



## External Wall Insulation System Guide

# Combining form and function.

In a typical dwelling, around 30% of the energy used to heat or cool a room is wasted due to poorly insulated walls.

Sto external wall insulation systems dramatically cut energy loss by wrapping the building in a thermally resistant envelope, helping to reduce energy bills and CO<sub>2</sub> emissions. They also provide lasting protection for the entire fabric of the building.

External wall insulation systems embody our belief in 'Building with conscience'.

Performance is just part of the story. Sto systems can be finished in a wide range of colours and textures using our classic Sto renders, and combined with Sto facade embellishments for almost unlimited creativity.



# External Wall Insulation Systems

The importance of well-insulated buildings.

**In recent years there has been a huge increase in social and political pressure to minimise unnecessary energy consumption. Diminishing fossil fuels and rapidly increasing energy bills are a cause for concern around the world.**

Heating and cooling buildings is a considerable cost for both domestic and commercial property owners. Significant, ongoing savings can be made if the entire building is insulated properly. Sto has a market-leading range of external wall insulation (EWI) systems to help reduce energy consumption and energy costs.

Heat transfer through a wall is known as thermal transmittance and measured using U-values. The materials used, number of windows and doors, just about everything involved in the construction of a building, has a direct impact upon heat loss and heat gain. The UK Building Regulations provide maximum U-values across the UK and Eire.

There are 3 typical approaches to insulating walls: internal, cavity and external wall insulation. Sto has always maintained that the best possible building performance can only be realised if walls are externally insulated.



## System characteristics

	System	Impact resistance	Flexibility	Fire resistance <sup>1</sup>	Cost
External wall insulation systems	StoTherm Classic	●●●	●●●	●	●●
	StoTherm Mineral	●	●	●●●	●●●
	StoTherm Vario	●	●	●●	●
Rainscreen cladding	StoVentec R	●●●	●●●	●●	●●●

<sup>1</sup> Fire performance is dependent on selected insulation and finishes

● Minimum    ●● Medium    ●●● Maximum



## Substrate requirements

System	Fixing method	Substrate quality			
		Fair-face tolerance	Curved substrate	Sound substrate	Friable and unreliable
StoTherm Classic, StoTherm Mineral & StoTherm Vario	Adhesive fix	< 1 cm	●●	●●	●
	Mechanical fix (rail)	< 3 cm	●	●●	●●
	Mechanical fix (Sto Rotofix)	< 5 cm	●●	●●	●●
StoVentec R	Adjustable sub-construction	4-40 cm	●●	●●	●●

● Unsuitable    ● Not ideal    ●● Suitable

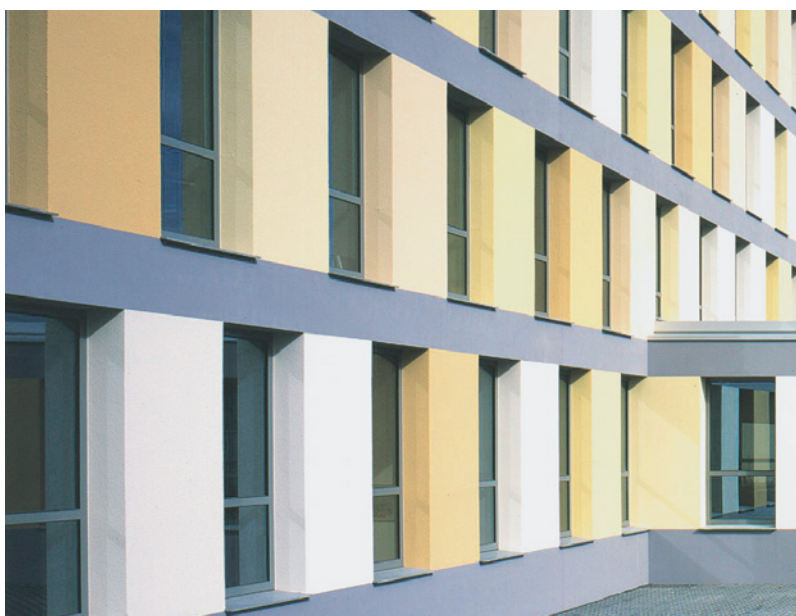
# Design options

Quality render finishes for creative designs.

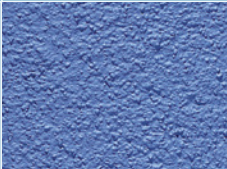


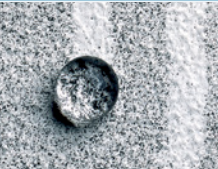
**Sto believes that there is no reason why choosing an external wall insulation system should limit your creativity. StoTherm and StoVentec systems offer the architect a diverse palette of creative options.**

StoTherm and StoVentec systems are compatible with our range of innovative, through-coloured, thin coat renders, including the Lotus-Effect® water and dirt repellent render.

Sto renders are available in a range of grain sizes and textures. Up to 800 colours are available, depending on the finish, and can be combined with Sto embellishments, panel systems and special effect techniques to create striking designs.



## Available render finishes

	<b>Stolit</b> Acrylic render	<b>StoSuperlit</b> Exposed natural stone	<b>StoSilco</b> Silicone resin render	<b>StoLotusan</b> Lotus-Effect® render
				
<b>Colour range</b>	Full range (800)	StoSuperlit range (25)	Silicone range (618)	StoLotusan range (590)
<b>Finishes available</b>	Stippled / Rilled / Freestyle	Exposed Aggregate	Stippled / Rilled / Freestyle	Stippled / Freestyle
<b>Grain sizes available (mm)</b>	1.5 / 2 / 3 / 6	2	1.5 / 2 / 3	1.5 / 2 / 3
<b>Vapour permeability</b>	●●	●●	●●●	●●●
<b>Water repellence</b>	●	●	●●	●●●
<b>Flexibility</b>	●●●	●●	●●	●●●

●●● Maximum    ●● Medium    ● Minimum



**All Sto renders can be enhanced with iQ - Intelligent Technology - façade paints from Sto. These innovative façade paints don't just add colour, they also provide protection from a variety of stresses and influences, such as the weather, age, wear and UV radiation.**

# Decorative embellishments

More than just render.







**Surface detailing is not always a creative consideration. Planning authorities can insist that the architectural design of new projects should match the appearance of existing buildings in the surrounding area. How can this be reconciled with the need to meet thermal insulation requirements using external wall insulation systems?**

In the UK and Ireland, brick and stone facades are commonplace. Sto offers a full range of decorative embellishments that are in-keeping with the surroundings, and are compatible with Sto external wall insulation systems.

But these products are not limited to replicating existing details. Shape, size, texture and colour choice can be custom manufactured, allowing the flexibility to realise some truly inspiring designs.



## Embellishment options by system

						
System	Deco Profiles	Brick Slips	Natural Stone	Rustications	Ashlar Grooves	Panels/Grid
StoTherm Classic	●●	●●	●●	●●	●●	●
StoTherm Mineral	●●	●●	●	●●	●	●
StoTherm Vario	●●	●●	●	●●	●	●
StoVentec R	●●	●●	●●	●●	●	●●

● Unsuitable    ● Not ideal    ●● Suitable





### **Sto Brick Slips**

Manufactured from acrylic render, Sto Brick Slips can be custom made in any of the 800 colours of the StoColor System, and in a range of sizes and textures. They can also be custom made to match existing brickwork.

### **StoDeco Profiles**

Whether you are replicating the profiles on a renovation project, or looking to create a contemporary, modern look, StoDeco Profiles are the ideal option to meet your requirements.

Made from Verolith, a lightweight, long-lasting material that is easy to form, StoDeco Profiles can be manufactured to individual specifications, including logos and other custom-created shapes.

# StoTherm Classic

The original EPS insulation system.

**Over 50 years of development and carefully chosen components have made StoTherm Classic a durable, functional and versatile choice for meeting and exceeding building insulation requirements.**

StoTherm Classic is available in two fixing methods for a variety of substrates:

**StoTherm Classic K** Adhesive fixing for fast and easy installation.

**StoTherm Classic M** Sto Rotofix or mechanical rail fixing to overcome surface irregularities.

## Design

- Extremely flexible, making it ideal for curved structures.
- Compatible with all Sto renders, Sto Brick Slips and StoDeco Profiles.
- Can provide a seamless rendered facade.

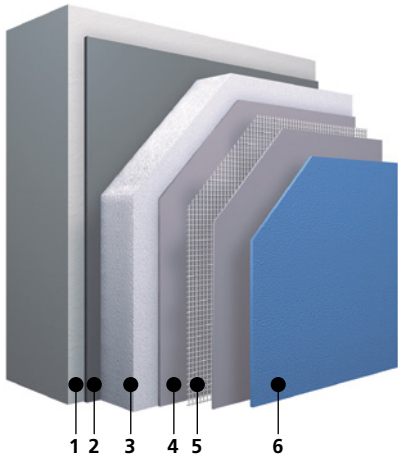
## Performance

- Entirely cement-free system makes StoTherm Classic highly resistant to cracking.
- Up to 10 times more impact resistant than cementitious systems.
- Excellent thermal insulation.
- Allows for the maximum use of internal space.
- Protects the external wall from weathering.
- Lightweight system for easy installation.

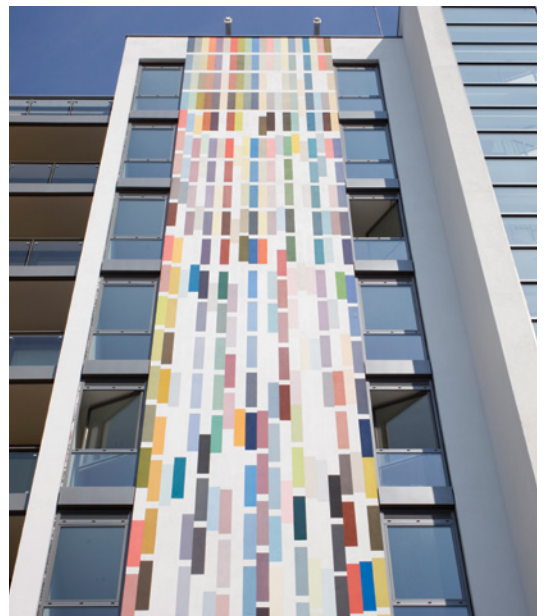
## Technical

- BBA certification No. 95/3132
- European Technical Approval ETA-09/0058





1. Substrate
2. Adhesive coat / mechanical rail system
3. Expanded polystyrene insulation board
4. Cement-free reinforcing coat
5. Reinforcing mesh
6. Decorative render finish



# StoTherm Mineral

Mineralic insulation system for extra fire security.

**A mineralic insulation system built up of mineral fibre insulation boards or lamella strips for trusted fire protection.**

StoTherm Mineral is available in three fixing methods:

**StoTherm Mineral K** Adhesive and dowel fixing of mineral fibre insulation board.

**StoTherm Mineral M** Sto Rotofix or mechanical rail fixing to overcome surface irregularities.

**StoTherm Mineral L** Adhesive fixing of mineral fibre lamella strips.

## Design

- Curves can be accommodated.
- Suited for Sto synthetic render finishes and StoDeco Profiles. Mineralic renders and Sto Brick Slips can also be used if required.
- Can provide a seamless rendered facade.

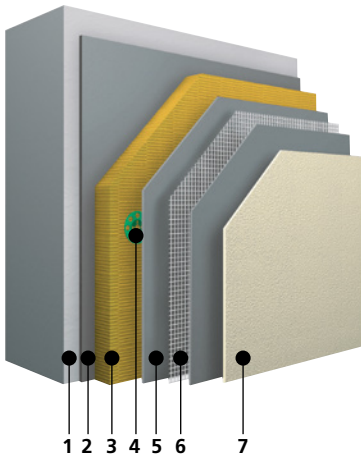
## Performance

- Mineral fibre and mineralic render provide unrivalled fire protection.
- Excellent thermal insulation.
- Allows for the maximum use of internal space.
- Protects the external wall from weathering.
- The dense construction materials provide improved sound insulation.

## Technical

- BBA certification No. 95/3132
- European Technical Approval ETA-07/0023





1. Substrate
2. Adhesive mortar
3. Mineral fibre board
4. Fixing dowel
5. Mineralic reinforcing coat
6. Glass fibre reinforcing mesh
7. Primer and decorative render finish



# StoTherm Vario

## Insulation essentials.

**The cost-effective, expanded polystyrene insulation system with cement-based reinforcement and a selection of finishes. Suitable for a diverse range of substrates, including brick and blockwork, concrete, cement and panels.**

StoTherm Vario is available in two fixing methods: **StoTherm Vario K** adhesive fixing with dowels. **StoTherm Vario M** Sto Rotofix or mechanical rail fixing to overcome surface irregularities.

### Design

- Curves can be easily accommodated.
- Ideally suited for Sto mineralic render finishes and StoDeco Profiles. Synthetic renders and Sto Brick Slips can also be used if required.
- Can provide a seamless rendered facade.

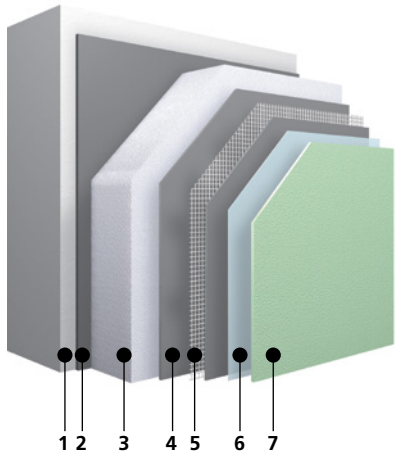
### Performance

- Excellent thermal insulation.
- Allows for the maximum use of internal space.
- Protects the external wall from weathering.
- Mineralic render products provide increased fire protection.

### Technical

- BBA certification No. 95/3132
- BR135 assessment available
- European Technical Approval ETA-06/0107





1. Substrate
2. Adhesive mortar
3. Expanded polystyrene insulation board
4. Reinforcing coat
5. Glass fibre reinforcing mesh
6. Intermediate priming coat
7. Decorative render finish



# StoVentec R

Ventilated rainscreen technology for limitless design.

**A ventilated, insulated and seamless rainscreen cladding system that allows for the greatest freedom of design – from Sto render finishes in any colour or shade, to a wide range of panellised surfaces.**

## Design

- The unique recycled-glass carrier board is fully compatible with Sto flexible renders and stone or glass panel finishes.
- The ventilated cavity allows even the darkest colours to be used, including black.
- Curves and shapes are easily formed.

## Performance

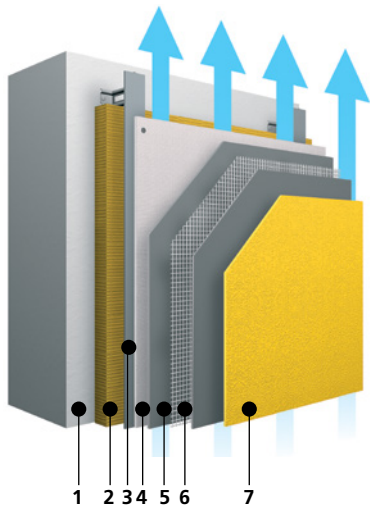
- Ventilated, drained cavity ensures the wall remains dry and breathes.
- Adjustable sub-construction can overcome large surface irregularities and provides a true and plumb surface.
- Reinforced carrier board provides exceptional impact resistance.
- Dimensionally stable carrier board provides superior performance to alternative carrier boards.

## Technical

- BBA certification No. 10/4792







1. Substrate
2. Mineral fibre insulation board
3. Timber or aluminium sub-construction
4. Carrier board
5. Cement-free reinforcing coat
6. Glass fibre reinforcing mesh
7. Decorative render finish

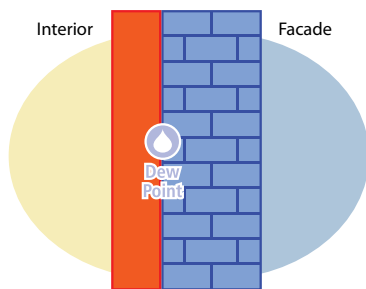


# Insulation Glossary

Understanding insulation systems.

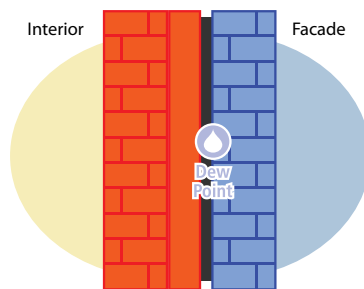
## Building insulation methods

### Internal Wall Insulation



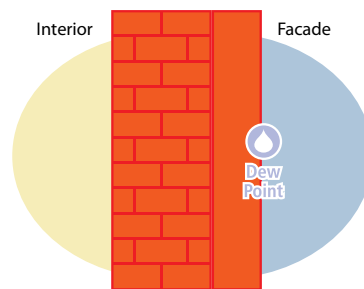
- Rooms can be heated quickly.
- Added insulation thickness reduces the internal room dimensions.
- Structural wall is cold and potentially damp, increasing the risk of condensation and freeze/thaw damage.
- Installation is disruptive for building occupants.
- Exposure to cold bridges, resulting in condensation, damp and mould.
- Risk of interstitial condensation.

### Cavity Wall Insulation



- One of the most common building insulation methods.
- Cavity construction is expensive and time consuming.
- Thicker wall construction reduces the internal room dimensions.
- Limits options for thermal upgrades in the future.
- Outer leaf construction isn't insulated or protected, increasing the risk of condensation and freeze/thaw damage.

### External Wall Insulation



- Structural wall is warm and dry, increasing thermal performance and reducing building maintenance.
- Removal of cold bridges reduces the risk of condensation, damp and mould.
- The heat retention capability of the existing wall is fully utilised.
- Lightweight construction methods can be used, allowing for fast installation.
- Interstitial condensation can be eliminated, irrespective of climate conditions.
- Eliminates cracking caused by thermal expansion and contraction, even in mixed blockwork.

## Key insulation terms

### Cold Bridge

Wherever a building element crosses through an externally-facing wall (e.g. floor and ceiling joints; door and window frames) heat can escape through the element. This is especially a problem in concrete and steel framed buildings. Where the temperature of the surface falls below the condensation point of the surrounding air, this can lead to condensation and mould growth inside the building, which is harmful to the health of the building occupants.

### Cold Spot

Any part of an exterior-facing surface with a significantly lower thermal resistance than the surrounding area. This can lead to a blotchy appearance on a facade, particularly early in the morning.

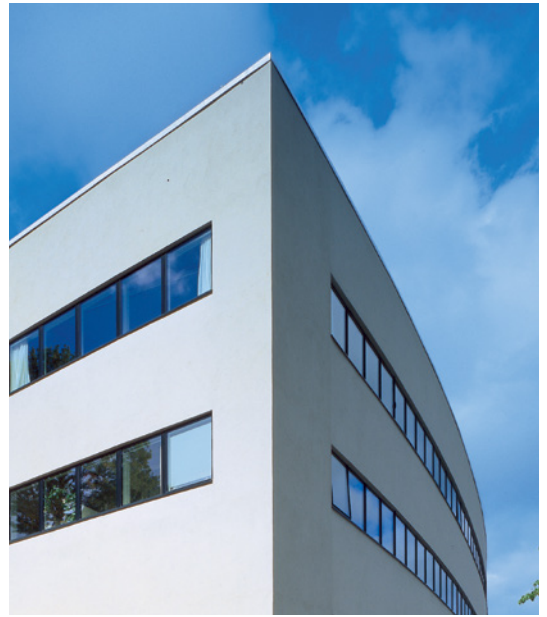
### U-Values

A calculation to determine how much thermal energy in Watts (W) is transported through a building material with the size of 1m<sup>2</sup> at a temperature difference of 1 Kelvin. The unit of measurement for U-values is W/(m<sup>2</sup>K). Achieving low U-values reduces the energy used to heat a building, which reduces energy bills and contributes towards saving energy. U-Values are measured in accordance with BS EN ISO 6946:1997.

### Building regulations

In the UK and Ireland, ongoing efforts to limit the use of natural fuel resources have been implemented through the UK Building Regulations. As part of the assessment, the Regulations specify maximum U-Values for new buildings and these values are different across the United Kingdom and Ireland.

Sto external wall insulation systems already meet or exceed the standards required by the UK Building Regulations.



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