Frequently Asked Questions

For Steel Stud and CMU Backup, and for Permeter Fire Containment

1. What are Owens Corning® Enclosure Solutions Wall Systems?

A: Enclosure Solutions are wall systems with assured and documented performance yet with flexibility to choose from a variety of components. They are a variety of commercial wall systems that are fully documented for code compliance providing the architect with a wide array of structural backup and cladding options, making specification more efficient, performance more reliable and missing a critical detail less likely. With energy codes requiring increasing amounts of continuous insulation and air/weather barriers, and with the variety of cladding materials used today including glass curtain walls, getting the right combination of materials and fire containment details that comply with codes is always a concern. Owens Corning® Enclosure Solutions make it easier to specify a wide array of systems that comply.

2. What are the key components of the Owens Corning® Enclosure Solutions Wall Systems?

A: The key components are continuous insulation and air/weather barriers. Based on NFPA 285 compliance, Enclosure Solutions Wall Systems are steel stud and CMU backed wall systems that use Owens Corning® FOAMULAR® Extruded Polystyrene and/or Thermafiber® RainBarrier® 45 mineral wool insulation as continuous insulation, coupled with dozens of air/weather resistive barrier products from multiple manufacturers from which to choose, making it easy to find a system that meets your design needs and to comply with critical building and energy codes and standards.

When specialized details like perimeter fire containment joints are required, Enclosure Solutions can provide those details as well using Owens Corning Thermafiber® Safing Insulation, FireSpan® 90 and FireSpan 40® wall insulation and mullion covers and Thermafiber® Impasse Hangers for correct & efficient installation.

3. What are the base standards that are met by using the Owens Corning® Enclosure Solutions Wall Systems?

A: Owens Corning® Enclosure Solutions Wall Systems provide the documentation needed to demonstrate compliance with critical codes and standards including NFPA 285 (fire propagation resistance), ASTM E119 (structural fire resistance) and ASTM E2307 (perimeter fire containment). ASTM E2357 (resistance to air leakage) and ASTM E331 (resistance to water leakage) are provided from testing available from the dozens of air/weather barrier products that are NFPA 285 approved for use in the Enclosure Solutions Wall Systems.

4. I have heard about CavityComplete® Wall Systems but I'd rather use a different air/weather barrier or cladding/ fastener system. Do I have options?

A: Owens Corning® Enclosure Solutions Wall Systems are an alternative to CavityComplete®. CavityComplete® is a portfolio of high performance masonry veneer wall assemblies, a collaboration between five well known manufacturers. CavityComplete® Wall Systems are highly documented for many aspects of code compliance, compatibility, sustainability, regional design recommendations, and are jointly warranted by the five CavityComplete® component manufacturers. With Enclosure Solutions Wall Systems the warranty coverage is reduced, but the interchangeability of systems and components is increased while maintaining high levels of documentation and design/specification assistance.

5. What if there are no tested or listed perimeter fire containment systems that match my project's design?

A: Most of the time listed assemblies do not always match real-world situations. If there are no tested assemblies for a particular design, the manufacturer or an independent 3rd party testing lab such as UL or Intertek or a 3rd party fire protection engineering firm can evaluate the design and issue an engineering judgment. EJ's are basically interpolations of previously tested systems that are similar in nature. And really it is up to the AHJ on whether they will accept an EJ. The IFC (International Firestop Council) has published recommended guidelines for evaluating and providing EJ for firestopping systems.

1. All-phase consultation. You need an engineering judgment, accurate CAD drawings or a knowledge base of building codes and insulation application techniques.

2. High-Performance Products. You need insulation that withstands the highest heat for the longest time — prioritizing life safety while saving energy and reducing sound.

3. Cost-Saving Insulation Hanger Systems. You're frustrated with impaling pins and want a method that makes insulation positioning fast, and accurate by locking fire barriers into place.

4. Labor-Saving Customization and Packaging. You have better uses for your time and labor than cutting insulation into special sizes and shapes and ensuring that the right pieces get to the right places.

6. What other options do Owens Corning® Enclosure Solutions Wall Systems provide?

A: Enclosure Solutions Wall Systems includes additional options to use key wall system components from a variety of manufacturers that provide options for water drainage, cladding anchors, fire resistance and containment, and air and water resistance. Also provided are key CAD and BIM files and other helpful and educational documentation.

Steel Stud & Concrete Masonry Unit Backup Walls

7. What types of exterior cladding can be used with Owens Corning® Enclosure Solutions Wall Systems?

A: Enclosure Solutions Wall Systems can utilize multiple cladding types including brick and CMU masonry veneer, stone, precast concrete, stucco, terracotta, and ACM, MCM and HDL panels. Owens Corning provides FOAMULAR® Extruded Polystyrene and/or Thermafiber® RainBarrier® 45 mineral wool continuous insulation in a variety of thicknesses and R-values designed to provide the right properties for use with dozens of air/weather barriers and virtually any exterior cladding material.

8. What is the best source for key design guidance for steel stud and CMU structural backup walls?

A: Owens Corning® Enclosure Solutions Wall Systems are based on NFPA 285 compliance. Follow the simple Owens Corning NFPA 285 Design Guide to choose from dozens of wall system combinations and be assured that your system will comply with multiple codes and standards.

9. What is NFPA 285?

A: NFPA 285 is a fire test standard required by the International Building Code for many buildings of Types I, II, III or IV construction, the types that require non-combustible wall construction. It is designed to determine the extent to which an exterior wall may be ignited by a limited fire source (a fire plume exiting a window), and then propagate flame on its exterior surface and through its core away from the point of origin. Although NFPA 285, or a concept like it, has been in model building codes since the mid-1980's, it has gained prominence in recent years due to the common use of combustible air/water barriers and continuous foam plastic insulation in exterior walls that are otherwise required by code to be made of non-combustible components. NFPA 285 has been referenced by name in Chapter 26, Plastics, of the International Building Code since its first edition in 2000.

10. Are all walls required to comply with NFPA 285?

A: For wall systems NFPA 285 is only applicable to Types I, II, III and IV construction. Those are the building construction types that are required to have noncombustible exterior walls. See Chapter 36 of the International Building Code for a complete listing of other sections that reference NFPA 285 compliance.

11. How is NFPA 285 conducted?

A: NFPA 285 is conducted in a full scale, two-story, three sided test rig. The fourth side is enclosed with a full scale wall assembly built exactly as it would be in the field. The test wall has a window opening. During the test, in the lower story, an interior test fire designed to replicate flashover conditions inside the test room creates a fire plume that exits the window head exposing the wall, inside and out, to flame and increasing temperature for 30 minutes. Pass/fail criteria is based on the extent of flame propagation on the face and inside the core of the wall measured primarily by thermocouples placed throughout the full scale wall assembly. Smoke leakage and flame penetration from the first floor room of fire origin into the second story of the test structure is also observed and can trigger a failure.

12. Can gypsum sheathing/air/weather barrier be eliminated and FOAMULAR® extruded Polystyrene continuous insulation be installed directly to steel stud framing with joints taped for air/weather resistance behind masonry veneer?

A: Yes. If gypsum sheathing is not otherwise required, FOAMULAR® XPS may be attached directly to the steel stud framing with joints taped using Owens Corning® JointSealR™ Joint Sealing Tape. The assembly has passed NFPA 285 (fire propagation, ASTM E2357 (air leakage and ASTM E331 (water leakage) testing.

13. What are the continuous insulation (CI) requirements for my steel stud or CMU project?

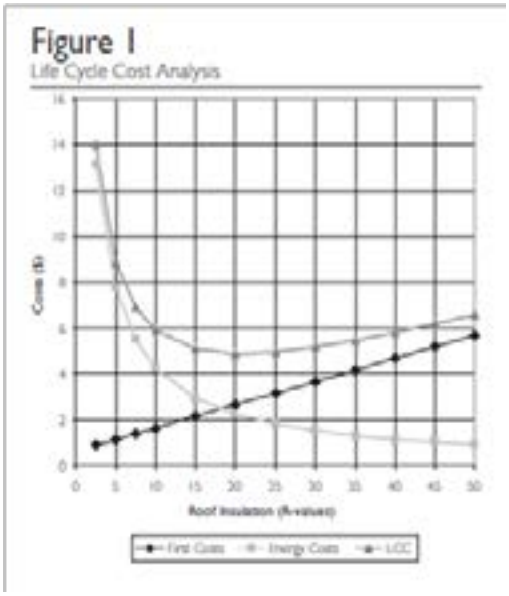
A: Continuous insulation is often necessary to meet any one of several compliance paths available in energy codes. Because there are alternative paths to compliance, continuous insulation is not "required". Instead energy codes "prescribe" or "recommend" CI R-value amounts that are often based on "optimum insulation levels". Most energy codes have a "prescriptive path" to compliance. In that case, if the prescribed details, including CI are followed, the final design is "deemed to comply". Regardless of the compliance path utilized continuous insulation is a major contributor to compliance, energy efficiency and sustainability. To determine the amount of continuous insulation that is "prescribed" for a particular project always consult local energy codes, and, see the family of Enclosure Solutions Wall Systems guides to prescribed CI R-values.

14. What is “optimum insulation”?

A: Optimum insulation is that amount of insulation that has the lowest life cycle cost. Insulation is an investment. Like other investments, it is expected to provide a return, or, an economic benefit. Otherwise, why buy insulation? The obvious economic benefit of insulation is that it saves on heating & cooling costs. The question is, “How much insulation is enough?”

“What is the optimum amount of insulation?” “Optimum insulation” is the amount of insulation that has the lowest life cycle cost (LCC). LCC can be expressed as:

LCC = FC+M+R+E -RV
LCC = Life Cycle Cost ($)
FC = First Cost ($)
M = Maintenance and repair cost ($)
R = Replacement Cost ($)
E = Energy Cost ($)
RV = Resale value or salvage ($)



The concept of determining lowest life cycle cost is illustrated in Figure 1. It shows first cost increasing as R-value increases. Install more insulation, and the first cost of insulation increases. It shows energy cost decreasing as R-value increases. Add more insulation and energy consumption and cost decreases.

The lowest life cycle cost (LCC) is the lowest sum of first cost and energy cost at a given level of R-value. In this hypothetical example, R-20 is the lowest LCC, and, is therefore the optimum insulation level. This example only demonstrates the concept of “optimum insulation”. Actual optimum levels must be calculated for specific climates, specific building construction types, specific building usage patterns and specific economic assumptions. The concept of Life Cycle Cost Analysis and Optimum Insulation are utilized by ASHRAE in the development of the energy standard 90.1.

15. Is FOAMULAR® Extruded Polystyrene and Thermafiber® RainBarrier® continuous insulation compatible with air/weather barriers, sealants, waterproofing, other insulations, claddings, substrates, etc?

A: Continuous insulation is often necessary to meet any one of several compliance paths available in energy codes. Because there are alternative paths to compliance, continuous insulation is not “required”. Instead energy codes “prescribe” or “recommend” CI R-value amounts that are often based on “optimum insulation levels”. Most energy codes have a “prescriptive path” to compliance. In that case, if the prescribed details, including CI are followed, the final design is “deemed to comply”. Regardless of the compliance path utilized continuous insulation is a major contributor to compliance, energy efficiency and sustainability. To determine the amount of continuous insulation that is “prescribed” for a particular project always consult local energy codes, and, see the family of Enclosure Solutions Wall Systems guides to prescribed CI R-values.

16. How do Enclosure Solutions warranties differ from the CavityComplete® Wall Systems Warranty?

A: CavityComplete™ offers a product defect based system limited warranty. The CavityComplete™ group of manufacturers have a Joint Marketing Agreement that provides a single-source system limited warranty for the entire wall assembly covering material defects and limited replacement labor. Please see the actual warranty for complete details. Enclosure Solutions Wall Systems are individual warranties as normally provided by the component manufacturers. The Owens Corning team can provide design, testing and code compliance assistance, however a single-source system warranty is not available for Enclosure Solutions Wall Systems.

17. Are there special installation or contractor training programs?

A: Because Owens Corning® Enclosure Solutions Wall Systems consist of standard methods and materials, no special training or fees are required. Please check with the individual product manufacturers regarding their requirements for product warranty and proper installation. For example, the air barrier manufacturer may require training or inspection for additional warranty or the Air Barrier Association of America may perform inspections.

18. How much more do Owens Corning® Enclosure Solutions Wall Systems cost than standard construction?

A: As with all construction projects, location, labor, and type of construction all affect total cost so specific estimates are necessary for each project. However, Enclosure Solutions Wall Systems are standard methods and materials sold through standard and familiar distribution channels at standard market prices. There is no “up-charge” for the value of the system documentation provided. Because many of the products listed in / Enclosure Solutions have already undergone testing and there are multiple options for components, cost is kept down through competition and multiple installation options. There is no product cost difference between these products getting randomly chosen for use on a project versus specifying them as a system. Yet when specifying Enclosure Solutions there is a savings in time and analysis for the architect during the design, the contractor during estimating, and the installer during submittal and installation and in owner peace of mind upon completion.

19. What if a CavityComplete® or Enclosure Solutions Wall system product isn’t available?

A: All products in CavityComplete® both system categories are widely available and may be ordered if not in stock at a local distributor. CavityComplete® If using CavityComplete® and it is determined that a substitution is needed, the Enclosure Solutions Wall Systems have multiple product options and enable substitutions of products that may be more readily available. However, note that the CavityComplete® system warranty is only applicable to CavityComplete® systems.

20. Are examples available of Enclosure Solutions Wall Systems in my area?

A: Yes. Contact the Owens Corning specification team leader for your area (https://w.owenscorning.com/ocbuildingspec/contact.html), and request more information.

Perimeter Fire Containment Joints in Glass Curtain Wall Systems

21. What is a perimeter fire containment joint system?

A: Perimeter fire containment joints are required by Section 715.4 of the International Building Code (IBC) where fire resistance rated floor or floor/ceiling assemblies are required. Voids created at the intersection of the exterior curtan wall assemblies and such floor assemblies must be sealed with an approved joint closure system to prevent the interior spread of fire from a floor below to a floor above via voids at the perimeter intersection. The code requires an approved fire resistant joint system to be tested, or approved via engineering analysis, in accordance with ASTM E2307, to provide an "F Rating" for a time period not less than the fire resistance rating of the floor assembly. See Section 715.4 of the IBC for other important exceptions and details.

22. What thickness of mineral wool do I need to get an hourly rating?

A: Thermafiber® Insulation does not have an hourly fire rating because it is not a stand-alone product. Thermafiber materials are dependent upon mechanical fasteners and other construction components that withstand the rigors of fire exposure and stay in place for the time period of the rated "assembly". If these components fail, then the Thermafiber® insulation will fall out of place, jeopardizing the fire performance of the assembly. For hourly fire ratings on specific assemblies, go to Underwriters Laboratories Online Fire Resistance Directory at http://www.ul.com/ or Intertek's (Omega Point Laboratories Inc.) directory at http://www.intertek-etlsemko.com/.

23. Can I install Safing Insulation only within the safe-off void between the intersection of the exterior non rated curtain wall and the rated floor slab and still meet the requirements of the code?

A: The model building code, International Building Code 2012 and 2015, Section 715.4- "Exterior curtain wall/floor intersection" both require the interior joint between the face of a fire-resistance-rated floor assembly and a non-rated exterior curtain wall assembly to be sealed with an approved "system" to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E2307 to provide an F rating for a time period not less than the fire- resistance rating of the floor assembly. All "approved" tested and listed perimeter fire containment systems require the curtain wall spandrel to be protected with mineral wool insulation (per the system design criteria) so that the spandrel stays in place during the fire. If the spandrel fails, then the exterior wall will fall away allowing the Safing Insulation installed within the interior joint to also fall away. Once the insulation is gone, fire will quickly propagate to the floor above.

24. If my building is equipped throughout with automatic sprinklers, do I still have to provide fire containment protection at the perimeter of the building?

A: There is often confusion between the requirements of section 715.4 and section 705.8.5. Section 705.8.5 is the vertical separation of openings and this has to do with the 3' tall fire-resistant rated spandrel requirement. 705.8.5 basically tells you that you have to have a minimum 3' fire-resistant rated spandrel between openings but allows for exceptions. Those exceptions are: 1. If your building is 3 stories or less in height, 2. If your building is equipped throughout with automatic sprinklers, and 3. If it is an open parking garage. So if you meet one of these exceptions, then you aren't required to have a 3' tall fire resistance rated spandrel. However there is no place in the codes that allows for any exceptions to section 715.4 "Exterior curtain wall/floor intersection". Therefore, it must be followed. In fact, section 715.5 "spandrel walls" was added to the codes to clarify the confusion. This states that height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5. Where Section 705.8.5 does not require a fire-resistance-rated spandrel wall, the requirements of Section 715.4 shall still apply to the intersection between the spandrel wall and the floor.

25. If I have a steel back pan on the back of my spandrel (back pan inboard of the curtain

wall insulation), does the steel back pan act as the backer-reinforcement member to keep the compression requirement and tight seal of the Safing Insulation within the void to prevent the interior spread of flame and hot gases?

A: The issue with a steel back pan is that steel expands when exposed to heat. When the steel back pan expands, it warps or oil cans. Unfortunately, the Safing Insulation cannot form to the various curves and shapes from the oil canning. Without a tight seal where the Safing Insulation is in contact with the interior face of the back pan, fire breaches to the floor above. All tested steel back pan systems listed in the Underwriters Laboratories Fire Resistance Directory require a backer reinforcement member and other design criteria such as increased mechanical attachment of the curtain wall insulation and a Safing shelf installed below the Safing to provide additional protection to the seam between the interior face of the back pan and where the Safing Insulation is in contact with the back pan. For more details refer to the listed and approved systems within the UL Fire Resistance Directory.

26. In a Perimeter Fire Containment System, what is the difference between an F rating and an Integrity rating?

A: An F-Rating is required by the codes for providing a barrier against the interior spread (through the safe-off area) of flame and hot gases. F Rating is also a requirement of ASTM E 2307 (Standard Test Method for Evaluating Perimeter Fire Barrier Systems Using the Intermediate-Scale Multi-Story Test Apparatus). The F Rating is the ability of the design to prevent flame and hot gasses from passing through the interior of the system between the edge of the slab and interior face of the curtain wall. Integrity Rating, on the other hand, is a rating provided only by UL. This rating represents the system's ability to maintain the interior joint (F-Rating) plus prevent the leap frog effect from causing failure for the hourly Integrity Rating listed. Leap Frog is where the fire breaks the glass on the room of origin and the flame and hot gasses escape outside the building and up the face of the curtain wall then breaks through and re-enters the building by means of the vision glass on the floor above. Although not a requirement of the building codes, this is still a critical area that needs to be considered for providing the maximum protection and fully containing the fire to the room of origin to allow the occupants the time needed to safely exit the building and first responders a safe entry time into the building to extinguish the fire.

28. There is an exception in the current IBC Section 715.4 building codes where it states: "voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions...for the time period equal to the fire-resistance rating of the floor assembly". Are there approved materials tested to ASTM E 119 that will provide the protection if this exception exists on the project?

A: It is Thermafiber's opinion that this language was added to the code for two reasons. 1. There were no tested designs at the time that allowed for the extension of vision glass down to the floor line. 2. This exemption also allowed for systems tested prior to the development of the ASTM E 2307 to be grandfathered and covered under the new code language. However, in regards to reason 1, we now have tested and listed assemblies that allow for the vision glass to be extended down to a point where it is level with the top surface of the floor slab. One such system is CW-D-1014 which has an F rating of 2 hours per ASTM E 2307. Therefore, it is our recommendation to always go with a tested and proven system, compliant with ASTM E 2307 for providing the maximum level of fire containment at the perimeter of the building. Therefore, there should be no reason for someone having to provide proof that the material is sufficient per the ASTM E119 exception.

29. What if, on my project, I have no spandrel area to insulate and install a perimeter fire

containment system? In other words, I have floor to ceiling vision glass.

A: Unfortunately there are no tested systems per ASTM E 2307 that allow for zero protected spandrel area. Although the exterior curtain wall is a non-rated element, we have data through testing here in the United States and also test data published from the United Kingdom's Loss Prevention Council that an all glass exterior curtain wall with mineral wool Safing Insulation installed only between the vision glass on the exterior curtain wall will not provide the protection necessary to keep fire from spreading at the perimeter joint. When Safing is installed between the face of the floor slab and vision glass the glass will break out and the Safing will only stay in place for approximately 10 minutes into the fire test. When the glass is compromised, the Safing Insulation falls out as soon as the glass breaks. Therefore this method of protection does not meet code requirements. The IBC Building Code, Section 715.4 "Exterior curtain wall/floor intersection" requires the interior joint between the face of a fire-resistance-rated floor assembly and a non-rated exterior curtain wall assembly to be sealed with an approved "system" to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E2307 to provide an F rating for a time period not less than the fire- resistance rating of the floor assembly." All "approved" tested and listed perimeter fire containment systems require a minimum height of curtain wall spandrel protection with mineral wool insulation (per the system design criteria) so that the spandrel stays in place during the fire. Again, conditions with all vision glass at the exterior curtain wall/floor intersection will not meet the building code requirements.

30. Why are backer/reinforcement members required in perimeter fire containment systems?

A: Backer/reinforcement members are required to maintain a tight seal created in the void when the safing is compression-fit from 25-30% between the slab edge and the vertical insulation. The force that the compressed safing creates will cause the spandrel insulation to bow, losing the integrity of the seal and creating an area where fire can breach through the void. There are several different types of backer/reinforcement members. The key is that they have to be constructed from a minimum of 20 ga galvanized steel. There are tested designs that incorporate hat channels, T-Bars and steel angles. You will need to refer to the tested assembly to see which applies. There are newer systems that do not require a backer/reinforcement member. One such system is where the horizontal window sill transom is located at a distance of no greater than 3" above the floor line. The location of this horizontal transom, in conjunction with Thermafiber® Impasse Horizontal Hangers, provides the support necessary to keep the spandrel insulation from bowing. Therefore, when using these particular systems, a backer/reinforcement member is not required. Other systems incorporate an additional layer of insulation to support the safing insulation and provide the required reinforcement at the safing void. For these specific assemblies, go to Underwriters Laboratories Online Fire Resistance Directory at http://www.ul.com/.

31. What if there are no tested or listed perimeter fire containment systems that match my project's design?

A: See question #5.

The Owens Corning® Enclosure Solutions Concrete Masonry Unit (CMU) Wall System excludes the masonry veneer and concrete masonry units. A detailed list of the components is available at OwensCorning.com/enclosure.

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