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ENGINEERING EVALUATION

Engineering Evaluation of Various Metal Design Systems
Cladding Attachments for NFPA 285 Compliance

Project No. 10434, Revision 5

Prepared for:

Metal Design Systems, Inc.
4150 C Street SW
Cedar Rapids, IA 52404

May 21, 2018

Abstract

Metal Design Systems manufactures various types of cladding attachment systems. Normally, attachment systems are not considered as the main component being evaluated in an NFPA 285 test. However, after analyzing the various systems, and NFPA 285 test reports, it is evident that specific attachment systems will not detract from approved NFPA 285 wall designs with ACM/MCM claddings, with specific limitations.

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.

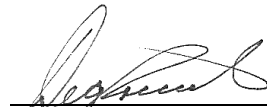
Submitted by,



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May 21, 2018

Reviewed and Approved,



Deg Priest
President

May 21, 2018



INTRODUCTION

Normally, attachment systems are not considered as the main component being evaluated in an NFPA 285 test. Typically, combustible cladding systems, insulation or weather barriers are evaluated. Since the test is not a component test, manufacturers typically test worst case wall assemblies so that alternate wall components can replace the tested components for various construction projects. The reason for this is because there are dozens of choices for each wall component (interior sheathing, studs, cavity insulation, exterior sheathing, WRB, exterior insulation, air gap, cladding and attachment systems) and it is impractical to test every combination. Based on this, most approvals for alternate constructions (DRJ Evaluation Reports, ICC-ES ER Reports, Intertek Listings and CCRR reports, UL Listings and ER reports, IAPMO evaluation reports, etc.) are based on worst case system testing. In most cases, typical generic attachment systems are used. For this evaluation, we will consider if various Metal Design Systems will or will not affect test results.

Most approvals for insulation or weather barriers are based on tests with brick, or ACM claddings. These two claddings are the accepted baseline claddings from which most other claddings can be approved. All other claddings are evaluated as being improvements to the tested design (or equivalent or deemed to not affect results). For combustible cladding approvals (ACM, HPL, etc.), these are typically tested with mineral fiber insulation. For insulated wall systems, ACM claddings are used as the worst case cladding in order to allow other more robust claddings.

REFERENCED DOCUMENTS

- 1) *Intertek/ATI Test Report G3195.02-121 NFPA 285 Test on 4 mm Reynobond (FR) ACM with mineral Fiber Insulation*
- 2) *Intertek/ATI Test Report G2014.03-121-24 NFPA 285 Test on 4 mm Alpolic FR ACM (Metal Design Systems Series 20) with 4 inch Atlas EnergyShield Pro Exterior Insulation*
- 3) *Metal Design Systems Literature (Series 10, 20, 20-1, 25, 40, 42, 44, 70 and 72 with ACM/MCM material manufacturers - Alpolic, Reynobond, Alucobond and Larson)*
- 4) *NFPA 285-12 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-loadbearing Wall Assemblies Containing Combustible Components*
- 5) *Dow Thermax ESR 1659*
- 6) *Alpolic ICC-ES ESR 2653*
- 7) *Reynobond ICC-ES ESR 3435*
- 8) *Alucobond Plus ICC-ES ESR 1185*
- 9) *Larson (Alucoil) Intertek Design ANA/MCMWP 30-01*

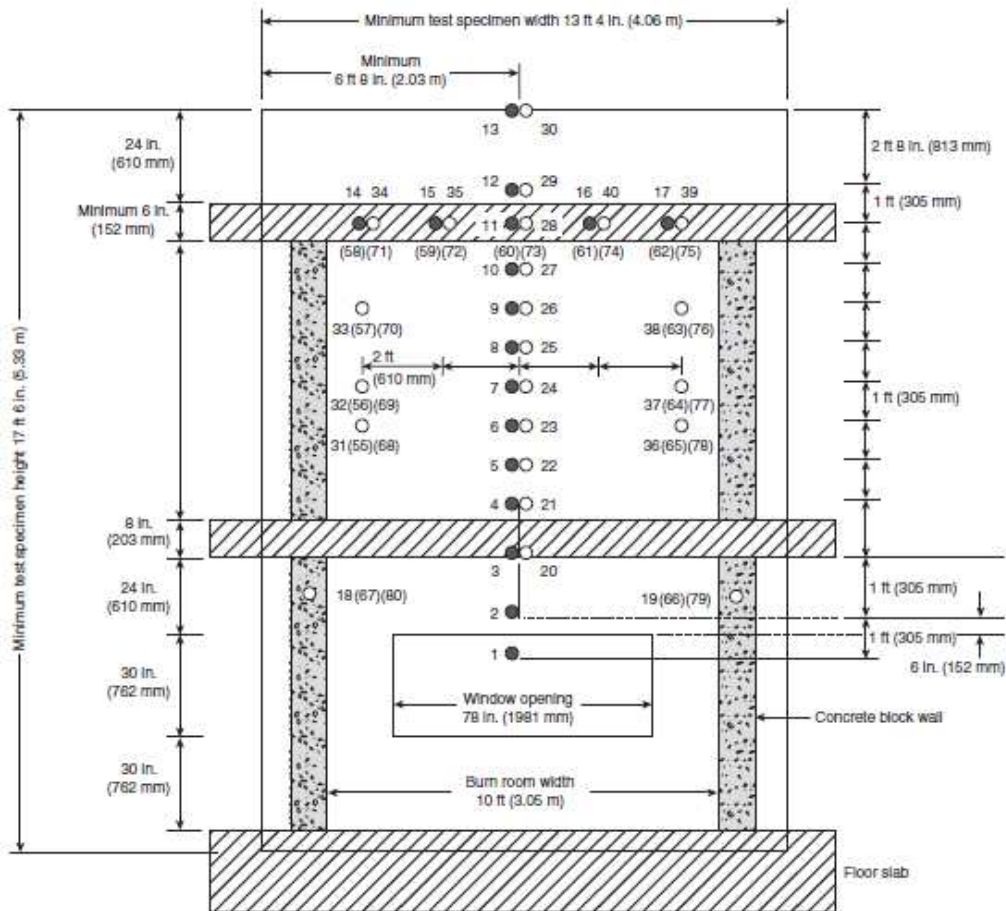
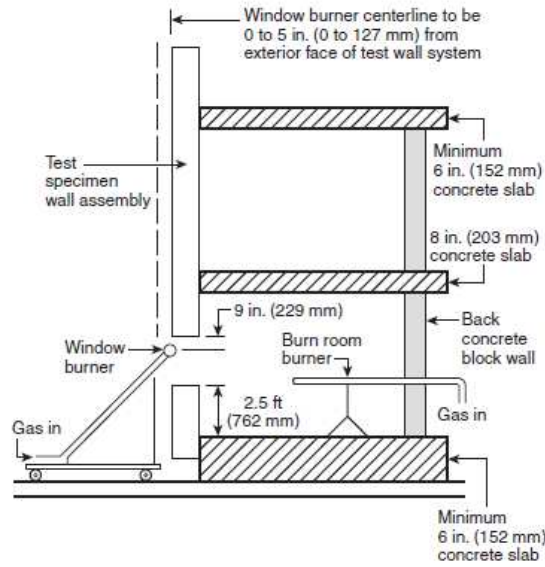
EVALUATION METHOD

NFPA 285 Criteria

The NFPA 285 fire test (Ref. 4) is designed to test 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 (and becomes) the exterior face of the rooms. A typical test wall measures 14 ft x 18 ft with a 30 in. x 78 in. window opening placed on the bottom floor.

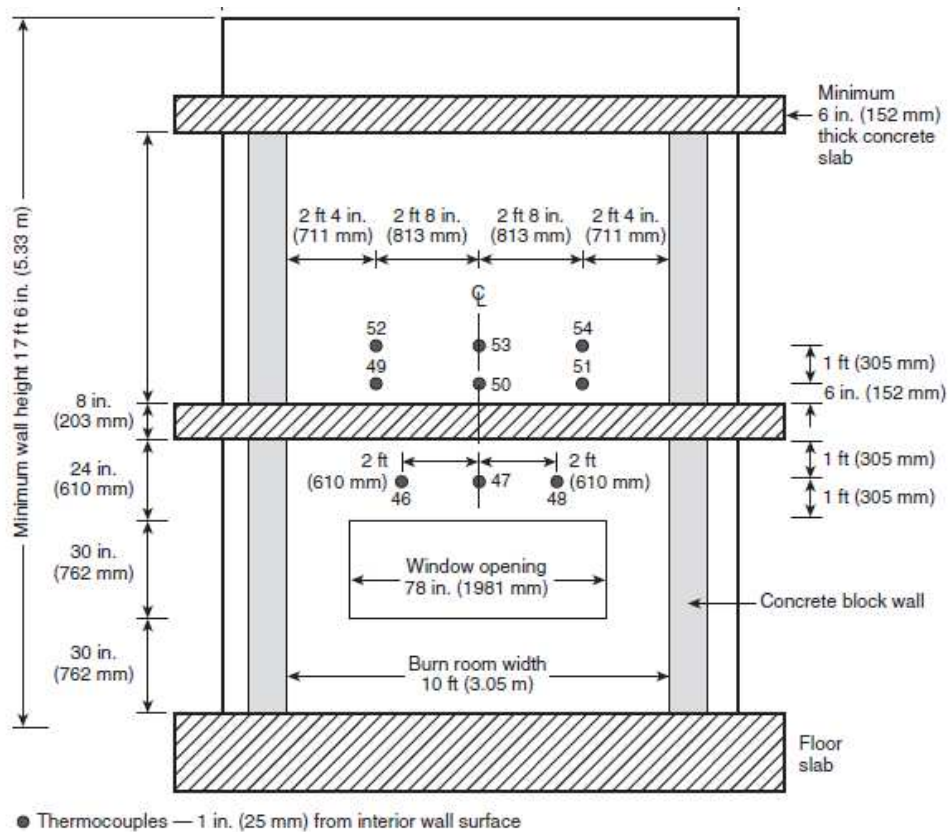
Two burners are ignited to produce a specific time-temperature profile in the room and on the exterior face of the wall. Thermocouples are placed at strategic locations to monitor temperature as an indicator of flame spread. In the depiction below, thermocouples 1-10, and 20-27 are not used for compliance purposes. The remainders are used to monitor flame spread.





- 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.





During a test, a calibrated fire starts in the bottom room. After 5 minutes, the exterior 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. Personnel monitor flame spread visually during the course of the test. A computer data acquisition system monitors and records the thermocouple temperatures. The criteria for passing (Ref. 4) are as follows (reworded in simpler terms for this analysis):

- 1) Flames shall not spread vertically 10 ft above the window opening as determined visually or by thermocouples located 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 on either side of the centerline of the window opening.
- 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 or 55-65 and 68-79 exceed 750°F above ambient.
- 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 wall/wall intersection of the bottom story room.



Tested Assemblies

Constructions Tested

The table below outlines the reports submitted for analysis (Ref. 2). For each tested system, critical components are listed. These include cavity insulation, exterior sheathing, water resistive barrier (WRB), exterior insulation, exterior WRB, air gaps, claddings and window details. Some details such as fastener patterns, application rates, etc., are not included. For those details, the descriptions in the referenced reports should be used.

Reports Submitted

Ref.	Int. sheath	Stud	Cavity Insulation	Ext. Sheath	WRB	Ext Insulation	Ext. WRB	Gap	Ext. Clad
1. Note 1	5/8 in. Type X	18 GA. 6 in. deep 16 in. OC. With lateral Bracing every 4 ft vertically	None 4 pcf mineral wool Firestop at floor lines	1/2 in. USG Securock Glass Mat Sheathing	Grace Perm- A-Barrier VP (with Grace Perm-A- Barrier Primer Plus)	4 in. Owens Corning Thermafiber Rainbarrier 45 mineral wool	None –	Not reported – SAF Dwg states approx. 1 1/8 in.	4 mm Reynobond (FR) ACM attached with Metal Designs System Series 20 System
2 Note 2 Note 3	5/8 in. Type X	20 GA. 3 3/8 in. 24 in. OC	None 4 pcf mineral wool Firestop at floor lines and at header	None	None	4 in. Atlas EnergyShield Pro	Vapro- Shield Wrap- shield SA		MDS Series 20 ACM (4 mm Alpolic FR Panels)

Note 1: Window Header 0.080 aluminum

Note 2 Window Header 5/8 inch gypsum board with 24 GA steel flashing. Panel joint locations appear to meet proposed 2018 change to NFPA 285 pertaining to joint locations (see below). Base wall cavity had 4 pcf mineral fiber safing at header.

5.7.3.1

Joists or seams representative of standard construction practices shall be incorporated into the test specimen.

5.7.3.2

At least one horizontal joint or seam shall be located not more than 36 in. (0.91 m) above the window opening.

5.7.3.3

At least one vertical joint or seam shall extend upward from ±13 in. (0.33 m) of the center of the window opening width.

Note 3. Technoform clips were used in this test assembly. They are a hybrid thermal spacer designed to carry the structural loads to the wall framing.

Analysis of Typical Wall Test Components

When analyzing flammability comparisons of NFPA 285 wall systems, the elements which could potentially cause increased flame spread should be considered. Justifications are established for interchanging / removing/adding brands/types/models of components for each element.

- 1) **Interior Gypsum Wallboard** – Most approvals list 5/8 inch type X gypsum wallboard as the only option. Our experience has shown that using 1/2 inch regular gypsum wallboard causes failures of thermocouples 18 and 19 (Foam Core Thermocouples). Therefore, use of 1/2 inch regular gypsum board is not permitted as the interior sheathing.



- 2) **Steel Studs** – Most NFPA 285 tests use 3 $\frac{5}{8}$ inch deep 20 GA. steel studs spaced 24 inch OC with lateral horizontal bracing every 4 ft as the worst case. Field applications typically use 16 or 24 inch spacing. Wider spacing is worst case since the wall is potentially more flexible and prone to warping. Therefore, thicker studs, deeper stud depth and 16 inch spacing is allowed based on testing worst case. Testing with steel stud base walls allows use of concrete or CMU masonry base walls as replacements.
- 3) **Cavity Insulation** – Some tests incorporate stud cavity insulation. Various types are used such as SPF foam, fiberglass matt, or mineral fiber. Typically, testing with none allows use of faced or unfaced fiberglass or mineral wool matt or sheets. Testing with SPF will allow less flammable SPF brands or models based on cone calorimeter flammability data analysis.
- 4) **Exterior Sheathing** – Tests usually incorporate $\frac{1}{2}$ or $\frac{5}{8}$ inch thick gypsum sheathing or glass matt sheathing, such as Densglass Gold. The exterior sheathing may be replaced with any other tested, listed or approved exterior sheathings of the same thickness or greater. Some approvals allow none based on tests with no sheathing. However, allowing no exterior sheathing may allow the exterior insulation to burn from both sides, or may ignite combustible cavity insulations. For the case of allowing no exterior sheathing, specific approvals (such as Ref. 6, ESR 1659) should be followed carefully.
Note: It is our opinion that the base wall reacts independently of the products exterior to the base wall when the wall is sheathed with gypsum board on both sides. The gypsum layer prevents direct ignition of the cavity insulation and prevents flames from spreading when floor-line fire stopping is used.
- 5) **WRB Over Exterior Sheathing** - Some tests incorporate a WRB product over the exterior sheathing. Testing with a WRB will allow less flammable WRB brands or models based on cone calorimeter flammability data analysis.
- 6) **Exterior Insulation** – Some tests incorporate exterior insulation. Various types are used, such as mineral fiber, SPF, Polyisocyanurate, EPS and XPS. Typically, interchanging insulation types is not allowed. But reducing the thickness of a combustible insulation is allowed since the wall has less fuel load than the tested system.

However, removing the insulation totally may expose the WRB product to direct flame exposure (for light, low melting point claddings). Some WRB products are more flammable than the overlying foam insulation. Because of this, we do not allow "none" to be an option for insulation in wall designs incorporating WRB's unless that WRB has been proven to not cause failures with tests on ACM-clad walls. However, some WRB's are less flammable than the overlying foam insulation or do not combust under NFPA 285 heating conditions.

These cases must be addressed on a case by case basis using cone calorimeter analysis of the foam and/or WRB.

- 7) **Exterior WRB** - Some tests incorporate a WRB product over the exterior insulation. Testing with a WRB will allow less flammable WRB brands or models based on cone calorimeter flammability data analysis.
- 8) **Air Gap** –Testing with ACM or brick both incorporate an air gap. For brick, the tested air gap is typically 2 inches. For ACM, the air gap is typically between $\frac{1}{2}$ inch and 2 $\frac{1}{4}$ inches. It is important that the air gap not be greater than which was tested.
- 9) **Exterior Cladding** – As previously stated, most approvals for insulation or weather barriers are based on tests with brick, or ACM claddings. These two claddings are the accepted baseline claddings from which most other claddings can be approved. All other claddings are evaluated as being improvements to the tested design (or equivalent or deemed to not affect results). For combustible cladding approvals (ACM, HPL, etc.), these are typically tested with mineral fiber insulation.



Attachment System

As previously stated, most tests incorporate generic cladding attachment systems. For ACM, there is no common attachment system. Most ACM manufacturers do not manufacture attachment systems; they sell their product to ACM fabricators who cut, bend and create their own attachment systems.

Most approvals do not list attachment systems, only because it is not practical to include every possible cladding attachment which would qualify. There are simply too many to list. This report is an evaluation of a specific array of attachment systems (Metal Design Systems' Series 10, 20, 20-1, 25, 40, 42, 44, 70 and 72) for ACM panels manufactured by Alpolic, Reynobond, Alucobond and Larson.

Testing with ACM is considered worst case due to the fact that ACM can melt and ignite and typically utilize semi-open joint designs. During a fire test, as the ACM melts, this creates a simulated open joint design in the worst possible location – at the fire source.

The melt pattern for NFPA 285 fire tests on ACM is usually large (approx 3 ft wide x 3 ft tall in a triangular pattern). Because of this extreme opening size, we allow joint types other than that tested with specific limitations.

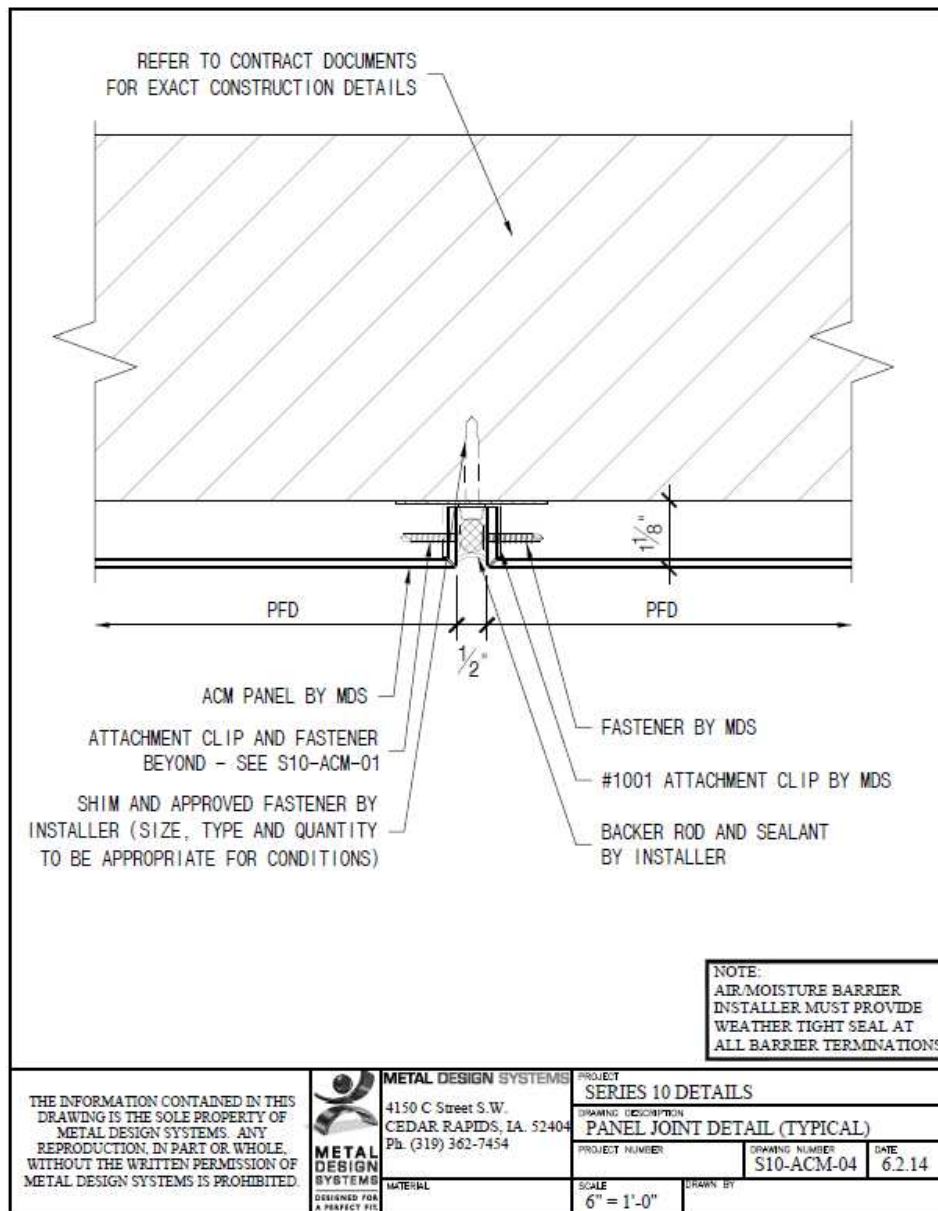
The depictions on the following pages show the various Metal Design Systems attachment designs.

For all constructions, Technoform clips are a Hybrid thermal spacer designed to carry the structural loads to the wall framing and may be used in the approved assemblies.

Metal Design Systems Series 10, 20, 20-1, 25, 40, 42, 44, 70 and 72 and Technoform clips on next pages.



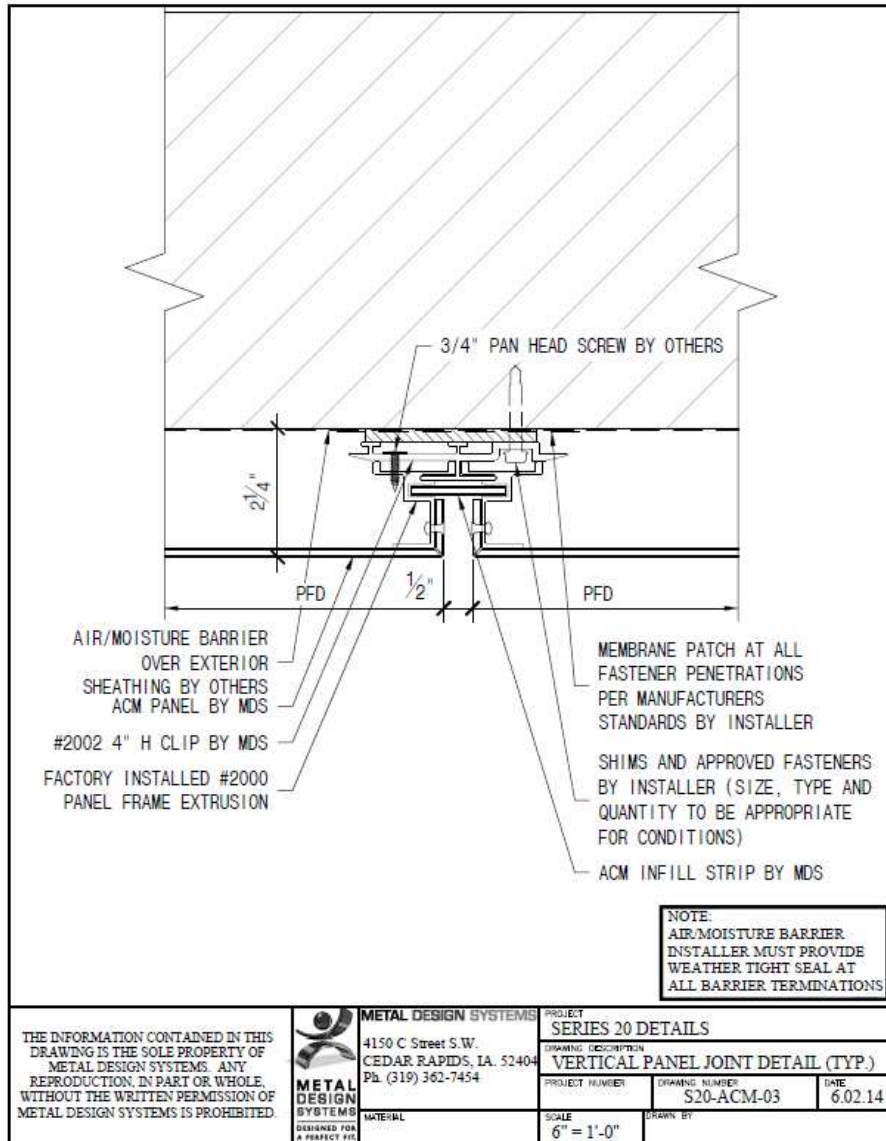
Series 10



Series 10 has caulked seams. As long as the caulk is silicon, these joint types resist flame spread. The airgap is smaller than the tested design (Series 20) and is deemed an improvement since smaller gaps spread flame less than large gaps.



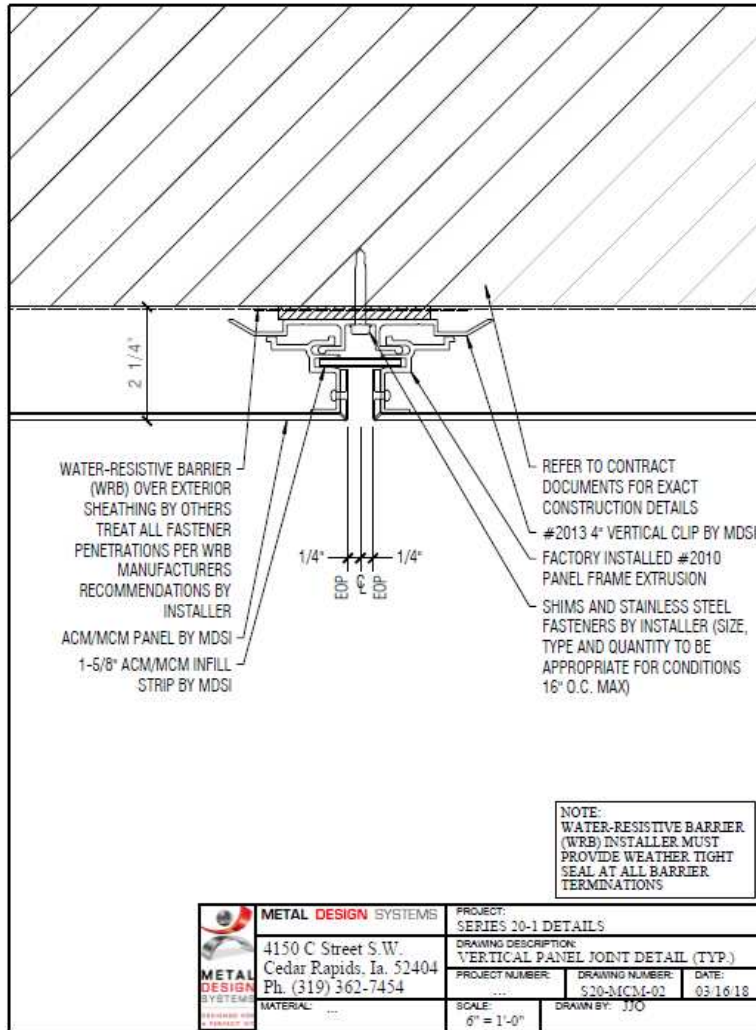
Series 20



Series 20 is a splined rain screen. This is considered a semi-open joint design (worst case). This joint type was used in both tests referenced herein and is the baseline design.



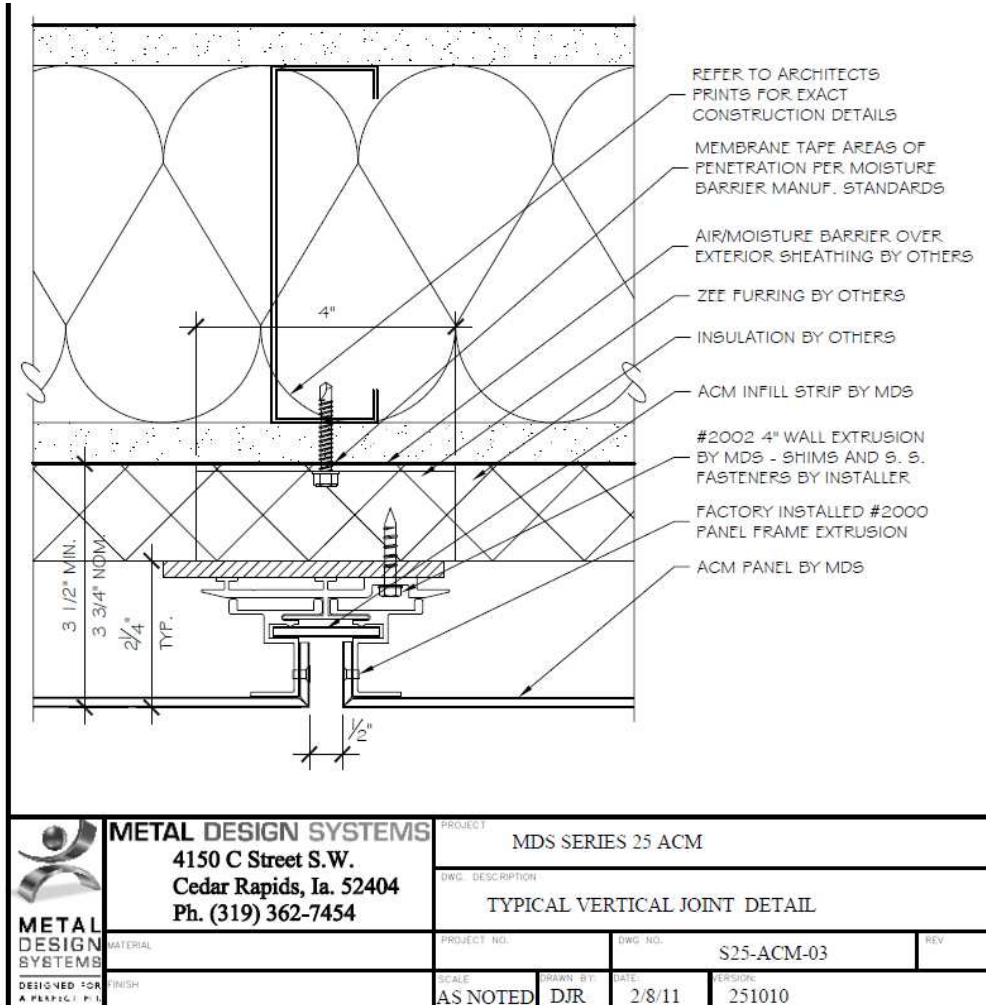
Series 20-1



Series 20-1 is a revised version of System 20. The differences will not affect NFPA 285 results.



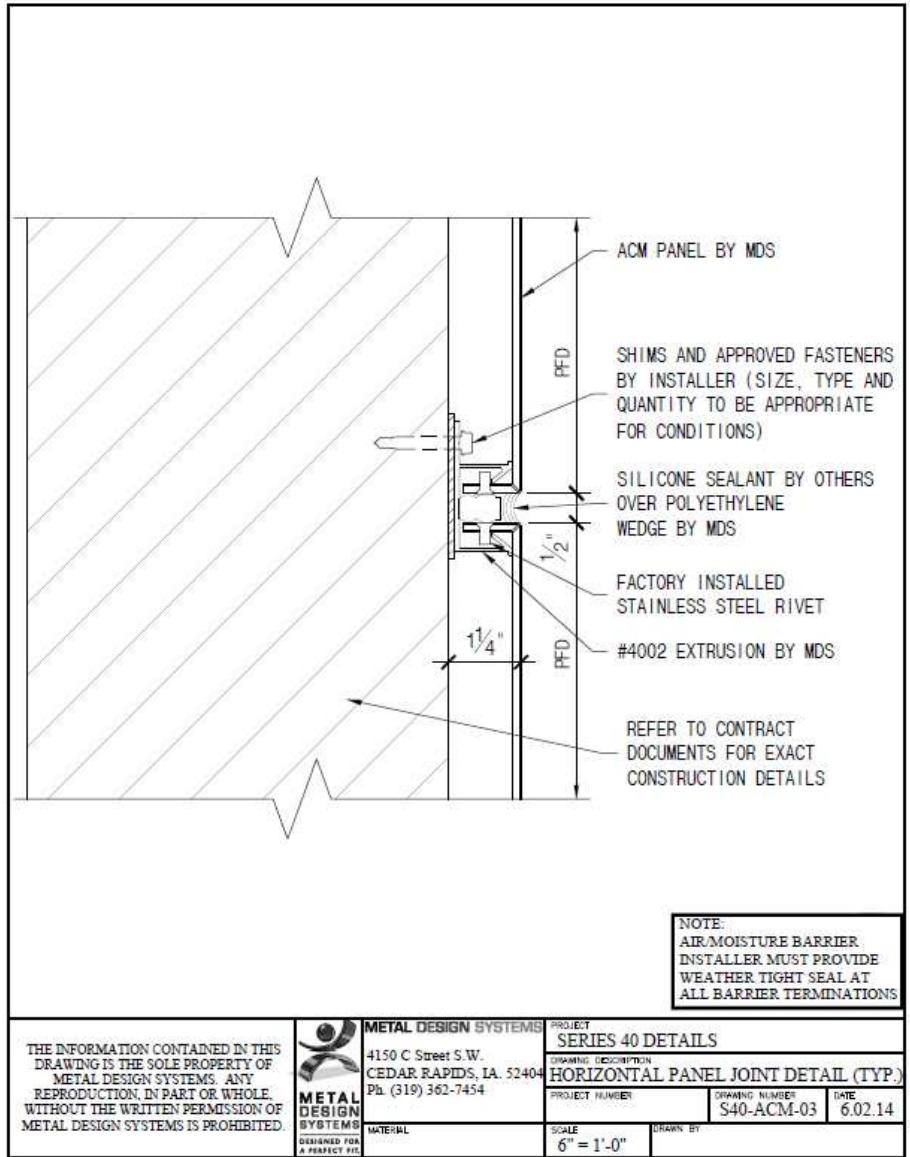
Series 25



System 25 is also a splined rain screen. This is considered a semi-open joint design (similar to System 20 tested per NFPA 285) and has similar mass and geometry as System 20 (from a fire point of view). System 25 uses the same air gap as System 20.



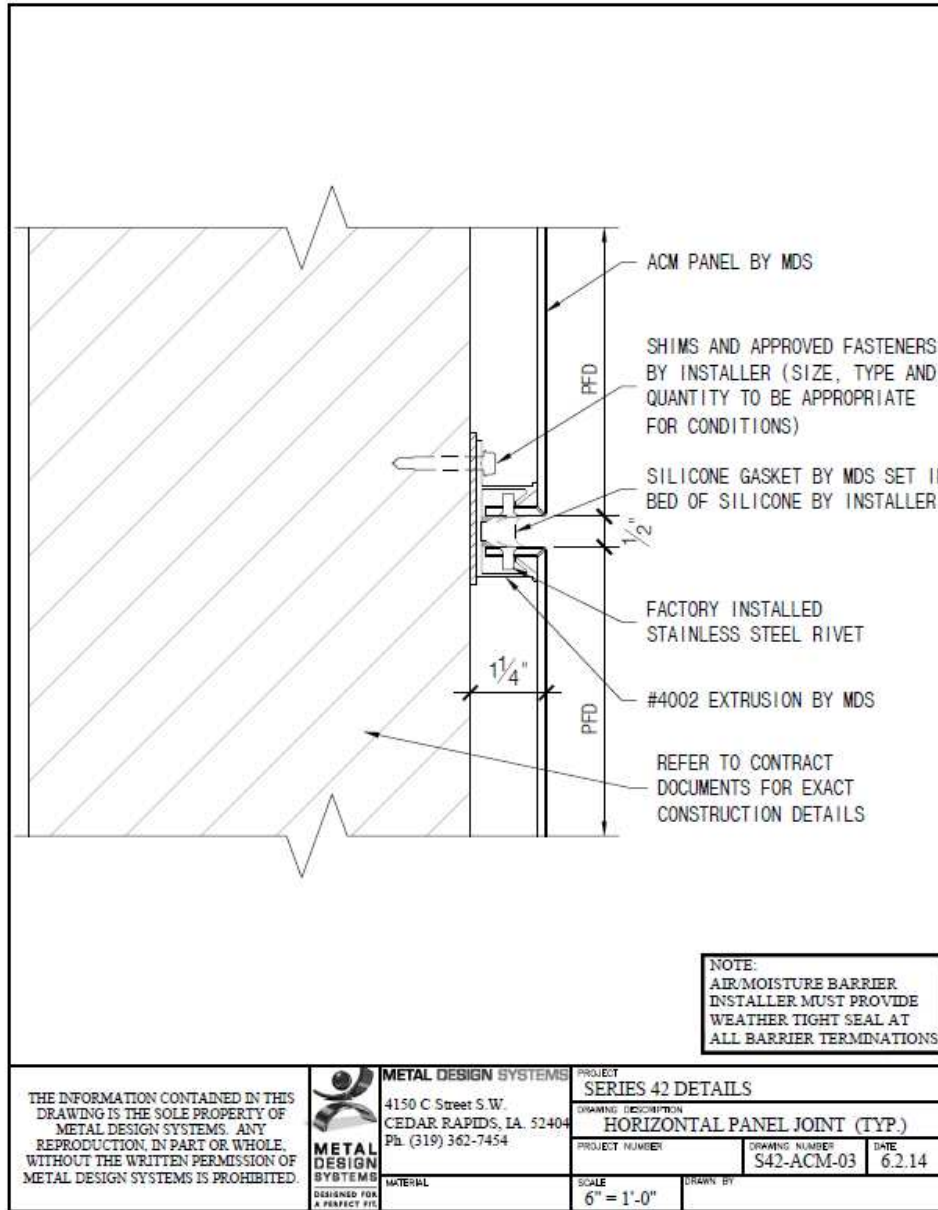
Series 40



Series 40 is a caulked/sealed system. As long as the caulk is silicon, these joint types resist flame spread. The airgap is smaller than the tested design (Series 20) and is deemed an improvement since smaller gaps spread flame less than large gaps.



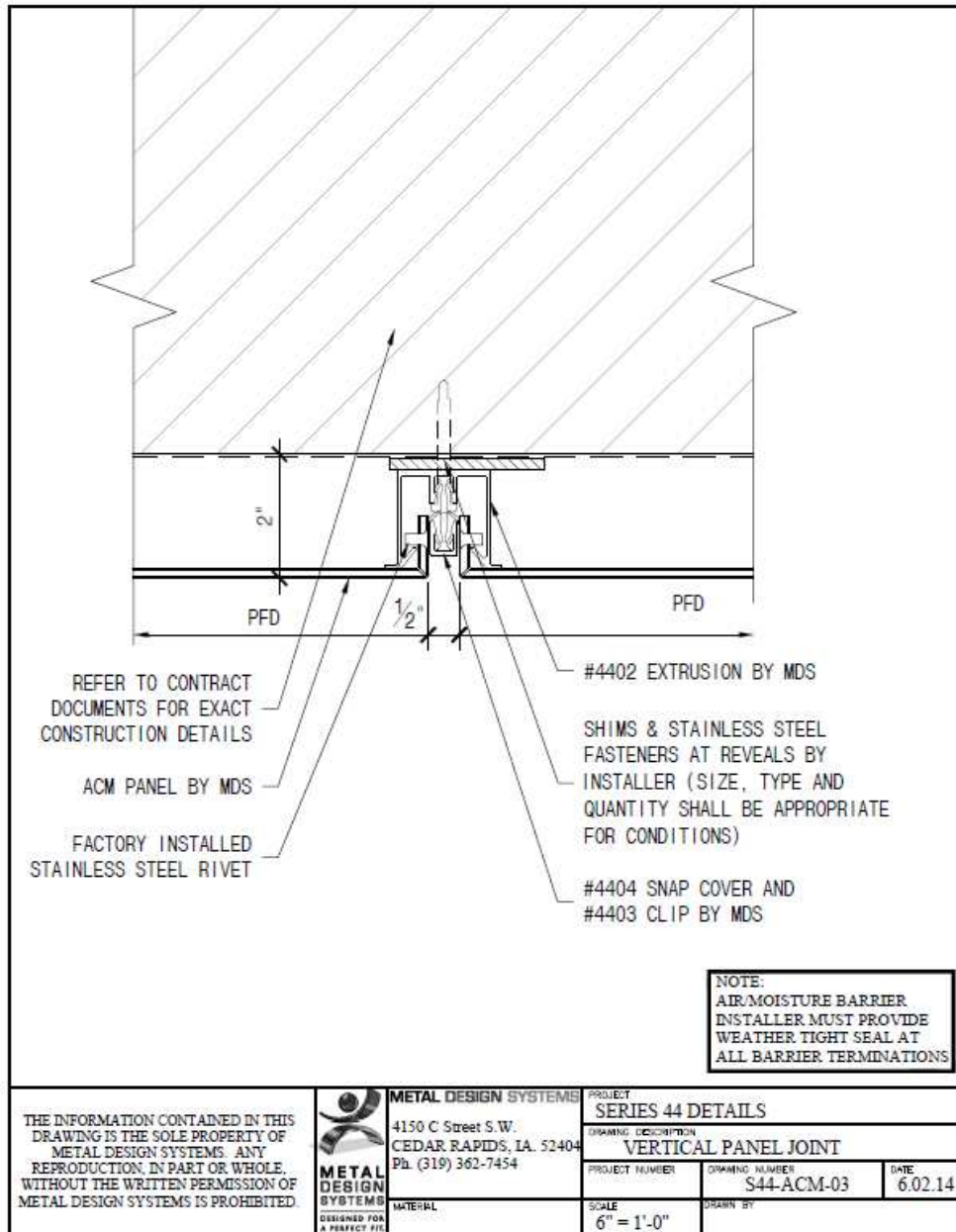
Series 42



Series 42 uses the same attachment extrusions as 40 but uses a cured silicone gasket in the panel joint. This is also considered a sealed system. As long as the caulk is silicone, these joint types resist flame spread. The airgap is smaller than the tested design (Series 20) and is deemed an improvement since smaller gaps spread flame less than large gaps.



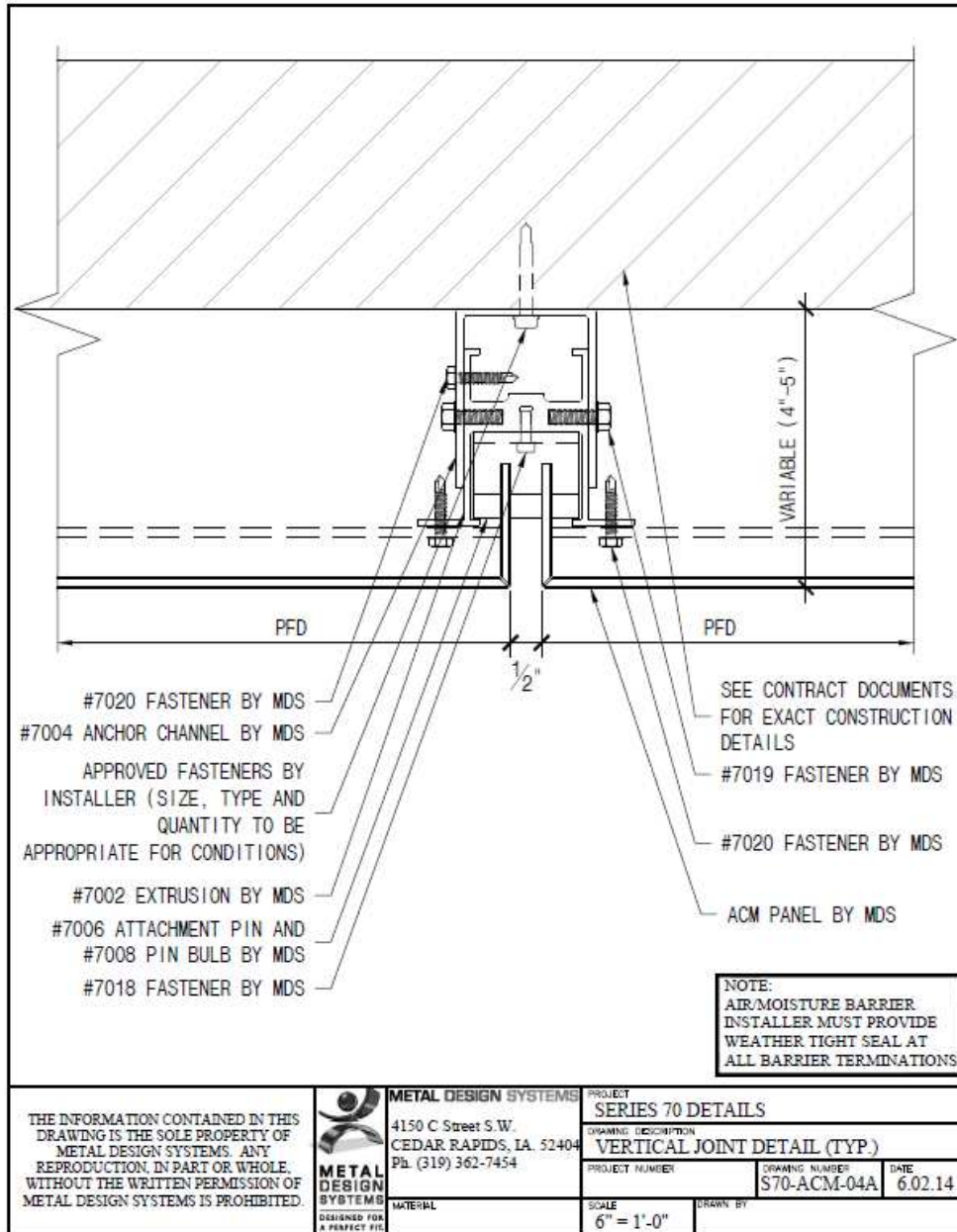
Series 44



Series 44 is a non-progressive rain screen. The snap cover should be metal versus plastic to reduce potential flame spread of the joint. The airgap is smaller than the tested design (Series 20) and is deemed an improvement since smaller gaps spread flame less than large gaps.



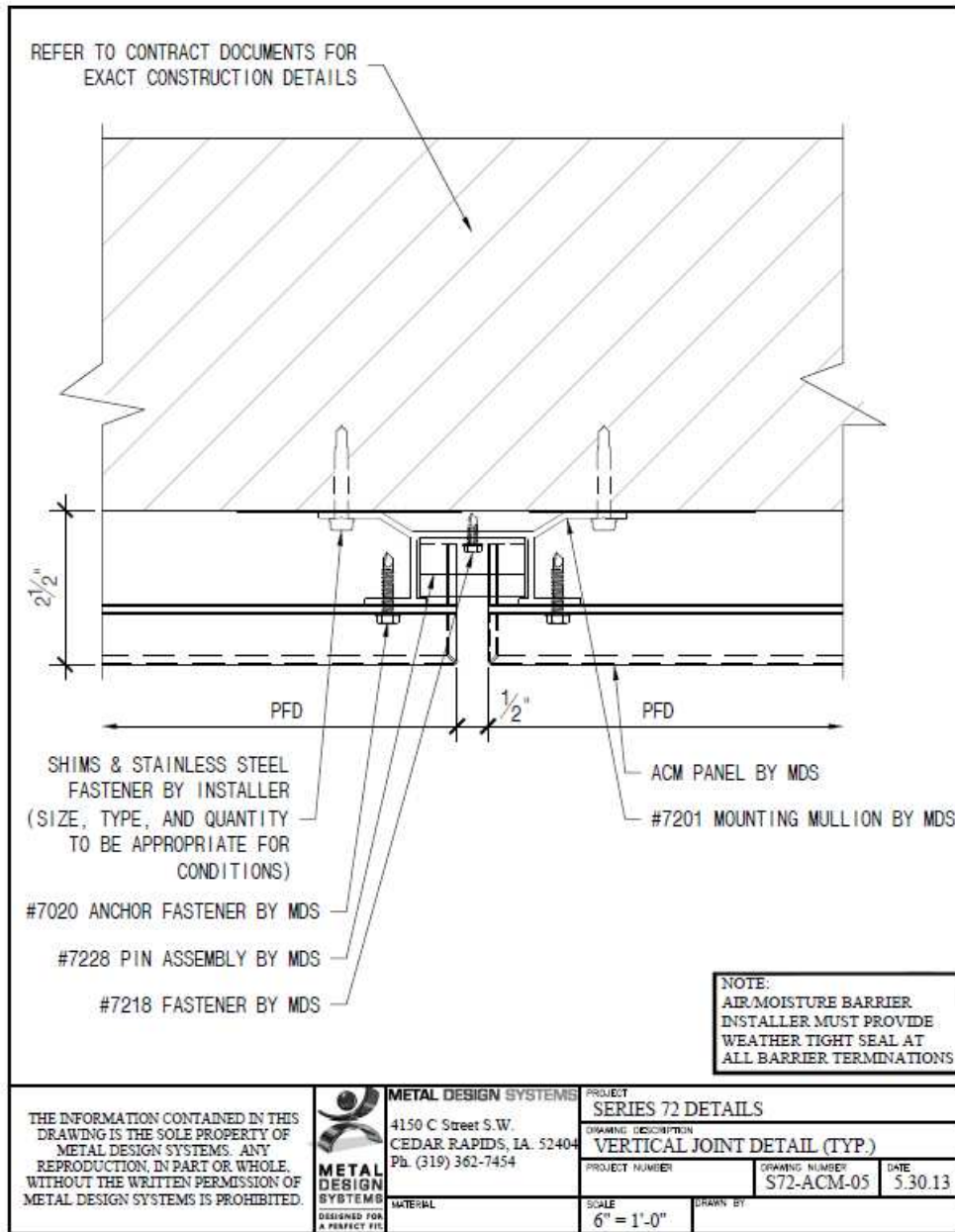
Series 70



Series 70 is a hook and pin rain screen design. Series 70 is a deep attachment to allow for exterior insulation. The air gap is larger than the tested design (Series 20). The series 20 was tested with mineral wool insulation and with polyiso foam insulation. Because of the larger air gap, this system can only be used with mineral wool insulation with ACM panel brands that have passed NFPA 285 with air gaps up to 5 inches.



Series 72

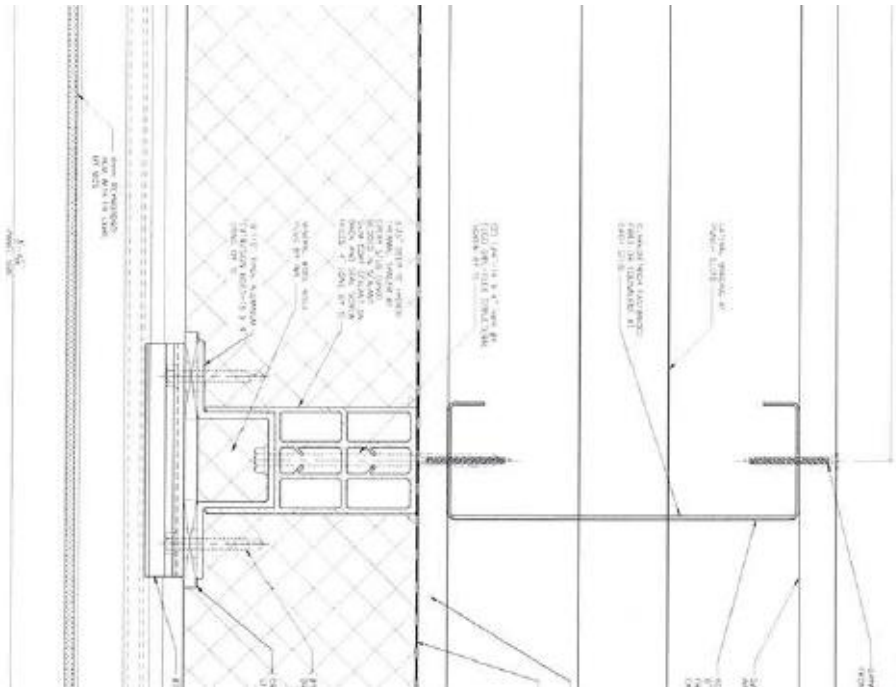


Series 72 is a hook and pin rain screen design, and was designed for a solid substrate. The air gap is slightly larger than the tested design (Series 20). The series 20 was tested with mineral wool insulation and with polyiso foam insulation. Because of the larger air gap, this system can only be used with mineral wool insulation or as the design states, on solid substrates.



Technoform clips

Description below is from the NFPA 285 report referenced herein.



The panel installation began with a #2006 continuous aluminum starter extrusion by Metal Design Systems, Inc. (MDSI) located at the assembly sill. The starter extrusion was fastened to the each of the Technoform Hybrid Thermal Spacers at the sill with #12-14 x 1-1/2 inch long Dril-Flex® structural self-drilling fasteners every 16 inches. The 4mm Reynobond® ACM with FR core (RB160FR) panels were installed, using two #2002 4 inch H aluminum extrusion clips by MDS. The first row of panels were placed on the aluminum starter extrusion and were attached to the Technoform Hybrid Thermal Spacers using two #12-14 x 1-1/2 inch long HWH #3 point ELCO Dril-Flex® Structural self-drilling fasteners. The 4 mm thick Reynobond® ACM with FR Core (RB160FR) splines were placed in the vertical and horizontal panel joints. The panel installation continued by placing the next row panels into the aluminum extrusion clips on the panel row immediately below. The panel system utilized a nominal 1/2 inch reveal at the panel joints. The first panel row above the window opening header was placed on a starter extrusion and fastened to the Technoform Hybrid Thermal Spacer clips at the window opening header. Panel installation continued vertically to the assembly header/parapet. Vertical joint locations were located on the assembly centerline and at the vertical planes of the window opening jambs.





Photo No. 3

Installed of Technoform TE Hybrid Thermal Spacers

Technoform clips are a Hybrid thermal spacer designed to carry the structural loads to the wall framing.



ACM Claddings

The following third party approved (ICC-ES or Intertek) claddings are approved for Type I-IV construction (via NFPA 285 testing) and may be used with the Metal Design Systems attachment series described above.

Alpolic/fr (ICC-ES ESR Report 2653)



DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 42 43—COMPOSITE WALL PANELS

REPORT HOLDER:

MITSUBISHI PLASTICS COMPOSITES AMERICA, INC.

401 VOLVO PARKWAY
CHESAPEAKE, VA 23320

EVALUATION SUBJECT:

ALPOLIC®/fr WALL PANELS



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Reynobond FR (ICC-ES ESR 3435)

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
SECTION: 07 42 43—COMPOSITE WALL PANELS

REPORT HOLDER:

ALCOA ARCHITECTURAL PRODUCTS

50 INDUSTRIAL BOULEVARD
EASTMAN, GEORGIA 31023

EVALUATION SUBJECT:

REYNOBOND® FR AND PE METAL COMPOSITE MATERIAL (MCM) PANELS



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SECTION: 07 42 43—COMPOSITE WALL PANELS

REPORT HOLDER:

3A COMPOSITES USA, INC.

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208 WEST 5TH STREET
BENTON, KENTUCKY 42025-0507

EVALUATION SUBJECT:

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Larson - Alucoil FR (Intertek Design ANA/MCMWP 30-01)

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LISTING INFORMATION OF Alucoil - larsen® by Alucoil® FR 4 mm and 6 mm ACM Panels

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Joint Location

All known NFPA 285 approvals do not limit the position of joints. This report will be consistent with that philosophy. If an approval lists specific joint limitations, those limitations will apply.

CONCLUSIONS

Based on the information above, we have determined that previously approved NFPA 285 wall systems for ACM/MCM may use the Metal Design Systems Series 10, 20, 20-1, 25, 40, 42, 44, 70 (only with ACM panels tested with up to 5 inch air gap) and 72 (and Technoform clips) with ACM/MCM material manufacturers – Alpolic/fr, Reynobond FR, Alucobond Plus and Larson Alucoil FR as discussed herein and can meet the criteria of NFPA 285 with specific limitations as per the table below.



Allowed NFPA 285 Assemblies

NFPA 285 Compliance Requirements: Items listed below must be a part of the third party approved wall assembly in order for the assembly with the Metal Design Systems Series 10, 20, 20-1, 25, 40, 42, 44, 70 (only with ACM panels tested with up to 5 inch air gap) and 72 (and Technoform clips) with ACM/MCM material manufacturers – Alpolic/fr, Reynobond FR, Alucobond Plus and Larson Alucoil FR Systems to be NFPA 285 compliant. Refer to foam or WRB manufacturer NFPA 285 approval tables for actual allowances other than those shown below. *Approvals from DRJ Engineering, ICC-ES, Intertek, UL and IAPMO are considered valid for this report. These reports are typically referred to as follows - DRJ TER Evaluation Reports, ICC-ES ESR Reports, Intertek Listings and CCRR reports, UL Listings and ER reports, IAPMO evaluation reports.*

NFPA 285 Table of Allowed Component

Wall Component	Specific Component
<p>Base Wall Use 1, 2 or 3 <i>Note – use the exact base wall approval from DRJ Engineering, ICC-ES, Intertek, UL and IAPMO</i></p>	<ol style="list-style-type: none"> 1) Concrete 2) CMU 3) 1 layer of 5/8 inch thick type X gypsum wallboard installed on the interior side of minimum 35/8 inch deep (min.), minimum 20 gauge galvanized steel studs spaced a maximum of 24 inch on center, minimum of 1 layer of 1/2" thick exterior gypsum sheathing installed on the exterior side. Lateral bracing installed minimum every 4 ft vertically or as required.
<p>Fire Stopping in Stud Cavity at floor lines</p>	<p>4 inch, 4 pcf mineral wool (e.g., Thermafiber) in each stud cavity at each floor line. The insulation is friction fit between studs or installed with z-clips.</p>
<p>Cavity Insulation Use 1, 2, 3, 4 or 5</p>	<ol style="list-style-type: none"> 1) None (see note 2) 2) Fiberglass (faced or unfaced) 3) Mineral wool insulation (faced or unfaced) 4) Any other noncombustible insulation material (faced or unfaced) 5) Any approved SPF spray foam insulation approved for use in stud cavities in NFPA 285 compliant assemblies. Must use exterior sheathing 1 listed below. See Note 1 for approval agencies. <p><i>Note 1. Approvals from DRJ Engineering, ICC-ES, Intertek, UL and IAPMO are considered valid for this report.</i> <i>Note 2: See special requirement below if exterior sheathing is not used.</i></p>
<p>Exterior Sheathing <i>Note. Specific approvals require specific minimum exterior sheathings and brands/types.</i></p>	<ol style="list-style-type: none"> 1) Minimum 1/2 or 5/8 inch thick listed or certified exterior-type gypsum sheathing (see Note). 2) NONE - only for those approvals that allow no exterior sheathing and specific cavity insulations (including no cavity insulation). <i>For those cases where no exterior sheathing is allowed, use the specific cavity insulation in the approval.</i>
<p>WRB over Base Wall Use 1, 2 or 3</p>	<ol style="list-style-type: none"> 1) None 2) Any WRB/AVB barrier that has been approved to be used in an NFPA 285 compliant assembly with MCM/ACM paired with mineral wool, or Polyisocyanurate, insulation. See Note for approval agencies. 3) Any WRB that meets the 2015 IBC Exceptions for WRB's (Only for walls in which the WRB is the only combustible). <p><i>Note. Approvals from DRJ Engineering, ICC-ES, Intertek, UL and IAPMO are considered valid for this report.</i></p>
<p>Exterior Insulation – Use either 1, 2 or 3</p>	<ol style="list-style-type: none"> 1) None – For constructions requiring a WRB, the construction must incorporate a WRB or AVB that meets the 2015 IBC exceptions for WRB's. These WRB's can only be used with noncombustible claddings and insulations per the 2015 code exceptions. 2) 2 inch thick (min.) 4 pcf mineral fiber insulation allowed for use with WRB item 2 or 3 above (note - WRB Item 3 must use Cladding 1a below)



	<p>3) Any Polyisocyanurate, insulation that has been approved (see note) to be used in an NFPA 285 compliant assembly paired with the WRB's in item 2 above)</p> <p><i>Note1 - Approvals from DRJ Engineering, ICC-ES, Intertek, UL and IAPMO are considered valid for this report.</i></p>
<p>Exterior Cladding - Use 1 or 2 with cladding installation technique shown for Metal Design Systems Series 10, 20, 20-1, 25, 40, 42, 44, 70 (see note 3) and 72 and Technoform clips with limitations noted.</p> <p>ACM/MCM thickness (4 mm or 6mm) must be approved for the exact assembly being referenced.</p> <p>Note 1. List of attachment systems for item 1: Series 10, 20, 20-1, 25, 40, 42, 44, 70 (see note 3) and 72 and Technoform clips</p> <p>Note 2. List of attachment systems for item 2: Series 10, 20, 20-1, 25, 40, 42, 44 and Technoform clips</p> <p>Note 3 – System 70 to be used only with ACM panels tested with up to 5 inch air gap</p>	<p>1) Claddings below may only be used with noncombustible exterior insulation Item 2 above (mineral fiber).</p> <ul style="list-style-type: none"> a. Any noncombustible cladding including solid metal (aluminum, copper, steel) b. Combustible cladding. Use ACM/MCM claddings listed below that have been successfully tested by the panel manufacturer (or fabricator) via the NFPA 285 test method. Use the Metal Design Systems installation systems listed in note 1. <ul style="list-style-type: none"> i. Alpolic/fr ii. Reynobond FR iii. Alucobond Plus iv. Larson Alucoil FR <p>2) Claddings below may be used with any approved (see note) exterior insulation item 3 above (Polyiso foam panels)</p> <p>ACM/MCM cladding listed below that have been approved to be used in an NFPA 285 compliant assembly paired with approved Polyisocyanurate insulation. Each insulation must be specifically approved for the exact cladding types listed in the approval. Use the Metal Design Systems installation systems listed in note 2.</p> <ul style="list-style-type: none"> i. Alpolic/fr, ii. Reynobond FR, iii. Alucobond Plus iv. Larson Alucoil FR <p>IMPORTANT: See next item (Window/Door Header/Jamb details) for specific insulation types which require special detailing.</p> <p><i>Note. Approvals from DRJ Engineering, ICC-ES, Intertek, UL and IAPMO are considered valid for this report.</i></p>
<p>Window/Door Headers/Jambs</p>	<p>Must use approved design for specific system being considered (see note)</p> <p><i>Note. Polyiso and SPF may or may not require specific header/jamb details. See approvals from DRJ Engineering, ICC-ES, Intertek, UL and IAPMO for the specific header/jamb detail required for each insulation type</i></p>

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