CHAPTER 14

EXTERIOR WALL COVERINGS

780 CMR 1401.0 GENERAL

1401.1 Scope: The provisions of 780 CMR 14 shall establish the minimum requirements for exterior walls. Exterior walls shall be designed and constructed in accordance with 780 CMR.

780 CMR 1402.0 DEFINITIONS

1402.1 General: The following words and terms shall, for the purposes of 780 CMR 14 and as used elsewhere in 780 CMR, have the meanings shown herein.

Exterior wall finish: A material or assembly of materials applied on the exterior side of exterior walls for the purpose of providing a weather-resisting barrier, insulation or for aesthetics, including veneers, siding, exterior insulation and finish systems, architectural trim and embellishments such as cornices, soffits, facias, gutters and leaders.

Wall

Apron wall: That portion of a skeleton wall below the sill of a window.

Skeleton or panel wall: A nonbearing wall supported by each story on a skeleton frame.

Spandrel wall: That portion of a skeleton wall above the head of a window or door.

Veneered wall: A wall having a facing of masonry or other weather-resistant noncombustible material that is securely attached to the backing, but not so bonded as to exert common action under *load*.

780 CMR 1403.0 PERFORMANCE REQUIREMENTS

1403.1 General: The provisions of 780 CMR 1403.0 shall apply to exterior walls and components thereof.

1403.2 Durability: All exterior walls and components thereof shall be of approved materials which maintain the performance characteristics required herein for the duration of use.

1403.3 Weather resistance: The exterior walls shall be faced with an approved weather-resistant covering that is properly attached to resist wind and rain. The cellular spaces shall be so ventilated as not to vitiate the *firestopping* at floor, *attic* and roof levels, or shall be provided with an approved interior noncorrodible *vapor retarder*, or other approved means to avoid condensation and leakage of moisture.

1403.4 Structural: Exterior walls shall be designed and constructed to resist safely all superimposed *loads* as required by 780 CMR 16.

1403.4.1 Structural strength against wind forces: In all buildings required to resist the wind pressures described in 780 CMR 1611.0, glazing in exterior window openings shall be designed to resist the *wind loads* specified in 780 CMR 1611.0 for components and cladding.

1403.4.2 Structural strength of sash or frames: Mullions, sash and frames of glazed exterior window openings shall be designed to resist the *wind loads* specified in 780 CMR 1611.0 for components and cladding.

1403.5 Fireresistance: All exterior walls shall comply with the fireresistance rating requirements of 780 CMR 705.0.

1403.5.1 Fireresistance rated openings: Openings in exterior walls, where required to have a fire protection rating, shall comply with the provisions of 780 CMR 7.

1403.6 Flood-resistant construction: Exterior walls of structures that are erected in areas prone to flooding shall comply with the provisions of 780 CMR 3107.0.

1403.7 Ratproofing: Exterior walls of buildings that are required to be ratproofed shall comply with the provisions of 780 CMR 1215.0.

780 CMR 1404.0 MATERIALS

1404.1 Wood: Exterior walls of wood construction shall be designed and constructed in accordance with 780 CMR 23.

1404.2 Masonry: Exterior walls of masonry construction shall be designed and constructed in accordance with 780 CMR 21.

1404.3 Metal: Exterior walls of formed steel construction structural steel or lightweight metal alloys shall be assigned in accordance with 780 CMR 22 and 780 CMR 20, respectively.

1404.4 Concrete: Exterior walls of concrete construction shall be designed and constructed in accordance with 780 CMR 19.

1404.6 Plastics: *Plastic* panel, apron or spandrel walls as defined in 780 CMR shall not be limited in thickness, provided that such *plastics* and their assemblies conform to the requirements of 780 CMR 26 and are constructed of approved weather-resistant materials of adequate strength to resist the *wind loads* specified in 780 CMR 1611.0.

1404.7 Other: Materials not prescribed herein shall be permitted provided that any such alternative has been approved. Exterior walls constructed of alternative materials shall be shown to be durable, weather resistant, structurally adequate, fireresistant, flood resistant and ratproof as required herein.

780 CMR 1405.0 VENEERS

1405.1 General: All veneers consisting of nonstructural facing of brick, concrete, stone, tile, metal, *plastic*, synthetic stucco or other approved exterior coverings attached to a backing, shall be designed and constructed in accordance with the applicable provisions of 780 CMR 1405.

1405.2 Structural support: Surfaces to which veneer is attached shall be designed to support the additional *loads* imposed by the veneer.

1405.2.1 Backing surfaces for veneers: Veneers for other than buildings of Type 5 construction shall be attached only to substantial, rigid and noncombustible surfaces which are plumb, straight and of true plane. Wood backing surfaces shall not be used, except in buildings of Type 5 construction. The backing shall provide sufficient rigidity, stability and weather resistance, and the veneer shall be installed and anchored as required in 780 CMR for the specific material.

1405.3 Materials: The materials of the minimum nominal thickness specified in Table 1405.3 shall be acceptable as approved weather coverings.

Table 1405.3
MINIMUM THICKNESS OF WEATHER COVERINGS

Covering type	Minimum thickness
Aluminum siding[b]	0.019 inch
Asbestos cement boards	_ inch
Asbestos shingles	5/32 inch
Brick and concrete masonry veneers	2 inches
Ceramic veneer (architectural terra cotta, anchored type)	1 inch
Clay tile (flat slab)	¼ to 1 inch
Clay tile (structural)	1¾ inches
Exterior plywood (with sheathing)	5/16 inch
Exterior plywood (without sheathing)	See 780 CMR 2307.0
Glass fiber reinforced concrete panels	_ inch
Hardboard siding	¼ inch
Marble slabs	1 inch
Particleboard (with sheathing)	See 780 CMR 2308.5
Particleboard (without sheathing)	See 780 CMR 2308.5
Precast stone facing	_ inch
Protected fiber board siding	½ inch
Rigid PVC siding[c]	0.035 inch
Steel (approved corrosion-resistive)	0.017 inch
Stone (cast artificial)	1½ inches
Stone (natural)	2 inches
Structural glass	11/32 inch
Stucco or exterior portland cement plaster	
three-coat work over	_ inch[b]
metal plaster base	_ inch[b]
unit masonry	_ inch[b]
cast-in-place or precast concrete	
Two-coar work over	½ inch[b]
unit masonry	_ inch[b]
cast-in-place or precast concrete	
Wood shingles	_ inch
Wood siding (without sheathing)[a]	½ inch

Note a. For wood siding of a lesser thickness, see 780 CMR 1405.3.5.
Note b. Exclusive of texture

1404.5 Structural glass: Exterior walls of structural glass block shall be designed and constructed in accordance with 780 CMR 2115.0.

1405.3.1 Basic hardboard: Basic hardboard shall conform to the requirements of AHA A135.4 listed in ***Appendix A***.

1405.3.2 Hardboard siding: Hardboard siding shall conform to the requirements of AHA A 135.6 listed in ***Appendix A*** and, where used structurally, shall be so identified by an *approved agency*.

1405.3.3 Rigid PVC siding: Rigid PVC siding shall conform to the requirements of ASTM D3679 listed in ***Appendix A***.

1405.3.4 Aluminum siding: Aluminum siding shall conform to the requirements of AAMA 1402 listed in ***Appendix A***.

1405.3.5 Wood siding: Wood siding of thicknesses less than ½ inch shall be placed over sheathing which conforms to 780 CMR 2305.13.

1405.3.6 Building paper: Where veneers of brick, clay tile, concrete or natural or artificial stone are used, 14-pound felt or paper shall be attached to the sheathing with flashing wherever

necessary to prevent moisture penetration behind the veneer.

1405.3.7 Nailing: All weather boarding and wall coverings shall be securely nailed with aluminum, copper, zinc, zinc-coated or other approved corrosion-resistant nails in accordance with the nailing schedule in Table 2305.2 or the approved manufacturer's installation instructions. Shingles and other weather coverings shall be attached with appropriate standard-shingle nails to furring strips securely nailed to studs, or with approved mechanically bonding nails, except where

sheathing is of wood not less than one-inch nominal thickness or of wood structural panels not less than 5/16 inch thick. Where wood shingles or shakes are applied over fiberboard shingle backer and fiberboard sheathing, such shingles or shakes shall be attached with approved corrosion-resistant annular-grooved nails and the installation shall be done in accordance with the approved manufacturer's installation instructions. Where wood shingles or shakes and asbestos shingles or siding are nailed directly to nail base fiberboard sheathing, the sheathing shall not be less than ½-inch nominal thickness, the shingles, shakes and siding shall be attached with approved corrosion-resistant annular-grooved nails, and the installation shall be done in accordance with the approved manufacturer's installation instructions.

1405.3.8 Metal siding: Exposed metal siding or sheathing shall be protected from corrosion at the ground level by supporting the foundation channel at sufficient height above grade on the concrete apron or other approved water-resistant foundation.

1405.3.9 Exterior wall pockets: In exterior walls of all buildings or structures, wall pockets or crevices in which moisture can accumulate shall be avoided or protected with adequate caps or drips, or other approved means shall be provided to prevent water damage.

1405.3.10 Flashings: Approved corrosion-resistant flashings shall be provided at the top and sides of all exterior window and door openings in such a manner as to be leakproof Approved corrosion-resistant flashings shall be installed: at the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings; under and at the ends of masonry, wood or metal copings and sills; continuously above all projecting wood trim; at the intersection of exterior walls and porches and decks; at wall and roof intersections; and at built-in gutters.

Exception: When approved, flashing is not required where an approved water-resistant sheathing is installed and an approved water-resistant caulking is applied at the top and sides of all window and door openings in such a manner as to be leakproof.

1405.4 Metal veneers: Veneers of metal shall be fabricated from approved corrosion-resistant materials or shall be protected front and back with porcelain enamel or shall otherwise be treated to render the metal resistant to corrosion. Such veneers shall not be less than 0.017-inch nominal thickness galvanized sheet steel mounted on wood or metal furring strips or approved sheathing on the wood construction.

1405.4.1 Construction: Metal veneer for buildings of other than Type 5 construction shall be: securely attached to masonry; supported on approved metal framing protected by painting, galvanizing or other approved protection; or supported by wood furring strips treated with an approved *preservative* process that complies with 780 CMR 2311.3.

1405.4.2 Waterproofing: All joints and edges exposed to the weather shall be caulked with approved durable waterproofing material or by other approved means to prevent penetration of moisture.

1405.4.3 Grounding metal veneers: Grounding of metal veneers on all buildings shall comply with the requirements of 780 CMR 27 and 527 CMR listed in ***Appendix A***.

1405.5 Anchored masonry veneer: Anchored veneer is veneer secured with approved mechanical fasteners to an approved backing. All masonry units, mortar and metal accessories used in anchored veneer shall meet the physical requirements of 780 CMR 21. Anchored veneer units shall not be less than 1_ inches (41 mm) in actual thickness for solid masonry units and not less than 2_ inches (67 mm) in actual thickness for hollow masonry units.

1405.5.1 Height of anchored veneer: Anchored veneer shall be supported on footings, foundation walls or other approved noncombustible structural supports or on wood foundations meeting the requirements of 780 CMR 1808.3. The weight of all anchored veneer installed on structures more than 30 feet (9144 mm) in height above the noncombustible foundation or support, with the exception of concrete masonry veneers, shall be supported by noncombustible construction. The construction shall have horizontal supports located at each story height above the initial 30 feet (9144 mm).

Exception: Height increases are permitted where an engineering analysis is prepared by a *registered design professional* and approved.

1405.5.2 Horizontal supports: Noncombustible lintels and noncombustible supports shall be provided over all openings. Beams and lintels supporting unreinforced masonry veneer shall not exceed 1/600 of the span nor 0.3 inches (8 mm).

1405.5.3 Wood frame: Masonry veneer anchored to wood framing shall be attached with corrosion-resistant corrugated sheet metal not less than 0.029 inch (No. 22 gage) by _ inch wide, or

corrosion-resistant ties of strand wire not less than 0.148-inch (No.9 W&M gage) wire with the ends of the wire bent to a 90-degree (1.57 rad) angle to form a hook not less than two inches (51 mm) long. The metal ties shall be embedded in the mortar joint a minimum of one-half the veneer

thickness. Each metal tie shall support not more than three square feet (0.28 m^2) of wall area with a maximum spacing of 16 inches (406 mm) vertically and 32 inches (813 mm) horizontally. Where anchored veneer is applied over wood frame, the studs shall be spaced a maximum of 24 inches (610 mm) on center and be faced with sheathing on both sides. A one-inch (25 mm) minimum air space shall be maintained between the anchored veneer and the sheathing. Moisture protection shall be provided as required by 780 CMR 1405.3.6.

1405.5.4 Steel frame: Masonry veneer anchored to corrosion-resistant steel framing shall be attached with corrosion-resistant ties of strand wire not less than 0.148-inch (No. 9 W&M gage) wire with the ends of the wire bent to a 90-degree (1.57 rad) angle to form a hook not less than two inches (51 mm) long. The wire ties shall be embedded in the mortar joint a minimum of one-half the veneer thickness. Each metal tie shall support not more than 2.67 square feet (0.25 m^2) of wall area with a maximum spacing of 16 inches (406 mm) vertically and 24 inches (610 mm) horizontally. Where anchored veneer is applied over steel frame, the studs shall be spaced a maximum of 24 inches (610 mm) on center and be faced with sheathing on both sides. A one-inch (25 mm) minimum air space shall be maintained between the anchored veneer and the sheathing. Moisture protection shall be provided as required by 780 CMR 1405.3.6.

1405.5.5 Masonry or concrete walls: Masonry veneer anchored to masonry or concrete walls shall be attached with corrosion-resistant ties of strand wire not less than 0.148-inch (No. 9 W&M gage) wire with the ends of the wire bent to a 90-degree (1.57 rad) angle to form a hook not less than two inches (51 mm) long. The metal ties shall be embedded in the mortar joint a minimum of one-half the veneer thickness. Each metal tie shall support not more than three square feet (0.28 m^2) of wall area with a maximum spacing of 16 inches (406 mm) vertically and 32 inches (813 mm) horizontally. A one-inch (25 mm) minimum air space shall be maintained between the anchored veneer and the supporting masonry or concrete walls.

1405.5.6 Stone veneer: Stone veneer units not exceeding ten inches in thickness are permitted to be anchored directly to masonry, concrete or to stud construction by one of the following methods.

1. With concrete or masonry backing, anchor ties shall not be less than No. 12 gage corrosion-resistant wire formed beyond the base of the backing. The legs of the loops shall not be less than six inches (153 mm) in length bent at right angles and laid in the mortar joint and spaced so that the eyes or loops are 12 inches (305 mm) maximum on center in both directions. There shall be provided not less than a No.12 gage corrosion-resistant wire tie threaded through the exposed loops for every two square feet (0.186 m^2) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length bent so that the tie will lie in the stone veneer mortar joint. The last two inches (51 mm) of each wire leg shall have a right-angle bend. One inch (25 mm) of cement grout shall be placed between the backing and the stone veneer.
2. With stud backing, a two-inch by two-inch No. 16 gage corrosion-resistant wire mesh with two layers of waterproof paper backing shall be applied directly to wood studs spaced a maximum of 16 inches (406 mm) on center. On studs, the mesh shall be attached with two-inch-long (51mm) corrosion-resistant steel wire furring nails at four inches (102 mm) on center providing a minimum 1_-inch (28 mm) penetration into each stud and with 8d common nails at eight inches (200 mm) on center into top and bottom plates. The corrosion-resistant wire mesh is permitted to be attached to steel studs with equivalent wire ties. There shall not be less than a No. 12 gage corrosion-resistant wire, looped through the mesh for every two square feet (0.186 m^2) of stone veneer. This tie shall be a loop having legs not less than 15 inches (38 mm) in length, so bent that the tie will lie in the stone veneer mortar joint. The last two inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer.

1405.5.7 Slab-type veneer: Slab-type veneer units not exceeding two inches (51 mm) in thickness are permitted to be anchored directly to masonry, concrete or stud construction. For veneer units of marble, travertine, granite or other stone units of slab form, ties of corrosion-resistant dowels in drilled holes shall be located in the middle third of the edge of the units spaced a maximum of 24 inches (610 mm) apart around the perimeter of each unit with not less than four ties per veneer unit. Units shall not exceed 20 square feet (1.86 m^2) in area.

If the dowels are not tight fitting, the holes are permitted to be drilled not more than 1/16 inch (1.6 mm) larger in diameter than the dowel with the hole countersunk to a diameter and depth equal to twice the diameter of the dowel in order to provide a tight-fitting key of cement mortar at the dowel locations when the mortar in the joint has set. All veneer ties shall be corrosion-resistant metal capable of resisting in tension or

compression a force equal to two times the weight

Sheet metal veneer ties shall not be smaller in area than No. 22 gage by one inch. Wire veneer ties shall not be smaller in diameter than No. 9 gage wire.

1405.5.8 Terra cotta or ceramic veneer: Anchored terra cotta or ceramic units not less than 1_ inches thick are permitted to be anchored directly to masonry, concrete or stud construction. Tied terra cotta or ceramic veneer units shall not be less than 1_ inches thick with projecting dovetail webs on the back surface spaced approximately eight inches (203 mm) on center. The facing shall be tied to the backing wall with corrosion-resistant metal anchors of not less than No. 8 gage wire installed at the top of each piece in horizontal bed joints not less than 12 inches (305 mm) nor more than 18 inches (457 mm) on center. These anchors shall be secured to ¼-inch corrosion-resistant pencil rods which pass through the vertical aligned loop anchors in the backing wall. The veneer ties shall have sufficient strength to support the full weight of the veneer in tension. The facing shall be set with not less than a two-inch (51 mm) space from the backing wall and the space shall be filled solidly with portland cement grout and pea gravel. Immediately prior to setting, the backing wall and the facing shall be drenched with clean water and shall be damp when the grout is poured.

1405.6 Adhered masonry veneer: Adhered veneer is a veneer secured and supported through the adhesion of an approved bonding material applied to an approved backing. All masonry units used in adhered veneer walls shall meet the physical requirements of 780 CMR 21. Adhered veneer units shall be less than 1_ inches thick and the units shall not support any super-imposed *loads*. With the exception of ceramic tile, adhered veneer and backing shall be designed to provide a bond to the supporting element sufficient to withstand a shearing stress of 50 psi (344 kPa) after curing 28 days.

1405.6.1 Backing surface: Backing permitted for adhered veneer shall be continuous and shall be of any approved material. The backing shall have surfaces prepared to secure and support the imposed *loads* of the adhered veneer.

1405.6.2 Height of adhered veneer: Exterior adhered veneer shall not be attached to wood frame construction at a point more than 30 feet (9144 mm) in height above the noncombustible foundation. Height increases are permitted where an engineering analysis is prepared by a *registered design professional* and approved.

1405.6.3 Sizing of adhered veneer: Adhered veneer units shall not exceed 36 inches (914 mm) of the attached veneer.
in the greatest dimension nor more than 720 square inches (0.46 m^2) in total area and shall not weigh more than 15 pounds per square foot (73 kg/mm^2) unless approved.

Exception: Adhered veneer units weighing less than three pounds per square foot (15 kg/mm^2) shall not be limited in dimension or area.

1405.6.4 Construction: Adhered veneer units shall be adhered directly to the backing by one of the following methods.

1. A paste of neat portland cement shall be brushed on the backing and the back of the veneer unit. Type S mortar shall then be applied to the backing and the veneer unit. Sufficient mortar shall be used to create a slight excess to be forced out the edges of the units. The units shall be tapped into place so as to fill completely the space between the units and the backing. The resulting thickness of mortar in back of the units shall not be less than ½ inch (13 mm) nor more than 1¼ inches (32 mm).
2. Units of masonry, stone or terra cotta, not over one inch in thickness shall be restricted to 81 square inches (0.052 m^2) in area unless the back side of each unit is ground or box screened to true up any deviation from plane. Those units not over two inches by two inches by _ inch in size are permitted to be adhered by means of portland cement. Backing shall be of masonry, concrete or portland cement plaster on metal lath. Metal lath shall be fastened to the supports in accordance with the requirements of 780 CMR 25. Mortar that complies with Table 1405.6.4 shall be applied to the backing as a setting bed. The setting bed shall be a minimum of _ inch (9 mm) thick and a maximum of ¾ inch (19 mm) thick. A paste of neat portland cement or half portland cement and half graded sand shall be applied to the back of the exterior veneer units and to the setting bed and the veneer pressed and tapped into place to provide complete coverage between the mortar bed and veneer unit. A portland cement grout shall be used to point the veneer.

Table 1405.6.4
ADHERED VENEER SETTING MORTAR

Wall Area	Coat	Volume Type I portland cement	Volume Type S portland hydrated lime	Volume sand		Maximum thickness of coat (inches)[a]	Maximum interval between coats (hours)
				Dry	Damp		
Walls over 10 sq. ft.	Scratch	1	½	4	5	_	24
		1	0	3	4	_	24
	Float or level-ing	1	½	4	5	¾	24
		1	1	6	7	¾	24
Walls 10 sq. ft. or less	Scratch & float	1	½	2½	3	_ ¾	24

Note a. one inch = 25.4mm; one sq. Ft. = 0.093m^2

1405.6.5 Adhered ceramic tile: Adhered veneer of ceramic tile shall be bonded to the backing as provided for in 780 CMR 2105.10.

1405.6.6 Building paper: Adhered veneer over wood frame construction shall be backed by solid sheathing covered with 14-pound felt building paper as required by 780 CMR 1405.3.6.

1405.7 Structural glass veneers: The minimum thickness of glass veneer shall be 11/32 inch and the area of individual panels shall not exceed ten square feet (0.93 m^2), with a maximum length of four feet (1219 mm). The edge of each unit shall be ground square with a slight arise. All exposed external corners and angles shall he rounded to a radius of not more than 3/16 inch (5 mm).

1405.7.1 Backing surface: The glass veneer shall be set in mastic cement on a float coat of 1-inch-thick (25 mm) cement mortar reinforced with wire lath attached to noncombustible furring spaced not more than 12 inches (305 mm) on center.

1405.7.2 Support of veneer: The base course of glass units shall be supported on a corrosion-resistant metal frame anchored to the backing and caulked with a waterproof compound at grade.

1405.7.3 Reinforcement: Metal reinforcing of cold-formed corrosion-resistant angles of not less than 0.064-inch nominal thickness galvanized sheet steel or other approved reinforcement shall be provided in all horizontal joints anchored into the masonry wall with expansion or toggle bolts.

1405.7.4 Expansion joints: Expansion joints shall be provided at ends and at intermediate sections which are caulked with an approved waterproofing compound. Where necessary for water tightness, exposed edges shall be protected with corrosion-resistant metal or other approved noncombustible flashing.

1405.7.5 Other loads: *Signs*, awning brackets or other *loads* shall not be hung directly from glass veneers, but shall be supported on framing anchored to or otherwise supported by the masonry wall, free from contact with the glass.

780 CMR 1406.0 COMBUSTIBLE MATERIALS ON THE EXTERIOR SIDE OF EXTERIOR WALL

1406.1 General: 780 CMR 1406.0 shall apply to *exterior wall finish*, half-timbering, balconies and similar appendages, and bay and *oriel windows* constructed of combustible materials including light-transmitting *plastic* panels and foam plastic.

1406.2 Combustible exterior wall finish: Combustible *exterior wall finish* shall be tested and installed in accordance with 780 CMR 1406.2.1 through 1406.2.4.

Exceptions
1. Light-transmitting plastic panels shall be constructed and installed in accordance with 780 CMR 26.
2. Foam plastic installed in or on the exterior side of walls of buildings in accordance with 780 CMR 2603.6 shall not be required to comply with 780 CMR 1406.2.1 provided that the foam plastic is protected on the out side by:
   2.1. A thermal barrier complying with 780 CMR 2603.4;
   2.2. A minimum one-inch (25 mm) thickness of masonry or concrete;
   2.3. A minimum _-inch (22 mm) thickness of stucco complying with 780 CMR 2506.0;
   2.4. A minimum 0.019-inch thickness of aluminum; or
   2.5. A minimum 0.016-inch thickness or corrosion-resistant steel.

1406.2.1 Radiant heat exposure: Combustible *exterior wall finish* shall be tested for exposure to radiant heat. Test specimens shall be prepared in accordance with 780 CMR 1406.2.1.1 and tested in accordance with 780 CMR 1406.2.1.2. The criteria for acceptance shall be as given by 780 CMR 1406.2.1.3.

Exceptions: The testing shall not be required for:
1. Wood or wood-based products.
2. Other combustible materials covered with a material listed in Table 1405.3.
3. Aluminum having a minimum thickness of 0.019 inch.
4. *Exterior wall finish* on exterior walls of Type 5 construction.

1406.2.1.1 Test specimen: The test specimen shall be constructed to reflect the end-use configuration. Where a material is intended to be installed in more than one thickness, tests of the minimum and maximum thickness intended to be used shall be performed. Test specimens shall consist of a minimum four-foot-wide by eight-foot-high assembly which shall be mounted in a vertical position.

1406.2.1.2 Test exposure and apparatus: The test exposure and apparatus shall conform to 780 CMR 1406.2.1.2.1 through 1406.2.1.2.4.

1406.2.1.2.1 Apparatus: A three-foot by three-foot propane-fired radiant panel shall be provided and shall operate at a constant temperature of 1,600°F (871°C) ± 50°F (28°C).

1406.2.1.2.2 Configuration: The radiant panel and the test specimen shall be configured in a parallel plate orientation such that the axis perpendicular to, and running through, the center of the radiant panel face and the test specimen are concurrent.

1406.2.1.2.3 Heat flux: The temperature of the radiant heat panel shall be fixed to produce an average heat flux of 12.5 ± 5% kW/m^2 over the center square foot of the test assembly. Average heat flux shall be determined as the average of four calorimeter readings located at the corners of the center square foot of the test assembly.

1406.2.1.2.4 Exposure: The four-foot by eight-foot test specimen shall be exposed to a "square wave" exposure for a period of 20 minutes. A spark igniter shall be installed and located at a point 18 inches vertically above the center point of the test specimen and _ inch off the face of the test specimen. The spark igniter shall be operated throughout the 20-minute test period. If the spark igniter is operated in an intermittent mode, the "off" portion of the cycle shall not be longer than two seconds and the "on" portion of each cycle shall be at least five seconds in duration.

1406.2.1.3 Conditions of acceptance: Materials shall qualify for installation under the provisions of 780 CMR 1406.2.1.3.1 or 1406.2.1.3.2.

1406.2.1.3.1 Unrestricted installation: For any *fire separation distance*, an assembly shall be acceptable for installation in accordance with 780 CMR 1406.0 and 780 CMR 1405.0 and 2603.6 if, during the exposure described in 780 CMR 1406.2.1.2, continuous flaming ignition does not occur for a time period greater than five seconds. Continuous flaming ignition shall be judged to occur when continuous flaming is visually observed by laboratory personnel for greater than five seconds.

1406.2.1.3.2 Restricted installation: For *fire separation distances* greater than five feet (1524 mm), an assembly shall be permitted with increased *fire separation distance* if a test specimen in accordance with 780 CMR 1406.2.1.1, while being exposed to a reduced level of incident radiant heat energy in accordance with 780 CMR 1406.2.1.2, meets the conditions of acceptance in 780 CMR 1406.2.1.3.1. The minimum *fire separation distance* required for the assembly shall be determined from Table 1406.2.1.3.2 based on the maximum tolerable level of incident radiant heat energy determined by 780 CMR 1406.2.1.3.2

1406.2.2 Construction requirements: Combustible *exterior wall finish*, other than fireretardant-treated wood complying with 780 CMR 2310.0 for exterior installation, shall not exceed 10% of an exterior wall surface area where the *fire separation distance* is five feet or less. In buildings of Types 1, 2, 3 and 4 construction, all architectural trim which exceeds 40 feet (12192 mm) in height above *grade plane* shall be constructed of approved noncombustible materials and shall be secured to the wall with metal or other approved noncombustible brackets.

Exception: Foam plastics, installed in accordance with 780 CMR 2603.6, as required, shall not be subject to these limitations.

Table 1406.2.1.3.2
MINIMUM FIRE SEPARATION DISTANCE FOR COMBUSTIBLE VENEERS BASED ON MAXIMUM TOLERABLE LEVEL OF INCIDENT RADIANT HEAT ENERGY

Fire Separation Distance (feet)[a]	Tolerable level incident radient heat energy (kW/m^2)	Fire separation distance (feet)[a]	Tolerable level incident radiant heat energy (kW/m^2)
5	12.5	16	5.9
6	11.8	17	5.5
7	11.0	18	5.2
8	10.3	19	4.9
9	9.6	20	4.6

10	8.9	21	4.4
11	8.3	22	4.1
12	7.7	23	3.9
13	7.2	24	3.7
14	6.7	25	3.5
15	6.3		

Note a. one foot = 304.8mm.

1406.2.3 Location: Where combustible *exterior wall finish* is located along the top of exterior walls, such trim shall be completely backed up by the exterior wall and shall not extend over or above the top of exterior walls.

1406.2.4 Firestopping: Continuous *exterior wall finish* constructed of combustible materials shall be *firestopped* as required in 780 CMR 720.0.

1406.3 Combustible half-timbering: In buildings of Types 3 and 4 construction which do not exceed three stories or 40 ft (12192 mm) in *height* above *grade plane*, exterior half-timbering and similar architectural decorations are permitted to be constructed of wood or other equivalent combustible material, provided that such trim is backed up solidly with approved noncombustible materials.

1406.4 Balconies and similar appendages: All balconies, porches, decks and supplemental exterior *stairways* attached to or supported by buildings of Types 1 and 2 construction shall be constructed of approved noncombustible materials. Such appendages attached to or supported by buildings of Types 3, 4 and 5 construction shall be of either noncombustible or combustible construction. Such appendages of combustible construction, other than fireretardant-treated wood, shall afford the fireresistance rating required by Table 602 for floor construction or shall be of Type 4 construction as described in 780 CMR 2304.0 and the aggregate length shall not exceed 50% of the building perimeter on each floor.

Exceptions:
1. Untreated wood is permitted for pickets and rails, or similar guardrail devices which are limited to 42 inches (1067 mm) in height.
2. Balconies and similar appendages on buildings of Types 3, 4 and 5 construction shall be permitted to be of Type 5 construction, and shall not be required to have a fireresistance rating where *sprinkler* protection is extended to these areas.

1406.5 Bay and oriel windows: A bay window is a window that projects beyond the wall line of a building and extends down to the foundation. All bay and *oriel windows* attached to or supported by walls in other than buildings of Type 5 construction, shall be of noncombustible construction and be framed with brackets of steel, concrete or other approved noncombustible materials.