

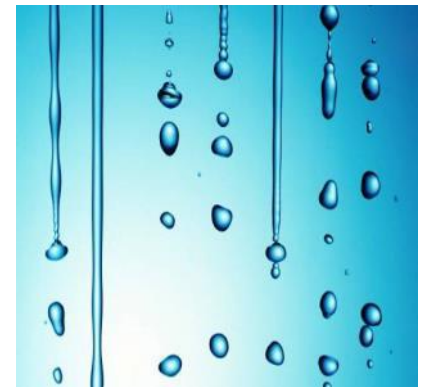
A large fire with firefighters on a ladder in the background. The fire is intense, with bright yellow and orange flames. Two firefighters in full gear are visible on a white aerial ladder, positioned against the fire. The scene is set at night or in low light, with the fire providing the primary illumination. The ladder has the word 'LADDER' partially visible on its side.

# Does my wall have to comply with NFPA285?

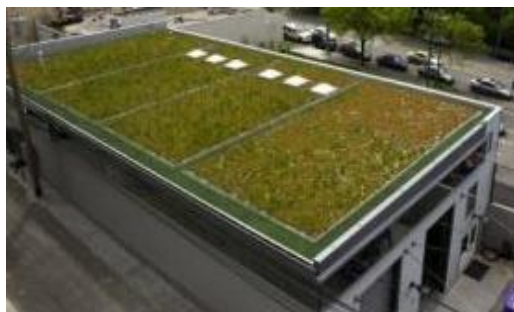
Contact Henry Company directly to schedule a CEU at your firm.

# What we do

Henry<sup>®</sup> Company products and systems **manage** the flow of **water, air, vapor and energy** through the building envelope, from foundation to roof, improving the structure's energy efficiency, livability and sustainability for the benefit of owner, occupant and the environment.



# Building Envelope Systems®



## North American Leader

- Air barrier systems
  - Self-adhered, fluid applied, permeable, non-permeable
- Waterproofing systems
  - Self-adhered, hot rubberized asphalt, cold fluid-applied, PUMA
- Roofing systems
  - Vegetative Roofing Assemblies (VRA), roofing underlayment, cool roof coatings, restoration systems, PUMA

This program is registered with the AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product. Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



# Definitions

# Definitions

## Air barrier

- Wall assembly components installed to effectively resist air leakage
  - An air barrier should be considered a SYSTEM not a product.

## Water-resistive barrier (WRB)

- Product designed to repel water and protect sheathing and framing.

## Continuous insulation

- A thermal resistant product installed continuously over a building envelope to eliminate thermal bridging.

## Exterior Insulation Finishing System (EIFS)

- Light weight insulated water-resistive veneer
  - Rigid insulation adhered to substrate with synthetic coating weather protection.

## National Fire and Protection Association (NFPA)

- Trade association that creates and maintains standards and codes for usage and adoption by local governments

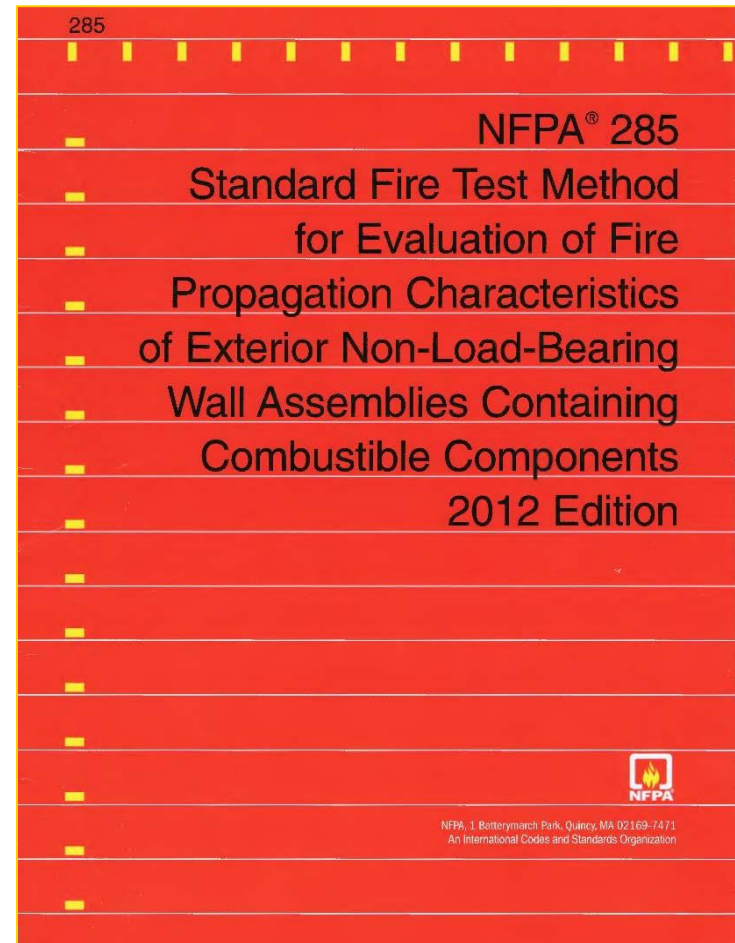
## Authority Having Jurisdiction (AHJ)

- Building and/or fire official of the city or county where the project is located

# Definitions

## NFPA 285

- Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale, Multi-story Apparatus



NFPA 285 Test Document Cover

# History of NFPA 285



# History of NFPA 285

Late 1970's - Escalating energy costs demand energy efficient buildings

- Exterior Insulation Finishing System (EIFS) popularity increases
  - Lightweight synthetic stucco
  - Insulated cladding (continuous foam plastic insulation)
  - Water-resistive veneer

Late 1980's - Uniform Building Code requires exterior wall assemblies containing foam plastic to comply with UBC 17-6

- Method of Test for the Evaluation of Flammability Characteristics of Exterior, Non load-bearing Wall Panel Assemblies Using Foam Plastic Insulation
  - EIFS
  - Insulated metal wall panels
- Later versions include parallel test methods UBC 26-4 and UBC 26-9

**NFPA 285 (or similar) testing is not new.**

Evaluation of exterior wall fire propagation characteristics containing combustible components have been a requirement for over 3 decades

# History of NFPA 285

International Building Code (IBC) created in 2000

- Initially, UBC 26-4 and NFPA 285 were both acceptable methods of verifying flame spread and heat propagation
- 2003 IBC eliminates UBC 26-4; only recognizing NFPA 285
  - Begins expanding exterior wall fire testing to other sections

International Building Code (IBC) Section	Adopted
Foam Plastic Insulation, Section 2603.5.5	2000
Metal Composite Materials (MCM), Section 1407.10.4	2003
Fiber Reinforced Polymer (FRP), Section 2612.6	2009
Exterior Wall Covering (Fire Blocking), Section 718.2.6	2012
Weather Resistive Barrier (WRB), Section 1403.5	2012
High Pressure Laminates (HPL), Section 1409.10.4	2012
Mechanical Equipment Screens (Roof), Section 1509.6.2	2012

# The importance of NFPA 285

# The importance of NFPA 285

NFPA 285 regulates combustible components in exterior wall assemblies; limiting fire spread to adjacent areas.

– Testing emphasis

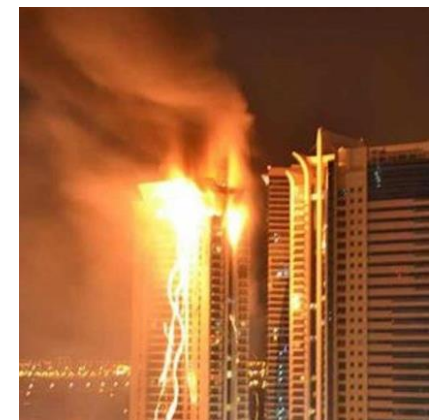
- Fires originating from the interior of a building
- Fire spread to adjacent interior areas and stories above/below fire origination
- Exterior wall assembly flammability
- Vertical and lateral fire spread to adjacent compartment or spaces
- Heat generation



Source: DailyStar.co.UK: 2017 fire at “Grenfell Tower”, London



Source: DailyMail.co.UK: 2015 fire at “The Address”, Dubai



Source: DZBreaking.com: 2017 fire at “The Torch”, Dubai

# The importance of NFPA 285

NFPA 285 verifies flame spread; ensuring buildings function as designed.

IBC Table 601: Fire Resistance Rating Requirements for Building Elements (Hours)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A <sup>d</sup>	B	A <sup>d</sup>	B	HT	A <sup>d</sup>	B
Primary structural frame <sup>g</sup> (see Section 202)	3 <sup>a</sup>	2 <sup>a</sup>	1	0	1	0	HT	1	0
Bearing Walls									
Exterior <sup>f,g</sup>	3	2	1	0	2	2	2	1	0
Interior	3 <sup>a</sup>	2 <sup>a</sup>	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior <sup>e</sup>	0	0	0	0	0	0	Section 602.4.6	0	0
Floor construction and secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and secondary members (see Section 202)	1 1/2 <sup>b</sup>	1 <sup>b,c</sup>	1 <sup>b,c</sup>	0 <sup>c</sup>	1 <sup>b,c</sup>	0	HT	1 <sup>b,c</sup>	0

**Type I:** Fire rated exterior walls and structural components

**Type II:** Noncombustible exterior walls, floors, and roof

**Type III:** Noncombustible exterior walls; interior walls may be constructed of any material permitted by code

**Type IV:** Heavy Timber

**Type V:** Combustible construction; structural elements, exterior walls, and interior walls may be constructed of any material permitted by code

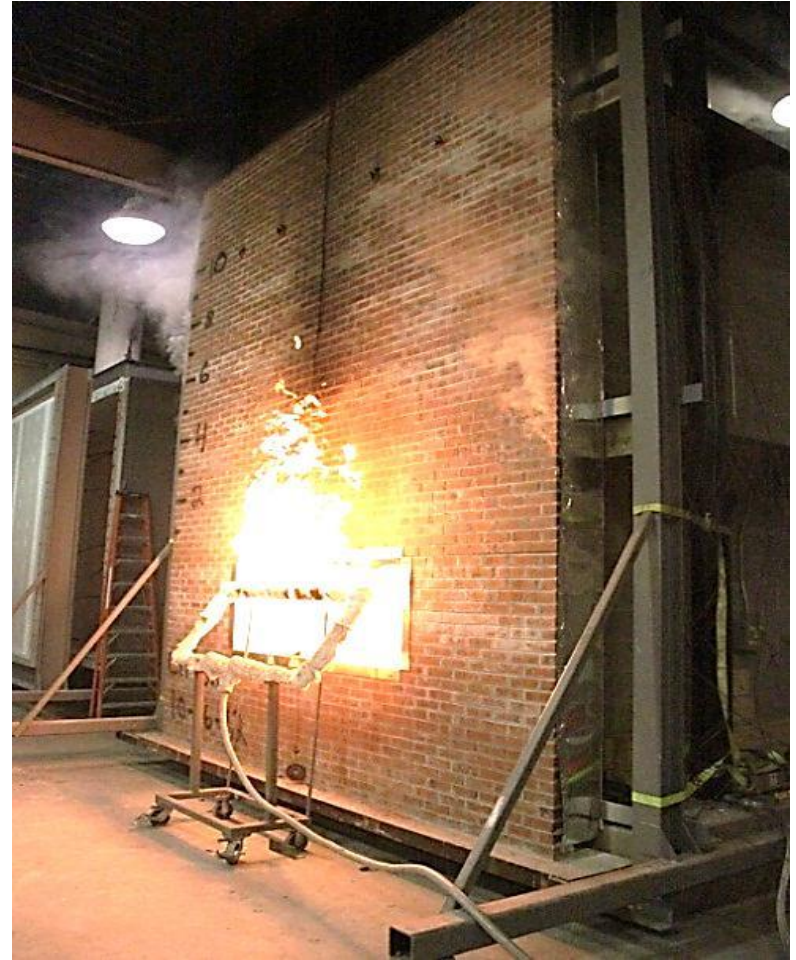
Refer to Table 601 of the International Building Code for footnote information.

# NFPA 285: an assembly test

# NFPA 285: an assembly test

## NFPA 285 testing apparatus

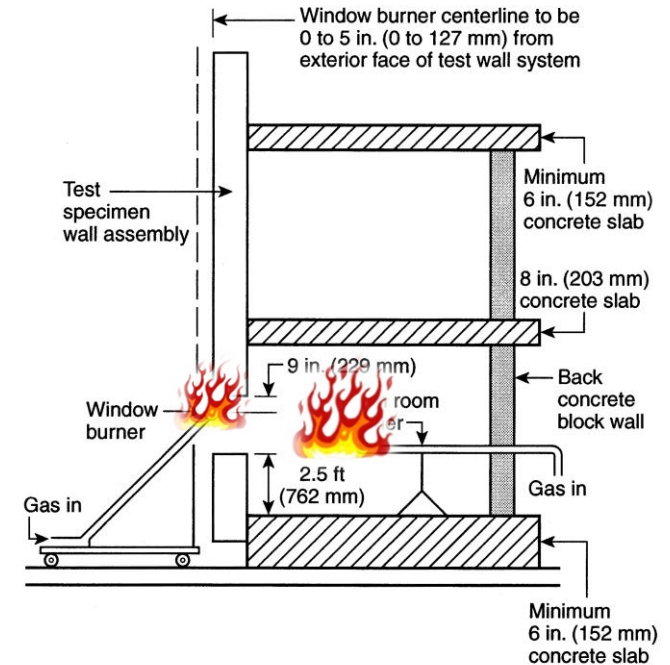
- Interior gas burner initiates a simulated interior fire
- Fire flashes over out of rough opening
  - Ignites exterior gas burner
- Exterior burner maintains fire to exterior wall assembly for duration of fire test
  - Fire burns for 30 minutes
  - Visual and temperature observations during the fire test determine NFPA 285 compliance



# NFPA 285: an assembly test

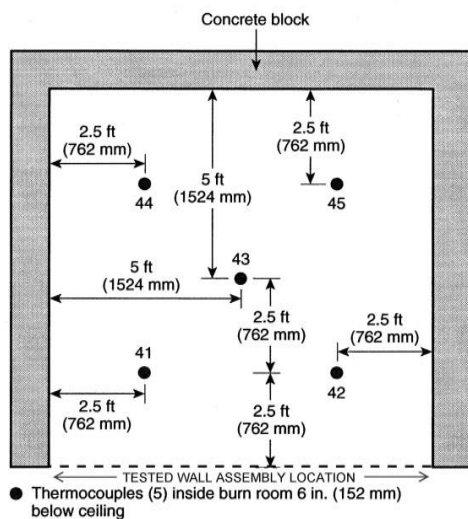
## NFPA 285 testing apparatus

- Gas burner #1
  - Interior of first story
- Gas burner #2
  - Exterior of rough opening (simulated window without the glass plane for safety reasons)
  - Ignited 10 minutes after test initiation

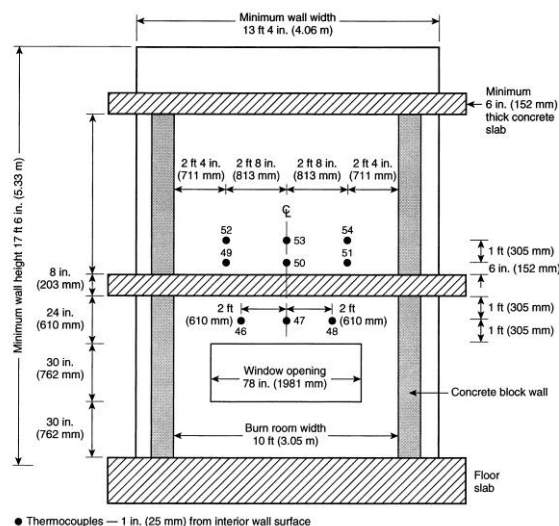




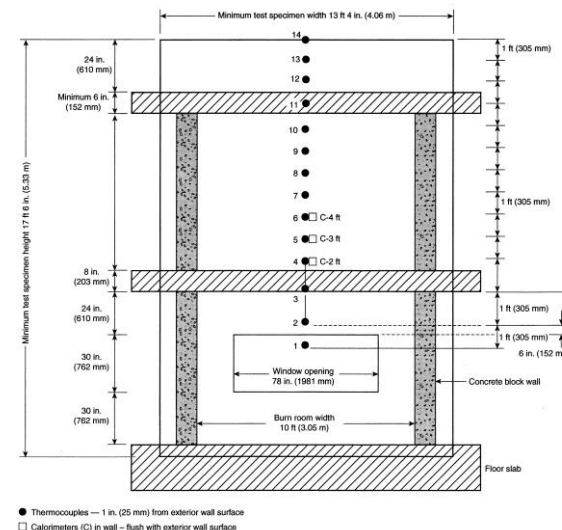
# NFPA 285: an assembly test



Plan view



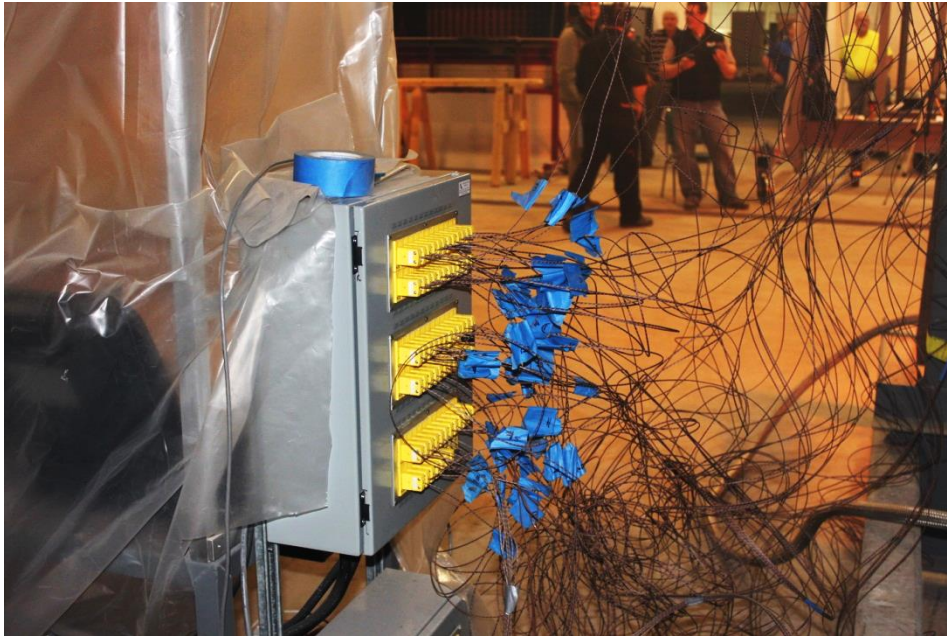
Interior Section



Exterior Elevation

A passing result is based upon visual observations and temperatures taken at various thermocouples during the allotted time.

# NFPA 285: an assembly test

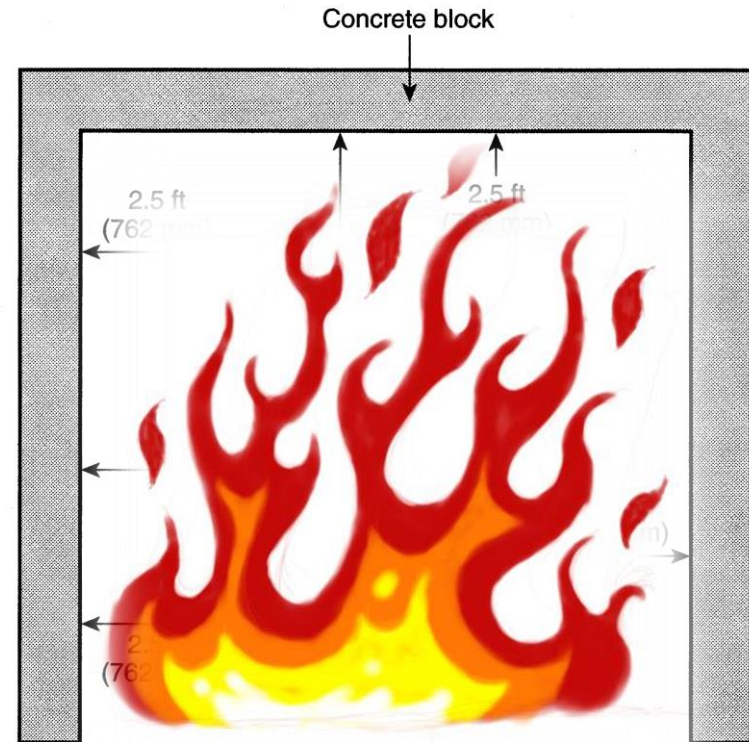


Closer view of thermocouples associated with temperature observation and recordings.

# NFPA 285: an assembly test

## NFPA 285 – compliant wall assembly minimum requirements

- Fire must stay within predetermined temperatures
  - Interior wall and stud cavity space
    - Typically 750 °F (417 °C)
- Flames must remain within the first floor interior space
  - Cannot exceed side walls of testing structure
  - Cannot extend into second floor



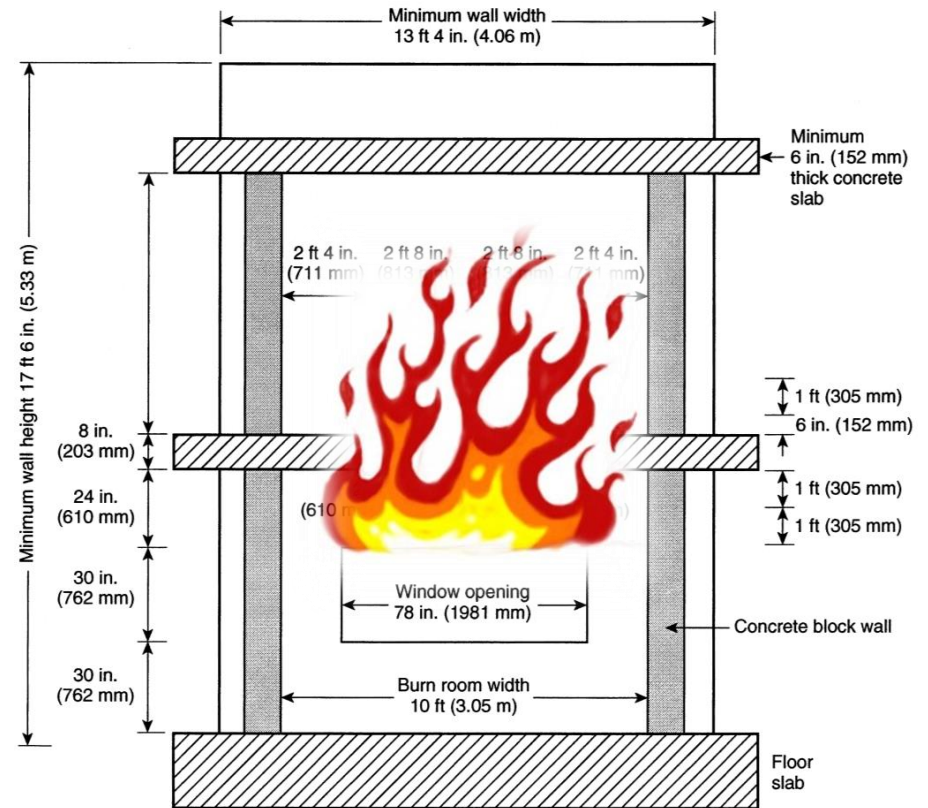
- Thermocouples (5) inside burn room 6 in. (152 mm) below ceiling

Plan view of testing apparatus

# NFPA 285: an assembly test

## NFPA 285 – compliant wall assembly minimum requirements

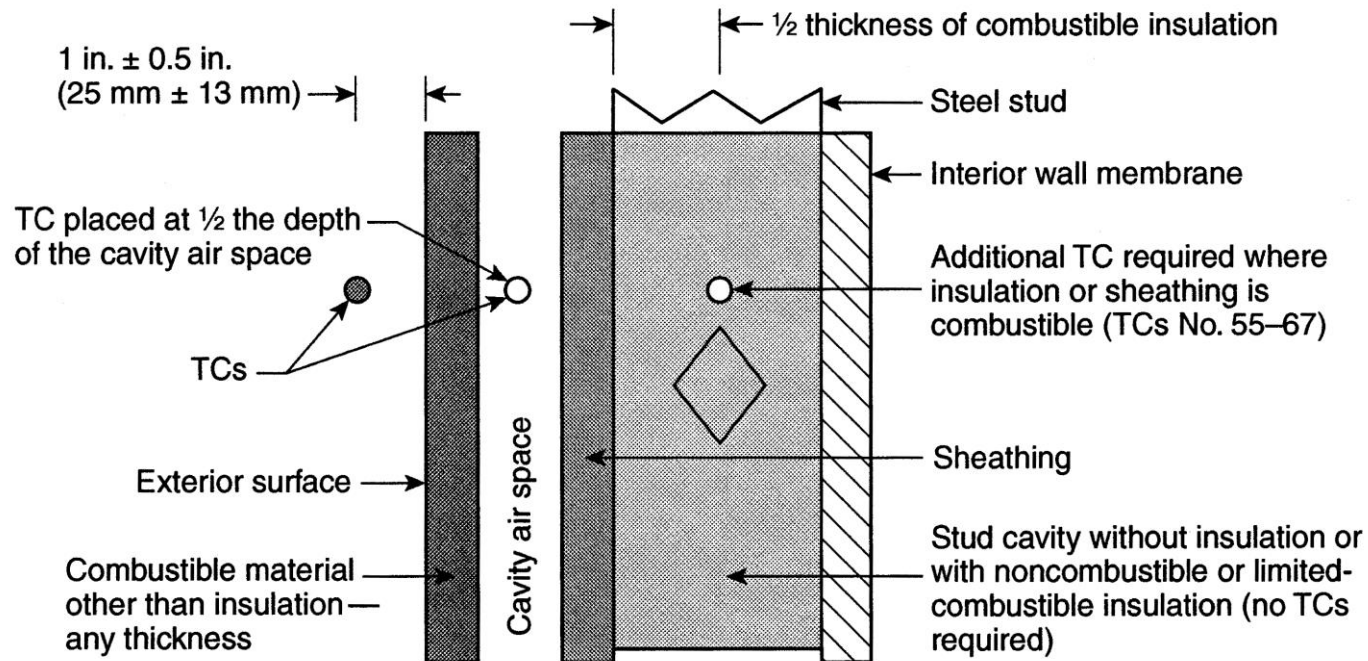
- Vertical and horizontal flame spread
  - Less than 10'-0" above window opening
  - Less than 5'-0" from center of window opening
- Must stay within predetermined temperatures
  - Exterior face of wall assembly
    - 1000 °F (538 °C)



● Thermocouples — 1 in. (25 mm) from interior wall surface

## Interior section of testing apparatus

# NFPA 285: an assembly test



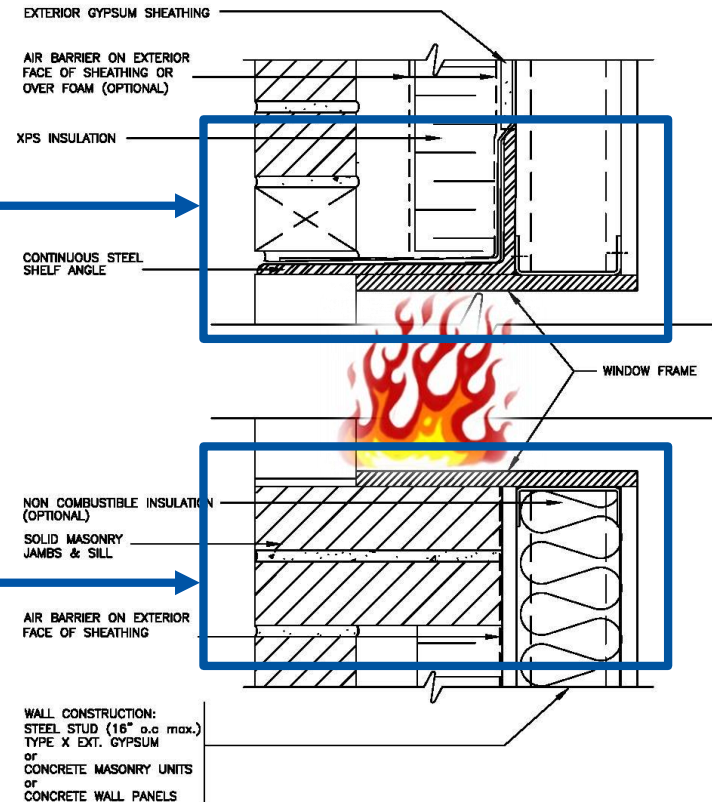
NFPA 285 is an assembly test. Any adjustment to a tested wall assembly must be evaluated for compliance.

# NFPA 285: an assembly test

## Special conditions for NFPA 285 compliant wall assemblies

- Wall assemblies may vary
- Some requirements may include
  - Floor line Fire-stopping
    - Mineral wool
  - Rough openings
    - Continuous steel shelf angle
    - Stainless steel header flashing
    - Mineral wool at header

Provide firestop at rough openings



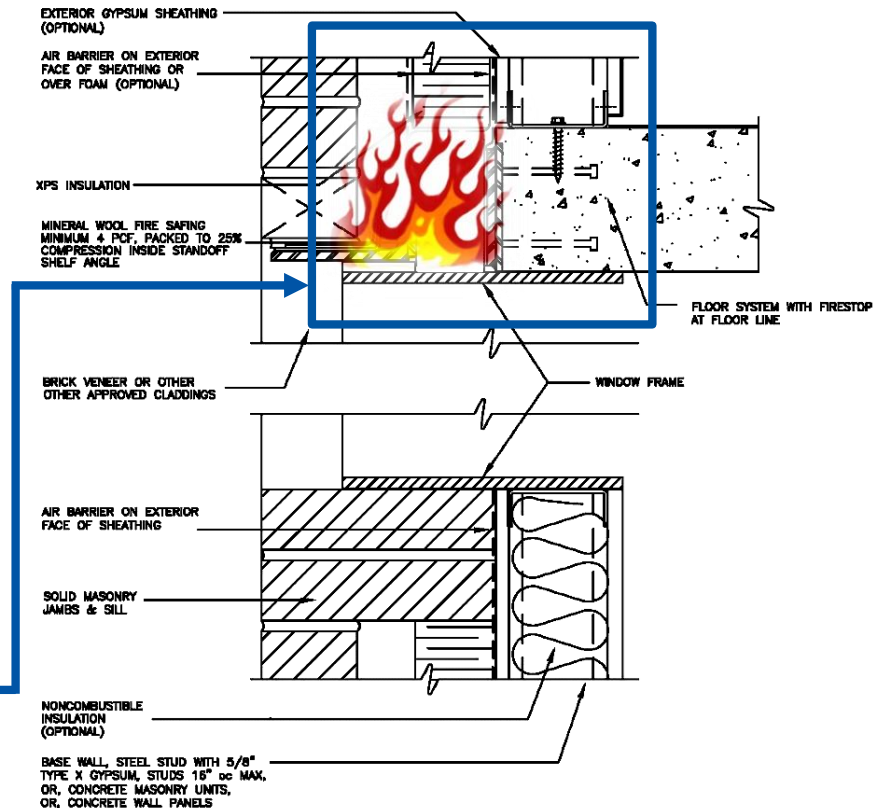
Wall assemblies may have special conditions for construction.

# NFPA 285: an assembly test

## Special conditions for NFPA 285 compliant wall assemblies

- Must be installed per manufacturer published literature
- Deviations may void NFPA 285 compliance

Elimination of firestop may encourage fire spread into the wall cavity



Refer to manufacturer technical bulletin for wall specific requirements.

# Conducting an NFPA 285 test



# Conducting an NFPA 285 test

## NFPA 285 tested wall assembly

- Base wall components installed
  - Common products include
    - Steel studs
    - Interior poly vapor barrier
    - Batt insulation
    - Interior and exterior grade gypsum sheathing
- Sheathing joints detailed in accordance with the air barrier manufacturer published literature



# Conducting an NFPA 285 test

## NFPA 285 tested wall assembly

- Air barrier installed in accordance with air barrier manufacturer published literature.
- Common air barrier material types include
  - Fluid-applied
  - Self-adhered
  - Mechanically attached



# Conducting an NFPA 285 test

## NFPA 285 tested wall assembly

- Cladding securement and rigid insulation installed
  - Metal panel channels installed onto cured air barrier
  - Rigid insulation installed onto cured air barrier
- This test included metal panels and polyisocyanurate
  - Special conditions
    - Metal flashing installed at rough opening



# Conducting an NFPA 285 test

## NFPA 285 tested wall assembly

- Exterior cladding installed
  - Metal panels secured
- Final inspection prior to fire test

Further clarification later in the discussion on the 2019 edition of NFPA 285 and the lack of vertical and horizontal joints



# Conducting an NFPA 285 test

## NFPA 285 tested wall assembly

- Interior gas burner lit
- Fire ignited
- Timer started
  - Gas burners will promote fire simulation for 30 minutes



# Conducting an NFPA 285 test

## NFPA 285 tested wall assembly

- Interior fire flashes over
- Exterior gas burner ignited



# Conducting an NFPA 285 test

## NFPA 285 tested wall assembly

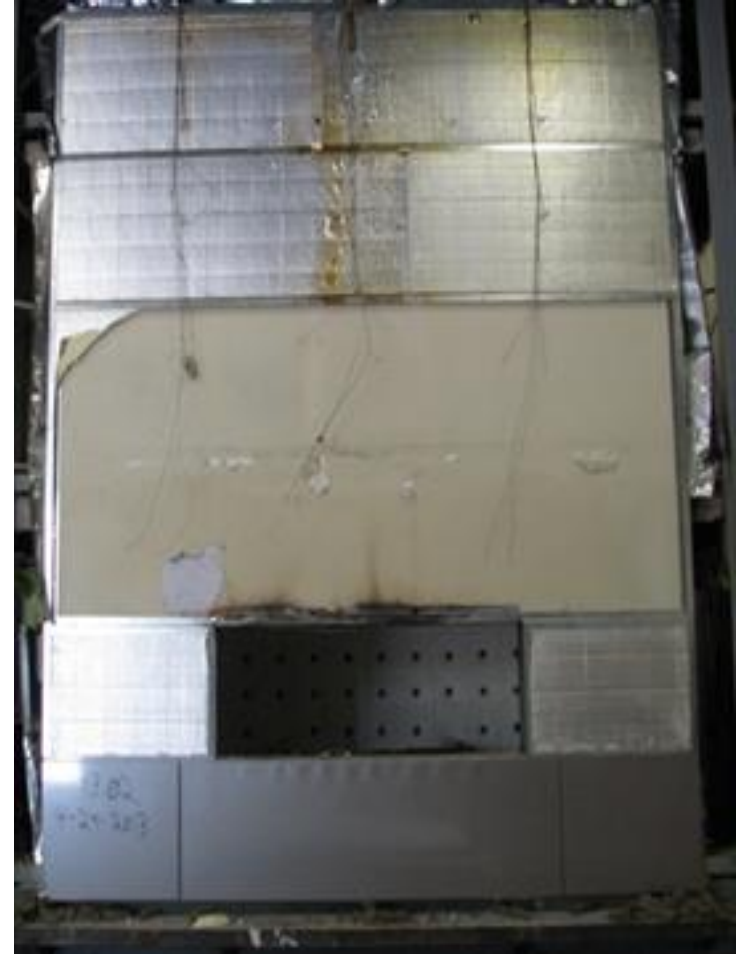
- Gas burners turned off after 30 minutes
- Observation of fire without gas burners encouraging fire propagation



# Conducting an NFPA 285 test

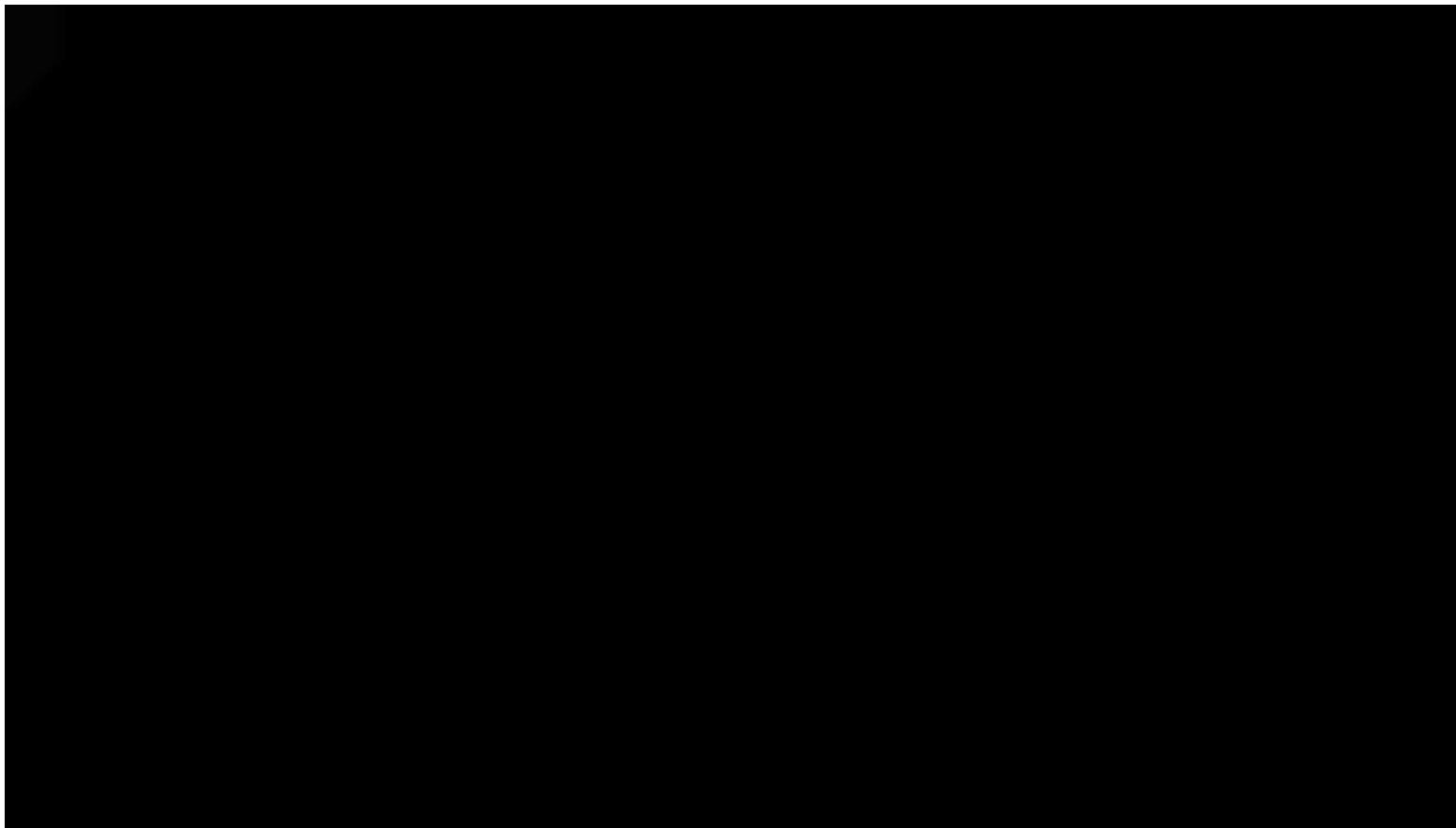
## NFPA 285 tested wall assembly

- Removal of metal panels and insulation
- Observation conclusions:
  - Fire did not consume and/or penetrate through metal rough opening flashing
  - No exterior wall fire damage
  - No fire damage to second story or beyond testing apparatus walls
  - Temperatures within required range
- Confirmed NFPA 285 compliance





# Conducting an NFPA 285 test



# Building code compliance

# Building code compliance

Increased demand for energy efficient buildings and advancements in technology triggers NFPA 285.

Common exterior wall materials that trigger NFPA 285 compliance	Building codes	
	IBC	2012 IECC
Foam plastic insulation	Chapter 26	Continuous insulation (ci)

Climate Zone	1		2		3		4 Except Marine		5 and Marine 4		6		7		8	
	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R
<b>Walls, Above Grade</b>																
Mass	R-5.7ci	5.7ci	5.7ci	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci	R-11.4ci	R-11.4ci	R-13.3ci	R-13.3ci	R-15.2ci	R-15.2ci	R-15.2ci	R-25ci	R-25ci
Metal building	R-13 + R-6.5ci	R-13 + R-6.5ci	R-13 + R-6.5ci	R-13ci	R-13 + R-6.5ci	R-13ci	R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-19.5ci	R-13 + R-13ci	R-13 + R-19.5ci
Metal framed	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-15.6ci	R-13 + R-7.5ci	R-13 + R-17.5ci
Wood framed and other	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-15.6ci or R-20 + R-10ci	R-13 + R-15.6ci or R-20 + R-10ci

Refer to International Energy Conservation Code (IECC) Table C402.2 Opaque thermal envelope requirements.

# Building code compliance

Increased demand for energy efficient buildings and advancements in technology triggers NFPA 285

Common exterior wall materials that trigger NFPA 285 compliance	Building codes			
	IBC	2012 IECC	ASHRAE 90.1 2010	LEED V4
Water-resistive barriers/ Air barriers	Chapter 14	Climate zones 4-8	Required	Prerequisite

“**1403.5 Vertical and lateral flame propagation.** Exterior walls on buildings of Types I, II, III or IV construction that are greater than 40 feet (12192mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.”

Air barriers are always a requirement for new construction.

# Specifying an NFPA 285 compliant wall assembly

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 1:

#### Select a base wall system

#### • Common materials

- Concrete wall
- Concrete masonry wall
- 5/8" thick type X gypsum over steel studs

Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	<ol style="list-style-type: none"> <li>1. Concrete wall</li> <li>2. Concrete masonry wall</li> <li>3. 1 layer – 5/8-inch thick, Type X, gypsum wallboard on interior, installed over steel studs: minimum 3 5/8-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically</li> </ol>
<b>Floorline Firestopping</b>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Floxul) in each stud cavity at each floorline – <i>smoothed with caps or equivalent</i>
<b>Cavity insulation</b> <i>Use either 1, 2, 3, 4 or 6</i>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Any noncombustible insulation (faced or unfaced) per ASTM E136</li> <li>3. Any mineral fiber (Board type Class A, ASTM E84 faced or unfaced)</li> <li>4. Any fiberglass (Batt type Class A, ASTM E84 faced or unfaced)</li> <li>5. Items 2-4 may incorporate a Class A vapor barrier film</li> <li>6. Henry Formax™ SFF maximum thickness 6-inch</li> </ol>
<b>Interior vapor membrane (optional)</b> <i>Use either 1 or 2</i>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. One layer of maximum 6-mil thick polyethylene film</li> </ol>
<b>Exterior sheathing</b> <i>Use either 1 or 2</i>	<ol style="list-style-type: none"> <li>1. 1/2-inch thick, exterior type gypsum sheathing</li> <li>2. 3/8-inch thick, Type X, exterior type gypsum sheathing</li> </ol>
<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Air-Bloc® 16MR</li> <li>3. Air-Bloc® 17MR</li> <li>4. Air-Bloc® 21FR or 21S</li> <li>5. Air-Bloc® 31MR</li> <li>6. Air-Bloc® 33MR</li> <li>7. Air-Bloc® 33MR</li> <li>8. Blueskin® VP160</li> <li>9. Blueskin® SA or SALT</li> <li>10. Metal Clad™</li> <li>11. FoilSkin®</li> </ol>
<b>Exterior insulation</b>	Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 - Maximum of 3-inch thickness on insulation joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash - max. 12-inch width can be used.
<b>Exterior veneer</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	<ol style="list-style-type: none"> <li>1. Brick - Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick</li> <li>2. Concrete - 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete.</li> <li>3. Concrete masonry units - 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU.</li> <li>4. Stone veneer - Minimum 2-inch thick, limestone or natural stone veneer or minimum 1 1/2-inch thick cast artificial stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc. can be used.</li> <li>5. Terracotta cladding - Use any terracotta cladding system in which terracotta is minimum 1 1/4-inch thick. Any non-open-joint installation technique such as ship-lap, etc. can be used.</li> <li>6. Stucco - Minimum 3/4-inch thick, exterior cement plaster and lath. This exterior veneer cannot be used with the exterior insulation described above.</li> </ol>
<b>Special conditions</b>	Use header treatment shown in figure 1, 2 or 3 for all window and door openings in walls utilizing XPS insulation.

Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	<ol style="list-style-type: none"> <li>1. Concrete wall</li> <li>2. Concrete masonry wall</li> <li>3. 1 layer – 5/8-inch thick, Type X, gypsum wallboard on interior, installed over steel studs: minimum 3 5/8-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically</li> </ol>

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 2:

#### Select interior components

- Verify requirement for floor-line fire stopping (where applicable)
  - Common materials
    - 4 lb/cu ft. mineral wool
  - Some wall assemblies may not require floorline firestopping
    - Refer to wall specific assembly

Moisture analysis	
Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	1. Concrete wall 2. Concrete masonry wall 3. 1 layer – ½-inch thick, Type X, gypsum wallboard on interior, installed over steel studs; minimum 3½-inch depth, maximum 2½-inch air gap at a maximum 24-inch OC with lateral bracing every 4 ft. vertically
<b>Floorline Firestopping</b> <i>Use either 1, 2, 3, 4 or 6</i>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Roxul) in each stud cavity at each floorline – attached with Z-clips or equivalent
<b>Interior vapor membrane (optional)</b> <i>Use either 1 or 2</i>	1. None 2. One layer of maximum 6-mil thick polyethylene film
<b>Exterior sheathing</b> <i>Use either 1 or 2</i>	1. ½-inch thick, exterior type gypsum sheathing 2. ¾-inch thick, Type X, exterior type gypsum sheathing
<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	1. None 2. Air-Bloc® 16MR 3. Air-Bloc® 17MR 4. Air-Bloc® 21FR or 21S 5. Air-Bloc® 31MR 6. Air-Bloc® 33MR 7. Air-Bloc® 33MR 8. Blueskin® VP160 9. Blueskin® SA or SALT 10. Metal Clad™ 11. FoliSkin®
<b>Exterior insulation</b>	Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 - Maximum of 3-inch thickness on insulation joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash - max. 12-inch width can be used.
<b>Exterior veneer</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	1. Brick - Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick. 2. Concrete - 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete. 3. Concrete masonry units - 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU. 4. Stone veneer - Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc. can be used. 5. Terracotta cladding - Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick. Any non-open-joint installation technique such as ship-lap, etc. can be used. 6. Stucco - Minimum ¾-inch thick, exterior cement plaster and lath. This exterior veneer cannot be used with the exterior insulation described above.
<b>Special conditions</b>	Use header treatment shown in figure 1, 2 or 3 for all window and door openings in walls utilizing XPS insulation.

#### Floorline Firestopping

4 lb/cu ft. mineral wool (e.g. Thermafiber or Roxul) in each stud cavity at each floorline – attached with Z-clips or equivalent

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 3:

#### Select interior components

- Interior insulation (where applicable)

- Common materials

- Noncombustible insulation
- Mineral fiber
- Fiberglass batt
- Spray foam

Moisture analysis	
Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	1. Concrete wall 2. Concrete masonry wall 3. 1 layer – ½-inch thick, Type X, gypsum wallboard on interior, installed over steel studs; minimum 3½-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically
<b>Floorline Firestopping</b>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Roxul) in each stud cavity at each floorline –
<b>Cavity insulation</b> <i>Use either 1, 2, 3, 4 or 6</i>	1. None 2. Any noncombustible insulation (faced or unfaced) 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. Items 2-4 may incorporate a Class A vapor barrier film 6. Henry Permax™ SPF maximum thickness 6-inch
<b>Interior vapor membrane (optional)</b> <i>Use either 1 or 2</i>	1. None 2. One layer of maximum 6-mil thick polyethylene film
<b>Exterior sheathing</b> <i>Use either 1 or 2</i>	1. ½-inch thick, exterior type gypsum sheathing 2. ¾-inch thick, Type X, exterior type gypsum sheathing
<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	1. None 2. Air-Bloc® 16MR 3. Air-Bloc® 17MR 4. Air-Bloc® 21FR or 21S 5. Air-Bloc® 31MR 6. Air-Bloc® 32MR 7. Air-Bloc® 33MR 8. Blueskin® VP160 9. Blueskin® SA or SALT 10. Metal Clad™ 11. FoilSkin®
<b>Exterior insulation</b>	Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 - Maximum of 3-inch thickness on insulation joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash - max. 12-inch width can be used.
<b>Exterior veneer</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	1. Brick - Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick. 2. Concrete - 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete. 3. Concrete masonry units - 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU. 4. Stone veneer - Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open joint installation technique such as ship-lap, etc. can be used. 5. Terracotta cladding - Use any terracotta cladding system in which terracotta is minimum 1½-inch thick. Any non-open joint installation technique such as ship-lap, etc. can be used. 6. Stucco - Minimum ¾-inch thick, exterior cement plaster and lath. This exterior veneer cannot be used with the exterior insulation described above.
<b>Special conditions</b>	Use header treatment shown in figure 1, 2 or 3 for all window and door openings in walls utilizing XPS insulation.

#### Cavity insulation

*Use either 1, 2, 3, 4 or 6*

1. None
2. Any noncombustible insulation (faced or unfaced) 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. Items 2-4 may incorporate a Class A vapor barrier film
6. Henry Permax™ SPF maximum thickness 6-inch



# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 4:

### Select interior components

- Interior vapor barrier (where applicable)

Moisture analysis	
Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	<ol style="list-style-type: none"> <li>1. Concrete wall</li> <li>2. Concrete masonry wall</li> <li>3. 1 layer – ½-inch thick, Type X, gypsum wallboard on interior, installed over steel studs; minimum 3½-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically</li> </ol>
<b>Floorline Firestopping</b>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Roxul) in each stud cavity at each floorline – attached with Z-clips or equivalent
<b>Cavity insulation</b> <i>Use either 1, 2, 3, 4 or 6</i>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Any noncombustible insulation (faced or unfaced) per ASTM E136</li> <li>3. Any mineral fiber (Board type Class A, ASTM E84 faced or unfaced)</li> <li>4. Any fiberglass (Batt type Class A, ASTM E84 faced or unfaced)</li> <li>5. Items 2-4 may incorporate a Class A vapor barrier film</li> </ol>
<b>Interior vapor membrane (optional)</b> <i>Use either 1 or 2</i>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. One layer of maximum 6-mil thick polyethylene film</li> </ol>
<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Air-Bloc® 16MR</li> <li>3. Air-Bloc® 17MR</li> <li>4. Air-Bloc® 21FR or 21S</li> <li>5. Air-Bloc® 31MR</li> <li>6. Air-Bloc® 33MR</li> <li>7. Air-Bloc® 33MR</li> <li>8. Blueskin® VP160</li> <li>9. Blueskin® SA or SALT</li> <li>10. Metal Clad™</li> <li>11. FoilSkin®</li> </ol>
<b>Exterior insulation</b>	Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 - Maximum of 3-inch thickness on insulation joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash - max. 12-inch width can be used.
<b>Exterior veneer</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	<ol style="list-style-type: none"> <li>1. Brick - Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick</li> <li>2. Concrete - 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete.</li> <li>3. Concrete masonry units - 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU.</li> <li>4. Stone veneer - Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open joint installation technique such as ship-lap, etc. can be used.</li> <li>5. Terracotta cladding - Use any terracotta cladding system in which terracotta is minimum 1½-inch thick. Any non-open joint installation technique such as ship-lap, etc. can be used.</li> <li>6. Stucco - Minimum ¾-inch thick, exterior cement plaster and lath. This exterior veneer cannot be used with the exterior insulation described above.</li> </ol>
<b>Special conditions</b>	Use header treatment shown in figure 1, 2 or 3 for all window and door openings in walls utilizing XPS insulation.

#### Interior vapor membrane (optional)

*Use either 1 or 2*

1. None

2. One layer of maximum 6-mil thick polyethylene film

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 5:

#### Select exterior components

- Exterior sheathing (where applicable)
  - Common materials
    - ½” thick exterior grade gypsum sheathing
    - 5/8” thick, Type X, exterior grade gypsum sheathing
    - FT wood (certain assemblies)

Moisture analysis	
Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	1. Concrete wall 2. Concrete masonry wall 3. 1 layer – ½-inch thick, Type X, gypsum wallboard on interior, installed over steel studs; minimum 3½-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically
<b>Floorline Firestopping</b>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Roxul) in each stud cavity at each floorline – attached with Z-clips or equivalent
<b>Cavity insulation</b> <i>Use either 1, 2, 3, 4 or 6</i>	1. None 2. Any noncombustible insulation (faced or unfaced) 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. Items 2-4 may incorporate a Class A vapor barrier film 6. Henry Formax™ SFF maximum thickness 6-inch
<b>Interior vapor membrane (optional)</b>	1. None
<b>Exterior sheathing</b> <i>Use either 1 or 2</i>	1. ½-inch thick, exterior type gypsum sheathing 2. ⅝-inch thick, Type X, exterior type gypsum sheathing
<b>to gypsum sheathing</b> <i>Select from list</i>	2. Air-Bloc® 16MR 3. Air-Bloc® 17MR 4. Air-Bloc® 21FR or 21S 5. Air-Bloc® 31MR 6. Air-Bloc® 32MR 7. Air-Bloc® 33MR 8. Blueskin® VP160 9. Blueskin® SA or SALT 10. Metal Clad™ 11. FoliSkin®
<b>Exterior insulation</b>	Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 - Maximum of 3-inch thickness on insulation joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash - max. 12-inch width can be used.
<b>Exterior veneer</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	1. Brick - Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick 2. Concrete - 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete. 3. Concrete masonry units - 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU. 4. Stone veneer - Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc. can be used. 5. Terracotta cladding - Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick. Any non-open-joint installation technique such as ship-lap, etc. can be used. 6. Stucco - Minimum ¾-inch thick, exterior cement plaster and lath. This exterior veneer cannot be used with the exterior insulation described above.
<b>Special conditions</b>	Use header treatment shown in figure 1, 2 or 3 for all window and door openings in walls utilizing XPS insulation.

#### Exterior sheathing

*Use either 1 or 2*

1. ½-inch thick, exterior type gypsum sheathing
2. ⅝-inch thick, Type X, exterior type gypsum sheathing

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 6:

### Select exterior components

- Air barrier

- Typically installed onto exterior sheathing
- NFPA 285 has become an industry standard
  - Most manufacturers offer air barriers as part of compliant wall assemblies

Moisture analysis	
Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	1. Concrete wall 2. Concrete masonry wall 3. 1 layer – ¾-inch thick, Type X, gypsum wallboard on interior, installed over steel studs; minimum 3½-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically
<b>Floorline Firestopping</b>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Floxul) in each stud cavity at each floorline – attached with Z-clips or equivalent
<b>Cavity insulation</b> <i>Use either 1, 2, 3, 4 or 6</i>	1. None 2. Any noncombustible insulation (faced or unfaced) 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. Items 2-4 may incorporate a Class A vapor barrier film 6. Henry Formax™ SFF maximum thickness 6-inch
<b>Interior vapor membrane (optional)</b> <i>Use either 1 or 2</i>	1. None 2. One layer of maximum 6-mil thick polyethylene film
<b>Exterior sheathing</b>	1. ½-inch thick, exterior type gypsum sheathing
<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	1. None 2. Air-Bloc® 16MR 3. Air-Bloc® 17MR 4. Air-Bloc® 21FR or 21S 5. Air-Bloc® 31MR 6. Air-Bloc® 32MR 7. Air-Bloc® 33MR 8. Blueskin® VP160 9. Blueskin® SA or SA LT 10. Metal Clad™ 11. FoilSkin®
<b>Exterior insulation</b>	Exterior rigid foam insulation type I or II per ASTM E1363 – maximum 6-inch thickness for treatment joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash – max. 12-inch width can be used.
<b>Exterior veneer</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	1. Brick – Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick. 2. Concrete – 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete. 3. Concrete masonry units – 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU. 4. Stone veneer – Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open joint installation technique such as ship-lap, etc. can be used. 5. Terrazzo cladding – The open-joint cladding system in which terrazzo is minimum 1½-inch thick. 6. Any non-open joint installation technique such as ship-lap, etc. can be used.

<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	<ol style="list-style-type: none"> <li>1. None</li> <li>2. Air-Bloc® 16MR</li> <li>3. Air-Bloc® 17MR</li> <li>4. Air-Bloc® 21FR or 21S</li> <li>5. Air-Bloc® 31MR</li> <li>6. Air-Bloc® 32MR</li> <li>7. Air-Bloc® 33MR</li> <li>8. Blueskin® VP160</li> <li>9. Blueskin® SA or SA LT</li> <li>10. Metal Clad™</li> <li>11. FoilSkin®</li> </ol>
--	--

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 7:

#### Select exterior components

- Exterior insulation (where applicable)
  - Common materials
    - None
    - Extruded Polystyrene (XPS)
    - Mineral fiber
    - Spray foam
    - Polyisocyanurate
    - Expanded Polystyrene (EPS)

Moisture analysis	
Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	1. Concrete wall 2. Concrete masonry wall 3. 1 layer – ½-inch thick, Type X, gypsum wallboard on interior, installed over steel studs; minimum 3½-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically
<b>Floorline Firestopping</b>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Roxul) in each stud cavity at each floorline – attached with Z-clips or equivalent
<b>Cavity insulation</b> <i>Use either 1, 2, 3, 4 or 6</i>	1. None 2. Any noncombustible insulation (faced or unfaced) 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. Items 2-4 may incorporate a Class A vapor barrier film 6. Henry Permax™ SF maximum thickness 6-inch
<b>Interior vapor membrane (optional)</b> <i>Use either 1 or 2</i>	1. None 2. One layer of maximum 6-mil thick polyethylene film
<b>Exterior sheathing</b> <i>Use either 1 or 2</i>	1. ½-inch thick, exterior type gypsum sheathing 2. ¾-inch thick, Type X, exterior type gypsum sheathing
<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	1. None 2. Air-Bloc® 16MR 3. Air-Bloc® 17MR 4. Air-Bloc® 21FR or 21S 5. Air-Bloc® 31MR 6. Air-Bloc® 32MR 7. Air-Bloc® 33MR 8. Blueskin® VP160 9. Blueskin® SA or SALT 10. Metal Clad™
<b>Exterior insulation</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	1. Blueskin® Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 – Maximum of 3-inch thickness on insulation joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash – max. 12-inch width can be used.
	24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick 2. Concrete – 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete. 3. Concrete masonry units – 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU. 4. Stone veneer – Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open joint installation technique such as ship-lap, etc. can be used. 5. Terracotta cladding – Use any terracotta cladding system in which terracotta is minimum 1½-inch thick. Any non-open joint installation technique such as ship-lap, etc. can be used. 6. Stucco – Minimum ¾-inch thick, exterior cement plaster and lath. This exterior veneer cannot be used with the exterior insulation described above.
<b>Special conditions</b>	Use header treatment shown in figure 1, 2 or 3 for all window and door openings in walls utilizing XPS insulation.

#### Exterior insulation

Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 – Maximum of 3-inch thickness on insulation joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash – max. 12-inch width can be used.

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 8:

### Select exterior components

#### • Exterior veneer

##### – Common materials

- Brick
- Concrete
- Concrete masonry units (CMU)
- Stone
- Terracotta
- Stucco
- Metal Panels
  - (must use Polyisocyanurate or mineral wool for exterior insulation)
- Cement board

Moisture analysis	
Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	1. Concrete wall 2. Concrete masonry wall 3. 1 layer – ½-inch thick, Type X, gypsum wallboard on interior, installed over steel studs; minimum 3½-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically
<b>Floorline Firestopping</b>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Floxul) in each stud cavity at each floorline – attached with Z-clips or equivalent
<b>Cavity insulation</b> <i>Use either 1, 2, 3, 4 or 6</i>	1. None 2. Any noncombustible insulation (faced or unfaced) 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. Items 2-4 may incorporate a Class A vapor barrier film 6. Henry Formax™ SFF maximum thickness 6-inch
<b>Interior vapor membrane (optional)</b> <i>Use either 1 or 2</i>	1. None 2. One layer of maximum 6-mil thick polyethylene film
<b>Exterior sheathing</b> <i>Use either 1 or 2</i>	1. ½-inch thick, exterior type gypsum sheathing 2. ¾-inch thick, Type X, exterior type gypsum sheathing
<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	1. None 2. Air-Bloc® 16MR 3. Air-Bloc® 17MR 4. Air-Bloc® 21FR or 21S 5. Air-Bloc® 31MR 6. Air-Bloc® 32MR 7. Air-Bloc® 33MR 8. Blueskin® VP160 9. Blueskin® SA or SALT 10. Metal Clad™ 11. FoilSkin®
<b>Exterior insulation</b>	Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 - Maximum of 3-inch thickness on insulation
<b>Exterior veneer</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	1. Brick – Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick 2. Concrete – 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete. 3. Concrete masonry units – 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU. 4. Stone veneer – Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc. can be used. 5. Terracotta cladding – Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick. Any non-open-joint installation technique such as ship-lap, etc. can be used. 6. Stucco – Minimum ¾-inch thick, exterior cement plaster and lath. This exterior veneer cannot be used with the exterior insulation described above.

#### Exterior veneer

*Use either 1, 2, 3, 4, 5 or 6*

1. Brick – Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick
2. Concrete – 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete.
3. Concrete masonry units – 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU.
4. Stone veneer – Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc. can be used.
5. Terracotta cladding – Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick. Any non-open-joint installation technique such as ship-lap, etc. can be used.
6. Stucco – Minimum ¾-inch thick, exterior cement plaster and lath. This exterior veneer cannot be used with the exterior insulation described above.

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 9:

Verify special conditions (where applicable)

#### • Common requirements

- Continuous steel lintel at header/floor line
- Mineral wool firestopping at rough opening header
- Steel flashing around rough opening
  - Least common method
  - Typically applicable for spray foam exterior insulation

Moisture analysis	
Wall component	Materials
<b>Base wall system</b> <i>Use either 1, 2 or 3</i>	1. Concrete wall 2. Concrete masonry wall 3. 1 layer – ½-inch thick, Type X, gypsum wallboard on interior, installed over steel studs; minimum 3½-inch depth, minimum 20-gauge at a maximum of 24-inch OC with lateral bracing every 4-ft. vertically
<b>Floorline Firestopping</b>	4 lb/cu ft. mineral wool (e.g. Thermafiber or Roxul) in each stud cavity at each floorline – attached with Z-clips or equivalent
<b>Cavity insulation</b> <i>Use either 1, 2, 3, 4 or 6</i>	1. None 2. Any noncombustible insulation (faced or unfaced) 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. Items 2-4 may incorporate a Class A vapor barrier film 6. Henry Formax™ SF maximum thickness 6-inch
<b>Interior vapor membrane (optional)</b> <i>Use either 1 or 2</i>	1. None 2. One layer of maximum 6-mil thick polyethylene film
<b>Exterior sheathing</b> <i>Use either 1 or 2</i>	1. ½-inch thick, exterior type gypsum sheathing 2. ¾-inch thick, Type X, exterior type gypsum sheathing
<b>Air barrier membrane applied to gypsum sheathing</b> <i>Select from list</i>	1. None 2. Air-Bloc® 16MR 3. Air-Bloc® 17MR 4. Air-Bloc® 21FR or 21S 5. Air-Bloc® 31MR 6. Air-Bloc® 33MR 7. Air-Bloc® 33MR 8. Blueskin® VP160 9. Blueskin® SA or SALT 10. Metal Clad™ 11. FoilSkin®
<b>Exterior insulation</b>	Extruded Polystyrene Foam Insulation (XPS) - Type IV per ASTM C578 - Maximum of 3-inch thickness on insulation joints, flashing tape such as Henry® Blueskin® SA or Butyl Flash - max. 12-inch width can be used.
<b>Exterior veneer</b> <i>Use either 1, 2, 3, 4, 5 or 6</i>	1. Brick - Standard nominal 4-inch thick, clay brick. Brick installed with standard type veneer anchors at maximum 24-inch OC vertically on each stud. Maximum 2-inch air gap between exterior insulation and brick 2. Concrete - 2-inch thick or greater. Maximum 2-inch air gap between exterior insulation and concrete. 3. Concrete masonry units - 4-inch thick or greater. Maximum 2-inch air gap between exterior insulation and CMU. 4. Stone veneer - Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc. can be used. 5. Terracotta cladding - Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick. Any non-open-joint installation technique such as ship-lap, etc. can be used. 6. Stone veneer - Minimum 2-inch thick, limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard non-open-joint installation technique such as ship-lap, etc. can be used.
<b>Special conditions</b>	Use header treatment shown in figure 1, 2 or 3 for all window and door openings in walls utilizing XPS insulation.

**Special conditions**

Use header treatment shown in figure 1, 2 or 3 for all window and door openings in walls utilizing XPS insulation.

# Specifying an NFPA 285 compliant wall assembly

## Selecting an NFPA 285 compliant wall assembly

### Step 10:

#### Cross reference and coordinate project documents

- Specifications

- Coordinate relevant specification sections
  - Fire-stopping
  - Air barrier
  - Exterior insulation
  - Exterior cladding

- Drawings

- Coordinate relevant details
  - Rough openings
    - Continuous steel angles
    - Mineral wool at headers
  - Floor line fire-stopping

.....  
SPEC NOTE: Coordination of terminations, transitions, and penetrations are pertinent to ensure chemical compatibility and adhesion of adjacent products. Edit the following related sections as required for project specific needs and to ensure a continuous air and water tight building envelope. Contact manufacturer(s) where products transition from one assembly to another to confirm minimum installation requirements for warranty issuance.  
.....

1.03. RELATED REQUIREMENTS

- A. DIVISION 03 – Section 03 40 00 – Precast Concrete
- B. DIVISION 04 – Section 04 20 00 – Unit Masonry
- C. DIVISION 05 – Section 05 40 00 – Cold-Formed Metal Framing
- D. DIVISION 05 – Section 05 50 00 – Metal Fabrications
- E. DIVISION 06 – Section 06 16 00 – Sheathing

.....  
SPEC NOTE: 2012 IECC requires a continuous air barrier. Contact product manufacturers and coordinate dampproofing/waterproofing with this section to ensure compatibility and/or single source warranty.  
.....

- F. DIVISION 07 – Section 07 10 00 – Dampproofing and Waterproofing

.....  
SPEC NOTE: Inclusion of plastic thermal insulation may require NFPA 285 compliance. Contact product manufacturers to confirm passing assemblies.  
.....

- G. DIVISION 07 – Section 07 21 00 – Thermal Insulation

.....  
SPEC NOTE: Climate zones 4 and greater require a vapor retarder in accordance with the International Building Code (IBC) and the National Building Code of Canada (NBC). Coordinate and/or delete related requirement below as needed.  
.....

- H. DIVISION 07 – Section 07 26 00 – Vapor Retarders

- I. DIVISION 07 – Section 07 40 00 – Roofing and Siding Panels

.....  
SPEC NOTE: 2012 IECC requires a continuous air barrier on building envelope systems. Contact product manufacturers and coordinate membrane roofing with this section to ensure compatibility and/or single source warranty.  
.....

- J. DIVISION 07 – Section 07 50 00 – Membrane Roofing

- K. DIVISION 07 – Section 07 62 00 – Sheet Metal Flashing and Trim

Simply specifying NFPA 285 isn't enough. All exterior wall components must be coordinated in the project manual.

# Common questions



# Common questions

## Engineering judgments

- Also known as Engineering Analysis/Engineering Evaluation
- In depth investigation of a product substitution in a currently passing assembly
  - For example: A licensed consulting engineer specializing in fire code safety may authorize a 'one off' from an NFPA 285 passing wall assembly based off substantial data and evaluation.
- Only conducted by licensed fire evaluation centers

### Testing data required to apply for engineering evaluation

ASTM E84–Surface Burning Characteristics

ASTM E1354–Cone Calorimeter Test

ICC ES Reports

ASTM E119/UL 263/IBC 703.2

NFPA 268–Radiant Ignitibility of Assemblies

# Common questions

## Exclusion of flashings for windows, doors and other exterior wall penetrations

- 2015 International Building Code (IBC), Section 1403.5 Vertical and lateral flame propagation
  - 2015 IBC further defined NFPA 285 to eliminate flashings

**“1403.5 Vertical and lateral fame propagation.** Exterior walls on buildings of Types I, II, III or IV construction that are greater than 40 feet (12192mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. *For the purposes of this section, fenestration products and flashing of fenestration products shall not be considered part of the *water-resistive barrier*.”*

Air barrier flashings are not considered part of an air barrier assembly for the purposes of NFPA 285 compliance.

# Common questions

Exclusion of NFPA 285 requirement where the water-resistive barrier/air barrier is the only combustible component

- 2015 International Building Code (IBC), Section 1403.5 Vertical and lateral flame propagation
  - 2015 IBC eliminates NFPA 285 requirement for wall assemblies where the WRB/air barrier is the only combustible exterior wall component

**“1403.5 Vertical and lateral flame propagation.**

**Exceptions:**

1. Walls in which the water-resistive barrier is the only combustible component and the exterior wall has a wall covering of brick, concrete, stone, terracotta, stucco or steel with minimum thickness in accordance with Table 1405.2.”

To comply with NFPA 285 exception,  
the exterior wall must have a masonry cladding.

# Common questions

Exclusion of NFPA 285 requirement where the WRB/air barrier is the only combustible component (continued)

**“1403.5 Vertical and lateral flame propagation.**

**Exceptions:**

2. Walls in which the water-resistive barrier is the only combustible component and the water-resistive barrier has a peak heat release rate of less than 150 kW/M<sup>2</sup>, a total heat release of less than 20MJ/m<sup>2</sup> and an effective heat of combustion of less than 18MJ/kg as determined in accordance with ASTM E 1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723.”

To comply with NFPA 285 exception, the air barrier must meet ASTM E1354 and ASTM E84 as defined by the 2015 IBC.

# Common questions

## 2019 NFPA 285 for 2021 IBC

- Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Wall Assemblies Containing Combustible Components
  - The title and scope have been modified to remove the wording “Non-Load Bearing
  - Scope will include Type V Construction
  - The word “noncombustible” has been removed from the type of wall to be tested
  - Wood studs are allowed for tested wall construction
  - This is to accommodate Tall Timber and Podium construction etc.
  - Prior NFPA Tests may not meet the 2019 edition
  - Applies primarily to exterior veneers of panel systems (MCM, HPL, etc.)
  - Stucco and EFIS exempt in most cases (no vertical or horizontal joints)

# Summary

# Summary

Tragic fires highlight the importance of NFPA 285 compliance when installing combustible components on non-combustible exterior wall assemblies.

- Construction types
  - Types I, II, III and IV
- Testing emphasis
  - Fires originating from the interior of a building
  - Fire spread to adjacent interior areas and stories above/below fire origination
  - Exterior wall assembly flammability
  - Vertical and lateral fire spread to adjacent compartment or spaces
  - Heat generation



Source: freemalaysiatoday.com: 2017 fire at "Grenfell Tower", London

# Summary

NFPA 285 is a test method for evaluating fire propagation characteristics of an exterior wall assembly.

- Fire spread on the exterior wall
  - Fires originating from the interior of the building
- Types of construction
  - Walls containing combustible components on non-combustible construction types
  - Multi-story buildings
  - One story buildings greater than 40ft

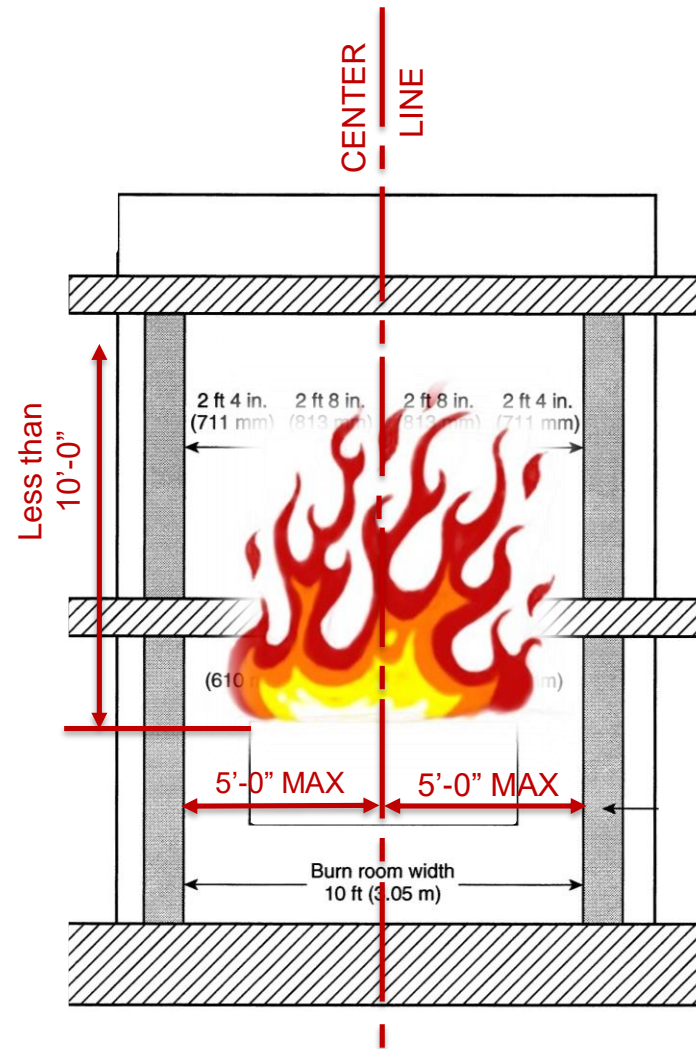




# Summary

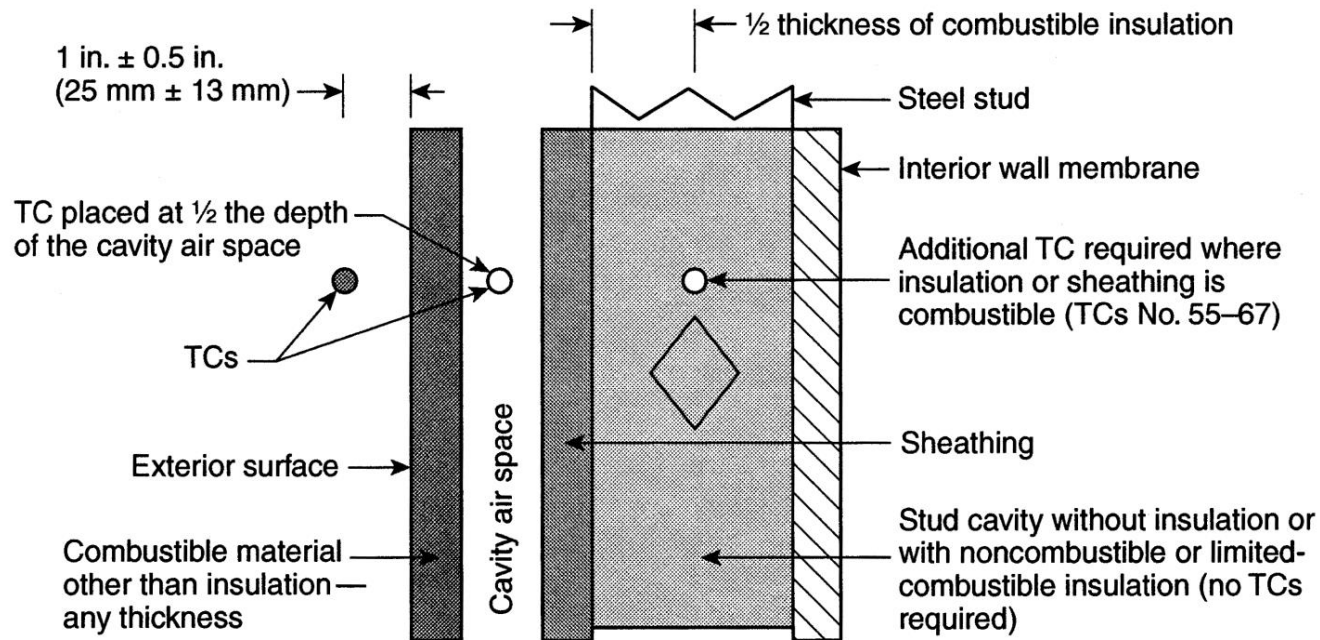
## NFPA 285 – compliant wall assembly minimum requirements

- Flame spread
  - Less than 10'-0" from top of rough opening
  - Less than 5'-0" from center of rough opening
- Temperature limitations
  - Interior wall and stud cavity space
    - Typically 750 °F (417 °C)
  - Exterior face of wall assembly
    - 1000 °F (538 °C)



# Summary

NFPA 285 is an assembly test. Any adjustment to a tested wall assembly must be evaluated for compliance

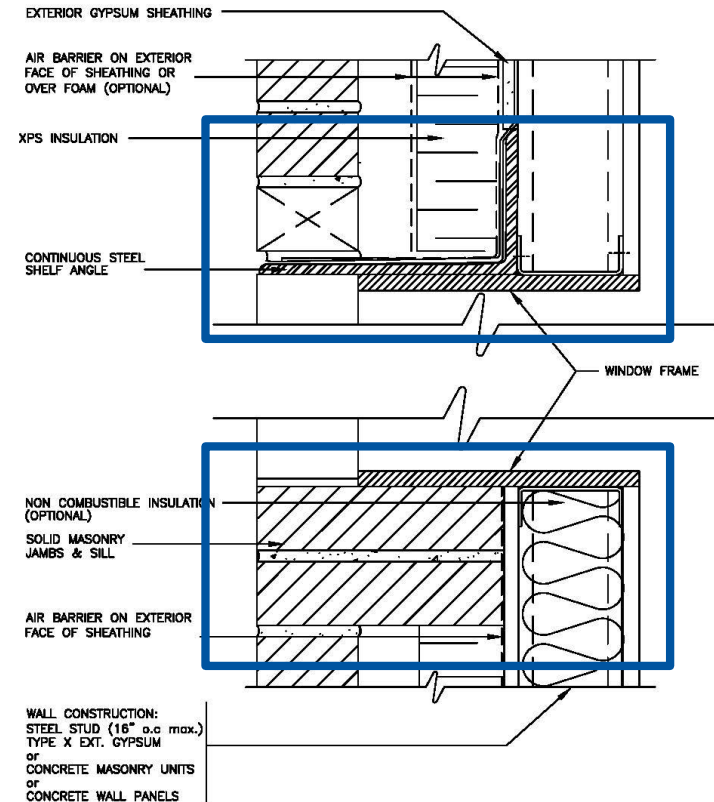


Engineering judgements are common methods of verifying NFPA 285 compliance.

# Summary

## Special conditions may apply

- Mineral wool floor line fire-stopping
- Rough openings
  - Continuous steel shelf angle
  - Stainless steel header flashing
  - Mineral wool at header



Wall assemblies may have special conditions for construction.

# Summary

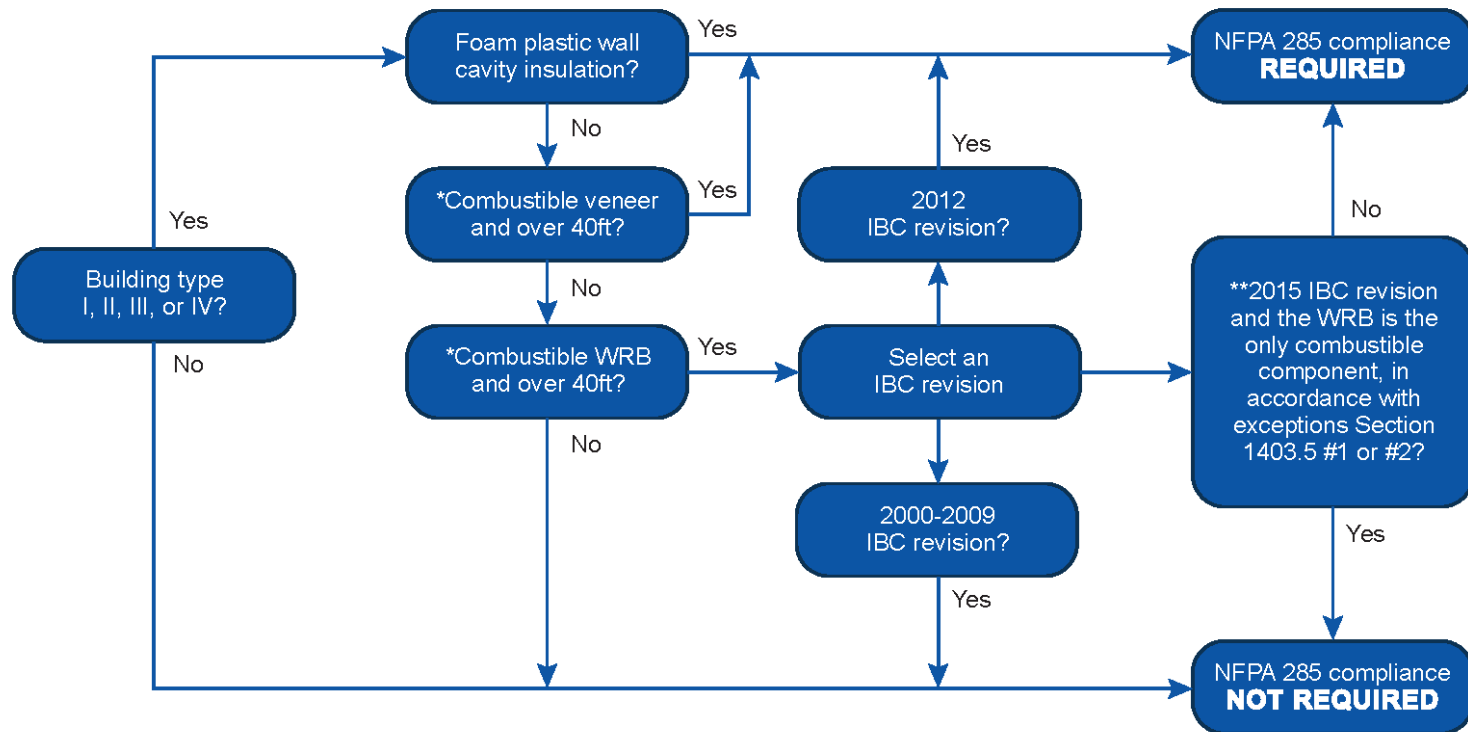
## Common materials and building code requirements that trigger NFPA 285 compliance

- Exterior walls containing a Weather Resistive Barrier (WRB) and/or air barrier
- Exterior walls containing foam plastic insulation
  - Installed onto the exterior wall cavity
- Metal Composite Panels (MCM)

Common exterior wall materials that trigger NFPA 285 compliance	Building codes			
	IBC	2012 IECC	ASHRAE 90.1 2010	LEED V4
Weather resistive barriers/ Air barriers	Chapter 14	Climate zones 4-8	Required	Prerequisite
Foam plastic insulation	Chapter 26	Continuous insulation (ci)	-	-
Combustible Cladding (MCM, ACM, HPL)	Chapter 14	-	-	-

# Summary

Feel confident when identifying if a wall requires NFPA 285 compliance.



Understand what components trigger NFPA 285.  
Refer to manufacturer published literature to verify NFPA 285 compliance.

# Thank you!

This concludes the AIA presentation for continuing professional education.

## Questions??



**Henry®**