap, etc. can be used.
	5	Concrete or precast concrete panels - Minimum 1 1/2 in. thick panel, with a 2-in. maximum air gap between exterior insulation and concrete panel. Any standard non-open-joint installation technique such as ship-lap, etc. can be used.

	6	Concrete Masonry Units - Minimum 2 in. thick panel, with a 2 in. maximum air gap between exterior insulation and the interior face of the exterior CMU. Any standard non-open-joint installation technique can be used
Flashing of Window, Door, and Other Exterior Wall Penetrations	As an option, flash window, door and other exterior penetrations with either.	
	a.	DuPont LiquidArmor™ - CM Flashing and Sealant - max. 60-mil wet thickness, max. 12 in. width.
	b.	DuPont LiquidArmor™ - LT Flashing and Sealant - max. 35-mil wet thickness, max. 12 in. width.
	c.	DuPont LiquidArmor™ - QS Flashing and Sealant-max. 60-mil wet thickness, max. 12 in. width
	d.	DuPont Tyvek® Fluid Applied Flashing & Joint Compound -max. 25-mil wet thickness, max. 3 in. width
	e.	DuPont DuraGard™ CM Transition Flashing - max. 12 in. width
	f.	Limited amounts of acrylic, asphalt or butyl-based flashing tape - max. 12 in. width.
	g.	Hohmann & Barnard Textroflash™ Flashing
	h.	DOWSIL DEFENDAIR™ 200 or DOWSIL DEFENDAIR™ 200C
	Note	Flashing tape used in wall openings may extend the wall width plus extend up to a maximum of 4 in. onto the exterior face of the sheathing. Flashing tape may be used on sheathing exterior corners where the flashing tape may extend a maximum of 4 in. onto the sheathing face on either side of the corner
Mortar Net	As an option, non-full wall coverage mortar drop and drainage nets and meshes can be installed at base of wall and at shelf angles to permit water drainage. Maximum 12 in. high	

Walls containing a maximum 3-inch thick Thermax™ insulation board

Based on Jensen Hughes Report 1JJB05306.011 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System Use either 1, 2, 3, 4, 5, or 6	1	Concrete Wall
	2	Concrete Masonry Unit (CMU) Wall
	3	Standard clay brick wall
	4	Adobe block wall
	5	Wood studs: nominal 2-in. x 4-in. or greater FRTW wood studs spaced at a maximum of 24-in. OC. Wall cavity empty (no insulation) or filled with fiberglass batt insulation (faced or unfaced) or mineral wool insulation (faced or unfaced). One layer of 5/8 in. thick Type X gypsum wallboard installed on interior face of wood studs. One layer of 5/8 in. thick Type X exterior gypsum sheathing installed on exterior face of wood studs. Minimum two top plates at floorlines. As an option, any thickness of plywood or OSB may be installed on exterior face of wood studs under exterior gypsum sheathing.
	6	Steel studs: minimum 3 5/8 in. depth, minimum 20-gauge at a maximum spacing of 24 in. OC with lateral bracing every 4 ft. vertically with:
		a. One layer of 5/8 in. thick Type X gypsum wallboard on interior face of studs. Gypsum wallboard joints shall receive at a minimum a Level 2 finish with all fasteners covered with joint compound, or
		b. MONOKOTE® Z-3306 installed at a minimum 3/8 in. thickness over Thermax, or
		c. International Cellulose Corporation's Ure-K® Thermal Barrier System installed at a minimum of 1 1/4 in. thickness over Thermax
Floorline Firestopping Required in curtain-wall construction	4 lb/cu ft mineral wool (e.g., Thermafiber) in each stud cavity and at each floor line - friction fit cavity, attached with Z-clips, or equivalent	
Interior Vapor / Moisture barrier for use with Base Wall 5 or 6	1	None
	2	Any 6-mil thick polyethylene film
Cavity Insulation Use either 1, 2, or 3 or combination of 2 and 3	1	None - Screw end of fasteners that protrude into the stud cavity can be covered with a maximum of 1 1/2 in. diameter plug of DuPont™ Froth-Pak™ Class A rated per ASTM E84

	2	Maximum 2 in. thickness of BASF SPRAYTITE® 81206 SPF (covered in Intertek CCRR-1031) or BASF WALLTITE® LWP (covered in Intertek CCRR-0374) applied using sheathing or insulation as substrate and covering the width of the cavity and inside the stud flange. Must cover the SPRAYTITE® 81206 or WALLTITE® LWP above any window, louver or door opening with minimum 2 in. thickness of mineral wool insulation (1 1/2 in. mineral wool cover in 3 1/2 in. deep studs). The mineral wool insulation must be installed from top of opening to bottom of floor deck above. Additionally, a special construction of the header must be used.
	3	Fiberglass blown-in or batt insulation (faced or unfaced) or mineral wool blown-in or batt insulation (faced or unfaced)
Exterior Sheathing Use either 1, 2, or 3 OR	1	None
	2	1/2 in. thick exterior gypsum sheathing
	3	5/8 in. thick Type X exterior gypsum sheathing
	Note	Exterior sheathing is not required for Base wall systems 1 through 4 above
Multi-Function Sheathing & WRB Products	1	USG Securock® ExoAir® 430 System
	Note	This item replaces the exterior sheathings above. When this item is used the exterior sheathings are not required and WRBs below (Layer IV) shall not be used.
WRB Materials Applied to Exterior Sheathing 2 or 3 Use either 1, 2, 3, 4, 5, 6, 7, or 8	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® NPL 10
	5	PERM-A-BARRIER® Ultra
	6	PERM-A-BARRIER® NPS
	7	PERM-A-BARRIER® VPS 30
	8	PERM-A-BARRIER® VPL 50RS UV
	Note	Any WRB material shown above can be applied over Base Wall System 1 through 4 above, where able.
Drainage Mat Use either 1 or 2	1	None
	2	DuPont™ Tyvek® DrainVent™ Rainscreen - Limited to use as:
		Must be used in conjunction with any WRB shown above Exterior veneers #1 thru #6 in Layer VIII below when no air gap is present between the veneer and the DrainVent™ Exterior veneers #2 thru #15, #16b thru 16m, #17 and #19 in Layer VIII below when no air gap is present between the veneer and the DrainVent™
Exterior Insulation Use either 1 or 2	1	None (Exterior sheathing must be Item 2 or 3 listed in exterior sheathings above)
	2	DuPont™ Thermax™ Brand Rigid Insulation - Total thickness to be a minimum of 5/8 in. to maximum of 3 in.

Exterior Insulation Joint Flashing Use either 1 or 2	1	None - Only when a water-resistive barrier is applied to the exterior sheathing or when a water-resistive barrier is applied to the exterior insulation
	2	Flash all exterior insulation joints and veneer tie penetrations with one of the following:
	a.	DuPont™ LiquidArmor™ - CM Flashing and Sealant-max. 60-mil wet thickness, max. 5 in. width
	b.	DuPont™ LiquidArmor™ - LT Flashing and Sealant-max. 35-mil wet thickness, max. 5 in. width.
	c.	DuPont™ LiquidArmor™ - QS Flashing and Sealant-max. 60-mil wet thickness, max. 5 in. width
	d.	DuPont™ Tyvek® Fluid Applied Flashing & Joint Compound -max. 25-mil wet thickness, max. 3 in. width
	e.	DuPont™ WeatherMate™ Flashing - max. 4 in. width
	f.	Asphalt, acrylic, or butyl-based flashing tape - max. 4 in. width
	g.	DuPont™ Great Stuff PRO™- Use on joints that are ≤ 1/4 in. width, vertical joints must be staggered & remove significant excess from the face of the Thermax
	h.	DOWSIL DEFENDAIR™ 200 or DOWSIL DEFENDAIR™ 200C
	Note	With either e) or f), a small amount of spray primer may be used to aid in adhesion; maximum 4 in. width
Exterior Veneer Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 or 19	1	ACM System - Use any Aluminum Composite Material (ACM) system that has been successfully tested by the panel manufacturer via the NFPA 285 test method. Acceptable NFPA 285 testing shall consist of successful NFPA test results on a wall assembly incorporating a comparable thickness of combustible foam insulation (e.g., polyiso) behind the ACM. These ACM panel systems include:
		- Reynobond® FR ACM
		- ALPOLIC® fr ACM
		- ALUCOBOND® PLUS ACM
	2	Terracotta cladding - use any terracotta cladding system in which terracotta is minimum 1 1/4 in. thick. Any standard installation can be used.
	3	Metal exterior wall coverings such as steel, aluminum, copper, zinc, etc. Any standard installation technique can be used
	4	Fiber-cement siding (noncombustible) - minimum 1/4 in. thick. Any standard installation technique with noncombustible furring can be used. A maximum 1 1/2 in. air gap allowed behind the fiber-cement siding.

	5	Brick - Standard nominal 4 in. thick, clay brick with standard type brick veneer anchors, installed maximum 24 in. OC vertically on each stud. Air gap between exterior insulation and brick to be a maximum of 2 in.
	6	Stucco - Minimum 3/4 in. thick, exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier can be 1 or 2 layers of asphalt building paper but shall not be full-coverage asphalt or butyl-based self-adhered membranes.
	7	Corium Thin brick system
	8	Minimum 1 1/4 in. thick limestone or natural stone veneer or minimum 1 1/4 in. thick artificial cast stone veneer. Any standard installation technique such as ship-lap, etc., can be used.
	9	StoneLite® natural stone wall panels by Stone Panels, Inc.
	10	Glen-Gery Thin Tech® Elite Series- Masonry veneer
	11	Concrete or precast concrete panels - Minimum 1 1/2 in. thick panel. Air gap between exterior insulation and concrete panel shall be as per wall design. Any standard installation technique can be used.
	12	Ceramic tile (min. 3/8 in. thick) bonded using noncombustible mortar adhesive to minimum 1/2 in. thick cement board or gypsum sheathing
	13	Thin brick (min. 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. 1/2 in. thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can be installed between the board/sheathing and the brick. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes.
	14	Natural stone or artificial stone (min. 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. 1/2 in. thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can be installed between the board/sheathing and the stone. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes
	15	Concrete Masonry Units - Minimum 2 in. thick panel, with a 2 in. maximum air gap between exterior insulation and the interior face of the exterior CMU. Any standard non-open-joint installation technique can be used
	16	Knight Wall Systems to include:

	a. ACM System - Use any ACM system that has been successfully tested by the panel manufacturer via the NFPA 285 test method. Any standard installation technique can be used. These ACM panel systems include:
	- Reynobond® FR ACM
	- ALPOLIC® fr ACM
	- ALUCOBOND® PLUS ACM
	b. Terracotta cladding - use any terracotta cladding system in which terracotta is minimum 1 1/4 in. thick. Any standard installation can be used.
	c. Metal exterior wall coverings such as steel, aluminum, copper, zinc, etc. Any standard installation technique can be used
	d. Brick - Standard nominal 4 in. thick, clay brick with standard type brick veneer anchors, installed maximum 2 in. OC vertically on each stud. Air gap between exterior insulation and brick to be as per wall design.
	e. Stucco - Minimum 3/4 in. thick, exterior cement plaster and lath attached to minimum 1/2 in. thick backer board. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier can be 1 or 2 layers of asphalt building paper but shall not be full-coverage asphalt or butyl-based self-adhered membranes.
	f. Corium Thin brick system
	g. Minimum 1 1/4 in. thick limestone or natural stone veneer or minimum 1 1/4 in. thick artificial cast stone veneer. Any standard installation technique such as ship-lap, etc., can be used.
	h. StoneLite® natural stone wall panels by Stone Panels, Inc.
	i. Glen-Gery Thin Tech® Elite Series- Masonry veneer
	j. Concrete or precast concrete panels - Minimum 1 1/2 in. thick panel. Air gap between exterior insulation and concrete panel shall be as per wall design. Any standard installation technique can be used.
	k. Ceramic tile (min. 3/8 in. thick) bonded using noncombustible mortar adhesive to minimum 1/2 in. thick cement board or gypsum sheathing
	l. Thin brick (min. 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. 1/2 in. thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can be installed between the board/sheathing and the brick. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes.

		m. Natural stone or artificial stone (min. 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer modified) to min. 1/2 in. thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can be installed between the board/sheathing and the stone. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes
	17	Cornerstone Building Products to include:
		- PBR Panel (Exposed fasteners)
		- PBU Panel (Exposed fasteners)
		- AVP Panel (Exposed fasteners)
		- Designer Series Panels (Exposed fasteners)
		- ShadowRib™ Panels (Exposed fasteners)
		- NuWall® Panels (Exposed fasteners)
		- MasterLine 16® (Concealed fasteners)
	18	FUNDERMAX GmbH "M Look" panels - 7-mm thick, installed with 1 to 1 1/2 in. air gap behind the panels and using exposed fasteners.
Flashing of Window, Door, and Other Exterior Wall Penetrations	19	TABS II Plus Wall System w/o TABS II Plus "RainScreen" with Pre-attached wrap.
		As an option, flash window, door and other exterior penetrations with either.
		a. DuPont™ LiquidArmor™ - CM Flashing and Sealant - max. 60-mil wet thickness, max. 12 in. width.
		b. DuPont™ LiquidArmor™ - LT Flashing and Sealant - max. 35-mil wet thickness, max. 12 in. width.
		c. DuPont™ LiquidArmor™ - QS Flashing and Sealant-max. 60-mil wet thickness, max. 12 in. width
		d. DuPont™ Tyvek® Fluid Applied Flashing & Joint Compound -max. 25-mil wet thickness, max. 3 in. width
		e. Limited amounts of acrylic, asphalt or butyl-based flashing tape - max. 12 in. width.
		f. Hohmann & Barnard Textroflash™ Flashing
		g. DOWSIL DEFENDAIR™ 200 or DOWSIL DEFENDAIR™ 200C
		h. DuPont™ DuraGard™ CM Transition Flashing - max. 12 in. width
Mortar Net	Note	Flashing tape used in wall openings may extend the wall width plus extend up to a maximum of 4 in. onto the exterior face of the sheathing. Flashing tape may be used on sheathing exterior corners where the flashing tape may extend a maximum of 4 in. onto the sheathing face on either side of the corner
		As an option, non-full wall coverage mortar drop and drainage nets and meshes can be installed at base of wall and at shelf angles to permit water drainage. Maximum 12 in. high

For Firestone (now Amrize) Enverge™ CI foil exterior wall insulation or Enverge™ CI glass exterior wall insulation wall component

Based on Hughes Assoc. Report 1JJB00090.000 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System Use either 1, 2, or 3	1	Concrete Wall
	2	Concrete Masonry Wall
	3	1 layer - 5/8 in. thick Type X gypsum wallboard on interior, installed over steel studs: minimum 3 5/8 in. depth, minimum 20-gauge at a maximum of 24 in. OC with lateral bracing every 4 ft. vertically
Floorline Firestopping	4 lb/cu ft mineral wool (e.g., Thermafiber®) in each stud cavity and at each floor line - attached with Z-clips or equivalent	
Cavity Insulation Use either 1, 2, or 3	1	None
	2	Any noncombustible insulation
	3	Fiberglass batt insulation (faced or unfaced)
Exterior Sheathing Use either 1, 2, or 3	1	None
	2	1/2 in. thick, exterior type gypsum sheathing
	3	5/8 in. thick, exterior type gypsum sheathing
Water-Resistive Barrier Applied to Exterior Sheathing 2 or 3 above Use either 1, 2, 3, 4, or 5	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
Exterior Insulation Use either 1 or 2	1	Firestone Enverge™ CI Foil Exterior Wall Insulation - 2 1/2 in. maximum thickness with Exterior Veneer - Part 1 or 4 in. maximum thickness with Exterior Veneer - Part 2
	2	Firestone Enverge™ CI Glass Exterior Wall Insulation - 2 1/2 in. maximum thickness with Exterior Veneer - Part 1 or 4 in. maximum thickness with Exterior Veneer - Part 2
Flashing Use either None, 1, or 2	Optional - Flash all exterior insulation joints and veneer tie penetrations with	
	1	4 in. wide Shuretape® AF 100 or AF 975CT aluminum foil tape
	2	Asphalt or butyl-based flashing tape-Maximum 4 in. wide (AAMA71 or ICC-ES AC 148 complying)
	Note	Optional - Spray primer to aid in adhesion of either 1 or 2 applied at a maximum of 5 inches wide
Weather-resistive barrier applied to exterior insulation	None	
Exterior Veneer Part 1 Use either 1, 2, 3, 4, 5, 6, 7, or 8	1	Brick
		- Brick veneer anchors - standard types - installed maximum 24 in. OC vertically on each stud
		- Maximum 2 in. air gap between exterior insulation and brick

		- Standard nominal 4 in. thick clay brick
	2	Stucco - Minimum 3/4 in. thick exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes.
	3	Minimum 2 in. thick limestone or natural stone veneer or minimum 1 1/2 in. thick artificial cast stone veneer. Any standard installation technique can be used.
	4	Terracotta cladding - Use any terracotta cladding system in which terracotta is minimum 1 1/4 in. thick. Any standard installation technique can be used
	5	Metal veneer such as steel, aluminum, copper, etc. Any standard installation technique can be used.
	6	Cement board siding - Any standard installation technique can be used.
	7	MCM System - Use any Metal Composite Panel that has been successfully tested by the panel manufacturer via NFPA 285 test method. Installation shall be such that the free air cavity behind the MCM shall not exceed 2 7/8 in.
	8	Aluminum faced, aluminum honeycomb core panels. Any standard installation technique can be used.
Exterior Veneer Part 2 Use either 1, 2, 3, or 4	1	Brick
		- Brick veneer anchors - standard types - installed maximum 24 in. OC vertically on each stud
		- Maximum 2 in. air gap between exterior insulation and brick
		- Standard nominal 4 in. thick clay brick
	2	Stucco - Minimum 3/4 in. thick exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes.
	3	Minimum 2 in. thick limestone or natural stone veneer or minimum 1 1/2 in. thick artificial cast stone veneer. Any standard non-open joint installation technique such as ship-lap, etc. can be used.
	4	Terracotta cladding - Use any terracotta cladding system in which terracotta is minimum 1 1/4 in. thick. Any standard non-open joint installation technique such as ship-lap, etc. can be used.

Note: all barriers to be installed at indicated or recommended application rates and per manufacturer's installation instructions.

For walls containing Atlas EnergyShield® Pro, CGF Pro, Ply Pro or XR exterior insulation

Based on DrJ TER 1306-03 (NFPA 285-23 for code years up to 2024). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System Use any of these items No Sheathing is needed for 1 and 2	1	Cast concrete walls (1 in. minimum)
	2	CMU Concrete Walls (1 in. minimum)
	3	20-gauge (minimum) 3 5/8 in. (minimum) steel studs with 5/8 in. thick Type X gypsum wallboard on interior
	4	Fire-Retardant Treated (FRT) wood studs spaced 24 in. o.c. (maximum) with 5/8 in. thick Type X gypsum wallboard on interior
Floorline Firestopping Use any of these items	1	None - only with exterior sheathing option 1, 3, 4, or 5 (gypsum wallboard, concrete, DensElement® or Securock® ExoAir® 430)
	2	4 in. thick, 4-pcf mineral fiber (wool) safing insulation installed with Z-clips or equivalent
	3	1 1/2 in. FRT lumber for use with FRT studs
Cavity Insulation Use any of these items Note: SPF cavity insulations 5-22 must use fire stopping at floor lines and exterior gypsum sheathing (thickness as noted)	1	None
	2	Any noncombustible insulation per ASTM E136
	3	Any mineral fiber (Board Type Class A ASTM E84 faced or unfaced)
	4	Any fiberglass (Batt Type Class A ASTM E84 faced or unfaced)
	5	5 1/2 in. (maximum) Icynene LD-C-50™ spray foam in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing
	6	5 1/2 in. (maximum) Icynene MD-C-200™ 2 pcf spray foam in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	7	5 1/2 in. (maximum) Icynene MD-R-210™ 2 pcf spray foam in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	8	6 in. (maximum) SWD Urethane QUIK-SHIELD® (QS) 112, 2-pcf spray foam in 6" deep studs (maximum) or partial fill with a maximum 2 1/2 in. air gap. Use with 5/8 in. exterior sheathing.
	9	3 1/2 in. (maximum) Gaco Western 183M spray foam in 3 5/8 in. deep studs (maximum). Use with 5/8 in. exterior gypsum sheathing
	10	3 1/2 in. (maximum) Gaco Western F1850 with 5/8 in. exterior sheathing in 3 5/8 in. deep studs (maximum)
	11	3 5/8 in. (maximum) Demilec Sealection® 500 with 5/8 in. exterior sheathing in 3 5/8 in. deep studs (maximum).
	12	3 5/8 in. (maximum) Demilec HeatLok Soy® 200 Plus with 5/8 in. exterior sheathing in 3 5/8 in. deep studs (maximum)
	13	3 in. (maximum) Bayer Bayseal® with 5/8 in. exterior sheathing
	14	3 in. (maximum) Lapolla Foam-Lok™ FL 2000 with 5/8 in. exterior sheathing in 3 5/8 in. deep studs (maximum)

	15	3 5/8 in. (maximum) BASF SPRAYTITE® 81206 or WALLTITE® (US and US-N) with 5/8 in. exterior sheathing in 3 5/8 in. deep studs (maximum)
	16	3 5/8 in. (maximum) Accella (Premium Spray Products) Foamsulate™ 220 with 5/8 in. exterior sheathing in 3 5/8 in. deep studs (maximum)
	17	3 5/8 in. (maximum) JM Corbond® III or IV - Full stud Cavity depth or less for use with 5/8 in. exterior gypsum sheathing
	18	BASF WALLTITE® (LWP, Max, XL, Plus) - 3 5/8 in. (maximum). Use with 1/2 in. exterior gypsum sheathing
	19	Carlisle SealTite™ PRO HFO, SealTite™ PRO Closed Cell, SealTite™ Pro One Zero, SealTite™ Pro Open Cell, SealTite™ Pro High Yield, SealTite™ Pro No Mix, SealTite™ Pro No Trim 21, SealTite™ Pro OCX- 3 5/8 in. (maximum). Use with 1/2 in. exterior gypsum sheathing
	20	Huntsman HeatLok HFO or HFO Pro - 3 5/8 in. (maximum). Use with 5/8 in. exterior gypsum sheathing
	21	Holcim Enverge™ EasySeal® 5, Enverge™ SucraSeal - 3 5/8 in. (maximum). Use with 1/2 in. exterior gypsum sheathing
	22	SWD Urethane (Quick-Shield Goblin or Yeti - 1 in. to 3 5/8 in. thick for use in 3 5/8 in. studs (maximum). Use with 5/8 in. exterior gypsum sheathing)
Exterior Sheathing Use any of these items Note: When Items 4 or 5 (integrated sheathing WRB) are used, WRB listed below may not be added on top of the sheathing. Sheathings 1-7 are only used for stud base walls No sheathing is needed for Base Walls 1 or 2	1	1/2 in. or thicker exterior type gypsum sheathing
	2	None - only when cavity SPF insulation is not used and a special opening perimeter is used (see the last entry in this table).
	3	2 in. thick precast concrete panels attached to structural elements of building
	4	1/2 in. or thicker GP DensElement® sheathing with integrated WRB
	5	1/2 in. or 5/8 in. thick USG Securock® ExoAir® 430
	6	7/16 in. (minimum) FRT plywood panels complying with IBC Section 2303.2 and installed following code allowances for Types I, II, III, or IV construction
	7	NexGen MAXTERRA® MgO 12 mm, 16 mm, or 20 mm
	Note	When SPF is used in the cavity, exterior sheathing must be used. See specific sheathing thicknesses above
WRB Over Base Wall Use any of these items	1	PERM-A-BARRIER® VPL LT
	2	PERM-A-BARRIER® NPL 10
	3	PERM-A-BARRIER® NPS
	4	PERM-A-BARRIER® VPL
	5	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	6	PERM-A-BARRIER® VPS 30
	7	PERM-A-BARRIER® Ultra
	8	PERM-A-BARRIER® VPL 50RS UV

Z Girts Use any of these items for claddings requiring girts	1	Metallic Z Girts
	2	Horizontal Smart Ci-GreenGirt
	3	Horizontal Armatherm™ FRR Z Girt
	4	Knight Wall ThermaZee®
	5	Strongirt® (Horizontal only) - Claddings must be 8 mm minimum thickness, and not for use with Claddings 7, 8, 10, or 12
	6	SFS NH3 (horizontal only)
	7	Cascadia Clip (horizontal only)
	Note	Girt spacing should be to comply with wind load per manufacturer instructions.
Exterior Insulation Use any of these items Items 1, 2, 3, and 4 may be multiple layers of thinner product with faces on each side	1	4 in. (maximum) Atlas EnergyShield Pro
	2	4 in. (maximum) EnergyShield CGF Pro
	3	4 3/4 in. (maximum) EnergyShield Ply Pro (4 in. EnergyShield CGF Pro with 5/8 in. or 1/4 in. FRT Plywood)
	4	4 in. (maximum) Atlas EnergyShield XR
	Note 1	1/2 in. (minimum) exterior gypsum sheathing may be attached to exterior side of any item listed above. 5/8 in. (min) FRT plywood may be attached to exterior side of Item 1, 2, or 4 listed above
	Note 2	GP DensGlass® and GP DensElement® (both minimum 1/2 in.) may be installed exterior to items 1, 2, or 4 as listed above
	Note 3	MgO Board may be installed over the polyiso foam boards. NexGen Max Terra 12mm, 16mm, or 20mm mechanically attached or adhered with construction adhesive 2 in. dabs spaced 18 in. apart or 1 ft. long, 1/4 in. wide ribbons spaced 1 ft. apart.
	Note 4	The listed sheathing products installed over Items 1, 2, or 4 may only be covered with the WRB products listed to be used over insulation (see WRB list below this section), but are now used over the sheathing covering the insulation unless other are justified via Fire Engineering Evaluation. DensElement® already has a WRB. No WRB goes over this product except the sheathing joint flashing listed in ICC ESR 3786.
	Note 5	Mineral Wool (unfaced) that meets ASTM E136 as noncombustible may be used over Items 1, 2, 3, or 4. When the mineral wool thickness is 2 in. or greater and density is 4-pcf (minimum), the air gap from the mineral wool surface to the back of the listed claddings is unlimited, except Cladding #7 and #12 are restricted to a 2.25 in. air gap. When the mineral wool is less than 2" thick or 4-pcf density, the air gap from the mineral wool surface to the back of the cladding is restricted to that listed for each Exterior Cladding below.

	Note 6	See the Special Cladding section of this Table when insulation items 1, 2, or 4, as listed above, are covered with 5/8 in. gypsum sheathing and exterior claddings as listed below are not being used
WRB Over Exterior Insulation Use any of these items	1	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® NPS
	4	PERM-A-BARRIER® VPL LT
	5	PERM-A-BARRIER® Ultra
Exterior Cladding Use any of these items Note: Important: Maximum air gap 2 1/4 in. (distance from cladding inner face to insulation) Note: Cladding 8 (zinc) may only be used with EnergyShield Pro, EnergyShield XR, or EnergyShield Ply Pro. Note: Diamond Furr TT-4 (manufactured by Brand X Metals) may be used to install 3-coat stucco item 2 in the cladding list. Cladding may be attached with Knight Wall Systems ThermaZee® or other metallic Z girt	1	Brick – Nominal 4 in. clay brick or CMU veneer (hollow or solid) with maximum 2 1/4 in. air gap behind the brick or CMU. Brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath. An optional secondary WRB (WRB allowed OVER foam over first WRB) can be installed between the insulation and lath. The optional second WRB may be any mechanically attached sheet product, asphalt, or butyl-based building paper (stapled or other mechanical attachment) with no adhesive. The second WRB may not be self-adhering full coverage asphalt or self-adhering full coverage butyl-based membranes. See note for Diamond Furr TT-4 installation. For example, the secondary WRB may be paper backing attached to lath meeting Federal Specification UUB790A: Type 1, Grade D, Style 2, or Fortifiber / Henry Jumbo Tex 60 Minute
	3	Limestone – Minimum 2 in. thick
	4	Natural stone veneer – Minimum 2 in. thick
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51
	6	Terracotta cladding – Minimum 1 1/4 in. thick
	7	Any ACM or MCM that has passed NFPA 285
	8	Uninsulated sheet metal building panels including aluminum, steel, copper, or zinc (see Note)
	9	Uninsulated fiber-cement cladding or siding minimum 1/4 in. thick. Must be 8 mm when Strongirt® is used
	10	Stone/aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria
	11	Autoclaved-aerated-concrete (AAC) panels (minimum 1 1/2 in. thick)
	12	Reynobond® ZCM zinc metal composite panel
	13	Terreal Zephir® Evolution Rainscreen System (terra cotta), minimum 9/16 in. thick

	14	User note - reserved for FunderMax m.look cladding with maximum 1 1/2 in. airspace, cladding manufacturer no longer supports use of this cladding in U.S. exterior walls
	15	CERACLAD using the manufacturer standard installation technique, air gap not to exceed 15mm
	16	CUPACLAD Slate: 101 Logic, 101 Random, 101 Parallel, 210 Vanguard. Must be 8mm minimum when Strongirt® is used
	17	Glen-Gery Thin Tech® Masonry Veneer (only with optional noncombustible mortar)
	18	Glen-Gery Tru-Brix (only with optional noncombustible mortar)
	19	Telling Corium Thin Brick System (only with steel or aluminum brick tray and optional noncombustible mortar)
	20	Thin brick or stone (minimum 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer-modified) to the base wall. A secondary WRB can be installed between the exterior sheathing and the brick. The secondary WRB shall not be full-coverage asphalt or butyl-based self-adhered membranes. See cladding #2 for examples
	21	Telluride Stone (minimum 1 in.) applied to the base wall (with Atlas approved WRB or WRB in Cladding #20) using plaster/lath
	22	5/8 in. Nichiha Architectural Wall Panels (AWP 3030), Nichiha Cladding 5/16 in. per Intertek CCRR 0258. Nichiha Cladding must be 8mm minimum when Strongirt® is used
	23	Ceramic or Porcelain Tile. Must be 8mm minimum when Strongirt® is used
		a. 1/4 in. minimum generic Ceramic or Porcelain tile - mechanically attached
		b. Ceramic or Porcelain tile- 3/8 in. thick (minimum) bonded using noncombustible mortar adhesive to a 1/2 in. thick (minimum) cement board or gypsum sheathing
		c. 12 mm Porcelanosa XTone per ESR 4555
	24	Any one coat stucco (3/8 in. to 1/2 in. min) that meets any of the following:
		a. AC11 acceptance criteria for one coat stucco; or
		b. is approved for use in Type I-IV construction; or
		c. has been tested per NFPA285; or
		d. stays in place when tested per ASTM E119 (stucco exposed to fire) for at least 30 minutes

	25	Any noncombustible cement board adhered to the exterior side or mechanically attached to framing through EnergyShield Pro, EnergyShield XR or EnergyShield CGF Pro. The cement board is covered with NFPA 285 approved EIFS lamina (mesh, base coat, and finish coat) WITHOUT the EIFS Expanded Polystyrene (EPS) board. Adhered cement board may be installed over the polyiso with construction adhesive of 2 in. D dabs spaced 18 in. apart or, 1 ft. long 1/4 in. wide ribbons spaced 1 ft. apart. EIFS Approval Examples: MasterWall (IAPMO ER0433), Dryvit (ESR 1543), STO (ESR 2536), and other accredited 3rd party EIFS approvals.
	26	8 mm (min) or 5/16 in. (min) SwissPearl® Fiber Cement Cladding
	27	Thin Brick with SpeedyMason Brick Lath and Brick Lath Rainscreen - minimum 9/16 in. thick
	a.	May be used without exterior stud sheathing
	b.	All screws must penetrate through to studs, with the exception of EnergyShield Ply Pro, where the system can attach directly to the FRT plywood
	c.	Must use Spec Mix Adhered Veneer Thin Veneer Adhesion Mortar XP500 or cementitious mortar (standard or polymer modified)
Special Claddings Use the base walls listed above. When gypsum sheathing is not used on stud exterior, do not use spray foam in stud cavity. ONLY use WRBs over 5/8 in. gypsum that are explicitly approved together with the Special Claddings	d.	Must use header as test
	1	When 5/8 in. gypsum sheathing is used over Atlas polyiso with or without exterior sheathing on the exterior of studs (and the window opening is lined with 5/8 in. gypsum board over 16-gauge steel), the following claddings may be used.
	a.	High Pressure Laminate (HPL) exterior veneers are allowed for use when the HPL veneer and the water resistive barrier proposed for use have been successfully tested / approved together per NFPA 285. The installation requirements outbound from the 5/8 in. gypsum layer in the approval report must be followed, including all exterior layers, furring, attachment depth, and maximum air gap behind the cladding.
	b.	Exterior veneers of NFPA 285-compliant combustible materials are allowed for use when the combustible veneer and the WRB contemplated for use have been successfully tested/approved together per NFPA 285. The installation requirements outbound from the 5/8 in. gypsum layer in the approval report must be followed, including all exterior layers, furring, attachment depth, and maximum air gap behind the cladding. As an example, Parklex Prodema Naturclad-B F wood laminate panel system installed over DuPont™ Tyvek® Firecurb HDPE Membrane water-resistive barrier per Intertek Design PUI/CWP 30-05.

Flashing of Opening Perimeter (Windows, Doors, etc.) Use items 1, 2, or 3	1	There is no restriction on flashings of openings for wall designs referencing compliance with NFPA 285-12, when using gypsum sheathing on the exterior of studs or Base Wall 1 or 2.
	2	For wall designs referencing NFPA 285-23 or older editions of NFPA 285 with gypsum sheathing on the stud exterior, or for Base Wall 1 or 2, use the following: Header 24-gauge Steel w/ 0.040 aluminum surrounding the steel.
	3	When the Atlas polyiso is directly attached to studs with no sheathing over the exterior side of studs, use 5/8 in. Type X gypsum board on the opening perimeter, and 24-gauge (min) steel flashing shall be used. This meets NFPA 285-23 or older versions of NFPA 285.
	Note	Exception: When the Atlas polyiso is directly attached to studs and is covered with 1/2 in. (minimum) gypsum sheathing, 12 mm (minimum) NexGen MgO, GP DensGlass®, or DensElement®, the 24-gauge steel flashing restriction is waived if the studs are fire stopped at every floor line with mineral wool.

For walls with Rmax ECOMAXci® FR Ply

Based on DrJ TER 1811-02 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System (Select one option: 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	20-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
		a. 1/2 in. (minimum) type X Special Fire Resistance Gypsum Wallboard Interior
		b. bracing as required by code
	4	Where allowed by code in Types I, II, III, or IV construction, Fire-Retardant Treated Wood (FRTW) studs complying with IBC Section 2303.2, minimum nominal 2x4 dimension, spaced 24 in. o.c. (max.)
		a. 5/8 in. Type X gypsum wallboard interior
		b. bracing as required by code
Floorline Firestopping Select option 1 or 2	1	4 pcf mineral wool installed with Z-clips
	2	FRTW fire blocking at floor line in accordance with applicable code requirements (use with FRTW framing)
Cavity Insulation Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 EZ FLO may be used inside the box headers and jamb studs for NFPA 285 assemblies requiring SPF in stud cavities	1	None
	2	Any noncombustible insulation per ASTM E136
	3	Any Mineral Fiber (Board type Class A ASTM E84 faced or unfaced)
	4	Any Fiberglass (Batt type Class A ASTM E84 faced or unfaced)
	5	5 1/2 in. (maximum) Icynene LD-C-50™ SPF in 6 in. deep studs (maximum). Use with 5/8 in. exterior sheathing
	6	5 1/2 in. (maximum) Icynene MD-C-200™ 2 pcf SPF in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	7	5 1/2 in. (maximum) Icynene MD-R-210™ 2 pcf SPF in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	8	SWD Urethane QS 112 2 pcf SPF in 6 in. deep studs (maximum) partial fill with a maximum 2 1/2 in. air gap or full fill. Use with 5/8 in. exterior sheathing
	9	Gaco Western 183M SPF (3 1/2 in. maximum). Use with 5/8 in. exterior sheathing
	10	Gaco Western F 1850 SPF (3 1/2 in. maximum). Use with 5/8 in. exterior sheathing
	11	Demilec Sealection 500 SPF (3 5/8 in. maximum). Use with 5/8 in. exterior sheathing.

	12	Demilec HeatLok Soy 200 Plus SPF (3.4 in. maximum). Use with 5/8 in. exterior sheathing.
	13	Bayer Bayseal® SPF (3 in. maximum). Use with 5/8 in. exterior sheathing.
	14	Lapolla Foam-Lok™ FL 2000 SPF (3 in. maximum). Use with 5/8 in. exterior sheathing.
	15	BASF SPRAYTITE® 81206 or WALLTITE® (US & US-N) SPF (3 5/8 in. maximum). Use with 5/8 in. exterior sheathing.
Exterior Sheathing Select option 1, 2, 3, 4, 5, 6, 7, or 8	1	None (when using Base Wall 1 or 2)
	2	None (3 in. maximum exterior insulation with claddings 7-15)
	3	None (4 1/2 in. maximum exterior insulation with claddings 1-6)
	4	1/2 in. (minimum), exterior gypsum board sheathing
	5	1/2 in. (minimum) FRTW structural panels complying with IBC Section 2303.2 and installed in accordance with code allowances for Types I, II, III, or IV construction.
	6	5/8 in. DensElement® with DensDefy® or Prosoco FastFlash flashing at joints/fasteners
	7	Soprema SOPRASEAL® Xpress G
	8	Tremco/USG Securock® ExoAir® 43
Weather-Resistive Barrier Applied to Exterior Sheathing Select option 1, 2, 3, 4, 5, 6, 7, or 8 installed per manufacturer installation instructions Note: When no exterior sheathing is used, sheet building wraps may be applied directly to studs.	1	GCP PERM-A-BARRIER® Aluminum Wall Membrane
	2	GCP PERM-A-BARRIER® NPL 10
	3	GCP PERM-A-BARRIER® VPL
	4	GCP PERM-A-BARRIER® VPL Low Temperature
	5	GCP PERM-A-BARRIER® Ultra
	6	GCP PERM-A-BARRIER® NPS
	7	GCP PERM-A-BARRIER® VPS 30
	8	GCP PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation installation may include FRT plywood layer on exterior side or interior side. Use with plywood on interior side negates use of exterior sheathing since the FRT ply acts as the sheathing.	1	ECOMAXci® FR Ply- 4 1/2 in. (maximum) foam thickness, 5/8 in. (minimum) FRT plywood thickness.

FRTW Structural Panels over Exterior Insulation (Optional)	For use with all cladding options, installed in accordance with applicable code requirements. Must be applied with joints staggered. Fasteners used for securing FRTW panels must penetrate through the foam plastic into FRTW or steel framing. The system must be designed to handle the cladding load and wind load per the applicable code.	
	Note	May be applied in the field or factory. Adhesive must not be full coverage.
Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW) Use any in item 1 or 2 depending on the cladding used	1	For use with all claddings:
		a. None
		b. GCP PERM-A-BARRIER® Aluminum Wall Membrane
		c. GCP PERM-A-BARRIER® Ultra
	2	For use with cladding options 1-6 (heavy masonry) with non-open joint installation techniques (i.e., shiplap, etc.):
		a. GCP PERM-A-BARRIER® VPL
		b. GCP PERM-A-BARRIER® VPL Low Temperature
		c. GCP PERM-A-BARRIER® Ultra
Exterior Cladding Selection option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15, 16, or 17 Note: For WRB over exterior insulation, option 2 above, heavy masonry claddings 1-6 shall incorporate non-open joints.	Heavy Masonry:	
	1	Brick – Nominal 4 in. clay brick or veneer with a maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath with an optional secondary water resistive barrier between the exterior insulation and lath
	3	Limestone – Minimum 2 in. thick using any standard installation technique
	4	Natural stone veneer – Minimum 2 in. thick using any standard installation technique
	5	Cast artificial stone, Precast Concrete Panels, or CMU – Minimum 1 1/2 in. thick, using any standard installation technique. Cast stone complying with ICC-ES AC 51
	6	Terra cotta cladding – Minimum 1 1/4 in. thick using any standard installation technique
	Other:	
	1	Any MCM or ACM (aluminum, steel, copper, zinc) (with 2 1/2 in. maximum air gap) that has successfully passed NFPA 285 using any standard installation technique, such as Carter Companies EVO Architectural Panel Systems for use with any FR ACM/MGM NFPA 285 material.
	2	Uninsulated sheet metal building panels including aluminum, zinc, steel, or copper using any standard installation technique

	3	Uninsulated fiber-cement board siding using any standard installation technique
	4	Stone/Aluminum honeycomb composite building panels that have passed NFPA 285 or equivalent
		a. Stone Panels Inc. Stone Lite Panel system has been analyzed using manufacturer standard installation technique
	5	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 using any standard installation technique
	6	Thin Set Brick:
		a. Glen-Gary Thin Tech® Elite Series has been analyzed using manufacturer standard installation technique
		b. TABS II Panel System with 1/2 in. bricks using Tabs Wall Adhesive.
	7	Natural Stone Veneer - minimum 1 1/4 in. (adhered with mortar or concrete/cement based adhesive).
	8	FunderMax m.look, using the manufacturer standard installation technique. The air gap between cladding and insulation or WRB must not exceed 1 1/2 in.
	9	Glen-Gery Tru-Brix (only with optional non-combustible mortar).
	10	Thin brick (minimum 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 1/2 in. thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick
	11	Natural stone or artificial stone (minimum 3/4 in. thick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 1/2 in. thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick
	Note	The secondary barriers shall not be full-coverage asphalt or butyl-based self adhered membranes.
Rough Openings Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation	Rough opening perimeters shall incorporate one of the following, spanning at a minimum from the interior edge of the cladding to the interior edge of the exterior insulation at the rough opening:	
	1	0.08 in. (minimum) aluminum (examples include window frame, flashing, lintel, C-channel)
	2	20-gauge (min.) sheet steel (examples include window frame, flashing, lintel, C-channel)
	3	1/2 in. (min.) 4pcf (min.) mineral wool
	4	3/4 in. (min.) FRT wood buck
	5	3/4 in. (min.) FRT plywood
	6	5/8 in. (min.) type X GWB

	7	1/4 in. (min.) fiber cement board All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl flashing tape, liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12 in. maximum width.
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For walls with Rmax ECOMAXci® FR or FR White

Based on DrJ TER 1309-03 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System (Select Option 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	20-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
		a. 1/2 in. (minimum) type X Special Fire Resistance Gypsum Wallboard Interior
		b. bracing as required by code
	4	Where allowed by code in Types I, II, III, or IV construction, Fire-Retardant Treated Wood (FRTW) studs complying with IBC Section 2303.2, minimum nominal 2x4 dimension, spaced 24 in. o.c. (max.)
		a. 5/8 in. Type X gypsum wallboard interior
		b. bracing as required by code
Floorline Firestopping Select option 1 or 2	1	4-pcf mineral wool installed with Z-clips
	2	FRTW fire blocking at floor line in accordance with applicable code requirements (use with FRTW framing)
Cavity Insulation Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15	1	None
	2	Any noncombustible insulation per ASTM E136
	3	Any Mineral Fiber (Board type Class A ASTM E84 faced or unfaced)
	4	Any Fiberglass (Batt type Class A ASTM E84 faced or unfaced)
	5	5 1/2 in. (maximum) Icynene LD-C-50™ SPF in 6 in. deep studs (maximum). Use with 5/8 in. exterior sheathing
	6	5 1/2 in. (maximum) Icynene MD-C-200™ 2 pcf SPF in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	7	5 1/2 in. (maximum) Icynene MD-R-210™ 2 pcf SPF in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	8	SWD Urethane QS 112 2-pcf SPF in 6 in. deep studs (maximum) partial fill with a maximum 2 1/2 in. air gap or full fill. Use with 5/8 in. exterior sheathing
	9	Gaco Western 183M SPF (3 1/2 in. maximum). Use with 5/8 in. exterior sheathing
	10	Gaco Western F 1850 SPF (3 1/2 in. maximum). Use with 5/8 in. exterior sheathing
	11	Demilec Sealection 500 SPF (3 5/8 in. maximum). Use with 5/8 in. exterior sheathing.

	12	Demilec HeatLok Soy 200 Plus SPF (3.4 in. maximum). Use with 5/8 in. exterior sheathing.
	13	Bayer Bayseal® SPF (3 in. maximum). Use with 5/8 in. exterior sheathing.
	14	Lapolla Foam-Lok™ FL 2000 SPF (3 in. maximum). Use with 5/8 in. exterior sheathing.
	15	BASF SPRAYTITE® 81206 or WALLTITE® (US & US-N) SPF (3 5/8 in. maximum). Use with 5/8 in. exterior sheathing.
Exterior Sheathing Select option 1, 2, 3, 4, 5, 6, 7, or 8 Note: When SPF is used, 5/8 in. exterior gypsum sheathing must also be used	1	None (when using Base Wall 1 or 2)
	2	None (3 in. maximum exterior insulation with claddings 7-15)
	3	None (4 1/2 in. maximum exterior insulation with claddings 1-6)
	4	1/2 in. (minimum), exterior gypsum board sheathing
	5	1/2 in. (minimum) FRTW structural panels complying with IBC Section 2303.2 and installed in accordance with code allowances for Types I, II, III, or IV construction.
	6	5/8 in. DensElement® with DensDefy® or Prosoco FastFlash flashing at joints/fasteners
	7	Soprema SOPRASEAL® Xpress G
	8	Tremco/USG Securock® ExoAir® 430
Weather-Resistive Barrier Applied to Exterior Sheathing Select option 1, 2, 3, 4, 5, 6, 7, or 8 installed per manufacturer installation instructions Note: When no exterior sheathing is used, sheet building wraps may be applied directly to studs.	1	GCP PERM-A-BARRIER® Aluminum Wall Membrane
	2	GCP PERM-A-BARRIER® NPL 10
	3	GCP PERM-A-BARRIER® VPL
	4	GCP PERM-A-BARRIER® VPL Low Temperature
	5	GCP PERM-A-BARRIER® Ultra
	6	GCP PERM-A-BARRIER® NPS
	7	GCP PERM-A-BARRIER® VPS 30
	8	GCP PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation Use either 1 or 2 Note: See Exterior sheathing options for thickness limitations when no exterior sheathing is used.	1	4 1/2 in. (max. consisting of a single panel or multiple thinner panels) Rmax ECOMAXci® FR
	2	4 1/2 in. (max. consisting of a single panel or multiple thinner panels) Rmax ECOMAXci® FR White
FRTW Structural Panels over Exterior Insulation (Optional)	For use with all cladding options, installed in accordance with applicable code requirements. Must be applied with joints staggered. Fasteners used for securing FRTW panels must penetrate through the foam plastic into FRTW or steel framing. The system must be designed to handle the cladding load and wind load per the applicable code.	
	Note	May be applied in the field or factory. Adhesive must not be full coverage.
	1	For use with all claddings:

Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW) Use any in item 1 or 2 depending on the cladding used Note: Exterior WRB items in 1. b. are not traditional WRB products but are insulation panel joint tapes. The insulation panel joints shall be staggered.		a. None
		b. GCP PERM-A-BARRIER® Aluminum Wall Membrane
		c. GCP PERM-A-BARRIER® Ultra
	2	For use with cladding options 1-6 (heavy masonry) with non-open joint installation techniques (i.e., shiplap, etc.):
		a. GCP PERM-A-BARRIER® VPL
		b. GCP PERM-A-BARRIER® VPL Low Temperature
		c. GCP PERM-A-BARRIER® Ultra
		d. GCP PERM-A-BARRIER® NPS
Exterior Cladding Selection option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, or 17 Note: For WRB over exterior insulation, option 2 above, heavy masonry claddings 1-6 shall incorporation non-open joints.	Heavy Masonry:	
	1	Brick – Nominal 4 in. clay brick or veneer with a maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath with an optional secondary water resistive barrier between the exterior insulation and lath
	3	Limestone – Minimum 2 in. thick using any standard installation technique
	4	Natural stone veneer – Minimum 2 in. thick using any standard installation technique
	5	Cast artificial stone, Precast Concrete Panels, or CMU – Minimum 1 1/2 in. thick, using any standard installation technique. Cast stone complying with ICC-ES AC 51
	6	Terra cotta cladding – Minimum 1 1/4 in. thick using any standard installation technique
	Other:	
	1	Any MCM or ACM (aluminum, steel, copper, zinc) (with 2 1/2 in. maximum air gap) that has successfully passed NFPA 285 using any standard installation technique, such as Carter Companies EVO Architectural Panel Systems for use with any FR ACM/MGM NFPA 285 material.
	2	Uninsulated sheet metal building panels including aluminum, zinc, steel, or copper using any standard installation technique
	3	Uninsulated fiber-cement board siding using any standard installation technique
	4	Stone/Aluminum honeycomb composite building panels that have passed NFPA 285 or equivalent
		a. Stone Panels Inc. Stone Lite Panel system has been analyzed using manufacturer standard installation technique
	5	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 using any standard installation technique
	6	Thin Set Brick:

		a. Glen-Gary Thin Tech® Elite Series has been analyzed using manufacturer standard installation technique
		b. TABS II Panel System with 1/2 in. bricks using Tabs Wall Adhesive.
	7	Natural Stone Veneer - minimum 1 1/4 in. (adhered with mortar or concrete/cement based adhesive).
	8	FunderMax m.look, using the manufacturer standard installation technique. The air gap between cladding and insulation or WRB must not exceed 1 1/2 in.
	9	Glen-Gery Tru-Brix (only with optional non-combustible mortar).
	10	Thin brick (minimum 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 1/2 in. thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick
	11	Natural stone or artificial stone (minimum 3/4 in. thick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 1/2 in. thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick
	Note	The secondary barriers shall not be full-coverage asphalt or butyl-based self adhered membranes.
Rough Openings Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation	Rough opening perimeters shall incorporate one of the following, spanning at a minimum from the interior edge of the cladding to the interior edge of the exterior insulation at the rough opening:	
	1	0.08 in. (minimum) aluminum (examples include window frame, flashing, lintel, C-channel)
	2	20-gauge (min.) sheet steel (examples include window frame, flashing, lintel, C-channel)
	3	1/2 in. (min.) 4pcf (min.) mineral wool
	4	3/4 in. (min.) FRT wood buck
	5	3/4 in. (min.) FRT plywood
	6	5/8 in. (min.) type X GWB
	7	1/4 in. (min.) fiber cement board
	All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl flashing tape, liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12 in. maximum width.	

For walls with Rmax Thermaseath®, TSX-8500, or TSX-8510

Based on DrJ TER 1309-03 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System Use either 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	20-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. (minimum) type X Gypsum Wallboard Interior
	b.	bracing as required by code
	4	Where allowed by code in Types I, II, III, or IV construction, Fire-Retardant Treated Wood (FRTW) studs complying with IBC Section 2303.2, minimum nominal 2x4 dimension, spaced 24 in. o.c. (max.)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	bracing as required by code
Floorline Firestopping Select option 1 or 2	1	4 pcf mineral fiber insulation installed with Z-clips
	2	FRTW fire blocking at floor line in accordance with applicable code requirements (use with FRTW framing)
Cavity Insulation Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 EZ FLO may be used inside the box headers and jamb studs for NFPA 285 assemblies requiring SPF in stud cavities	1	None
	2	Any noncombustible insulation per ASTM E136
	3	Any Mineral Fiber (Board type Class A ASTM E84 faced or unfaced)
	4	Any Fiberglass (Batt type Class A ASTM E84 faced or unfaced)
	5	5 1/2 in. (maximum) Icynene LD-C-50™ SPF in 6 in. deep studs (maximum). Use with 5/8 in. exterior sheathing
	6	5 1/2 in. (maximum) Icynene MD-C-200™ 2 pcf SPF in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	7	5 1/2 in. (maximum) Icynene MD-R-210™ 2 pcf SPF in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	8	SWD Urethane QS 112 2 pcf SPF in 6 in. deep studs (maximum) partial fill with a maximum 2 1/2 in. air gap or full fill. Use with 5/8 in. exterior sheathing
	9	Gaco Western 183M SPF (3 1/2 in. maximum). Use with 5/8 in. exterior sheathing
	10	Gaco Western F 1850 SPF (3 1/2 in. maximum). Use with 5/8 in. exterior sheathing
	11	Demilec Sealection 500 SPF (3 5/8 in. maximum). Use with 5/8 in. exterior sheathing.
	12	Demilec HeatLok Soy 200 Plus SPF (3.4 in. maximum). Use with 5/8 in. exterior sheathing.

	13	Bayer Bayseal® SPF (3 in. maximum). Use with 5/8 in. exterior sheathing.
	14	Lapolla Foam-Lok™ FL 2000 SPF (3 in. maximum). Use with 5/8 in. exterior sheathing.
	15	BASF SPRAYTITE® 81206 or WALLTITE® (US & US-N) SPF (3 5/8 in. maximum). Use with 5/8 in. exterior sheathing.
Exterior Sheathing Use either 1, 2, 3, 4, 5, 6, 7, or 8 Note: When SPF is used, 5/8 in. exterior gypsum sheathing must also be used	1	None (when using Base Wall 1 or 2)
	2	1/2 in. thick or thicker, exterior gypsum board sheathing
	3	1/2 in. (minimum) FRTW structural panels complying with IBC Section 2303.2 and installed in accordance with code allowances for Types I, II, III, or IV construction.
	4	5/8 in. DensElement® with DensDefy® or Prosoco FastFlash flashing at joints/fasteners
	5	Soprema SOPRASEAL® Xpress G
	6	Tremco/USG Securock® ExoAir® 430
Weather-Resistive Barrier Applied to Exterior Sheathing Use any WRB installed per manufacturer installation instructions Note: When no exterior sheathing is used, sheet building wraps may be applied directly to studs.	1	GCP PERM-A-BARRIER® Aluminum Wall Membrane
	2	GCP PERM-A-BARRIER® NPL 10
	3	GCP PERM-A-BARRIER® VPL
	4	GCP PERM-A-BARRIER® VPL Low Temperature
	5	GCP PERM-A-BARRIER® Ultra
	6	GCP PERM-A-BARRIER® NPS
	7	GCP PERM-A-BARRIER® VPS 30
	8	GCP PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation Use either 1, 2, or 3	1	4 1/2 in. (max. consisting of a single panel or multiple thinner panels) Rmax Thermasheath®
	2	4 1/2 in. (max. consisting of a single panel or multiple thinner panels) Rmax TSX-8500
	3	4 1/2 in. (max. consisting of a single panel or multiple thinner panels) Rmax TSX-8510
FRTW Structural Panels over Exterior Insulation (Optional)	For use with all cladding options, installed in accordance with applicable code requirements. Must be applied with joints staggered. Fasteners used for securing FRTW panels must penetrate through the foam plastic into FRTW or steel framing. The system must be designed to handle the cladding load and wind load per the applicable code.	
	Note	May be applied in the field or factory. Adhesive must not be full coverage.
Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW) Use any in item 1 or 2 Note: Exterior WRB items in 1. b. are not traditional WRB products but are insulation panel joint	1	For use with all claddings:
		a. None
		b. GCP PERM-A-BARRIER® Aluminum Wall Membrane
		c. GCP PERM-A-BARRIER® Ultra
	2	For use with cladding options 1-6 (heavy masonry) with non-open joint installation techniques (i.e., shiplap, etc.):
		a. GCP PERM-A-BARRIER® VPL

tapes. The insulation panel joints shall be staggered.		b. GCP PERM-A-BARRIER® VPL Low Temperature
		c. GCP PERM-A-BARRIER® Ultra
		d. GCP PERM-A-BARRIER® NPS
Exterior Cladding Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, or 17 Note: For WRB over exterior insulation, option 2 above, heavy masonry claddings 1-6 shall incorporate non-open joints.	Heavy Masonry:	
	1	Brick – Nominal 4 in. clay brick or veneer with a maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath. A secondary WRB shall be installed between the exterior insulation and lath to provide a bond break
	3	Limestone – Minimum 2 in. thick using any standard installation technique
	4	Natural stone veneer – Minimum 2 in. thick using any standard installation technique
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard installation technique
	6	Terra cotta cladding – Minimum 1 1/2 in. thick using any standard installation technique
	Other:	
	1	Uninsulated fiber-cement panel siding using any standard installation technique
	Note	The secondary barriers shall not be full-coverage asphalt or butyl-based self adhered membranes.
Rough Openings Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation	Rough opening perimeters shall incorporate one of the following, spanning at a minimum from the interior edge of the cladding to the interior edge of the exterior insulation at the rough opening:	
	1	20-gauge (min.) sheet steel (examples include window frame, flashing, lintel, C-channel)
	2	1 in. (min.) 4 pcf (min.) mineral wool
	3	1 1/2 in. (min.) FRT wood buck
	4	Two layers 3/4 in. (min.) FRT plywood
	5	Two layers 5/8 in. (min.) type X GWB
	6	1/2 in. (min.) fiber cement board (or two layers minimum 3/4 in.)
	All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl flashing tape, liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12 in. maximum width.	

For walls with Rmax ECOMAXci® FR Air Barrier or EVOMAXci®

Based on DrJ TER 1212-03 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall System (Select Option 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	20-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
		a. 1/2 in. (minimum) type X Special Fire Resistance Gypsum Wallboard Interior
		b. bracing as required by code
	4	Where allowed by code in Types I, II, III, or IV construction, Fire-Retardant Treated Wood (FRTW) studs complying with IBC Section 2303.2, minimum nominal 2x4 dimension, spaced 24 in. o.c. (max.)
		a. 5/8 in. Type X gypsum wallboard interior
		b. bracing as required by code
Floorline Firestopping Select option 1 or 2	1	4 pcf mineral wool installed with Z-clips
	2	FRTW fire blocking at floor line in accordance with applicable code requirements (use with FRTW framing)
Cavity Insulation Select option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15 EZ FLO may be used inside the box headers and jamb studs for NFPA 285 assemblies requiring SPF in stud cavities	1	None
	2	Any noncombustible insulation per ASTM E136
	3	Any Mineral Fiber (Board type Class A ASTM E84 faced or unfaced)
	4	Any Fiberglass (Batt type Class A ASTM E84 faced or unfaced)
	5	5 1/2 in. (maximum) Icynene LD-C-50™ SPF in 6 in. deep studs (maximum). Use with 5/8 in. exterior sheathing
	6	5 1/2 in. (maximum) Icynene MD-C-200™ 2 pcf SPF in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	7	5 1/2 in. (maximum) Icynene MD-R-210™ 2 pcf SPF in 6 in. deep studs (maximum) full fill without an air gap. Use with 5/8 in. exterior sheathing.
	8	SWD Urethane QS 112 2 pcf SPF in 6 in. deep studs (maximum) partial fill with a maximum 2 1/2 in. air gap or full fill. Use with 5/8 in. exterior sheathing
	9	Gaco Western 183M SPF (3 1/2 in. maximum). Use with 5/8 in. exterior sheathing
	10	Gaco Western F 1850 SPF (3 1/2 in. maximum). Use with 5/8 in. exterior sheathing
	11	Demilec Sealection 500 SPF (3 5/8 in. maximum). Use with 5/8 in. exterior sheathing.

	12	Demilec HeatLok Soy 200 Plus SPF (3.4 in. maximum). Use with 5/8 in. exterior sheathing.
	13	Bayer Bayseal® SPF (3 in. maximum). Use with 5/8 in. exterior sheathing.
	14	Lapolla Foam-Lok™ FL 2000 SPF (3 in. maximum). Use with 5/8 in. exterior sheathing.
	15	BASF SPRAYTITE® 81206 or WALLTITE® (US & US-N) SPF (3 5/8 in. maximum). Use with 5/8 in. exterior sheathing.
Exterior Sheathing Select option 1, 2, 3, 4, 5, 6, 7, or 8 Note: When SPF is used, 5/8 in. exterior gypsum sheathing must also be used	1	None (when using Base Wall 1 or 2)
	2	None (3 in. maximum exterior insulation with claddings 7-17)
	3	None (4 1/2 in. maximum exterior insulation with claddings 1-6)
	4	1/2 in. thick or thicker exterior gypsum board sheathing
	5	1/2 in. (minimum) FRTW structural panels complying with IBC Section 2303.2 and installed in accordance with code allowances for Types I, II, III, or IV construction.
	6	5/8 in. DensElement® with DensDefy® or Prosoco FastFlash flashing at joints/fasteners
	7	Soprema SOPRASEAL® Xpress G
	8	Tremco/USG Securock® ExoAir® 430
Weather-Resistive Barrier Applied to Exterior Sheathing Select option 1, 2, 3, 4, 5, 6, 7, or 8 installed per manufacturer installation instructions Note: When no exterior sheathing is used, sheet building wraps may be applied directly to studs.	1	GCP PERM-A-BARRIER® Aluminum Wall Membrane
	2	GCP PERM-A-BARRIER® NPL 10
	3	GCP PERM-A-BARRIER® VPL
	4	GCP PERM-A-BARRIER® VPL Low Temperature
	5	GCP PERM-A-BARRIER® Ultra
	6	GCP PERM-A-BARRIER® NPS
	7	GCP PERM-A-BARRIER® VPS 30
	8	GCP PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation Use either 1 or 2 Note: See Exterior sheathing options for thickness limitations when no exterior sheathing is used.	1	4 1/2 in. (max. consisting of a single panel or multiple thinner panels) Rmax ECOMAXci® FR Air Barrier
	2	4 1/2 in. (max. consisting of a single panel or multiple thinner panels) Rmax EVOMAXci®
FRTW Structural Panels over Exterior Insulation (Optional)	1	For use with all cladding options, installed in accordance with applicable code requirements. Must be applied with joints staggered. Fasteners used for securing FRTW panels must penetrate through the foam plastic into FRTW or steel framing. The system must be designed to handle the cladding load and wind load per the applicable code.
	Note	May be applied in the field or factory. Adhesive must not be full coverage.
	1	For use with all claddings:

Weather-Resistive Barrier Applied over Exterior Insulation (or FRTW) Use any in item 1 or 2 depending on the cladding used Note: Exterior WRB items in 1b are not traditional WRB products but are insulation panel joint tapes. The insulation panel joints shall be staggered.		a. None
		b. GCP PERM-A-BARRIER® Aluminum Wall Membrane
	2	For use with cladding options 1-6 (heavy masonry) with non-open joint installation techniques (i.e., shiplap, etc.):
		a. GCP PERM-A-BARRIER® VPL
		b. GCP PERM-A-BARRIER® VPL Low Temperature
		c. GCP PERM-A-BARRIER® Ultra
		d. GCP PERM-A-BARRIER® NPS
Exterior Cladding Selection option 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, or 17 Note: For WRB over exterior insulation, option 2 above, heavy masonry claddings 1-6 shall incorporation non-open joints.	Heavy Masonry:	
	1	Brick – Nominal 4 in. clay brick or veneer with a maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath with an optional secondary water resistive barrier between the exterior insulation and lath
	3	Limestone – Minimum 2 in. thick using any standard installation technique
	4	Natural stone veneer – Minimum 2 in. thick using any standard installation technique
	5	Cast artificial stone– Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard installation technique
	6	Terra cotta cladding – Minimum 1 1/4 in. thick using any standard installation technique
	Other:	
	7	Any MCM or ACM (aluminum, steel, copper, zinc) (with 2 1/2 in. maximum air gap) that has successfully passed NFPA 285 using any standard installation technique, such as Carter Companies EVO Architectural Panel Systems for use with any FR ACM/MGM NFPA 285 material.
	8	Uninsulated sheet metal building panels including aluminum, zinc, steel, or copper using any standard installation technique
	9	Uninsulated fiber-cement board siding using any standard installation technique
	10	Stone/Aluminum honeycomb composite building panels that have passed NFPA 285 or equivalent
	a	Stone Panels Inc. Stone Lite Panel system has been analyzed using manufacturer standard installation technique
	11	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 using any standard installation technique
	12	Thin Set Brick:
		a. Glen-Gary Thin Tech® Elite Series has been analyzed using manufacturer standard installation technique

		b. TABS II Panel System with 1/2 in. bricks using Tabs Wall Adhesive.
	13	Natural Stone Veneer - minimum 1 1/4 in. (adhered with mortar or concrete/cement based adhesive).
	14	FunderMax m.look, using the manufacturer standard installation technique. The air gap between cladding and insulation or WRB must not exceed 1 1/2 in.
	15	Glen-Gery Tru-Brix (only with optional non-combustible mortar).
	16	Thin brick (minimum 3/4 in. thick clay brick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 1/2 in. thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick
	17	Natural stone or artificial stone (minimum 3/4 in. thick) fully adhered with cementitious mortar (standard or polymer-modified) to minimum 1/2 in. thick cement backer board or gypsum sheathing. A secondary water resistive barrier can be installed between the exterior sheathing and the brick
	Note	The secondary barriers shall not be full-coverage asphalt or butyl-based self adhered membranes.
Rough Openings Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation	Rough opening perimeters shall incorporate one of the following, spanning at a minimum from the interior edge of the cladding to the interior edge of the exterior insulation at the rough opening:	
	1	0.08 in. (minimum) aluminum (examples include window frame, flashing, lintel, C-channel)
	2	20-gauge (min.) sheet steel (examples include window frame, flashing, lintel, C-channel)
	3	1/2 in. (min.) 4pcf (min.) mineral wool
	4	3/4 in. (min.) FRT wood buck
	5	3/4 in. (min.) FRT plywood
	6	5/8 in. (min.) type X GWB
	7	1/4 in. (min.) fiber cement board
	All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl flashing tape, liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12 in. maximum width.	

For walls containing Hunter Xci Foil Exterior Insulation

Based on DrJ TER 1402-02 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
		a. 5/8 in. Type X gypsum wallboard interior
		b. lateral bracing every 4 ft optional or as required by code
	4	FRTW studs: minimum nominal 2 in. x 4 in. spaced 24 in. o.c. (maximum)
		a. 5/8 in. Type X gypsum wallboard interior
		b. bracing as required by code
Fire-Stopping at Floor Lines (Use Item 1 or 2)	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use any item 1–11)	1	None
	2	1 1/2 in. maximum of Carlisle SPI SealTite™ PRO, SealTite™ Closed Cell, SealTite™ One Zero
	3	Any noncombustible insulation per ASTM E136
	4	Any mineral fiber (Board type faced or unfaced)
	5	Any fiberglass (Batt type faced or unfaced)
	6	3 1/4 in. (maximum) of Carlisle SPI SealTite™ PRO, SealTite™ Closed Cell, SealTite™ One Zero – only with Sheathing 2
	7	Carlisle SealTite™ PRO HFO, SealTite™ PRO Open Cell, SealTite™ PRO High Yield, SealTite™ PRO No Mix, SealTite™ PRO No Trim 21, SealTite™ PRO OCX. 3 5/8 in. maximum. Use with 1/2 in. exterior sheathing
	8	JM Corbond® III or IV - 3 5/8 in. maximum. Use with 5/8 in. exterior sheathing
	9	BASF WALLTITE® Max - 3 5/8 in. maximum. Use with 1/2 in. exterior sheathing
	10	Huntsman HeatLok HFO Pro. Huntsman HeatLok HFO High Lift. 3 5/8 in. maximum. Use with 5/8 in. exterior sheathing
	11	SWD Urethane QUIK-SHIELD® Goblin or Yeti - 1 to 3 5/8 in. thick for use in 3 5/8 in. studs (maximum). Use with 5/8 in. exterior sheathing
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with Claddings 1-6 and Cavity Insulations 1, 3, 4, or 5)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels in Type III construction

Multi-Function Sheathing and WRB Products (Use 1 or 2)	1	USG Securock® ExoAir® 430 System.
	2	5/8 in. Georgia-Pacific DensElement® flashed with Prosoco R-Guard FastFlash on sheathing joints
	Note	Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB on base wall surface.
	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® NPL 10
	5	PERM-A-BARRIER® Ultra
	6	PERM-A-BARRIER® NPS
Exterior Insulation Use any Item 1 or 2, depending on cladding	7	PERM-A-BARRIER® VPS 30
	8	PERM-A-BARRIER® VPL 50RS UV
WRB over Exterior Insulation	1	4 in. thick (maximum) Xci Foil for Claddings 1-6
	2	3 1/2 in. thick (maximum) Xci Foil for Claddings 7-16 (with special Opening Perimeter)
	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
Exterior Cladding Use any item 1–17 Cladding 1-6 for 4 in. (maximum) insulation thickness Cladding 7-17 for 3 1/2 in. (maximum) insulation thickness with unique opening perimeter Maximum air gap 2 in. for claddings 1–6 Maximum air gap 1½ in. for claddings 7–17. If claddings 2, 3, 4, 5, 11, 12, or 14 are on stucco base with lath,	5	PERM-A-BARRIER® NPS
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap

a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full-coverage asphalt or self-adhering membranes, but may be slip sheet (stapled) with no adhesive.	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
	7	Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness
	8	Uninsulated sheet metal building panels including steel, copper, or aluminum
	9	1/4 in. (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached
	10	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
	11	Thin brick or cultured stone set in thin set adhesive and metal lath
	12	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive
	13	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) using any installation technique with ventilated shiplap
	14	3/8 in. or 1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria
	15	Natural stone veneer – Minimum 1 1/4 in. thick using any standard installation technique
	16	AFC Terraslat by Tonality® – Tonality® Classic26 or Tonality® Classic22
	17	8 mm (minimum) or 5/16 in. (minimum) SwissPearl® Fiber Cement cladding
	Note 1	Armatherm™ Z Girts may be used horizontally in Hunter assemblies
Special Opening Perimeter (Use with Claddings 7-17)	Note 2	Strongirt® (Mix U) horizontal fiberglass Z Girt may be used for all claddings listed, other than ACM or MCM
	1	Tested Opening - 2 layers 5/8 in. gypsum, with 18-gauge steel flashing at header and 1 layer 5/8 in. gypsum and 18-gauge Galvanized Steel Flashing at jambs and sill
	2	2 in. mineral wool 4 lb/ft ³ density
	3	1 1/2 in. thick FRT wood buck
	4	Two layers of 3/4 in. FRT plywood

For walls containing Hunter Xci Foil Class A or Xci 286 Exterior Insulation

Based on DrJ TER 1402-01 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
		a. 5/8 in. Type X gypsum wallboard interior
		b. lateral bracing every 4 ft
	4	Fire-Retardant Treated Wood (FRTW) studs minimum nominal 2 in. x 4 in. spaced 24 in. o.c. (maximum)
		a. 5/8 in. Type X gypsum wallboard interior
		b. bracing as required by code
Fire-Stopping at Floor Lines	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use any item 1–6)	1	None
	2	1 1/2 in. max Carlisle SPI SealTite™ PRO, SealTite™ Closed Cell, SealTite™ One Zero
	3	Any noncombustible insulation per ASTM E136
	4	Any mineral fiber (board type faced or unfaced)
	5	Any fiberglass (batt type faced or unfaced)
	6	3 1/4 in. max Carlisle SPI SealTite™ PRO, SealTite™ Closed Cell, SealTite™ One Zero – only with Exterior Sheathing 2
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with cavity insulation 1–5 and cladding 1–6 with max 3 1/2 in. Xci-Foil Class A)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels in Type III construction
Multi-Function Sheathing and WRB Products (Use 1 or 2)	1	USG Securock® ExoAir® 430 System
	2	5/8 in. Georgia-Pacific DensElement® flashed with Prosoco R-Guard FastFlash on sheathing joints
	Note	Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRBs on base wall surface shown below
	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® NPL 10
	5	PERM-A-BARRIER® Ultra
	6	PERM-A-BARRIER® NPS

	7	PERM-A-BARRIER® VPS 30
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation (Use either 1 or 2 depending on cladding) Note: A construction which utilizes no exterior sheathing may not use spray foam cavity insulation	1	3 1/2 in. max Xci Foil Class A or Xci-286 for all claddings
	2	4 in. Xci Foil Class A or Xci-286 for claddings 1–6
WRB Over Exterior Insulation	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use any item 1–16. Maximum air gap 2 in. for claddings 1–6 and 1½ in. for claddings 7–16. If claddings 2, 3, 4, 5, 11, 12, or 14 are on stucco base with lath, a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full-coverage asphalt or self-adhering membranes, but may be slip sheet (stapled) with no adhesive. Armatherm™ Z Girts may be used horizontally in Hunter assemblies.	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath (with approved WRB over exterior insulation as listed above)
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
	7	Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness
	8	Uninsulated sheet metal building panels including steel, copper, or aluminum
	9	1/4 in. (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached
	10	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria

11	Thin brick or cultured stone set in thin set adhesive and metal lath
12	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive
13	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) with ventilated shiplap
14	1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria
15	Natural stone veneer – Minimum 1 1/4 in. thick using any standard installation technique
16	AFC Terraslat by Tonality® – Tonality® Classic26 or Tonality® Classic22

For walls containing Hunter Xci CG Class A Exterior Insulation

Based on DrJ TER 1402-01 (NFPA 295-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	Lateral bracing every 4 ft
	4	FRTW studs, minimum nominal 2 in. x 4 in., spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	Bracing as required by building code
Fire-Stopping at Floor Lines (Use item 1 or 2)	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line; Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use any item 1–6)	1	None
	2	1 1/2 in. (maximum) Carlisle SPI SealTite™ PRO, SealTite™ PRO Closed Cell, or SealTite™ PRO One Zero
	3	Any noncombustible insulation per ASTM E136
	4	Any mineral fiber insulation (board type, ASTM E84 Class A, faced or unfaced)
	5	Any fiberglass insulation (batt type, ASTM E84 Class A, faced or unfaced)
	6	3 1/4 in. (maximum) of Carlisle SPI SealTite™ PRO, SealTite™ PRO Closed Cell, or SealTite™ PRO One Zero – only with Sheathing 2
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with claddings 1–6 and cavity insulation 1, 3, 4, or 5)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels for Type III construction
Multi-Function Sheathing and WRB Products (Use 1 or 2)	1	USG Securock® ExoAir® 430 System
	2	5/8 in. Georgia-Pacific DensElement® flashed with Prosoco R-Guard FastFlash on sheathing joints
	Note	Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRBs on base wall surface.
WRB Over Base Wall Surface	1	PERM-A-BARRIER® VPS 30
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	4	PERM-A-BARRIER® VPL LT
	5	PERM-A-BARRIER® NPL 10

	6	PERM-A-BARRIER® Ultra
	7	PERM-A-BARRIER® NPS
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation (Use either 1 or 2 depending on cladding)	1	4 in. thick (maximum) Xci CG Class A for claddings 1–6
	2	3 1/2 in. thick (maximum) Xci CG Class A for claddings 7–16 (with special opening perimeter)
WRB Over Exterior Insulation	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use any item 1–16. Cladding 1–6 for 4 in. (maximum) insulation thickness Cladding 7–16 for 3 1/2 in. (maximum) insulation thickness with special opening perimeter Maximum air gap 2 in. for claddings 1–6 and 1 1/2 in. for claddings 7–16. If claddings 2, 3, 4, 5, 11, 12, or 14 are on stucco base with lath, a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full-coverage asphalt or self-adhering membranes, but may be slip sheet (stapled) with no adhesive. Armatherm™ Z Girts may be used horizontally in Hunter assemblies.	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath (with approved WRB over exterior insulation as listed above)
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
	7	Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness
	8	Uninsulated sheet metal building panels including steel, copper, or aluminum
	9	1/4 in. (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached
	10	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
	11	Thin brick or cultured stone set in thin set adhesive and metal lath

	12	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive
	13	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) with ventilated shiplap
	14	1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria
	15	Natural stone veneer – Minimum 1 1/4 in. thick using any standard installation technique
	16	AFC Terraslat by Tonality® – Tonality® Classic26 or Tonality® Classic22
Special Opening Perimeter (Use with Claddings 7-16)	1	Tested Opening - 2 layers 5/8 in. gypsum, with 18-gauge steel flashing at header and 1 layer 5/8 in. and 18-gauge Galvanized Steel Flashing at jambs and still
	2	2 in. mineral wool 4 lb density
	3	1 1/2 in. thick FRT wood buck
	4	Two layers of 3/4 in. FRT plywood

For walls containing Hunter Xci Ply Class A Exterior Insulation

Based on DrJ TER 1402-01 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	Lateral bracing every 4 ft
	4	FRTW studs, minimum nominal 2 in. x 4 in., spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	Bracing as required by building code
Fire-Stopping at Floor Lines (Use item 1 or 2)	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line; Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use any item 1–6)	1	None
	2	1 1/2 in. (maximum) Carlisle SPI SealTite™ PRO, SealTite™ PRO Closed Cell, or SealTite™ PRO One Zero
	3	Any noncombustible insulation per ASTM E136
	4	Any mineral fiber (Board type, ASTM E84 Class A, faced or unfaced)
	5	Any fiberglass (Batt type, ASTM E84 Class A, faced or unfaced)
	6	3 1/4 in. (maximum) of Carlisle SPI SealTite™ PRO, SealTite™ PRO Closed Cell, or SealTite™ PRO One Zero – only with Sheathing 2
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with claddings 1–6 and cavity insulation 1, 3, 4, or 5). Also see note for Cavity insulation
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels for Type III construction
Multi-Function Sheathing and WRB Products (Use 1 or 2)	1	USG Securock® ExoAir® 430 System
	2	5/8 in. Georgia-Pacific DensElement® flashed with Prosoco R-Guard FastFlash on sheathing joints
	Note	Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRBs on base wall surface.
WRB Over Base Wall Surface	1	PERM-A-BARRIER® VPS 30
	2	PERM-A-BARRIER® NPL 10
	3	PERM-A-BARRIER® VPL
	4	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	5	PERM-A-BARRIER® VPL LT

	6	PERM-A-BARRIER® Ultra
	7	PERM-A-BARRIER® NPS
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation (Use either 1 or 2 depending on cladding)	1	4 1/4 in. thick (maximum) Xci Ply Class A (3 1/2 in. foam maximum, 3/4 in. FR Plywood maximum) with Claddings 7-16 (with Special Opening Perimeter)
	2	4 3/4 in. thick (maximum) Xci Ply Class A (4 in. foam maximum, 3/4 in. FR Plywood maximum) may be used with claddings 1-6
WRB Over Exterior Insulation (Only with Claddings 1-6)	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® VPL LT
	3	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1-6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use any item 1–16. Cladding 7-16 for 3 1/2 in. (maximum) insulation thickness with special opening perimeter Maximum air gap 2 in. for cladding 1-6 Cladding 7-16 for 3 1/2 in. (maximum) insulation thickness with special opening perimeter Maximum air gap 2 in. for claddings 1-6 If claddings 2, 3, 4, 5, 11, 12, or 14 are on stucco base with lath, a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full-coverage asphalt or self-adhering membranes, but may be slip sheet (stapled) with no adhesive. Armatherm™ Z Girts may be used horizontally in Hunter assemblies.	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath (with approved WRB over exterior insulation as listed above)
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
	7	Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness
	8	Uninsulated sheet metal building panels including steel, copper, or aluminum
	9	1/4 in. (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached

	10	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
	11	Thin brick or cultured stone set in thin set adhesive and metal lath
	12	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive
	13	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) with ventilated shiplap
	14	1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria
	15	Natural stone veneer – Minimum 1 1/4 in. thick using any standard installation technique
	16	AFC Terraslat by Tonality® – Tonality® Classic26 or Tonality® Classic22
Special Opening Perimeter (Use with Claddings 7-16)	1	Tested Opening - 2 layers 5/8 in. gypsum, with 18-gauge > steel flashing at header and 1 layer 5/8 in. and 18-gauge Galvanized Steel Flashing at jambs and sill
	2	2 in. mineral wool 4 lb density
	3	1 1/2 in. thick FRT wood buck
	4	Two layers of 3/4 in. FRT plywood

For walls containing Hunter Xci Foil Class A Plus Exterior Insulation

Based on DrJ TER 1402-01 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	Lateral bracing every 4 ft
	4	FRTW studs, minimum nominal 2 in. x 4 in., spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	Bracing as required by building code
Fire-Stopping at Floor Lines (Use item 1 or 2)	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line; Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use any item 1–6)	1	None
	2	1 1/2 in. (maximum) Carlisle SPI SealTite™ PRO, SealTite™ PRO Closed Cell, or SealTite™ PRO One Zero
	3	Any noncombustible insulation per ASTM E136
	4	Any mineral fiber (Board type, ASTM E84 Class A, faced or unfaced)
	5	Any fiberglass (Batt type, ASTM E84 Class A, faced or unfaced)
	6	3 1/4 in. (maximum) of Carlisle SPI SealTite™ PRO, SealTite™ PRO Closed Cell, or SealTite™ PRO One Zero – only with Sheathing 2
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with cavity insulation 1, 2, 3, 4, 5, or 6)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels for Type III construction
Multi-Function Sheathing and WRB Products (Use 1 or 2)	1	USG Securock® ExoAir® 430 System.
	2	5/8 in. Georgia-Pacific DensElement® flashed with Prosoco R-Guard FastFlash on sheathing joints
	Note	Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRBs on base wall surface.
WRB Over Base Wall Surface	1	PERM-A-BARRIER® VPS 30
	2	PERM-A-BARRIER® NPL 10
	3	PERM-A-BARRIER® VPL
	4	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	5	PERM-A-BARRIER® VPL LT
	6	PERM-A-BARRIER® Ultra

	7	PERM-A-BARRIER® NPS
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation (Use either 1 or 2 depending on cladding)	1	4 in. thick (maximum) Xci Foil Class A Plus for all claddings listed
WRB Over Exterior Insulation (Only with Claddings 1-6)	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® VPL LT
	3	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1-6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use any item 1–16. Cladding 7-16 for 3 1/2 in. (maximum) insulation thickness with special opening perimeter Maximum air gap 2 in. for cladding 1-6 Cladding 7-16 for 3 1/2 in. (maximum) insulation thickness with special opening perimeter Maximum air gap 2 in. for claddings 1-6 Maximum Air Gap 1 1/2 in. for Claddings 7-16 If claddings 2, 3, 4, 5, 11, 12, or 14 are on stucco base with lath, a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full-coverage asphalt or self-adhering membranes, but may be slip sheet (stapled) with no adhesive. Armatherm™ Z Girts may be used horizontally in Hunter assemblies.	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath (with approved WRB over exterior insulation as listed above)
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
	7	Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness
	8	Uninsulated sheet metal building panels including steel, copper, or aluminum
	9	1/4 in. (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached
	10	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
	11	Thin brick or cultured stone set in thin set adhesive and metal lath
	12	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive

	13	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) with ventilated shiplap
	14	1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria
	15	Natural stone veneer – Minimum 1 1/4 in. thick using any standard installation technique
	16	AFC Terraslat by Tonality® – Tonality® Classic26 or Tonality® Classic22
Special Opening Perimeter (Use with Claddings 7-16)	1	Tested Opening - 2 layers 5/8 in. gypsum, with 18-gauge > steel flashing at header and 1 layer 5/8 in. and 18-gauge Galvanized Steel Flashing at jambs and sill
	2	2 in. mineral wool 4 lb density
	3	1 1/2 in. thick FRT wood buck
	4	Two layers of 3/4 in. FRT plywood

For walls containing Hunter Xci CG Exterior Insulation

Based on DrJ TER 1402-02 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	lateral bracing every 4 ft optional or as required by code
	4	FRTW studs: minimum nominal 2 in. x 4 in. spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	bracing as required by code
Fire-Stopping at Floor Lines (Use Item 1 or 2)	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use any item 1–11)	1	None
	2	1 1/2 in. maximum of Carlisle SPI SealTite™ PRO, SealTite™ Closed Cell, SealTite™ One Zero
	3	Any noncombustible insulation per ASTM E136
	4	Any mineral fiber (Board type faced or unfaced)
	5	Any fiberglass (Batt type faced or unfaced)
	6	3 1/4 in. (maximum) of Carlisle SPI SealTite™ PRO, SealTite™ Closed Cell, SealTite™ One Zero – only with Sheathing 2
	7	Carlisle SealTite™ PRO HFO, SealTite™ PRO Open Cell, SealTite™ PRO High Yield, SealTite™ PRO No Mix, SealTite™ PRO No Trim 21, SealTite™ PRO OCX. 3 5/8 in. maximum. Use with 1/2 in. exterior sheathing
	8	JM Corbond® III or IV - 3 5/8 in. maximum. Use with 5/8 in. exterior sheathing
	9	BASF WALLTITE® Max - 3 5/8 in. maximum. Use with 1/2 in. exterior sheathing
	10	Huntsman HeatLok HFO Pro. Huntsman HeatLok HFO High Lift. 3 5/8 in. maximum. Use with 5/8 in. exterior sheathing
	11	SWD Urethane QUIK-SHIELD® Goblin or Yeti - 1 to 3 5/8 in. thick for use in 3 5/8 in. studs (maximum). Use with 5/8 in. exterior sheathing
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with Claddings 1-6 and Cavity Insulations 1, 3, 4, or 5)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels in Type III construction

Multi-Function Sheathing and WRB Products (Use 1 or 2)	1	USG Securock® ExoAir® 430 System
	2	5/8 in. Georgia-Pacific DensElement® flashed with Prosoco R-Guard FastFlash on sheathing joints
	Note	Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB on base wall surface.
WRB Over Base Wall Surface	1	PERM-A-BARRIER® VPS 30
	2	PERM-A-BARRIER® NPL 10
	3	PERM-A-BARRIER® VPL
	4	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	5	PERM-A-BARRIER® VPL LT
	6	PERM-A-BARRIER® Ultra
	7	PERM-A-BARRIER® NPS
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation Use any Item 1 or 2	1	4 in. thick (maximum) Xci CG for Claddings 1-6
	2	3 1/2 in. thick (maximum) Xci CG for Claddings 7-17 (with special Opening Perimeter)
WRB Over Exterior Insulation	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® VPL LT
	3	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use any item 1–17 Cladding 1-6 for 4 in. (maximum) insulation thickness Cladding 7-17 for 3 1/2 in. (maximum) insulation thickness with unique opening perimeter Maximum air gap 2 in. for claddings 1–6 Maximum air gap 1½ in. for claddings 7–17. If claddings 2, 3, 4, 5, 11, 12, or 14 are on stucco base with lath,	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap

a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full-coverage asphalt or self-adhering membranes, but may be slip sheet (stapled) with no adhesive.	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
	7	Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness
	8	Uninsulated sheet metal building panels including steel, copper, or aluminum
	9	1/4 in. (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached
	10	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
	11	Thin brick or cultured stone set in thin set adhesive and metal lath
	12	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive
	13	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) using any installation technique with ventilated shiplap
	14	3/8 in. or 1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria
	15	Natural stone veneer – Minimum 1 1/4 in. thick using any standard installation technique
	16	AFC Terraslat by Tonality® – Tonality® Classic26 or Tonality® Classic22
	17	8 mm (minimum) or 5/16 in. (minimum) SwissPearl® Fiber Cement cladding
	Note 1	Armatherm™ Z Girts may be used horizontally in Hunter assemblies
Special Opening Perimeter (Use with Claddings 7-17)	Note 2	Strongirt® (Mix U) horizontal fiberglass Z Girt may be used for all claddings listed, other than ACM or MCM
	1	Tested Opening - 2 layers 5/8 in. gypsum, with 18-gauge steel flashing at header and 1 layer 5/8 in. gypsum and 18-gauge Galvanized Steel Flashing at jambs and sill
	2	2 in. mineral wool 4 lb/ft ³ density
	3	1 1/2 in. thick FRT wood buck
	4	Two layers of 3/4 in. FRT plywood

For walls containing Hunter Xci Ply Exterior Insulation

Based on DrJ TER 1402-02 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	lateral bracing every 4 ft optional or as required by code
	4	FRTW studs: minimum nominal 2 in. x 4 in. spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	bracing as required by code
Fire-Stopping at Floor Lines (Use Item 1 or 2)	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use any item 1–11)	1	None
	2	1 1/2 in. maximum of Carlisle SPI SealTite™ PRO, SealTite™ Closed Cell, SealTite™ One Zero
	3	Any noncombustible insulation per ASTM E136
	4	Any mineral fiber (Board type faced or unfaced)
	5	Any fiberglass (Batt type faced or unfaced)
	6	3 1/4 in. (maximum) of Carlisle SPI SealTite™ PRO, SealTite™ Closed Cell, SealTite™ One Zero – only with Sheathing 2
	7	Carlisle SealTite™ PRO HFO, SealTite™ PRO Open Cell, SealTite™ PRO High Yield, SealTite™ PRO No Mix, SealTite™ PRO No Trim 21, SealTite™ PRO OCX. 3 5/8 in. maximum. Use with 1/2 in. exterior sheathing
	8	JM Corbond® III or IV - 3 5/8 in. maximum. Use with 5/8 in. exterior sheathing
	9	BASF WALLTITE® Max - 3 5/8 in. maximum. Use with 1/2 in. exterior sheathing
	10	Huntsman HeatLok HFO Pro. Huntsman HeatLok HFO High Lift. 3 5/8 in. maximum. Use with 5/8 in. exterior sheathing
	11	SWD Urethane QUIK-SHIELD® Goblin or Yeti - 1 to 3 5/8 in. thick for use in 3 5/8 in. studs (maximum). Use with 5/8 in. exterior sheathing
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with Claddings 1-6 and Cavity Insulations 1, 3, 4, or 5). See note for Cavity Insulation
	2	1/2 in. or thicker exterior gypsum sheathing

	3	1/2 in. minimum FRTW structural panels in Type III construction
Multi-Function Sheathing and WRB Products (Use 1 or 2)	1	USG Securock® ExoAir® 430 System
	2	5/8 in. Georgia-Pacific DensElement® flashed with Prosoco R-Guard FastFlash on sheathing joints
	Note	Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB on base wall surface.
WRB Over Base Wall Surface	1	PERM-A-BARRIER® VPS 30
	2	PERM-A-BARRIER® NPL 10
	3	PERM-A-BARRIER® VPL
	4	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	5	PERM-A-BARRIER® VPL LT
	6	PERM-A-BARRIER® Ultra
	7	PERM-A-BARRIER® NPS
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation Use any Item 1 or 2, depending on cladding	1	4 3/4 in. thick (maximum) Xci Ply (4 in. foam maximum, 3/4 in. FRT Plywood maximum) may be used with Claddings 1-6
	2	4 1/4 in. thick (maximum) Xci Ply (3 1/2 in. Foam maximum, 3/4 in. FRT Plywood maximum) with Claddings 7-17 (with special Opening Perimeter)
WRB Over Exterior Insulation	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® VPL LT
	3	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use any item 1–17 Cladding 1-6 for 4 3/4 in. (maximum) insulation thickness Cladding 7-17 for 4 1/4 in. (maximum) insulation thickness with unique opening perimeter Maximum air gap 2 in. for claddings 1–6	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone

Maximum air gap 1½ in. for claddings 7–17. If claddings 2, 3, 4, 5, 11, 12, or 14 are on stucco base with lath, a secondary WRB (WRB items above allowed over foam) can be installed between the insulation and lath and must not be full-coverage asphalt or self-adhering membranes, but may be slip sheet (stapled) with no adhesive.	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
	7	Any ACM or MCM that has passed NFPA 285 with foam of comparable thickness
	8	Uninsulated sheet metal building panels including steel, copper, or aluminum
	9	1/4 in. (minimum) uninsulated fiber-cement siding, or porcelain or ceramic tile mechanically attached
	10	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
	11	Thin brick or cultured stone set in thin set adhesive and metal lath
	12	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive
	13	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) using any installation technique with ventilated shiplap
	14	1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria
	15	Natural stone veneer – Minimum 1 1/4 in. thick using any standard installation technique
	16	AFC Terraslat by Tonality® – Tonality® Classic26 or Tonality® Classic22
	17	8 mm (minimum) or 5/16 in. (minimum) SwissPearl® Fiber Cement cladding
	Note 1	Armatherm™ Z Girts may be used horizontally in Hunter assemblies
	Note 2	Strongirt® (Mix U) horizontal fiberglass Z Girt may be used for all claddings listed, other than ACM or MCM
Special Opening Perimeter (Use with Claddings 7-17)	1	Tested Opening - 2 layers 5/8 in. gypsum, with 18-gauge steel flashing at header and 1 layer 5/8 in. gypsum and 18-gauge Galvanized Steel Flashing at jambs and sill
	2	2 in. mineral wool 4 lb/ft³ density
	3	1 1/2 in. thick FRT wood buck
	4	Two layers of 3/4 in. FRT plywood

For walls containing Carlisle R2+ MATTE as exterior insulation

Based on DrJ TER 1407-01 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	lateral bracing every 4 ft optional or as required by code
	4	FRTW studs: minimum nominal 2 in. x 4 in. spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	bracing as required by code
Fire-Stopping at Floor Lines	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15) Items 8, 9, 10, and 11 may only be used with exterior sheathing	1	None
	2	1 1/2 in. minimum Covestro EcoBay™ CC SPF (up to full cavity thickness)
	3	1 1/2 in. minimum BASF WALLTITE® SPF (up to full cavity thickness)
	4	Any noncombustible insulation per ASTM E136
	5	Any mineral fiber (Board type Class A ASTM E84 faced or unfaced)
	6	Any fiberglass (Batt type Class A ASTM E84 faced or unfaced)
	7	Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m ² heat flux) and shown by analysis to be less flammable (improved T _{ign} , PK, HRR) than Covestro EcoBay™ CC or BASF WALLTITE®
	8	NCFI InsulBloc® SPF (up to full cavity thickness)
	9	Icynene MD-C-200™v3 (ProSeal™) up to 5 1/2 in. (only with 1/2 in. [minimum] exterior gypsum sheathing)
	10	SWD Urethane QUIK-SHIELD® 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2 in.
	11	1 1/2 in. (minimum) ThermoSeal® 2000 (up to full cavity thickness)
	12	Carlisle SealTite™ PRO High Yield, SealTite™ PRO Open Cell, SealTite™ PRO No Mix, SealTite™ PRO No Trim 21 or SealTite™ PRO OCX - up to full cavity thickness with 1/2 in. (minimum) exterior gypsum sheathing
	13	Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 - 3 1/2 in. (maximum) for use with 5/8 in. Exterior Gypsum Sheathing

	14	JM Corbond® III or Corbond® IV - Full stud cavity depth or less for use with 5/8 in. exterior gypsum sheathing
	15	Huntsman ProSeal™ HFO (8 in. maximum thickness with no air gap, 6 in. maximum thickness with air gap) for use with 1/2 in. or thicker exterior gypsum sheathing
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with Claddings 1-6 and Cavity Insulation 1, 3, 4, 5, or 6)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels in Type III construction
Water Resistive Barrier (WRB) Over Base Wall Surface	1	PERM-A-BARRIER® VPL LT
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® Aluminum Wall Membrane
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	6	PERM-A-BARRIER® NPL 10 (only with Claddings 1-6)
	7	PERM-A-BARRIER® VPS 30 (only with Claddings 1-6)
	8	PERM-A-BARRIER® VPL 50RS UV (only with Claddings 1-6)
Exterior Insulation Use option 1	1	3 1/2 in. (maximum) R2+ MATTE
WRB Over Exterior Insulation	1	PERM-A-BARRIER® VPL LT
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® Aluminum Wall Membrane
	4	PERM-A-BARRIER® Ultra
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, or 17 Item 7 may use any tested/approved installation technique Items 8, 9, or 12 may use any standard installation technique	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation (above) can be used as a slip sheet between the WRB/external insulation and the lath.
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone

5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
7	Any ACM or MCM that has successfully passed NFPA 285
8	Uninsulated sheet metal building panels including steel, copper, or aluminum
9	Uninsulated fiber-cement siding
10	Stone/Aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria
11	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
12	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) with ventilated shiplap
13	1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per NFPA 285 or stays in place when tested per ASTM E119 (stucco exposed to fire) for at least 30 minutes
14	Thin brick/cultured stone set in thin set adhesive and metal lath that has been tested to ASTM E119 (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed an NFPA 285 test Minimum 3/4 in. For these systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation (above) can be used as a slip sheet between the WRB/AVP and the lath
15	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive
16	Natural Stone Veneer - minimum 1 1/4 in. thick using any standard installation technique
17	Fundermax m.look Grey Core - minimum 1 1/4 in. thick using any standard installation technique

For walls containing Carlisle R2+ SILVER as exterior insulation

Based on DrJ TER 1407-01 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	lateral bracing every 4 ft
	4	FRTW studs: minimum nominal 2 in. x 4 in. spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	bracing as required by code
Fire-Stopping at Floor Lines	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15) Items 8, 9, 10, and 11 may only be used with exterior sheathing	1	None
	2	1 1/2 in. minimum Covestro EcoBay™ CC SPF (up to full cavity thickness)
	3	1 1/2 in. minimum BASF WALLTITE® SPF (up to full cavity thickness)
	4	Any noncombustible insulation per ASTM E136
	5	Any mineral fiber (Board type Class A ASTM E84 faced or unfaced)
	6	Any fiberglass (Batt type Class A ASTM E84 faced or unfaced)
	7	Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m2 heat flux) and shown by analysis to be less flammable (improved T _{ign} , PK, HRR) than Covestro EcoBay™ CC or BASF WALLTITE®
	8	NCFI InsulBloc SPF (up to full cavity thickness)
	9	Icynene MD-C-200™v3 (ProSeal™) up to 5 1/2 in. (only with 1/2 in. [minimum] exterior gypsum sheathing)
	10	SWD Urethane QUIK-SHIELD® 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2 in.
	11	1 1/2 in. (minimum) ThermoSeal 2000 (up to full cavity thickness)
	12	Carlisle SealTite™ PRO High Yield, SealTite™ PRO Open Cell, SealTite™ PRO No Mix, SealTite™ PRO No Trim 21 or SealTite™ PRO OCX - up to full cavity thickness with 1/2 in. (minimum) exterior gypsum sheathing
	13	Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 - 3 1/2 in. (maximum) for use with 5/8 in. Exterior Gypsum Sheathing

	14	JM Corbond® III or Corbond® IV - Full stud cavity depth or less for use with 5/8 in. exterior gypsum sheathing
	15	Huntsman ProSeal™ HFO (8 in. maximum thickness with no air gap, 6 in. maximum thickness with air gap) for use with 1/2 in. or thicker exterior gypsum sheathing
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with Cavity Insulation 1, 4, 5, or 6)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels in Type III construction allowed in place of gypsum sheathing when combustible cavity insulation is not used
Water Resistive Barrier (WRB) Over Base Wall Surface	1	PERM-A-BARRIER® VPL LT
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® Aluminum Wall Membrane
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	6	PERM-A-BARRIER® NPL 10 (only with Claddings 1-6)
	7	PERM-A-BARRIER® VPS 30 (only with Claddings 1-6)
	8	PERM-A-BARRIER® VPL 50RS UV (only with Claddings 1-6)
Exterior Insulation Use option 1	1	3 1/2 in. (maximum) R2+ SILVER
WRB Over Exterior Insulation	1	PERM-A-BARRIER® VPL LT
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® Aluminum Wall Membrane
	4	PERM-A-BARRIER® Ultra
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use 1, 2, 3, 4, 5, or 6	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation (above) can be used as a slip sheet between the WRB/external insulation and the lath.
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap

	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap

For walls containing Carlisle R2+ BASE as exterior insulation

Based on DrJ TER 1407-01 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use items 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	lateral bracing every 4 ft
	4	FRTW studs: minimum nominal 2 in. x 4 in. spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	bracing as required by code
Fire-Stopping at Floor Lines	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15) Items 3, 8, 9, 10, and 11 may only be used with exterior sheathing	1	None
	2	1 1/2 in. minimum Covestro EcoBay™ CC SPF (up to full cavity thickness)
	3	1 1/2 in. minimum BASF WALLTITE® SPF (up to full cavity thickness)
	4	Any noncombustible insulation per ASTM E136
	5	Any mineral fiber (Board type Class A ASTM E84 faced or unfaced)
	6	Any fiberglass (Batt type Class A ASTM E84 faced or unfaced)
	7	Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m ² heat flux) and shown by analysis to be less flammable (improved T _{ign} , PK, HRR) than Covestro EcoBay™ CC or BASF WALLTITE®
	8	NCFI InsulBloc SPF (up to full cavity thickness)
	9	Icynene MD-C-200™v3 (ProSeal™) up to 5 1/2 in. (only with 1/2 in. [minimum] exterior gypsum sheathing)
	10	SWD Urethane QUIK-SHIELD® 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2 in.
	11	1 1/2 in. (minimum) ThermoSeal 2000 (up to full cavity thickness)
	12	Carlisle SealTite™ PRO High Yield, SealTite™ PRO Open Cell, SealTite™ PRO No Mix, SealTite™ PRO No Trim 21 or SealTite™ PRO OCX - up to full cavity thickness with 1/2 in. (minimum) exterior gypsum sheathing
	13	Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 - 3 1/2 in. (maximum) for use with 5/8 in. Exterior Gypsum Sheathing

	14	JM Corbond® III or Corbond® IV - Full stud cavity depth or less for use with 5/8 in. exterior gypsum sheathing
	15	Huntsman ProSeal™ HFO (8 in. maximum thickness with no air gap, 6 in. maximum thickness with air gap) for use with 1/2 in. or thicker exterior gypsum sheathing
Exterior Sheathing (Use 1, 2, or 3)	1	None (only with Cavity Insulation 1, 2, 4, 5, or 6)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels in Type III construction
Water Resistive Barrier (WRB) Over Base Wall Surface	1	PERM-A-BARRIER® VPL LT
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® Aluminum Wall Membrane
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	6	PERM-A-BARRIER® NPL 10 (only with Claddings 1-6)
	7	PERM-A-BARRIER® VPS 30 (only with Claddings 1-6)
	8	PERM-A-BARRIER® VPL 50RS UV (only with Claddings 1-6)
Exterior Insulation Use option 1	1	4 1/4 in. (maximum) R2+ BASE (3 1/2 in. foam maximum, 3/4 in. FR Plywood maximum)
WRB Over Exterior Insulation	1	PERM-A-BARRIER® VPL LT
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® Aluminum Wall Membrane
	4	PERM-A-BARRIER® Ultra
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, or 17 Item 9 may use any tested/approved installation technique Items 10, 11, or 14 may use any standard installation technique	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)
	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation can be used as a slip sheet between the WRB/ exterior insulation and the lath.
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone

5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
7	Thin brick/cultured stone set in thin set adhesive and metal lath that has been tested to ASTM E119 (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed an NFPA 285 test Minimum 3/4 in. For these systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation can be used as a slip sheet between the WRB/AVP and the lath
8	TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive
9	Any MCM that has successfully passed NFPA 285
10	Uninsulated sheet metal building panels including steel, copper, or aluminum
11	Uninsulated fiber-cement siding
12	Stone/Aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria
13	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
14	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) with ventilated shiplap
15	1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per NFPA 285 or stays in place when tested per ASTM E119 (stucco exposed to fire) for at least 30 minutes
16	Natural Stone Veneer - minimum 1 1/4 in. thick using any standard installation technique
17	Fundermax m.look Grey Core - minimum 1 1/4 in. thick using any standard installation technique

For walls containing Carlisle R2+ SHEATHE as exterior insulation

Based on DrJ TER 1407-02 (2018 IBC NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System (Use one option: 1, 2, 3, or 4)	1	Cast concrete walls
	2	CMU concrete walls
	3	25-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	lateral bracing every 4 ft
	4	FRTW studs: minimum nominal 2 in. x 4 in. spaced 24 in. o.c. (maximum)
	a.	5/8 in. Type X gypsum wallboard interior
	b.	bracing as required by code
Fire-Stopping at Floor Lines	1	Any approved mineral-fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth
	2	Solid FRTW fire blocking at floor line in accordance with building code requirements for Type III construction
Cavity Insulation (Use any items 1-15) Note: Items 8, 9, 10, and 11 may only be used with exterior sheathing	1	None
	2	1 1/2 in. minimum Covestro EcoBay™ CC SPF (up to full cavity thickness)
	3	1 1/2 in. minimum BASF WALLTITE® SPF (up to full cavity thickness)
	4	Any noncombustible insulation per ASTM E136
	5	Any mineral fiber (Board type Class A ASTM E84 faced or unfaced)
	6	Any fiberglass (Batt type Class A ASTM E84 faced or unfaced)
	7	Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m2 heat flux) and shown by analysis to be less flammable (improved T _{ign} , PK, HRR) than Covestro EcoBay™ CC or BASF WALLTITE®
	8	NCFI InsulBloc SPF (up to full cavity thickness)
	9	Icynene MD-C-200™v3 (ProSeal™) up to 5 1/2 in. (only with 1/2 in. [minimum] exterior gypsum sheathing)
	10	SWD Urethane QUIK-SHIELD® 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2 in.
	11	1 1/2 in. (minimum) ThermoSeal® 2000 (up to full cavity thickness)
	12	Carlisle SealTite™ PRO High Yield, SealTite™ PRO Open Cell, SealTite™ PRO No Mix, SealTite™ PRO No Trim 21 or SealTite™ PRO OCX - up to full cavity thickness with 1/2 in. (minimum) exterior gypsum sheathing
	13	Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 - 3 1/2 in. (maximum) for use with 5/8 in. Exterior Gypsum Sheathing

	14	JM Corbond® III or Corbond® IV - Full stud cavity depth or less for use with 5/8 in. exterior gypsum sheathing
	15	Huntsman ProSeal™ HFO (8 in. maximum thickness with no air gap, 6 in. maximum thickness with air gap) for use with 1/2 in. or thicker exterior gypsum sheathing
Exterior Sheathing (Use either 1, 2, or 3)	1	None (only with Cavity Insulation 1, 4, 5, or 6)
	2	1/2 in. or thicker exterior gypsum sheathing
	3	1/2 in. minimum FRTW structural panels in Type III construction
Multi-Function Sheathing and WRB Products (Use 1 or 2)	1	USG Securock® ExoAir® 430 System.
	2	5/8 in. Georgia Pacific DensElement®, flashed with Prosoco R-Guard FastFlash on sheathing joints
	Note	Item 1 or 2 replaces the exterior sheathings above. When either of these items are used, do not use exterior sheathings or WRB on base wall surface.
WRB Over Base Wall Surface	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	The following may only be used with claddings 1-6:	
	1	PERM-A-BARRIER® NPL 10
	2	PERM-A-BARRIER® VPS 30
	3	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation	1	3 1/2 in. (maximum) R2+ SHEATHE for all claddings
	2	4 in. thick R2+ SHEATHE for claddings 1-6
WRB Over Exterior Insulation	1	PERM-A-BARRIER® VPL
	2	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® Ultra
	5	PERM-A-BARRIER® NPS
	Note	The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1 in. air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with claddings 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4 in. minimum.
Exterior Cladding Use any item 1-17 Note: Item 7 may use any	1	Brick – Nominal 4 in. thick clay or concrete brick or veneer with maximum 2 in. air gap behind the brick; brick ties/anchors 24 in. o.c. (maximum)

tested/approved installation technique Note: Items 8, 9, or 12 may use any standard installation technique	2	Stucco – Minimum 3/4 in. thick exterior cement plaster and lath. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #9 in WRB Over Exterior Insulation can be used as a slip sheet between the WRB/exterior insulation and the lath.
	3	Limestone – Minimum 2 in. thick using any standard non-open joint installation technique such as shiplap
	4	Natural stone veneer – Minimum 2 in. thick using any standard non-open joint installation technique such as grouted or mortared stone
	5	Cast artificial stone – Minimum 1 1/2 in. thick complying with ICC-ES AC 51 using any standard non-open joint installation technique such as shiplap
	6	Terra cotta cladding – Minimum 1 1/4 in. thick (solid or equivalent by weight) using any standard open or non-open joint installation technique such as shiplap
	7	Any MCM that has passed NFPA 285
	8	Uninsulated sheet metal building panels including steel, copper, or aluminum
	9	Uninsulated fiber-cement siding
	10	Stone/Aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria
	11	Autoclaved-aerated-concrete (AAC) panels that have successfully passed NFPA 285 criteria
	12	Terra cotta cladding – Any rain-screen terra cotta (minimum 1/2 in. thick) with ventilated shiplap
	13	1/2 in. stucco – Any one-coat stucco (1/2 in. minimum) that meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per NFPA 285 or stays in place when tested per ASTM E119 (stucco exposed to fire) for at least 30 minutes
	14	Thin brick/cultured stone set in thin set adhesive and metal lath that has been tested to ASTM E119 (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed an NFPA 285 test Minimum 3/4 in. For these systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #9 in WRB Over Exterior Insulation can be used as a slip sheet between the WRB/AVP and the lath
	15	Glen Gery Thin Tech® Elite Series Masonry Veneer or TABS II Panel System with 1/2 in. thick bricks using TABS Wall Adhesive.
	16	Natural Stone Veneer - minimum 1 1/4 in. thick using any standard installation technique

	17	Fundermax m.look Grey Core - minimum 1 1/4 in. thick using any standard installation technique
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Walls containing a maximum of 4 3/4 in. thick Kingspan Kooltherm® K15, K8, K10, K12, or K20 Insulation

Based on DrJ TER 1601-06 (NFPA 285-23 for code years up to 2024). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System Use 1, 2, or 3	1	Cast concrete walls
	2	Concrete Masonry Wall
	3	One layer 5/8 in. thick Type X gypsum wallboard on interior installed over steel studs: minimum 3 5/8 in. depth, minimum 20-gauge, spaced at a maximum of 24 in. o.c. with lateral bracing every 4 ft vertically
Floorline Firestopping	1	4 lb./cu ft. mineral wool in each stud cavity at each floor line, attached with Z-clips or equivalent
Cavity Insulation Use 1, 2, or 3	1	None
	2	Fiberglass batt or mineral wool insulation (faced or unfaced)
	3	Any noncombustible insulation (faced or unfaced)
Exterior Gypsum Sheathing Use 1 or 2	1	None; when base wall systems #1 or #2 are used, sheathing is optional
	2	Minimum 5/8 in. thick, Type X, exterior type gypsum sheathing
Water-Resistive Barrier Use 1, 2, 3, 4, 5, 6, 7, or 8 Applied over exterior gypsum sheathing and underneath exterior insulation	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® NPL 10
	5	PERM-A-BARRIER® Ultra
	6	PERM-A-BARRIER® NPS
	7	PERM-A-BARRIER® VPS 30
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation	1	Kingspan Kooltherm® K15, K8, K10, K12 or K20 insulation - minimum 1 in. (25 mm) thick to a maximum of 4 3/4 in. (120 mm) thick. Standard silver aluminum, black coated aluminum, white coated aluminum or glass tissue facers are all acceptable facing materials.
Sealing of Exterior Insulation	1	Optional: All exterior insulation joints and veneer tie penetrations sealed with acrylic, asphalt, or butyl based sealing tape - maximum 4 in. width
Exterior Veneer Use any of these options	1	Brick
		a. Standard nominal 4 in. thick, clay brick
		b. Brick veneer anchors - standard types - installed maximum 24 in. o.c. vertically on each stud
		c. Maximum 2 in. air gap between exterior insulation and brick
	2	Concrete

		a. Minimum 2 in. thick
		b. Maximum 2 in. air gap between exterior insulation and concrete.
		c. Any standard non-open joint technique may be used
	3	Concrete Masonry Units (CMU)
		a. Minimum 4 in. thick
		b. Maximum 2 in. air gap between exterior insulation and CMU
	4	Stone Veneer
		a. Minimum 2 in. thick limestone or natural stone veneer
		b. Minimum 1 1/2 in. thick cast artificial stone veneer
		c. Any standard non-open joint technique may be used (such as shiplap, etc.)
	5	Stucco
		a. Minimum 3/4 in. thick 2 or 3-coat stucco installed over lath
Flashing of Window, Door, and Other Exterior Wall Penetrations	1	As an option, flash window, door, and other exterior penetrations with limited amounts of acrylic, asphalt or butyl based seating tape, maximum 12 in. width.
	2	As an option, Kooltherm® Cavity Closure can be used to close wall cavities at openings

Walls containing a maximum 3 in. thick Kingspan Kooltherm® K15, K8, K10, K12 or K20 Insulation

Based on DrJ TER 1601-06 (NFPA 285-23 for code years up to 2024). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System Use 1, 2, or 3	1	Cast concrete walls
	2	Concrete Masonry Wall
	3	One layer 5/8 in. thick Type X gypsum wallboard on interior installed over steel studs: minimum 3 5/8 in. depth, minimum 20-gauge, spaced at a maximum of 24 in. o.c. with lateral bracing every 4 ft vertically
Floorline Firestopping	1	4 lb./cu ft. mineral wool in each stud cavity at each floor line, attached with Z-clips or equivalent
Cavity Insulation Use 1, 2, or 3	1	None
	2	Fiberglass batt or mineral wool insulation (faced or unfaced)
	3	Any noncombustible insulation (faced or unfaced)
Exterior Gypsum Sheathing Use 1 or 2	1	None (only allowed when base wall systems #1 or #2 are used)
	2	1/2 in. or 5/8 in. thick, Type X, exterior type gypsum sheathing
Water-Resistive Barrier Use 1, 2, 3, 4, 5, 6, 7, or 8 Applied over exterior gypsum sheathing and underneath exterior insulation	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® VPS 30
	5	PERM-A-BARRIER® NPL 10
	6	PERM-A-BARRIER® Ultra
	7	PERM-A-BARRIER® NPS
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation	1	Kingspan Kooltherm® K15, K8, K10, K12 or K20 insulation - minimum 1 in. (25 mm) thick to a maximum of 3 in. (75 mm) thick. Standard silver aluminum, black coated aluminum, white coated aluminum or glass tissue facers are all acceptable facing materials.
Sealing of Exterior Insulation	1	Optional: All exterior insulation joints and veneer tie penetrations sealed with acrylic, asphalt, or butyl based sealing tape - maximum 4 in. width
Exterior Veneer Use any of these options	1	MCM Panel System
		a. Any metal composite material system that has been successfully tested by the panel manufacturer via the NFPA 285 test method
		b. Acceptable NFPA 285 testing shall consist of successful NFPA 285 test results on wall assembly incorporating a comparable thickness of combustible foam insulation behind the MCM
		c. MCM panels shall be maximum 4 mm thick
	2	Steel, Aluminum, or Copper Metal Exterior Wall Cladding

	a. Aluminum cladding shall be minimum 0.080 in. thick
	b. Steel cladding shall be minimum 0.0149 in. thick
	c. Copper cladding shall be minimum 0.0216 in. thick
	d. Any standard installation technique may be used
	e. Also acceptable to install cladding using Knight Wall Rainscreen Attachment System
3	Fiber-Cement Siding (Noncombustible)
	a. Minimum 1/4 in. thick
	b. Any standard installation technique with noncombustible furring can be used
	c. A maximum 1 1/2 in. air gap allowed behind the fiber-cement siding
4	Swisspearl® Carat Panels
	a. Minimum 0.315 in. (8 mm) thick with closed or open joints (maximum 1/2 in. joints when open)
	b. Any standard installation technique using noncombustible furring can be used
	c. A maximum 1 1/2 in. air gap allowed behind panels
5	Brick Veneer
	a. Standard nominal 3 5/8 in. thick, clay brick
	b. Brick veneer anchors - standard types - installed maximum 24 in. o.c. vertically on each stud
	c. Maximum 2 in. air gap between exterior insulation and brick
6	Concrete
	a. Minimum 2 in. thick
	b. Maximum 2 in. air gap between exterior insulation and concrete.
	c. Any standard non-open joint technique may be used
7	Concrete Masonry Units (CMU)
	a. Minimum 4 in. thick
	b. Maximum 2 in. air gap between exterior insulation and CMU
8	Stone Veneer
	a. Minimum 2 in. thick limestone or natural stone veneer
	b. Minimum 1 1/2 in. thick cast artificial stone veneer
	c. Any standard non-open joint technique may be used (such as shiplap, etc.)
9	Stucco
	a. Minimum 3/4 in. thick
	b. 2 or 3-coat stucco installed over lath
10	Terracotta Cladding
	a. Use any terracotta cladding system in which terracotta is minimum 1 1/4 in. thick

		b. Any standard joint installation technique such as shiplap, etc. may be used
	11	EIFS
		a. Henkel Polybit Industries Limited Ceresit EIFS-EIFS system consisting of Ceresit-CT 85 adhesive mortar and basecoat, Ceresit-CT 16 primer, and Ceresit-CT 60 finish coat
	12	Thin Brick
		a. Minimum 1/4 in. thick clay brick fully adhered with cementitious mortar (standard or polymer modified) to minimum 1/2 in. thick cement backer board or gypsum sheathing
		b. A secondary water-resistive barrier can be installed between the board/sheathing and the brick
Flashing of Window, Door, and Other Exterior Wall Penetrations		c. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes
	1	As an option, flash window, door, and other exterior penetrations with limited amounts of acrylic, asphalt or butyl based seating tape, maximum 12 in. width.
	2	As an option, Kooltherm® Cavity Closure can be used to close wall cavities at openings

For walls containing a maximum 3 in. thick Kingspan Kooltherm® K110, K110 CB, K120, or K122 Insulation

Based on DrJ TER 1601-06 (NFPA 285-23 for code years up to 2024). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System Use 1, 2, or 3	1	Cast concrete walls
	2	Concrete Masonry Wall
	3	One layer 5/8 in. thick Type X gypsum wallboard complying with ASTM C1396 on interior installed horizontally or perpendicular to framing, attached with Type S #6 x 1 1/4 in. screws at 8 in. o.c. on the perimeter and 12 in. o.c. in the field. Joists shall be taped and covered with joint compound. Fastener heads shall be covered with joint compound. Framing shall be steel studs: minimum 3 5/8 in. depth, minimum 20-gauge, spaced at a maximum of 16 in. o.c. with lateral bracing every 4 ft. vertically.
Floorline Firestopping	1	4 lb./cu ft. mineral wool in each stud cavity at each floor line, attached with Z-clips or equivalent
Cavity Insulation Use 1, 2, or 3	1	None
	2	Fiberglass batt or mineral wool insulation (faced or unfaced)
	3	Any noncombustible insulation (faced or unfaced)
Exterior Gypsum Sheathing Use 1 or 2	1	Minimum 5/8 in. thick, Type X, exterior type gypsum sheathing complying with ASTM C1177, installed horizontal or perpendicular to framing, attached with Type S #6 x 1 1/4 in. screws at 8 in. o.c. on the perimeter and 12 in. o.c. in the field
	2	Minimum 1/2 in. thick, Type X, exterior type gypsum sheathing faced with paper or glass mat complying with ASTM C1177 and having a UL or cUL mark. Shall be installed horizontal or perpendicular to framing, attached with Type S #6 x 1 1/4 in. screws at 8 in. o.c. on the perimeter and 8 in. o.c. in the field
Water-Resistive Barrier Use 1, 2, 3, 4, 5, 6, 7, or 8 Applied over exterior gypsum sheathing and underneath exterior insulation	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® VPS 30
	5	PERM-A-BARRIER® NPL 10
	6	PERM-A-BARRIER® Ultra
	7	PERM-A-BARRIER® NPS
	8	PERM-A-BARRIER® VPL 50RS UV
Exterior Insulation	1	Kingspan Kooltherm® K110, K110 CB, K120 or K122 insulation - minimum 1 in. (25 mm) thick to a maximum of 3 in. (75 mm) thick shall be installed between Slotted-Z framing members and attached to framing with sufficient fasteners to hold the insulation boards in place

	Note	Thermally broken Slotted-Z by Cladiator framing members are attached horizontally to vertical framing members with 1 1/2 in. long Tek 5, 5/8 in. hex head stainless steel screws, one per stud. Maximum vertical spacing is 47 1/4 in. A stack joint consisting of the 24-gauge galvanized steel angle (MK-03) with Slotted-Z framing above and below shall be located a maximum of 47 1/4 in. above openings. The stack joint shall extend a minimum of 43 in. on either side of the opening. The steel angle shall be attached to steel framing members with #8 x 1 1/4 in. wafer head crews.
Sealing of Exterior Insulation	1	Kingspan Kooltherm® K122 Insulation Boards joints and penetrations shall be taped using Nashua 324A insulation tape
Exterior Veneer Use any of these options	1	Morin MX-8 Wall Cladding Panels
		a. Shall be oriented vertically and shall be attached to the Slotted-Z framing members with Matrix Series galvanized clips, which use two #14 x 2 1/4 in. screws per clip. Maximum 2 in. air gap between exterior insulation and concrete
	2	Concrete
		a. Minimum 2 in. thick
		b. Maximum 2 in. air gap between exterior insulation and concrete.
		c. Any standard non-open joint technique may be used
	3	Concrete Masonry Units (CMU)
		a. Minimum 2 in. thick
		b. Maximum 2 in. air gap between exterior insulation and CMU
	4	Brick Veneer
		a. Minimum 3 5/8 in. thick, clay brick
		b. Offset to provide 2 in. air gap between exterior insulation and brick
	5	Stone Veneer
		a. Minimum 2 in. thick natural stone veneer
		b. Any standard non-open joint technique may be used (such as shiplap, etc.)
	6	Terracotta Cladding
		a. Minimum 1 1/4 in. thick terracotta cladding
		b. Any standard joint installation technique may be used (such as shiplap, etc.)
	7	Stucco
		a. Minimum 3/4 in. thick
		b. 2 or 3-coat stucco installed over lath

Flashing of Window, Door, and Other Exterior Wall Penetrations	1	Openings shall be framed with minimum 20-gauge steel. The header shall be two layers consisting of 20-gauge galvanized steel angle (MK-03) and 24-gauge Galvalume flashing (MK-02). Windowsills shall be covered with 24-gauge Galvalume (MK-01). The MK-03 angel shall extend a minimum of 43 in. on either side of the opening.
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For walls containing InSoFast® UX 2.0 or EX 2.5 exterior insulation

Based on DrJ TER 1910-03 (NFPA 285-12 for code years up to 2018). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Component	Materials	
Base Wall Use 1, 2, or 3	1	Cast concrete walls
	2	CMU concrete walls
	3	20-gauge minimum 3 5/8 in. (minimum) steel studs spaced 24 in. o.c. (maximum) with 5/8 in. (minimum) type X Special Fire Resistance Gypsum Wallboard Interior
Fire-Stopping in Stud Cavity at Floor Lines	1	4-pcf mineral fiber insulation installed
Cavity Insulation Use 1, 2, 3, or 4	1	None
	2	Any noncombustible insulation per ASTM E136
	3	Any Mineral Fiber (Board type Class A ASTM E84 faced or unfaced)
	4	Any Fiberglass (Batt type Class A ASTM E84 faced or unfaced)
WRB Under Exterior Insulation Continued	1	PERM-A-BARRIER® NPL 10
	2	PERM-A-BARRIER® NPS
	3	PERM-A-BARRIER® VPL
	4	PERM-A-BARRIER® VPL LT
	5	PERM-A-BARRIER® Aluminum Wall Membrane (AWM)
	6	PERM-A-BARRIER® Ultra
	7	PERM-A-BARRIER® VPS 30
	8	PERM-A-BARRIER® VPL 50RS UV
Adhesive Use item 1 or 2 with Base Wall 1 or 2	1	3/8 in. beads of Loctite PL premium adhesive 16 in. o.c.
	2	NFPA 285 approved EIFS "mud"
Exterior Insulation Use 1 or 2 adhered with adhesive or mechanically attached	1	InSoFast® UX 2.0 Panels (with or without raceways)
	2	InSoFast® EX 2.5 Panels (with or without raceways)
Exterior Sheathing Installed Over Exterior Insulation Use 1 or 2	1	1/2 in. (minimum) generic cement board mechanically attached to InSoFast® interior frame strips with screws 8 in. o.c. in the field and 12 in. o.c. on panel edges
	2	1/2 in. (minimum) glass matt board (such as DensGlass®) mechanically attached to InSoFast® interior frame strips with screws 8 in. o.c. in the field and 12 in. o.c. on panel edges
WRB Over Exterior Sheathing Installed Over Exterior Insulation	1	Any WRB that has been tested or approved to be used in an NFPA 285 compliant assembly paired with the outer coverings listed below
	Note	The WRB must be approved for use directly under exterior sheathing installed over exterior insulation or over exterior insulation. WRB allowed over Exterior Sheathing Under Exterior Insulation are protected by the insulation and do not qualify as allowable WRB for this location.

Outer Covering Use any item 1-7 Where aluminum is listed, this means aluminum sheet metal panels, NOT aluminum composite panels	1	EIFS coatings that are NFPA 285 approved for applications over cement board
	2	Adhered thin brick (with noncombustible mortar)
	3	Adhered stone (with noncombustible mortar)
	4	Fiber cement lap or panels (or any non-combustible cladding) mechanically fastened through the cladding directly to the InSoFast® Studs
	5	Fiber cement lap or panels (or any non-combustible cladding) mechanically fastened to metal hat channels or mounting element fastened through the cladding into the InSoFast® Studs
	6	Vertical or horizontal steel or aluminum cladding mechanically fastened through the cladding into the InSoFast® Studs
	7	Vertical or horizontal steel or aluminum cladding mechanically fastened to metal hat channels or non-combustible mounting element fastened through the cladding into the InSoFast® Studs
Rough Openings Note: Must cover both the air gap between the cladding and the exterior insulation and the exposed edge of the exterior insulation	Rough opening perimeters shall incorporate one of the following, spanning at a minimum from the interior edge of the cladding to the interior edge of the exterior insulation at the rough opening:	
	1	0.08 in. (minimum) aluminum (examples include window frame, flashing, lintel, C-channel)
	2	20-gauge (min.) sheet steel (examples include window frame, flashing, lintel, C-channel)
	3	1/2 in. (min.) 4pcf (min.) mineral wool
	4	3/4 in. (min.) FRT wood buck
	5	3/4 in. (min.) FRT plywood
	6	5/8 in. (min.) type X GWB
	7	1/4 in. (min.) fiber cement board
	All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic or butyl flashing tape, liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12 in. maximum width.	

For walls containing a maximum 6 in. thick Kingspan KS-Series IMP System

Based on Jensen Hughes Report 1AJP22008.000 (NFPA 285-19 for code years up to 2021). Please refer to the original evaluation report and manufacturers' recommendations for window and door header details.

Wall Components	Materials	
Base Wall System Use either 1, 2, 3, 4, or 5	1	Concrete Wall
	2	Concrete Masonry Unit (CMU) Wall
	3	Standard clay brick wall (nominal 3 5/8 in. thick brick)
	4	Wood studs: nominal 2-inch x 4-inch or greater FRTW wood studs spaced at a maximum of 24-inch OC. Wall cavity empty (no insulation) or filled with fiberglass batt insulation (faced or unfaced) or mineral wool insulation (faced or unfaced). One layer of 5/8 in. thick Type X gypsum wallboard installed on interior face of wood studs. One layer of 5/8 in. thick Type X exterior gypsum sheathing installed on exterior face of wood studs. Minimum two top plates at floorlines. As an option, any thickness of plywood or OSB may be installed on exterior face of wood studs under exterior gypsum sheathing.
	5	Steel studs: minimum 6 in. depth, minimum 16-gauge at a maximum spacing of 39 in. OC with lateral bracing every 2 ft. vertically.
Floorline Firestopping Required in curtain-wall construction	4 lb/cu ft mineral wool friction fit in each stud cavity, at each floor line	
Interior Vapor/Moisture barrier Use either 1 or 2	1	None
	2	Any 6-mil thick polyethylene film
Cavity Insulation Use either 1, or 2	1	None
	2	Fiberglass blown-in or batt insulation (faced or unfaced) or mineral wool blown-in or batt insulation (faced or unfaced)
Exterior Sheathing Use either 1, or 2	1	1/2 in. thick exterior gypsum sheathing
	2	5/8 in. thick Type X exterior gypsum sheathing
	Note	5/8 in. thick Type X exterior gypsum sheathing required for wood stud framed wall assemblies
WRB Materials Applied to Exterior Sheathing Use either 1, 2, 3, 4, 5, or 6	1	PERM-A-BARRIER® Aluminum Wall Membrane
	2	PERM-A-BARRIER® VPL
	3	PERM-A-BARRIER® VPL LT
	4	PERM-A-BARRIER® VPS
	5	PERM-A-BARRIER® Ultra
	6	PERM-A-BARRIER® NPS
	Note	Any WRB shown above can be applied directly over Base Wall Systems 1 through 3 above, where able.

Exterior Veneer Use either 1 or 2	1	Maximum 6 in. thick. minimum 24 in. wide Kingspan IMP KS-series IMP installed vertically installed over maximum 2 in. deep, minimum 16-gauge vertical hat channels spaced 8 ft. OC.
	2	Maximum 6 in. thick, minimum 24 in. wide Kingspan IMP KS-series IMP installed horizontally installed over maximum 2 in. deep, minimum 16-gauge vertical hat channels spaced 39 in. OC
Opening Protection	All wall openings (windows, doors, etc.) are required to be protected with 8 in. wide, 26-gauge galvanized steel trim around the entire perimeter of the wall opening (header, jambs, and sill). Steel trim secured to exterior face of IMP and interior drywall using #10 x 3/4 in. long Stitch Tek fasteners spaced maximum 12 in. on center	
Flashing of Windows, Doors, and Other Exterior Wall Penetrations	As an option, flash window, door and other exterior penetrations with either.	
	1	DuPont™ LiquidArmor™ - CM Flashing and Sealant - max. 50-mil wet thickness, max. 12 in. width.
	2	DuPont™ LiquidArmor™ - LT Flashing and Sealant - max. 35-mil wet thickness, max. 12 in. width.
	3	DuPont™ DuraGard™ CM Transition Flashing - max. 12 in. width
	4	Limited amounts of acrylic, asphalt or butyl-based flashing tape - max. 12 in. width.
	Note	Flashing tape used in wall openings may extend the wall width plus extend up to a maximum of 4 in. onto the exterior face of the sheathing. Flashing tape may be used on sheathing exterior corners where the flashing tape may extend a maximum of 4 in. onto the sheathing face on either side of the corner