



**PRIEST & ASSOCIATES
CONSULTING, LLC**

ENGINEERING EVALUATION

**AVM Industries WRBs with Various Insulations
in NFPA 285-12 Assemblies**

Project No. 11615

Prepared for:

AVM Industries Inc.
8245 Remmet Ave.
Canoga Park, CA

March 19, 2025

Abstract

Atlas EPS and Polyiso NFPA 285 approvals are referenced to determine Engineering Extensions of alternate WRB products manufactured by AVM Industries. AVM Industries reports, approvals, and cone calorimeter (ASTM E1354) data were used to create a matrix of constructions using various combinations of insulations and AVM Industries products that could meet NFPA 285 with specific limitations.

This report aims to present an expert evaluation of the materials, products, or assemblies specified herein concerning a certain code or standard. The end-user is responsible for deciding whether they are fit for use. The scope of this Engineering Judgment is for flame spread per NFPA 285 only. It does not purport to make judgments on other criteria, such as the assembly's structural or sound transmission performance.

The conclusions reached by this evaluation are true and correct, within the bounds of sound engineering practice. All reasoning for our decisions is contained within this document.

Submitted by,



Javier Trevino
Associate Engineer
210-601-0655

March 19, 2025

Reviewed and approved,



Deg Priest
Chief Executive Officer

March 19, 2025



INTRODUCTION

This evaluation aims to allow using an AVM Industries WRB product with specific insulations in existing NFPA 285 approval tables (Refs. 6 & 7). Cone Calorimeter data (Ref. 3) was submitted to compare the flammability of an AVM Industries WRB product to a WRB in the referenced approvals.

This report aims to present an expert evaluation of the materials, products, or assemblies specified herein concerning a certain code or standard. The end-user is responsible for deciding whether they are fit for use.

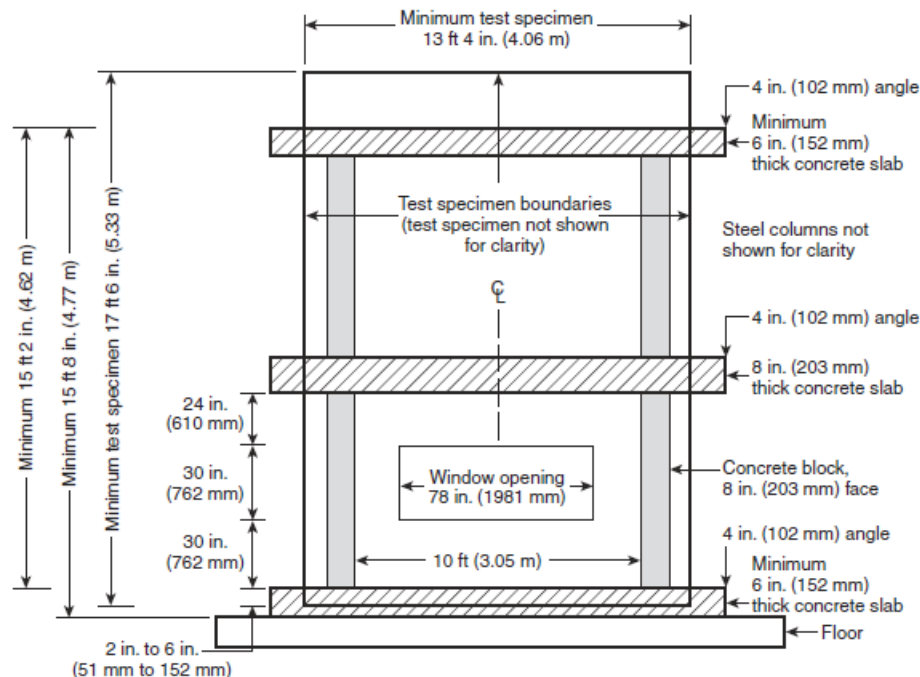
REFERENCED DOCUMENTS

- 1) NFPA 285-12 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-loadbearing Wall Assemblies Containing Combustible Components
- 2) Babrauskas, V., Lucas, D., Eisenberg, D., Singla, V., Dedeo, M., & Blum, A. (2012). Flame retardants in building insulation: a case for re-evaluating building codes. *Building Research & Information*. doi:10.1080/09613218.2012.744533
- 3) Cone Calorimeter Data for AVM Industries vs. Baseline(s) – Data Confidential between AVM Industries and Priest & Associates.
- 4) Lindholm et al. Cone Calorimeter – a Tool for Measuring Heat Release http://www.ffrc.fi/FlameDays_2009/4B/LindholmPaper.pdf
- 5) Babrauskas et al., 10 Years of Heat Release Research NIST Publication <http://fire.nist.gov/bfrlpubs/fire93/PDF/f93048.pdf>
- 6) UL ER16529-01 – NFPA 285 Approval for Atlas ThermalStar EPS (see Appendix A)
- 7) DrJ Engineering TER 1306-03 Atlas Approved NFPA 285 Assemblies (see Appendix B)

EVALUATION METHOD

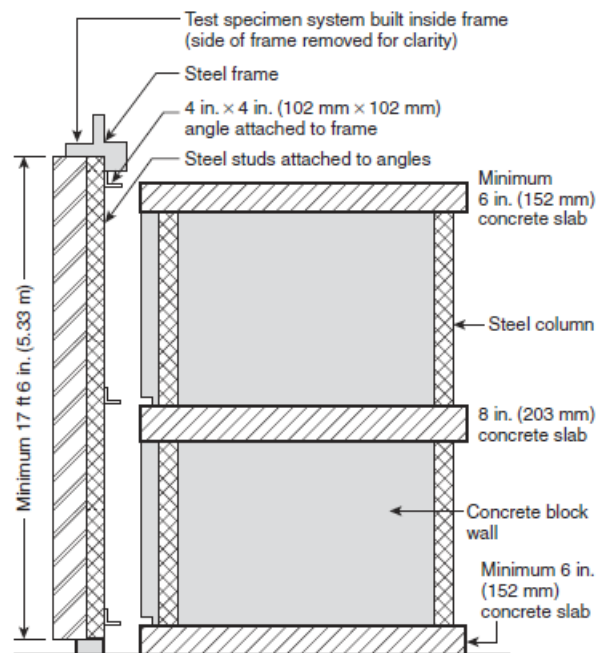
NFPA 285 Criteria

The NFPA 285 fire test (see References section) tests the flame spread properties of exterior walls containing combustible components. Two noncombustible rooms are stacked to simulate two stories of a multi-story building. The wall assembly is then attached to the outer face of the rooms.



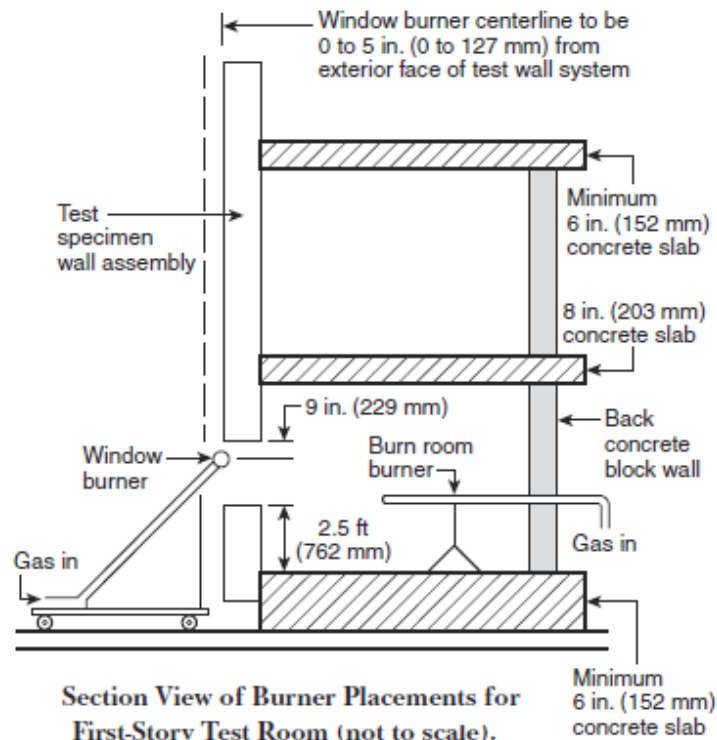
Front View of Test Specimen Superimposed over Test Apparatus (not to scale).





Side View of Test Apparatus with Test Specimen in Movable Test Frame (not to scale).

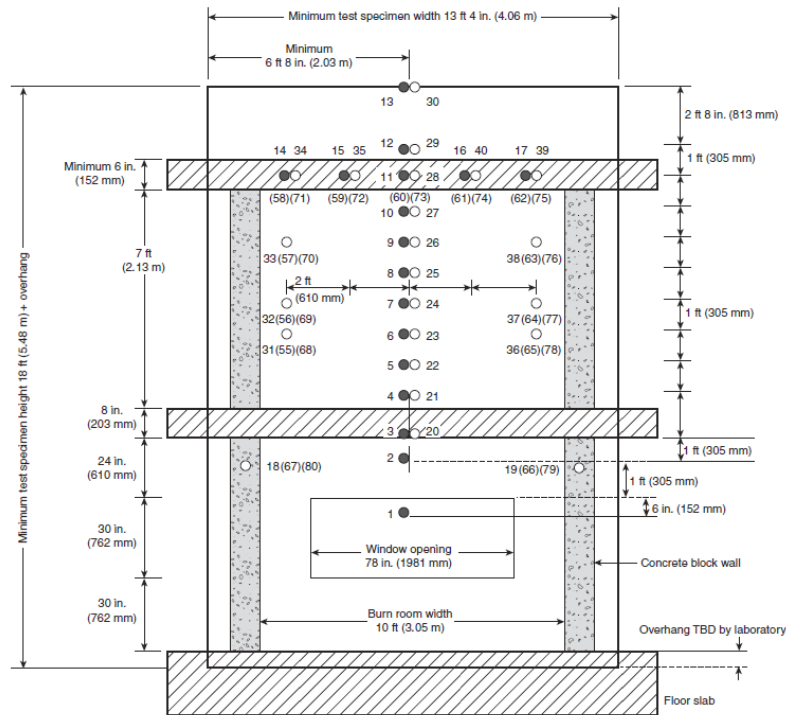
The two burners illustrated below are ignited to produce a specific time-temperature profile in the room and on the wall's exterior face.



Section View of Burner Placements for First-Story Test Room (not to scale).

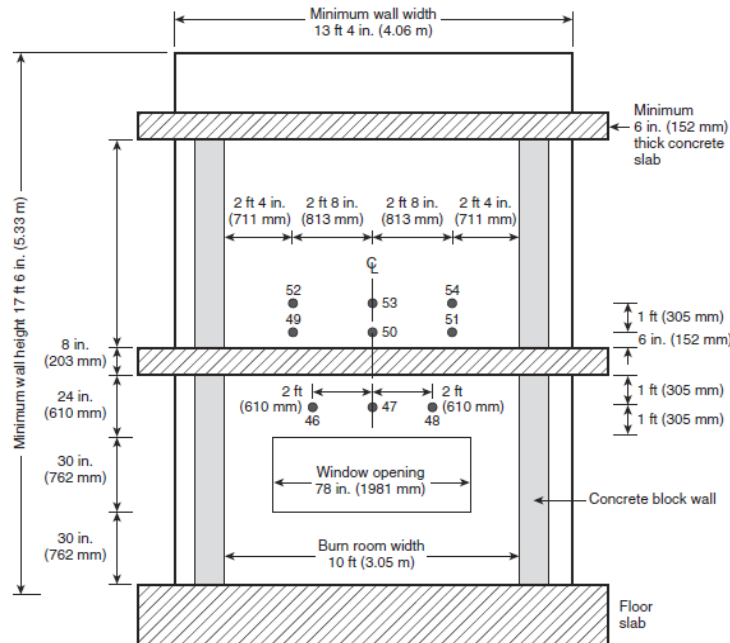


A typical test wall measures 14 ft x 18 ft with a 30 in. tall x 78 in. wide window opening placed on the bottom floor. Thermocouples are placed strategically to monitor temperature as an indicator of flame spread. In the depictions below, Thermocouples 1 - 10 and 20 - 27 are not used for compliance. The remainders are used to monitor the spread of flame.



- Thermocouples — 1 in. (25 mm) from exterior wall surface
- Thermocouples — In the wall cavity air space or the insulation, or both, as shown in Figure 6.1(b) Details A through I.
- () Thermocouples — Additional thermocouples in the insulation or the stud cavity, or both, where required for the test specimen construction being tested, as shown in Figure 6.1(b) Details C through I.

Figure not to scale



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

Interior View of the Test Specimen. Instrumentation arrangement.



During a test, a calibrated fire starts in the bottom room. After 5 minutes, the exterior (window) burner is ignited to produce a specific heat flux/temperature pattern on the exterior of the wall. Both burners remain ignited during the remainder of the 30-minute test, with the gas flow increasing every five minutes. During calibration, the temperatures at various locations throughout the 30 minutes must reach those indicated below.

Calibration Average Values for Time Periods Indicated

Thermocouple Location and Numbers	Temperature											
	0-5 min		5-10 min		10-15 min		15-20 min		20-25 min		25-30 min	
	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C
Test room ceiling: Nos. 18-22	1151	622	1346	730	1482	806	1600	871	1597	869	1648	898
Interior wall surface of test room: Nos. 15-17	1065	574	1298	703	1433	778	1578	859	1576	858	1655	902
1 ft (305 mm) above top of window opening: No. 2	602	317	870	466	952	511	992	533	1046	563	1078	581
2 ft (610 mm) above top of window opening: No. 3	679	359	1015	546	1121	605	1183	639	1245	674	1296	702
3 ft (914 mm) above top of window opening: No. 4	646	341	971	521	1096	591	1174	634	1245	674	1314	712
4 ft (1219 mm) above top of window opening: No. 5	577	302	858	459	982	528	1063	573	1135	613	1224	662
5 ft (1524 mm) above top of window opening: No. 6	521	272	765	407	875	469	949	509	1007	542	1106	597
6 ft (1829 mm) above top of window opening: No. 7	472	244	690	366	787	419	856	458	913	489	1010	543

Also, during the calibration procedure, the radiant flux at the identified locations and times must reach those indicated in the table below.

Calorimeter Locations and Numbers	Heat Flux (W/cm ²)					
	0-5 min	5-10 min	10-15 min	15-20 min	20-25 min	25-30 min
2 ft (610 mm) above top of window opening: Letter C-2ft	0.9 ± 0.2	1.9 ± 0.4	2.5 ± 0.5	2.9 ± 0.6	3.4 ± 0.7	3.8 ± 0.8
3 ft (914 mm) above top of window opening: Letter C-3ft	1.0 ± 0.2	2.0 ± 0.4	2.6 ± 0.5	3.2 ± 0.6	3.7 ± 0.7	4.0 ± 0.8
4 ft (1219 mm) above top of window opening: Letter C-4ft	0.8 ± 0.2	1.5 ± 0.3	2.0 ± 0.4	2.5 ± 0.5	3.0 ± 0.6	3.4 ± 0.7

The room and window burners are under programmed PID control, so once they are calibrated to meet the above requirements, they repeat the same exposure for each test wall.

Personnel monitor flame spread visually during the test; a computer data acquisition system monitors and records the thermocouple temperatures. The criteria for passing are as follows (reworded in more straightforward terms for this analysis):

- 1) Flames shall not spread vertically 10 ft or more above the window opening as determined visually or by thermocouples at the 10 ft level. Failure occurs when Thermocouples 11 or 14 - 17 exceed 1000 °F.
- 2) Flames shall not spread (visually) horizontally 5 ft or more on either side of the window opening centerline.
- 3) Flames shall not spread inside the wall cavity as determined by thermocouples placed within the wall cavity insulation and air gaps if present. Failure occurs when Thermocouples 28, 31 - 40, 55 - 65, or 68 - 79 exceed 750 °F above ambient temperature.
- 4) Flames shall not spread horizontally within the wall cavity past the interior room dimension as determined by wall cavity thermocouples. Failure occurs when Thermocouples 18 - 19, 66 - 67, or 79 - 80 exceed 750 °F above ambient.
- 5) Flames shall not spread to the second-story room as determined by interior wall surface thermocouples. Failure occurs when Thermocouples 49 - 54 exceed 500 °F above ambient.
- 6) Flames shall not occur in the second story (visually).
- 7) Flames shall not escape (visually) from the interior to the exterior at the bottom story room wall/wall intersection.



Constructions Tested

This evaluation is based on NFPA 285 approvals (Ref. 6 in Appendix A, Ref 7 in Appendix B) as the basic documents. The NFPA 285 section of the approvals was based on NFPA 285 tests deemed worst-case, allowing various component options based on the NFPA 285 testing and analysis. The specific tested construction is confidential but includes multiple combinations of wall components such as cavity insulation, exterior sheathing, water-resistive barrier (WRB), exterior insulation, air gap, and cladding.

WRB Flammability Analysis

If a potential WRB is less flammable than the NFPA 285 tested or approved WRB, it is allowed as an alternate component. Cone Calorimeter data (Ref. 3) was submitted to compare the flammability of an AVM Industries WRB product to an approved WRB in the referenced approvals. When analyzing cone calorimeter data, two sets of numbers are typically used. These are the Time to Ignition (T_{ign}) at a given heat flux and the Peak Heat Release Rate (Pk. HRR). Smaller Peak Heat Release Rate values and longer Time to Ignition (T_{ign}) values are improvements (i.e., less flammable) when comparing materials using the Cone Calorimeter. However, some data for a given comparison are conflicting. Researchers (Ref. 5) have used a ranking system to organize cone calorimeter data for flammability comparison to resolve these discrepancies. The expression $Rank = \frac{Pk.HRR}{T_{ign}}$ resolves inconsistencies in relative flammability data when using the Cone Calorimeter. Lower HRR and longer T_{ign} make the Rank smaller. So, smaller Rank materials are considered less flammable than higher Rank materials. With that understood, it should be noted that the accepted relative error [of the HRR] in cone calorimeters is “approximately 20 – 30 % for 1 kW fires, 10 % for 3 kW fires and less than 10 % for 5 kW fires” (Ref. 4).

The AVM Industries WRB product listed below is less flammable (Peak HRR or improved Rank) than at least one of the WRBs in the referenced approvals (Ref. 6 in Appendix A, Ref 7 in Appendix B) for WRBs used under the exterior insulation (over the base wall surface). This data (Ref.s 6 & 7) is confidential between Priest & Assoc. and AVM Industries. See the WRB list below, which is deemed less flammable than an approved WRB in the referenced approvals.

- AVM Industries Aussie Shield™ 300-PLM

Options

The following alternate options may apply:

- 1) Noncombustible unfaced mineral wool may replace the foam insulation. Four pcf (min.), one inch thick (min.) mineral wool may replace the polyiso since mineral wool is noncombustible. If no insulation is used— see item 3 below.
- 2) The referenced NFPA 285 polyiso table allows “None” for exterior gypsum sheathing. Since this report is for AVM Industries WRBs, “None” for the exterior sheathing is not an option. The sheathing is required since a substrate is needed for WRBs on the base wall surface.
- 3) Aussie Shield™ 300-PLM may be used “bare” with no insulation (on the sheathing substrate) since this WRB is less flammable (per Cone Calorimeter) than the WRB in UL NFPA 285 approval EWS0005 per cone calorimeter data submitted (Ref. 3). This approval allows for the use of ACM cladding with no protection to the WRB. Any cladding superior to ACM may replace the approved ACM. The claddings in Appendix A or B meet these criteria. Optionally, covering this WRB with mineral wool makes the wall design less combustible. This allowance only applies to gypsum board or other noncombustible sheathings listed in the approvals referenced. This does not apply to FRT plywood sheathing in the polyiso approval.

CONCLUSIONS

Based on the discussion above, the following Table of NFPA 285 Assemblies shall apply to AVM Industries. The following table shows the relevant content for specific WRBs for use with specific insulation based on the referenced documents.



IMPORTANT – The approved assemblies listed in the appendices are to be used specific to the approval cited. Do not substitute materials (WRB or Insulation or Cladding, etc.) from one approval table to another. The materials used in each approval table must be used together and not mixed with others.

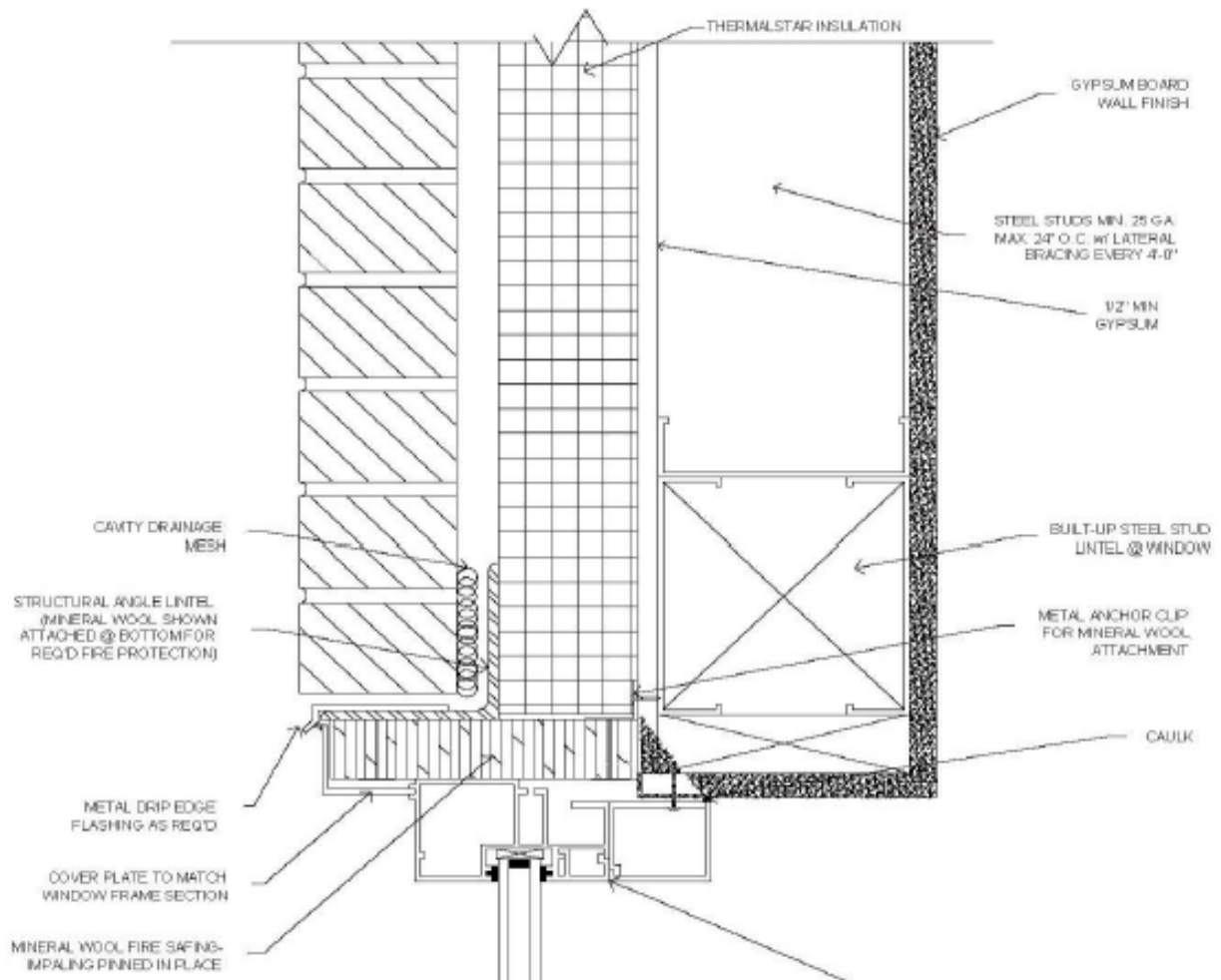
NFPA 285-12 Approved Wall Details for use with AVM Industries (see Appendix A or Appendix B for exact allowances)

Wall Component	Optional Components
Base Wall System Use any Item 1-2	1) 20 GA. (min.) 3 $\frac{5}{8}$ in. (min.) steel studs spaced max. 24 in. OC with $\frac{5}{8}$ in. type X gypsum wallboard Interior 2) The Base Wall in Appendix A or B IMPORTANT Do not substitute the base wall from one approval to another. The materials used in each approval must be used together and not mixed with others.
Fire-Stopping in Stud Cavity at Floor Lines Use Item 1 or 2	1) 4-inch (min.), four pcf (min.) mineral fiber (mineral wool) installed friction fit or with z-clips 2) Any Firestop in Appendix A or B IMPORTANT Do not substitute fire stops for one approval to another. The materials used in each approval must be used together and not mixed with others.
Cavity Insulation Use any Item 1 - 5	1) None 2) Any noncombustible insulation per ASTM E136 3) Any Mineral Fiber (faced or unfaced) complying with the applicable code 4) Any Fiberglass (faced or unfaced) complying with the appropriate code 5) Any cavity insulation listed in Appendix A or B IMPORTANT Do not substitute cavity insulation from one approval to another; the materials used in each approval must be used together and not mixed with those in another. Some cavity insulations require $\frac{5}{8}$ in. exterior gypsum sheathing.
Exterior Sheathing Use any Item 1 - 2	1) $\frac{1}{2}$ inch (min.) Exterior Gypsum Sheathing 2) Any sheathings listed in Appendix A or B IMPORTANT Do not substitute sheathing (including "None") from one approval to another. The materials used in each approval must be used together and not mixed with others.
WRB on Base Wall	1) AVM Industries Aussie Shield™ 300-PLM IMPORTANT The materials used in each approval number should be used together and not mixed with other materials. Each approval number component list is shown in a specific Appendix in this report (see Appendices A - B). Special Note - WRB #1 may be used bare – with no insulation covering the WRB.
Exterior Insulation Use any Item 1 - 4	1) None 2) Atlas ThermalStar EPS (Ref. ER16529-01) – See Appendix A 3) Atlas EnergyShield Polyiso - Various (Ref TER 1306-03) – See Appendix B 4) Mineral Wool (unfaced noncombustible) – 1 in. min. Four pcf density min.



Wall Component	Optional Components
	IMPORTANT The materials used in each approval number should be used together and not mixed with other materials. Each approval number component list is shown in a specific table in the approval.
Cladding	1) For Atlas ThermalStar EPS (Ref UL ER16529-01) – See Appendix A claddings (Mandatory - use special window design) 2) For Atlas EnergyShield Polyiso (Ref TER 1306-03) – See Appendix B Claddings Any cladding in Appendices A - B may be used when mineral wool is used. IMPORTANT The materials used in each approval number should be used together and not mixed with other materials. Each approval number component list is shown in a specific Appendix in this report (See Appendices A - B).
Special Window Opening Design	Important Atlas EPS requires a special window opening design. See the design below.

**Use the Window Opening Design (jambs and header) shown below for EPS.
Jambs recommended by Priest & Assoc. for added fire safety.**



APPENDIX A

Atlas EPS Table (Ref UL ER16529-01)

Table 6 – NFPA 285 Compliant Assembly Options

Wall Component	Options
Base Wall Use 1, 2, or 3	1) Cast Concrete Walls 2) CMU Cast Concrete Walls 3) 25 GA (min) 3-5/8 inch thick (min) steel studs spaced 24 inches oc (max) a. Any 5/8 inch Type X gypsum wallboard interior b. Any 1/2 inch Exterior gypsum sheathing c. Lateral bracing every 4 ft. vertically
Fire Stopping at Floor Lines	Any approved 4.0 pcf density mineral fiber based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. Use mineral fiber insulation manufacturer instructions for installation
Cavity Insulation Use 1, 2, or 3	1) None 2) Any Class A, B, or C Fiberglass batt insulation (faced or unfaced) 3) Any non-combustible insulation
Exterior Sheathing	1/2" or thicker exterior grade gypsum sheathing

WRB list not shown. Use the following:

WRB allowed over Sheathing

- AVM Industries Aussie Shield™ 300-PLM

This WRB may only be used under the insulation (or with no insulation).

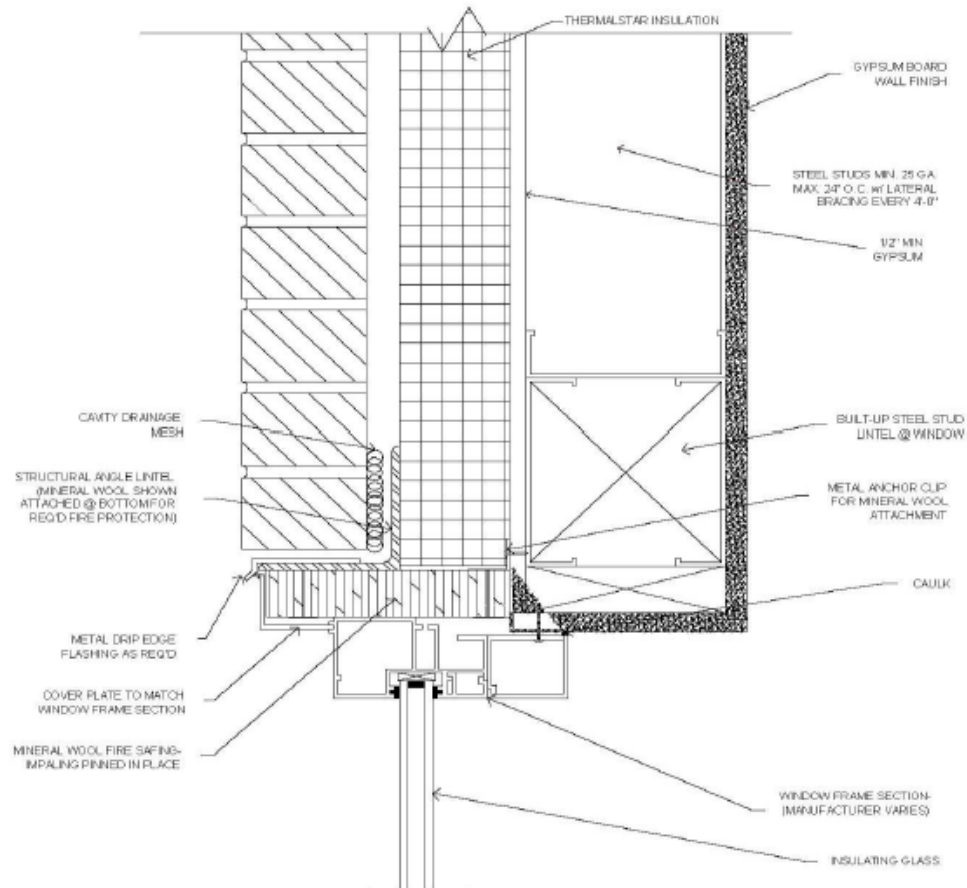
Table 6 – NFPA 285 Compliant Assembly Options (continued)

Wall Component – (continued)	Options
WRB Over Exterior Insulation	None
Exterior Insulation Use 1, through 9	1) None 2) ThermalStar Type I up to 10.2 inches thick 3) ThermalStar Type II up to 7.2 inches thick 4) ThermalStar Type IX up to 5.4 inches thick 5) ThermalStar LWI 10 up to 10.2 inches thick 6) ThermalStar LWI 15 up to 7.2 inches thick 7) ThermalStar LWI 25 up to 5.4 inches thick 8) ThermalStar LCI 10 up to 10.2 inches thick 9) ThermalStar LCI 15 up to 7.2 inches thick
Exterior Cladding Use any of 1 through 8	1) Brick – nominal 4-inch clay brick or veneer with maximum 2-inch air gap cavity behind the cladding. Brick with ties / anchors spaced 24 inches oc (max) 2) Concrete – minimum 2-inch thick with a maximum 2-inch air gap cavity behind the cladding 3) Concrete Masonry Units – minimum 4-inch thick with maximum 2-inch air gap cavity behind the cladding 4) Limestone – minimum 2-inch thick with non-open joints installation technique such as shiplap 5) Natural Stone Veneer – minimum 2-inch thick with non-open joints installation technique such as shiplap 6) Precast Artificial Stone – minimum 1-1/2 inch thick complying with ICC-ES AC51 with non-open joint installation technique 7) Terra Cotta Cladding – minimum 1-1/4 inch thick (solid) with non-open joint installation technique such as shiplap 8) Stucco – minimum 3/4 inch thick exterior cement plaster and lath
Window Header Use either 1 or 2 – See Figure 1 for Window Header Detail	1) Flashing composed of 25 GA (min) sheet metal (steel) with 1 inch thick, 4 pcf mineral wool over the interior of the sheet metal 2) Any header design deemed more robust than item 1 per analysis

IMPORTANT – Window Opening Perimeter for Atlas EPS – Mandatory



**Use the Window Opening Design (jambs and header) shown below for EPS.
Jambs recommended by Priest & Assoc. for added fire safety.**



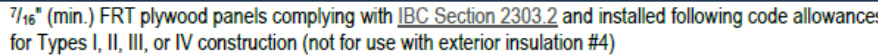
**STUD WALL w/ ATLAS EPS THERMALSTAR INSULATION
WINDOW HEAD w/ MINERAL WOOL FIRE SAFING & BRICK**



APPENDIX B

Atlas EnergyShield Polyiso Table (Ref DRJ TER 1306-03)

Table 4. Approved NFPA 285 Wall Assemblies¹

Wall Component	Materials
Base Wall Use any of these items No Sheathing is needed for 1 and 2.	1. Cast Concrete Walls (1" minimum) 2. CMU Concrete Walls (1" minimum) 3. 20-gauge (min.) 3 ⁵ / ₈ " (min.) steel studs with 5/8" thick Type X gypsum wallboard on interior 4. Fire-Retardant Treated (FRT) wood studs spaced 24" o.c. (max.) with 5/8" thick Type X gypsum wallboard on interior
Floor Line Fire-Stopping Use any of these items	1. None – only with exterior sheathing option 1, 3, or 4 (gypsum wallboard, concrete, or DensElement®) 2. 4 inch thick, 4 pcf mineral fiber (wool) safing insulation (i.e., Thermafiber®) installed with Z-clips or equivalent 3. 1½" FRT lumber for use with FRT studs
Cavity Insulation Use any of these items NOTE: SPF cavity insulations 5 - 17 must use fire stopping at floor lines (compliant with Item 2) and 5/8" exterior gypsum sheathing.	1. None 2. Any noncombustible insulation per ASTM E136 3. Any mineral fiber (Board Type Class A ASTM E84 faced or unfaced) 4. Any fiberglass (Batt Type Class A ASTM E84 faced or unfaced) 5. 5½" (max.) Icynene LD-C-50 spray foam in 6" deep studs (max.) full fill without an air gap 6. 5½" (max.) Icynene MD-C-200™, 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap 7. 5½" (max.) Icynene MD-R-210, 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap 8. 6" (max.) SWD Urethane Quik-Shield (QS) 112, 2 pcf spray foam in 6" deep studs (max.) or partial fill with a maximum 2½" air gap 9. 3½" (max.) Gaco™ Western 183M spray foam in 3½" deep studs (max.) 10. 3½" (max.) Gaco™ Western F1850 with 5/8" exterior sheathing in 3½" deep studs (max.) 11. 3½" (max.) Demilec Sealection® 500 with 5/8" exterior sheathing in 3½" deep studs (max.) 12. 3½" (max.) Demilec HeatLok Soy 200 Plus® with 5/8" exterior sheathing in 3½" deep studs (max.) 13. 3" (max.) Bayer Bayseal® with 5/8" exterior sheathing 14. 3" (max.) Lapolla FoamLok™ FL 2000 with 5/8" exterior sheathing in 3½" deep studs (max.) 15. 3½" (max.) BASF SprayTite® 81206 or WallTite® (US & US-N) with 5/8" exterior sheathing in 3½" deep studs (max.) 16. 3½" (max.) Accella (Premium Spray Products) Foamsulate™ 220 with 5/8" exterior sheathing in 3½" deep studs (max.) 17. JM Corbond III – Full stud Cavity depth or less for use with 5/8" exterior gypsum sheathing.
Exterior Sheathing Use any of these items NOTE: when Items 4 or 5 (integrated sheathing WRBs) are used, WRBs listed below may not be added on top of the sheathing. Sheathings 1-6 are only used for stud base walls.	1. ½" or thicker exterior type gypsum sheathing 2.  3. 2" precast concrete panels attached to structural elements of building 4.  5.  6. 7/16" (min.) FRT plywood panels complying with IBC Section 2303.2 and installed following code allowances for Types I, II, III, or IV construction (not for use with exterior insulation #4) When SPF is used in the cavity, exterior sheathing must be used. See specific sheathing thicknesses above.

Sheathing 2 ("None") is hidden for Polyglass WRB; sheathing must be used as a substrate.

Sheathing 4 and 5 hidden (these are pre-manufactured WRB/sheathing products).

Sheathing 6 may only be used with insulation covering the WRB (Atlas polyiso or mineral wool)

WRB allowed over Sheathing.

- AVM Industries Aussie Shield™ 300-PLM

This WRB may only be used under the insulation (or with no insulation).



Z Girts Use any of these items for claddings requiring girts	1. Metallic Z Girts 2. Horizontal Smart Ci-GreenGirt 3. Horizontal Armatherm FRR Z Girt NOTE: Girt spacing should be to comply with wind load per manufacturer instructions.
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Table 4. Approved NFPA 285 Wall Assemblies¹

Wall Component	Materials
Exterior Insulation Use any of these items Items 1, 2, 3 and 4 may be multiple layers of thinner product with facers on each side.	1. 4" (max.) Atlas EnergyShield Pro 2. 4" (max.) EnergyShield CGF Pro 3. 4 3/4" (max.) EnergyShield Ply Pro (4" EnergyShield CGF Pro with 5/8" or 3/4" FRT Plywood) 4. 4" (max.) Atlas EnergyShield XR (Exterior Claddings 1 - 6 only) NOTE: 1/2" (min.) exterior gypsum sheathing may be attached to exterior side of any item listed above. 5/8" (min) FRT plywood may be attached to exterior side of Item 1 or 2 listed above. NOTE: GP DensGlass (min. 1/2") and GP DensElement (min. 1/2") may be installed exterior to ES Pro & ES Pro CGF. NOTE: The listed sheathing products as installed over Items 1 & 2 may only be covered with the WRB products listed to be used over insulation (see WRB list below this section) but are now used over the sheathing covering the insulation unless others are justified via Fire Engineering Evaluation. DensElement already has a WRB. No WRB goes over this product except the sheathing joint flashing listed in ICC ESR 3786.

WRB over Insulation not shown

Flashing of Opening Perimeter (Windows, Doors, etc.)	No restriction - except as noted below. When the Atlas polyiso is directly attached to studs with no sheathing over the exterior side of studs, 5/8" Type X gypsum board opening perimeter, and 24-gauge (min) steel flashing shall be used. Exception - When the Atlas polyiso is directly attached to studs and is covered with 1/2" (min.) gypsum sheathing, GP DensGlass, or DensElement, the 24-gauge steel flashing restriction is waived if the studs are firestopped at every floor line with mineral wool.
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Claddings on the next page



Table 4. Approved NFPA 285 Wall Assemblies¹

Wall Component	Materials
Exterior Cladding Use any of these items NOTE: Important – Maximum air gap 2.25" (distance from cladding inner face to insulation) NOTE: Cladding 8 (zinc) may only be used with EnergyShield Pro or EnergyShield Ply Pro. NOTE: Diamond Furr TT-4 (mfg. by Brand X Metals) may be used to install 3-coat stucco item 2 in the cladding list. Cladding may be attached with Knight Wall Thermazee or other metallic Z girt.	1. Brick – nominal 4" clay brick or CMU veneer (hollow or solid) with maximum 2 1/4" air gap behind the brick or CMU. Brick ties/anchors 24" o.c. (max.) 2. Stucco – minimum 3/4" thick exterior cement plaster and lath. An optional secondary WRB (WRB allowed OVER foam over 1st WRB) can be installed between the insulation and lath. The optional 2nd WRB may be any mechanically attached sheet product, or asphalt or butyl-based building paper (stapled or other mechanical attachment) with no adhesive. The second WRB may not be self-adhering full coverage asphalt or self-adhering full coverage butyl-based membranes. See note for Diamond Furr TT-4 installation. 3. Limestone – minimum 2" thick 4. Natural stone veneer – minimum 2" thick 5. Cast artificial stone – minimum 1 1/2" thick complying with ICC-ES AC 51 6. Terracotta cladding – minimum 1 1/4" thick 7. Any ACM that has successfully passed NFPA 285 8. Uninsulated sheet metal building panels including aluminum, steel, copper, or zinc (see note) 9. Uninsulated fiber-cement cladding siding minimum 1/4" thick 10. Stone/aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria 11. Autoclaved-aerated-concrete (AAC) panels (minimum 1 1/2" thick) 12. Reynobond® ZCM zinc metal composite panel 13. Terreal Zephir® Evolution Rainscreen System (terra cotta), minimum 9/16" thick 14. 15. CERACLAD using the manufacturer standard installation technique. 16. CUPACLAD Slate: 101 Logic, 101 Random, 101 Parallel, 210 Vanguard 17. Glen-Gery Thin Tech Masonry Veneer (only with optional noncombustible mortar) 18. Glen-Gery Tru-Brix (only with optional noncombustible mortar) 19. Telling Corium Thin Brick System (only with steel or aluminum brick tray and optional noncombustible mortar) 20. Thin brick (min. 3/4 inch thick clay brick) fully adhered with cementitious mortar (standard or polymer-modified) to min. 1/2 inch thick cement backer board or gypsum sheathing. A secondary water-resistive barrier can be installed between the exterior sheathing and the brick. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 21. Telluride Stone (minimum 1") applied to the base wall (with Atlas approved WRB or WRB in Cladding #20) using plaster/lath. 22. Nichiha Cladding per Intertek CCRR 0258. 23. Ceramic or Porcelain Tile a. 1/4 in. min. generic Ceramic or Porcelain tile - mechanically attached b. Ceramic or Porcelain tile – 3/8 in. thick (min.) bonded using noncombustible mortar adhesive to a 1/2 in. thick (min.) cement board or gypsum sheathing c. 12 mm Porcelanosa XTone per ESR 4555.
SI: 1 inch = 25.4 mm 1. The assemblies combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Jensen Hughes, Inc. and Priest and Associates. 2. Acceptance criteria for ASTM E1354 testing have not been well established in the referenced building codes and foam sheathing related sections. The criteria stated here for substitution of products is based on testing and professional thermal engineering analysis by Priest and Associates. T_{ign} is the time to ignition from the start of the test until the sheathing ignites. Pk. HRR is the peak heat release rate during the test.	

~ End of Report ~

