

StoTherm systems

Application guideline

Facade



External wall insulation systems

The StoTherm family is made up of four systems with six different insulants.

This means we can provide the ideal solution to fulfil your project's individual requirements.



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View this guideline as a film:
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go to the YouTube channel.

Title image:

Bikini Haus, Berlin, DE

Building owner: Bayrische Hausbau GmbH & Co. KG, Berlin, DE

Planning: Hild und K Architekten, Munchen, DE

Sto Expertise: StoTherm Vario, Stolit®, StoTherm Mineral, Sto-Textured Render/
insulation boards custom variant 3D Glasolit tiles obtained when the Bikini
Haus was demolished were ground down and blown into the Stolit®

Foto: Maximilian Meisse, Berlin, DE

Please note that the details, illustrations, general technical information, and drawings contained in this brochure are only general proposals and details which merely describe the basic functions schematically. 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 described only 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.

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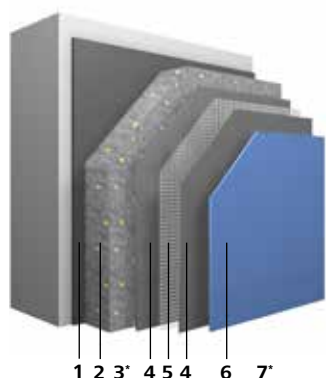
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StoTherm Classic®

Cement-free external wall insulation system, with maximum resistance to cracking and impacts

System build-up



1 — Bonding: Sto-Turbofix

Bonding process with a PU foam base (insulation board as groove and tongue construction system made from expanded polystyrene foam)

Alternative: **Sto-ADH-B**

Mineral, adhesive compound, suitable for application by machine

2 — Insulation: Sto polystyrene rigid foam board

Insulation board made of expanded polystyrene foam in accordance with EN 13163

3 — Fixing: *not shown

In accordance with the requirements set by the relevant authorities

4 — Base coat: StoArmat Classic plus

Organic, cement-free reinforcing compound/base coat with large texturing grain

Alternative: **StoLevell Classic**

Organic, cement-free lightweight reinforcing compound/base coat, ready-to-use

5 — Reinforcement: Sto-Glass Fibre Mesh

Alkali-resistant reinforcing mesh

Alternative: **StoArmat Classic S1** Organic, cement-free reinforcing compound/base coat with large texturing grain

Alternative: **StoArmat Classic plus/Sto-RFP/StoLevell Classic**

Organic, cement-free lightweight reinforcing compounds/base coats, ready-to-use

6 — Finish: StoSilco® K/R/MP

Ready-to-use silicone resin finishing render

Alternative: **Stolit® K/R/MP**

Organic, cement-free, ready-to-use finishing render

Alternative: **StoLotusan® K/MP**

Ready-to-use finishing render with Lotus-Effect® Technology

7 — Top paint coat (optional): *not shown

Example **StoColor Lotusan® G with Lotus-Effect® Technology** or **StoColor Silco G**

System description

Areas of application	<ul style="list-style-type: none"> • New and existing buildings up to high-rise level • Suitable for passivhaus standard
Substrate	<ul style="list-style-type: none"> • Masonry, e.g. brick, calcium silicate masonry units, cellular concrete, fair-faced masonry and masonry veneer • Concrete and concrete slab construction (three-layer concrete slabs) • Timber construction (solid, frame, and panel construction) • Steel construction (column and framing) • Existing external wall insulation systems (doubling-up)
Fixing	<ul style="list-style-type: none"> • Bonding • Bonding and fixing with anchors • Purely mechanical fixing
Thermal protection	<ul style="list-style-type: none"> • Insulation board made of EPS, up to 400 mm thick
Reaction to fire	<ul style="list-style-type: none"> • Limited combustibility • Class B, C in accordance with EN 13501-1, depending on the system build-up • Additional fire protection measures may be required.
Impact resistance	<ul style="list-style-type: none"> • High mechanical resistance, up to 15 joules in standard build-up • Resistant up to 60 joules with highly impact-proof build-up • In the appropriate system build-up – highest hail resistance class 5 (maximum resistance class) • Ball-impact resistant in accordance with DIN 18032-3 • Resistant to hail, heavy rain, and hurricanes according to the FIBAG simultaneous test
Other properties	<ul style="list-style-type: none"> • Lotus-Effect® Technology optional • Anti-electro-smog optional
Design options	<ul style="list-style-type: none"> • Organic renders, silicone resin renders, as well as render with Lotus-Effect® Technology in stippled, rilled, or free-style textures • Resin brick slips and three-dimensional facade elements made of Verolith granulate • Natural stone tiles, brick slips, and ceramic tiles and boards possible following agreement
Colour range	<ul style="list-style-type: none"> • Tintable in accordance with the StoColor System • Light reflectance value < 25 % possible
Application	<ul style="list-style-type: none"> • Cement-free, ready-to-use system components • No intermediate coat required • Special protection against algae and fungi with double paint coat • Suitable for application by machine • QuickSet technology makes it possible to carry out projects during the colder seasons
Approvals	<ul style="list-style-type: none"> • The relevant European and/or national approvals apply

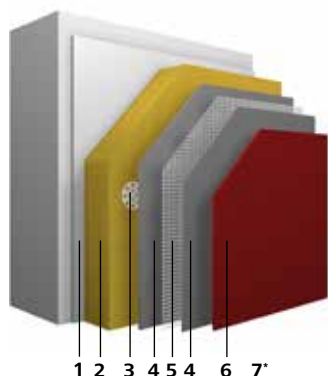


The StoTherm Classic® external wall insulation system in connection with the detail solutions especially developed for passive houses is certified as a component suitable for passive houses by the Passivhaus institute in Darmstadt.

StoTherm Classic® S1

Non-combustible external wall insulation system, cement-free, with maximum impact resistance

System build-up



- 1 — Bonding: Sto-ADH-B**
Mineral, adhesive compound, suitable for application by machine
Alternative: **StoLevell Uni**
Mineral bonding mortar
- 2 — Insulation: Sto-Stone Wool Insulation Boards-/Speedlamelle**
Insulation board made of stone wool in accordance with EN 13162
- 3 — Fixing:**
In accordance with the requirements set by the relevant authorities
- 4 — Base coat: StoArmat Classic S1**
Organic, cement-free reinforcing compound/base coat with large texturing grain
- 5 — Reinforcement: Sto-Glass Fibre Mesh**
Alkali-resistant glass fibre mesh, meets the very highest requirements for resistance to cracking and impact resistance
- 6 — Finish: StoSilco® K/R/MP**
Ready-to-use silicone resin finishing render
Alternative: **Stolit® K/R/MP**
Organic, cement-free, ready-to-use finishing render
Alternative: **StoSilco® blue K/MP**
Silicone resin finishing render without biocidal film protection
- 7 — Top paint coat: *not shown**
Example **StoColor Lotusan® G** with Lotus-Effect® Technology or **StoColor Silco G**

System description

Areas of application	<ul style="list-style-type: none"> • New and existing buildings • Especially suitable for high-rise, public, and special-use buildings • Suitable for passivhaus standard
Substrate	<ul style="list-style-type: none"> • Masonry, e.g. brick, calcium silicate masonry units, cellular concrete, fair-faced masonry and masonry veneer • Concrete and concrete slab construction (three-layer concrete slabs)
Fixing	<ul style="list-style-type: none"> • Bonding • Bonding and fixing with anchors
Thermal protection	<ul style="list-style-type: none"> • Insulation board made of mineral wool, up to 340 mm thick
Reaction to fire	<ul style="list-style-type: none"> • Non-combustible, class A2-s1, d0 in accordance with EN 13501-1
Impact resistance	<ul style="list-style-type: none"> • High mechanical resistance, up to 15 joules in standard build-up • Resistant to over 60 joules with highly impact-proof build-up • Ball-impact resistant in accordance with DIN 18032-3
Other properties	<ul style="list-style-type: none"> • Lotus-Effect® Technology optional • Anti-electro-smog optional
Design options	<ul style="list-style-type: none"> • Organic renders, silicone resin renders, as well as render with Lotus-Effect® Technology in stippled, rilled, or free-style textures • Three-dimensional facade elements made of Verolith granulate
Colour range	<ul style="list-style-type: none"> • Tintable in accordance with the StoColor System • Light reflectance value < 25 % possible
Application	<ul style="list-style-type: none"> • Cement-free, ready-to-use system components throughout • No intermediate coat required • Special protection against algae and fungi with double paint coat • Application by machine
Approvals	<ul style="list-style-type: none"> • The relevant European and/or national approvals apply

Note

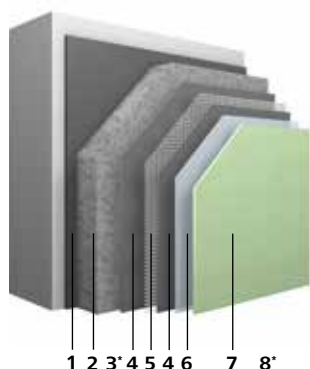
The information on the following pages is also valid and applicable to the StoTherm Classic® S1 external wall insulation system as far as possible. Any deviations are described from page 56 onwards.



StoTherm Vario

External wall insulation system with a mineral base coat for a wide range of surfaces

System build-up



- 1 — **Bonding: StoLevell Uni or Sto-ADH-B**
Mineral bonding mortar
Alternative: **StoLevell FT**¹⁾
Mineral bonding and reinforcing mortar/base coat, quick-setting, with early rainproofing
Alternative: **Sto-Turbofix**
Single-component PU foam for bonding insulation boards
- 2 — **Insulation: Sto polystyrene rigid foam board**
Insulation board made of expanded polystyrene foam in accordance with EN 13163
- 3 — **Fixing: *not shown**
In accordance with the requirements set by the relevant authorities
- 4 — **Base coat: StoLevell Uni or StoLevell Duo plus**
Mineral base coat
Alternative: **StoLevell FT**¹⁾
Mineral bonding and reinforcing mortar/base coat, quick-setting, with early rainproofing
- 5 — **Reinforcement: Sto-Glass Fibre Mesh**
Alkali-resistant reinforcing mesh
- 6 — **Intermediate paint coat: Sto-Primer**
For organic finishing render
Alternative: **StoPrep Miral** for mineral finishing render
Filled, pigmented, silicate undercoat
- 7 — **Finish: StoLotusan® K/MP**
Ready-to-use finishing render with Lotus-Effect® Technology
Alternative: **Stolit® K/R/MP**
Organic, cement-free, ready-to-use finishing render
Alternative: **StoSilco® K/R/MP**
Ready-to-use silicone resin finishing render
Alternative: **StoSil® K/R/MP**
Ready-to-use silicate finishing render
Alternative: **StoMiral® K/R/MP**
Mineral finishing render
Alternative: **StoMiral® FT K**¹⁾
Mineral finishing render
- 8 — **Top paint coat: *not shown**
Example **StoColor Lotusan® G with Lotus-Effect® Technology**,
StoColor Silco G or **StoColor Jumbosil**

¹⁾ FastTrack Technology for the wet and cold season, quick-setting – with early rainproofing

System description

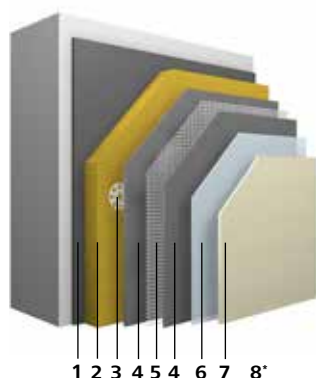
Areas of application	<ul style="list-style-type: none"> New and existing buildings up to high-rise level Suitable for passivhaus standard
Substrate	<ul style="list-style-type: none"> Masonry, e.g. brick, calcium silicate masonry units, cellular concrete, fair-faced masonry and masonry veneer Concrete and concrete slab construction (three-layer concrete slabs) Timber construction (solid, frame, and panel construction) Steel construction (column and framing) Existing external wall insulation systems (doubling-up)
Fixing	<ul style="list-style-type: none"> Bonding Bonding and fixing with anchors Purely mechanical fixing
Thermal protection	<ul style="list-style-type: none"> Insulation board made of EPS, up to 400 mm thick In case of natural stone and ceramic cladding, up to 200 mm
Reaction to fire	<ul style="list-style-type: none"> Limited combustibility Class B, C in accordance with EN 13501-1, depending on the system build-up Additional fire protection measures may be required.
Impact resistance	<ul style="list-style-type: none"> Mechanically resistant In the appropriate system build-up – hail resistance class 3
Other properties	<ul style="list-style-type: none"> Lotus-Effect® Technology optional Anti-electro-smog optional
Design options	<ul style="list-style-type: none"> Organic renders, silicone resin renders, as well as render with Lotus-Effect® Technology in stippled, rilled, or free-style textures Resin brick slips and three-dimensional facade elements made of Verolith granulate Natural stone tiles, brick slips, and ceramic tiles and boards possible following agreement
Colour range	<ul style="list-style-type: none"> Tintable in accordance with the StoColor System Light reflectance value < 25 % possible
Application	<ul style="list-style-type: none"> Suitable for application by machine Stop & Go technology QuickSet technology makes it possible to carry out projects during the colder seasons Double paint coat necessary depending on the render type and colour No paint coat necessary for organic finishing renders Special protection against algae and fungi with double paint coat
Approvals	<ul style="list-style-type: none"> The relevant European and/or national approvals apply

¹⁾ FastTrack technology for the wet and cold season, quick-setting – with early rainproofing

StoTherm Mineral

Non-combustible external wall insulation system, especially suitable for high-rise and public buildings

System build-up



- 1 — Bonding: StoLevell Uni or Sto-ADH-B**
Mineral bonding mortar
Alternative: e.g. **StoLevell FT¹⁾**
Mineral bonding and reinforcing mortar/base coat, quick-setting, with early rainproofing
- 2 — Insulation: Sto-Stone Wool Insulation Boards-/Speedlamelle**
Insulation board made of stone wool in accordance with EN 13162
- 3 — Fixing:**
In accordance with the requirements set by the relevant authorities
- 4 — Base coat: StoLevell Uni**
Mineral base coat
Alternative: **StoLevell FT¹⁾**
Mineral bonding and reinforcing mortar/base coat, quick-setting, with early rainproofing
- 5 — Reinforcement: Sto-Glass Fibre Mesh**
Alkali-resistant glass fibre mesh, meets the very highest requirements for resistance to cracking and impact resistance
Alternative: **Sto-Shield Mesh AES**
Reinforcing mesh for protection against electro-smog
- 6 — Intermediate coat: Sto-Primer**
For organic finishing render
Alternative: **StoPrep Miral** for mineral finishing render
Filled, pigmented, silicate undercoat
- 7 — Finish: StoLotusan® K/MP**
Ready-to-use finishing render with Lotus-Effect® Technology
Alternative: **Stolit® K/R/MP**
Organic, cement-free, ready-to-use finishing render
Alternative: **StoSilco® K/R/MP**
Ready-to-use silicone resin finishing render
Alternative: **StoSil® K/R/MP**
Ready-to-use silicate finishing render
Alternative: **StoMiral® K/R/MP**
Mineral finishing render
Alternative: **StoMiral® FT K¹⁾**
Mineral finishing render
- 8 — Top paint coat: *not shown**
Example **StoColor Lotusan® G** with Lotus-Effect® Technology or **StoColor Silco G**

System description

Areas of application	<ul style="list-style-type: none"> New and existing buildings, up to a height of 100 m Especially suitable for high-rise, public, and special-use buildings Suitable for passivhaus standard
Substrate	<ul style="list-style-type: none"> Masonry, e.g. brick, calcium silicate masonry units, cellular concrete, fair-faced masonry and masonry veneer Concrete and concrete slab construction (three-layer concrete slabs) Timber construction (solid, frame, and panel construction) Steel construction (column and framing) Existing external wall insulation systems (doubling-up)
Fixing	<ul style="list-style-type: none"> Bonding Bonding and fixing with anchors Purely mechanical fixing
Thermal protection	<ul style="list-style-type: none"> Insulation board made of mineral wool, up to 340 mm thick In case of natural stone and ceramic cladding, up to 200 mm
Reaction to fire	<ul style="list-style-type: none"> Non-combustible, class A2-s1, d0 in accordance with EN 13501-1
Impact resistance	<ul style="list-style-type: none"> Mechanically resistant In the appropriate system build-up – hail resistance class 3
Other properties	<ul style="list-style-type: none"> Lotus-Effect® Technology optional Anti-electro-smog optional
Design options	<ul style="list-style-type: none"> Organic renders, silicone resin renders, render with Lotus-Effect® Technology, as well as mineral and silicate renders in stippled, rilled, or free-style textures Three-dimensional facade elements made of Verolith granulate Natural stone tiles, brick slips, and ceramic tiles and boards
Colour range	<ul style="list-style-type: none"> Limited tintability in accordance with the StoColor System Light reflectance value of $\geq 20\%$
Application	<ul style="list-style-type: none"> Suitable for application by machine Stop & Go technology QuickSet and FastTrack technologies make it possible to carry out projects during the colder seasons Double paint coat necessary depending on the render type and colour No paint coat necessary for organic finishing renders Special protection against algae and fungi required with double paint coat
Notes	<ul style="list-style-type: none"> System components of the “Blue Angel” eco-label are listed in the certificates
Approvals	<ul style="list-style-type: none"> The relevant European and/or national approvals apply

Note

The information on the following pages is also valid and applicable to the StoTherm Mineral mineral external wall insulation system as far as possible. Any deviations are described from page 56 onwards.



Substrate

Substrate preparation

An external wall insulation system can only be applied properly if the substrate satisfies certain criteria and is tested for its load-bearing capacity. In the case of soiled, absorbent, or uneven substrates, pre-treatment is always necessary; in the case of non-load bearing substrates, the system must be applied with a mechanical fixing system.

Primers are always applied diluted to suit the substrate. Primers must not remain glossy after drying.

After successful substrate preparation, the next important step is to choose the right adhesive for the selected system. Depending on the system and the substrate, additional anchor fixing of the insulation boards may be required. During mechanical fixing (rail fixing or fixing with Sto-Rotofix plus), substrate preparation can be eliminated, although it is essential in this case to ensure that the masonry is dry and load-bearing in order to use anchors.

Substrate table

Substrate EWIS	Recommended measures	Prime coating
Smooth fair-faced concrete/ smooth ceramic surfaces	Adhesion-promoting undercoat	StoPrep Contact + 20 % StoFlexyl Cement
Load-bearing organic finishing renders, EN 15824	Clean, if necessary	–
Load-bearing mineral base coats, EN 998	Clean, if necessary	–
Chalking facade paint	Clean and prime	StoPlex W
Absorbent	Priming	StoPlex W
Highly absorbent, mineral	Priming	StoPrim Micro
Crumbling	Priming	StoPlex W
Crumbling, absorbent, mineral	Priming	StoPrim Micro
Algae, fungi, moss cover	Clean and disinfect	StoPrim Fungal
Residue of formwork release oil, greases	Clean with high-pressure jet washer and cleaning additives	–
Dust and loosely adhering dirt	Brush dry and/or wet with high-pressure cleaner	–
Non-load bearing, loose paint coat	Remove: by mechanical means, with paint remover, with high-pressure cleaner	–
Sinter skin	Remove by mechanical means	–
Brittle, non-load bearing render substrates	Remove by mechanical means	–
Cavities in render substrate	Remove non-load bearing render and fill with suitable mortar	–
Unevenness ¹⁾	Remove by mechanical means or level with a suitable mortar	–
Moisture-penetrated	Eliminate the cause, wait until dry, and assess again	–
Salt efflorescence	Sweep dry ²⁾	–

¹⁾ ≤ 1 cm/m in the case of bonded systems,
≤ 2 cm/m in the case of bonded and anchor-fixed systems,
≤ 3 cm/m in the case of mechanical fixing with a rail system,
≤ 7 cm/m in the case of mechanical fixing with Sto-Rotofix plus.

²⁾ In the event of rising damp with a noticeable moisture penetration level, these preparatory measures are not sufficient.

Fixing

Fixing systems



Bonding

Load-bearing substrate, suitable for bonding, with an unevenness of up to 1 cm/m

In the case of load-bearing substrates suitable for bonding ($\geq 0.08 \text{ N/mm}^2$), it is sufficient to bond the insulation board with a minimum bonded proportion of 40 %.



Bonding and fixing with anchors

Substrate suitable for bonding with insufficient load-bearing capacity and/or an unevenness of up to 2 cm/m

In the case of substrates with an insufficient load-bearing capacity ($< 0.08 \text{ N/mm}^2$), additional fixing using approved anchors is required.



Mechanical fixing

M system (centre image): substrate suitable for bonding with an unevenness of up to 3 cm/m and/or substrates not suitable for bonding

Sto-Rotofix plus: substrate suitable for bonding with an unevenness of up to 7 cm/m and/or substrates not suitable for bonding

In the case of substrates with an unevenness between 2 and 7 cm/m, a mechanical fixing system must be used. Alternatively, the substrate may be replaced or lined with masonry or the render and/or paint coat may be removed by mechanical means. The mechanical fixing systems are also used for substrates with an insufficient load-bearing capacity ($< 0.08 \text{ N/mm}^2$).





Insulation board fixing (EPS)

Bonding the insulant/bonding and anchor fixing



Sto polystyrene rigid foam boards

These insulation boards are delivered cut to precise angles, with straight edges and dimensionally accurate, and are available with straight or overlapped edges and as a groove and tongue construction set.

Note

Protect the polystyrene rigid foam boards against the action of heat, UV radiation, moisture, and mechanical damage (do not use moist, wet, or damaged insulation boards). Due to the silver/grey colour of the insulation board (thermal conductivity group 032), measures for preventing thermal heating should be considered. The insulant should therefore be protected against direct solar radiation, e.g. by means of scaffold netting, during and after application. Further coatings should be applied within a few days.

Bonding the insulation boards

Excessive drying times of the bonding mortar on the insulation board or wall lead to the formation of a skin on the bonding mortar, which can lead to adhesion problems. Immediately after application of the bonding mortar (after 10 minutes at the latest), press, float into place, and press-fit the insulation boards. Depending on the weathering, this application time interval may be shorter. Bond the insulation boards together precisely from bottom to top, join together fully, and bond the joints completely so that there are no open joints between the insulation boards. Unavoidable joints must be sealed with a suitable filler foam. Use insulant strips to seal joints with a width greater than 5 mm. There must be no base coat mortar in joints or between board joints. Damaged insulation boards must not be installed. Scatter offcuts (minimum width 15 cm) across the surface (not at the outer edges of a building or at building openings). Seal the gap between the starter track and the wall using a suitable filler foam. Country-specific anchor patterns must be taken into account.

Note

After establishing the height of the plinth, the Sto-Starter Profiles are mounted torsion-free, vertically, and flush (see application details). Seal the gap between the Sto-Starter Profiles and the wall using a suitable filler foam.

Bonding



Full-surface bonding

In the case of smooth substrates, apply bonding mortar to the full surface of the insulation board. Then comb with a notched trowel (15 x 15 mm). When doing so, do not hold the notched trowel too flat. Use a sanding board for board fixation.



After pressure has been applied to the insulation board, it is important to ensure that the board is bonded evenly to the substrate.



Spot/edge bonding

In the case of uneven substrates up to 1 cm/m, apply a line of adhesive all the way around the edge of the board and six adhesive fixing dabs in the central area.



After pressure has been applied to the insulation board, the bonded proportion must be at least 40 % on both the substrate and the insulation board.



1c

Application of adhesive mortar to the insulation boards by machine

In the case of smooth and uneven substrates up to 1 cm/m, apply a bead of adhesive all the way around the edge that encloses a W or M shape.



2c

After pressure has been applied to the insulation board, the bonded proportion must be at least 40 % on both the substrate and the insulation board.



3c

Install insulation boards from bottom to top, tight-butted in the bond, and offset to the building corners. Press the boards firmly against the wall. Remove any adhesive that oozes out in order to prevent thermal bridges forming.



Insulation board fixing (EPS)

Bonding



Application of adhesive mortar to the wall by machine

In the case of smooth substrates, apply a bead of adhesive in sinuous lines with a max. spacing of 10 cm to the wall.



Press the insulation boards into the fresh layer of adhesive, or float them into place and apply pressure.



After pressure has been applied to the insulation board, the bonded proportion must be at least 60 % on both the substrate and the insulation board.



Laying of the insulation boards

Install insulation boards from bottom to top, tight-butted in the bond, and offset to the building corners. Press the boards firmly against the wall. Remove any adhesive that oozes out in order to prevent thermal bridges forming.

In the case of bonding with Sto-Turbofix, the installed insulation boards must be pressed down again and re-adjusted after max. 10 minutes using a long spirit level.

Additional fixing with anchors

Substrates

In the case of substrates with an insufficient load-bearing capacity, the insulation boards must be fixed with anchors as well as bonded. Depending on wind loads, building height, location, etc., additional anchor fixing may also be necessary for load-bearing substrates. The relevant European and/or national specifications must be observed.

Anchorage depth

The anchor must be fixed in the load-bearing substrate at the depth required by the relevant anchor approval. Tiles and existing render are not classed as suitable anchorage substrates.

Pull-out tests

If the anchor is to be anchored in a substrate that is not exactly described in the anchor approval, then use pull-out tests on the construction site for evaluation of the anchor's load-bearing capacity.

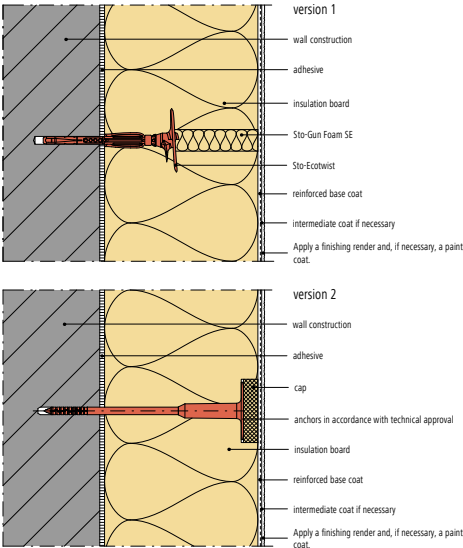
Anchor specifications

The anchor length normally depends on the existing wall structure and the insulant thickness. The number of anchors depends on the height and location (surface, edge). Anchors are usually fixed beneath the reinforcing coat or the reinforcing mesh. Ensure an even anchor pattern.

Anchors/m ²	Anchor pattern	Anchors/m ²	Anchor pattern
4		6	
8			
10		10	
12		12	
14		14	
16		16	

Facade insulation system, bonded and anchor-fixed

Sto-HQ-EN_GEN-0010_2018-05-01





Insulation board fixing (EPS)

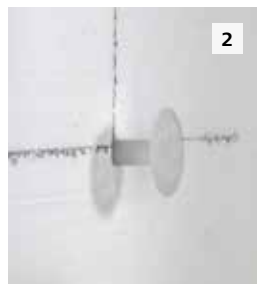
Additional fixing with anchors, Version I: Sto-Thermo Dowel, recessed



1

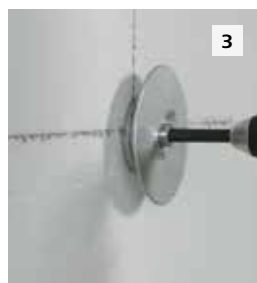
Drill the required drill holes into the wall in accordance with the anchor patterns. Use impact drilling for solid building materials, drill without impact for perforated building materials and cellular concrete.

Note: Prior to this, the insulation boards must be bonded as described on page 14 onwards. Adhere to the specified drying times.



2

Insert the anchor into the drill hole until the anchor plate is flush with the insulation board.



3

Screw in the anchor screw using a suitable screwdriver and corresponding installation tool. End the setting procedure as soon as the stop washer fits closely to the surface of the insulant. There is no unpleasant milling dust, as the insulation material is compressed.



4

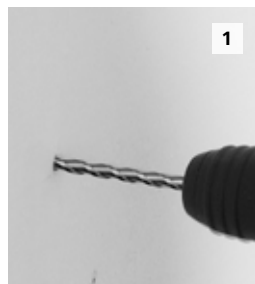
Insert the Sto-Thermo Dowel Cap into the anchor plate recess.



5

Insert the Sto-Thermo Cap into the anchor plate recess. Then sand until even using the sanding board. This results in a closed, level insulation layer that prevents the later appearance of anchor pattern markings on the facade.

Additional fixing with anchors, Version II: Sto-Ecotwist



1

Drill the required drill holes into the wall in accordance with the anchor patterns, with a spacing of at least 10 cm from the edge of the insulation board. Use impact drilling for solid building materials, drill without impact for perforated building materials and cellular concrete.

Note: Prior to this, the insulation boards must be bonded as described on page 14 onwards. Adhere to the specified drying times.



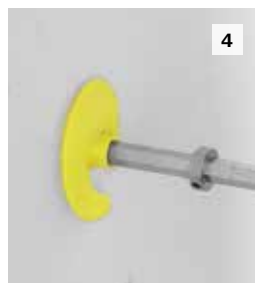
2

Adjust the stop on the setting tool in accordance with the insulant thickness.



3

Insert the anchor.



4

Press the anchor gently against the insulant using the setting tool. Screw in the anchor by applying even pressure until the stop is flush with the surface of the insulant.



5

Seal the small hole in the surface of the insulant using the Sto-Ecotwist VE closing element or the Sto-Gun Foam SE. Finally, create a smooth surface using a utility knife and a sanding board.

Additional fixing with anchors, Version III: Sto-Schraubdübel, recessed



1

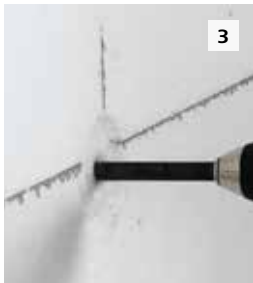
Drill a hole for the anchor in accordance with the anchor approval.

Note: Prior to this, the insulation boards must be bonded as described on page 14 onwards. Adhere to the specified drying times.



2

Mill a recess in the insulant for the Sto-Schraubdübel using the Sto-Thermo countersinking tool. Then remove the milling dust.



3

Insert the anchor into the drill hole until the anchor plate lies flush with the recess in the insulation board. Then screw in the anchor screw.



4

Insert the Sto-Thermo Cap into the anchor plate recess. Then sand until even using the sanding board. This results in a closed, level insulation layer that prevents the later appearance of anchor pattern markings on the facade.

Additional fixing with anchors, Version IV: Sto-Schlagdübel



1

Prior to fixing anchors flush with the surface, sand the insulation boards smooth.

Note: Prior to this, the insulation boards must be bonded as described on page 14 onwards. Adhere to the specified drying times.



2

Drill a hole for the anchor in accordance with the anchor approval.



3

Insert the anchor into the drill hole until the anchor plate is flush with the insulation board.

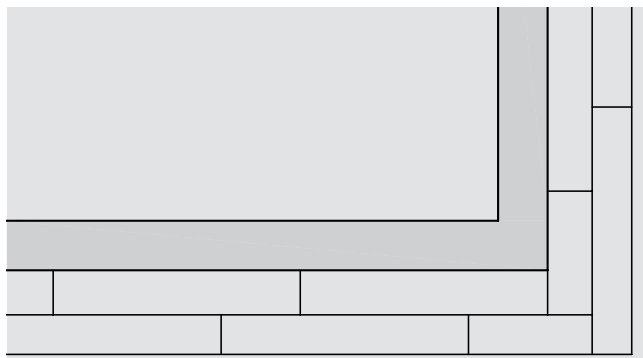


4

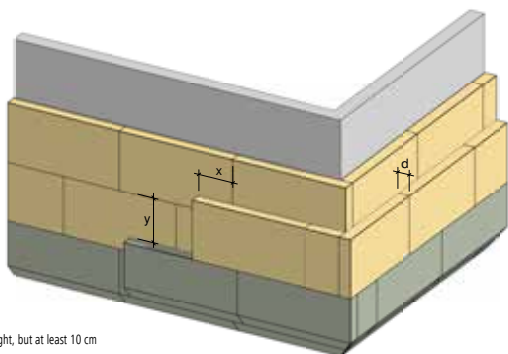
Hammer in the integrated nail so that the anchor plate is flush with the surface of the insulant.

Insulation board fixing (EPS)

Two-layer installation



In the case of the insulant thicknesses (> 20 cm) used in low-energy construction and passive houses, for example, two-layer installation of the insulation boards is recommended. The second layer of insulant is to be applied sufficiently offset against the first layer both vertically and in terms of the joints (no continuous joints).



d = insulation thickness
 $x \geq d$, but at least 10 cm
 $y \geq d$, ideal: half plate height, but at least 10 cm

The installation of two-layer insulation boards allows details to be produced more easily and free from thermal bridges (e.g. in the case of window connections).

Note

When installing the second insulation layer, application to both surfaces is recommended due to the low absorption capacity of the substrate (EPS).

Tip



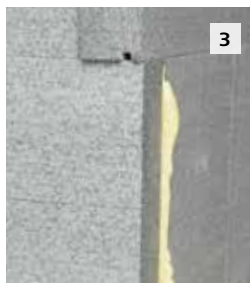
If mechanical fixing is required (by a standard), shorter and therefore cheaper anchors can be used for two-layer bonding. This thereby eliminates local thermal bridges and the risk of marks being left behind by the anchors.



Full-surface bonding of the second insulation layer



It is generally recommended that you create the staggered corner laying by force-transmitting it using a suitable installation adhesive (e.g. Sto-Turbofix).



Cut off any adhesive that has oozed out during staggered corner laying.

Insulation board fixing

Mechanical fixing with Sto-Rotofix plus

Anchor patterns for polystyrene rigid foam boards

Anchors/m ²	Anchor pattern	Anchors/m ²	Anchor pattern
4		12	
6		14	
8		16	
10		18	

Anchor patterns for Sto-Stone Wool Insulation Board 040

Anchors/m ²	Anchor pattern	Anchors/m ²	Anchor pattern
8		14	
10		16	
12		18	

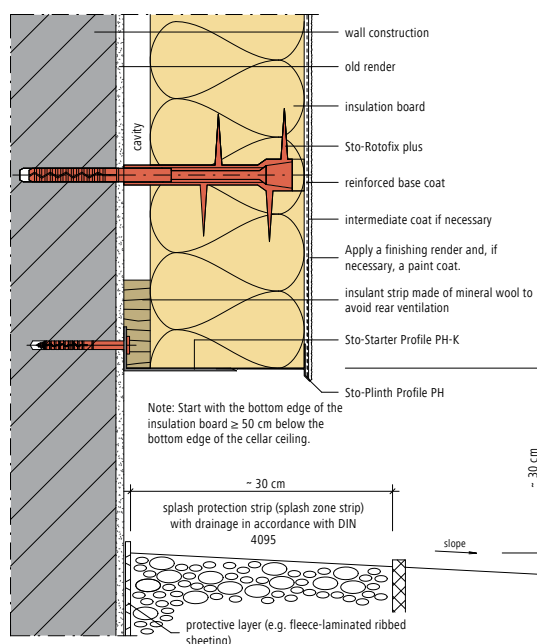
Notes

In edge and corner areas, additional anchors must be fitted (e.g. starter track).

The relevant European and/or national approvals apply.

Facade insulation system with mechanical fixing (Sto-Rotofix plus), plinth formation

Sto-HQ-EN_GEN-0125_2018-05-01



Notes

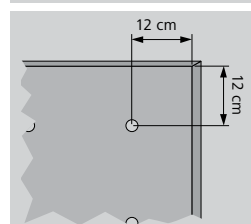
Substrates not suitable for bonding can be mechanically insulated using Sto-Rotofix plus. This is particularly useful if substrate preparation is especially complex (e.g. if the existing render has to be knocked off).

With StoTherm Classic® and StoTherm Vario, the Sto-Polystyrol-Hartschaumplatten, groove and tongue construction set, must be used.

With StoTherm Mineral, the Sto-Stone Wool Insulation Board 040 without groove and tongue must be used.

For further information on fixing with Sto-Rotofix plus, we recommend the Sto-Rotofix plus application guideline.

Note



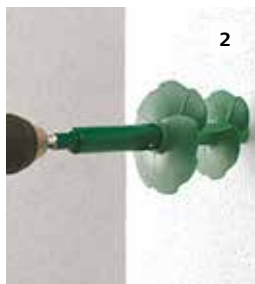
When inserting the anchors, observe the minimum edge distance of 12 cm.

Insulation board fixing

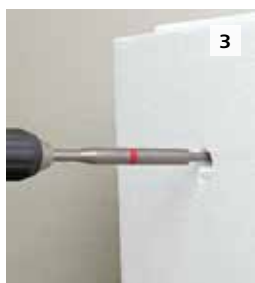
Mechanical fixing with Sto-Rotofix plus



1 Using the driving tool, drill a hole approx. 10 cm in depth. Pull out the screwdriver in slightly circular movements.



2 Screw in the spiral coil using the driving tool. The spiral coil must always be screwed in at a 90° angle to the insulation board.



3 Use a stop drill bit to drill a hole right through the spiral coil. With a rotating drill bit, blow out the drill hole several times. Do not use the hammer action on a drill when drilling holes in perforated bricks.



4 Using the setting and adjustment tool, press the anchor with the pre-assembled screw through the spiral coil until the tool makes contact with the spiral coil (checking the embedment depth).



5 Screw in the anchor screw using the driving tool until it sits firmly in place. When tightening in the screw, the Sto-Rotofix plus must be reset.



6 Using the setting and adjustment tool, align the insulation board precisely.
Spacing from the wall:
Sto-Rotofix plus green (E1/B3) = max. 3 cm,
Sto-Rotofix plus black (E100/B300) = 3 to 7 cm



7 Screw the expanded polystyrene rod into the drill hole and cut off flush with a sharp blade. Alternatively, the drill hole can be filled with foam insulation. In the case of mineral fibre boards, seal the drill hole using mineral fibre remnants.



8 Sand the surface until it is even.

Notes

EPS insulation boards must always be fixed with the Sto-Rotofix plus with the tongue facing upwards and in the direction of laying.

No boards shorter than 50 cm may be used at building corners.

Window lintel boards must have a minimum width and a minimum height of 30 cm.

Base coat

Preliminary works before base coat application in the case of EPS insulation boards

Note

Prior to reinforcement, it is important to check carefully whether the insulation boards are tight-butted and are ground even. A smooth insulant surface free from open joints reduces the risk of cracks as well as joint marks on the finish.



Unavoidable joints between the insulation boards must be sealed with Sto-Gun Foam SE. After the foam has dried, smoothly cut off protruding foam. Use insulant strips to seal joints with a width greater than 5 mm.



Sand down the insulation boards until smooth. The sanding dust must be removed from the facade.

Reinforcement of reveals

Note

The window or door connection, which is resistant to driving rain, must be produced using Sto-Seal Beads and/or Sto-Joint Sealing Tape. When using Sto-Seal Beads, the mesh of the seal beads must first be embedded at the internal reveal sides in the base coat. See the "Window connection" section on page 45 onwards.



At the corners of window and door openings, diagonal reinforcement must be installed and embedded in the base coat before the base coat is applied. The dimensions are approx. 20 x 40 cm. The longitudinal edge must be set precisely to the corner point of the opening.



The internal reveal corners are reinforced with Sto-Glass Fibre Mesh, whereby the mesh wings must be at least 10 cm long.



Produce the external reveal corners using the Sto-Mesh Angle Bead Standard. Cut the mesh angle bead to size as appropriate, position it, and embed it full-surface into the base coat. The mesh angle bead must overlap the internal corners of the mesh by at least 10 cm.



Embed the Sto-Glass Fibre Mesh into the base coat flush across the entire wall (overlapping the opening).



Base coat

Reinforcement of reveals



5

Cut off the mesh at an angle of 45° along the reveal edge. When cutting to size, the corners in particular must be clean and precise.

Important: Before applying the base coat, check all edges for mesh projections and cut them off if necessary.



6

Work the mesh into the base coat again around the area of the cut edges.

Large-area reinforcement

Notes

The specified drying times after bonding the insulation boards must be observed.

Sufficient weather protection must be provided during the application and drying time of the base coat.



1

Apply the base coat using the plastering trowel or by machine at a width of 110 to 120 cm across the entire surface.



2

Embed the mesh into the still damp base coat. The mesh strips must overlap by 10 cm. Then smooth the base coat using a finishing spatula.

Product tip



Sto-Glass Fibre Mesh

The Sto-Glass Fibre Mesh is flexible and easy to apply. The mesh format, with a width of 1.10 m (in the case of horizontal mesh embedding), covers exactly one scaffolding platform with two mesh strips. Alternative: Sto-Shield Mesh AES for protection against electro-smog

Medium to thick-layer reinforcement with StoLevell Novo

StoLevell Novo can be applied both in a medium or thick layer. The thickness range depends on the insulant:

Insulant	Layer thickness
EPS	5–15 mm
Mineral fibre	5–15 mm

Application recommendation

5 to ≤ 8 mm	Application in one cycle
8 to ≤ 12 mm	Application in two cycles (version a)
≤ 15 mm	Application in three cycles (version b)



1

Version a: application in two cycles (wet-in-wet)

Apply the reinforcing compound and then use a notched trowel (10 x 10 mm) to comb it in the direction in which the mesh is laid.



2

If necessary, remove any splashes of render and smooth the surface with a sanding board. Then remove any dust from the surface with a brush.



3

After a short drying time, apply the material again and fill the notching.



4

Apply the material again in the corner area and embed Sto-Mesh Angle Bead Standard in the reinforcing compound.



5

Embed the mesh in the reinforcing compound while it is still wet.



6

In the case of a medium or thick-layer system build-up, diagonal reinforcement is only carried out following large-area reinforcement. Laying strips of mesh diagonally prevents cracks forming at the corners and openings.



7

Then smooth the base coat using a finishing spatula.



Base coat

Medium to thick-layer reinforcement with StoLevel Novo



1

Version b: application in three cycles

Apply the reinforcing compound and then use a notched trowel (10 x 10 mm) to comb it in the direction in which the mesh is laid.



2

If necessary, remove any splashes of render and smooth the surface with a sanding board. Then remove any dust from the surface with a brush.



3

After a drying time of 24 to 36 hours, apply the material again and fill the notching.



4

Then comb the surface with a notched trowel (4 x 4 mm) and leave the material to dry for a short time.



5

Apply the material again in the corner area and embed Sto-Mesh Angle Bead Standard in the reinforcing compound.



6

Apply the material again and embed the mesh in the reinforcing compound without any air pockets.



7

In the case of a medium or thick-layer system build-up, diagonal reinforcement is only carried out following large-area reinforcement. Laying strips of mesh diagonally prevents cracks forming at the corners and openings.



8

Then smooth the base coat using a finishing spatula.

Tip

The reinforcing compound can also be applied by machine.

Note

The mesh joints must overlap by 10 cm. Apply diagonal reinforcement on building openings (e.g. window and door reveals). The mesh must lie in the upper third of the reinforcing coat. The reinforcing coat must cover the mesh by min. 2–3 mm. The layer thickness must be the same over the entire facade surface area. The values mentioned here are for guidance. Depending on the area of use (e.g. in corners and reveals), the layer thickness may vary significantly.

Finish

Finishing render

Notes

If a rilled render texture is not desired, the intermediate coat can be omitted when using StoTherm Classic®.

Sufficient weather protection must be provided during the application and drying time of the intermediate coat and/or finishing render.

The finishing renders can be tinted in up to 800 colours of the StoColor System.



1

After the base coat has dried through, use a roller sleeve to apply the pigmented undercoat (Sto-Primer or StoPrep Miral) to the entire surface of the reinforcement.



2

After the intermediate coat/base coat has dried through, apply the finishing render. Apply the finishing render and trowel off to grain size. Only apply render to the area that will be textured immediately.

Product tip



StoLotusan® K/MP

Finishing render with Lotus-Effect® Technology; dirt runs off with the rain.

Note

Light reflectance value

These limiting values always apply to the light reflectance value of finishes when dealing with EWIS:

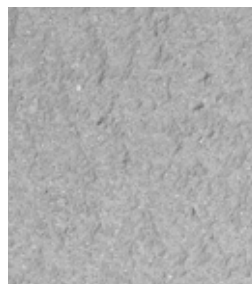
- StoTherm Classic®: ≥ 15
- StoTherm Vario: ≥ 20
- StoTherm Mineral: ≥ 20
- The light reflectance value is based on the light reflected by a surface (100 % = white, 0 % = black).

StoSignature surfaces



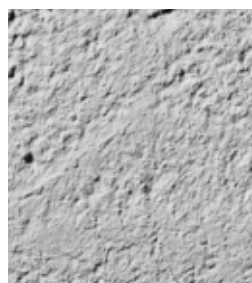
Standard

Rilled and stippled renders are two of the classic choices when it comes to render texture. The use of various grainings and tools makes it possible to model both directional and non-directional textures in their surfaces.



Fine

Fine, even surfaces boast impressive purity and are the embodiment of perfection. They emphasise the craftsmanship of the tradesmen and the quality of the material.



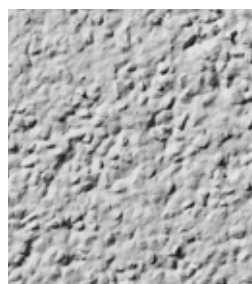
Rough

A rough surface with coarse graining gives the facade texture and slight depth. Changing incidences of light create effects with light and shadows.



Linear

Straight lines reinforce the effect of the changing incidence of light and accentuate contours. An expert handling of the material – whether brushing or combing, with brushwood or metal effect – makes the facade distinctive.



Graphic

Graphically designed rendered surfaces make room for individual concepts and novel patterns. Genuinely unique designs can be produced on building envelopes using stamps, templates, and custom-built tools – regardless of whether you want strict geometric shapes, floral patterns, or free forms.



Cladding

StoDeco Facade Elements



1

Use the StoDeco Profile Hacksaw to saw the StoDeco facade elements to size and, if necessary, mitre them. Next, remove dust from the full surfaces of all cut edges using a hand brush (and compressed air, if available).



2

Mix the StoDeco Coll white. The mixing ratio should be in line with the Technical Data Sheet that is currently valid. Apply adhesive to the marked-out wall surface using the notched trowel (10 x 10 mm). Adjust the notching based on the unevenness of the substrate.



3

Apply the adhesive to the StoDeco facade element in a criss-cross pattern with the notched trowel (10 x 10 mm). This bonding procedure is described in the EN 12004 standard as application to both surfaces (back-buttering). Then apply a surrounding adhesive bead.



4

Float the StoDeco facade element into place at the intended position (wet-on-wet). During application, the adhesive must emerge evenly from all around the StoDeco facade element. Form the adhesive which has emerged above the profile into a fillet (correct water run-off). Trowel off the adhesive on the other sides to form a sealed joint seam around the element.



5

Next, coat the StoDeco facade elements. Use the same coating build-up here to coat the open joints.

Note

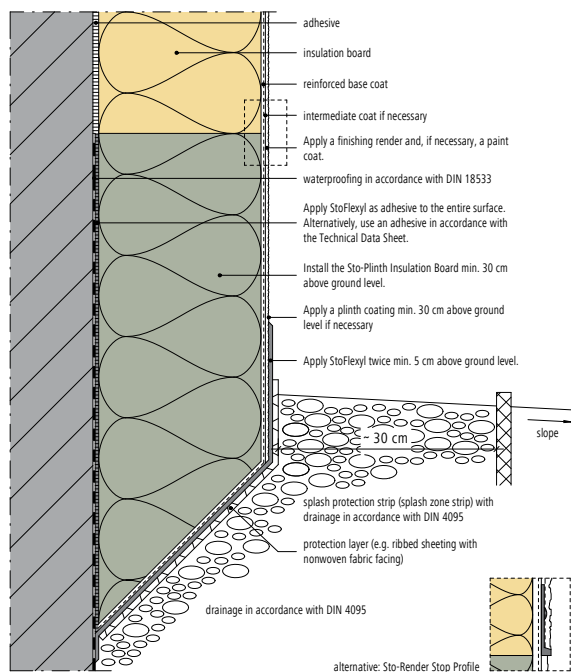
Due to the high dead weight of the finish, the facade insulation system must be anchor-fixed through the mesh. Sto-Glass Fibre Mesh G should always be used as the reinforcing mesh. For detailed information on applying cladding, we recommend the "Cladding for facade insulation systems" application guideline.

Plinth

Connection in ground and splash zone

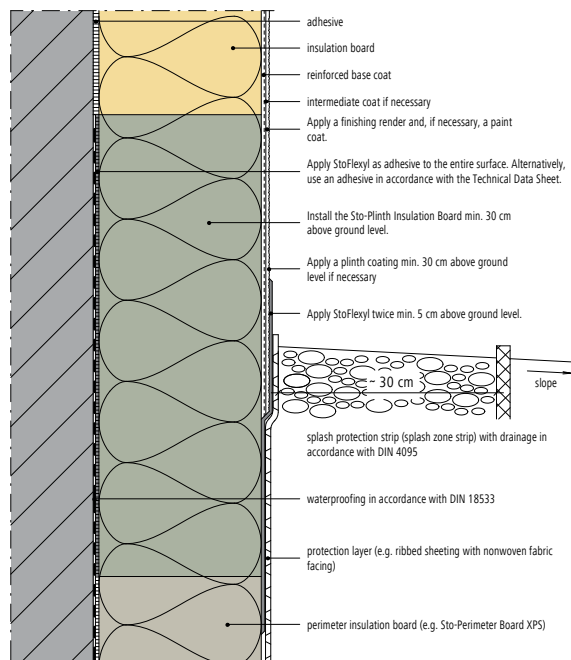
Plinth formation without perimeter insulation, with a change of render

Sto-HQ-EN_GEN-0100_2018-05-01



Plinth formation with perimeter insulation

Sto-HQ-EN_GEN-0110_2018-05-01



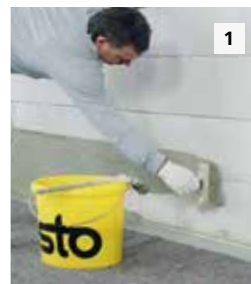
Plinth insulation in the splash zone

Notes

In the case of plinth insulation in a splash zone, existing waterproofing is required, which has already been installed on-site.

Splash zones cover all areas where the facade is exposed to splash water. Apart from the plinth area, this applies for example to balcony areas as well as to loggia and roof connection areas. The splash zone is approx. 30–50 cm high.

Alternatively, Sto-Turbofix can be used as adhesive for Sto-Sockelplatten.



Pre-coat the plinth area up to approx. 30 - 50 cm above ground level using 10 % water-diluted StoFlexyl (mix StoFlexyl 1:1 with cement). Observe the drying time.



After the StoFlexyl has dried (mixed 1:1 with cement), trowel it on undiluted as an adhesive and then ridge it or comb it with the notched trowel (15 x 15 mm).



Full-surface bond Sto-Sockelplatten that are cut at an angle and install tight-butted.



Install insulation boards as described on page 14 onwards and 57 onwards.

When using StoTherm Classic®, the insulant can be changed (Sto-Sockelplatte/facade insulation board) at ground level.



Plinth

Plinth insulation in the splash zone



5

Perform preliminary and detail work, such as the setting of Sto mesh angle beads, before the large-area reinforcement. Then apply base coat to the entire surface.

Note: The base coat runs across and beyond the Sto-Sockelplatte, right up to the water-proofing of the external cellar wall.



6

Embed the Sto-Glass Fibre Mesh into the damp base coat, ensuring that the mesh strips overlap by 10 cm.



7

Embed a render stop profile at the height of the plinth insulation board. Produce the joints in a tight-butted way.



8

In the case of organic finishing renders, brush the plinth twice with 10 % water-diluted StoFlexyl (mix StoFlexyl 1:1 with cement).

Note: The coating is applied at least 5 cm above ground level. In areas reaching below ground level, the paint coat starts from the external cellar wall.



9

Apply the finishing render to the facade as described on page 27.



10

Once the StoFlexyl paint coat has dried, the intermediate coat of Sto-Primer (shown tinted grey here) is applied.



11

Apply finishing render to the plinth.



12

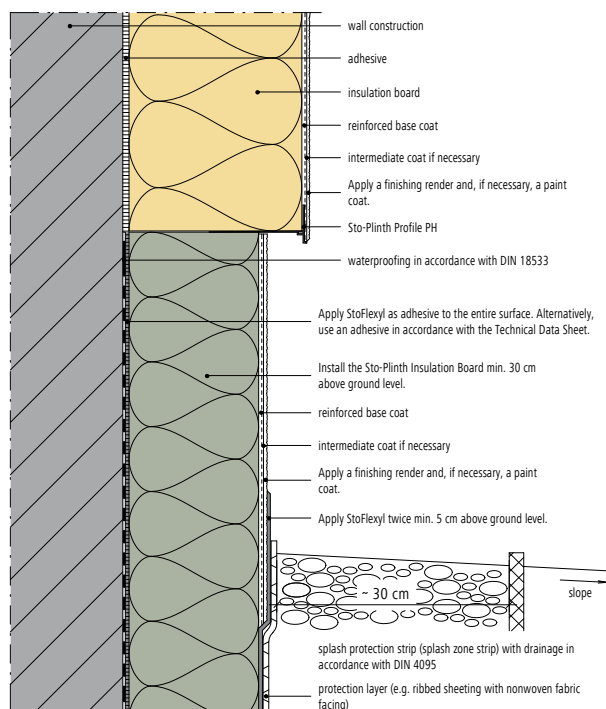
A splash zone strip/gravel bed with drainage is essential in this plinth area. To allow the water to trickle down, a 20–30 cm wide strip of gravel should be laid. The insulation system is additionally protected by ribbed sheeting.

Plinth connection

Free from thermal bridges, Version I

Facade insulation on top of the plinth insulation

Sto-HQ-EN_GEN-0135_2018-05-01



1

Insert the lower wing of the Sto-Plinth Profile PH into the joint between the plinth insulation and the facade insulation.



2

Use Sto-Starter Track Connectors L to join the plinth profiles. Cut the connectors to size as needed. They should be at least as long as the visible width of the plinth profile underside. The strip of mesh of the plinth profile overlaps in the joint area.



3

Apply the base coat to the insulation boards in the area of the plinth profile. Then embed the perforated wing and integrated strip of mesh for the plinth profile in the still damp base coat.



4

Install large-area reinforcement as described on page 23. Cut off the Sto-Glass Fibre Mesh flush with the upper edge of the weather groove.



5

Once the plinth reinforcement has dried, clean the joint between the plinth profile and the plinth insulation. Then seal with StoSeal F 100.



6

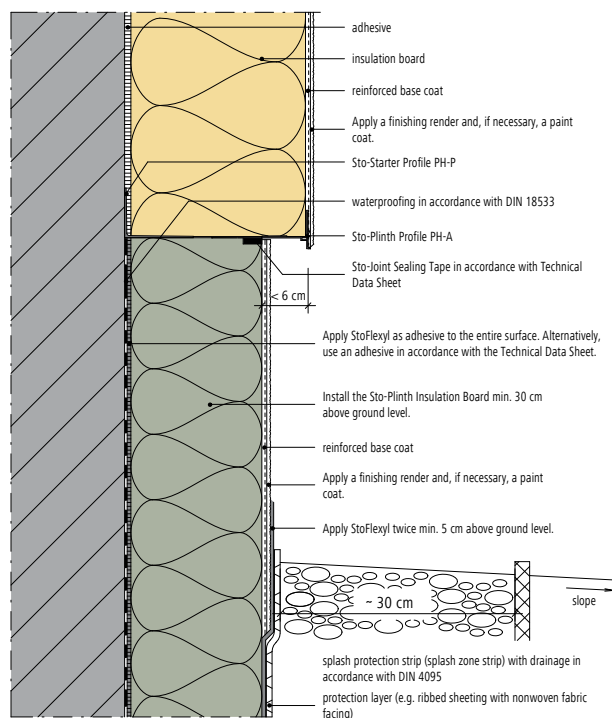
Observe the "Plinth insulation in the splash zone" work steps on page 29 onwards when installing the plinth insulation.

Plinth connection

Free from thermal bridges, Version II

Plinth insulation following facade insulation

Sto-HQ-EN_GEN-0136_2018-05-01



1 Before starting to lay the boards, determine the height of the plinth and mark this with a plumb line.

Then brush the plinth area with 10 % water-diluted StoFlexyl (mix StoFlexyl 1:1 with cement).



2 Fix Sto-Starter Profile PH-P/PH-K using Sto-Schraubdübel S UEZ 8 according to the height of the plinth. Install the anchors with a max. spacing of 30 cm. Use Sto-Packing Shims to compensate for unevenness in the wall.

Mitre cut any starter profiles that go in corners.



3 Fit facade insulation boards onto the starter profile. Apply the base coat to the facade insulation boards in the area of the plinth profile.



4 Fix the Sto-Plinth Profile PH-A to the underside of the first insulation board row using the integrated self-adhesive tape.



5 Embed the perforated wing and integrated strip of mesh for the plinth profile in the still damp base coat. Proceed with large-area reinforcement as in Version I.

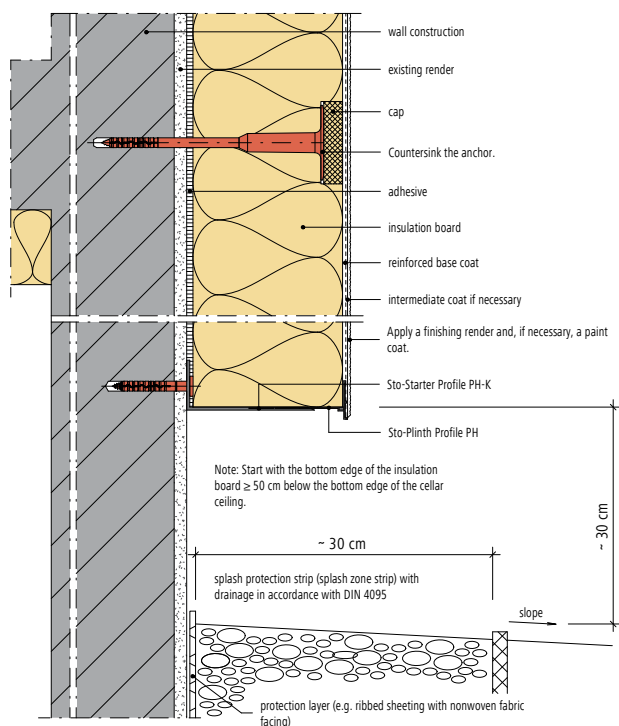


6 Attach the Sto-Joint Sealing Tape Lento to the underside of the plinth profile. Then insulate the plinth. Observe the "Plinth insulation in the splash zone" work steps on page 29 onwards when installing the plinth insulation.

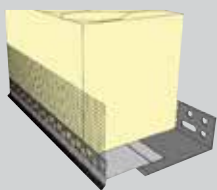
Free from thermal bridges, Version III

Plinth connection with uninsulated plinth

Sto-HQ-EN_GEN-0125_2018-05-01



Product tip



Creating the lower system connection using the Sto-Starter Profile PH-K and the Sto-Plinth Profile PH has several advantages:

- Projection is easy to adjust
- Flexible: all insulation thicknesses between 60 and 200 mm are covered by three starter profile versions
- Closed underneath

Different versions of the Sto-Starter Profile PH are available:

- Sto-Starter Profile PH-K, made of plastic in projections of 50, 100, and 160 mm
- Sto-Starter Profile PH-AL (160 mm) made of extruded aluminium, therefore very stable, white powder-coated



1 Fix Sto-Starter Profile PH-K (or Sto-Starter Profile PH-AL) using Sto-Schraubdübel S UEZ 8 according to the height of the plinth. Install the anchors with a max. spacing of 30 cm. Use Sto-Packing Shims to compensate for unevenness in the wall. Mitre cut any starter profiles that go in corners.



2 Then fit the facade insulation boards onto the starter profile.

Insert the Sto-Plinth Profile PH into the joint between the facade insulation and the starter profile.



3 Apply the base coat to the facade insulation boards in the area of the Sto-Plinth Profile PH-A.



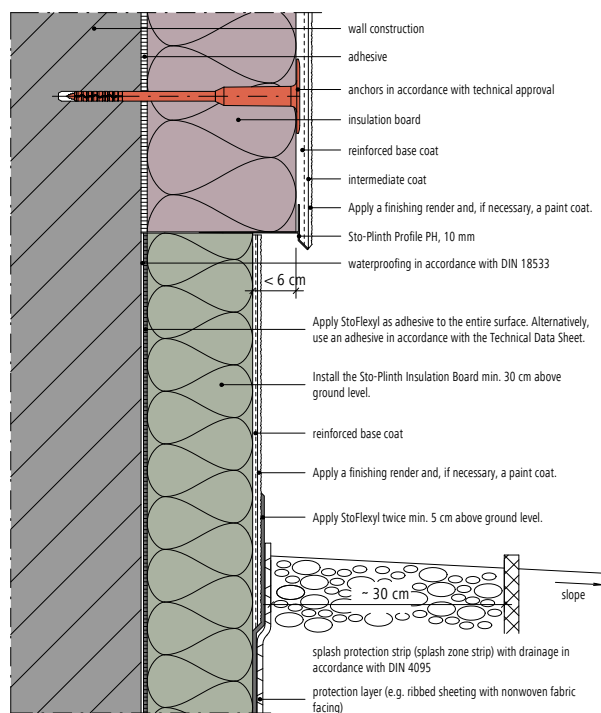
4 Embed the perforated wing and integrated strip of mesh for the plinth profile in the still damp base coat. Proceed with large-area reinforcement as in Version I.

Plinth connection

Connection in the ground and splash zone for thick-layer reinforcement

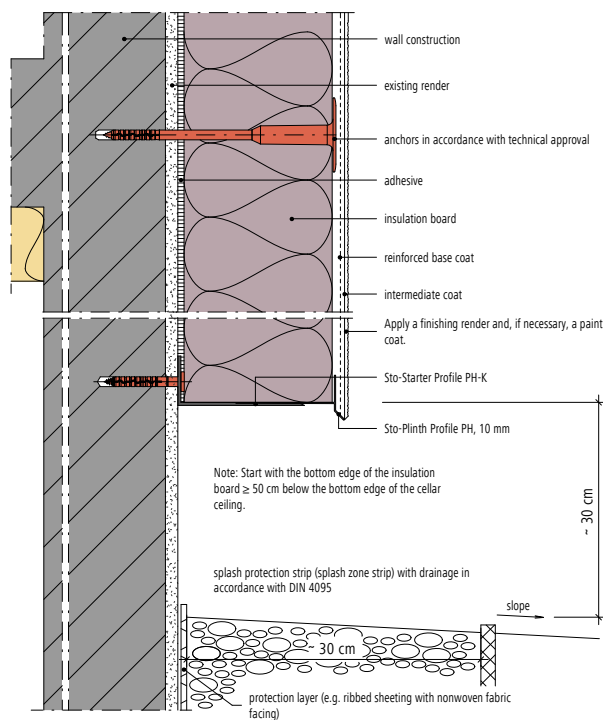
Facade insulation on top of the plinth insulation

Sto-HQ-EN_STP-0135_2018-05-01



Plinth connection with uninsulated plinth

Sto-HQ-EN_STP-0125_2015-08-01



Building with unheated basement

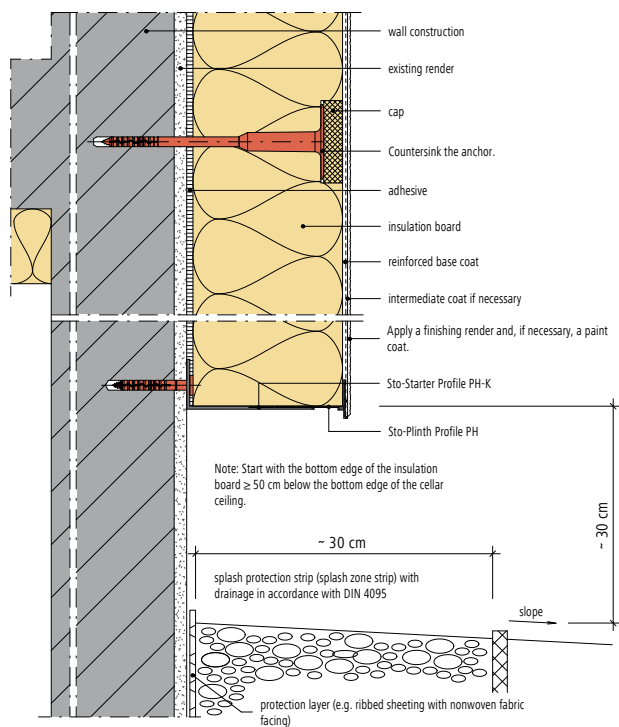
Note

Starter tracks made of aluminium have a high thermal conductivity. A plinth connection with the Sto-Starter Track Universal shown here should therefore only be used when the following conditions are satisfied:

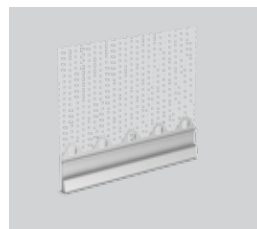
- The basement is unheated
- The cellar ceiling is insulated
- The facade insulation ends approx. 50 - 80 cm below the cellar ceiling
- The starter track is thermally separated from the wall structure by means of packing shims or a thermal stop (e.g. Sto-Joint Sealing Tape Lento)

Plinth connection with uninsulated plinth

Sto-HQ-EN_GEN-0125_2018-05-01



Product tip



The Sto-Clip-on Bead Perfect has the following advantages:

- Can be easily attached to the Sto-Starter Track Universal from below
- Integrated glass fibre mesh
- With smoothing ridge to ensure the base coat is thick enough



External wall/system transition

Area subject to a risk of impacts

Product tip



Sto-Armour Mesh is a reinforced glass fibre mesh. It increases the compressive strength in critical areas (e.g. the entrance area). When the StoTherm Classic® external wall insulation system is used, this results in an impact resistance of over 60 joules.



Apply and then smooth the base coat.



Embed the Sto-Armour Mesh in the base coat.

Tip: To ease application, it is recommended to cut the Sto-Armour Mesh to size early and put it down evenly.



Do not overlap the mesh, but rather join it up flush.

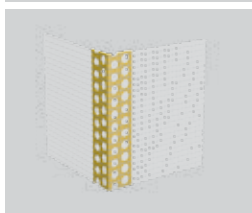


Once the base coat has dried, apply the reinforcement as described on page 23. Install the mesh strips and ensure a sufficient offset towards the joints of the Sto-Armour Mesh.

Note: On the surface with the Sto-Armour Mesh, a levelling coat with a width of approx. 30 cm must be applied to the transition to the rest of the facade surface due to the higher coating build-up.

Corner formation

Product tips



Sto-Mesh Angle Bead Standard

The use of corner profiles is recommended for corner formations. The Sto-Mesh Angle Bead Standard is an angled strip of mesh (90° angle) reinforced with a plastic rail.



Sto-Mesh Corner Roll Ideal

Alternatively: The Sto-Mesh Corner Roll Ideal is an edge profile with a variable angle and integrated glass fibre mesh. The stable plastic edge is particularly advantageous.



At the building corners, the insulation boards should be toothed. Saw off any protruding insulation boards at external corners. Sand the insulation boards to ensure that they are even.



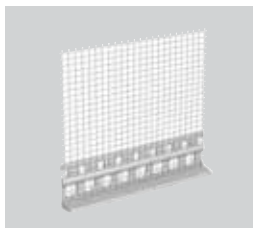
Apply the base coat in the corner area. Then press down the Sto-Mesh Angle Bead Standard, align it, and embed it in the base coat.



When applying the large-area reinforcement, guide the Sto-Glass Fibre Mesh into the corners. Overlap the mesh angle bead by at least 10 cm. Cut off protruding mesh. For large-area reinforcement see page 24.

Render edge

Product tip



Sto-Render Stop Profile

To produce flawless render edges, the use of render stop profiles is recommended. The Sto-Render Stop Profile consists of a profile with a stop and integrated glass fibre mesh. 3, 6, 10, 15, and 20 mm types are available.



1

Before starting installation, determine the position of the stop profile. Position the Sto-Render Stop Profile, press it into the base coat mortar, and align it using the spirit level.



2

The render stop profile is embedded in the base coat mortar, whereby any excess material is removed and smoothed across the mesh of the profile.



3

Apply the intermediate coat (or not if using StoTherm Classic®) and the finishing render. Peel off any protruding material along the render stop profile.



4

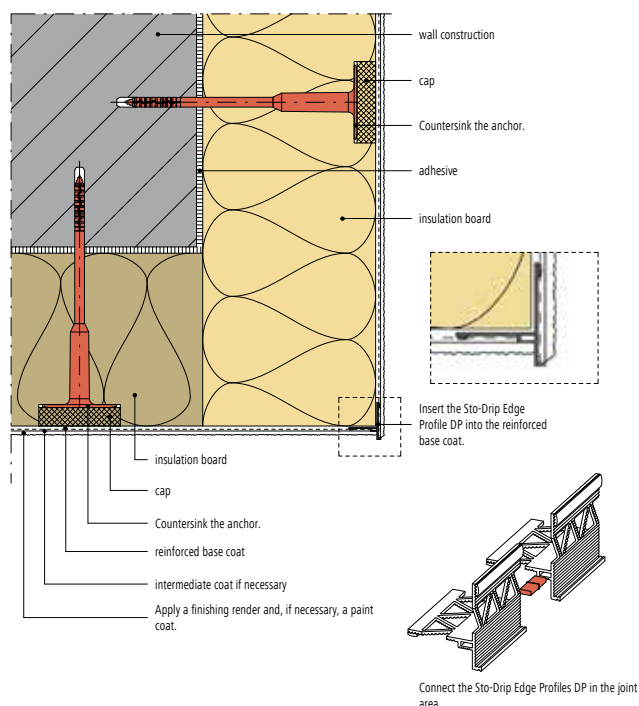
Connect the finishing render (Fig. StoSuperlit natural stone render) to the Sto-Render Stop Profile from below.

External wall/undersides

Drip edge formation

Drip edge formation with Drip Edge Profile

Sto-HQ-EN_GEN-0275_2018-05-01



Apply the base coat to the corners of the structural member. Apply the Sto-Drip Edge Profile DP corner piece to the fresh base coat.



Connect the Sto-Drip Edge Profile DP to the corner piece and embed it in the base coat.



Align the Sto-Drip Edge Profile DP.



Move the Sto-Glass Fibre Mesh up to the Drip Edge Profile. Then embed the mesh in the base coat. Mesh joints should overlap by at least 10 cm.

Note: Alternatively, the corner can be formed by means of a mesh angle bead.



Reinforce the underside of the structural member with Sto-Glass Fibre Mesh. The mesh should overlap by at least 10 cm at the connection with the reinforced facade.

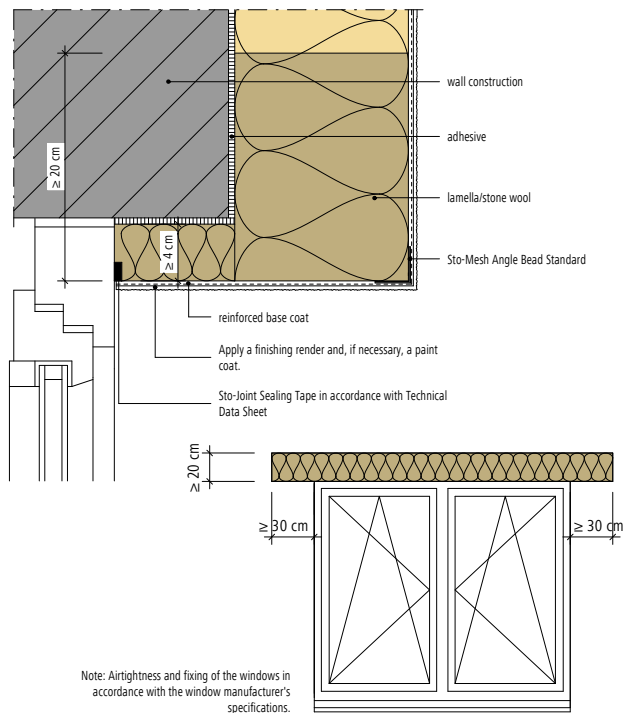


Once the base coat has dried through, apply the intermediate coat (or not if using StoTherm Classic®) and the finishing render. Trowel off any protruding finishing render from the edges.

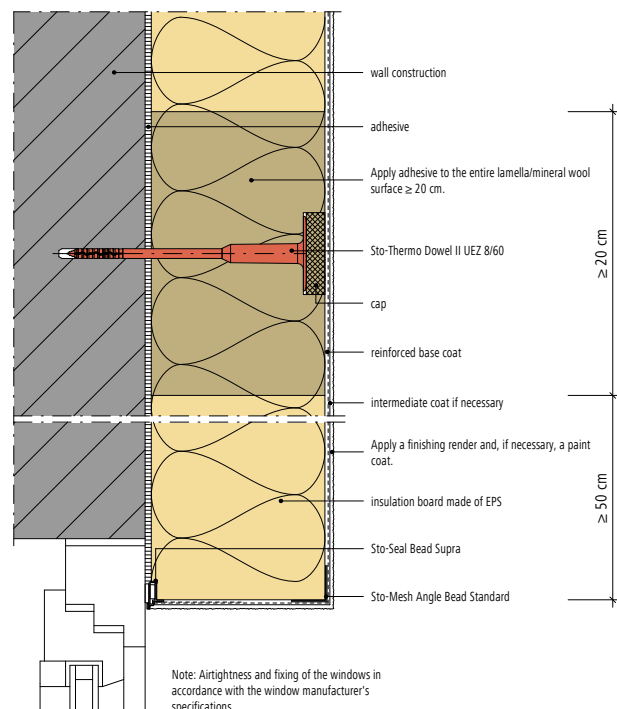
Windows and doors

Fire barrier

Sto-HQ-EN_GEN-0405_2018-05-01

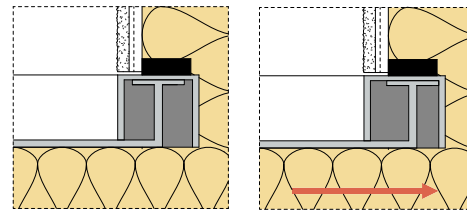


Sto-HQ-EN_GEN-0407_2018-05-01



Windows and doors – window sill installation prior to insulation board installation

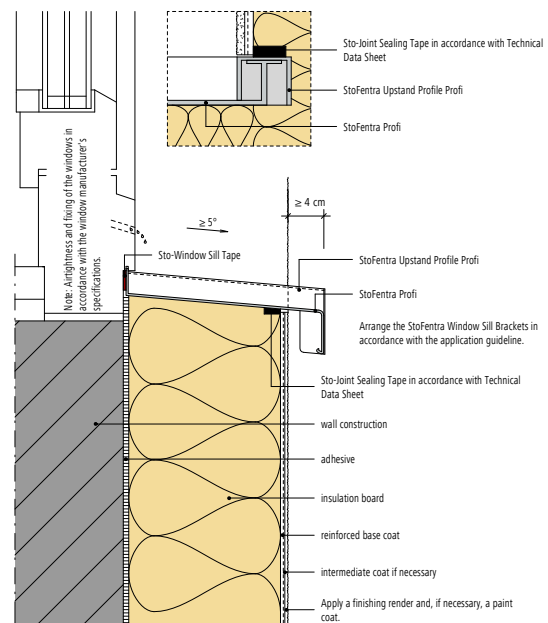
Sto-DE-DE_P16219-02a_2017-01-12



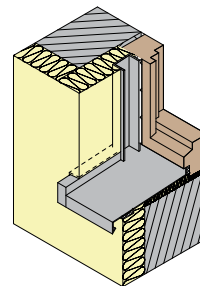
The StoFentra Upstand Profile Profi expansion strip absorbs thermal expansion in the window sill.

StoFentra Profi connection

Sto-HQ-EN_GEN-0500_2018-05-01



Sketch (schematically)





Windows and doors

Window sill installation prior to insulation board installation



1

To seal the connection joint, apply Sto-Window Sill Tape to the screw-on bar and guide it around each corner by approx. 5 cm.



2

Position the window sill, align it, and fix it to the window frame using window sill screws.



3

Mark and attach StoFentra Window Sill Brackets with a spacing of approx. 60 cm to the underside of the window sill. Then fix with suitable anchors.



4

Fill cavities below the window sill with Sto-Gun Foam SE.

Note: Support the window sill when filling foam from underneath.



5

To seal the connection joints, bond Sto-Joint Sealing Tape Lento to the end profile flush with the insulation boards.



6

Bond the joint sealing tape around the sides of the end profile and to the underside of the window sill. Never apply tension to the joint sealing tape when bonding it around the end profiles like this (see "Note").

Note



Wrong:

The joint sealing tape is not rolled on the edge, which means that it cannot expand. The joint sealing tape cannot seal the joint sufficiently.



Right:

The joint sealing tape is rolled on the edge, meaning it can expand.



7

Measure the insulation board at the window sill end profile. The final surface of the window reveal must be flush with the inside of the end profile.



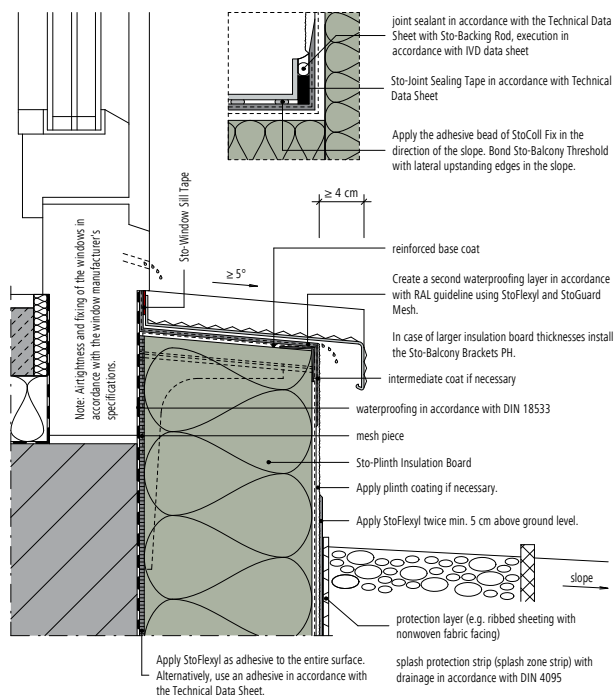
8

Once the insulation board adhesive has dried through, fill the cavity between the window sill and the insulation boards with Sto-Gun Foam SE.

Second waterproofing layer beneath window sills, Version I

Window sill connection with second waterproofing layer

Sto-HQ-EN_GEN-0730_2018-05-01



Note

This installation method is particularly suitable for the Sto-Balcony Threshold and the Sto-Window Sill Stone.



1 Create a sloping insulant surface in the area around the parapet if applicable. Bond and press on a strip of StoGuard Mesh into both corners of the reveal, parapet, and facade surface.



2 Apply a base coat below the parapet. Position the Sto-Render Stop Profile (15 mm or, if applicable, 20 mm) flush and embed the strip of mesh in the base coat. The Sto-Render Stop Profile projection serves as a drip edge for the water flowing off the second waterproofing layer.



3 Cut the StoGuard Mesh to size, then bond and press it on to the lower window frame profile (approx. 3 cm high) and the parapet surface. Make sure that the StoGuard Mesh overlaps sufficiently.



4 Apply StoFlexyl (mixture) to the parapet, the lower area of the reveals, and the lower window frame profile. For this application cycle, StoFlexyl (dispersion) is mixed with StoFlexyl Cement at a 1:1 ratio.



5 Apply a second layer of StoFlexyl (mixture). Dilute the compound with approx. 10 % water.



6 Then reinforce the facade and reveals. For this, please observe the "Reinforcement of reveals" and "Large-area reinforcement" application guidelines on page 23 onwards.

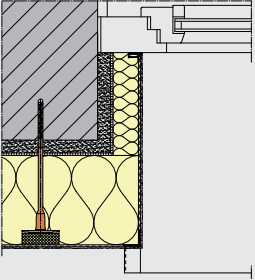
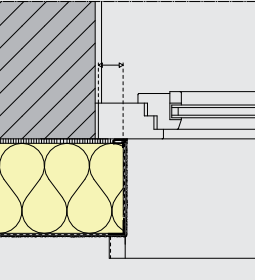
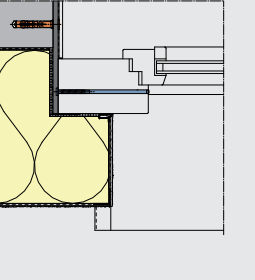


Windows and doors

Window connection – general information

- Windows and doors must be fixed in accordance with state-of-the-art technology in order to prevent undue movement. The appropriate relevant guidelines (e.g. those provided by the German RAL Quality Assurance Association for Windows and Doors) must be observed.
- The substrate (e.g. window frame) must be level, dry, and free of substances which can adversely affect the adhesive bond (e.g. grease, dirt). Cleaning is advisable. Produce an adhesive sample section (for precise instructions on this, see the Technical Data Sheet for the seal bead). In the case of special surface finishes, pre-treatment may be required (after consulting the door or window supplier).
- Only fix the seal beads immediately before installing the adjacent insulation boards.
- If the length of the connection is less than 2.40 m, apply the seal beads in one piece.
- If the connection is longer, always use the profile in its original length at the bottom and cut to size above.
- In the corner area (window lintel), first place the vertical seal beads in their maximum length and then fix the horizontal profile between the vertical profiles.
- Sto-Seal Beads may not be used for the connection of windows that are flush with the rendered facade, or for window elements that protrude from the (finished) facade.

Overview of Sto-Seal Beads

	Area of application				
	Window in masonry (wall structure), set back		Window flush with the masonry (wall structure)		Window in front of the masonry (wall structure), in the insulant ¹⁾
					
Window size	≤ 3 m ²	≤ 10 m ²	≤ 10 m ²	≤ 10 m ²	≤ 10 m ²
Installation length	≤ 2.4 m (without joints)	≤ 7.2 m	≤ 7.2 m	≤ 7.2 m	≤ 7.2 m
Insulant thickness	≤ 160 mm	≤ 300 mm	≤ 160 mm	≤ 300 mm	≤ 300 mm
Sto-Seal Bead Supra	■	■	■	■	■
Sto-Seal Bead Perfect	■	■	■ ¹⁾		

■ suitable

¹⁾ Can also be used with an insulant thickness of up to 200 mm if the window is ≤ 2 m²

Window connection, Version I



1 Measure the length of the first vertical seal bead and then cut the seal bead to size. A mitre edge is recommended in the top corner area.



2 Remove the protective film from the adhesive tape on the seal bead and position the seal bead on the end profile of the window sill. The joint between the end profile and the seal bead must first be sealed using joint sealing tape (except for when using Sto-Seal Bead Supra and Sto-Seal Bead Bravo S). Align the Sto-Seal Bead, bond it to the window frame and press on firmly.



3 Adjust and fit the horizontal seal bead between the vertical tracks, then align and fix in place.

Note: Always install the vertical seal beads first. To cover the window, the necessary film can be fixed to the integrated self-adhesive tape of the Sto-Seal Beads.



4 After insulating the facade and, if necessary, the reveal (in the case of windows/doors set back in the masonry), apply the base coat to the reveal. Work the mesh into the base coat. The overlap with the reveal reinforcement must be at least 10 cm.



5 To further reinforce the reveals, see the "Reinforcement of reveals" section on page 23 onwards.

Window connection, Version II



1 Immediately before installing the facade insulation boards, attach joint sealing tape to the window frame.



2 Then insulate the facade and, if necessary, the reveal (in the case of windows/doors set back in the masonry).



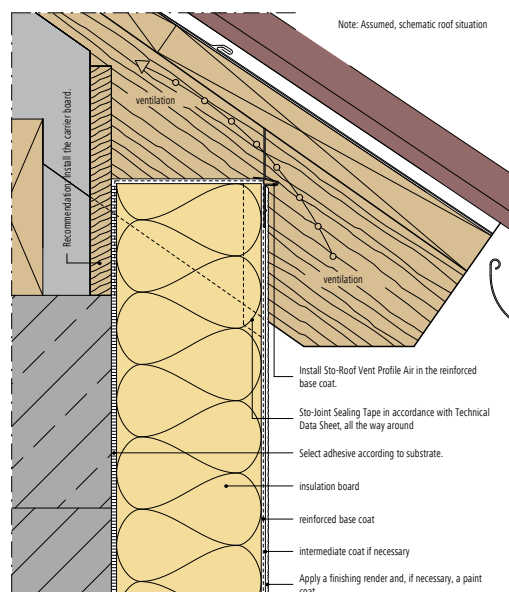
3 After reinforcing the reveal (see the "Reinforcement of reveals" section on page 23 onwards), separate the still damp base coat from the joint sealing tape using a trowel cut. Separate the finishing render from the joint sealing tape using a trowel cut.

Roof connection

Connection to a ventilated/non-ventilated roof

Connection to eaves with roof projection, ventilated

Sto-HQ-EN_GEN-0300_2018-05-01

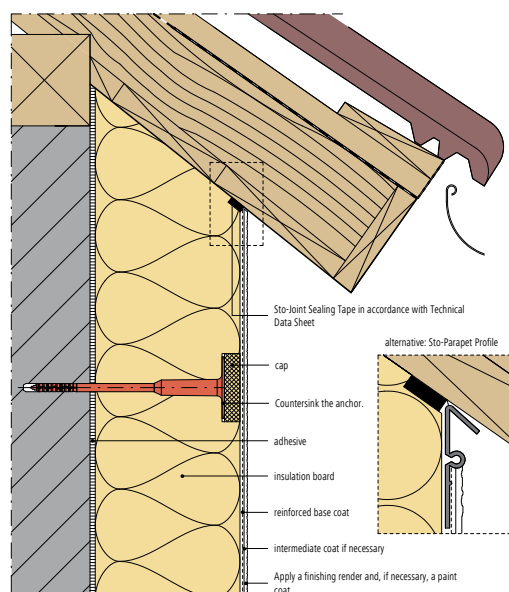


Note

A consistent transition from the EWIS and the roof insulation, which is free from thermal bridges, must be carefully planned and implemented.

Connection to eaves with roof projection, not ventilated

Sto-HQ-EN_GEN-0305_2018-05-01



Connection to a non-ventilated roof



1 Prepare and cut insulation boards according to the roof slope. Position the prepared insulation boards and mark the roof rafter. Then cut the insulation boards precisely to size.



2 Position the cut insulation boards again and mark the leading edge on the roof soffit and the rafter.



3 To seal the connection joint, bond Sto-Joint Sealing Tape Lento across its entire length and flush from inside with the marked leading edge of the insulation board.



4 Apply adhesive to the full surface of the insulation boards. Insert the insulation boards and install tight-butted. For technical reasons, always recess an area below the fitting pieces. Adjust and fit the insulant in this recess later (after installing the top row of boards).



5 Mask all the way around the roof rafters with adhesive tape.

Connection to a non-ventilated roof



Measure and cut the Sto-Parapet Profiles to size with a small margin.



Apply the base coat.



Position the Sto-Parapet Profiles with a small spacing from the roof connection and embed in the damp base coat.



While reinforcing the larger area, position Sto-Glass Fibre Mesh on the rafters and then cut them out. Cut off any protruding mesh on the rafters and parapet profiles. Then embed the mesh in the damp base coat.

Structural member fixing

Overview of mounting elements – mounting element examples



Anchorage in the insulant: StoFix Spirals
For subsequent fixing of lightweight building elements, e.g. bells or signs, in EPS insulation boards



Anchorage in the insulant: StoFix Zyrillo
Mounting underlay for fixing lightweight loads, e.g. lamps, rainwater pipes, closet poles, in EPS insulation boards



Bonding with the substrate: StoFix Quader ND Mini/Midi
Mounting underlay for fixing lightweight loads, e.g. lamps, rainwater pipes, closet poles; compression underlay for medium-weight loads



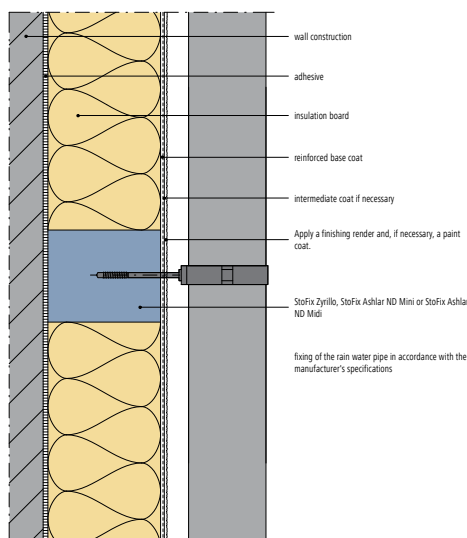
Compression underlay: StoFix Quader HD Maxi
Compression underlay for high compressive loads, suitable, for example, for awnings or railings



Application of load into the substrate: StoFix SLK-ALU-TR
Heavy load corbel for fixing heavy loads, e.g. awnings or porch roofs, in StoTherm systems

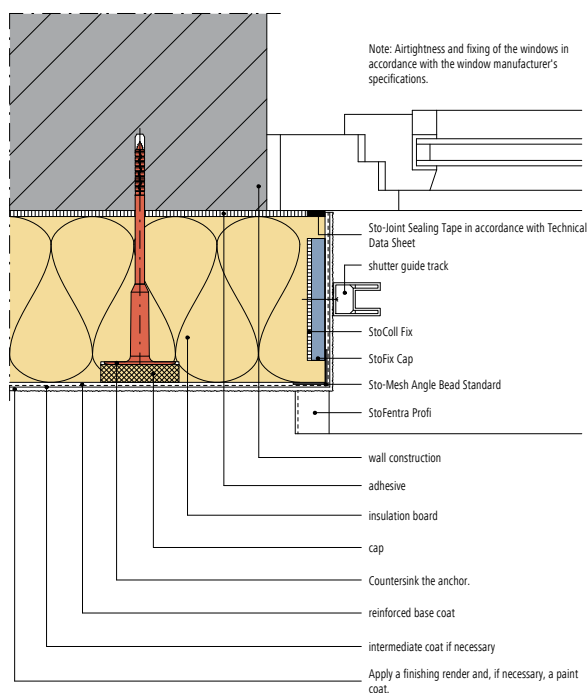
Rainwater pipe fixing

Sto-HQ-EN_GEN-0290_2018-05-01



Connection of a roller shutter guide track with StoFix Cap

Sto-HQ-EN_GEN-0600_2018-05-01



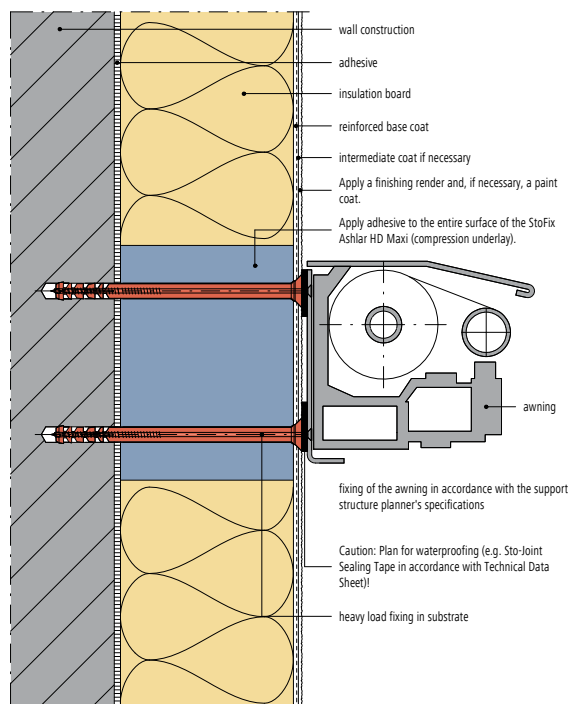
Note

For detailed information on structural member fixing with Sto mounting elements, we recommend the "StoFix mounting elements" brochure.

StoFix Quader

StoFix Quader HD Maxi as a compression underlay for porch roof purlin and other structural members

Sto-HQ-EN_GEN-0270_2018-05-01



Note

Install the StoFix Quader as described on the right after installing the insulation boards. Alternatively, it can be installed when the insulation boards are bonded. In this case, start at step 3.

StoFix Quader – subsequent installation



1 Mark the StoFix Quader on the insulation board.



2 Cut the marked area out of the insulant.



3 Apply adhesive to the full surface of the StoFix Quader and press evenly into the opening.



4 Fill joints with Sto-Gun Foam SE. Once dry, cut off any foam that has oozed out and sand smooth.



5 Mark the centre of the ashlar with a screw. The reinforcement and finish follow.



Supplementary products

Scaffold anchor hole plug

Product tip



Sto-Scaffold Plug

Scaffold anchors leave behind holes in the insulated and plastered wall. Use the Sto-Scaffold Plug made of impregnated flexible foam to seal these scaffold anchor holes.



1

Fill the cavity behind the Sto-Scaffold Plug using a suitable insulant. Compress the Sto-Scaffold Plug by rolling it between the palms of your hands.



2

Insert the compressed scaffold anchor hole plug into the scaffold anchor hole.



3

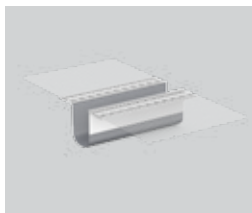
Apply the finishing render and level the transitions using a paint brush.

Structural expansion joints

Expansion joint formation

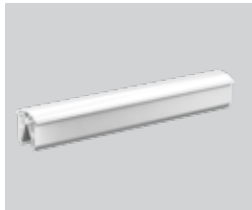
If expansion joints are required in the construction, these must also be formed within the EWIS. Both expanding expansion joint tapes and suspension profiles are used for this.

Product tips



Sto-Expansion Joint Profiles

Use Sto-Expansion Joint Profile Type E for level wall surfaces, V for offset wall surfaces (internal corners). Important: The expansion joints must be filled with insulant in order to prevent thermal bridges.



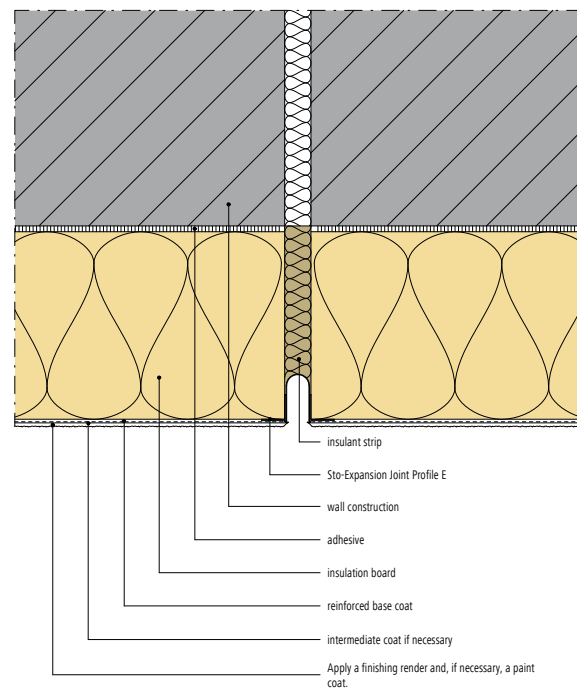
Sto-Dehnfugen-Abdeckprofil

If structural expansion joints need to be made less visible, Sto-Expansion Joint Profiles can be combined with the corresponding Sto-Dehnfugen-Abdeckprofil (E or V).

Version I: expansion joint profile

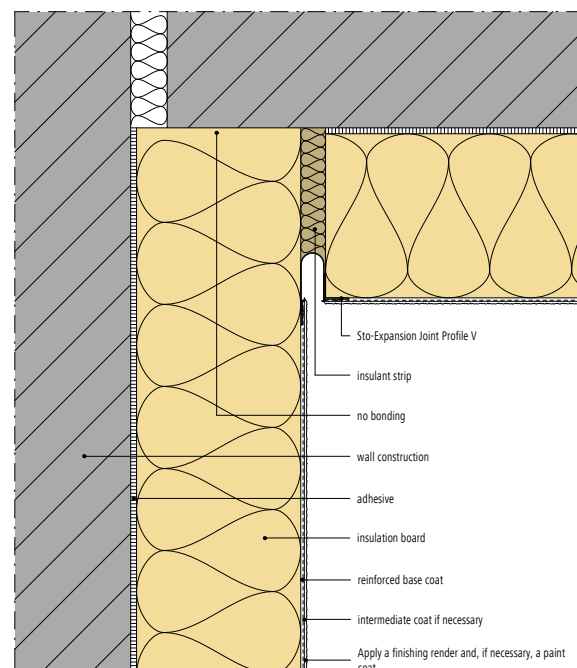
Expansion joint profile, surface application

Sto-HQ-EN_GEN-0800_2018-05-01



Expansion joint profile, corner application

Sto-HQ-EN_GEN-0805_2018-05-01





Structural expansion joints

Version I: expansion joint profile



1

Apply the base coat to the joint flanks and to approx. 20 cm of the adjacent surfaces.

Note: To avoid thermal bridges and for fire protection reasons, fill the rear area of the expansion joint with mineral wool before starting.



6

Once the base coat has completely dried through, apply and texture the finishing render.



2

Insert the Sto-Expansion Joint Profile E with the expanding joint cover projection facing up and embed in the reinforcing compound. For even joint formation, a polystyrene strip is used for fixation and alignment. The width of the polystyrene strip determines the width of the expansion joint.



7

Separate the expansion joint profile from the polystyrene strip using a trowel cut, if necessary.



3

The expansion joint profiles are installed from bottom to top. Install the second expansion joint profile so that the straight-edged end of the expanding joint cover lies on top of the protruding expanding joint cover of the first profile.



8

Carefully pull the polystyrene strip out of the expansion joint. Then rework the edges once again.



4

Apply base coat to the adjacent surfaces. When applying the large-area reinforcement, guide the Sto-Glass Fibre Mesh right up to the smoothing ridge of the expansion joint profile.



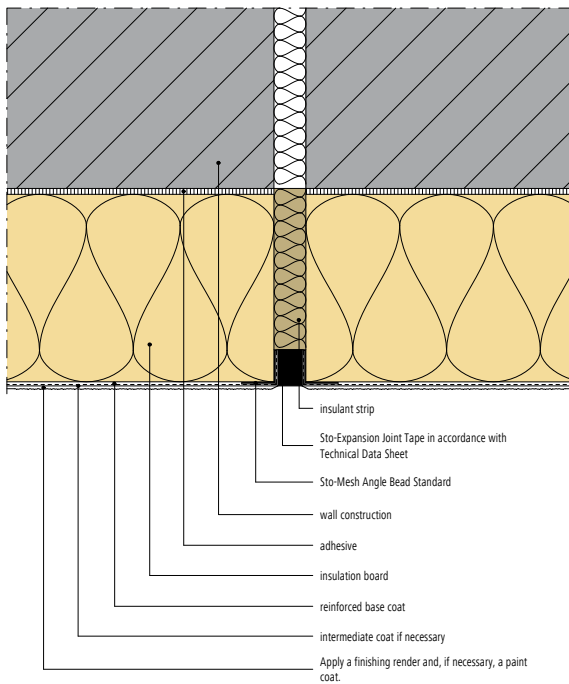
5

Separate the expansion joint profile from the polystyrene strip using a trowel cut, if necessary.

Version II: expansion joint tape

Expansion joint tape, surface

Sto-HQ-EN_GEN-0810_2018-05-01



1 Apply the base coat to the joint flanks and to approx. 20 cm of the adjacent surfaces.

Note: To avoid thermal bridges and for fire protection reasons, fill the rear area of the expansion joint with mineral wool before starting.



2 Insert the Sto-Mesh Angle Bead Standard and embed the mesh of both wings in the base coat.



3 The mesh angle bead is installed from bottom to top. Fit the mesh angle beads from the top, overlapping them.

Note: Ideally, the Sto-Mesh Angle Beads should overlap with a mesh protrusion of 10 cm.



4 Apply base coat to the adjacent surfaces. Embed the Sto-Glass Fibre Mesh. Here the mesh of the mesh angle bead overlaps by approx. 10 cm.



5 Trowel off the corners.



Structural expansion joints

Version II: expansion joint tape



6 After the base coat has completely dried through, bond the Sto-Expansion Joint Tape flush with the base coat onto an edge.



7 Mask the Sto-Expansion Joint Tape before applying the finishing render.



8 Apply and texture the finishing render.

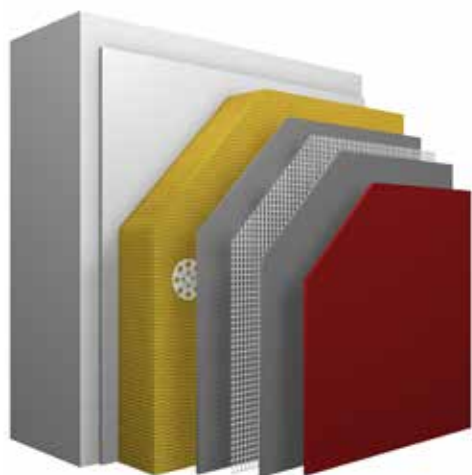


9 Finally, remove the adhesive strip while the finishing render is still damp.



StoTherm Mineral and StoTherm Classic® S1

Additional information on application



Note

The information up to page 56 also applies to the StoTherm Mineral and StoTherm Classic® S1 external wall insulation systems as far as possible. Any deviations are described on the following pages.



Insulation board fixing (mineral wool)

Bonding



Sto-Stone Wool Insulation Board
Insulation board made of mineral wool in accordance with EN 13162



Lamella insulation board made of mineral wool
Insulation board made of mineral wool in accordance with EN 13162; high pull-off resistance thanks to vertical fibres

Bonding the insulation boards

Immediately after application of the bonding mortar, and after 10 minutes at the latest, press, float into place, and press-fit the insulation boards. Depending on the weathering, this application time interval may be shorter. Excessive drying times of the bonding mortar on the insulation board or wall lead to the formation of a skin on the bonding mortar, which can lead to adhesion problems.

The insulation boards must be bonded together precisely; there must be no open joints between the insulation boards. Unavoidable gaps must be sealed with equivalent insulants. In order to prevent thermal bridges, there must be no bonding mortar in joints or between the board joints. Damaged insulation boards must not be installed.

Bonding the mineral wool insulation board



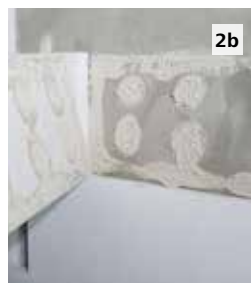
Full-surface bonding
In the case of smooth substrates, apply bonding mortar to the full surface of the insulation board. Then comb with a notched trowel (15 x 15 mm). When doing so, do not hold the notched trowel too flat. Use a sanding board for board fixation.



After pressure has been applied to the insulation board, it is important to ensure that the board is bonded evenly to the substrate.



Spot/edge bonding
In the case of uneven substrates up to 1 cm/m, apply a line of adhesive all the way around the edge of the board and – depending on the board format – three or six adhesive fixing dabs in the central area.



After pressure has been applied to the insulation board, the bonded proportion must be at least 40 % on both the substrate and the insulation board.



Laying of the insulation boards
Install insulation boards from bottom to top, tight-butted in the bond, and offset to the building corners. Press the boards firmly against the wall. Remove any adhesive that oozes out in order to prevent thermal bridges forming.

Bonding the lamella insulation board

Note

When using lamella insulation boards made of mineral wool on load-bearing substrates ($\geq 0.08 \text{ N/mm}^2$), we recommend the use of suitable anchors from a building height of 20 m in the edge zone in accordance with the specifications listed here.

Anchors/m ²	Anchor pattern	Anchors/m ²	Anchor pattern
4		6	
8			
10		10	
12		12	
14		14	



Insulation board fixing (mineral wool)

Bonding the lamella insulation board



1a Full-surface bonding

In the case of smooth substrates, apply bonding mortar to the full surface of the insulation board. Then comb with a notched trowel (15 x 15 mm). When doing so, do not hold the notched trowel too flat. Use a sanding board for board fixation.

Alternatively, in the case of uneven substrates up to 1 cm/m, use spot/edge bonding as described on page 14.



2a

After pressure has been applied to the insulation board, it is important to ensure that the board is bonded evenly to the substrate.



1b

Application of adhesive mortar to the wall by machine

In the case of smooth substrates, apply a bead of adhesive in sinuous lines with a max. spacing of 10 cm to the wall.



2b

After pressure has been applied to the insulation board, it is important to ensure that the board is bonded evenly to the substrate.



3

Laying of the insulation boards

Install insulation boards from bottom to top, tight-butted in the bond, and offset to the building corners. Press the boards firmly against the wall. Remove any adhesive that oozes out in order to prevent thermal bridges forming.

Additional fixing with anchors

Substrates

The Sto-Stone Wool Insulation Board must be fixed with anchors. Anchors meeting the European Technical Approval must be used for this. Depending on wind loads, additional anchor fixing may also be necessary for load-bearing substrates when working with the lamella insulation board. In the event of an insufficient load-bearing capacity, the lamella insulation board must also be fixed using anchors that meet the European Technical Approval or national application guidelines.

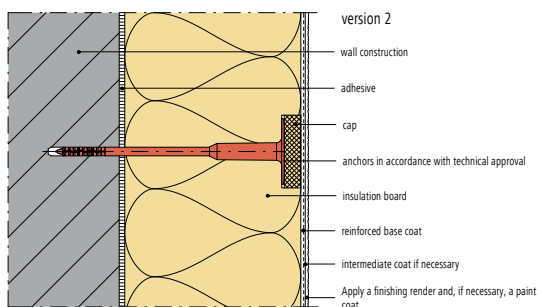
If the anchor is to be anchored in a substrate that is not exactly described in the anchor approval, then use pull-out tests on the construction site for evaluation of the anchor's load-bearing capacity.

Anchors/m ²	Anchor pattern	Anchors/m ²	Anchor pattern
4		6	
8			
10		8	
13		11	
14		16	
15		18	

Additional fixing with anchors, Version I: Sto-Thermo Dowel, recessed

Facade insulation system, bonded and anchor-fixed

Sto-HQ-EN_GEN-0010_2018-05-01



Note

The potential types of anchor fixing depend on the insulation board that has been selected. Recessed anchor fixing can only be performed if it has been expressly permitted. When using the Sto-Recessed Anchor Plate, the insulation board must have the following designation: T5-DS (T+). It must correspond to WL (P) and fulfil the following criteria: compressive strength or compressive stress at 10 % compression ≥ 4.0 kPa in accordance with EN 826, tensile strength ≥ 3.5 kPa in accordance with EN 1607, Euroclass A1 or A2-s-1, d-0 in accordance with EN 13501-1.



1

Drill a hole for the anchor in accordance with the anchor approval.

Note: Prior to this, the insulation boards must be bonded as described on page 14. Adhere to the specified drying times.



2

Insert the anchor into the drill hole until the anchor plate is flush with the insulation board.



3

Insert the thermally decoupled Sto-Thermo Dowel into the insulant by machine. Here the installation tool (Sto-Thermo Dowel MT) determines the uniform drilling depth.



4

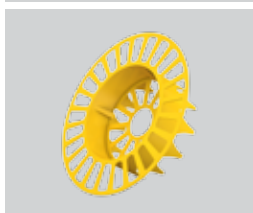
Insert the Sto-Thermo Dowel Cap MW into the anchor plate recess.

Then sand until smooth using the sanding board. This results in a closed, level insulation layer that reduces the risk of anchor markings.

Insulation board fixing (mineral wool)

Additional fixing with anchors, Version II: Sto-Thermo Dowel, recessed, with recessed anchor plate

Product tip



Sto-Recessed Anchor Plate

The Sto-Recessed Anchor Plate ensures a uniform, level surface. Furthermore, no additional installation tools are required for installation.



1

Drill a hole for the anchor in accordance with the anchor approval. Where required, observe edge distances in accordance with the insulant approval.

Note: Prior to this, the insulation boards must be bonded as described on page 14. Adhere to the specified drying times.



2

Plug the Sto-Recessed Anchor Plate onto the Sto-Thermo Dowel. Then insert the anchor into the drill hole and press down on the anchor plate enlarger so that the anchor plate lies on the insulant.



3

Screw in the anchor screw until the Sto-Recessed Anchor Plate lies flush with the surface of the insulant.



4

Insert the Sto-Thermo Dowel Cap MW into the anchor plate recess.

Then sand until smooth using the sanding board. This results in a closed, level insulation layer that reduces the risk of anchor markings.

Additional fixing with anchors, Version III: surface-flush anchor for surface-flush installation



1

Drill a hole for the anchor in accordance with the anchor approval.

Note: Prior to this, the insulation boards must be bonded as described on page 14. Adhere to the specified drying times.



2

With the anchor plate enlarger attached, insert the anchor 90 mm into the drill hole until the anchor plate lies flush with the insulation board.



3

Screw in the anchor screw so that the anchor plate is flush with the surface of the insulant.

Additional fixing with anchors – lamella insulation board

Anchors/m²	Anchor pattern
4	
6	
8	
10	
12	
14	

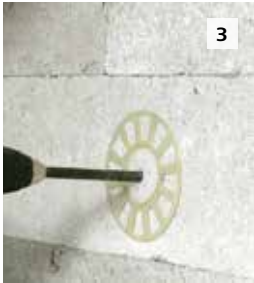


1 Drill a hole for the anchor in accordance with the anchor approval.

Note: Prior to this, the insulation boards must be bonded as described on page 14 onwards. Adhere to the specified drying times.



2 With the anchor plate enlarger attached, insert the anchor 140 mm into the drill hole until the anchor plate lies flush with the insulation board.



3 Screw in the anchor screw so that the anchor plate is flush with the surface of the insulant.



4 Finally, insert the EPS plug above the screw so that it lies flush.

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