

StoTherm

External wall insulation systems

Facade



We have been developing, producing, and selling external wall insulation systems (EWIS) for around 60 years. These systems are more in demand now than ever before for both new-build and refurbishment projects. This is because using external wall insulation systems in construction saves energy, prevents CO₂ emissions, and conserves resources.



Contents



Our responsibility: Building with conscience

- 04 Building with conscience
- 06 Preserving value is the most effective way to protect the climate



EWI systems: more than what they seem

- 10 Working in harmony: the layers of external wall insulation systems
- 12 In focus: insulant
- 14 Reinforced – and reliable: our base coats
- 16 The first impression: the outer shell

Cover photo and chapter introductions:

Ibis Styles Hotel, Aschaffenburg, DE

Building owner: Success Hotel Management GmbH, Stuttgart, DE

Design: MPP Meding Plan + Projekt GmbH, Hamburg, DE

Execution: Franz-Josef Riegel GmbH, Bürgstadt, DE

Sto expertise: StoTherm Mineral; StoTherm Vario; StoSignature,

Texture: Linear 30

Photo: Martin Baitinger, Böblingen, DE

It should be noted that the details, illustrations, general technical information, and drawings contained in this brochure are only general proposals and details which describe the functions. They are not dimensionally accurate. The applicator/customer is independently responsible for determining the suitability and completeness for the construction project in question. Neighbouring works are only described schematically. All specifications and information must be adjusted or agreed in the light of local conditions and do not constitute work, detail or installation plans. The technical specifications and product information included in the Technical Data Sheets and system descriptions/approvals must be observed.



Our external wall insulation systems: StoTherm

- 20 StoTherm: an overview
- 22 StoTherm AimS®
- 24 StoTherm Classic®
- 26 StoTherm Vario
- 28 StoTherm Classic® L/MW
- 30 StoTherm Mineral
- 32 StoTherm Wood



Possibilities, technology, service

- 36 EWIS can define design
- 38 Free from thermal bridges: down to the smallest detail
- 40 Innovative: coatings from nature
- 42 With you every step of the way: from design to completion



Building with conscience

More than ever before, we in the construction industry are being called upon to play our part in stopping rapid climate change. As a global market leader in external wall insulation systems, we have been combining our sense of responsibility with our expertise for over 60 years.

In the construction industry, we have launched numerous innovations in the field of energy-efficient design and construction in recent decades. The aim: climate neutrality. We are committed to reducing the energy consumption of buildings. At the same time, buildings need to be able to withstand day-to-day weather conditions and even instances of extreme weather. As architects, planners, or tradesmen, you are becoming more and more responsible for the realisation of functional, aesthetic, and eco-friendly buildings. At the same time, the complexity involved in planning and construction is increasing. Selecting the right facade material and a suitable facade construction plays a major role – not only in light of the huge consumption of raw materials, but in terms of CO₂ emissions, durability, and human and environmental health.

Our StoTherm external wall insulation systems (EWIS) are an effective, efficient, and convenient solution for these high expectations. We have insulated 640 million square metres of facade surface with our StoTherm systems since 1965. This has resulted in a saving of approximately 350 million tonnes of CO₂, while also protecting the building fabric. Our experience over recent decades demonstrates this. When properly and professionally installed and maintained as needed, the Environmental Product Declaration in accordance with ISO 14025/EN 15804 confirms that our systems will last as long as the building itself.*

During the realisation of the Pfarrmesnerhaus in Sterzing in South Tyrol (see photo), for example, Pedevilla Architects opted for our StoTherm Mineral system with a mineral wool insulant. This ensured that the multiple dwelling had optimum fire protection.

Of course, each individual construction project has its own special requirements. That is why it is important to choose products and systems with care. With our eight StoTherm systems in combination with the design possibilities provided by the three possible facade materials, we are sure to have the right solution for your project. Our personal advisors will also support you with every decision along the way. This is how we assume responsibility for shaping the world through construction and achieve our aim of building with conscience.

Image on right:
Pfarrmesnerhaus, Sterzing, IT
Building owner: Helmut Zingerle, Schabs, IT
Design: Pedevilla Architects, Bruneck, IT
Execution: Die Malermeister - Heidegger & Holzmann, Vahrn, IT
Sto expertise: StoTherm Mineral; StoSignature, Texture: Rough 20 (special version)
Photo: Gustav Willeit, Corvara, IT







Preserving value is the most effective climate protection

External wall insulation systems (EWIS) combine technical and energy-centred requirements with eco-friendly and aesthetic demands in refurbishment projects.

External wall insulation systems (EWIS) are often used in energy-centred facade refurbishments – regardless of whether or not the existing building already has an EWIS. Our external wall insulation systems are also hugely beneficial with regard to the protection of historical buildings and monuments. For example, in the case of the 1929 Dammerstock housing development (see photos): the facade used here still exudes the charm of the 1920s despite the EWIS refurbishment. Architect Georg Matzka largely managed to preserve the original appearance of the facade by using a very slim StoTherm system.

External wall insulation systems have been used in construction for around 60 years. For this reason, even buildings with an existing EWIS sometimes need to be upgraded. While it was previously common practice to tear down the old insulation layers and dispose of them, today it is not unusual for them to be doubled up. This involves installing a new EWIS on top of the old one. Doubling-up achieves up-to-date insulation values that can even meet passivhaus standards. Any damage such as cracks, anchor pattern staining, or thermal bridges also vanishes during this process.

Polystyrene or mineral wool are available as insulants. The benefits of polystyrene include its cost-effectiveness and its application properties. Mineral wool, on the other hand, meets more stringent fire protection requirements. There are a total of three insulants available for refurbishing existing buildings with a load-bearing, solid substrate. Each one addresses a specific set of requirements: soft wood fibre insulation is the most suitable if the insulant needs to be particularly eco-friendly.

If the focus needs to be on better fire protection, as is the case with public construction projects, mineral wool is the best option. And if external insulation is not an option, perhaps because the protection of historical buildings and monuments does not allow for it, we offer internal insulation systems as alternative solutions.

Refurbishing with our StoTherm systems means preserving value and contributes to our aim of building with conscience.

Image on right:
Dammerstock housing development, Karlsruhe, DE
Building owner: Hardtwaldsiedlung Karlsruhe eG, Karlsruhe, DE
Design: matzka. architekt, Ettlingen, DE
Tradespeople: Jegle GmbH, Karlsruhe, DE; Fritz Schucker GmbH, Karlsruhe, DE
Sto expertise: StoTherm Vario; StoSignature, Texture: Rough 1
Photo: Johannes Vogt, Mannheim, DE







External wall insulation systems: more than what they seem

10 Working in harmony: the layers of external wall insulation systems

12 In focus: insulant

14 Reinforced – and reliable: our base coats

16 The first impression: the outer shell

External wall insulation systems consist of multiple layers. The outer layer determines the appearance of the facade. The reinforcing layer and the insulation core sit behind this. These interior layers need to provide effective insulating and fire protection properties and are responsible for the durability of the entire system.







Working in harmony: the layers of external wall insulation systems

Insulating layer

The key element is the insulant (2), which can be selected from our range of three different materials depending on the requirements of the construction project. It is bonded (1) to the wall structure, in other words to the supporting external wall, and can be additionally fixed with anchors (3a) depending on the load-bearing capacity of the substrate, the wind suction load, and the insulant used. Fixing normally takes place after the insulant has been bonded. Systems with brick slips, or glass mosaic are exceptions to this. In this case, the insulation boards are only anchor-fixed (3b) through the mesh after application of the reinforcing layer in order to secure the bond between the base coat and insulation board despite the high weight of these materials.



- 1 — Bonding
- 2 — Insulation
- 3 — Fixing



3b

Detailed information on page 12/13

Reinforcing layer

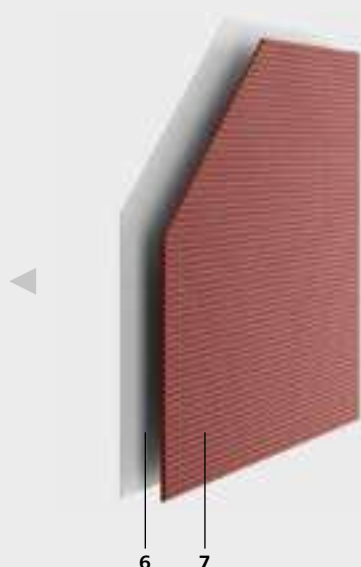
The basis for the facade material is established using organic or mineral base coats (4). The embedded mesh (5) provides the required resistance against the tensile forces to which the system is exposed due to temperature fluctuations in all weather conditions.



- 4 — Base coat
- 5 — Reinforcement

Detailed information on page 14/15

The external wall insulation system sits on the supporting external wall. The system comprises three layers: an insulating layer, a reinforcing layer, and a material layer. The insulant is mounted on the wall structure. The reinforced base coat is applied on top. Depending on the design, either the facade coating or cladding is then visible from the outside.

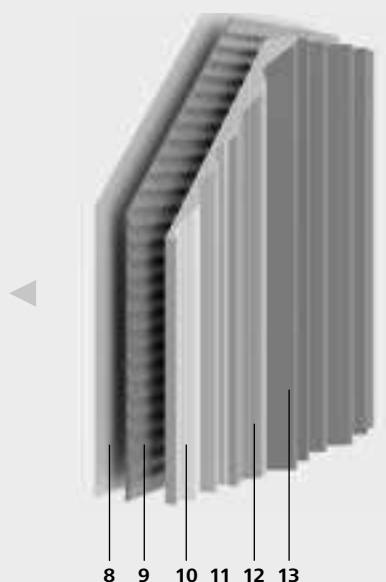


Material layer option 1: facade coating

The most common surface design version for external wall insulation systems is a seamless finish with render (StoSignature, 7). In the case of mineral base coats, this step needs to be preceded by another application cycle in order to optimally prepare the substrate: an intermediate coat applied with a roller and a paint brush (6).

- 6 — Intermediate coat (not necessary for systems with an organic base coat)
- 7 — Finish (StoSignature)

Detailed information on page 16/17



Material layer option 2: cladding

The surface of the EWIS does not have to be render. Prefabricated cladding, such as StoDeco 3D facade elements (10), can be bonded to the reinforcement. The 3D facade element is then generally coated using a facade paint (13). Find out which cladding options can be implemented with the different system solutions from Sto from page 21 onwards.

- 8 — Bonding agent
- 9 — Bonding
- 10 — Cladding
- 11 — Fixing
- 12 — Substrate coating
- 13 — Finishing coat

All material options including more detailed information on page 16/17



In focus: insulant

The main objective of an external wall insulation system is to lose as little heat as possible through the external wall. This aim can be achieved with all insulating materials available on the market. So how do they differ and what makes them all valid options?

Each insulating material has a specific insulating performance. Performance is high when heat is prevented from escaping from the interior to the exterior through the insulation. The thermal transmittance, also known as the U-value, provides information about this property per square metre of wall area. Its unit of measurement: watts per square metre-kelvin ($\text{W}/\text{m}^2\text{K}$). The smaller the U-value, the better the insulating performance and consequently, the slimmer the insulant.

The required thickness of the insulant depends on the objective of the insulation and the material of the supporting external wall. An insulation objective may be, for example, achieving the passivhaus standard. In terms of numbers, this means a U-value of $0.15 \text{ W}/\text{m}^2\text{K}$ for the entire wall structure. In the case of a concrete external wall with a thickness of 24 cm, for example, this objective can be achieved with a Sto-Top 32 Board with a thickness of 20 cm. For comparison, if the focus of the construction project is on making use of renewable resources, soft wood fibre is often the preferred option. In this case, the concrete external wall requires insulation with a thickness of 25 cm. Wood fibre is also prioritised when minimising the “grey energy” of the insulant is an important factor. However, with a service life of more than 40 years – a guarantee for all our external wall insulation systems regardless of the insulant used – the “grey energy” factor is negligible.

Another important aspect is the insulant’s reaction to fire. Mineral insulants are particularly effective

when more stringent requirements need to be met. Typical cases include public and high-rise buildings. Application properties play a key role alongside the insulation objective and fire protection. If, for example, you require a low weight as well as simple installation and easy cutting to size, EPS has proven itself to be very user-friendly. Together with mineral wool, EPS also offers the widest range of surface design possibilities.

The biggest challenge when selecting an insulant is therefore reconciling the properties of the building materials with the aims of your individual construction project. We are happy to help you with this. Please get in touch!

Determining the insulation thickness

The following factors need to be determined when calculating the insulant thickness (x):

1 Substrate*

Example 1: 24 cm vertical coring brick,
U-value: $1.34 \text{ W}/\text{m}^2\text{K}$

Example 2: 24 cm concrete, U-value:
 $3.00 \text{ W}/\text{m}^2\text{K}$

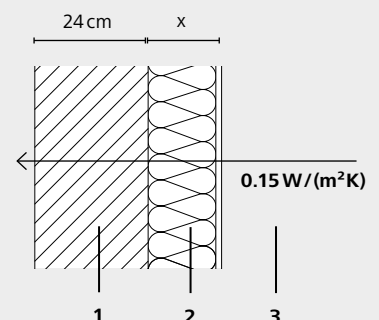
2 Insulant

a) Polystyrene foam, thermal conductivity
level 032

b) Soft wood fibre, thermal conductivity
level 039

3 Insulation objective

Passivhaus standard with $0.15 \text{ W}/\text{m}^2\text{K}$



This results in the following insulant thicknesses x:

1 a) 12 cm
2 a) 20 cm

1 b) 19 cm
2 b) 25 cm

1 c) 23 cm

*Wall structure with 1.5 cm plaster and 2 cm render



High-performing insulants

1 Soft wood fibre

Thermal protection from a renewable resource

- Thermal conductivity level: 039
- Fire protection class: E in accordance with EN 13501-1

Special features

- High thermal protection in summer
- High sound insulation
- Wood from FSC-certified, sustainable forestry

2 Mineral wool

Highly efficient for optimum fire protection

- Thermal conductivity level: 035–041
- Fire protection class: A1 in accordance with EN 13501-1

Special features

- Wide range of design possibilities in terms of material, colour, and surface

3 Polystyrene foam (EPS)

Versatile and cost-effective

- Thermal conductivity level: 032–035
- Fire protection class: E in accordance with EN 13501-1

Special features

- Wide range of design possibilities in terms of material, colour, and surface
- Ideal application properties



Reinforced – and reliable: our base coats

The main purpose of the layer between the insulation and the surface is to provide a solid adhesion primer for the facade material you have selected for your project. However, the combination of base coat and mesh also has a protective function within the system.

The reinforced base coat absorbs thermal stresses in the wall structure that may be caused by high temperature fluctuations, for example. This prevents crack formation and therefore protects the system against the ingress of water. The reinforced base coat also ensures high impact resistance.

Regardless of the type of base coat – organic or mineral – a glass fibre mesh is always embedded during installation. It is the combination of base coat and glass fibre mesh that makes the reinforced base coat resistant to the thermal stresses and mechanical loads that inevitably occur when the building is used.

Furthermore, the base coat provides a perfect foundation for the material layer and acts as a smoothing coat to level any unevenness caused by insulation board joints or anchors.

When it comes to base coats, a distinction is made between organic base coats and mineral (or inorganic) base coats. The binding agents for ready-to-use, organic base coats are dispersions. They are elastic and particularly good at balancing out stresses on the facade. This makes them extremely hard-wearing, resistant to cracks, and shock-proof. Organic base coats therefore provide an excellent foundation for durable rendered facades.

In the case of mineral base coats, lime or cement or an optimum mixture of the two acts as the main binding agent. The advantage of these base coats is their vapour permeability. In combination with polystyrene or mineral wool insulation, they are therefore suitable for creating full-surface external wall insulation systems, not only with render, but also with cladding such as brick slips, glass mosaic, or three-dimensional facade elements.



The glass fibre mesh embedded in the base coat during application gives the EWIS the required resistance to thermal stresses and mechanical influences.

A comparison of base coats

Organic reinforced base coat:

- Extremely hard-wearing
- Increased impact resistance (15 joules are possible in the standard system build-up with a rendered surface, up to 60 joules in the highly impact-proof build-up)
- Increased resistance to cracking (crack extension: approx. 2 %)
- More intense colour shades possible for the finishing render as stronger facade heating by the sun does not result in crack formation
- Cement-free building material (high CO₂ saving)
- The coating build-up comprising a reinforced base coat and finishing render does not require a priming coat (removing an application cycle)
- Ready to use upon delivery to the construction site (no need to mix with water; stir, adjust, and start)

Mineral reinforced base coat:

- Very highly water vapour permeable (class V1)
- In combination with the insulants polystyrene foam (EPS), mineral wool, full-surface cladding with brick slips, glass mosaic, and three-dimensional facade elements is possible
- Can be used on all insulants

The first impression: the outer shell

Image on right:
H5 Buga, Heilbronn, DE
Building owner:
Stadtsiedlung
Heilbronn GmbH, DE
Design: Finckh
Architekten BDA,
Stuttgart, DE
Execution: Schnabel
GmbH & Co. KG,
Mosbach, DE
Sto expertise:
StoSignature,
Texture: Rough 20
+Effect: Coating 10
Partial
Photo: Finckh Architekten BDA,
Stuttgart, DE



StoSignature

Detailed system for facade design using render with four texture families and additional effect materials

Format: can be freely selected
Form: two-dimensional design on level or curved substrate
Surface: render textures in the Fine, Rough, Linear, and Graphic groups. In the Effects category, these textures can be customised with render (2. Texture), colour coatings (Coating), or Granulates applied to the full surface (Total), partially (Partial), or using a stencil (Defined).
Colour shade: can be freely selected
Special feature: plannable individuality and uniqueness through creative use of the StoSignature system



StoEcoshape

Customised series products with prefabricated render elements

Format: max. 840x420x8 mm
Form: freely selectable element shapes for partial or full-surface application
Surface: texture can be selected from eight base textures (customised textures possible on request); additional effects possible with multi-colour design or granulates
Colour shade: can be freely selected for elements and pointing material
Special feature: maximum certainty of results thanks to prefabrication



StoDeco

Three-dimensional facade elements according to the planner's design for facade design that incorporates interaction between light and shadow

Format: elements with a possible footprint of up to 1200x2400 mm
Form: three-dimensional shapes with a free choice of design for partial or full-surface facade cladding
Surface: coating build-ups from smooth to rough possible
Colour shade: can be freely selected via the available coating build-ups without a light reflectance value limit
Special feature: architectural plans, dimensional sketches, or original form – any shape can be precisely produced from Verolith® according to the planner's specifications using the CNC method.

Our range offers surface materials for facade design: renders, prefabricated render elements, three-dimensional facade elements, resin brick slips and facade panels with timber appearance.

More information about
facade materials at
www.sto.com



StoCleyer B

StoCleyer B can be used on all Sto insulation systems; it does not require complex additional measures such as field demarcation joints. Similarly, no drying time is required between bonding and pointing. A utility knife is all you need to cut the StoCleyer B resin brick slips to size.

Sizes: All StoCleyer B resin brick slips are available in standard brick formats along with the associated corner solutions

Colour shade: typical colour range for the material; joint colour can be freely selected

Unique feature: can be combined with other materials, e.g. render or prefabricated insulation elements for maximum design freedom in the creation of a malleable curved brick-slip facade.



StoCleyer W

Cladding external wall insulation systems with real wood results in additional costs and is more time-consuming. Now there is a more cost-effective alternative with StoCleyer W.

StoCleyer W facade panels are available in many different grains. They can be painted in a wide range of colours and the appearance hardly differs from that of real wood. At the same time, the material is more durable and easier to maintain.



Our external wall insulation systems: StoTherm

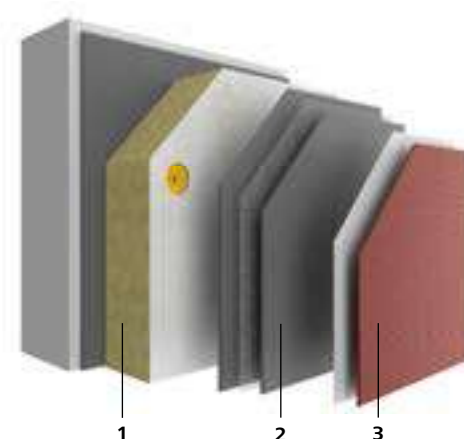
20 StoTherm: an overview
22 StoTherm AimS
24 StoTherm Classic®
26 StoTherm Vario
28 StoTherm Classic® L/MW
30 StoTherm Mineral
32 StoTherm Wood

StoTherm includes five external wall insulation systems (EWIS) for vastly different structural requirements and design preferences.





StoTherm: an overview



System	1 — Insulating layer		2 — Reinforcing layer			3 — Material layer		
	Insulant	Group/ thickness for PH standard*	Base coat	Resistance to cracking	Water vapour diffusion	Finishing render	Light reflectan- ce value limit	Additional material options
StoTherm AimS® 	 Mineral wool	From thermal conductivity group 035 / 19–22 cm	 Organic base coats	■ ■	Class V2	 StoSignature	> 15	
StoTherm Classic®	 Polystyrene foam	From thermal conductivity group 032 / 18–20 cm	 Organic base coats	■ ■	Class V2	 StoSignature	> 15	+ 2 StoEcoshape StoDeco
StoTherm Vario	 Polystyrene foam	From thermal conductivity group 032 / 18–20 cm	 Mineral base coats	■	Class V1	 StoSignature	> 20	+ 3 StoEcoshape StoDeco StoGlass Mosaic
StoTherm Classic® L/MW	 Mineral wool	From thermal conductivity group 035 / 19–22 cm	 Organic base coats	■ ■	Class V2	 StoSignature	> 15	+ 2 StoEcoshape StoDeco
StoTherm Mineral	 Mineral wool	From thermal conductivity group 035 / 19–22 cm	 Mineral base coats	■	Class V1	 StoSignature	> 20	+ 3 StoEcoshape StoDeco StoGlass Mosaic
StoTherm Wood	 Soft wood fibre	From thermal conductivity group 039 / 21–25 cm	 Mineral base coats	■	Class V1	 StoSignature	> 20	+ 2 StoEcoshape StoDeco

■ ■ very good
■ good

*Insulation thickness to achieve the passivhaus standard insulation objective; for calculation basis, see page 12

The name of our external wall insulation systems is StoTherm. With these five tried-and-tested systems, you can respond to the diverse requirements of your project without having to forego the security of a tested solution with technical approval.

System properties				Area of use	
Reaction to fire	Impact resistance Standard build-up	Sustainability	Cost-effectiveness	Detached house/multiple dwelling	High-rise building
					
A2, s1-d0	Up to 15 joules	■ ■	■	■	■ ■
Up to B	Up to 15 joules	■	■ ■	■ ■	
Up to B	Up to 3 joules	■	■ ■	■ ■	
Up to A2, s1-d0	Up to 15 joules	■	■	■	■ ■
A2, s1-d0	Up to 3 joules	■	■	■	■ ■
Up to B	Up to 3 joules	■ ■	■	■ ■	



StoTherm AimS®

Ecologically optimised external wall insulation system
with materials of the future

StoTherm AimS® is the first complete system to feature multiple layers that have been optimised with sustainability in mind: all system components are made from renewable and sufficiently available raw materials, from the mineral insulation to the paint with Lotus-Effect® Technology. This allows us to save many litres of mineral oil on every project. At the same time, however, the tried-and-tested application properties and the aesthetic effect of our StoTherm external wall insulation systems remain unchanged, as do their outstanding protective properties against weathering, microorganisms, cracks, and mechanical stress. That's why they've been awarded the "Blue Angel" eco-label.

System advantages

- Made of over 95 % renewable and sufficiently available raw materials
- Especially suitable for high-rise, public, and special-use buildings
- Crack- and impact-proof
- Fire protection class A2-s1,d0 in accordance with EN 13501-1
- Awarded the "Blue Angel" eco-label

Mineral oil saving when using AimS® products in comparison with corresponding standard product Example: multiple dwelling (Ø 800 m² facade surface)

Base coat (4) StoArmat Classic AimS®	109 litres
Finish (6) Stolit AimS®	57 litres
2 paint coats (7) StoColor Lotusan AimS®	7 litres
StoTherm AimS® Saving = total for all layers	173 litres



www.blauer-engel.de/uz140

- low level of harmful materials
- environmentally friendly thermal insulation
- façades without algicides



Cement-free for more
climate protection



No film protection,
guaranteed



Lotus-Effect® Technology:
Dirt runs off with the rain



Nothing is spared. Except the mineral oil.

The most sustainable external wall insulation system from Sto.
For the love of building. **Building with conscience.**



The system

StoTherm AimS® build-up



Insulating layer

- 1 — Bonding
- 2 — Insulation
- 3 — Fixing

Reinforcing layer

- 4 — Base coat
- 5 — Reinforcement

Material layer

- 6 — Finish
- 7 — Paint coat (optional)

Properties

Insulating layer

- Insulating material: mineral wool
- Thermal conductivity level: 035–041
- PH standard insulant thickness: 19–22 cm (for details, see p. 12)
- Fixing: bonded and anchor-fixed

Reinforcing layer

- Base coat: organic for maximum durability

Material layer

- StoSignature (rendered surfaces) in colour shades with a light reflectance value $\geq 20\%$

System

- Reaction to fire: class A2-s1, d0 in accordance with EN 13501-1 (adjust according to country!)
- Impact resistance with rendered surface:
 - Up to 15 joules in standard build-up

Material layer options



StoSignature

Finish (6)

- StoSignature (rendered surfaces)



StoTherm Classic®

Robust external wall insulation system with maximum crack and impact resistance

The StoTherm Classic® external wall insulation system is a combination of polystyrene insulation and an organic base coat. It combines the high insulating performance of the easy-to-install and cost-effective insulant with high durability. The organic base coat is an essential part of this. Over 100 million square metres of facade surface have been implemented using StoTherm Classic® to date. Furthermore, the FIBAG simultaneous test, for example, confirms that the system is resistant to hail, heavy rain, and hurricanes.

In addition to its high resistance to mechanical influences and the effects of the weather, StoTherm Classic® is also very well suited to intense facade paints. This impressed the planners at bgs architekten when they were designing the facade for the Kraftwerksschule apartment building in Essen (see photos). The almost black render (light reflectance value 8) was also coated with X-black Technology. This prevents the facade from heating up excessively in the summer.

System advantages

- Highly mechanically resistant
- Resistant to hail, heavy rain, and hurricanes according to the FIBAG simultaneous test
- Crack-proof due to organic coating build-up
- Highly resistant to microorganisms (algae and fungi)
- Cement-free, ready-to-use system components
- Can be applied without intermediate coat and paint coat
- Intense, dark colour shades possible

Kraftwerksschule apartment building, Essen, DE

Building owner: Kraftwerksschule e.V., Essen, DE

Design: bgs architekten GbR, Düsseldorf, DE

Execution: Lurvink GmbH, Bocholt, DE

Sto expertise: StoTherm Classic®; StoSignature, Texture: Rough 1;

StoSignature, Texture: Linear 10 +Effect: Coating 20; StoDeco Line

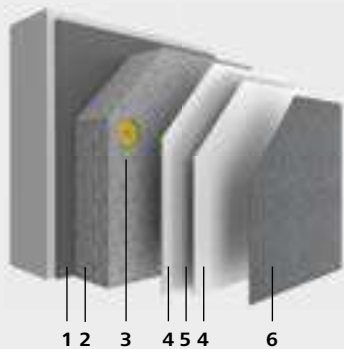
Photo: Guido Erbring, Cologne, DE





The system

StoTherm Classic® build-up



Insulating layer

- 1 — Bonding
- 2 — Insulation
- 3 — Fixing

Reinforcing layer

- 4 — Base coat
- 5 — Reinforcement

Material layer

- 6 — Finish
- 7 — Cladding*

* Alternative material layer, see material layer options

Properties

Insulating layer

- Insulating material: polystyrene foam (EPS)
- Thermal conductivity level: 032–035
- PH standard insulant thickness: 18–20 cm (for details, see p. 12)
- Fixing: bonded or bonded and anchor-fixed

Reinforcing layer

- Base coat: organic for maximum durability

Material layer

- StoSignature (rendered surfaces) and StoEcoshapes (prefabricated render elements) possible in colour shades with a light reflectance value of <25 %
- Partial StoDeco (three-dimensional facade elements), no light reflectance value limit with coating build-up using X-black Technology

System

- Reaction to fire: class B,S2-d0 in accordance with EN 13501-1 possible
- Impact resistance with rendered surface:
 - Up to 15 joules in standard build-up, resistant up to 60 joules with highly impact-proof build-up
- Highest hail resistance class 5 with the appropriate system build-up
- Ball-impact resistant in accordance with DIN 18032-3
- Resistant to hail, heavy rain, and hurricanes according to the FIBAG simultaneous test

Material layer options



StoSignature

Finish (6)

- StoSignature (rendered surfaces)



StoEcoshape



StoDeco

Cladding (7)

- StoEcoshapes (prefabricated render elements)
- StoDeco (three-dimensional facade elements), partial

StoTherm Vario

Economic external wall insulation system with a wide range of finishes

The StoTherm Vario external wall insulation system combines EPS boards with a mineral base coat, uniting economic advantages and maximum material selection. With StoTherm Vario, it is possible to use all facade materials from the Sto portfolio as facade surfaces, even in combination with one another.

Architect Paul Vandenbussche even achieved the passivhaus standard using this system in the realisation of a school extension in Londerzeel, Belgium (photo on the right). The architect chose StoBrick brick slips as the surface material. Since these slips – unlike classic bricks – do not have any structural function, the design idea featuring tilted, stacked bricks was relatively easy to implement.

System advantages

- Three-dimensional facade design possible through full-surface and partial use of StoDeco
- Purely mineral coating build-up possible
- High resistance to microorganisms (algae and fungi), especially with an additional paint build-up (including priming coat)

Rehabilitation centre, Bolzano, IT

Building owner: Autonomous Province of Bolzano, IT

Design: Modus Architects, Brixen, IT

Execution: Amac-Bau, Rodeneck, IT

Sto expertise: StoTherm Vario; StoSignature,

Texture: Linear 30

Photo: Rene Riller, South Tyrol, IT

Image on right:

GTI Londerzeel (Scholen van morgen), BE

Building owner: Publiek-private samenwerking tussen de Vlaamse overheid, Brussels, BE

Design: TEEMA architecten bvba, Brasschaat, BE

Execution: Quality Wall bvba, Hansbeke, BE

Sto expertise: StoTherm Vario; StoBrick, two customised surfaces; StoDeco Panel

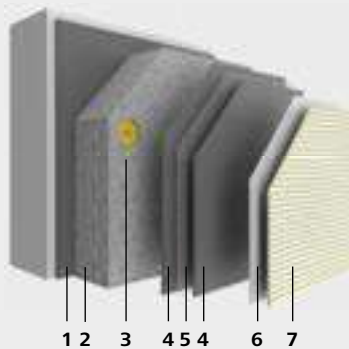
Photo: Dennis de Smet, Gent, BE





The system

StoTherm Vario build-up



Insulating layer

- 1 — Bonding
- 2 — Insulation
- 3 — Fixing

Reinforcing layer

- 4 — Base coat
- 5 — Reinforcement

Material layer

- 6 — Intermediate coat
- 7 — Finish
- 8 — Cladding*

* Alternative material layer, see material layer options

Properties

Insulating layer

- Insulating material: polystyrene foam (EPS)
- Thermal conductivity level: 032–035
- PH standard insulant thickness: 18–20 cm (for details, see p. 12)
- Fixing: bonded or bonded and anchor-fixed

Reinforcing layer

- Base coat: mineral for maximum freedom when selecting a material

Material layer

- StoSignature (rendered surfaces) and StoEcoshapes (prefabricated render elements) in colour shades with a light reflectance value of $\geq 20\%$
- StoDeco (three-dimensional facade elements), no light reflectance value limit with coating build-up using X-black Technology
- StoGlass Mosaic without light reflectance value limit

System

- Reaction to fire: class B, S2-d0 in accordance with EN 13501-1 possible
- Impact resistance with rendered surface:
 - In the appropriate system build-up – hail resistance class 3

Material layer options



StoSignature

Finish (7)

- StoSignature (rendered surfaces)



StoEcoshape



StoDeco



StoCleyer B



StoCleyer W

Cladding (8)

- StoEcoshapes (prefabricated render elements)
- StoDeco (three-dimensional facade elements), full-surface/ partial
- StoCleyer B (resin brick slips)
- StoCleyer W (timber resin brick slips)



StoTherm Classic® L/MW

Robust external wall insulation system featuring a non-combustible insulant

In contrast to StoTherm Classic®, StoTherm Classic® L/MW has a core made of mineral or stone wool. The main difference is the improved fire protection. The system is very well suited to high-rise construction or for executing construction measures from German building class 4 and higher. Architects from IMMOLOG took advantage of this in the multi-storey residential construction project “Wohnen am Hochdamm” in Berlin (see photos).

Another special feature of the StoTherm Classic® L/MW system: the StoTherm Classic® L/MW system does not require intermediate coats. This saves you a step during application. All the other positive properties from the StoTherm Classic® family, such as resistance to mechanical loads or weather conditions, as well as durability and intense colours, can also be found in this system.

System advantages

- Meets the most stringent fire protection requirements, non-combustible including StoArmat Classic S1 as base coat
- Highly mechanically resistant
- Crack-proof due to organic coating build-up
- Highly resistant to microorganisms (algae and fungi)
- Cement-free, ready-to-use system components
- Can be applied without intermediate coat and paint coat
- Intense, dark colour shades possible



www.blauer-engel.de/uz140

- low level of harmful materials
- environmentally friendly thermal insulation
- façades without algacides

Wohnen am Hochdamm, Berlin, DE

Design: IMMOLOG Architekten, Berlin, DE

Execution: Zabel GmbH, Wittenberg, DE;

Harald Schreiner Putz GmbH & Co. KG, Oberleichtersbach, DE

Sto expertise: StoTherm Classic® L/MW; StoSignature,

Texture: Rough 1

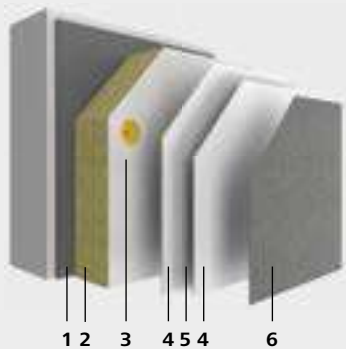
Photo: Mariela Apollonio, ES





The system

StoTherm Classic® L/MW build-up



Insulating layer

- 1 — Bonding
- 2 — Insulation
- 3 — Fixing

Reinforcing layer

- 4 — Base coat
- 5 — Reinforcement

Material layer

- 6 — Finish
- 7 — Cladding*

* Alternative material layer, see material layer options

Properties

Insulating layer

- Insulating material: mineral wool
- Thermal conductivity level: 035–041
- PH standard insulant thickness: 19–22 cm (for details, see p. 12)
- Fixing: bonded and anchor-fixed

Reinforcing layer

- Base coat: organic for maximum durability

Material layer

- StoSignature (rendered surfaces) and StoEcoshapes (prefabricated render elements) in colour shades with a light reflectance value of $\geq 20\%$
- Partial StoDeco (three-dimensional facade elements), no light reflectance value limit with coating build-up using X-black Technology

System

- Reaction to fire: class A in accordance with EN 13501-1 possible; with base coat StoArmat Classic S1 Non-combustible, A2-s1, d0 in accordance with EN 13501-1
- Impact resistance with rendered surface:
 - Up to 15 joules in standard build-up, resistant up to 60 joules with highly impact-proof build-up
- Ball-impact resistant in accordance with DIN 18032-3

Material layer options



StoSignature

Finish (6)

- StoSignature (rendered surfaces)



StoEcoshape

Cladding (7)

- StoEcoshapes (prefabricated render elements)
- StoDeco (three-dimensional facade elements), partial



StoDeco



StoCleyer W

- StoCleyer W (timber resin brick slips)

Base coat

- StoArmat Classic S1; non-combustible



StoTherm Mineral

External wall insulation system featuring a non-combustible insulant and a wide range of finishes

Above high-rise level and in many public buildings, such as the canteen and media library of the Längenfeld school centre in Balingen (photo on the right), external wall insulation systems need to meet more stringent fire protection requirements. StoTherm Mineral has these properties thanks to its insulating material made of mineral or stone wool. In addition to being particularly cost-effective, the system with a mineral base coat offers complete freedom when it comes to selecting the facade material. As the Straßburger Straße residential estate in Freudenstadt demonstrates (photo on the left), the system also makes combining materials easy.

System advantages

- Meets the most stringent fire protection requirements
- Three-dimensional facade design possible through full-surface and partial use of StoDeco
- Purely mineral coating build-up possible
- High resistance to microorganisms (algae and fungi), especially with an additional paint build-up (including priming coat)



www.blauer-engel.de/uz140

- low level of harmful materials
- environmentally friendly thermal insulation
- façades without algacides

Straßburger Straße residential estate, Freudenstadt, DE
Building owner: Borgmann Bauträger GmbH, Freudenstadt, DE
Design: Schmelzle+Partner MBB Architekten BDA, Hallwangen, DE
Execution: Thomas Kübler, Freudenstadt, DE
Sto expertise: StoTherm Mineral; StoBrick Sanded 490, format: 240x71 mm; StoSignature, Texture: Fine 40 +Effect: Coating 10; StoColor Lotusan® G
Photo: Martin Baitinger, Böblingen, DE

Image on right:

Canteen and media library, Längenfeld school centre, Balingen, DE

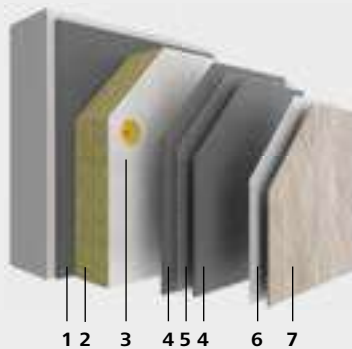
Building owner: City of Balingen, DE
Design: a+r Architekten, Tübingen, DE
Execution: MDD Stuck GmbH, Hechingen, DE
Sto expertise: StoTherm Mineral; StoSignature, Texture: Rough 30; StoSignature, Texture: Fine 40
Photo: Martin Duckek, Ulm, DE





The system

StoTherm Mineral build-up



Insulating layer

- 1 — Bonding
- 2 — Insulation
- 3 — Fixing

Reinforcing layer

- 4 — Base coat
- 5 — Reinforcement

Material layer

- 6 — Intermediate coat
- 7 — Finish
- 8 — Cladding*

* Alternative material layer, see material layer options

Properties

Insulating layer

- Insulating material: mineral wool
- Thermal conductivity level: 035–041
- PH standard insulant thickness: 19–22 cm (for details, see p. 12)
- Fixing: bonded or bonded and anchor-fixed

Reinforcing layer

- Base coat: mineral, for maximum freedom when selecting a material

Material layer

- StoSignature (rendered surfaces) and StoEcoshapes (prefabricated render elements) in colour shades with a light reflectance value of $\geq 20\%$
- StoDeco (three-dimensional facade elements), no light reflectance value limit with coating build-up using X-black Technology
- StoGlass Mosaic without light reflectance value limit

System

- Reaction to fire: class A2-s1, d0 in accordance with EN 13501-1
- Impact resistance with rendered surface:
 - In the appropriate system build-up – hail resistance class 3

Material layer options



StoSignature

Finish (7)

- StoSignature (rendered surfaces)



StoEcoshape



StoDeco



StoCleyer B



StoCleyer W

Cladding (8)

- StoEcoshapes (prefabricated render elements)
- StoDeco (three-dimensional facade elements), full-surface/ partial
- StoCleyer B (resin brick slips)
- StoCleyer W (timber resin brick slips)

StoTherm Wood

Climate-neutral external wall insulation system featuring a renewable insulant

The insulant, made of renewable wood, is the core of the StoTherm Wood external wall insulation system. This tried-and-tested system – which has been used for more than two decades – has been continuously optimised with regard to its insulating performance and application properties. The insulating performance is unbeaten among renewable insulants with a thermal conductivity level of 0.039. At 110 kg/m³, the relatively light insulation boards can be cut to size quickly and easily.

As part of the comprehensive “District for Generations” project in Neuhausen auf den Fildern (see photos), Schwille Architektenpartnerschaft mbB chose to mount this system on the timber stud walls of the extension. The entire concept is based on natural materials. This has also been consistently implemented in the non-visible areas of the insulation.

System advantages

- Awarded the “Blue Angel” eco-label
- Insulant made of wood, a renewable resource
- Improves the sound insulation in timber frame construction
- High resistance to microorganisms (algae and fungi), especially with an additional paint build-up (including priming coat)
- Excellent thermal protection in summer



www.blauer-engel.de/uz140

- low level of harmful materials
- environmentally friendly thermal insulation
- façades without algicides

St. Franziskus day-care centre, Neuhausen auf den Fildern, DE

Building owner: Catholic parish of Saint Peter and Saint Paul, Neuhausen auf den Fildern, DE

Design: Schwille Architektenpartnerschaft mbB, Reutlingen, DE

Execution: Gottfried Mack Stuckateurfachbetrieb GmbH, Pliezhausen, DE

Sto expertise: StoTherm Wood; StoSignature, Texture: Rough 1

+Effect: Coating 10; StoColor Lotusan® G

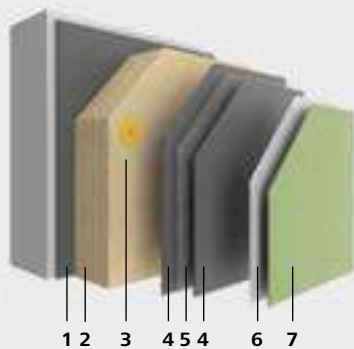
Photo: Martin Duckek, Ulm, DE





The system

StoTherm Wood build-up



Insulating layer

- 1 — Bonding
- 2 — Insulation
- 3 — Fixing

Reinforcing layer

- 4 — Base coat
- 5 — Reinforcement

Material layer

- 6 — Intermediate coat
- 7 — Finish
- 8 — Cladding*

* Alternative material layer, see material layer options

Properties

Insulating layer

- Insulating material: soft wood fibre
- Thermal conductivity level: 039
- PH standard insulant thickness: 21 – 25 cm (for details, see p. 12)
- Fixing: bonded and anchor-fixed

Reinforcing layer

- Base coat: mineral

Material layer

- StoSignature (rendered surfaces) and StoEcoshapes (prefabricated render elements) in colour shades with a light reflectance value of $\geq 20\%$
- Partial StoDeco (three-dimensional facade elements), no light reflectance value limit with coating build-up using X-black Technology

System

- Reaction to fire: class B, S2-d0 in accordance with EN 13501-1 possible
- Impact resistance with rendered surface:
 - Mechanically resistant

Material layer options



StoSignature

Finish (7)

- StoSignature (rendered surfaces)



StoEcoshape

Cladding (8)

- StoEcoshapes (prefabricated render elements)
- StoDeco (three-dimensional facade elements), partial
- StoCleyer W (timber resin brick slips)



StoDeco



StoCleyer W



Potential, technology, service

36 EWIS can define design

38 Free from thermal bridges: down to the smallest detail

40 Innovative: coatings from nature

42 With you every step of the way: from design to completion

For a long time now, EWIS facades have done more than just satisfy their functional purpose of ensuring effective energy balances. Instead, the system's potential challenges architects to experiment and create entirely new types of customised building envelopes. This requires a great deal of expertise in detailed work. Sto offers support in the form of products, solutions, information materials, and highly qualified specialists.



EWIS can define design

While ten years ago, external wall insulation systems were accepted as a must for compliance with legal specifications, they are now regarded as a defining facade design element thanks to digital design techniques and manufacturing methods.

The external wall insulation system (EWIS) was not one of the profession's favourites at first, but that has long since changed: more and more architects are incorporating the EWIS into their design as a defining element and using it to create outstanding facade designs.

Digital design techniques and, most importantly, innovative manufacturing methods such as 3D milling are certainly crucial to this development. This can involve the use of both additive and subtractive methods: in the case of additive applications, the insulation is bonded together in

multiple layers. Insulation thicknesses may vary if this is the case. This allows for a very high level of design freedom, as can be seen in the example of the Alemannenhalle sports hall in Stetten designed by dk architekten Stuttgart (photos and details on the right).

However, an EWIS is much more than just a rectangular board – it also enables three-dimensional shaping. The insulant EPS, for example, can even be milled. This facilitates countless design possibilities and, thanks to prefabrication, also offers a high degree of planning certainty.

Further information is
available at:
www.sto.com

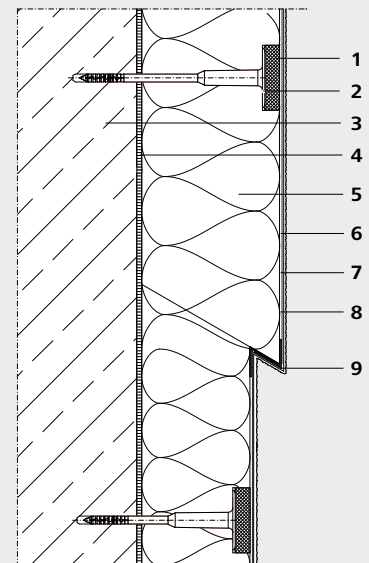


**Alemannenhalle
sports hall, Stetten
am kalten Markt, DE**
Building owner:
Stetten a. k. M
municipal authorities,
DE
Design: dk architekten,
Stuttgart, DE
Execution:
MAUCH – MÄRTE
GmbH, Sipplingen, DE
Sto expertise:
StoTherm Classic®;
StoSignature, Texture:
Rough 1
Photo: Johannes Vogt,
Mannheim, DE



Working with insulant

Two insulation boards with different thicknesses made of polystyrene foam (EPS) were used for the realisation of the facade of the Alemannenhalle sports hall (see photo/details). These were cut to size and mounted onto the facade on site. The finish of the EWIS involved rendering and coating. In addition to this linear method, it is also generally possible to prefabricate the EWIS in the factory. EPS, for example, is very well suited to milling, which is particularly in demand for parametric designs. This method not only gives architects maximum design freedom, but also a high degree of planning certainty. Combining this with in-depth consultation with Sto – ideally as early as in the design phase – can help you to realise your outstanding visions.



Construction detail

External wall insulation system, transition between different insulant thicknesses

- 1 — Cap
- 2 — Anchor
- 3 — Wall construction
- 4 — Adhesive
- 5 — Insulation board
- 6 — Reinforced base coat
- 7 — Intermediate coat if required
- 8 — Finishing render and paint coat if required
- 9 — Sto-Mesh Corner Roll Ideal

Free from thermal bridges: down to the smallest detail

Planning and constructing without creating thermal bridges is a huge challenge. To make the work of architects, planners, and tradesmen easier, we offer up our extensive expertise, for example in the form of detail drawings and highly qualified specialists.

As a partner to all those involved in construction, we assist architects, planners, and tradesmen throughout the entire construction process. To help you choose an EWIS, we provide not only highly qualified technical consultants, but also suitable CAD detail drawings for standard details and BIM objects. The most popular details, such as plinth, external wall, window, roof, balcony, and terrace connections, as well as window blind boxes, system sections, reveals, lintels, and structural expansion joints, are all taken into account.

Window blind box innovation

Window blind box details pose a particular challenge due to the different trades involved. Window blind boxes are installed by a tradesman as a prefabricated element with the same thickness as the insulation. This allows all render connections to be executed cleanly and minimises installation errors and thermal bridges. Work responsibilities are clearly divided: the EWIS tradesman installs the insulation system including the window blind box – the roller shutter fitter then installs the window blind.

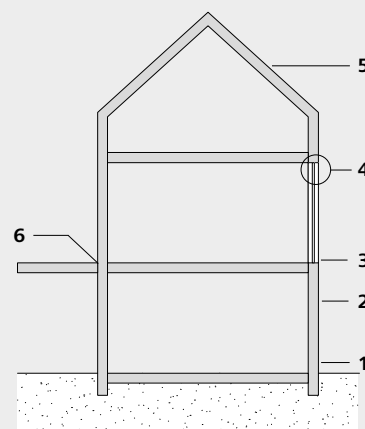
Secure fixing with anchors

Proper insulation requires precision and attention to detail. No compromises should be made, especially with regard to the long-term reliability of the system. If the only way to fix an EWIS to the supporting wall is by using anchors, the Sto-Thermo Dowel is the widely tried-and-tested solution for all insulants. Recessed installation including appropriate covering with insulant caps, which is possible with EPS and mineral wool insulation boards, halves the thermal bridge effect of the anchor. At the same time, the risk of anchor pattern staining is reduced considerably.

Photo on the right:
Commercial building
TTR, Reutlingen, DE
Design: a+r Architekten,
Stuttgart, DE
Execution: Rupert
Linder GmbH, Albstadt,
DE
Sto expertise:
StoTherm Classic®;
StoSignature, Texture:
Rough 1 +Effect:
Granulate 20
Photo: THOMAS HERRMANN
PHOTOGRAPHY, Stuttgart, DE

Details

- 1 — Plinth connections
- 2 — External wall
- 3 — Window connections
- 4 — Window blinds
- 5 — Roof connections
- 6 — Balcony/terrace connections





Innovative: coatings from nature

Paints with Dryonic® Technology protect facades against attack from microorganisms – without any biocidal film protection. This results in facades that remain bright, gleaming, and environmentally friendly for many years.

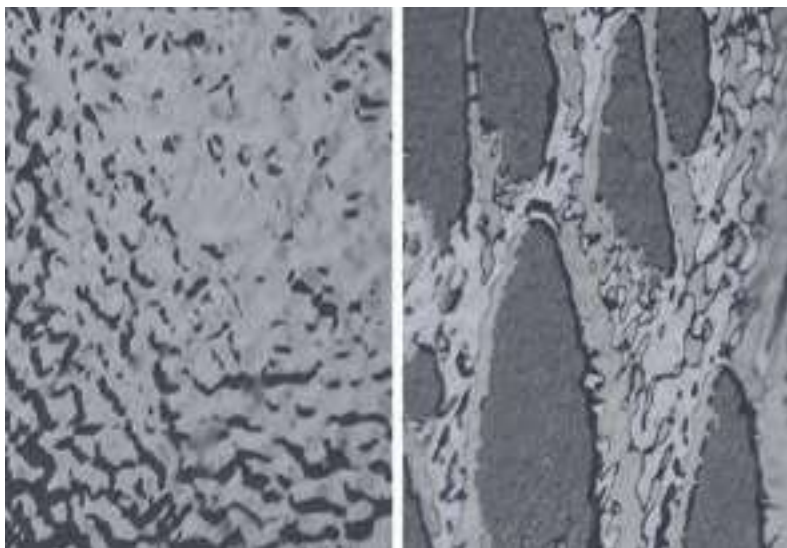
Our StoColor facade paints cover a spectrum of 800 colour shades. In addition, AC Architectural Colours provides a range of 300 colour shades specially selected for facades. Dryonic® Technology is used to preserve all these paints on the facade for as long as possible, while also protecting the facade against weathering due to water, UV radiation, or heat, as well as against algae or fungal attack. Its formulation follows a biomimetic principle – a groundbreaking field that we have been working in for over 20 years and from which we derived the facade paints with Lotus-Effect® Technology back in the 1990s.

The name StoColor Dryonic® is synonymous with dry facades. With integrated SunBlock Technology, StoColor Dryonic® S also protects the facade against fading due to UV radiation. All shades are also available with X-black Technology. Dark surfaces can heat up to over 80 °C when exposed to direct solar radiation – X-black Technology ensures that temperature peaks are kept below 65 °C. This prevents facades from heating and cracks from forming as a possible consequence of high temperatures.

Our inspiration for the Dryonic® family was the fog-basking beetle which lives in the desert. The insect has adapted perfectly to the dry conditions and collects fog as drinking water, which it lets run into its mouth early in the morning by standing on its head. This is made possible by its undulating shell structure with countless microscopic dimples: while the hydrophilic (water-loving) tips allow the water to condense, the hydrophobic (water-evading) depressions in between repel water.

In line with this principle, the microtexture of StoColor Dryonic® also features subtle mounds. The paint's special surface texture ensures that dew and rain on the facade are drained away and dry in record time, depriving algae and fungi of the nutrients they need to grow.

Image on right:
**Detached house,
Dettingen/Teck, DE**
Execution: A.
Baumann & Sohn
GmbH & Co. KG,
Heubach, DE
Sto expertise:
StoTherm Classic®;
StoSignature, Texture:
Rough 1 +Effect:
Coating 10; StoColor
Dryonic® S
Photo: Martin Baitinger,
Böblingen, DE



The results of the comparison test: a standard paint on the left and StoColor Dryonic® on the right



StoColor Dryonic® and StoColor Dryonic® S

Benefits at a glance

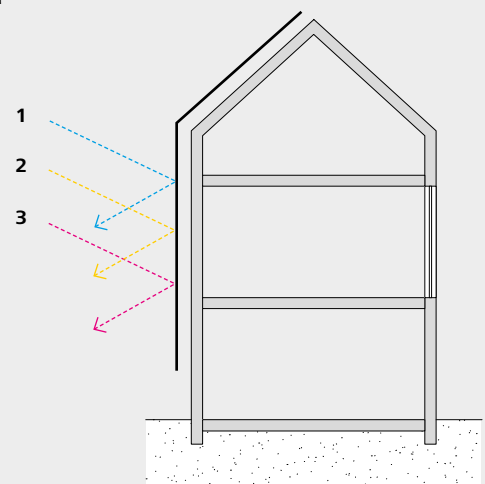
- Rapid drying after rain and dew formation
- Biomimetic principle for dry facades to protect against algae and fungal attack
- Wide colour shade variety and high colour stability thanks to the SunBlock Technology in StoColor Dryonic® S
- Low chance of extender material breakdown/ scuffing
- Can be applied to virtually all standard building substrates
- Optionally available with heat shield to protect against solar heating (X-black Technology)

Classes in accordance with EN 1062-1:

- Water vapour diffusion: V2 (medium)
- Liquid water permeability: W3 (low)
- CO₂ permeability: class C1 (inhibiting)

Overview

- 1 — Quick drying in the StoColor Dryonic® and StoColor Dryonic® S versions
- 2 — Colour protection thanks to SunBlock Technology in the StoColor Dryonic® S version
- 3 — Heat protection thanks to X-black Technology (optional in the StoColor Dryonic® and StoColor Dryonic® S versions)





With you every step of the way: from design to completion

Sto partners and the technical service team support architects, planners, and tradesmen from the design right through to the last detail of the finished facade.

Our services

- Planner and tradesmen consultation, particularly for custom solutions
- Visits to construction sites
- Communication of project-based structural analyses
- Determination of wind loads (simplified method)
- Estimation of quantities
- Communication of layout drawings
- Preliminary dimensioning of anchors

Advice for every project phase

Comprehensive advice is a key component of our services. Sto offers expert advice quickly during every stage of the project – about planning, how to best coordinate different processes, how to apply Sto products correctly, right through to the most detailed questions about the external wall insulation system.

Sto advisors at the construction site

Sto Technical Consultants come to your construction site to provide training on special material characteristics or working with special application methods. They also demonstrate how to use products and tools effectively.

Support for partners

The Sto Technical Advisor provides professional, on-site assistance. As a qualified, technical contact person, they support our customers in the correct application of Sto products. Practical explanations on all materials and application techniques can be found in the application guidelines and in videos on the Sto YouTube channel.

Personal contact

The Infoservice is available to answer questions about the StoTherm systems on +49 77 44 57-1131, or you can ask your local Sto sales representative. All Sto locals are listed at www.sto.com.



Services

Sample service

Sto helps you to select the right system and surface with material samples that are specific to your project.
infoservice.export@sto.com

Material workshops

We organise “Experiencing is understanding” workshops which focus on the materials for facade design. These workshops explore the process of planning surfaces design-relevant properties, technical application techniques, and design potential. Current dates available at werkstatt.sto.com/en/werkstatt/cpd/cpd.html

Tender specifications

Tender specifications are available from Sto to provide support during the planning stage.
infoservice.export@sto.com

Details

The Sto technical consultant team develops highly individual details together with architects, planners, and tradesmen upon request:
infoservice.export@sto.com

Our service team provides CAD drawings and BIM objects:
infoservice.export@sto.com

StoDesign

The StoDesign team develops and tests various technical and design versions and defines materials, surfaces, and colour shades for aesthetic questions relating to paint and facade materials – from individual buildings to large-scale urban design.
infoservice.export@sto.com

Headquarters

Sto SE & Co. KGaA Market Development

Ehrenbachstrasse 1
79780 Stühlingen
Germany

Phone +49 7744 57-1131
Fax +49 7744 57-2428
infoservice.export@sto.com
www.sto.com

StoWerkstatt

International Project
Support Hub
153-157 Goswell Road
Clerkenwell
London EC1 7HD

Phone +44 20 7222 2221
werkstatt@sto.com
werkstatt.sto.com

Your Contact

