



**Good | Better | Best**

ROXUL® Solutions For Residential  
Thermal Applications in Canada

**ROXUL®**  
The Better Insulation™

# Good. Better. Best.



Most people like choices when deciding on the quality of building materials for their residential construction and renovation projects. This includes builders, contractors, and homeowners who appreciate a say in determining the effective R-value of their home’s thermal insulation. From meeting the specified minimum, to achieving R-values that will exceed building codes well into the future, it’s great to know you have options.

This thermal guide to ROXUL®’s **Good. Better. Best.** insulation solutions addresses various common residential applications, including exterior walls, attics, cathedral ceilings, crawl spaces and exposed floors using ROXUL thermal insulation.

## ROXUL’s Good. Better. Best. Thermal Insulation Guide

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**The Good:** For each application, we start by demonstrating how to meet the minimum R-value of insulation required according to the climate zone and building code of the region where you reside. As R-values vary by region, state, province, city and township, we always recommend checking with your local building code prior to starting your project.

**The Better:** Next, we show you how to achieve R-values that exceed the minimums. This may include installing insulation with a stated R-value that exceeds the minimum. In some cases, the BETTER solution utilizes more than one type of ROXUL insulation; when used in conjunction with each other, they exceed the minimum codes.

**The Best:** The R-value of insulation is worth considering to achieve optimum energy efficiency and improve the overall comfort of your home. When you choose the BEST solution, you are making a long-term commitment to the environment and energy savings well into the future.

Compared to other insulation like foam plastics and fibreglass, ROXUL stone wool ranks superior.

# What sets ROXUL® insulation apart from other insulation



## Fire resistant

The combination of stone wool and recycled content makes ROXUL® insulation fire resistant. This non-combustible product does not develop smoke or promote flame spread when exposed to fire, making ROXUL insulation a critical line of defense in fire protection. In fact, studies have shown that stone or mineral wool insulations provide a 54% increase\* in overall fire resistance rating compared to non-insulated walls.



## Water repellent

ROXUL insulation repels water and moisture, thereby maintaining its shape within the wall cavity for delivery of maximum sound and fire performance. ROXUL insulation will not corrode and does not promote fungi growth.



## Sag free, tight fit

The higher density of ROXUL insulation provides superior sag resistance and fit. Once installed, ROXUL insulation holds its shape without sagging or slumping in the wall cavity to provide continuous fire protection and thermal performance over time.



## Fast, easy installation

Working with ROXUL insulation is a breeze. Simply cut with a serrated knife for quick and easy installation between studs, around electrical boxes, pipes, wiring, ductwork and between studs and joists with non-standard widths.

\* Sultan, M.A. (1996), A Model for Predicting the Heat Transfer Through Non-insulated Unloaded Steel-Stud Gypsum Board Wall Assemblies Exposed to Fire, Institute for Research in Construction, National Research Council Canada, Ottawa, Ontario, Canada.

# ROXUL® thermal insulation for residential applications



**ROXUL COMFORTBOARD™ IS**

Rigid stone wool insulation board fastened to outside studs and fabricated to improve thermal performance to the building envelope.

**ROXUL COMFORTBATT™**

Thermal insulation for use in exterior walls, attics and crawlspaces. It provides indoor comfort and energy savings all year round.

**ROXUL ROCKFILL™**

Loose fill thermal insulation that is easy to apply over existing attic insulation. Pour, fluff to aerate and spread. No need to rent an expensive blowing machine required with other types of insulation.

**ROXUL DRAINBOARD®**

Rigid stone wool insulation board for fibrous foundation drainage. Its non-directional fibre structure means the boards can be installed either horizontally or vertically without any loss of drainage ability.

# What is R-value?

The term R-value confuses many homeowners. Technically, it is a unit of measure describing the resistance of heat flow through a material (e.g. insulation, stud, wallboard) or a wall assembly. Generally, the higher the R-value, the better the material/assembly at reducing heat loss (or heat gain). Many factors play a role in this transfer of heat, including other thermal bridging materials that come in contact with the insulation (e.g. studs, wallboard, vapour barrier, etc.), as well as humidity and variance of fluctuating daily temperatures.

## Effective R-values versus stated (nominal) R-values

People are often surprised at the difference between the commonly stated (nominal) R-value of insulation and the true, or effective R-value of the insulation within the wall assembly. This reflects the difference between controlled lab tests versus the real-world environment.

Just because the insulation package states R-28, it doesn't mean the insulation will perform like a R-28 wall/attic/floor. Much of this difference depends on the thermal bridging of the materials and structures involved in the attic/wall/floor assembly – studs, wallboard, vapour barrier, insulation, etc. These materials can increase or decrease the heat resistance; and ultimately, the effective R-value.

For example, wood studs slow heat transfer slightly better than higher conductive metal studs. High-density stone wool insulation resists heat loss better and achieves better energy performance than fibreglass insulation, which is less dense and less stable.

Humidity and fluctuating daily temperatures also influence the difference between nominal R-values and effective R-values.

Today's building codes are moving to mandate effective R-values over nominal R-values – and ROXUL® stone wool, because of its higher density and dimensional stability, leads the way as the interior and exterior insulation of choice for residential applications.

## Decreased thermal bridging equals a better performing wall

ROXUL insulation helps reduce thermal bridging through wood studs, leading to a better performing thermal wall. In a typical single-family building, wood studs make up 25% of the wall surface, so it's important to ensure the use of exterior insulation to complete the building envelope.

## Factors that contribute to superior thermal performance

With informed consumers and the building industry pushing for innovative solutions that are truly energy efficient, ROXUL raises the bar in developing wall systems with excellent long-term thermal performance. This is the result of two inherent properties in its insulating systems – lack of thermal loss due to dimensional changes, and the insulation's ability to repel water, which aids in the control of heat loss and gain.

As well, the use of ROXUL stone wool as a continuous insulation (c.i.) also contributes to a building envelope with higher effective thermal resistance values than foam plastics.

Made from stone wool, an inorganic combination of basalt and recycled slag, ROXUL insulation is thermally stable, maintaining its R-value over time. The insulation will not expand or contract due to humidity or temperature variance.

# Meeting the challenges of today's climate zones

## Building codes vary by province and climate zone

Keep in mind that building codes often differ by province and climate zone. The insulation solutions shown on the following pages represent applications based on specific locations and on current provincial building code regulations.

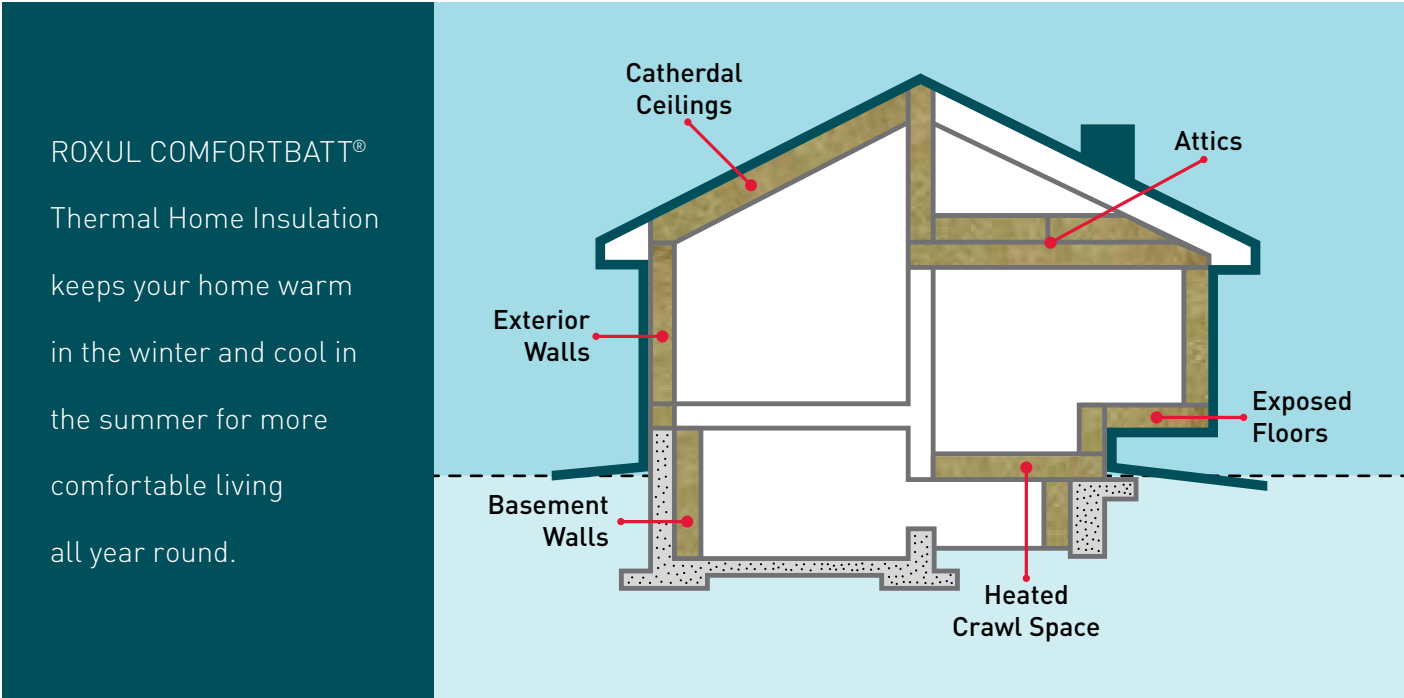
While R-value applications will differ depending on location, thermal preferences and financial considerations, one factor should remain invariable: the quality features of your insulation. *When compared to other insulation like foam plastics and fibreglass, ROXUL® stone wool ranks superior for soundproofing and fireproofing, as well as for ease of installation and long-term performance in wall systems, floors and attics.*

The following solutions are only suggested approaches to consider. Check with your local building code for specific details.

## ASHRAE – History of R-Value Requirements

The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), is an international Society of technical individuals who provide knowledge to the building industry on heating, ventilation, air conditioning, and refrigeration (HVAC&R). The Society developed ASHRAE 90.1, an energy conservation standard that provides the minimum requirements for energy efficient buildings. This standard, or an equivalent, is applied today in many states for commercial, government and high-rise and residential building applications.

In Canada, look to the National Building Code and refer to section A-5.3.1.2 for information on condensation and energy conservation standards.





# Thermal insulation systems for residential attic applications

To increase home comfort and save energy year round, start by reducing the heat loss through the attic, probably the most cost-effective area to add insulation.

Using ROXUL® thermal insulation, this can easily be done as a weekend project to insulate the attic portion of a new extension, or to increase the R-value and top up the current attic insulation, especially in an older home.

## R-50\*: The New Minimum R-Value Requirement for Attics



*Gaps and voids in the attic can account for up to 30% of the heat loss. Areas around pipe, wiring and attic vents are often neglected and can account for the majority of those gaps and voids. ROXUL ROCKFILL™ loose fill, top up attic insulation makes it easy because unlike other attic insulation, there is no blowing machine required, and installation can be done by hand.*

### Venting Your Attic

Before adding insulation, ensure proper venting in the attic, which is usually supplied by vents in the soffit. Inadvertently blocking the vents with insulation allows moist air to collect in the attic, which can cause wood rot and mildew. To avoid this, install rigid plastic/foam vents (baffles) over the soffit vent and staple the baffles in place.



### Good: R-50\*

CB R-22 + CB R-28 + ROCKFILL™ (as much as desired)

- 1 2" x 8" Roof Trusses
- 2 ROXUL COMFORTBATT® (R22)
- 3 ROXUL COMFORTBATT® (R28)
- 4 ROXUL ROCKFILL™
- 5 Vapour Control Layer\*

### Better: R-64

CB R-22 + CB R-28 + CB R-14 + ROCKFILL™ (as much as desired)

- 1 2" x 8" Roof Trusses
- 2 ROXUL COMFORTBATT® (R22)
- 3 ROXUL COMFORTBATT® (R28)
- 4 ROXUL COMFORTBATT® (R14)
- 5 ROXUL ROCKFILL™
- 6 Vapour Control Layer\*

### Best: R-72

CB R-22 + CB R-28 + CB R-22 + ROCKFILL™ (as much as desired)

- 1 2" x 8" Roof Trusses
- 2 ROXUL COMFORTBATT® (R22)
- 3 ROXUL COMFORTBATT® (R28)
- 4 ROXUL ROCKFILL™
- 5 Vapour Control Layer\*



# Thermal insulation systems for cathedral ceiling applications

When building a cathedral ceiling as a room renovation project or as the ceiling for an entire new home or cottage, it makes sense to start with the best solution possible if starting from scratch. This makes sense in colder climate zones since a cathedral ceiling, by its very design, lacks the optimum thermal performance when compared to a vented attic.

Regardless, in warmer climate zones, and from an aesthetic design perspective, many architects and homeowners opt for modern cathedral ceilings, and ROXUL COMFORTBATT® insulation can play an effective role in the good, better, best solution.

To increase the R-value of the cathedral ceiling, either start with 2 x 12 ceiling joists, or add a 2" furring strip to existing 2 x 10 joists, which gives a deeper joist cavity to add the COMFORTBATT insulation.

### Ceiling air space

When building a cathedral ceiling, the most important reminder is to properly maintain an air space of 63 mm (2 1/2") between the insulation and the sheeting. Check your local building code for specific recommendations.



### Zero Net Energy (ZNE) Residential Buildings

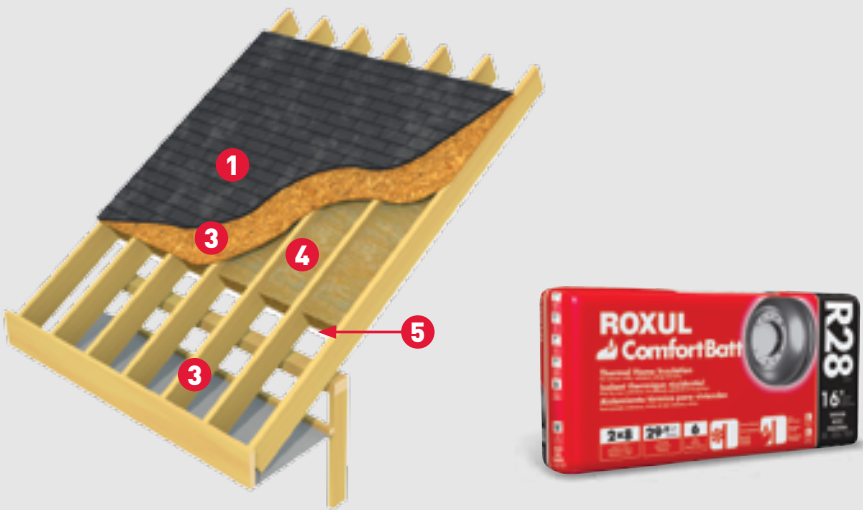
The critical steps to reduce a building's energy consumption usually occur during the design process. The development towards modern zero net energy (ZNE) buildings that take as little off the grid as possible, has become possible through sustainable products like ROXUL® stone wool insulation. All ROXUL products produced in the Milton facility contain a minimum of 40% recycled content.



## Good: R-28

CB R-28 + VB + Air Space  
(63 mm (2 1/2"))

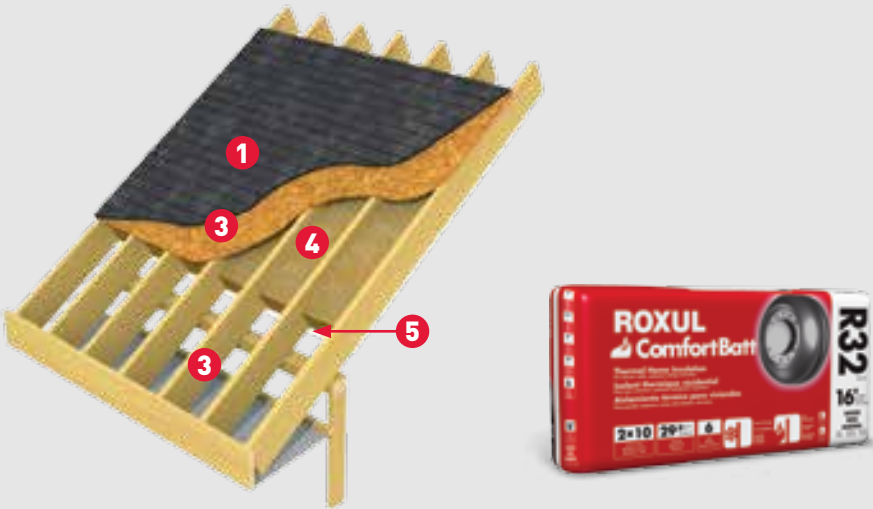
- 1 Shingles
- 3 Sheathing
- 3 2" x 10" Roof Trusses
- 4 ROXUL COMFORTBATT® (R28)
- 5 Vapour Control Layer\*



## Better: R-32

CB R-32 + VB + Air Space  
(63 mm / 2 1/2")

- 1 Shingles
- 3 Sheathing
- 3 2" x 10" Roof Trusses
- 4 ROXUL COMFORTBATT® (R32)
- 5 Vapour Control Layer\*



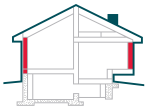
## Best: R-36

CB R-14 + CB R-22 + VB + Air Space  
(63 mm (2 1/2"))

- 1 Shingles
- 3 Sheathing
- 3 2" x 10" Roof Trusses
- 4 ROXUL COMFORTBATT® (R22)
- 5 ROXUL COMFORTBATT® (R14)
- 5 Vapour Control Layer\*



\*Check with your local building code for approved vapour barrier/retarder information.



# Thermal insulation systems for residential exterior wall applications

As society demands more energy-efficient houses, building codes and builders (and DIY homeowners) are responding by increasing the R-value of the building enclosure, in particular, the above-grade exterior wall. Given that the cavity of the standard 2 x 6 wood frame wall used in residential housing (new construction) is already filled with insulation, the clear path forward to higher R-values is to add layers of exterior insulation.

ROXUL COMFORTBOARD™ IS is a rigid stone wool insulation board fastened to the outside face of the exterior studs used in residential construction and designed to provide increased thermal performance to the building envelope.

As building codes adjust to increased effective R-value requirements, the need for insulated sheathing will increase accordingly, and COMFORTBOARD™ IS leads the way as the exterior insulation of choice for residential applications.

## What makes ROXUL COMFORTBOARD™ IS a superior exterior insulation sheathing

**More “Breathability” than Foam Plastics**  
COMFORTBOARD IS is a moisture resistant, yet vapour permeable insulation (30-40 perms) and will allow transient vapours to pass through without restriction. This unique vapour permeable quality of ROXUL®’s cavity wall insulation allows for an increased potential for drying “breathability” without trapping moisture in the wall assembly.

Lower permeable insulations such as foam plastics can act as vapour retarders and greatly affect the drying potential of many typical residential wall assemblies.

**Fast Outward Drying**  
Highly permeable insulation like COMFORTBOARD IS has the added benefit of allowing fast outward drying during cold weather. This dries the wood-frame cavity very quickly, even if the framing is wet from construction or becomes wet because of incidental water leaks.

## How to insulate a typical above-grade exterior wall

Exterior walls should be insulated to their maximum R-value, determined by the thickness of the stud wall. If your walls are constructed with 2 x 6 studs, then COMFORTBATT® R-24 batts should be used. R-24 batts are 5 ½ inch thick and snugly fit into a 2 x 6 cavity wall.

When installing COMFORTBATT between the wall studs, eliminate any gaps and ensure the ends butt snugly together. Ensure the surface of each batt is flush with the interior surface of the studs.

*If your home is older and built with 2 x 4 studs for the exterior walls, never attempt to squeeze COMFORTBATT R-24 into the wall cavity. Compressing the insulation will cause it to lose its effective R-value – instead, install ROXUL COMFORTBATT® R-14.*

*Another option to improve the wall’s thermal performance is to build out the studs by adding 2 x 2 strapping/furring to the existing edges of the 2 x 4 studs, which will create a 2 x 6 stud wall. You can then add COMFORTBATT R-24 to the expanded deeper cavity and end up with increased insulation R-value.*

## Vapour barriers

Typically, a vapour barrier/retarder (e.g. poly sheeting) is installed on the warm side of the wall, over the insulation and studs. Once the vapour barrier is up and stapled, seal all vapour barrier seams with red tape to completely seal the wall and eliminate any chance of warm air getting into the wall cavity, where it can contribute to condensation and cause mould problems.\*

\*Check with your local building code for approved vapour barrier/retarder information.



### Good: R-24

2 x 6 Stud Cavity + CB R-24 + Vapour Barrier\*

- 1 Cladding
- 2 Air Barrier
- 3 Sheathing
- 4 2 x 6 Wood Studs
- 5 ROXUL COMFORTBATT® (R24)
- 6 Vapour Control Layer\*
- 7 Gypsum

### Better: R-29

2 x 6 Stud Cavity + CB R-24 + CB IS R-5 + Vapour Barrier\*

- 1 Cladding
- 2 Air Barrier
- 3 ROXUL COMFORTBOARD™ IS (R5)
- 4 Sheathing
- 5 2 x 6 Wood Studs
- 6 ROXUL COMFORTBATT® (R24)
- 7 Vapour Control Layer\*
- 8 Gypsum

### Best: R-40

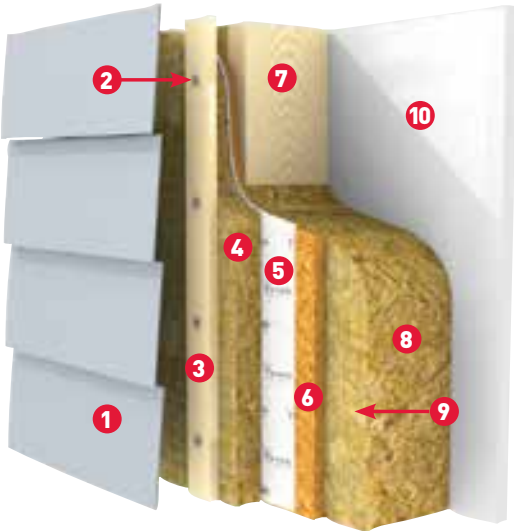
2 x 8 Stud Cavity + CB R-28 + CB IS R-12 + Vapour Barrier\*

- 1 Cladding
- 2 Air Barrier
- 3 ROXUL COMFORTBOARD™ IS (R12)
- 4 Sheathing
- 5 2 x 8 Wood Studs
- 6 ROXUL COMFORTBATT® (R28)
- 7 Vapour Control Layer\*
- 8 Gypsum

\*Check with your local building code for approved vapour barrier/retarder information.



# Typical exterior wall claddings using ROXUL COMFORTBATT® and ROXUL COMFORTBOARD™ IS



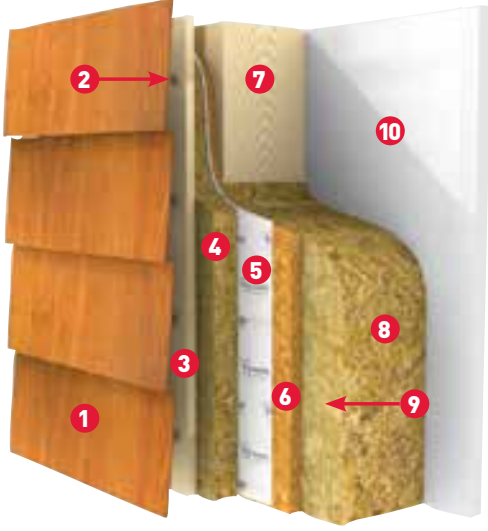
### Vinyl wall components

*[shown from outside to inside]*

- 1 Vinyl siding
- 2 Fasteners
- 3 1 x 3 furring strips
- 4 1.25" (R5) to 3" (R12) of insulating ROXUL COMFORTBOARD™ IS sheathing
- 5 Exterior air/moisture barrier membrane
- 6 Sheathing
- 7 (2 x 6) stud wall @ 24"o.c.
- 8 ROXUL COMFORTBATT® cavity insulation
- 9 Vapour control layer\*
- 10 Gypsum wall board

### Vinyl and wood siding

- Minimum 1" x 3" furring strip to be placed vertically with screw attachment of 16" OC for 16" on wood studs and 12" OC for 24" on-centre wood studs.
- #8 or #10 screws recommended.
- Each screw must have a minimum embedment of 1" into the wood stud or substrate.



### Wood wall components

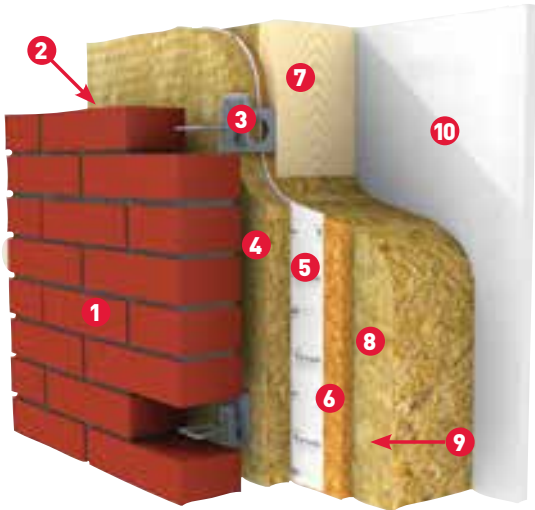
*[shown from outside to inside]*

- 1 Wood lay siding
- 2 Fasteners
- 3 1 x 3 furring strips,
- 4 1.25" (R5) to 3" (R12) of Insulating ROXUL COMFORTBOARD™ IS Sheathing
- 5 Exterior air/moisture barrier membrane
- 6 Sheathing
- 7 (2 x 6) stud wall @ 24"o.c.
- 8 ROXUL COMFORTBATT® cavity insulation
- 9 Vapour control layer\*
- 10 Gypsum wall board

### Brick

- Metal ties or anchors required for nailing into the framing through the insulation boards (to building code requirements).
- 1" (25 mm) space between the masonry and insulation required.

\*Check with your local building code for approved vapour barrier/retarder information.



### Brick wall Components

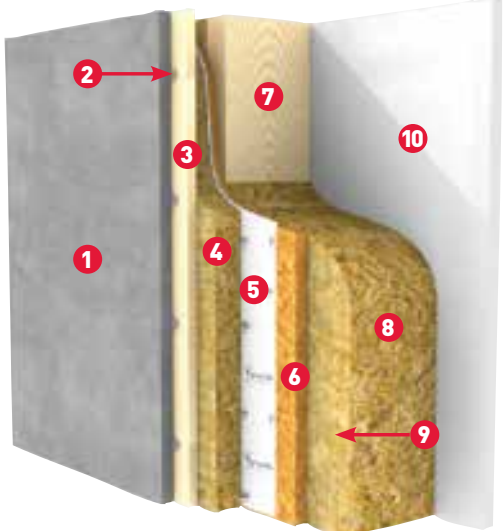
*[shown from outside to inside]*

- 1 Brick
- 2 Air space
- 3 Brick ties
- 4 1.25" (R5) to 3" (R12) of Insulating ROXUL COMFORTBOARD™ IS sheathing
- 5 Exterior air/moisture barrier membrane
- 6 Sheathing
- 7 (2 x 6) stud wall @ 24"o.c.
- 8 ROXUL COMFORTBATT® cavity insulation
- 9 Vapour control layer\*
- 10 Gypsum wall board

### Air barrier

- Air barrier is required as per building code and necessary for effective air tightness.
- Can be applied on the inner side or outer side of the insulation board and should be continuous.

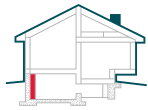
\*Check with your local building code for approved vapour barrier/retarder information.



### Cement board wall components

*[shown from outside to inside]*

- 1 Cement board
- 2 Fasteners
- 3 1 x 3 furring strips
- 4 1.25" (R5) to 3" (R12) of insulating ROXUL COMFORTBOARD™ IS sheathing
- 5 Exterior air/moisture barrier membrane
- 6 Sheathing
- 7 (2 x 6) stud wall @ 24"o.c.
- 8 ROXUL COMFORTBATT® cavity insulation
- 9 Vapour control layer\*
- 10 Gypsum wall board



# Thermal insulation systems for interior basement wall foundations

## Building codes are changing: R-values are increasing

Insulating a new or unfinished basement is an excellent way to make your home comfortable, more energy efficient and reduce your overall heating and cooling costs.

In addition to comfort and efficiency reasons for insulating the basement, new building codes are mandating that the foundation wall assembly have increased R-values, depending on the climate zone. Generally speaking, the colder the climate, the higher the new R-values required.

ROXUL® has two thermal insulation products for interior basement wall assemblies: ROXUL COMFORTBOARD™ IS (Insulation Sheathing) and ROXUL COMFORTBATT®. When used in tandem within the 2 x 4 stud wall cavity, these two products help create a drier, more comfortable basement.

**Note:** To help ensure soil moisture doesn't have a chance to seep through the concrete foundation, you may wish to attach a layer of ROXUL DRAINBOARD® to the exposed exterior foundation before the soil is filled in.

ROXUL DRAINBOARD is a rigid stone wool insulation board specifically designed for fibrous foundation drainage. Its non-directional fibre structure means the boards can be installed either horizontally or vertically without any loss of drainage ability.

## Won't trap moisture & won't grow mould or mildew

Basements are notorious for dampness, which is why COMFORTBOARD™ IS sheathing is so highly recommended. Like all ROXUL insulations, COMFORTBOARD IS is moisture-resistant and yet vapour permeable: moisture can pass through without being trapped.

COMFORTBOARD IS won't absorb water and is not susceptible to mould or mildew growth due to its inorganic composition of basalt and recycled slag. In the event of a flooded basement where the insulation becomes wet, COMFORTBOARD IS quickly dries out and maintains its R-value.

## COMFORTBOARD™ IS and the effects of thermal bridging

Before recommending the good, better, best R-values for the basement wall assembly, we need to understand thermal bridging, the process that describes a material's capacity to conduct heat or cold from one material to another.

In a typical basement, cold air transfers from the outside concrete foundation through the wood studs and eventually into the living space. The studs perform as the conduit or "thermal bridge", lowering the R-value of the wall assembly. Insulated sheathing like COMFORTBOARD IS reduces this thermal bridging by acting as a thermal barrier between the concrete and the studs.

### Vapour Barrier or Not?

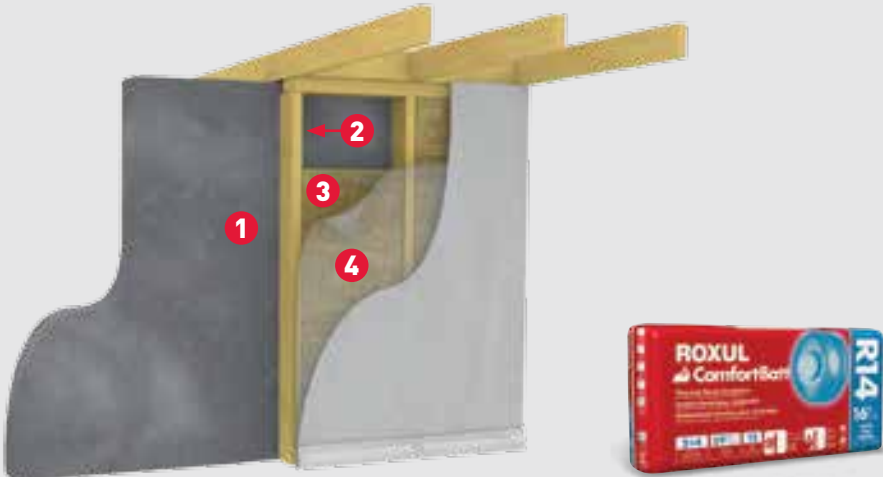
In many regions, particularly in colder climates, local building codes may require a vapour barrier over the final wall assembly. If so, remember to staple and overlap the plastic vapour barrier to reduce the thermal bridging before adding the drywall. **Note:** The average below-grade temperature of soil is between 4-6 degrees Celsius. Below 39 inches, the temperature remains constant all year round.



## Good: R-14

2 x 4 Studs + CB R-14

- 1 Foundation Wall
- 2 2 x 4 Studs
- 3 ROXUL COMFORTBATT® (R14)
- 4 Vapour Control Layer\*
- 5 Gypsum Board



## Better: R-20

2 x 4 Studs + CB R-14 + CB IS R-6

- 1 Foundation Wall
- 2 ROXUL COMFORTBOARD™ IS (R6)
- 3 2 x 4 Studs
- 4 ROXUL COMFORTBATT® (R14)
- 5 Vapour Control Layer\*
- 6 Gypsum Board



## Best: R-22

2 x 4 Studs + CB R-14 + CB IS R-8

- 1 Foundation Wall
- 2 ROXUL COMFORTBOARD™ IS (R8)
- 3 2 x 4 Studs
- 4 ROXUL COMFORTBATT® (R14)
- 5 Vapour Control Layer\*
- 6 Gypsum Board



\*Check with your local building code for approved vapour barrier/retarder information.



# Thermal insulation systems for exterior exposed floors

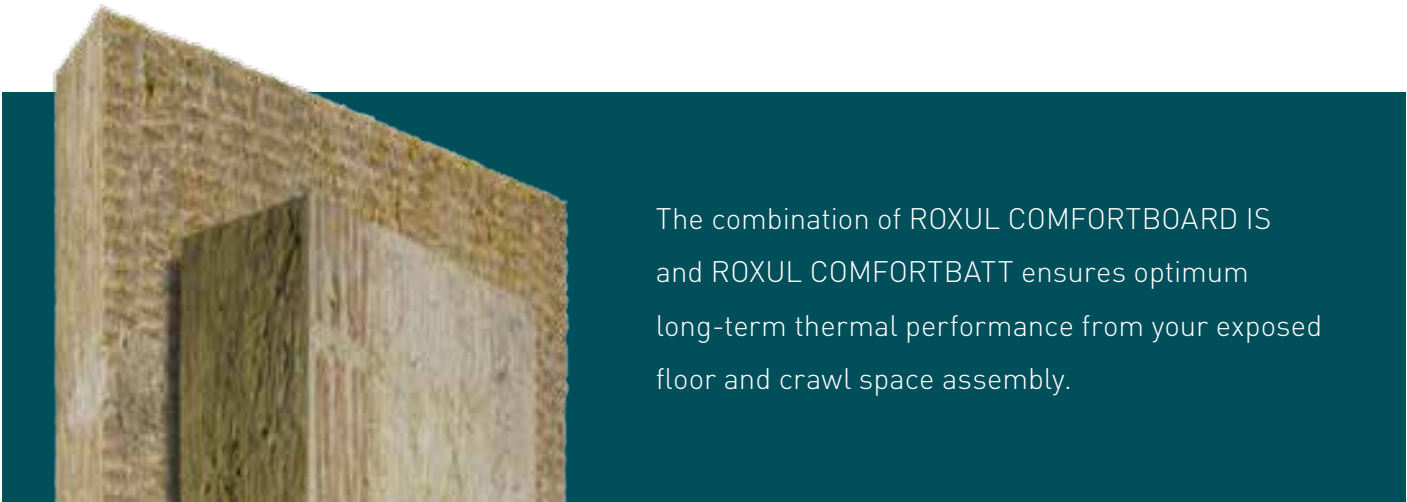
Many home and cottage owners experience a multitude of long-term benefits by insulating their exposed floors. This can apply to an overhang that extends beyond the house, an unheated porch you wish to turn into living space, or a cottage with floors too cold for bare feet.

Sometimes the most difficult aspect of insulating an exposed floor is having enough working room to apply the insulation. If the underfloor area is easy to get at, the application is simple.

Insulating the exposed floor with ROXUL® insulation will help stop air and moisture from getting in. It can make the home or cottage more comfortable, reduce the incidence of frozen pipes, and help eliminate condensation and mould growth problems and, ultimately, help save on overall energy costs.

## ROXUL COMFORTBOARD™ IS installation recommendations

ROXUL COMFORTBOARD™ IS high-performance insulation boards should be attached to wood studs using roofing nails or wood screws with heads/ washers with a minimum diameter of 1" (25 mm) at spacing no more than 12" on-centre along the perimeter of the board and along the studs.



The combination of ROXUL COMFORTBOARD IS and ROXUL COMFORTBATT ensures optimum long-term thermal performance from your exposed floor and crawl space assembly.

When properly installed, the product's rigid yet flexible edges allow for a tightly butted edge where the boards meet, further increasing the floor's thermal performance.

## How to hold insulation in place over time

While the insulation batts should stay in place, you can apply an extra layer of material to secure the batts over time. This includes plastic strapping, a crisscross of string, weather grade sheathing, or holding in place with a layer of chicken wire. Simply unroll the wire and staple it to the joists.

*Studies have proven that wall assemblies with gaps and voids can result in 35% loss of the stated R-value. ROXUL COMFORTBATT®'s higher density batts make it simple for precise cutting to ensure a fit without gaps and voids.*



## Good: R-28

2 x 8 Joists + CB R-28

- 1 Flooring
- 2 Sub-Floor
- 3 2 x 8 Joists
- 4 ROXUL COMFORTBATT® (R28)
- 5 Vapour Control Layer\*



## Better: R-32

2 x 10 Joists + CB R-32  
*(or attach 1 x 2 furring/strapping strip to 2 x 8 joist to build up the joist cavity depth)*

- 1 Flooring
- 2 Sub-Floor
- 3 2 x 10 Joists
- 4 ROXUL COMFORTBATT® (R32)
- 5 Vapour Control Layer\*



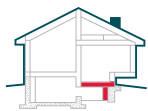
## Best: R-38

2 x 10 Joists + CB R-32 + CB IS R-6  
*(or attach 1 x 2 furring/strapping strip to build up the joist cavity depth)*

- 1 Shingles
- 3 Sheathing
- 2 2 x 10 Joists
- 4 ROXUL COMFORTBATT® (R32)
- 5 ROXUL COMFORTBOARD® IS (R6)
- 6 Vapour Control Layer\*



\*Check with your local building code for approved vapour barrier/retarder information.



# Thermal insulation systems for crawl spaces

Many home and cottage owners can enjoy additional benefits by insulating their crawl spaces. In some cases, the most difficult aspect of insulating a crawl space is having enough room to work around to properly install the insulation. If the crawl space area is easy to get at, the installation of ROXUL® insulation is quite simple.

## Non-Vented Crawl Spaces *(page 21)*

A non-vented crawl space is defined as having a heating or cooling source, or some other source that conditions the air within the crawl space. Conditioning the room helps to minimize the build up of moisture in the space, and helps to avoid the growth of mould and mildew.

We would treat insulating a non-vented crawl space in the same manner we do a conditioned basement. The exterior foundation would be framed in with studs and then insulation would be installed between the studs.

## ROXUL® Insulation: a two tiered solution to insulating crawl spaces

ROXUL has two thermal insulation products for interior crawl space wall assemblies: ROXUL COMFORTBOARD™ IS (Insulation Sheathing) and ROXUL COMFORTBATT®. When used in tandem within the 2 x 4 stud wall cavity, these two products help create a drier, more comfortable space.

A vented crawl space can be notorious for dampness, but ROXUL insulation is water repellent, moisture resistant yet vapour permeable. The permeance of ROXUL products allows moisture vapour to pass through the insulation without being trapped. In the unfortunate event of a flooded basement where the insulation becomes wet, ROXUL insulation quickly dries out and maintains its R-value. Unlike other insulations, ROXUL won't absorb water and is not susceptible to mould or mildew growth.

Typically, there are two types of crawl spaces – they are defined by either being vented or non-vented. The difference in how the two crawl space types are insulated is defined by either applying insulation to the exterior wall, or to the ceiling/floor between the heated living space and the crawl space.

## Vented crawl spaces *(page 22)*

Vented simply refers to the space having air vents, typically more than one, and are generally located across from one another at the upper part of the foundation wall. The vents allow the crawl space to breathe, helping to eliminate dry rot, moisture build up, and other conditions that can develop in these enclosed spaces. This type of venting would be very common in a lot of older homes.

With a vented crawl space, it would be treated in the same manner as a cantilever, or insulating a room of your house where the underside is exposed to the elements. The underside of the floor would then be insulated by adding batt insulation between the floor joists.

## COMFORTBOARD™ IS and the effects of thermal bridging

Before recommending the good, better, best R-values for the crawl space wall assembly, we need to understand thermal bridging – the process that describes a material's capacity to conduct heat or cold from one material to another.

In a typical crawl space, cold air transfers from the outside concrete foundation through the wood studs and eventually into the living space. The studs perform as the conduit or “thermal bridge”, lowering the R-value of the wall assembly. Insulated sheathing like COMFORTBOARD™ IS reduces this thermal bridging by acting as a thermal barrier between the concrete and the studs.



# Non-Vented Crawl Spaces

## Good: R-14

2 x 4 Studs + CB R-14

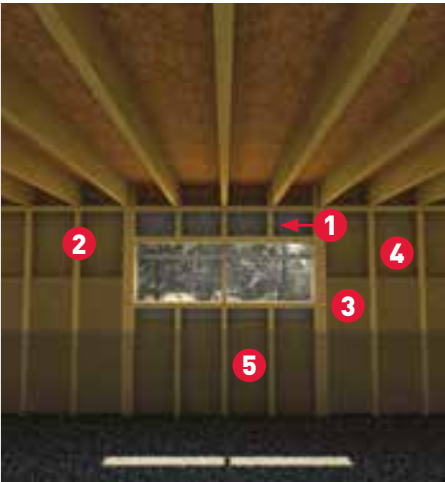
- 1 Foundation Wall
- 2 2 x 4 Studs
- 3 ROXUL COMFORTBATT® (R14)
- 4 Vapour Control Layer\*



## Better: R-20

2 x 4 Studs + CB IS R-6 + CB R-14

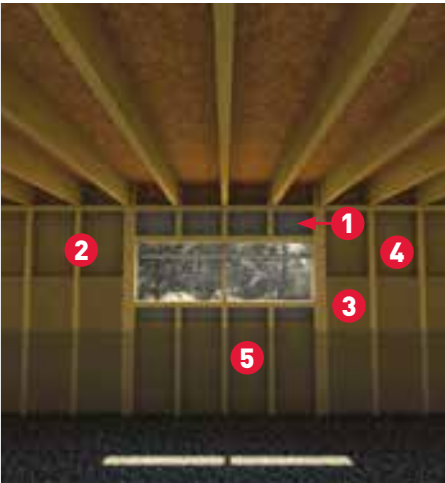
- 1 Foundation Wall
- 2 2 x 4 Studs
- 3 ROXUL COMFORTBATT® (R14)
- 4 ROXUL COMFORTBOARD™ IS (R6)
- 5 Vapour Control Layer\*



## Best: R-22/26

2 x 4 Studs + (CB IS R-8 or CB IS R-12) + CB R-14)

- 1 Foundation Wall
- 2 2 x 4 Studs
- 3 ROXUL COMFORTBATT® (R14)
- 4 ROXUL COMFORTBOARD™ IS (R8 or R12)
- 5 Vapour Control Layer\*



\*Check with your local building code for approved vapour barrier/retarder information.



# Vented Crawl Spaces

## Good: R-28

2 x 8 Joists + CB R-28

- 1 2 x 8 Joists
- 2 Vapour Control Layer\*
- 3 ROXUL COMFORTBATT® (R28)
- 4 Foundation Wall

## Better: R-32

2 x 10 Joists + CB R-32  
*(or attach 1 x 2 furring/strapping strip to 2 x 8 joist to build up the joist cavity depth)*

- 1 2 x 10 Joists
- 2 Vapour Control Layer\*
- 3 ROXUL COMFORTBATT® (R32)
- 4 Foundation Wall

## Best: R-38

2 x 10 Joists + CB R-32 + CB IS R-6  
*(or attach 1x2 furring/strapping strip to build up the joist cavity depth)*

- 1 2 x 10 Joists
- 2 Vapour Control Layer\*
- 3 ROXUL COMFORTBATT® (R32)
- 4 ROXUL COMFORTBOARD™ IS (R6)
- 5 Foundation Wall



Creating a more comfortable home for today, tomorrow and beyond.

In our ever changing world, we are always looking for new ways to live more comfortably, be more environmentally conscious, and save money along the way. ROXUL's **Good. Better. Best.** solutions to thermal insulation applications give contractors, builders, and home owners the information needed to make educated decisions about the options available.

Using the ROXUL **"Good"** solution means you are meeting the current building code. However, as the codes and R-values are constantly increasing, the ROXUL **"Better"** solution will ensure the space exceeds code and prepares you for the future. And, with the ROXUL **"Best"** solution, you are not only exceeding current and future building codes, but you are taking one additional step toward reducing your environmental footprint.

So, whether you are building a new home, putting on an addition, or renovating an existing room in your home, it is always good to think about your home comfort, the environment, and the money you could save – both today, and down the road.



## A global leader

ROXUL® Inc. is part of ROCKWOOL International, the largest producer of stone wool insulation, which is made from natural basalt rock and recycled material. ROCKWOOL International was founded in 1909 and today operates worldwide with more than 9,700 employees, with 26 factories across three continents.

ROCKWOOL has more than 40 years experience in developing and manufacturing advanced wall system products. For more than 20 years, ROXUL has been serving the North American market.

In addition to residential insulation, ROXUL also manufactures a range of other premium insulation products for commercial and industrial applications.

## Environmentally sustainable

ROXUL COMFORTBATT® and COMFORTBOARD™ IS are innovative insulations offering a world of green features. Our stone wool production process utilizes some of the most advanced technology available. The ROXUL facility is designed to capture and recycle rainwater, reduce energy consumption, and create zero waste to landfill by recycling raw materials back into the production process.

ROXUL insulations are created using naturally occurring, inorganic raw materials and materials with a high-recycled content. Stone wool insulation is non-combustible and achieves its thermal performance without the use of blowing agents. The products do not off-gas and are fully recyclable, therefore contributing to a sustainable environment.

ROXUL is pleased to have third-party certification of our products' recycled content for our Milton facility, completed by **ICC-ES SAVE™**. All ROXUL products produced at the Milton facility contain a minimum of 40% recycled content. For further details, contact your ROXUL Sales Representative. ROXUL products produced in our Grand Forks facility are currently under ICC-ES SAVE Certification review. Please visit [www.roxul.com](http://www.roxul.com) for the latest information.



Saves  
Energy



Fire  
Resistant



Water  
Repellent



Better  
Fit



Made  
from Stone



Recycled  
Content

# ROXUL®

The Better Insulation™



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