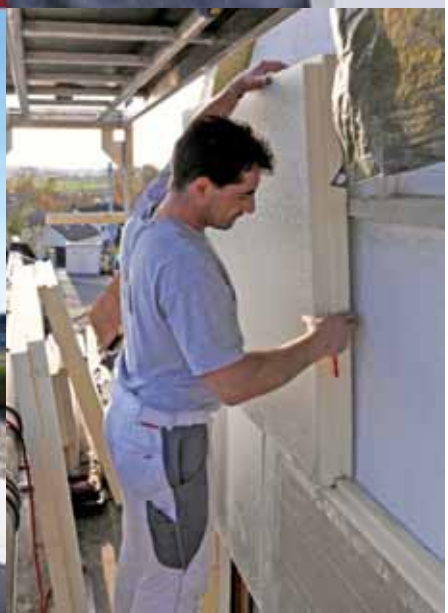
LINITHERM® insulation systems

LINZMEIER building elements

Installation

Exterior wall insulation

General information and examples regarding the installation of LINITHERM insulation systems on the exterior wall



AW-V

Preliminary remark

LINITHERM insulating elements are delivered in packets. Great care must be taken when unloading and transporting the elements on the building site.
The elements must be stored flat on level and dry ground. During all work (installation, cutting etc.) attention must be paid that no damage is done to the elements. During storage and transport, the elements must be protected against moisture and direct sunlight.

Safety provision

The safety regulations for building sites must be observed.

Rules of construction technology

LINITHERM insulation systems are high-quality products for the most various insulation solutions. The elements are manufactured on modern production facilities in top-quality, flawless condition. In order to achieve the benefit of an optimal insulation solution, proper installation of the elements is essential.
Our installation recommendations serve as schematic information for the buyer/user. They are non-binding and do not claim to be fundamentally valid, nor do they substantiate an entitlement to a guarantee. Each building offers different prerequisites; therefore the general procedure is to follow the rules of construction technology for each specific building.

Tools

Only a few tools, which are usually available on any building site, are required for the installation of LINITHERM insulation systems. Suitable tools are, e.g.: Hand-held circular saw with guide rail, hand saw, aligning board with spirit level, foam gun, drill, screwdriver.

Principles

The following points must generally be observed during and/or before the installation of the LINITHERM elements:
- The elements must be closely jointed on the longitudinal and transverse side and installed in formation. Cross joints must be avoided.
- Any damage must be properly repaired (e.g. by foaming, masking etc).
- Water penetration between the wall and the insulating panel must be avoided.
- Prior to commencing installation of the LINITHERM insulating elements, all preparatory work should be finished. (e.g. closure of cavities, creation of wall breakthroughs, removal of loose layers of plaster, installation of electric cables,…)
- **The elements must be installed with the printed roller stamp (batch number) facing the supporting structure.**
- Cladding of the facade should take place immediately after installation of the elements.

Installation options

The planning requirements and specialised regulations must always be adhered to.
PAL W can be installed in several ways:
- Installation of the elements directly on the plastered brickwork (renovation)
  The brickwork must be examined in advance to establish whether the plaster is still sound (if necessary, perform a pull-off test). Any faulty points must be repaired beforehand.
- Installation of the elements directly on concrete (new building/old building)
- Installation of the elements as a rear-ventilated facade or as core insulation for double-layer brickwork (new building/old building)
- Possible substrates for installation: Concrete, solid bricks, sand-lime bricks, lime-sand perforated brick, solid blocks of lightweight concrete, vertically perforated brick, wooden structure etc.

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AW-B

Fire protection for rear-ventilated curtain wall facades

- Only standardised or building regulations approved insulation materials, which fulfil the requirements according to DIN 4108-10:2008-06 type **WAB** may be used for the thermal insulation of rear-ventilated exterior wall claddings.
- The fire protection requirements depend on the building class
- In building classes 1 to 3, no particular fire protection requirements need to be fulfilled. Only building materials that at least comply with the requirements of the building regulations "normal flammability" B2 may be used.
- Increased fire protection requirements apply for building classes 4 to 5. Only building materials that at least comply with the requirements of the building regulations "flame retardant" (C-s2, d0) may be used. In all cases it must be checked whether there are increased requirements on fire protection, which may possibly involve special measures or the use of non-flammable materials.
- Requirements from the respective regional building laws and approvals must be observed.

Fire protection for double-layer brickwork

- In building classes 1 to 3, no particular fire protection requirements need to be fulfilled. Only building materials that at least comply with the requirements of the building regulations "normal flammability" B2 may be used.
- In classes 4 to 5 the fire protection requirements must be observed.
- When polyurethane rigid foam insulating materials are used, the clear distance between the layers must not exceed 300 mm.
- No fire protection measures need to be taken for models with finger-width-gaps.
- if a layer of air is planned between the insulation layer and the facing shell, the fire protection measures are required in the air gap to restrict the cross-storey spreading of fire in the space between the facade layers. No additional fire protection measures need to be taken for spaces of < 100 mm between the facade layers. In case of spaces of > 100 mm between the facade layers, circumferential fire barriers need to be installed either horizontally in every second storey or, as an alternative, laterally or circumferentially at the top round openings e.g. windows and doors.
- At least 200 mm high mineral wool insulation strips must be used as fire protection strips (A1 acc. to EN 13501-1 and melting point >1000°C), which must be tightly pressed into the gap and fastened to the carrier layer.

AW-A

Gluing

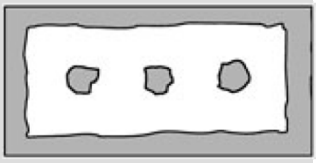


Fig. 1

General installation information

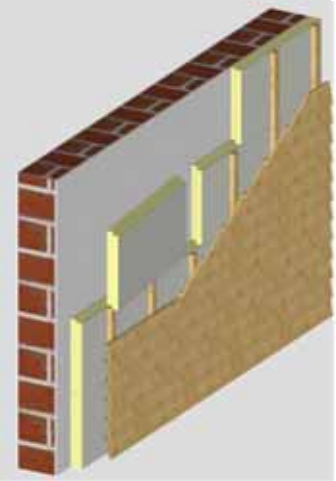
The elements must be generally fastened by mechanical means. Particular attention must be paid during installation, that there is no possibility of water penetration behind the insulation panels.
This can be achieved on the one hand by means of full-surface bonding of the element (apply adhesive using a notched trowel) to the substrate, and on the other hand by means of edge bead + spot bonding. (Fig. 1)
The adhesive can be directly applied to the aluminium foil. Bonding can take place either with mineral adhesives (e.g. SK leicht [Schwenk]) or with PU insulation material adhesives. The load-bearing capacity of the substrate must be examined beforehand. Irregularities in the wall can be compensated using the adhesive, if necessary. The thicker the layer of applied adhesive, the longer the setting time! The processing instructions of the adhesive manufacturer must be especially observed here!

As an alternative, the edging elements can also be separately sealed using pre-compressed sealing tapes (base point, building corners, windows, doors etc.)

If the elements are penetrated (e.g. cables for outdoor lighting), then the penetration elements must be tightly connected (foam cavities and mask for example with butyl adhesive tape if necessary).

The installation of the elements can begin after inspection of the load-bearing capacity (wall/plaster).

AW-HF



Exterior wall insulation with rear-ventilated facade construction

The connection of the exterior insulation to the perimeter insulation coming from the cellar must established without thermal bridging (possibly foam cavities). Conventional base profiles for ETICS systems can be used for the positioning of the insulating elements, which need to be aligned and dowelled before commencing the installation work.

The first row of elements is attached horizontally to the wall and aligned.

Attachment to the wall takes place applying one of the two adhesive systems stated above. At the end of the first row the last panel is cut to size and mounted. The emerging section is used as the first panel of the next row (endless installation).

It must be ensured that no cross joints arise; the transversal joint should have an offset of at least 30 cm. Multi-layer installation of the insulating panels is not permissible.

Cavities and faulty points must be foamed accordingly. Protruding, hardened foam is cut off and masked if necessary.

The mechanical fastening then takes place through the base slat, which serves as the substructure for the facade cladding.

Depending on the substrate (wood, concrete, bricks, etc.), appropriate screws and dowels are used (selection e.g. via query form of the Fischer Company). For a well-functioning rear ventilation, the distance between the insulation and the facade cladding must be at least 20 mm. The ventilation intake and exhaust openings must amount to at least 50 cm² per metre of wall.

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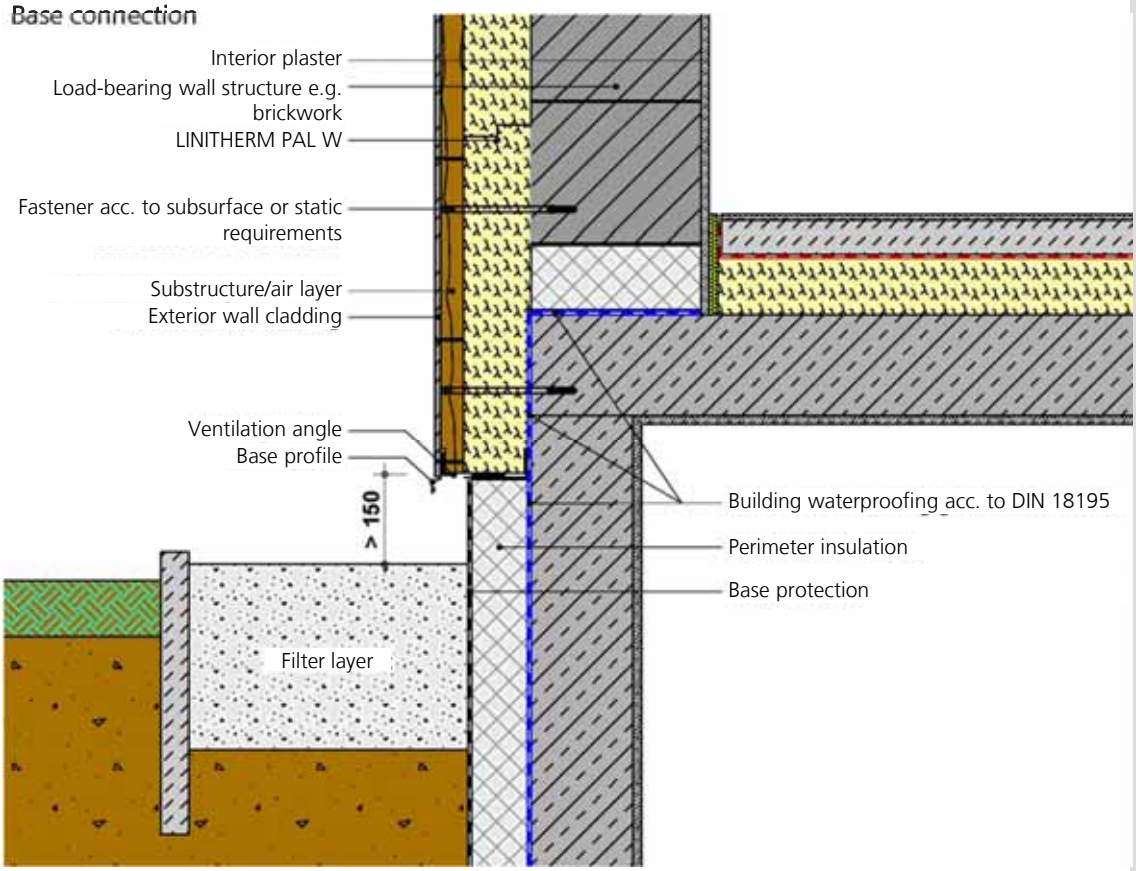
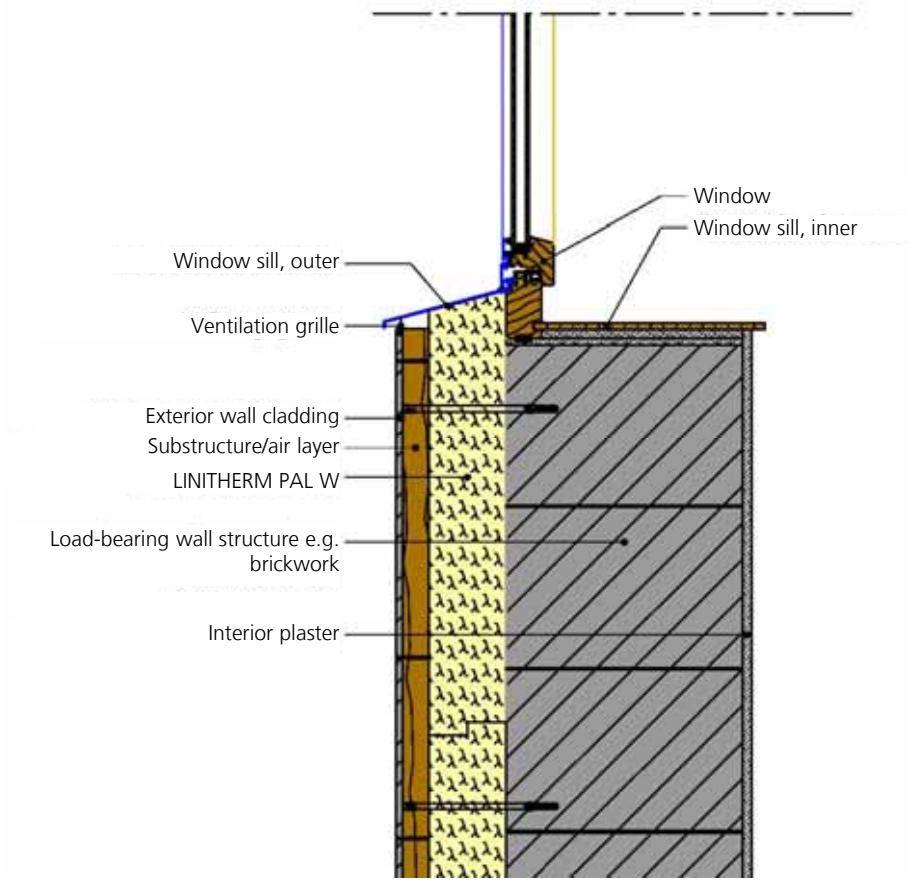
Base connection

AW-S



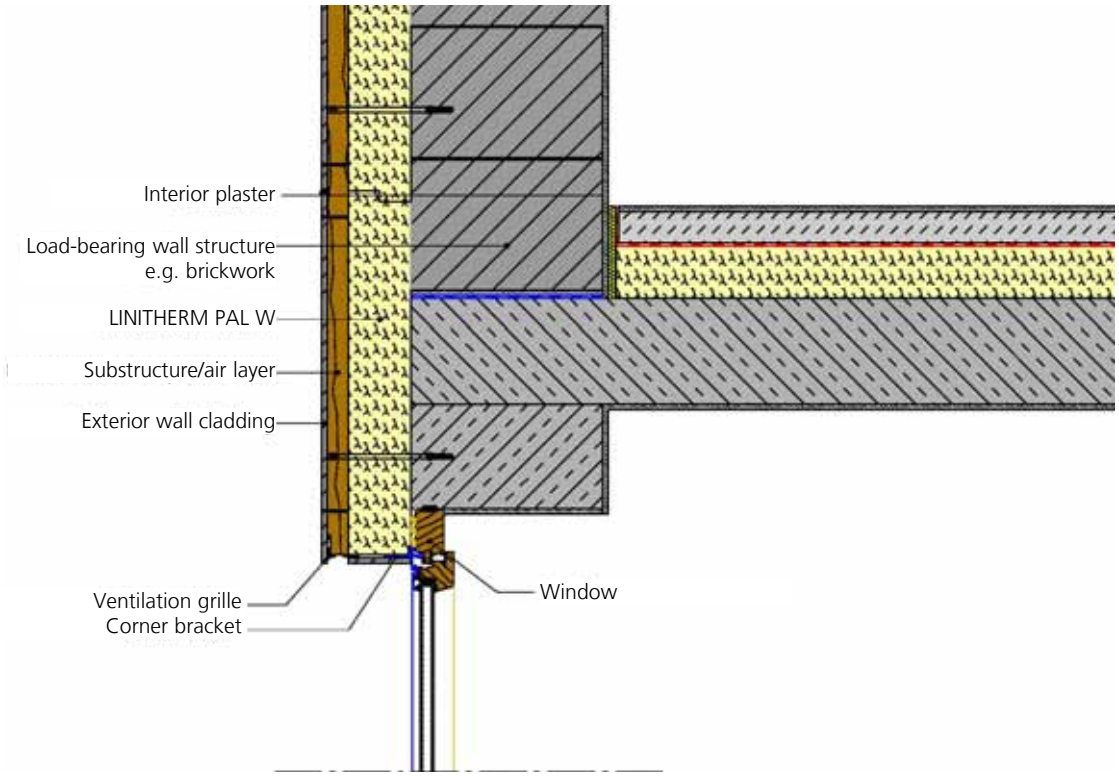
Bottom window connection with window sill

AW-UF



AW-OF

Upper window connection without roller shutters



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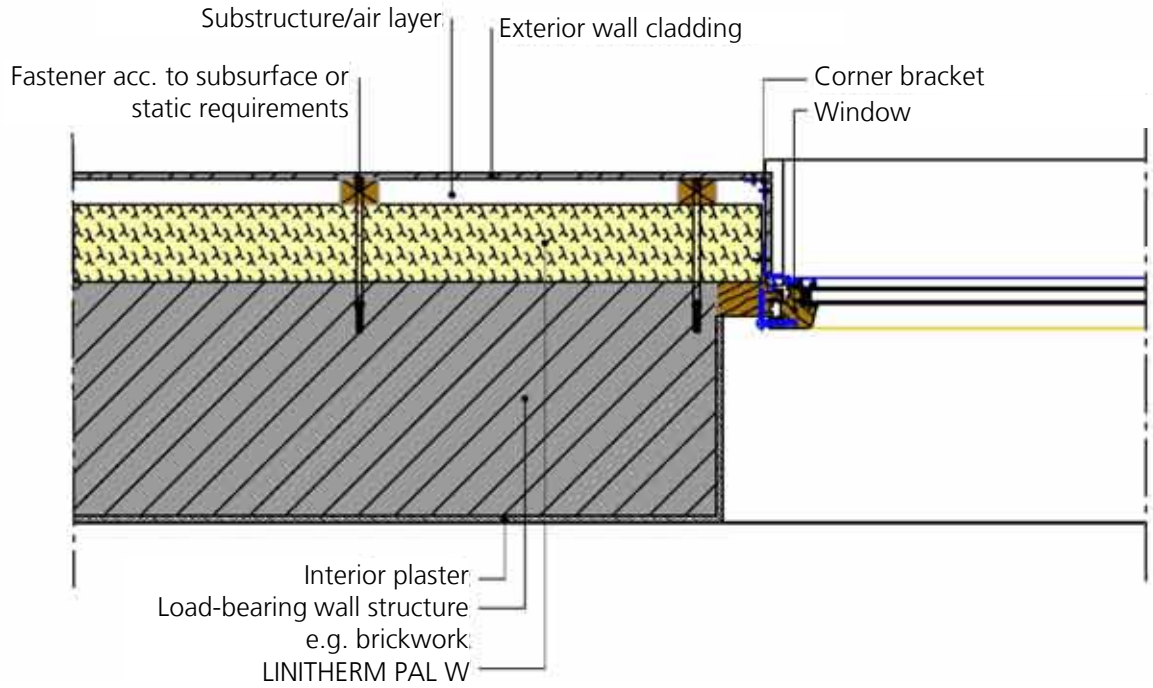

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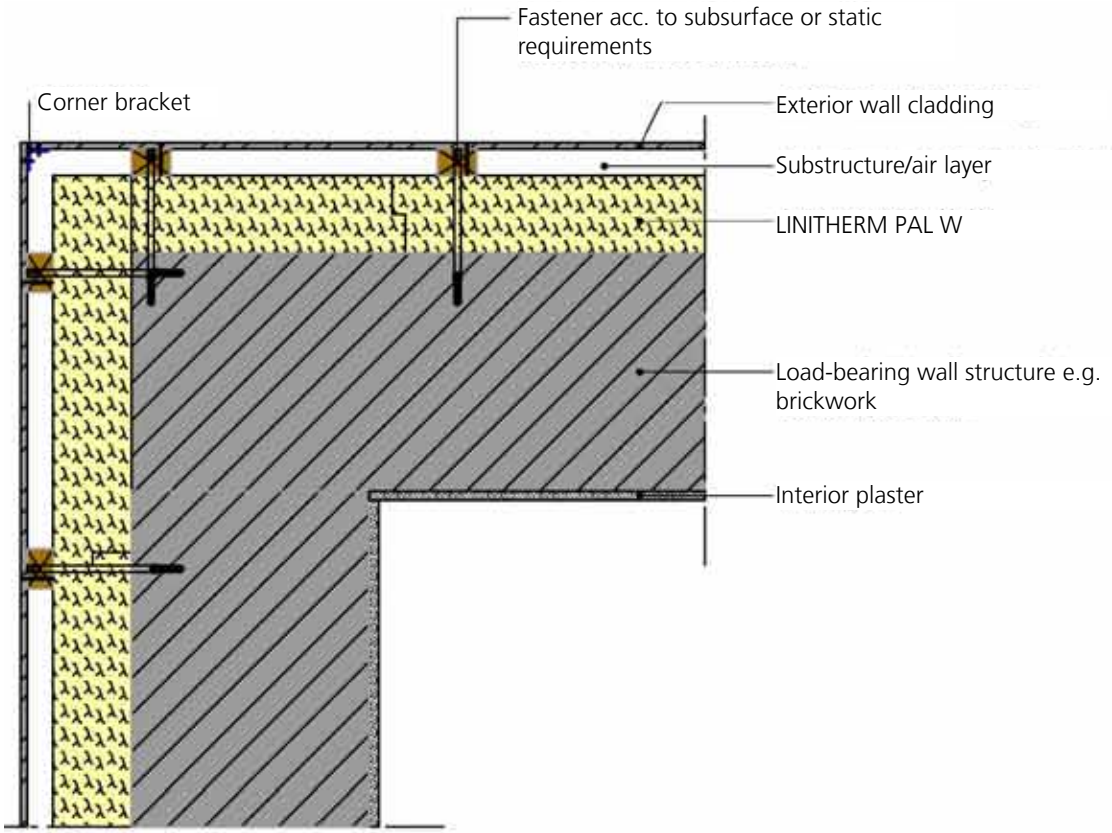
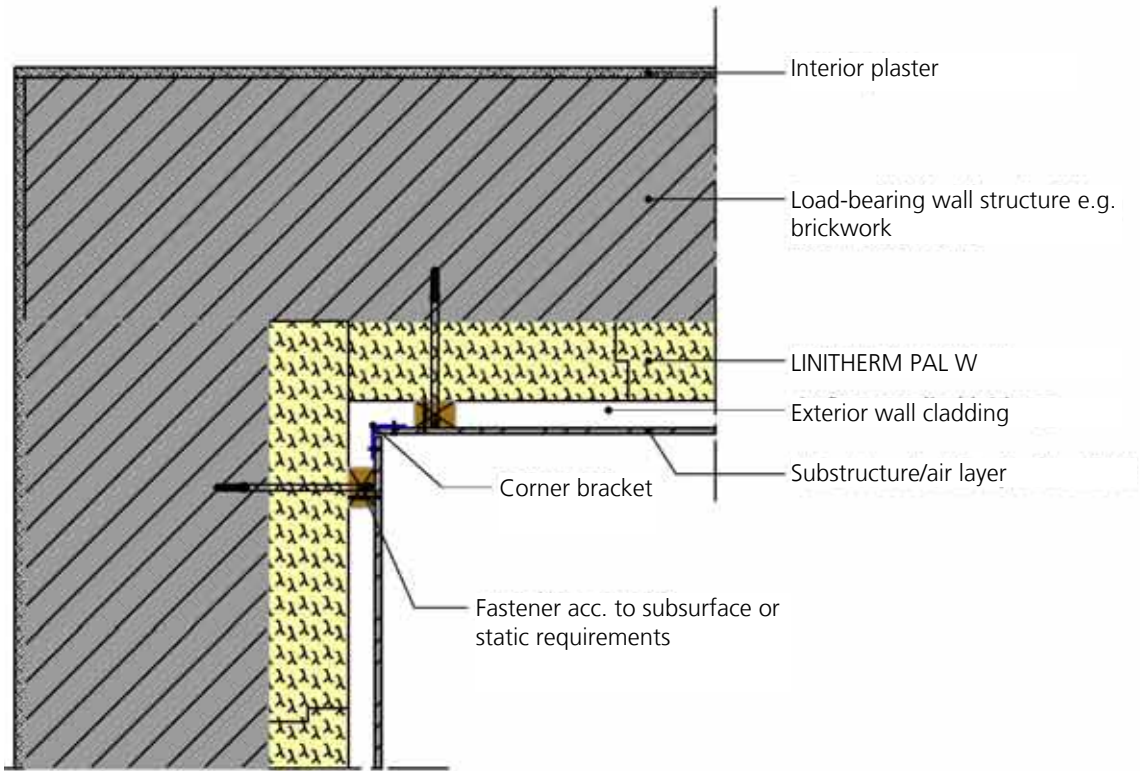
Connection outer corner

AW-AE



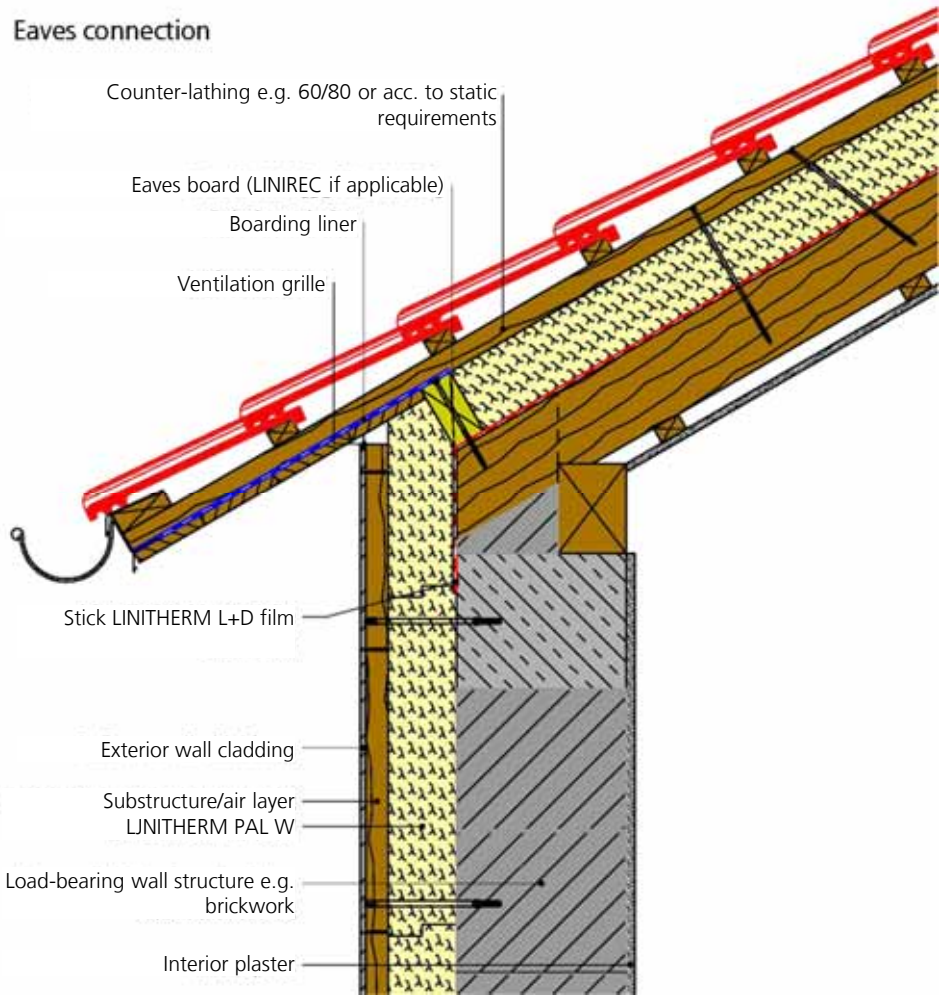
Connection inner corner

AW-IE



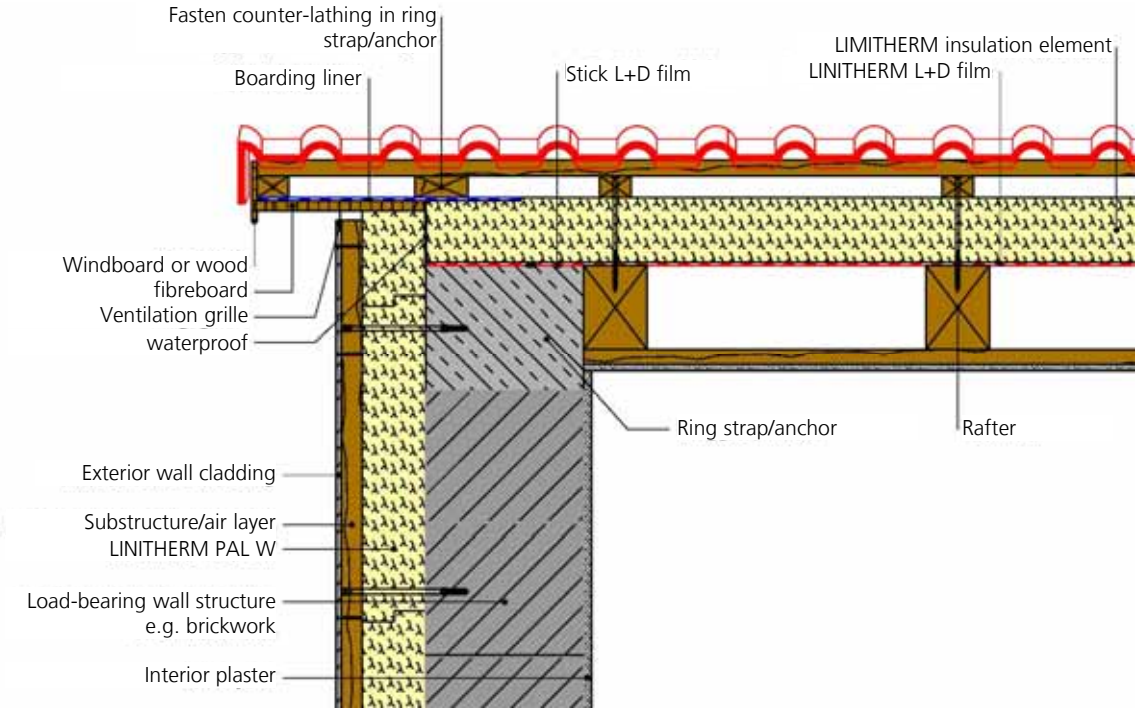
AW-T

Eaves connection



AW-O

Verge



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AW-ZM

Exterior wall insulation for double-layer brickwork

In the case of double-layer brickwork, the layer of thermal insulation lies between the load-bearing inner layer and the non-load-bearing outer layer (facing brickwork). For this, DIN 1053 must be observed accordingly. The outer layer serves as weather protection and enables individual facade design. As wind loads act on the outer layer, it must be correspondingly connected to the load-bearing inner layer.

The connection of the two layers takes place by means of stainless steel wire anchors or other types of anchors approved by the building authorities. During anchorage, ensure that no moisture is passed from the outer to the inner layer.

According to DIN 1053-1 "Brickwork – Calculation and design", the clear distance of the layers with surface anchorage may not exceed 150 mm.
If larger clearance values are required, special building authority approved masonry anchors must be used.

The minimum thickness of the non-load-bearing outer layer is 90 mm.
Brickwork posts require a minimum length of 240 mm.
All masonry bricks must be supported over the entire length at the level of the support.
If the support is interrupted it must be provided on both sides

The wire anchors required for connection in the surface are listed in DIN 1053. This standard contains information regarding the minimum quantity and the diameter of the required means of fastening per m² of wall surface depending on the spacing of the brickwork layers and the height of the wall areas above the terrain The vertical distance of the wire anchors should be 500 mm at the most acc. to DIN 1053-1; the horizontal distance 750 mm at the most. At the free edges (openings, building corners, expansion joints, upper ends of the outer layer), three anchors per metre of edge length must be additionally attached.

Minimum quantity and diameter of wire anchors per m² wall surface [excerpt DIN 1053-1]

		Wire anchors	
		Minimum number	Diameter (mm)
1	Minimum, unless lines 2 and 3 not relevant	5	3
2	Wall area higher than 12 m above ground or gap between eaves of wall more than 70 to 120 mm	5	4
3	Gap between eaves of wall more than 120 to 150 mm	7 or 5	4 or 5

Other types of anchorage for the wire anchors are permissible if it is verified by test certificate that this type of anchorage can absorb a tensile and compressive force of at least 1 kN with a slippage of 1.0 mm per wire anchor. if one of these values is not reached, the quantity of wire anchors must be increased accordingly.

If the wire anchors are not installed in the horizontal joints due to different brick formats of the inner and outer layers, then the layers must be connected to one another by another method e.g. by dowelling.

When installing LINITHERM PAL W, the insulation layer should be provided as complete insulation (core insulation). A layer of air for the rear ventilation of the non-load-bearing facing shell is no longer considered necessary due to practical building experience. The panels must be closely jointed by graded notches or butt edge and installed in formation. If panels are installed, only a finger-width-gap remains between the facing shell and the insulation required for bricklaying.

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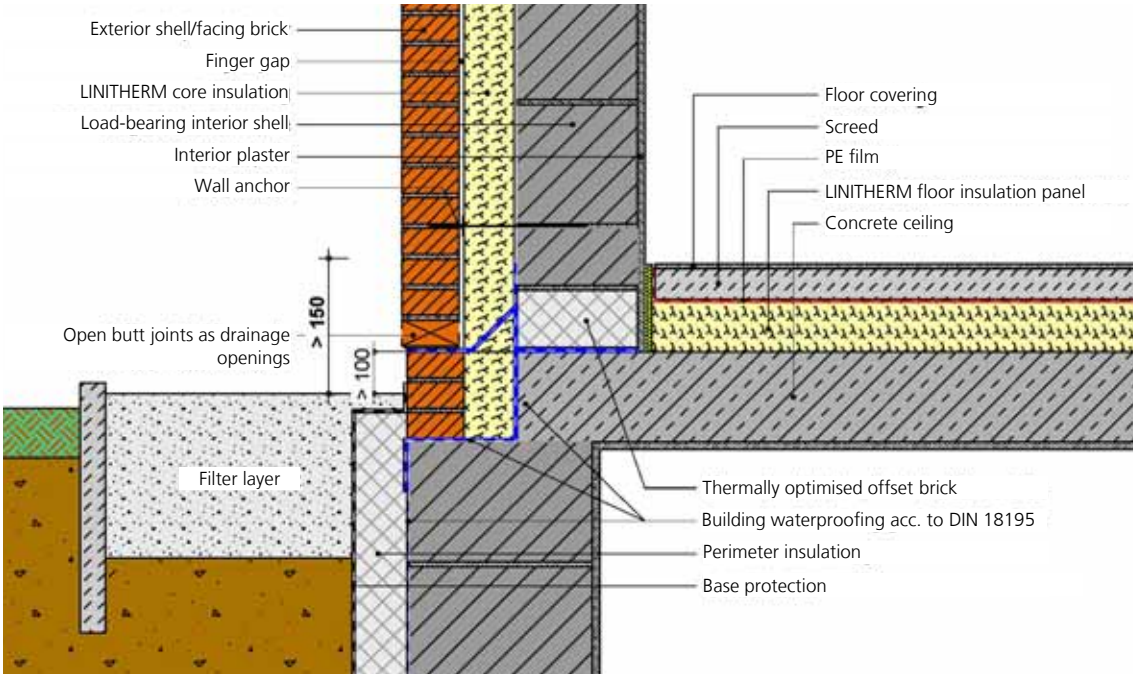
AW-ZM-S

Base connection



AW-ZM-O

Verge