

# Exterior Wall Insulation Application Guide

Exterior and Stud Cavity Insulation Solutions for  
Above-Grade Rainscreen Wall Assemblies



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**This is an Interactive Guide**

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**External Resources**

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## High-Performance Stone Wool Insulation Solutions

As building codes and standards evolve to demand more energy-efficient buildings, they are typically including one common requirement for almost all building types: continuous exterior insulation, used either alone or in combination with stud cavity insulation.

Exterior wall insulation, such as ROCKWOOL® continuous exterior insulation and stud cavity insulation stone wool products, can meet and exceed this requirement. These products also provide fire resistance and acoustic comfort, and they can mitigate your concerns about condensation risks in an appropriately designed wall.

ROCKWOOL developed this technical application guide to help you understand how exterior wall insulation can offer these solutions for many building types, including commercial, institutional, and multi-unit residential buildings. In this guide, you will learn how stone wool insulation products provide assembly solutions that meet and exceed your building performance targets. You will also find recommendations for integrating stone wool insulation into your exterior wall assemblies as well as design and installation guidance, tips, and additional resources.





# Managing Enclosure Loads

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# Managing Enclosure Loads

Many loads act on a building’s enclosure at any given time. The above-grade wall may be exposed to driving rain or snow, variations in temperature and relative humidity, air pressures, UV light, sound, and even fire, to name a few. Many aspects of the building contribute to how effectively these building loads are managed, including the building’s exterior climates, the building form (both height and exposure level), how occupants use and condition interior spaces, and the materials and components of each building assembly.

The materials and components within an above-grade wall assembly can be thought of as layers that are intentionally designed and installed to resist water, air, thermal, water vapor, fire, and sound loads on the wall.

Some materials within the assembly contribute to managing these loads either directly or indirectly. ROCKWOOL stone wool insulation products, for example, contribute to managing many loads, not just thermal loads. Continue reading to learn how walls can be designed to appropriately manage these loads.

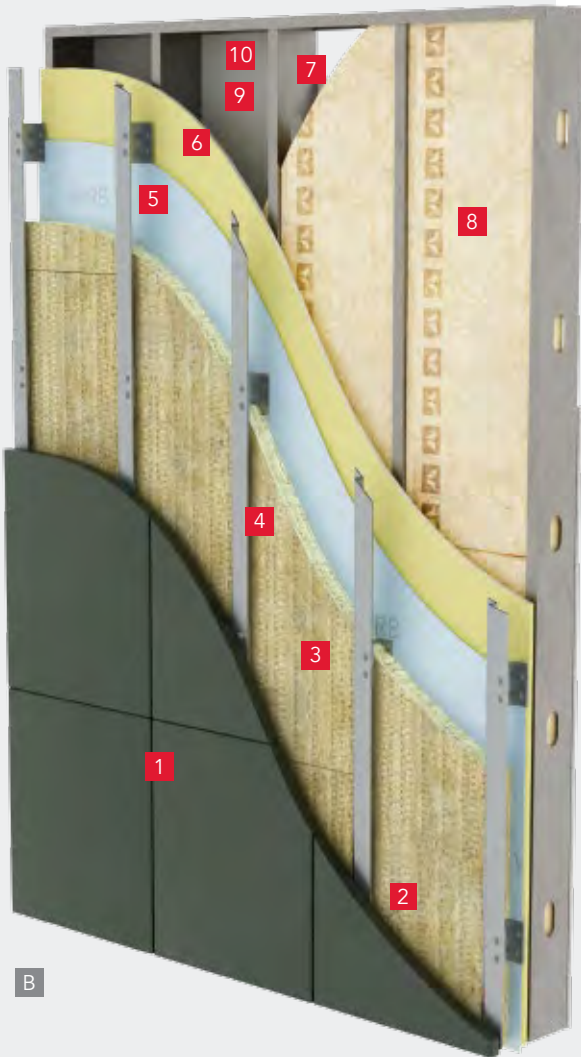
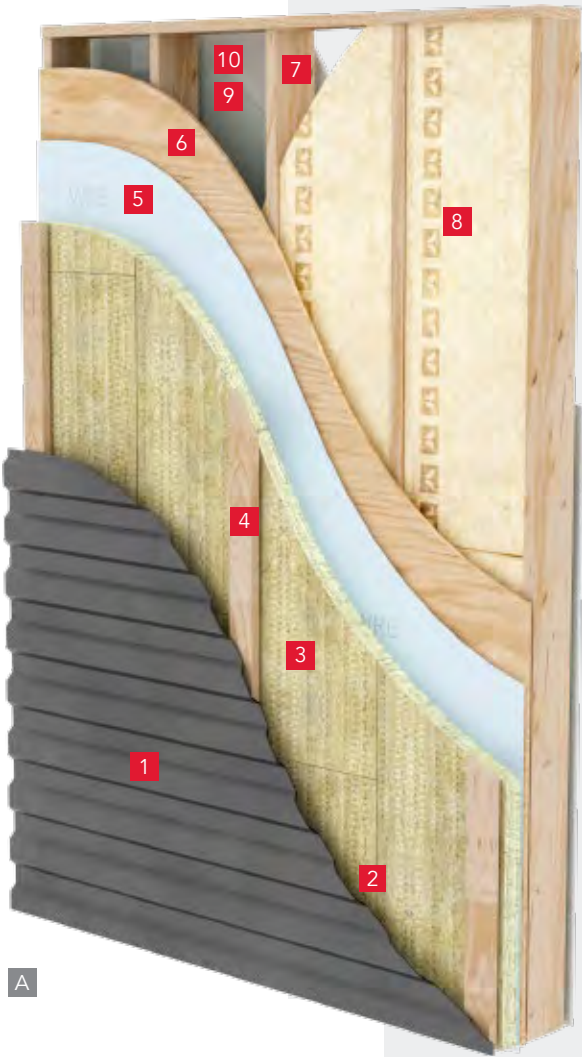


**Figure 1.** Examples above-grade rainscreen wall assemblies: A) with long screws through strapping cladding attachment system, and B) with a clip and rail cladding attachment system

## Did You Know?

The enclosure is also exposed to structural loads such as gravity, wind, seismic events, deflection, impacts, and more. These loads are managed by the building’s structural system, which include cladding attachments. Some cladding attachment systems even use continuous exterior insulation such as stone wool to transfer structural loads. **Learn more about cladding support and attachment methods on page 60.**

1. Cladding
2. Drainage and ventilation gap
3. Continuous exterior insulation
4. Cladding attachment system
5. Water-resistive barrier membrane (and often air barrier membrane)
6. Sheathing
7. Framed wall
8. Stud cavity insulation
9. Interior vapor retarder/barrier (where required for project-specific applications)
10. Interior finish



## Water Control

Exterior walls are often categorized by how they manage liquid water, like rain and snowmelt. This guide focuses specifically on a rainscreen cladding approach, as shown in **Figure 1 (p. 8)**.

Water control consists of two planes of protection:

- 1. Water-shedding surface.** The outer surface of the wall assembly is designed to manage liquid water on and within the system. This surface typically consists of claddings such as metal panels, fiber cement or brick veneer, as well as related components such as sheet metal flashings and sealant joints. Use of a hydrophobic stone wool insulation such as ROCKWOOL semi-rigid and rigid board insulation products behind this surface can help shed moisture that gets behind the water-shedding surface. The air gap behind the cladding facilitates drainage of penetrating water and drying behind the cladding if properly ventilated.
- 2. Water-resistive barrier.** The WRB is the innermost plane that can safely manage water and allow for drainage — the last line of defense against water intrusion into the building. The WRB is located outside of the exterior wall sheathing. A variety of mechanically fastened, self-adhered, and liquid-applied products may be used for this purpose. The WRB may also have physical properties that allow it to serve as part of the air barrier system to provide air control. Attachment methods that support continuous exterior insulation and/or cladding systems penetrate the WRB to transfer structural loads, so it is important to properly install and detail these components at the WRB plane.

### Why place the air/water control layer behind the exterior insulation?

Continuity of the air and water control layers is key when designing an exterior wall assembly. Continuity is more easily achieved by placing these layers behind the continuous exterior insulation and over the sheathing or backup wall. Moreover, the continuous exterior insulation protects these layers from incidental damage and creates a drainage surface to reduce water migration farther into the assembly. If the visibility of the continuous exterior insulation through open-joint cladding systems is a concern, ROCKWOOL Cavityrock® Black includes a UV-resistant facer specifically designed to mask the insulation layer.

### Does the air/water control layer have to be behind the exterior insulation?

Placing both the air and the water control layers behind the continuous exterior insulation offers significant benefits, but alternate placements are possible. The WRB may be placed on the exterior face of the continuous exterior insulation with a separate air barrier system placed behind the continuous exterior insulation. With open-joint cladding systems, this approach will require a UV-stable WRB.



## Air Control

Air control across the building enclosure is achieved by using an air barrier: a system of materials that controls airflow, typically between a conditioned space and the external environment.

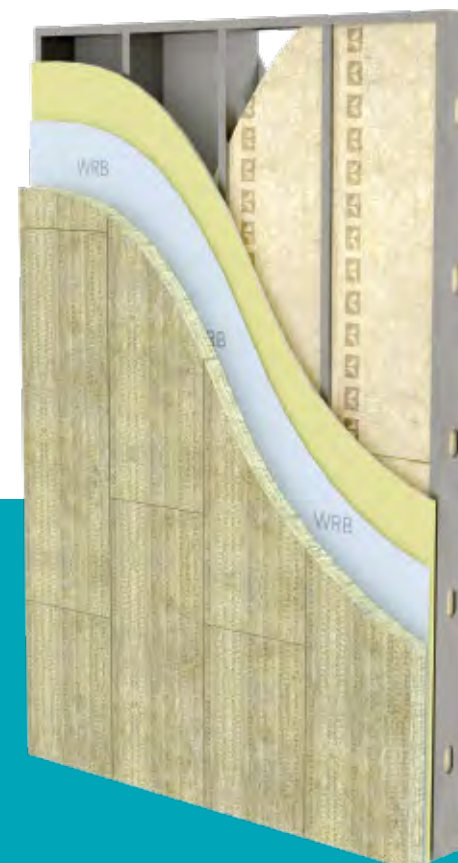
Air leakage plays a large role in the following enclosure impacts:

- Moving moisture into a wall assembly
- Negatively impacting the thermal performance of building enclosures
- Increasing building energy consumption
- Diminishing indoor air quality
- Increasing the ingress of unwanted exterior noise

Careful consideration is needed to ensure that the air barrier system is continuous so that air leakage is mitigated. Some jurisdictions now require testing of the air barrier system using whole-building airtightness testing.

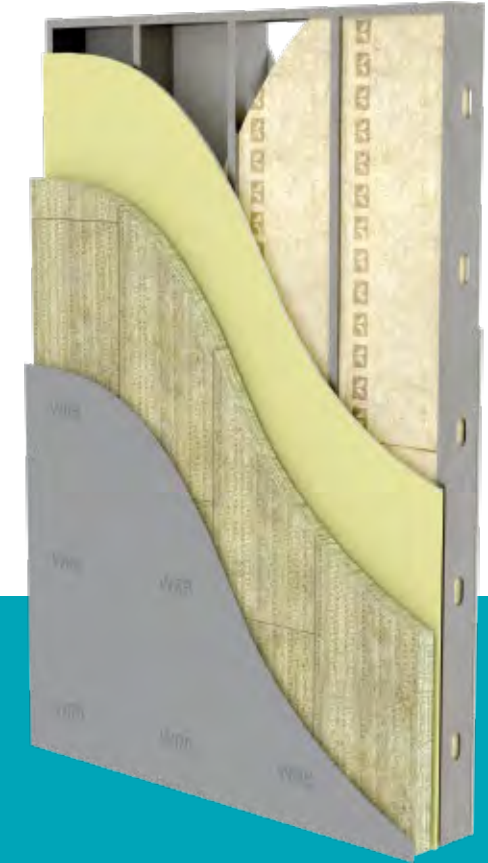
Various air barrier system approaches exist. One approach is to use a self-adhered sheathing membrane as the main air barrier material, with accessory components to provide continuity at details, though other approaches may also be used.

WRB behind continuous exterior insulation



vs.

UV-stable WRB over continuous exterior insulation



## Thermal Control

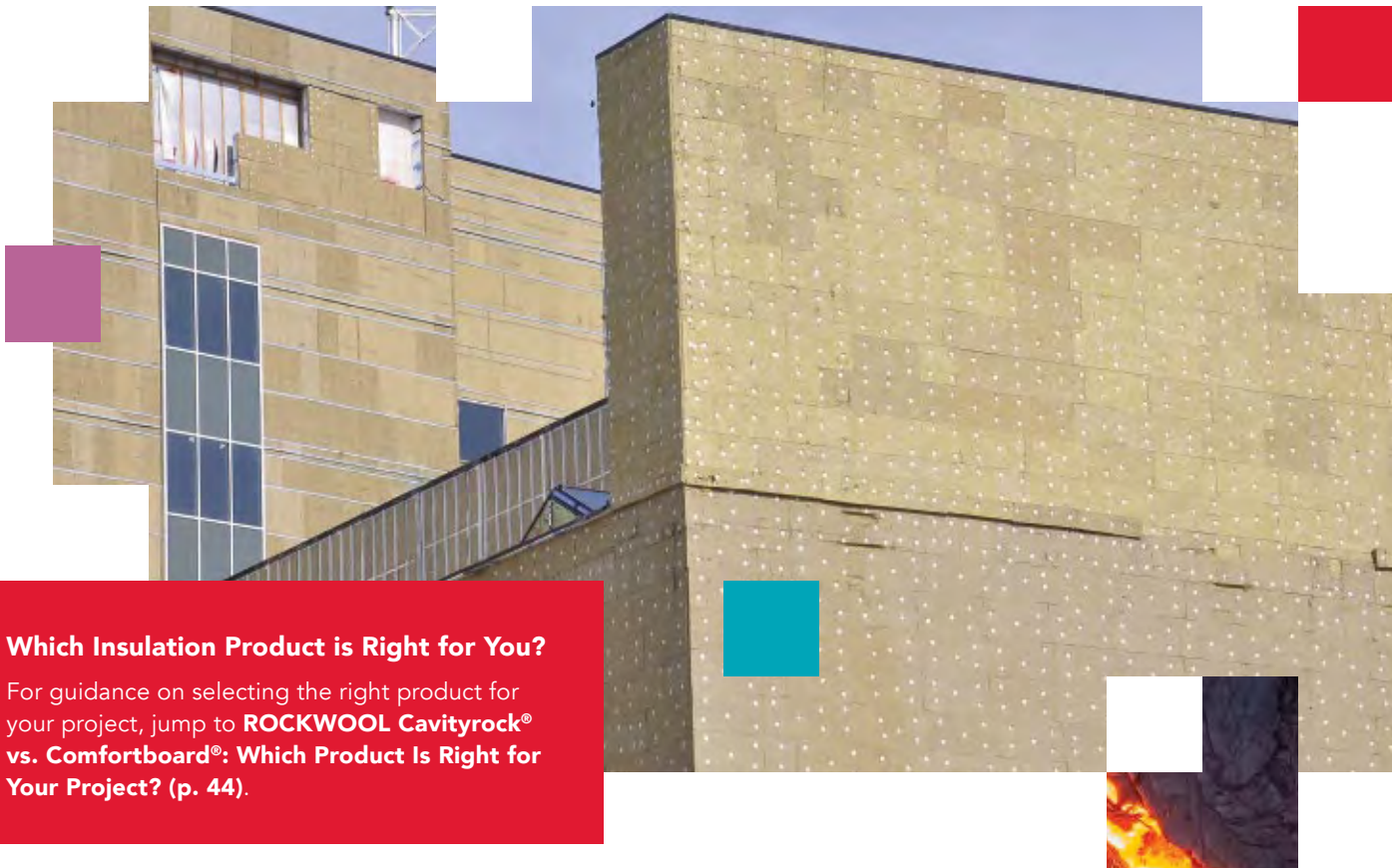
Thermal control resists conductive heat flow across the building enclosure. Thermal control across the wall assembly is provided by thermal insulation and other low-conductivity elements, such as thermally efficient cladding attachments, and is most effective when it is designed and installed as continuously as possible.

Exterior wall assemblies can be insulated with three main approaches:

- Interior/stud cavity insulated
- Split-insulated
- Exterior-insulated

See **Table 1** for more information.

Split-insulated wall and exterior-insulated wall insulation approaches using ROCKWOOL Comfortboard® or ROCKWOOL Cavityrock® stone wool insulation products provide thermal control solutions that reduce thermal transmission and improve thermal comfort. Using these products also reduces moisture-accumulation risks that can result from condensation on the wall sheathing/framing.



**Which Insulation Product is Right for You?**

For guidance on selecting the right product for your project, jump to **ROCKWOOL Cavityrock® vs. Comfortboard®: Which Product Is Right for Your Project?** (p. 44).

Table 1. Wall Insulation Approaches

| Interior/Stud Cavity Insulated                                                                                                                                                                                                                                               | Split-Insulated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Exterior-Insulated                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                        |
| Application                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Insulation placed only within the stud cavity</b> <ul style="list-style-type: none"><li>• Common in wood-framed wall applications</li></ul>                                                                                                                               | <b>Stud cavity insulation + insulation outboard of the sheathing/backup wall</b> <ul style="list-style-type: none"><li>• Common in steel stud-framed wall applications but also used with wood-framed wall applications</li><li>• Improves assembly fire resistance and acoustical performance</li><li>• Can be used to optimize cost, wall thickness, and thermal performance</li></ul>                                                                                                                  | <b>Insulation exterior placed only outboard of the sheathing/backup wall</b> <ul style="list-style-type: none"><li>• Commonly used with steel-stud-framed and monolithic backup wall systems such as mass timber, CMU, and concrete</li><li>• Can achieve a highly durable assembly when air, water, and vapor control layers are located directly behind the continuous exterior insulation</li></ul> |
| Insulation Considerations                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Stud cavity insulation</b> <ul style="list-style-type: none"><li>• Most effective when used with low-conductivity framing methods such as wood framing</li><li>• Installation is performed from the building interior, providing better access for installation</li></ul> | <b>Continuous exterior insulation</b> <ul style="list-style-type: none"><li>• Bypasses studs, building structure, services within cavities, and other systems that can interrupt insulation continuity and degrade the thermal performance of the insulation</li><li>• Reduces condensation risk within the assembly by keeping the wall sheathing warm</li><li>• Protects the WRB and air barrier from damage and UV when these layers are installed behind the continuous exterior insulation</li></ul> |                                                                                                                                                                                                                                                                                                                                                                                                        |

**Learn More**

For stone wool products used in split-insulated assemblies, see **page 49**.

**Learn More**

Read about The Perfect Wall on **page 15**.

## Vapor Control

Low-permeance building materials, such as vapor barrier and vapor retarder materials, slow the diffusion of water vapor across the building enclosure. However, if used incorrectly, these materials can trap moisture where it could condense or prevent an assembly from drying. These conditions could potentially lead to deterioration of the assembly materials and negative impacts on indoor air quality.

The use and location of a vapor barrier/retarder in an assembly will vary (see **Figure 2**). A dedicated vapor control layer may not always be needed and is based on the site's climate and the building's wall structure, interior space use and conditioning, and ratio of exterior to cavity insulation. Local code adoptions will also govern the appropriate placement of low-permeance or other vapor-retarding materials.

Vapor- and air-permeable stone wool products, such as ROCKWOOL Comfortboard®, Cavityrock®, and Comfortbatt®, allow the movement of water vapor through the insulation material. When used appropriately with other building materials, these products can reduce the risk of moisture accumulation.

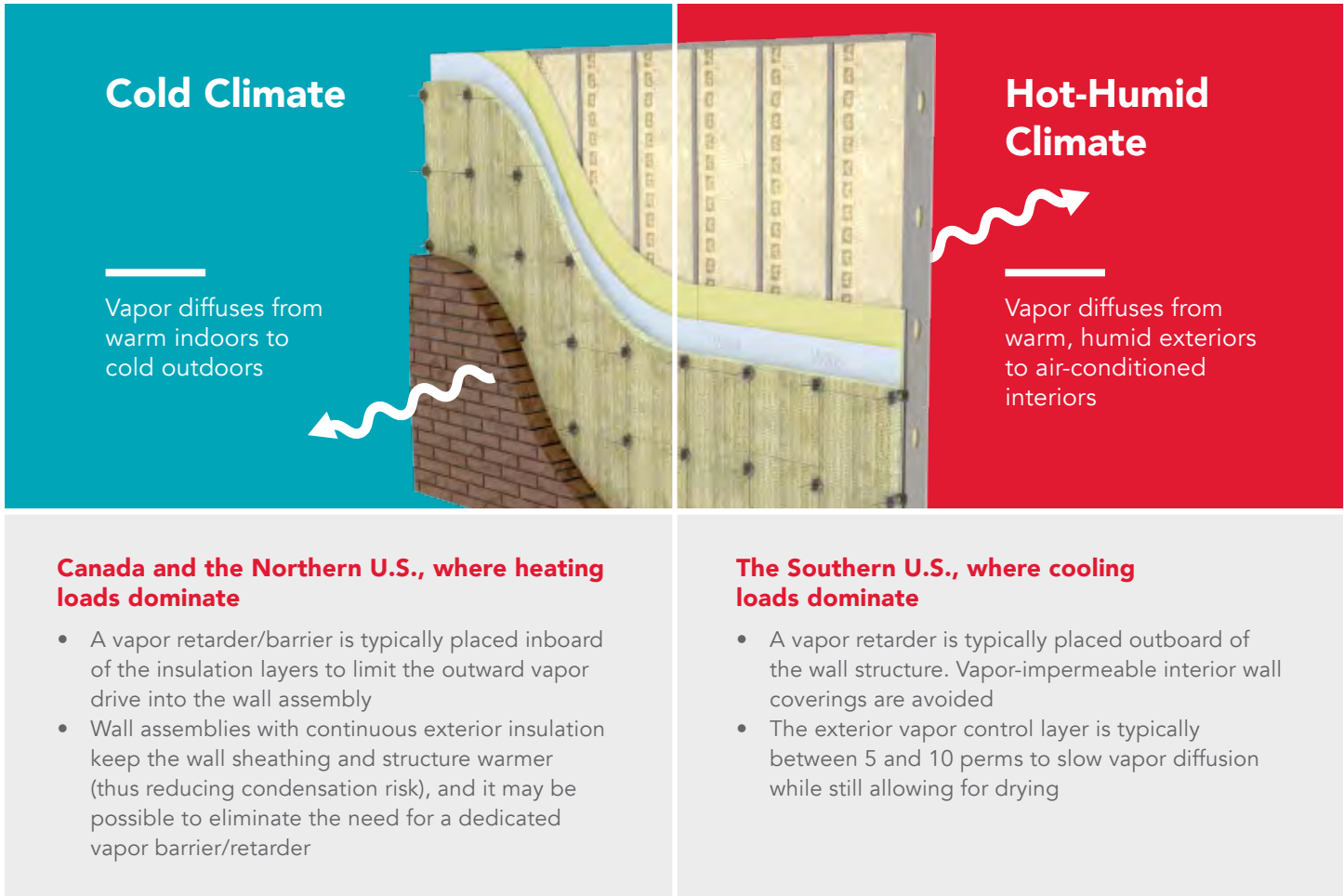


Figure 2. Understanding vapor diffusion

### The Perfect Wall

For a wall assembly to adequately perform its role — keep the outside out and the inside in — it must effectively control liquid water (e.g., rain or runoff), air movement, heat flow, and water vapor diffusion.

In the perfect wall, the layers that control water, air, heat, and water vapor are placed to the exterior of the structure (see **Figure 3**).

When an assembly contains a sufficient amount of continuous exterior insulation, such as Comfortboard or Cavityrock, this “perfect wall” can adequately perform in any climate.

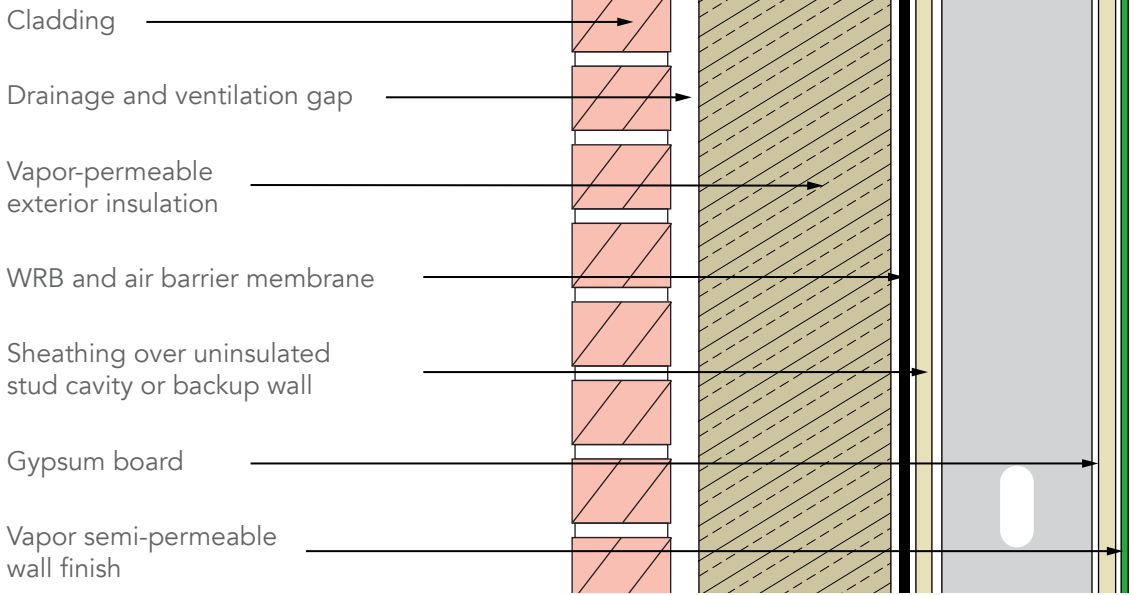


Figure 3. Wall section illustrating the perfect wall

### Learn More

For further information on vapor control, refer to the **Vapor Diffusion Guide**®.

For more information on designing for hot and humid climates, reference the **Exterior Wall Solutions for Hot, Humid Climates Guide**®.



### Need Help Completing an Analysis of Potential Moisture Risk?

The Building Science team at ROCKWOOL offers complimentary consultation and modeling services. Contact our team of experts at [rockwool.com/building-science-support](https://rockwool.com/building-science-support)®.





## Fire Control

Fire control provided by the building enclosure is rooted in the appropriate selection of rated assemblies and transitions that meet or exceed the project- and jurisdiction-specific fire/building codes. Fire control requirements may include considerations such as flame spread, heat transfer resistance, combustibility, and thermal or ignition protection. Even the toxicity that any potential combusting material within the wall assembly could contribute in a fire is considered. With respect to rainscreen wall applications, compartmentalization of the rainscreen cavity may also be a factor when selecting a wall design.

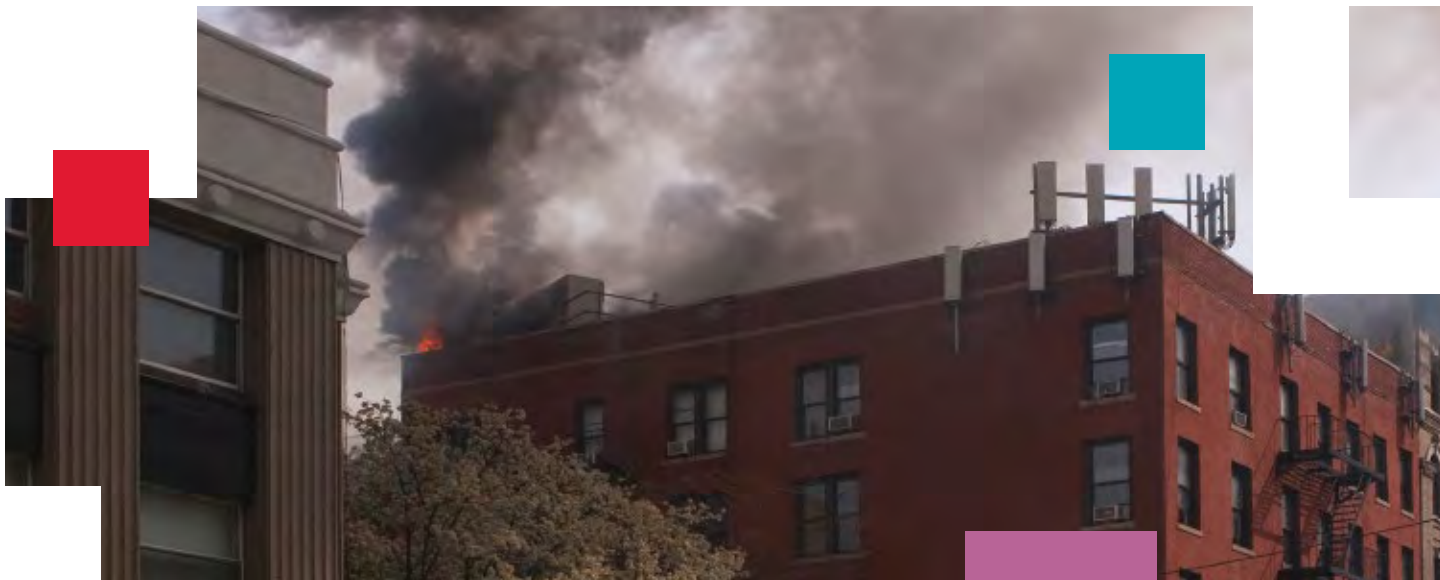
A noncombustible insulation such as ROCKWOOL stone wool can provide a barrier against the spread of flames to help protect occupants and reduce property damage. Unlike most other insulation materials, stone wool insulation will not develop smoke or promote flame spread, even when directly exposed to fire. Using noncombustible stone wool continuous exterior insulation in a wall assembly can also substantially improve a building's fire safety, providing valuable passive fire protection to the building enclosure.

For a list of fire-rated ROCKWOOL assemblies, refer to **Table 5 (p. 52)**.

### Thermal vs. Ignition Barriers

Codes define two types of fire control barriers: thermal and ignition barriers. ROCKWOOL products are listed for approval as thermal and ignition barriers in both the U.S. and Canada.

For more information on these types of barriers and a list of code approvals, refer to the **Thermal Barrier Solutions®** technical bulletin.



## Sound Control

When properly installed in today's building enclosures, continuous exterior insulation improves the acoustic comfort and productivity, health, and well-being of those within the interior space. A building enclosure that is wrapped in insulation can increase the rating of the exterior wall's outdoor/indoor transmission class (OITC). The OITC measures the external noise transmission into the building's interior.

Compared to concrete and masonry walls, stud cavity walls pose additional challenges for blocking exterior noise intrusion. Stud cavity wall insulation can add acoustical value by improving OITC ratings when added to exterior walls and improve sound transmission class (STC) ratings when installed in interior partition walls. When multiple strategies are used together, even greater sound control can be achieved for occupant comfort.

For a list of common assembly combinations and the resulting OITC and STC ratings, refer to **Table 6 (p. 52)**.

Additionally, the **ROCKWOOL Acoustic Wall Assemblies Catalog®** includes a comprehensive list of wall assemblies tested for their acoustic performance. This includes both OITC and STC ratings for steel and wood stud walls intended for both interior partition and exterior assemblies.



### Need Help Determining the Acoustic Performance of a Wall Assembly?

Contact our Building Science experts for support with complimentary acoustic modeling for your project.

Visit [rockwool.com/building-science-support](https://rockwool.com/building-science-support)®.



# Meeting and Exceeding Performance Targets

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## Meeting and Exceeding Performance Targets

To design an attractive, durable, and energy-efficient exterior wall assembly, you may need to consider many possible products and combinations. Often a project team's minimum goal is to ensure these combinations are safe and meet building code requirements. But more than ever before, project teams demand performance from the building enclosure that exceeds code minimums and instead reaches high-performance building targets.



### Which ROCKWOOL Product Can Help You Meet Your Thermal Performance Targets?

ROCKWOOL rigid and semi-rigid stone wool insulation products, including Comfortboard and Cavityrock, are ideal for use in exterior-insulated wall assemblies. ROCKWOOL Comfortbatt is used in cavity spaces that are protected from moisture. Together, these products provide thermally efficient and durable solutions to help meet and exceed today's energy codes and standards. See page 46 to learn more about ROCKWOOL stone wool exterior wall insulation products.

Thermal and Energy Performance

With the increased focus on energy efficiency, the need for added insulation and more airtight enclosures has changed the way wall systems are designed to meet their primary functions. The resulting shift requires a closer consideration of thermal control.

Compliance with new building standards and codes increasingly requires continuous insulation. For commercial and multi-unit residential buildings, these are the most widely applicable regulations:

- **International Energy Conservation Code (IECC) in the U.S.**
- **National Energy Code for Buildings (NECB) in Canada**
- **ASHRAE Standard 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings** (referenced by building and energy codes in most U.S. states)

While different versions and adaptations of these regulations are enforced in different jurisdictions, each requires consideration for thermal insulation and thermal bridging. Multiple paths to demonstrate

compliance are available, including the following approaches:

- **Prescriptive compliance approaches**, such as the R-value method, the U-factor method, and the component performance alternative method
- **Performance-based approaches**, which include whole-building energy modeling using building simulation software to demonstrate anticipated building performance against a defined target performance

The degree of accuracy with which wall assemblies and their interfaces are evaluated (e.g., modeled, calculated or estimated by reference tables) to demonstrate conformance varies with jurisdictional code requirements.

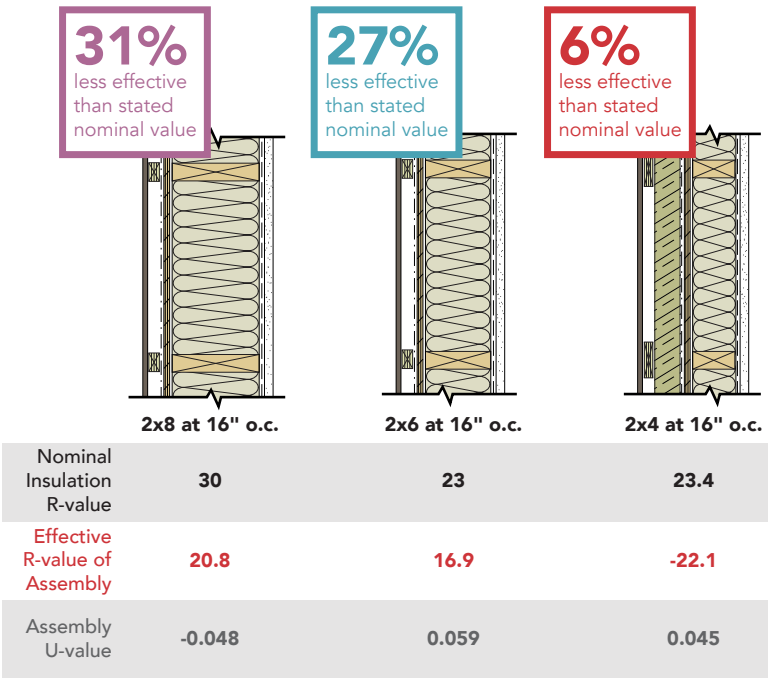


Figure 4. Thermal efficiency relative to insulation approach

Continuous Exterior Insulation Overview

Continuous exterior insulation is most effective when thermally efficient cladding attachments are used (see **Figure 4**). As a result, greater attention is being paid to the design of thermally efficient structural attachment systems. Many proprietary systems have been introduced into the market in recent years to meet this demand. Cladding attachment options include continuous girts, intermittent clip and rail systems, long screws through strapping and insulation, masonry ties, and other engineered supports, all with various impacts on the continuity and effectiveness of continuous exterior insulation. The extent to which the cladding attachment system impacts code compliance requirements will vary based on jurisdictional requirements, the compliance method, and project-specific performance goals.

Continuous exterior insulation is typically more thermally efficient than insulation placed between studs or inboard of the structural system and is effective in reducing thermal bridging — a significant source of heat transfer in the built environment. Thermal bridges are penetrations in a building’s insulation layer that allow heat (energy) to transfer through the enclosure more readily. Refer to **Figure 5** for typical locations of thermal bridges through the building enclosure.

For more information on attachment options, refer to **Table 7** (p. 60).

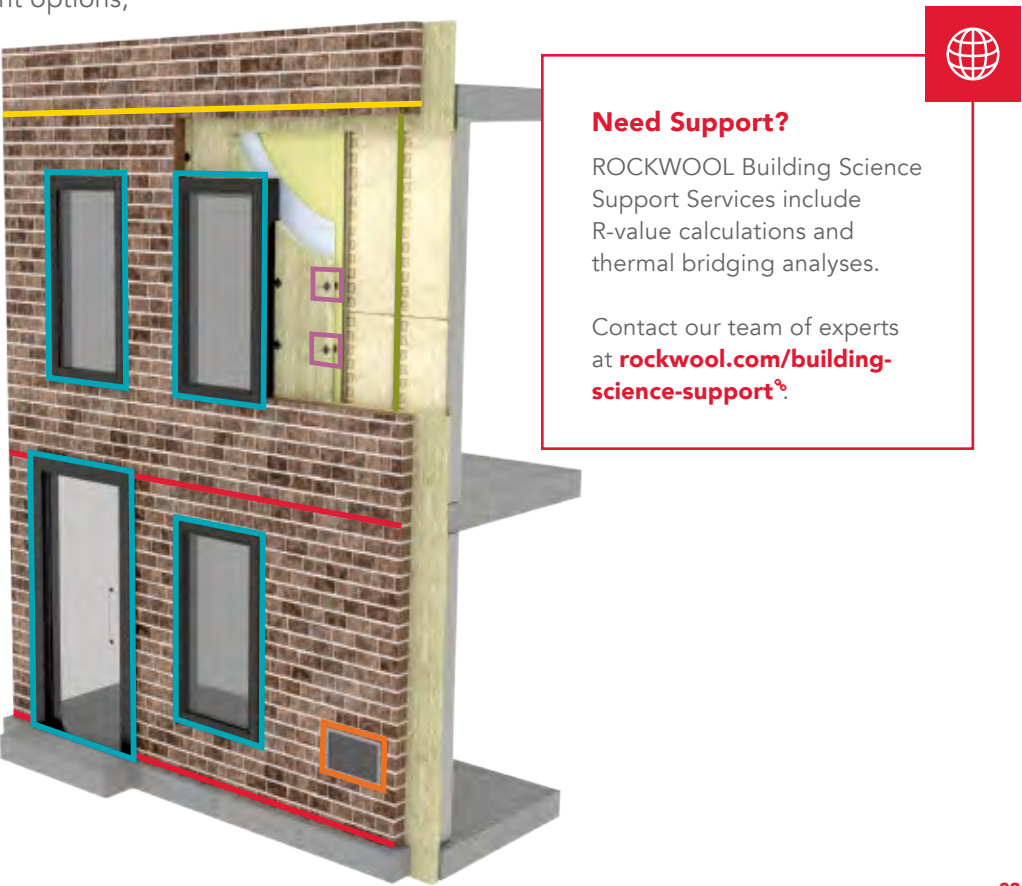
- Where the roof and wall connect
- Where the floor and wall connect
- Pipes, cables, and vents that penetrate through the building enclosure
- Window and door openings or framing
- Wall ties and other metal fasteners
- Wall studs (e.g., steel or wood)

Figure 5. Typical locations of thermal bridges through the building enclosure



What is Stud Ghosting?

Ghosting or shadowing is a visual effect that can occur on interior and exterior wall finishes. Differences in surface temperatures at backup wall, roof, and floor elements and surrounding wall areas can cause surface moisture and dirt/dust accumulation. This accumulation can lead to long-term visual impacts known as "ghosting". This phenomenon is easiest to avoid by implementing continuous exterior insulation within the wall assembly to limit thermal bridging effects.



# High-Performance Sustainable Design Strategies

Whereas regulations set minimum performance requirements, you can use voluntary frameworks, standards, and design methods to establish project-specific performance expectations that go above and beyond.

## LEED

The LEED green building rating system includes performance criteria for certifying the design and construction of commercial, institutional, and residential buildings. LEED works for all buildings anywhere, regardless of where they are in their life cycle. The process is designed to inspire innovative solutions that support healthy, highly efficient, and cost-saving green buildings during the design, construction, operation, and maintenance of these high-performance structures. As **Table 2** demonstrates, ROCKWOOL insulation products can help a project achieve critical points required for LEED certification.

## WELL

The WELL standard was created by both medical doctors and building practitioners to inspire the global community to apply the principles of health to their building designs. Projects designed to the WELL building standard support health for building occupants by meeting its requirements for indoor air quality, thermal and acoustic indoor comfort, and material transparency — all requirements that ROCKWOOL products are naturally suited to meet. Refer to the **ROCKWOOL Sustainable Project Solutions Guide** for more information on how ROCKWOOL products help meet the requirements for WELL Certification.



Table 2. ROCKWOOL Products for LEED v4 and v4.1

|                   | Energy and Atmosphere (EA) |                             | Materials and Resources (MR)         |                                                                                   |                                                                          |                                                                     | Indoor Environmental Quality (EQ) |                        |                 |                      |
|-------------------|----------------------------|-----------------------------|--------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------|------------------------|-----------------|----------------------|
|                   | Minimum Energy Performance | Optimize Energy Performance | Building Life-Cycle Impact Reduction | Building Product Disclosure and Optimization – Environmental Product Declarations | Building Product Disclosure and Optimization – Sourcing of Raw Materials | Building Product Disclosure and Optimization – Material Ingredients | Minimum Acoustical Performance    | Low-Emitting Materials | Thermal Comfort | Acoustic Performance |
| Exterior Walls    |                            |                             |                                      |                                                                                   |                                                                          |                                                                     |                                   |                        |                 |                      |
| Cavityrock®       | x                          | x                           | x                                    | x                                                                                 | x                                                                        | Declare                                                             | x                                 | x                      | x               | x                    |
| Comfortboard® 110 | x                          | x                           | x                                    | x                                                                                 | x                                                                        | Declare                                                             | x                                 | x                      | x               | x                    |
| Comfortboard® 80  | x                          | x                           | x                                    | x                                                                                 | x                                                                        | Declare                                                             | x                                 | x                      | x               | x                    |
| Comfortbatt       | x                          | x                           | x                                    | x                                                                                 | x                                                                        | Declare                                                             | x                                 | x                      | x               | x                    |

To generate a LEED letter specific to your project, visit [rockwool.com/leedcalculator](https://rockwool.com/leedcalculator).



## Passive House

Passive House is a standard for buildings where the primary goals are to achieve superior energy efficiency and occupant comfort. This enclosure-first, “passive” approach encompasses all aspects of high-energy performance, sustainability, and resiliency that can be applied to all types of buildings, in all types of climates.

ROCKWOOL has steel-framed and mass wall assemblies that have been designed and modeled to meet Passive House building enclosure recommendations, similar to the assembly shown in **Figure 6**. The full list of assemblies is outlined in the **Passive House Solutions Guide**.



## Net-Zero Energy Building

Net-zero energy building is a method of design and construction that aims to achieve an energy-efficient building that can generate energy from renewable sources to compensate for its own energy demand. As a result, these types of buildings boast a net-zero energy consumption: The total energy used by the building on an annualized basis is roughly equal to the amount of renewable energy created on the site or at a nearby location.

Continuous exterior-insulated systems aid in achieving net-zero by providing a continuous thermal barrier to reduce thermal bridging, thereby reducing energy losses.

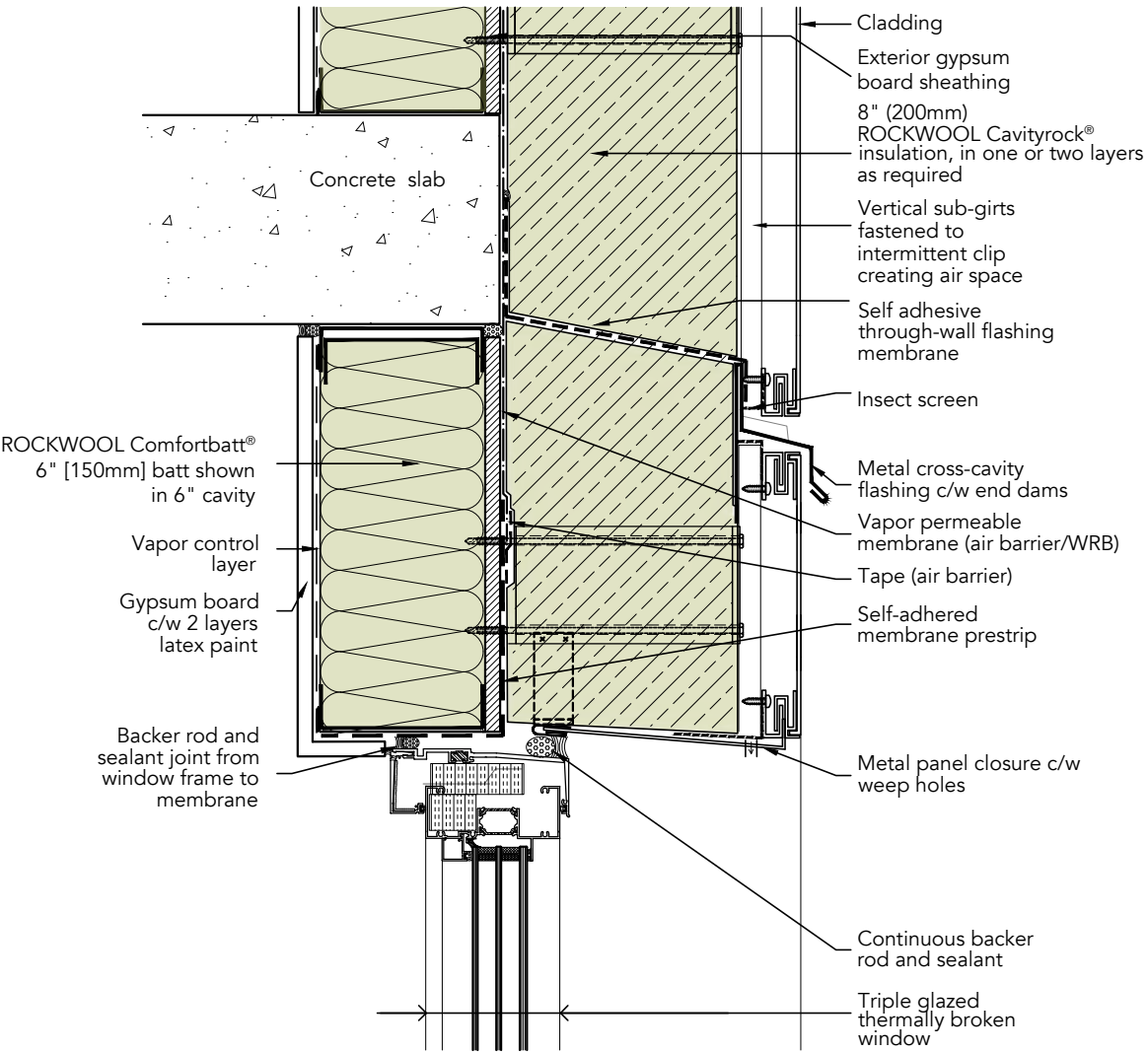


Figure 6. Passive House wall assembly

## Fire Performance

Both the U.S. and Canadian building codes contain specific provisions for the design and construction of exterior wall assemblies that are required to meet fire protection requirements, such as a fire-rated wall assembly. The need for a fire-rated wall assembly is determined based on the building construction type, bearing versus non-bearing elements, interior occupancy use, and the fire separation distance of the assembly from a property line.

Assembly fire ratings are determined by code-specified assembly configurations, generic listed assemblies, acceptable calculation methods and/or reference to previously accepted fire testing in determining the wall assemblies and detailing. Canadian and U.S. building codes also reference standardized tests designed to demonstrate that a specific building enclosure assembly is an acceptable solution and meets the fire protection code requirements. Codes may also allow alternative solutions for designs that don't follow the specific design, construction or full-scale testing methodologies outlined as acceptable solutions.

All code compliance approaches consider three primary fire protection/resistance parameters:

- Fire resistance rating
- Exterior fire spread
- Firestopping

The following sections describe the testing associated with the first two parameters that would be used to show compliance. For more information on firestopping, refer to [rockwool.com/firestopping](https://rockwool.com/firestopping).

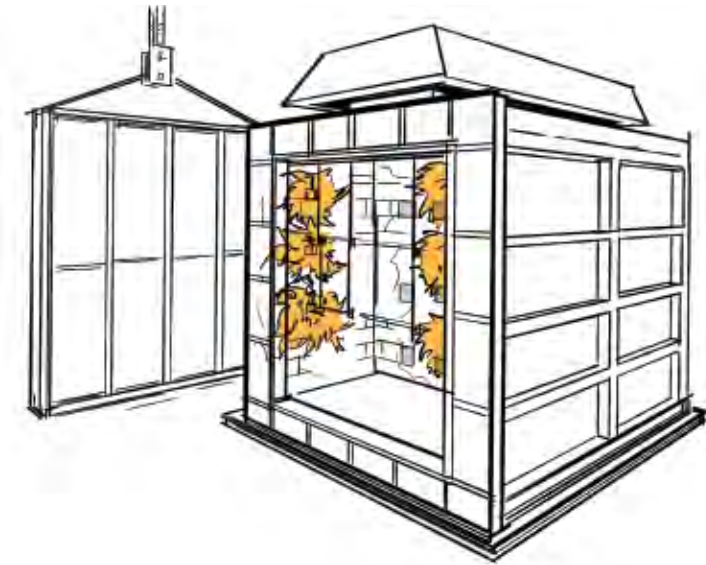


Figure 7. Schematic illustration of the test arrangement used when determining a fire resistance rating; fire exposure can be from the exterior side, interior side or both sides during the test



### Fire Resistance Rating

The fire resistance rating is the time (in minutes or hours) that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria (see Figure 7). It is used to assign minimum ratings for key assemblies in the structure and enclosure, including roofs.

Three standards are used to determine the fire resistance rating of building assemblies:

- **ASTM E119** – Standard Test Methods for Fire Tests of Building Construction and Materials
- **UL Standard 263** – Fire Tests of Building Construction and Materials
- **CAN/ULC S101** – Standard Methods of Fire Endurance Tests of Building Construction and Materials

These three tests provide a time-temperature curve that shows when the material in a wall system will fail. Stone wool products melt at higher temperatures and therefore resist fire much longer than other insulation materials, as shown in Figure 8.

### Did You Know?

Fire ratings for assemblies with ROCKWOOL insulation products are based on the complete wall assemblies, as every layer together affects the final rating.

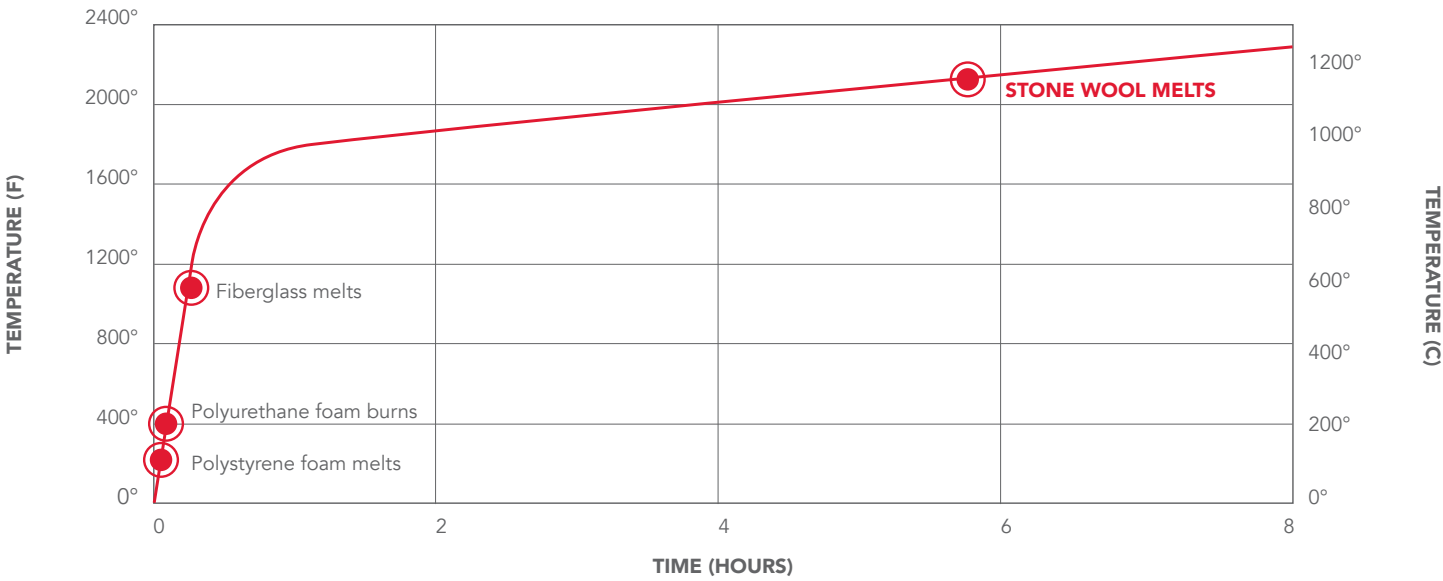


Figure 8. ASTM E119 time-temperature curve for various insulation materials



## Exterior Fire Spread

Using combustible materials poses challenges for complying with the fire-related provisions in building codes such as:

- **NFPA 285** – Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
- **CAN/ULC S134** – Standard Method of Fire Test of Exterior Wall Assemblies Noncombustible Stone wool insulation can play a key role in developing compliant wall assemblies

The NFPA 285 and CAN/ULC S134 standards include a test that evaluates flame propagation on an exterior wall assembly subjected to a standardized fire exposure (see **Figure 9**). Note that these standards evaluate exterior wall assemblies and not individual components.

The version of the building code being used for the project, along with project-specific elements, all play a role in determining whether the wall assembly will trigger testing to demonstrate conformance with these standards. The first step is to check the version of the local- or state-level code the project jurisdiction is using and the version of NFPA 285 or CAN/ULC S134 referenced.

### Triggers for testing may include:

- Combustible insulation materials, such as foam plastics
- Combustible exterior cladding
- Combustible WRB
- Building height and other fire code considerations

One way to reach NFPA 285 and CAN/ULC S134 compliance is to use noncombustible stone wool continuous exterior insulation. It can be an optimal choice when you need to balance the demands of the fire safety code with increasingly strict energy efficiency code requirements. Assembly options using Comfortboard 110 or Cavityrock have demonstrated conformance with both the NFPA 285 and the CAN/ULC S134 standards. These assemblies provide architects with a greater range of cladding and WRB options because stone wool protects vulnerable components behind the cladding.

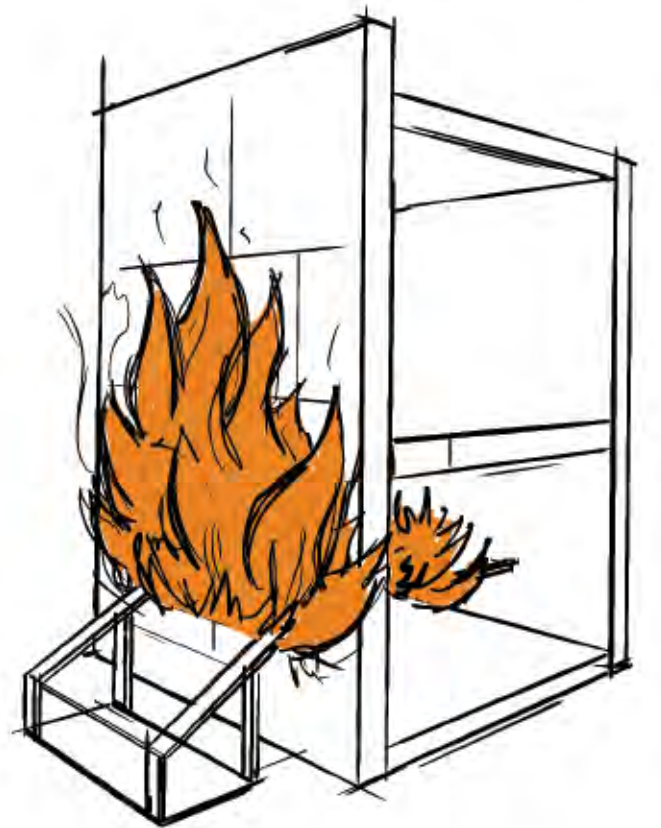


**Figure 9.** Schematic illustration of exterior fire spread testing of a vertical enclosure assembly

### Designing for NFPA 285

While foam plastic insulation triggers the need for NFPA 285 testing, noncombustible ROCKWOOL insulation does not. However, it is often used in conjunction with combustible claddings and/or WRBs that have triggered testing, to help achieve successful NFPA 285 test results. Noncombustible ROCKWOOL insulation can help you achieve successful results without compromising your creativity.

For more information, refer to the **Designing to Meet NFPA 285 Requirements**® fact sheet.



## Wildland–Urban Interface (WUI) Design

Most local, state, and provincial WUI codes mirror the International Wildland–Urban Interface Code with modifications made to reflect the specific needs of a community and its surrounding landscape. The state creates a map of fire hazard safety zones ranked by risk severity and designates state, federal or local responsibility. Municipalities may update their maps based on input from the county fire marshal and local legislative bodies.

In addition to requiring “defensible space” cleared of vegetation around the building, WUI codes also prescribe the use of noncombustible materials on the exterior and construction methods to prevent flame and ember intrusion into vents.

To help building professionals source reliable products for projects in the increasing number of fire-prone areas, the California Office of the State Fire Marshal (OSFM) Building Materials Listing (BML) includes products tested by OSFM-accredited laboratories. ROCKWOOL has multiple fire-resistant stone wool products — including the only insulation products in

the listing. As shown in the **CAL Fire Listed Products**® technical bulletin, each of these products has been independently tested in accordance with ASTM E84 (for flame spread and smoke development) and ASTM E136 (for noncombustibility) and is rated a zero on both the flame spread index and the smoke developed index.



For a list of fire-rated ROCKWOOL assemblies, refer to **Table 5 (p. 52)**.

For more information on WUI design, refer to [rockwool.com/wui-design](https://rockwool.com/wui-design)®.





## Acoustic Performance

Noise ordinances are typically established in areas near airports, but developing in areas with other significant noise sources, such as mixed-use buildings with retail space adjacent to residential space, may also be held to standards of minimum sound insulation. Specific requirements vary, but they almost all include direction on sound absorbency for exterior walls to decrease the impact of noise pollution.

### Government Regulation

It usually falls on governments, rather than industry or other interested bodies, to set noise limits as a means of reducing noise pollution.

In the U.S., the Environmental Protection Agency (EPA) has noise protection legislation in place, which includes:

- **The Noise Control Act of 1972:** outlines policies to protect people from noise that jeopardizes their health and welfare
- **Clean Air Act Title IV – Noise Pollution:** an update to the 1972 legislation
- **Model Community Noise Control Ordinance:** lays out the direction for communities to establish their own local guidelines

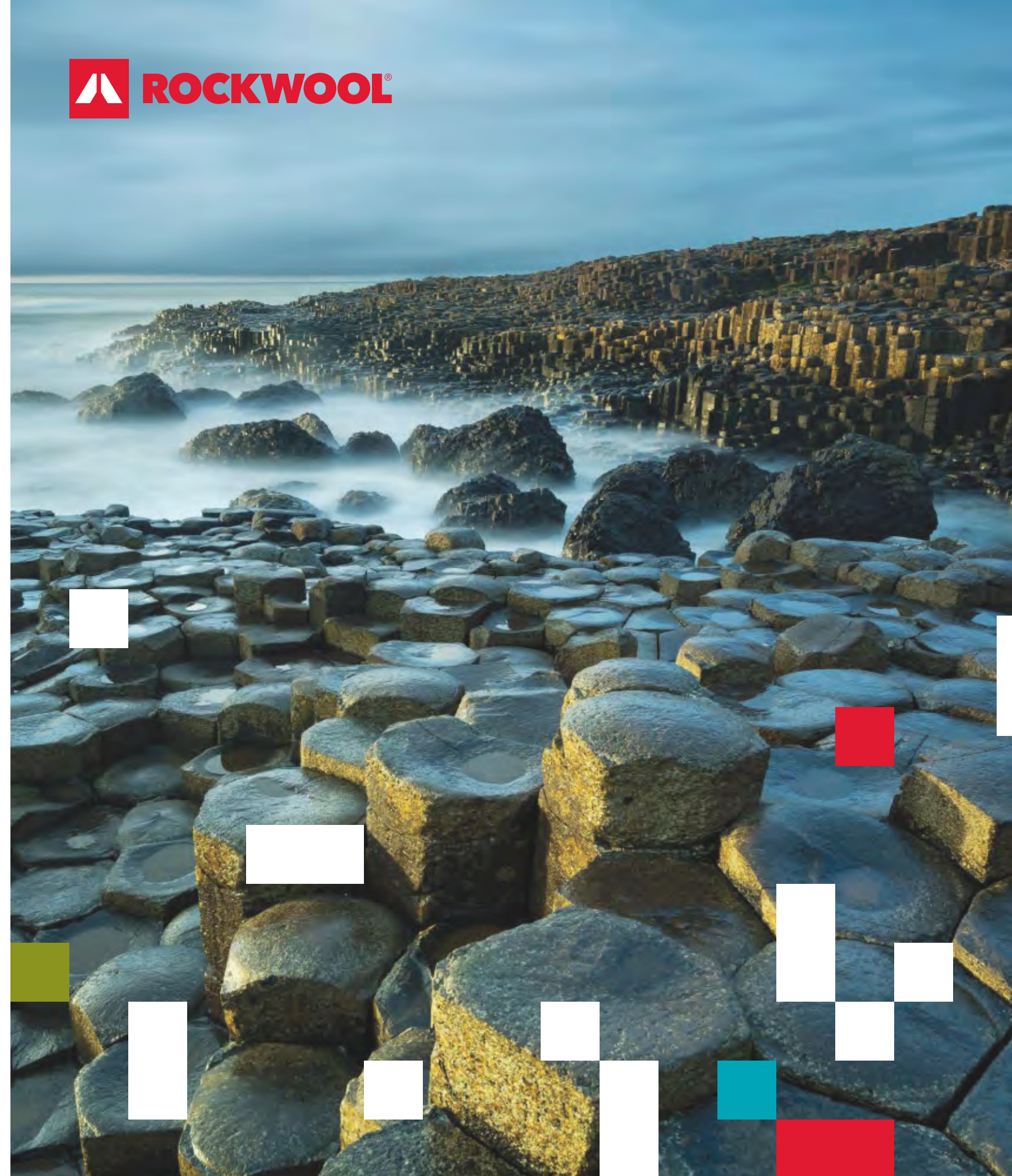
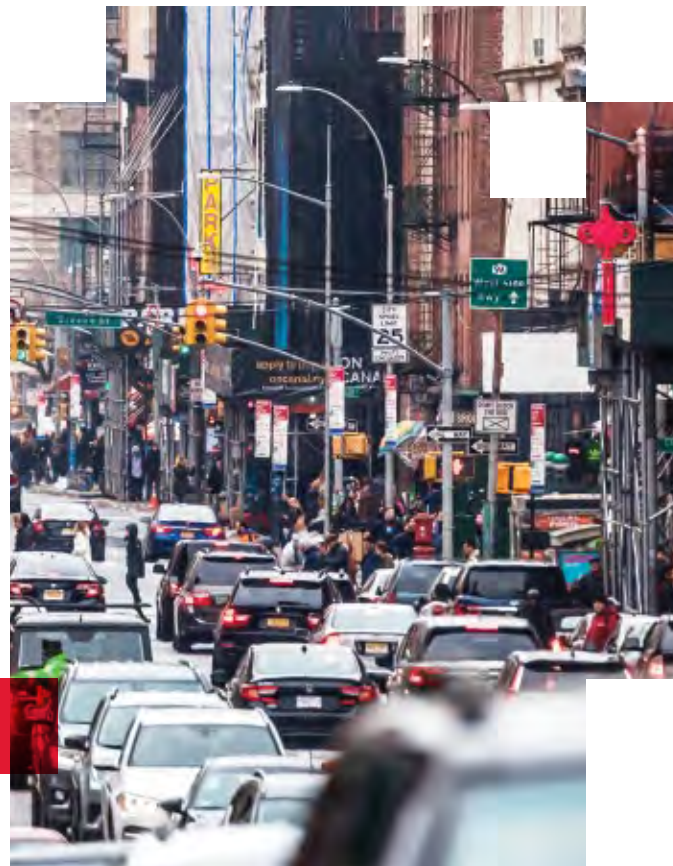
Additionally, the U.S. Code of Federal Regulations, the U.S. Department of Transportation, and the U.S. Department of Housing and Urban Development (HUD) provide guidelines on noise.

In Canada, modern noise control regulations began with the Canadian Centre for Occupational Health and Safety, the Canada Transportation Act, Motor Vehicle Safety Regulations, and Health Canada (specifically related to wind turbine noise). Specific guidelines and enforcement are left to provincial and municipal governments.

### The International Green Construction Code (IgCC)

The IgCC offers specific guidelines on controlling noise in different environments. Under the code, wall assemblies must have an OITC rating of 40 or greater or an STC rating of 50 or greater.

To learn more about tested ROCKWOOL stone wool solutions that meet or exceed these ratings, refer to **Table 6 (p. 52)**.





Fire safe, moisture resistant, breathable, sound absorbent, durable, and circular — these are the natural properties found in all ROCKWOOL stone wool insulation.

In its manufactured state, stone wool delivers unique benefits as an insulation solution. Our products contribute to addressing many of society's biggest climate change challenges, creating new opportunities to enrich modern living and build safer, healthier, and more climate resilient communities.

Not all building materials are created equal.  
Ours are created by nature.



## FIRE SAFE

Like the basalt rock it is made from, **ROCKWOOL stone wool insulation is fire resilient by nature with no added chemical flame retardants. Capable of withstanding temperatures of over 2150 °F (1177 °C), a melting point that exceeds the temperatures of most commercial and residential building fires, it works to contain fire and prevent its spread. The noncombustible characteristics of stone wool insulation mean that it will not develop toxic smoke or promote flame spread, even when directly exposed to fire. It provides passive fire protection and is a complement to active systems such as sprinklers.**

The fire safe performance benefits achieved with stone wool insulation for exterior wall assemblies include:

- An opportunity for exemption from NFPA 285, CAN/ULC S134, and NFPA 268 testing typically required for foam plastic-based assemblies

- Will not develop smoke or promote flame spread — when tested to ASTM E84, stone wool achieves a Flame Spread Index and Smoke Developed Index of 0 and 0, respectively
  - By comparison, when combustible extruded polystyrene (XPS) foam is tested to ASTM E84, it typically receives a Class A rating, which can have a Flame Spread Index as high as 25 and Smoke Developed Index of 450, and can contribute to the spread of fire
- Resistance to the transfer of heat in a wall assembly that causes layers on the other side to begin burning or smoking

Stone wool insulation products are a component in many fire-rated wall assemblies. Refer to **page 52** for examples of 1-hour and 2-hour rated assemblies.

For information on managing and exceeding fire performance targets for the design and construction of exterior wall assemblies, visit **page 26**.

## MOISTURE RESISTANT

**ROCKWOOL stone wool is water repellent by nature. During wet and rainy weather, stone wool insulation keeps buildings warm and dry without reduction in thermal performance over time. It also resists moisture in humid climates, protecting the long-term health of buildings and the people within them.**

The moisture resistant properties achieved with stone wool insulation for exterior wall assemblies include:

- Does not wick water, which means any bulk water that contacts the outer surface will drain and not be absorbed into the body of the insulation
- Performs as well following extended weather exposure after installation\*, if dried and then covered with cladding, as it would have without the exposure and delay
- Presents a minimal risk of decay, corrosion, and mold

For additional information on testing performance and results, refer to the report **Moisture Durability of Stone Wool Insulation<sup>®</sup>**.

To understand how stone wool insulation can contribute to managing many loads, including water control, see **page 10**.

\*Refer to the **Exposure to the Elements<sup>®</sup>** technical bulletin for more information.

## BREATHABLE

**The vapor permeable nature of ROCKWOOL stone wool insulation allows water vapor to diffuse through without becoming trapped. Other building materials, including some insulation types, can work as vapor retarders or barriers and can greatly reduce the drying potential of many typical building assemblies. When used appropriately along with other wall assembly layers and materials, stone wool insulation becomes part of an assembly that holds minimal risk of decay, mold, and mildew. This contributes to securing healthy, comfortable indoor environments.**

The vapor permeability benefits of stone wool insulation for exterior wall assemblies include:

- Allows the thermal performance to remain constant and unaffected
- Helps to reduce the risk of moisture accumulation within the wall assembly
- Provides a stable performance, no deterioration issues, and the longevity to remain in the building for as long as it stands
- Does not promote corrosion, and will not be impacted by corrosion

To understand how stone wool products help reduce moisture accumulation risks within exterior wall assemblies, see **page 14**.

## SOUND ABSORBENT

**ROCKWOOL stone wool insulation has an open, porous structure, which makes it highly efficient at absorbing sound by nature. This, in addition to its resistance to airflow, significantly reduces the ability of noise to travel through the building enclosure. Stone wool contributes to human health and well-being by providing quiet spaces to recover and recuperate in homes and hospitals and to avoid health issues associated with noise pollution, such as diabetes and increased blood pressure. Stone wool insulation also contributes to reduced noise in the workplace and educational institutions which can result in more efficient and pleasant work and learning environments for building occupants.**

The sound absorbent aspects achieved with stone wool insulation for exterior wall assemblies include:

- Reduced sound transmission across the wall system due to its fiber orientation and greater mass compared to other types of insulation
- Improved low-frequency sound absorption for both normal and random incidents of noise
- Enhanced acoustic dampening for a quieter environment, which is particularly valuable for construction in urban environments (tested in accordance with ASTM E1332)

ROCKWOOL has tested various wall assemblies for their acoustic performance and has provided both STC and OITC ratings for each assembly. See **page 52** for additional details.

## DURABLE

**Just like stone, ROCKWOOL stone wool insulation is durable by nature and keeps its shape and insulation properties over time. Its insulation performance is unaffected by humidity and temperature changes. And when it is appropriately installed, stone wool insulation requires no technical supervision or maintenance throughout the building's lifetime. Sample testing from existing buildings shows that ROCKWOOL stone wool retains its performance for 65 years — and counting!**

The durability benefits achieved with stone wool insulation for exterior wall assemblies include:

- High dimensional stability to avoid shrinking and expansion, which can lead to thermal bridging and unpredictable insulation performance
- The most temperature-stable of four different rigid board insulation types\*
- Stability in physical properties when exposed to UV light\*\*
- Ease in cutting and conforming to building irregularities

For additional information refer to the **Durability and Stone Wool Insulation<sup>®</sup>** fact sheet.

\*For further discussion and information, refer to the research summary on **Dimensional Stability of Rigid Board Insulation Products<sup>®</sup>**.

\*\*Refer to the **Resistance of ROCKWOOL Exterior Insulation to Ultraviolet Light<sup>®</sup>** technical bulletin for more information.

## CIRCULAR

**Based on one of Earth's most abundant raw materials, stone wool is circular by nature — and for long-term sustainability, a “circular economy” is the answer. The building sector produces one-third of all waste, much of which ends up in landfill today. However, stone wool can be recycled again and again without ever losing performance. The technology at ROCKWOOL allows the use of waste from other industries as alternative raw material. Overall, ROCKWOOL upcycles waste materials, recycles its own waste in closed loops, and design products for long life and indefinite recycling.**

The circular aspects of stone wool insulation for exterior wall assemblies include:

- Can be easily removed when a building is renovated or demolished and then recycled back into new products
- Can contribute to reducing a building's environmental impact during both construction and operations

- Achieves points in the Materials and Resources category under LEED with supporting Health Product Declarations (HPD) documents
- Maintains strong performance throughout its lifetime and does not need maintenance or regular replacement when installed correctly
- Can help extend the lifespan of the building

A range of stone wool thermal insulation products can be used to achieve the LEED Energy and Atmosphere minimum energy performance and optimized energy performance credits. Use the **LEED Submittal Guide<sup>®</sup>** to get started on your next submittal.

For more information on the circularity of stone wool visit **rockwool.com/circularity-facts**.

Download our **Environmental Product Declaration (EPD)<sup>®</sup>**.

THERMAL RESISTANCE

As the building industry seeks new and innovative solutions that are truly energy efficient, ROCKWOOL leads the way in developing insulation products with excellent long-term thermal performance. The R-value of stone wool insulation does not change over time because it is not produced with blowing agents, which off-gas and result in lower thermal performance.

The thermal performance benefits of stone wool insulation for exterior wall assemblies include:

- Work as a buffer against fluctuations in temperature — temperature maintenance can dramatically reduce heating, cooling, and ventilation costs, and reduce a building's carbon footprint
- Will not expand or contract due to temperature variances in the rainscreen system, nor is it adversely affected by the presence of moisture in the system

To learn more on continuous exterior insulation relating to thermal and energy performance, refer to **page 22**.

For additional insight on thermal performance impacts, see **page 58**.

Made for the Future

Climate change is not a future phenomenon — its impacts are evident today and, in many cases, devastating to the environment and societies around the world. According to the latest Intergovernmental Panel on Climate Change (IPCC) report, it is unequivocal that rising global temperatures and increasing frequency of extreme weather, flooding, and catastrophic wildfire events will have an unprecedented impact over many centuries to come<sup>1</sup>.

There is an urgent need to adapt and mitigate climate change impacts and foster climate resilience. This can be done, in part, by constructing sustainable and resilient buildings with materials that support a circular economy approach.

As **Figure 10** shows, stone wool is a versatile natural material with multiple benefits, such as being inherently circular and fire resilient, that makes it ideal for assemblies in above-grade

wall applications. The durability of ROCKWOOL stone wool insulation means that its incorporation in new and existing buildings today can contribute to future proofing them for the evolving building codes of tomorrow.

ROCKWOOL pursues a fact-based, auditable approach backed by third-party references and methodologies to document progress in maximizing our products' positive impact. Our products are designed and positioned to be used in high-performance wall assemblies with high R-values, making them ideal for projects as building codes, building owners, and developers continue to require higher thermal performance and lower building energy demands.

Download our **Sustainability Report**<sup>®</sup>.

CASE STUDY

Arizona State University  
Tempe, AZ



The 281,000 ft.<sup>2</sup> building's unique geometric façade includes a system of overlapping glass fiber reinforced concrete panels with open joints.

**Product:** Cavityrock Black (2" thickness)

**Why ROCKWOOL:** Thermal performance, aesthetics, sustainable, fire safe

**Building Type:** Institutional – Education

**Certification:** LEED Platinum (pending)

**View full case study**<sup>®</sup>

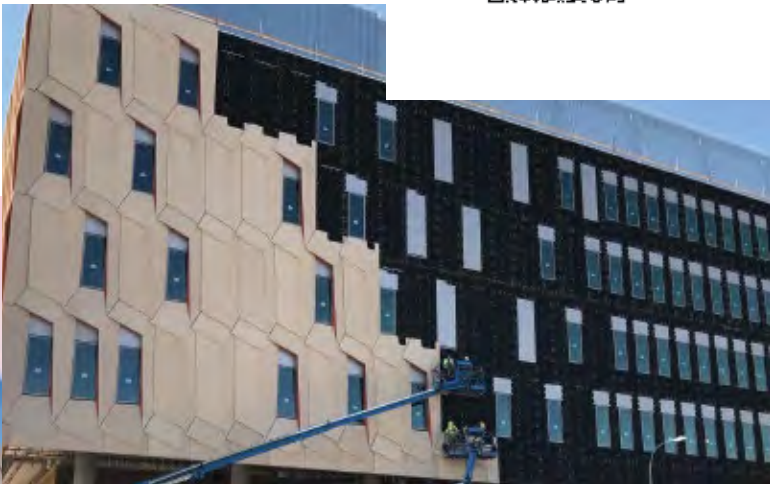
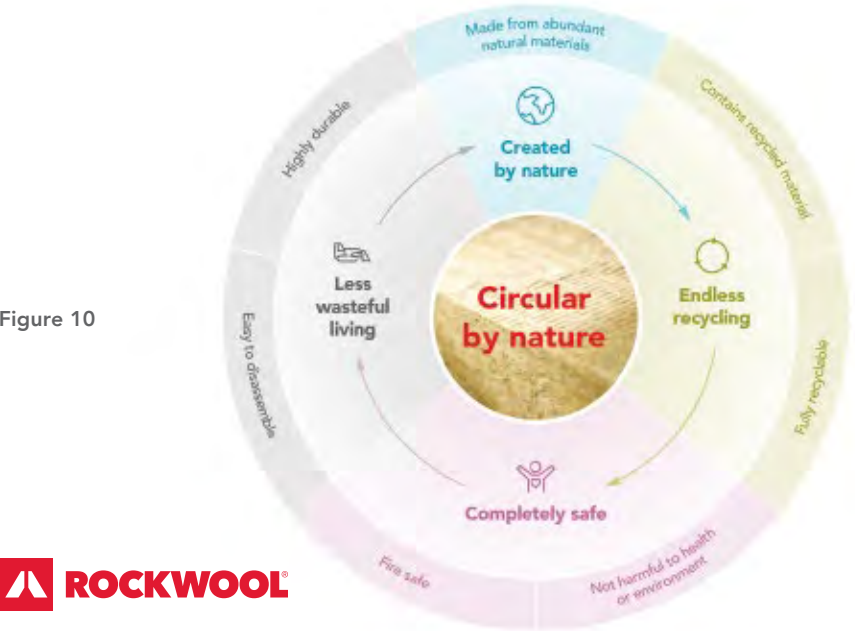


Figure 10



<sup>1</sup> IPCC, Climate Change 2021: The Physical Science Basis, Sixth Assessment Report (Geneva: Author, 2021), ipcc.ch.

Did You Know?

Reducing operational carbon is a critical component of the total decarbonization effort — and adequately insulating buildings can play a significant role by increasing energy efficiency and reducing energy demand, thereby lowering greenhouse gas (GHG) emissions. Therefore, insulation is a primary building material that can directly reduce the operational carbon of buildings over its lifetime.



# Stone Wool Insulation for Exterior Walls

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| Which Product is Right for Your Project?          | 44 |
| Product Summary Table                             | 46 |
| Typical Applications                              | 48 |
| Fire-Related Wall Assemblies Summary              | 52 |
| Acoustic (OITC and STC) Tested Assemblies Summary | 52 |

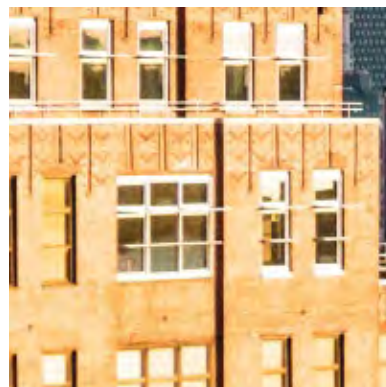


## Stone Wool Insulation for Exterior Walls

ROCKWOOL offers two product lines for use as continuous exterior insulation in rainscreen assemblies — Cavityrock and Comfortboard — while Comfortbatt products can be used in exterior stud-framed wall cavities.

### Cavityrock vs. Comfortboard

See which continuous exterior insulation product is right for your wall assembly on [page 44](#).



Which Product Is Right for Your Project?

The key to achieving the greatest performance benefit of insulation in exterior walls is selecting the right product for your project. ROCKWOOL exterior wall insulation products can be used in various applications and with many cladding types to maximize and cater performance to a specific project. With numerous stone wool products available, you will find insulation options for your project that support optimizing system cost, wall thickness, fire performance, acoustic performance, and thermal performance.

All ROCKWOOL exterior wall insulation products are:

- Noncombustible and fire resistant
- Sound absorbent
- Vapor permeable and moisture resistant

With most pre-engineered cladding attachment systems (e.g., clips or girts), semi-rigid ROCKWOOL Cavityrock is typically appropriate. However, when long screws through strapping and insulation cladding support systems are used, or in other applications where a more rigid board is preferred, ROCKWOOL Comfortboard is recommended. For a quick reference to identify which stone wool products are best suited for specific cladding attachment strategies, see Table 3.

To learn more about each product and its unique features, see Table 4 (p. 46).

Not all building materials are created equal. ROCKWOOL products are created by nature. See how stone wool insulation helps build safer, healthier, and more climate-resilient communities on page 32.

Recommended Stone Wool Insulation Product Based on Cladding Attachment Strategy

Table 3. ROCKWOOL Solutions For Various Cladding Attachments

|              | Continuous Framing (Z-Girts) | Clip and Rail Systems | Long Screws Through Strapping and Insulation | Masonry Ties |
|--------------|------------------------------|-----------------------|----------------------------------------------|--------------|
| Cavityrock   | ●                            | ●                     |                                              | ●            |
| Comfortboard |                              |                       | ●                                            | ●            |

Cost-Conscious Systems

Talk to your local ROCKWOOL representative for support in designing cost-effective systems that can help you meet (or come in under) your budget goals: [rockwool.com/salesrelocator](https://rockwool.com/salesrelocator).



# ROCKWOOL Stone Wool Exterior Wall Insulation Products

For a more detailed breakdown based on wall assembly or chosen cladding attachment strategy, go to **page 60**.

Table 4. Product Summary Table

|                   | Application                                                                         | Insulation Type                | Description            | Key Features                                                                                                                                                                                                                                                    | Cladding Attachment Considerations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|-------------------------------------------------------------------------------------|--------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cavityrock®       |    | Continuous Exterior Insulation | Semi-rigid Board       | A noncombustible stone wool product designed for reliable long-term thermal performance and enhanced acoustical comfort along with vapor permeance and moisture resistance for a durable enclosure                                                              | <ul style="list-style-type: none"><li>Approved for use in NFPA 285 compliant designs</li><li>Optimized density for use in between cladding attachment support systems</li><li>Able to form fit between girts, clips and masonry ties to create a tight and complete fit</li><li>Available in a dual density with a high-density outer layer for improved impact resistance and a lower density inner layer for reduced weight and conformance to wall irregularities</li></ul> <ul style="list-style-type: none"><li>Install between cladding attachments, such as continuous framing, clip and rail systems, and masonry ties</li></ul> <a href="https://rockwool.com/cavityrock">rockwool.com/cavityrock</a> ®                                                                               |
| Cavityrock® Black |   | Continuous Exterior Insulation | Faced Semi-rigid Board | A noncombustible black mineral-fiber faced stone wool product designed for reliable long-term thermal performance and enhanced acoustical comfort along with vapor permeance and moisture resistance for a durable enclosure                                    | <ul style="list-style-type: none"><li>Chemically bonded black mat fleece facing for open-joint cladding systems that creates the appearance of crisp, black lines behind the cladded assembly</li><li>Facing is designed for exposure to the elements, including weather, heat, and UV</li><li>Available in a dual density with a high-density outer layer for improved impact resistance and a lower density inner layer for reduced weight and conformance to wall irregularities</li></ul> <ul style="list-style-type: none"><li>Install between cladding attachments, such as continuous framing, clip and rail systems, and masonry ties</li><li>Specifically designed for use with open-joint cladding</li></ul> <a href="https://rockwool.com/cavityrock">rockwool.com/cavityrock</a> ® |
| Comfortboard® 80  |  | Continuous Exterior Insulation | Rigid Board            | A noncombustible rigid stone wool product designed for continuous exterior insulation assemblies with minimal penetrations to reduce thermal bridging, offering enhanced acoustical comfort, vapor permeance and moisture resistance for the building enclosure | <ul style="list-style-type: none"><li>High compressive resistance suitable for long screw cladding attachment systems</li><li>Certified by the California State Fire Marshal's Building Materials Listing Program (BML)</li></ul> <ul style="list-style-type: none"><li>Use with methods requiring higher compressive strength, such as attachment methods that use long screws through strapping and insulation</li></ul> <a href="https://rockwool.com/comfortboard80">rockwool.com/comfortboard80</a> ®                                                                                                                                                                                                                                                                                     |
| Comfortboard® 110 |  | Continuous Exterior Insulation | Rigid Board            | A noncombustible rigid stone wool product designed for continuous exterior insulation assemblies using long screws through strapping and insulation cladding support systems in residential and commercial construction                                         | <ul style="list-style-type: none"><li>High compressive resistance suitable for long screw cladding attachment systems</li><li>Approved for use in NFPA 285 compliant designs</li><li>Certified by the California State Fire Marshal's Building Materials Listing Program (BML)</li></ul> <ul style="list-style-type: none"><li>Use with methods requiring higher compressive strength, such as screws through strapping and insulation or other methods that require enhanced mechanical properties</li></ul> <a href="https://rockwool.com/comfortboard110">rockwool.com/comfortboard110</a> ®                                                                                                                                                                                                |
| Comfortbatt®      |  | Stud Cavity Insulation         | Semi-rigid Batt        | A noncombustible, semi-rigid stone wool batt insulation for exterior wall (wood and steel stud) applications where thermal performance and excellent sound absorbency are needed                                                                                | <ul style="list-style-type: none"><li>Features a unique, flexible edge designed to compress and spring back as the batt is inserted between studs to completely fill the cavity; this flexibility ensures the expected R-value is achieved and maintained</li><li>GREENGUARD Gold Certified and contributes to a healthier indoor environment</li></ul> <a href="https://rockwool.com/comfortbatt">rockwool.com/comfortbatt</a> ®                                                                                                                                                                                                                                                                                                                                                              |

## Typical Applications

ROCKWOOL stone wool insulation can be used in many applications. The most common and ideal applications use the interior, split, and exterior insulation approaches.

For examples of how these ROCKWOOL stone wool insulated wall systems can meet typical fire rating and acoustic performance targets, refer to **Table 5** and **Table 6 (p. 52)**.

### Interior-Insulated Wall Assembly

Interior-insulated assemblies can achieve improved thermal performance by using ROCKWOOL Comfortbatt within the stud cavity as the higher density batts reduce airflow within the wall cavity, thereby reducing convective losses. Refer to **page 22** to better understand R-values and thermal bridging effects.

#### Shown from exterior to interior:

1. Exterior cladding
2. Drainage and ventilation gap
3. WRB and air barrier membrane
4. Sheathing
5. Wood framing
6. Comfortbatt
7. Vapor retarder/barrier\*
8. Interior finishes

\*A vapor retarder/barrier may be required in the wall assembly, depending on the project-specific location and use.



### Need Support?

The ROCKWOOL Technical Services team is available to help you establish informed, project-specific design goals and determine the right products and assemblies for your next project.

Contact us at [techservice@rockwool.com](mailto:techservice@rockwool.com)

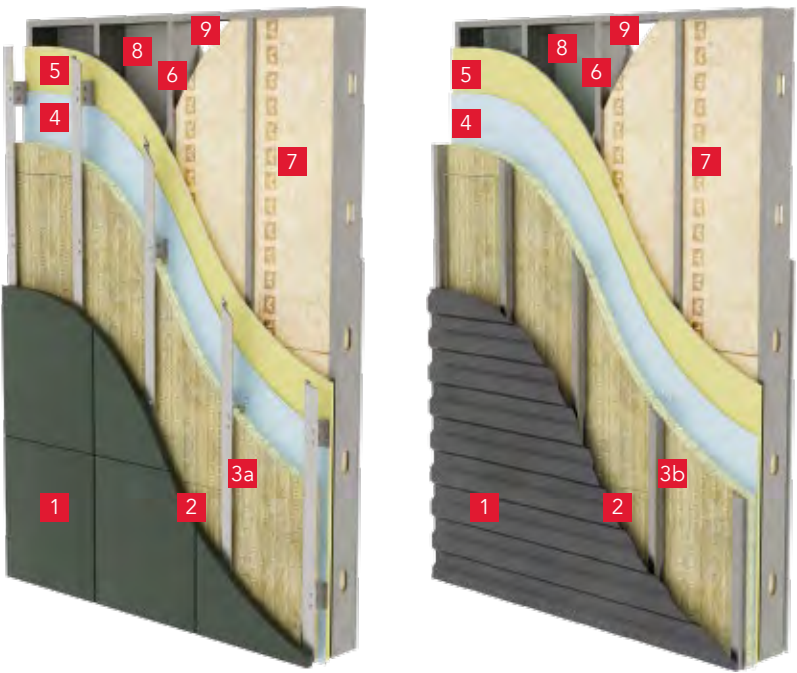
### Split-Insulated Wall Assembly

Split-insulated assemblies capitalize on the existing thickness of the stud cavity by using stud cavity insulation. With the addition of continuous exterior insulation, the assembly can achieve improved thermal resistance, and fire and acoustic targets while optimizing the wall thickness.

#### Shown from exterior to interior:

1. Exterior cladding
2. Drainage and ventilation gap
3. Continuous exterior insulation
  - a. Cavityrock with clip and rail cladding attachment system
  - b. Comfortboard with long-screw and strapping attachment system
4. WRB and air barrier membrane
5. Exterior gypsum board sheathing
6. Framing
7. Comfortbatt
8. Vapor retarder/barrier\*
9. Interior finishes

\*A vapor retarder/barrier may be required in the wall assembly, depending on the project-specific location and use.

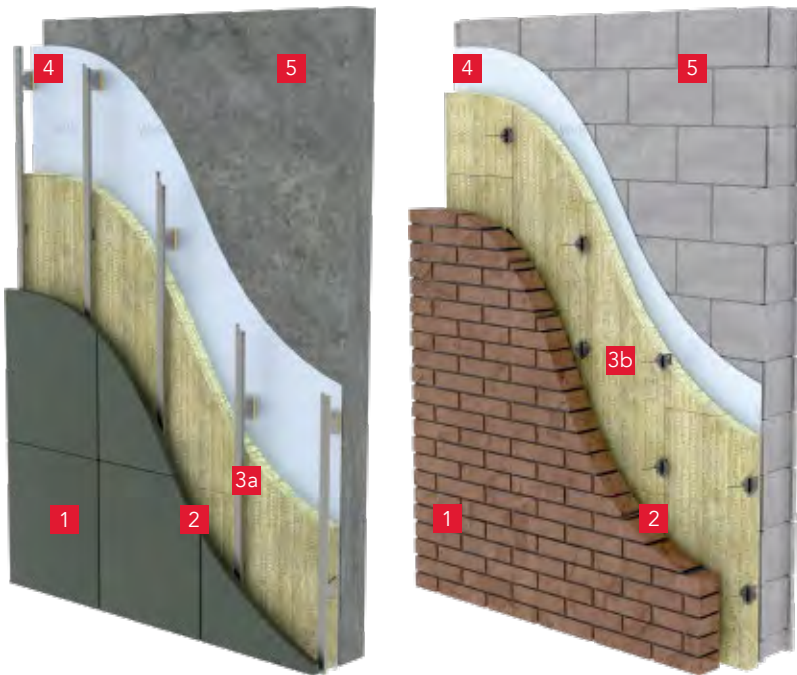


### Exterior-Insulated Wall Assembly

Exterior-insulated wall assemblies are simple, robust and have limited inherent risks. Using Cavityrock or Comfortboard as the continuous exterior insulation allows “The Perfect Wall” (see **Figure 3 p. 15**), simplifying the placement of control layers and the design of the wall assembly.

#### Shown from exterior to interior:

1. Exterior cladding
2. Drainage and ventilation gap
3. Continuous exterior insulation
  - a. Cavityrock with clip and rail cladding attachment system
  - b. Cavityrock with masonry anchors and ties
4. WRB and air barrier membrane
5. Backup wall



## Solutions for Any Backup Wall System and Cladding Type

Cavityrock and Comfortboard insulation products are installed outboard of the building enclosure's backup wall structure and can support myriad cladding attachment solutions, so the availability of wall cavity space does not limit the design or installation. Therefore, ROCKWOOL stone wool insulation can be used on mass timber walls, steel-and wood-framed walls, concrete walls, or CMU construction and with an array of cladding options as shown in **Figure 11**.

Backup walls with irregularities, such as CMU backup walls and reclads for existing buildings with irregular sheathing surfaces, may benefit from the use of Cavityrock continuous exterior insulation products.

The lower inner-layer density of this product helps it conform to the backup wall for a better fit compared to other types of rigid insulations.

Backup wall construction will affect choices related to insulation strategy and design. In most cases, solid backup walls, such as mass timber panels, concrete, and CMU, will require continuous exterior insulation. Steel- and wood-framed stud walls include a cavity, which gives the option to place the insulation at the exterior, within the stud cavity, or a combination of both, depending on building code and project-specific performance requirements.

The cladding system, including its weight, will determine the suitable attachment method and ROCKWOOL stone wool product. See **Table 7 (p. 60)** to learn more.



**Figure 11.** Backup wall structure examples: A) steel stud-framed wall with Comfortbatt and Comfortboard, B) wood-framed wall with Comfortbatt and Comfortboard, C) mass timber wall with Cavityrock, D) CMU wall with Cavityrock

## CASE STUDY

# Origine Québec City, QC



The 13-story, 92-unit residential tower consists of a 12-floor solid wood structure (glue-laminated timber and cross-laminated timber) supported by a concrete podium.

**Product:** Comfortboard 110 (3.5" thickness – two layers)

**Why ROCKWOOL:** Fire safe, sound absorbent, moisture resistant, sustainable

**Building Type:** Multi-family Residential

**Certification:** LEED Silver

[View full case study<sup>®</sup>](#)



Table 5. Fire-Rated Wall Assemblies Summary

| Design Numbers             | Interior Sheathing           | Studs                   | Stud Cavity Insulation    | Exterior Sheathing                     | Water-Resistive Barrier                                                                                                                                        | Continuous Exterior Insulation    | Cladding                                                                                                                                                                                 | Fire Rating |
|----------------------------|------------------------------|-------------------------|---------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| RI/MFF-60-01<br>(Intertek) | 1 layer, 5/8" Type X gypsum  | Wood: 2" × 4"           | 3.5" ROCKWOOL Comfortbatt | 7/16" OSB                              | Henry Blueskin VP or SA over primer                                                                                                                            | 1.5" ROCKWOOL Comfortboard 80     | HardiePlank over wood furring strips                                                                                                                                                     | 1 hour      |
| RI/MFF 60-02<br>(Intertek) | 1 layer, 5/8" Type X gypsum  | 20-gauge steel – 3 5/8" | 3.5" ROCKWOOL Comfortbatt | 5/8" Type X gypsum                     | Henry Blueskin VP or SA over primer                                                                                                                            | 2" ROCKWOOL Cavityrock            | 29-gauge steel installed over Z-bar channels over Cascadia Clips                                                                                                                         | 1 hour      |
| B1067-1g<br>(QAI)          | 1 layer, 5/8" Type X gypsum  | Wood: 2" × 4"           | 3.5" ROCKWOOL Comfortbatt | 1/2" Plywood or gypsum sheathing grade | <div><div>• As per site requirement and the applicable code</div><div>• Acceptable/not limited to:<div>• Henry Blueskin VP or SA over primer</div></div></div> | 1.5" ROCKWOOL Comfortboard 80/110 | <div><div>• Any cladding type (terracotta plank, fiber cement, stucco or wood based)</div><div>• Acceptable/not limited to:<div>• HardiePlank over wood furring strips</div></div></div> | 1 hour      |
| B1067-1h<br>(QAI)          | 2 layers, 5/8" Type X gypsum | Wood: 2" × 4"           | 3.5" ROCKWOOL Comfortbatt | 1/2" Plywood or gypsum sheathing grade | <div><div>• As per site requirement and the applicable code</div><div>• Acceptable/not limited to:<div>• Henry Blueskin VP or SA over primer</div></div></div> | 4" ROCKWOOL Comfortboard 80/110   | <div><div>• Any cladding type (terracotta plank, fiber cement, stucco or wood based)</div><div>• Acceptable/not limited to:<div>• HardiePlank over wood furring strips</div></div></div> | 2 hour      |

For more information on the assemblies listed here and other fire-related wall assembly options, visit [rockwool.com/fire-rated-assemblies](https://rockwool.com/fire-rated-assemblies).

Table 6. Acoustic (OITC and STC) Tested Assemblies Summary

| Report Number      | Interior Sheathing          | Studs                   | Stud Cavity Insulation    | Exterior Sheathing    | Air Barrier | Continuous Exterior Insulation | Outdoor-Indoor Transmission Class (OITC) | Sound Transmission Class (STC) |
|--------------------|-----------------------------|-------------------------|---------------------------|-----------------------|-------------|--------------------------------|------------------------------------------|--------------------------------|
| H5383.04-113-11-R0 | 1 layer, 5/8" Type X gypsum | 25-gauge steel – 3 5/8" | 3.5" ROCKWOOL Comfortbatt | 1 layer, 5/8" gypsum  | Yes         | 2" ROCKWOOL Comfortboard 110   | 33                                       | 52                             |
| H5383.03-113-11-R0 | 1 layer, 5/8" Type X gypsum | 25-gauge steel – 3 5/8" | 3.5" ROCKWOOL Comfortbatt | 1 layer, 5/8" gypsum  | Yes         | 2" ROCKWOOL Cavityrock         | 32                                       | 49                             |
| H5383.05-113-11-R0 | 1 layer, 5/8" Type X gypsum | 25-gauge steel – 3 5/8" | 3.5" ROCKWOOL Comfortbatt | 1 layer, 5/8" gypsum  | Yes         | 1" ROCKWOOL Comfortboard 110   | 32                                       | 51                             |
| H5383.06-113-11-R0 | 1 layer, 5/8" Type X gypsum | 25-gauge steel – 3 5/8" | N/A                       | 1 layer, 1/2" gypsum  | Yes         | 1" ROCKWOOL Comfortboard 110   | 30                                       | 43                             |
| H5383.02-113-11-R0 | 1 layer, 5/8" Type X gypsum | 25-gauge steel – 3 5/8" | 6" ROCKWOOL Comfortbatt   | 1 layer, 1/2" plywood | Yes         | 1.5" ROCKWOOL Comfortboard 80  | 29                                       | 39                             |
| H5383.01-113-11-R0 | 1 layer, 5/8" Type X gypsum | 25-gauge steel – 3 5/8" | 6" ROCKWOOL Comfortbatt   | 1 layer, 1/2" plywood | Yes         | N/A                            | 27                                       | 35                             |

For more acoustic wall assembly options using ROCKWOOL stone wool insulation, visit [ROCKWOOL Acoustic Wall Assemblies Catalog](#).





# Cladding Attachment Solutions Overview

|                                      |    |
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| Cladding Attachment Strategies Table | 60 |
| Structural Considerations            | 62 |
| Understanding Cladding Weights       | 63 |
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# Cladding Attachment Solutions Overview

Cladding systems and attachments through continuous exterior insulation are key considerations for limiting energy loss through exterior-insulated wall assemblies. Exterior cladding resists structural loads to maintain their performance, transferring these loads back to the primary building structure, which means bridging layers of continuous exterior insulation. With thermal efficiency top of mind, greater attention is being paid to cladding attachment design.

Several generic and proprietary cladding attachment systems have been introduced into the market in recent years to provide attachment solutions. A common challenge for designers is selecting and evaluating a project-specific cladding attachment strategy, including the continuous exterior insulation, and understanding the implications of these decisions. Refer to the sidebar titled “Common Cladding Attachment System Considerations” and read on to learn more about the resources and solutions ROCKWOOL stone wool products provide for simplifying attachment design.



This section provides an overview of cladding attachments; however, refer to the **ROCKWOOL Cladding Attachment Solutions Guide**® and the **ROCKWOOL Commercial New Construction Builder's Guide**® for more information.



## Cladding Attachment Strategies

Numerous generic and proprietary cladding support systems designed for use with continuous exterior insulation are available on the market today. Many different materials are used to make these systems, including galvanized steel, stainless steel, aluminum, fiberglass, and plastic. The four main cladding attachment strategies are described in Table 7 (p. 60).

### Common Cladding Attachment System Considerations

- Cladding weight and gravity loads
- Wind loads
- Seismic loads
- Backup wall construction (e.g., wood, concrete, CMU, steel framing)
- Attachment that points back into the structure (through studs, sheathing or slab edge)
- Thickness of continuous exterior insulation
- Attachment method
- Ability to fasten cladding supports directly through the face of rigid insulation boards
- Ability to fit insulation tightly around discrete supports and ease of installation
- Effective R-value target and tolerable thermal efficiency loss from supports
- Orientation and required attachment location for cladding system (e.g., vertical, horizontal)
- Details for attachment of cladding at corners, returns, and penetrations
- Combustibility requirements
- Accommodation of dimensional tolerance
- Allowable wall thickness

# Thermal Performance Impacts

Cladding attachment design, material, and fastener frequency will impact how much of the continuous exterior insulation's R-value is maintained once the cladding attachment system is complete. **Table 7 (p. 60)** summarizes the thermal performance of various cladding support strategies and the range of thermal effectiveness of the continuous exterior insulation. These percentages can be multiplied by the R-value of the continuous exterior insulation and added to the backup wall R-value to determine an approximate overall effective R-value for the wall assembly.

The range of values in **Table 7 (p. 60)** encompasses typical support structure spacing when attached to steel stud, concrete, and wood backup walls for a range of typical claddings. The percent insulation effectiveness also decreases with thicker amounts of continuous exterior insulation. These values were determined using calibrated 3D thermal modeling software. Each of the systems was modeled using the same set of assumptions, boundary conditions, and material property inputs.

Manufacturers of pre-engineered cladding attachment systems will also be able to provide their own published data. Because many cladding attachment systems are engineered and designed using structural load tables and attachment guidance developed

by the cladding manufacturer, it is important that the cladding support designer also understands the thermal performance requirement of the project. With this understanding, the designer can optimize the system and spacing of supports to make the best use of the continuous exterior insulation. For thermal performance, the best system is one that optimizes the cladding support needs of the system and minimizes thermal bridges and thermal bridging materials.

## Do You Need to Consider Wind-Washing Effects?

Wind washing is air movement driven by wind pressures through or behind the thermal insulation within enclosures. Wind-washing airflows are driven by wind-induced air pressure differences, which form over the face of a building (pressure gradients). Tall buildings and exposed sites experience the highest wind speeds.

This bulk movement of air increases heat loss, resulting in more energy consumption, a greater risk of condensation on cooled surfaces, and higher space heating/cooling loads.

A continuous exterior insulation, such as those available from ROCKWOOL, can limit the effects of wind washing when the insulation is appropriately installed with board joints butted tight and the insulation is secured tightly to the backup wall.

For additional information on wind washing, refer to the **Summary Report of Air Permeable Insulation and Wind Washing**.



### Reminder

For ROCKWOOL Cavityrock installed in an engineered cladding attachment solution, we recommend designers obtain both thermal and structural performance validation from the attachment product's manufacturer to ensure the proposed solutions meet the installer's and client's needs.

Additionally, our ROCKWOOL Building Science team can assist with optimizing the energy efficiency of building designs by providing a comprehensive service that evaluates and assesses the thermal performance of multiple cladding attachment systems.

Visit [rockwool.com/building-science-support](https://rockwool.com/building-science-support).



## CASE STUDY

# University of Victoria Victoria, BC



The 333,681 ft.<sup>2</sup> mixed-used complex consists of two buildings: mass timber and concrete structures.

**Products:** Cavityrock  
(8" thickness – two 4" layers)

**Why ROCKWOOL:** Fire safe, moisture resistant, durable, sustainable

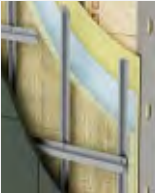
**Building Type:** Mixed-use – Institutional

**Certification:** LEED v4 Gold (Target),  
Passive House (Target)

[View full case study](#)



Table 7. Cladding Attachment Strategies and R-Value Effectiveness for Metal Stud Framing

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------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| <div><b>Clip and Rail Systems</b><p>Clip and rail systems have intermittent clips attached to the structure with a continuous girt (i.e., rail) to serve as a substrate for cladding attachment.</p><p>Horizontal or vertical rails are typically made from galvanized steel Z-girt or hat-channel sections or aluminum extrusions.</p><p>Clips are at intermittent attachment points back to the structure and are made from a range of materials, including galvanized steel, stainless steel, aluminum, fiberglass, plastic or some combination of these materials. Only the clips bridge through the insulation.</p></div> <div><b>Recommended insulation product</b><br/><b>ROCKWOOL Cavityrock</b><br/>Alternates: ROCKWOOL Comfortboard</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <div><b>Continuous Framing</b><p>Continuous-framing cladding support systems are typically composed of Z-shaped girts directly attached to the structure.</p><p>Girts typically consist of continuous galvanized steel framing members, generally 18- to 20-gauge Z-girt or C-channel profiles, or proprietary fiberglass framing options.</p></div> <div><b>ROCKWOOL Cavityrock</b><br/>Alternates: ROCKWOOL Comfortboard</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <div><b>Long Screws Through Strapping and Insulation</b><p>This system uses long fasteners that connect the strapping outboard of the exterior of rigid insulation (Comfortboard) directly into the building structure or backup wall framing.</p><p>The combination of the continuous exterior strapping/girts, long fasteners, and rigid insulation creates a truss system to support lightweight to medium-weight cladding systems.</p><p>Strapping is usually treated wood furring strips or metal hat channels.</p></div> <div><b>ROCKWOOL Comfortboard</b></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <div><b>Masonry Ties</b><p>Masonry veneer cladding is supported by gravity-bearing supports (shelf angles, corbels, etc.) and intermittent ties for lateral and out-of-plane support.</p><p>A range of proprietary and generic masonry tie systems is available in the market and includes both metal and low-conductivity materials.</p></div> <div><b>ROCKWOOL Cavityrock</b><br/>Alternates: ROCKWOOL Comfortboard</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <div><b>Attachment Type</b><p><b>Design Considerations</b></p><ul style="list-style-type: none"><li>• More thermally efficient due to reduced thermal bridging of attachment through insulation</li><li>• The less conductive the clip material and the fasteners that penetrate the insulation, the more thermally efficient the system</li><li>• Maximize the spacing to optimize system performance and cost</li><li>• Cladding wind loads and stiffness of the rail system typically govern the spacing of the system clips; however, constructability considerations such as available backup wall framing can also impact spacing</li><li>• Spacing can be maximized to optimize system performance and cost</li></ul></div> <div><div></div><div>Galvanized steel clips<br/>Percent Insulation Effectiveness<br/> 50%–75%</div></div> <div><div></div><div>Stainless steel clips<br/>Percent Insulation Effectiveness<br/> 65%–90%</div></div> <div><div></div><div>Thermally isolated galvanized clips<br/>Percent Insulation Effectiveness<br/> 60%–90%</div></div> <div><div></div><div>Fiberglass clips<br/>Percent Insulation Effectiveness<br/> 70%–95%</div></div> | <div><p><b>Design Considerations</b></p><ul style="list-style-type: none"><li>• Low-conductivity girts such as fiberglass provide better thermal performance</li><li>• High-conductivity girts will require greater insulation thicknesses to achieve target thermal performance</li><li>• Often easier to install than other attachment strategies</li><li>• Moderate cost consideration when single girts used, but crossing-girt options increase system cost</li><li>• Crossing-girt options accommodate cladding orientation needs while maintaining initial girt alignment with backup wall framing</li><li>• Maintain drainage at the backside of the cladding for long-term attachment and cladding durability</li></ul></div> <div><div></div><div>Vertical Z-girts<br/>Percent Insulation Effectiveness<br/> 20%–40%</div></div> <div><div></div><div>Horizontal Z-girts<br/>Percent Insulation Effectiveness<br/> 30%–50%</div></div> <div><div></div><div>Crossing Z-girts<br/>Percent Insulation Effectiveness<br/> 40%–60%</div></div> | <div><p><b>Design Considerations</b></p><ul style="list-style-type: none"><li>• Can be the most thermally efficient system because it has minimal thermal bridging through the insulation due to the screws</li><li>• The thermal performance of this system depends on the backup wall, the type of fastener, and the fastener spacing</li><li>• Strapping fastening patterns for ROCKWOOL rigid board insulation are specified based on the backup assembly and project-specific loads (weight of cladding) — reference Table 8 for steel stud fastening recommendations</li><li>• Long-screw fasteners must penetrate framing members like studs or approved structural wood-based sheathing, which affects the potential horizontal spacing of the fasteners and strapping</li></ul></div> <div><div></div><div>Long screws through strapping and insulation<br/>Percent Insulation Effectiveness<br/> 75%–95%</div></div> | <div><p><b>Design Considerations</b></p><ul style="list-style-type: none"><li>• Thermal efficiency ranges depend on the number of ties, tie type, and metal type used</li><li>• Wedges or clips installed over masonry anchors and ties can be used to secure ROCKWOOL semi-rigid or rigid stone wool boards to the backup wall</li><li>• The exact type and spacing of masonry anchors or ties should be determined based on the project-specific requirements and by the anchor or tie manufacturer’s recommendations</li><li>• If the masonry anchors or ties do not include an insulation retention system, the insulation boards should be attached using the designs indicated for plain board insulation</li><li>• ROCKWOOL board insulation should conform around the ties and the backup wall</li></ul></div> <div><div></div><div>Wedges or clips over masonry anchors and ties<br/>Percent Insulation Effectiveness<br/> 40%–90%</div></div> |

Did You Know?

While stainless steel is more than 4 times less conductive than galvanized steel and therefore more thermally efficient, fiberglass is approximately 200 times less conductive than galvanized steel. When used within a cladding attachment system, it can significantly improve thermal performance over metal-based attachment systems.

Structural Considerations

ROCKWOOL board insulation products can be installed over various substrates in different applications. The semi-rigid and rigid board insulation are most commonly installed as a component of a cladding attachment system.

While semi-rigid insulation installed tight against clips, girts or rails is supported to some degree by these components, only the insulation fasteners and impaling pins provide permanent support for the insulation to the wall structure. Alternatively, in some systems (i.e., systems with long screws through strapping and insulation), the insulation aids in the structural support for the cladding. The number of fasteners needed to secure insulation boards to the building structure is based on the cladding attachment system strategy and project-specific loads.

For these reasons, the installation of ROCKWOOL boards will vary depending on the project-specific application and type of cladding attachment system. A qualified design professional should determine and approve the type and number of fasteners required. When proprietary cladding attachment systems are used, the recommendations from the manufacturer of the cladding attachment system should be followed and include a project-specific evaluation performed by a qualified professional.

When screws through strapping and insulation is considered for cladding attachment, or in other applications where a more rigid board is preferred, Comfortboard is recommended, as indicated in **Table 8**.

Refer to the **Performance of Strapping Attachment on Walls With Long Screws Through ROCKWOOL Rigid Insulation®** technical bulletin for wood-framed wall assemblies.



Table 8. Strapping Attachment Estimates by Cladding Weight for Steel Studs Spaced 16" O.C.

| Insulation            | Cladding Weight                                        | Insulation Thickness | Minimum Screw Diameter | Maximum Vertical Screw Spacing | Minimum Screw Embedment Into Receiving Studs | Minimum Strapping Size           |
|-----------------------|--------------------------------------------------------|----------------------|------------------------|--------------------------------|----------------------------------------------|----------------------------------|
| ROCKWOOL Comfortboard | Light weight cladding                                  | Up to 3"             | #12                    | 16"                            | Through stud flange                          | 7/8" × 1 1/4" 20-gauge hat track |
|                       | < 5 lbs./ft. <sup>2</sup>                              | > 3" to 6"           |                        | 12"                            |                                              |                                  |
| ROCKWOOL Comfortboard | Medium weight cladding                                 | Up to 3"             | #12                    | 12"                            | Through stud flange                          | 7/8" × 1 1/4" 20-gauge hat track |
|                       | 5 lbs./ft. <sup>2</sup> to < 10 lbs./ft. <sup>2</sup>  | > 3" to 6"           |                        | 10"                            |                                              |                                  |
| ROCKWOOL Comfortboard | Heavy weight cladding                                  | Up to 3"             | #14                    | 12"                            | Through stud flange                          | 7/8" × 1 1/4" 20-gauge hat track |
|                       | 10 lbs./ft. <sup>2</sup> to < 15 lbs./ft. <sup>2</sup> | > 3" to 6"           |                        | 8"                             |                                              |                                  |
| ROCKWOOL Comfortboard | Very Heavy weight cladding                             | Up to 3"             | #14                    | 6"                             | Through stud flange                          | 7/8" × 1 1/4" 20-gauge hat track |
|                       | > 15 lbs./ft. <sup>2</sup>                             | > 6" to 9"           |                        | 6"                             |                                              |                                  |

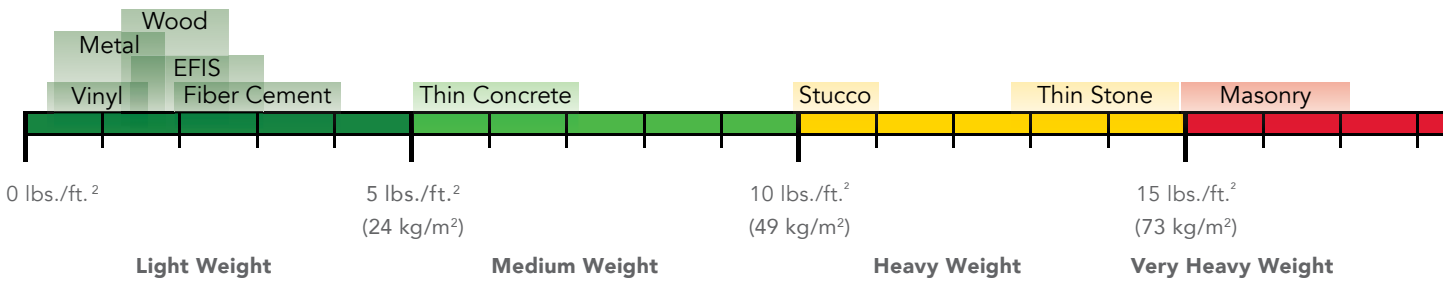


Figure 12. Approximate weights and classifications for common cladding types

Understanding Cladding Weights

Cladding weights vary by cladding type and are generally categorized into these four categories for the purposes of structural calculations: light, medium, heavy, and very heavy.

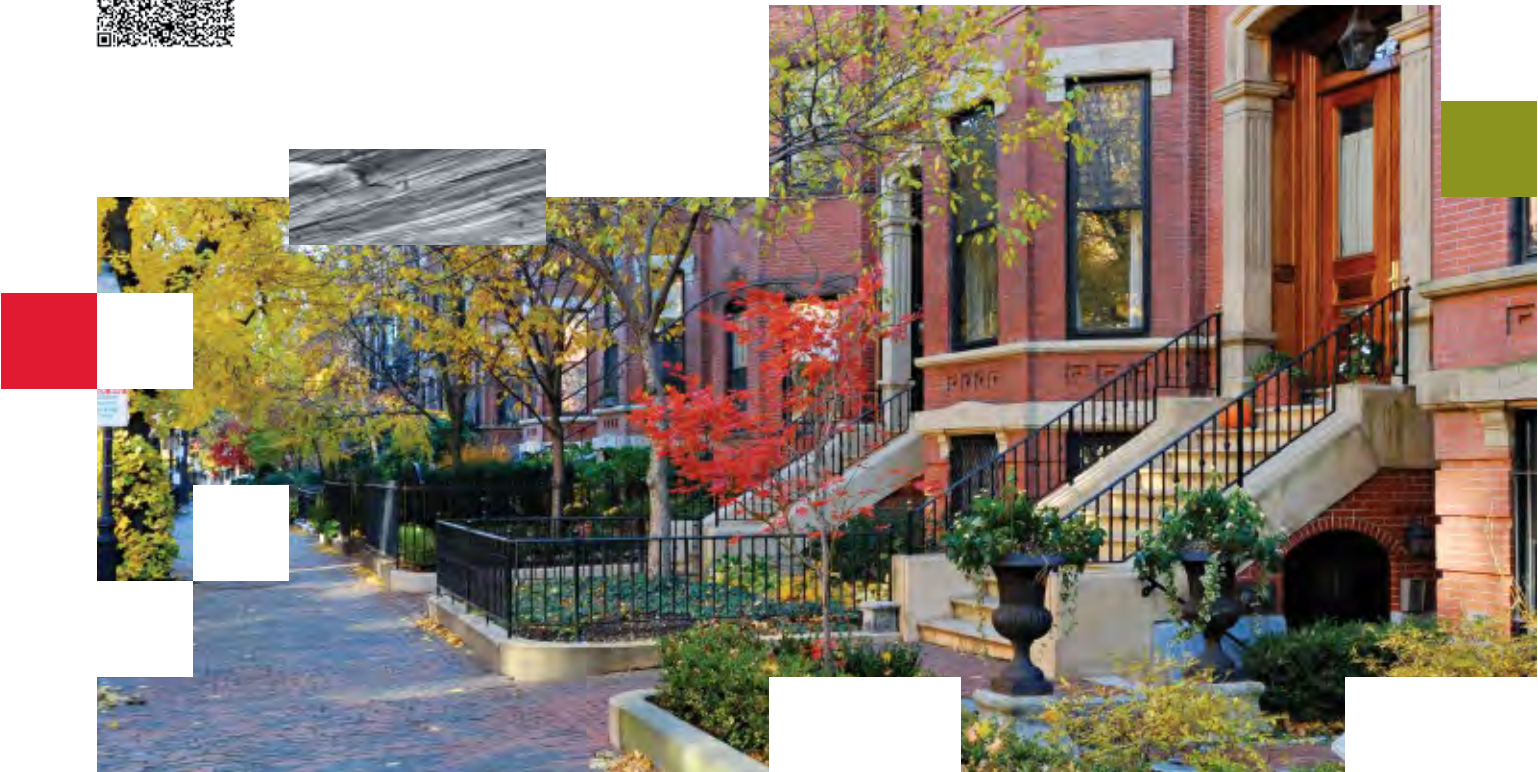
The approximate weight and category for various common cladding types are shown in **Figure 12**. Each cladding type will have different weights for different brands and cladding arrangements, so the project-specific cladding weight should be determined from product technical data.

For more information on the attachment considerations presented in **Table 8** and on determining a project-specific attachment solution, refer to the **Cladding Attachment Solutions Guide®**.



Reminder

To use Comfortboard installed with long screws through strapping and insulation, consult with a designer to determine approved project-specific attachment requirements. This approval will include an evaluation of the project-specific wind loads, cladding weight, backup wall material properties, attachment products, and other important variables.



Fastener Guidelines

Figure 13 shows various fastener types used for insulation support. The dimension of the insulation boards and the cladding attachment system dictates the minimum number of attachments required and their fastening pattern. As general guidance, when mechanical fasteners alone are used to support semi-rigid and rigid stone wool insulation boards, ROCKWOOL recommends a minimum of five attachments per board (see Figure 14). For the permanent attachment of stone wool board insulation, ROCKWOOL recommends the boards be attached using mechanical fasteners with minimum 2-inch diameter washers.

As general guidance for board attachment, it is recommended that attachments are:

- Chosen in accordance with the substrate type
- Capable of withstanding applied pullout and shear loads
- Numerous enough and of large enough cross-section to prevent tear-through of the insulation under expected conditions
- Sufficiently durable to withstand the environment to which they will be exposed for the lifetime of the installation

For additional information on fastener placement and permanent attachment of board insulation, refer to the **ROCKWOOL Board Insulation Attachment Guide**.



Figure 13. Types of fasteners used for insulation support



Figure 14. Illustration showing an example of a minimum of five attachments per board

Need support?

Each insulation attachment option comes with its own project-specific considerations. For help choosing the right solution for you, contact your ROCKWOOL sales rep. [rockwool.com/salesreplocator](https://rockwool.com/salesreplocator)



# ROCKWOOL Product and Application Documentation

Technical Data Sheets

- ROCKWOOL Cavityrock
- ROCKWOOL Cavityrock Black
- ROCKWOOL Comfortbatt (CA)
- ROCKWOOL Comfortbatt (US)
- ROCKWOOL Comfortboard 80
- ROCKWOOL Comfortboard 110

Technical Bulletins

- CAL Fire Listed Products (p. 29)
- Exposure to the Elements (p. 35)
- Insulating Movement Joints
- Performance of Strapping Attachment on Walls with Long Screws Through ROCKWOOL Rigid Insulation (p. 62)
- QAI Code Evaluation Report
- Resistance of ROCKWOOL Exterior Insulation to Ultraviolet Light (p. 37)
- Storage of ROCKWOOL Stone Wool Insulation
- Use of ROCKWOOL Stone Wool as a Thermal and Ignition Barrier (p. 16)

Technical Guides

- Cladding Attachment Solutions Guide (pp. 56 & 63)
- ROCKWOOL Board Insulation Attachment Guide (p. 64)

Installation Guide

- Commercial New Construction Builder's Guide: ROCKWOOL Cavityrock (p. 56)

Additional Documentation

- Designing to Meet NFPA 285 Requirements (p. 28)
- Dimensional Stability of Rigid Board Insulation Products (p. 37)
- Durability and Stone Wool Insulation Fact Sheet (p. 37)
- Environmental Product Declaration (EPD) (p. 37)
- Exterior Wall Solutions for Hot, Humid Climates Guide (p. 15)
- LEED Submittal Guide (p. 37)
- Moisture Durability of Stone Wool Insulation Report (p. 35)
- Passive House Solutions Guide (p. 25)
- ROCKWOOL Acoustic Wall Assemblies Catalog (pp. 17 & 53)
- ROCKWOOL Sustainable Project Solutions Guide (p. 24)
- Summary Report of Air Permeable Insulation and Wind Washing (p. 58)
- Sustainability Report (p. 38)
- Vapor Diffusion Guide (p. 15)

Visit our **Commercial Resource Library** to access all of our documentation to support the planning, design and installation of your commercial projects.



# ROCKWOOL Sales and Support

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- Effective thermal performance calculations
- 2D and 3D thermal modeling (THERM/HEAT3)
- Overall U-factor/effective R-value analysis
- Insulation detail review



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- Dew-point calculations



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[techservice@rockwool.com](mailto:techservice@rockwool.com)

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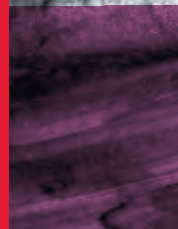
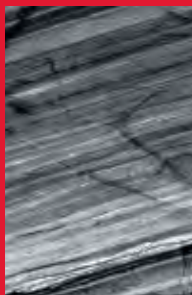
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