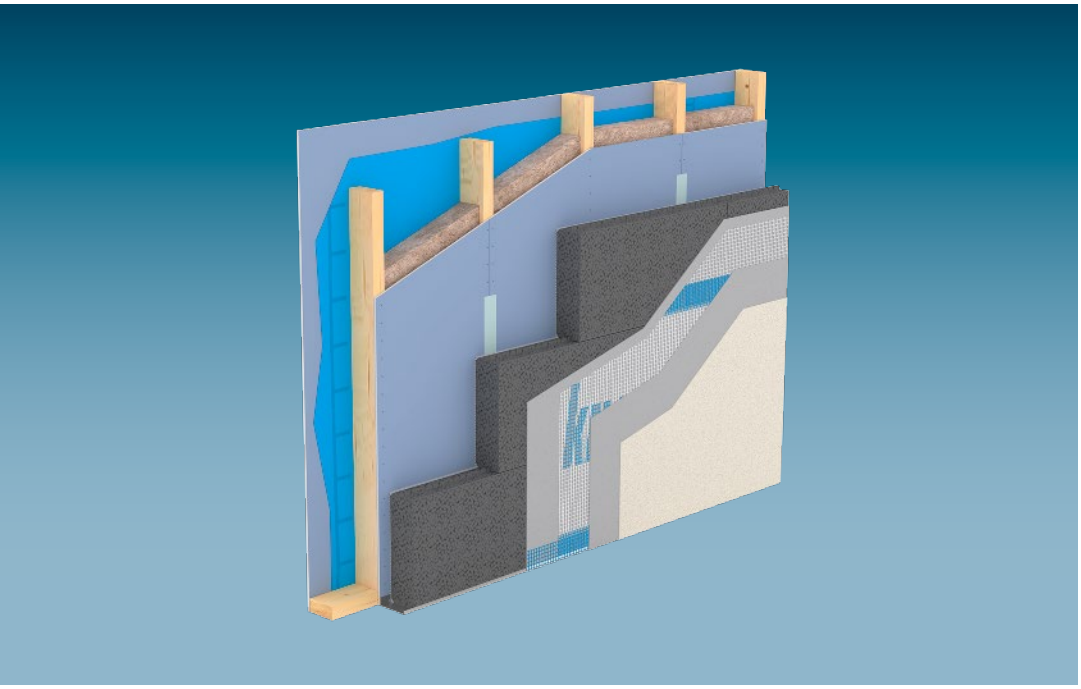


Plaster & Façade Systems

WE201.de

System Data Sheet 2022-10

Knauf WARM WALL Basis EPS in Timber Construction

ETICS with Insulation Materials made of EPS

WE201a.de – With mineral-based render system

WE201b.de – With organic render system

WE201c.de – With mineral-based / organic-based render system

Note on English translation / Hinweise zur englischen Fassung

This is a translation of the system data sheet valid in Germany.
All stated details and properties are in compliance with the regulations of the German standards and building regulations. They are only applicable for the specified products, system components, application rules, and construction details in connection with the specifications of the respective certificates and approvals.
Knauf Gips KG denies any liability for applications outside of Germany as this requires changes acc. to the respective national standards and building regulations.

Dies ist eine Übersetzung des in Deutschland gültigen Detailblattes. Alle angegebenen Werte und Eigenschaften entsprechen den in Deutschland gültigen Normen und bauaufsichtlichen Regelungen. Sie gelten nur bei Verwendung der angegebenen Produkte, Systemkomponenten, Anwendungsregeln und Konstruktionsdetails in Verbindung mit den Vorgaben der bauaufsichtlichen Nachweise.
Die Knauf Gips KG lehnt jegliche Haftung für Einsatz und Anwendung außerhalb Deutschlands ab, da in diesem Fall eine Anpassung an nationale Normen und bauaufsichtliche Regelungen notwendig ist.

Contents

Notes on the document

Knauf system data sheets are the basis for planning and application for planners and professional installers when applying Knauf systems. The contained information and specifications, constructions, details and stated products are based, unless otherwise stated, on the Certificates of Usability (e.g. general national technical approvals abZ and general type approvals aBG) valid at the date they are published as well as on the applicable standards. In addition, design and structural requirements and those regarding building physics (fire protection and sound insulation) are considered.

The details shown are solution suggestions intended for general orientation in the subject matter and must be adapted accordingly to suit the constructional features on site. Ancillary trades are only represented schematically.

References to other documents

System data sheets

- ETICS with Insulation Materials made of EPS Knauf WARM WALL Basis in Solid Construction P321.de
- Knauf Structural Wood Frame Panels W55.de

Technical brochures

- Knauf Multi-storey Timber Construction HB02.de

Product data sheets

- Observe the product data sheets of the Knauf system components

Intended use of Knauf Systems

Please observe the following:

Caution	Knauf systems may only be used for the application cases specified in the Knauf documentation. In case third-party products or components are used, they must be recommended or approved by Knauf. Flawless application of products / systems assumes proper transport, storage, assembly, installation and maintenance.

General notes on Knauf systems

Building physics requirements must be examined and tested in detail.

For design of timber structures see EN 1995-1-1 in conjunction with EN 1995-1-1/NA.

To avoid thermal bridges, see DIN 4108 amendment 2.

Freedom from condensation: The assessment of the freedom from condensation (hygrothermal performance) shall be performed in accordance with DIN 4108-3 or DIN EN 15026. A vapour retarder is required on the interior in accordance with the building physics ratings.

The assessment of the thermal insulation shall be performed in accordance with DIN 4108-2 and if required GEG (German energy saving ordinance).

The structural stability of the existing wall must be assured before installation of ETICS. The proof must include all load-bearing and associated elements.

It is essential to ensure that the construction is airtight. Refer to DIN 4108-7 as well as the guideline “Ausführung luftdichter Konstruktionen und Anschlüsse - *Implementing airtight constructions and connections* (German only)” issued by the Fachverband der Stuckateure für Ausbau und Fassade Baden-Württemberg, Germany.

Connections must be carefully planned and must be made driving-rain proof.

Before the application of a plastering system we recommend use of a handover certificate for the transfer of the site to another trade.

Term definition

Splash water zone

The splash water zone starts with the edge of the ground line or top edge of the covering and has a height of at least 300 mm and generally up to 600 mm. The use of moisture reisitant insulation panels is recommended in this area. Water from precipitation must be diverted away from the façade by constructional measures (gravel bed or layer that interrupts capillary action). Paving stone or paving must be installed sloping away from the building and be constructionally separated from the building. Observe the DIN 18533 as well as the DIN 68800-2.

Explanation of terms

In this system data sheet, the following general type approval / terms that diverge from the system are used:

- Finish coat with paint coat instead of a final coating

Abbreviations used in the document:

- DIBt: Deutsches Institut für Bautechnik - German Institute for Civil Engineering
- EPS: Expanded polystyrene
- GEG: German energy saving ordinance
- MW: Mineral wool
- VDPM: Verband für Dämmsysteme, Putz und Mörtel e. V. - Federation for Insulation Systems, Plaster and Mortar
- ETICS: External Thermal Insulation Composite System

Notes on fire resistance

In this system data sheet, unless explicitly stated, fire protection concerns are not taken into account in the detailed features shown.

Proof of Usability

Knauf System	Proof
WARM WALL Basis EPS in Timber construction with adhesively bonded EPS insulation materials	Z-33.47-899

The stated constructional and structural properties, and characteristic building physics of Knauf systems can solely be ensured with the exclusive use of Knauf system components, or other products explicitly recommended by Knauf. The validity and up-to-datedness of the stated proofs have to be considered.

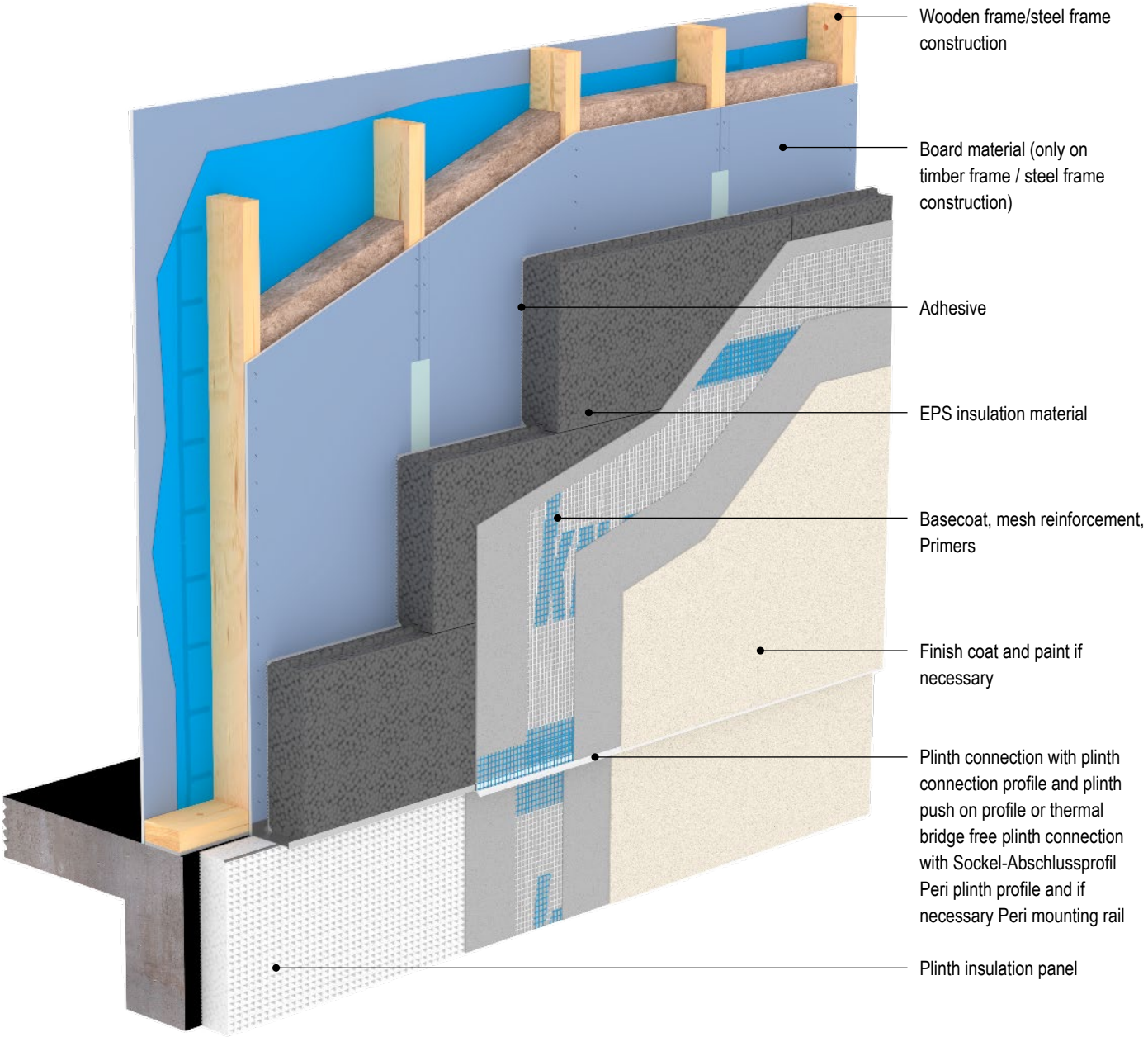
Knauf WARM WALL Basis EPS in Timber Construction

Knauf WARM WALL Basis EPS in Timber Construction is a building authority certified external thermal insulation composite system (ETICS) in timber construction with insulation materials made of expanded polystyrene (EPS). The façade insulation panels are adhesively bonded onto the timber construction clad with board material or steel frame construction, or onto the solid wooden substrate. The boards have end-to-end edge joints or a tongue and groove edge on the longitudinal ends. The latter guarantee a safe and fast insulation panel bond with a flat surface. The mortar pocket on the back prevents thermal bridges as the adhesive does not penetrate into the panel joints. The WARM WALL Basis EPS in Timber Construction system can be employed as a not easily flammable system up to the high-rise building limit. The building height is dependent on the respective applicable state building code.

Characteristics

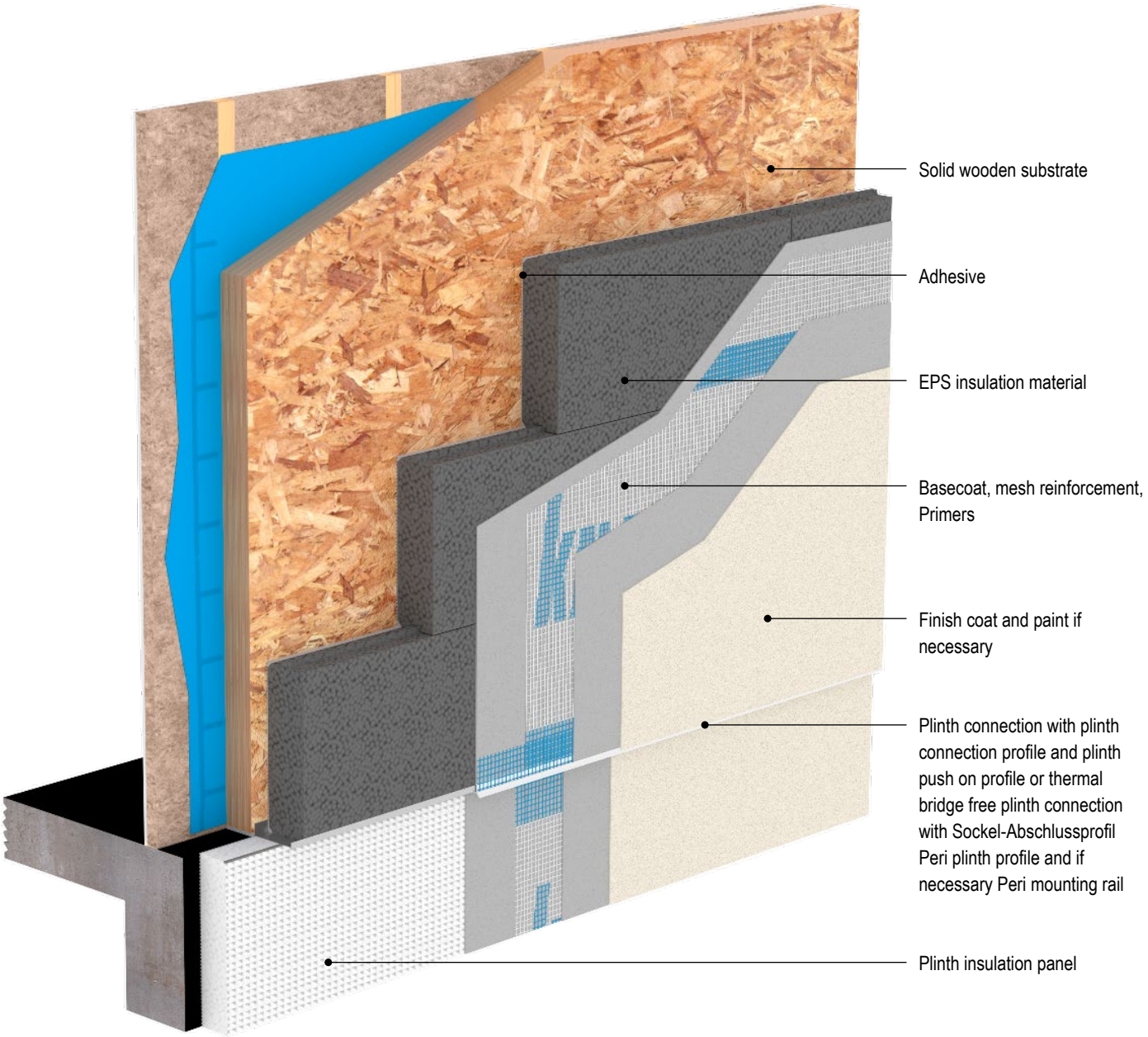
- Reaction to fire of ETICS: depending on the version is not easily flammable (building material class B1) or flammable (building material class B2), refer to table page 14
- Insulation material thickness: certified up to maximum 200 mm

Wooden frame/steel frame construction



Knauf WARM WALL Basis EPS in Timber Construction (Continuation)

Solid wooden substrate



System overview

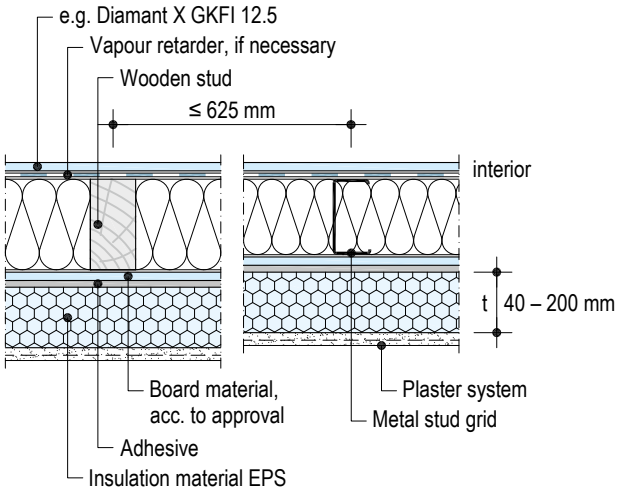
Knauf System	WE201a.de WARM WALL Basis EPS Mineral	WE201b.de WARM WALL Basis EPS Organic	WE201c.de WARM WALL Basis EPS Mineral / organic
Description	Natural rendering mortar made of high-quality mineral-based raw materials optionally available with marble grains. Robust, durable, open to diffusion with variable render surface. Combined with a mineral reinforcement (basecoat) layer.	Synthetic resin bonded, diffusion capable plaster system with low absorption of water. Optional use of silicon resin render or synthetic resin plaster for a larger range of colour shades.	Organically bonded finishing plaster for a more intensive range of colour shades. Combined with a mineral reinforcement (basecoat) layer.
Reaction to fire/building material class ETICS	Flammable B2 [1], not easily flammable B1 (see from page 14)		
Maximum insulation material thickness t	Up to 200 mm		
Plaster system layer thickness (reinforcement layer and finish coat)	5.5 – 15 mm	3.5 – 6 mm	5.5 – 13 mm
Façade			
Adhesive	SM700 Pro, SM300, Pastol, Pastol Dry, Luis		
Insulation materials EPS	Nut&Feder, Standard, SunJa (grey board with white EPS upper layer)		
Fasteners if required	Schraubdübel STR H / STR H A2 dowels, broadback staples		
Basecoat	SM700 Pro, SM300, Luis	Pastol, Pastol Dry	SM700 Pro, SM300, Luis
Reinforcement mesh	4x4 mm, 5x5 mm	Reinforcing mesh Pastol	4x4 mm, 5x5 mm
Primers	Isogrund (recommended)	Quarzgrund pro	Quarzgrund pro
Finish coat	SM700 Pro SP 260 Pro, RP 240 Noblo, Noblo Filz MineralAktiv Scheibenputz floated render MineralAktiv Scheibenputz Dry floated render	Conni S Addi S	Conni S Addi S
Coats	Siliconharz-EG-Farbe paint Autol , Autol TSR, Fassadol, Fassadol TSR, Minerol MineralAktiv Fassadenfarbe paint	Autol , Autol TSR Fassadol, Fassadol TSR MineralAktiv Fassadenfarbe paint	Autol , Autol TSR Fassadol, Fassadol TSR MineralAktiv Fassadenfarbe paint
Plinth/splash water area			
Adhesive	Sockel-SM Pro or Sockel-SM, SM700 Pro, SM300		
Insulation material	Sockeldämmplatte 032, Sockeldämmplatte 035		
Plinth connection (with re-cessed plinth)	Sockel-Abschlussprofil Peri plinth profile (free of thermal bridges) and if necessary Peri installation rail, plinth profile and push on plinth profile		
Basecoat	Sockel-SM Pro or Sockel-SM, SM700 Pro, SM300		
Mesh reinforcement, primer, finish coat and decorative coat	Such as façade , Butz, Sockel-SM Pro, Sockel-SM		
Moisture protection	Sockel-Dicht (with Sockel-SM Pro as a basecoat and render finish with a total ≥ 7 mm not required)		

1) When Pastol Dry adhesive as well as Pastol adhesive exceeding 100 mm insulation material thickness is used

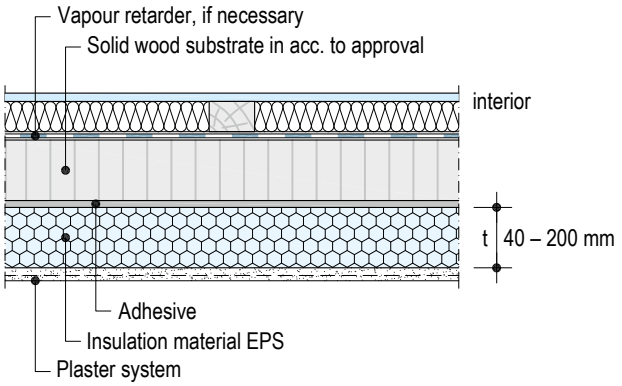
System variants

Scheme drawing

■ **New construction – Wooden frame/steel frame construction**[1)]



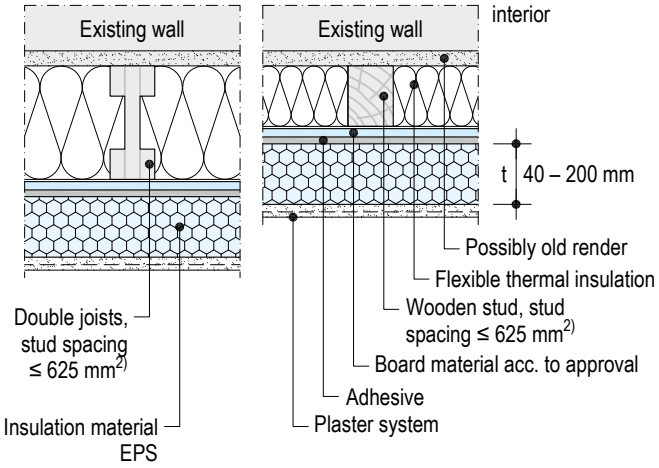
■ **New construction – solid wooden substrate**



■ **Old construction – special applications following Z-33.47-899**

Existing walls can be thermally retrofitted with a façade as a wood frame construction with WARM WALL Basis EPS, e.g. masonry and the half-timbered structure.

Coordination with the planning office is generally necessary.



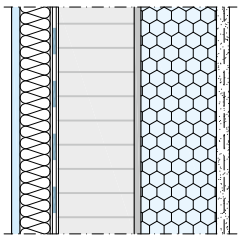
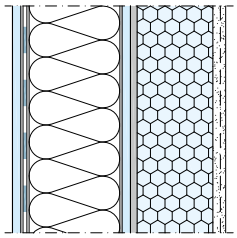
1) Steel frame constructions must feature a minimum stiffness that complies with common wooden frame constructions.

2) Cross-section of wooden studs as well as fixing with building authority approved frame dowels or connectors according to the structural certificate

t = insulation material thickness

System variants (continued)

EPS insulation material – Attachment to the substrate

Scheme drawing	Insulation material	Permissible insulating material thickness	Substrate	Adhesive	Layer thickness
Adhesively bonded to solid wooden substrate[1]					Glue only
	EPS Standard 035 white EPS Standard 034 EPS Standard 032 EPS Standard 031 EPS SunJa 032 EPS Nut&Feder 032	Up to 200 mm	■ Solid wood exterior wall components made of Lignotrend elements acc. to abZ/aBG Z-9.1-555 ■ Wood material exterior wall components made of SWISS KRONO MAGNUMBOARD® OSB elements acc. to ETA-13/0784 ■ Solid timber elements / panels (three- and five-layer boards made of softwood) acc. to EN 13986, type SWP/2 or SWP/3 ■ Stacked timber elements acc. to National Technical Approval or European Technical Assessment ■ Cross-laminated timber acc. to National Technical Approval or European Technical Assessment ■ Glulam and stacked wood laminate elements acc. to EN 14080	SM700 Pro Pastol Dry Luis	Full surface notched trowel surface (see approval)
Bonding of the insulation panels[2], t ≥ 12 mm					Glue only
	EPS Standard 035 white EPS Standard 034 EPS Standard 032 EPS Standard 031 EPS SunJa 032 EPS Nut&Feder 032	Up to 200 mm	■ Particle boards[3] acc. to EN 312, type P5 or P7 ■ Plywood panels[3] acc. to EN 636, type EN 636-2 or EN 636-3 ■ Cementitious particle boards[3] acc. to EN 13986 (DIN EN 634-2)	SM700 Pro Pastol Dry Luis	Full surface notched trowel surface (see approval)
			■ Gypsum fibre boards ■ Cement fibre boards acc. to EN 12467 (non-coated and without impregnation / water-repellents) of category B ■ Gypsum boards acc. to EN 520 with the properties EH2 or FH2 and additionally with the properties acc. to designation GKBI or GKFI acc. to DIN 18180 ■ AQUAPANEL® Cement Board Outdoor acc. to ETA-07/0173	SM700 Pro SM300 Pastol Dry Luis	
			■ Rough OSB boards [4] acc. to EN 300, type OSB/3 or OSB/4, e.g. AGEPAN® OSB 3 PUR, AGEPAN® OSB 4 PUR, EGGER OSB 3 EO, EGGER OSB 4 TOP, SWISS KRONO OSB/3 and SWISS KRONO OSB/F****	SM700 Pro Pastol Dry Luis	
			■ Smoothened OSB boards acc. to EN 300, type OSB/3 or OSB/4	Pastol	

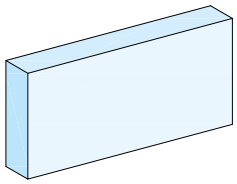
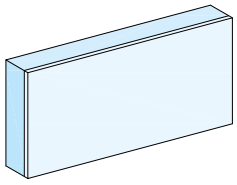
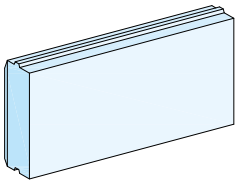
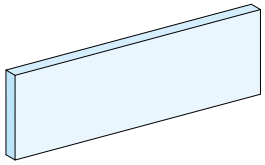
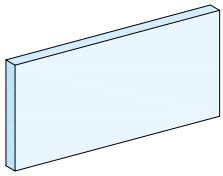
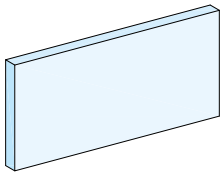
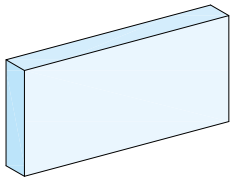
1) Glue application 1 – 3 mm

2) The board material must be suitable for use as exterior cladding or lining (without direct exposure to weather).

3) When Luis adhesive is used, only board materials with a homogeneous surface made of fine particles are permissible.

4) The surface must be free of loose particles.

Insulation material

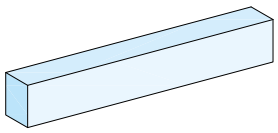
Insulation material	Description	Rated value of thermal conductivity λ W/(m·K)	Dimensions w x l mm	Application type	Insulation material thickness mm
Façade					
	**EPS Standard 035 white**	0.035	500 x 1000	Acc. to aBG	40 – 200
	EPS Standard 034[1)]	0.034	500 x 1000	Acc. to aBG	40 – 200
	EPS Standard 032[1)]	0.032	500 x 1000	Acc. to aBG	40 – 200
	EPS Standard 031	0.031	500 x 1000	Acc. to aBG	40 – 200
	**EPS SunJa 032** *Grey façade insulation panel with white EPS upper layer*	0.032	500 x 1000	Acc. to aBG	80 – 200
	**EPS Nut&Feder 032**[1)]	0.032	500 x 1000[2)]	Acc. to aBG	60 – 200
Reveal					
	**PF Slimtherm 022** *High-performance façade insulation panel*	0.022	400 x 1200	WAP	20 – 50
	**PU Slimtherm 024** *High-performance façade insulation panel*	0.026	500 x 1000	WAP / acc. to aBG	20 – 50
	**EPS Standard 035 white**	0.035	500 x 1000	WAP / acc. to aBG	20 – 50
	EPS Standard 032	0.032	500 x 1000	WAP / acc. to aBG	20 – 50
Plinth					
	**Sockeldämmplatte 035**[3)] *EPS, white*	0.035	500 x 1000	PW	30 – 200
	Sockeldämmplatte 032[3)] *EPS, grey*	0.032	500 x 1000	PW	40 – 200

1) Elastification on request

2) Cover dimension: 485 x 1000 mm

3) Fire resistance: For B1 system: maximum height 900 mm above the edge of the ground line

Insulation material (continued)

Insulation material	Description	Rated value of thermal conductivity λ W/(m·K)	Dimensions w x l mm	Application type	Insulation material thickness mm
Transoms / fire breaks					
	**MW Volamit 040**[1)] *Mineral wool lamella*	0.041	200 x 1200	Acc. to aBG	60 – 200

1) Coated on both sides

Accessories

Façade and ashlar profiles see page 41.

Thermal resistance

Examples

Insulation material	**Thermal resistance R** in $(m^2 \cdot K)/W$ Insulation thickness **t** in mm								
	40	**60**	**80**	**100**	**120**	**140**	**160**	**180**	**200**
EPS Standard 035 white	1.14	1.71	2.29	2.86	3.43	4.00	4.57	5.14	5.71
EPS Standard 034	1.18	1.76	2.35	2.94	3.53	4.12	4.71	5.29	5.88
EPS Standard 032	1.25	1.88	2.50	3.13	3.75	4.38	5.00	5.63	6.25
EPS Standard 031	1.29	1.94	2.58	3.23	3.87	4.52	5.16	5.81	6.45
EPS Nut&Feder 032	–	1.88	2.50	3.13	3.75	4.38	5.00	5.63	6.25
EPS SunJa 032	–	–	2.50	3.13	3.75	4.38	5.00	5.63	6.25

From the table, you can read off the thermal conductivity as well as the total thickness of the insulation material of the thermal resistance R using the rated value. The sum of all thermal resistances (plaster, timber construction, insulation materials, etc.) is added to the sum of the 0.17 $(m^2 \cdot K)/W$ of both thermal transfer resistances for interior and exterior and delivers the thermal resistance. The inverse value of the thermal transmission resistance is the U value.

Basecoat

The reinforcement mortar is referred to as basecoat in the approvals and in ETICS is a component of the rendering/plastering system. Its purpose is to protect the ETICS permanently from the effects of weather, to securely incorporate the reinforcement mesh and to form the basis for the subsequent finish coating.

Reinforcement mesh

The reinforcement mesh 4x4 mm and 5x5 mm are high strength, permanent, alkaline resistant reinforcement mesh made of glass fibres with a mesh spacing of 4x4 mm or 5 x 5 mm. The mesh is resistant to sliding and includes blue markings for mesh overlap indication. In addition to the mesh spacings, both meshes differ in terms of their tensile strengths, the weight per unit area and rigidity. They have the function of a reinforcement to avoid the formation of cracks and prevent the ingress of moisture into the system. The mesh is embedded into the fresh basecoat. The position of the basecoat depends on its thickness.

The reinforcement mesh Pastol features a narrower mesh size and is thus suitable for the use in in the Knauf System WARM WALL Basis EPS organic using Pastol and Pastol Dry.

Finish coat

Noblo Filz

Mineral-based, fine grain finishing plaster with 1.0 or 1.5 mm marble grains for fine sponged surface finishes.

Noblo, SP 260 Pro, RP 240

Mineral finishing renders as a floated render texture (Noblo and SP 260 Pro) and/or groove render texture (RP 240).

SM700 Pro

The mineral based, universal all-rounder for façades and plinths can be sponge finished or freely-structured as a natural white or coloured top coat.

MineralAktiv Scheibenputz floated render, MineralAktiv Scheibenputz Dry floated render

In a system together with MineralAktiv Fassadenfarbe paint, the mineral floated render offers the highest level of protection against the growth of algae and fungi and caters for the perfect appearance of façades. MineralAktiv Scheibenputz floated render also impresses with its elegant texture.

Conni S

Ready-to-use, paste-like, soiling-resistant silicone resin floated render, highly water-repellent and highly water permeable.

Addi S

Ready-to-use, paste-like, organically bonded and silicone resin reinforced floated render for intensive colour shades. Very extra-hard wearing, water-repellent and water-vapour-permeable.

Sockel-SM Pro, Sockel-SM

System approved and mineral based universal all rounder on a cementitious basis for the plinth area. Use as an adhesive and reinforcing mortar as well as a sponged finish coat. When using Sockel-SM Pro as a basecoat and render finish with a total render thickness ≥ 7 mm, no additional protection for the render against ground moisture (moisture protection) is necessary.

Butz

Can only be used in the plinth zone. Coloured stone render with washed plaster effect for surface design in areas subject to wear and tear, e.g. plinth surfaces in the splash water zone.

Finish coat (continued)

Characteristics of finish coats for plinths / splash water zone and façade

Characteristics	Mineral-based finishing plasters					Organic finishing plasters		
						Silicon resin renders		Resin plasters
	Noblo Filz, Noblo, SP 260 Pro, RP 240	SM700 Pro	MineralAktiv Scheibenputz floated render, MineralAktiv Scheibenputz Dry floated render	Sockel-SM Pro	Sockel-SM	Conni S	Butz	Addi S
Binder	Lime cement	Lime cement	Hybrid binder	Cement	Cement	Silicone resin emulsion, dispersion	Silicone resin emulsion, dispersion	Polymer dispersion, silicone resin
Hydrophobic (water-repellent)	●●	●●	●●	●●●●	●●●	●●●●	●●●●	●●●
Diffusion properties	●●●●	●●●●	●●●●	●●	●●	●●●	●●	●
Colour shade range	●●	●●	●●	●	●	●●●	●●	●●●●
Resistance to soiling	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●
Plinth/splash water area	●●	●●●●	●●	●●●●	●●●●	●●●	●●●●	●●

●●●● *Ideal*
●●● *Ideal to very well suited*
●● *Very suitable*
● *Suitable*

Application of finish coats for plinths / splash water zone and façade

Criteria	Mineral-based finishing plasters							Organic finishing plasters		
								Silicon resin renders		Resin plasters
	Noblo Filz	Noblo, SP 260 Pro	RP 240	SM700 Pro	MineralAktiv Scheiben-putz floated render	MineralAktiv Scheiben-putz Dry floated render	Sockel-SM Pro, Sockel-SM	Conni S	Butz	Addi S
Surfaces										
Sponged texture	●			●			●			
Freely styled texture	●			●					●	
Textured floated render		●			●	●		●		●
Textured groove render			●							
Application										
By machine	●	●	●	●	●	●	●	●		●
By hand	●	●	●	●	●	●	●	●	●	●
Order information										
Bucket (paste-like)					●			●	●	●
Bagged material	●	●	●	●		●	●			

Coats

Siliconharz-EG-Farbe paint
Siliconharz-EG-Farbe paint is especially suitable for equalisation (single coat) of mineral finishing coats with the same colour shade as the render and the paint. Suitable for equalisation of drying-related, weather-related or application-related differences in the colour shade on the finishing coat.

Autol
Autol is a highly permeable, matt, premium silicon resin self-cleaning effect façade paint. It is ideally suited as two paint coats on mineral and organically bound renders, as well as a top coat in case of different shades of finishing coat and paint. A strong reduction in the adhesion of dirt particles facilitates wash-off of dirt and soiling by the action of precipitation.

Autol TSR
Autol TSR is a highly permeable, matt, silicon resin self-cleaning effect façade paint. Reflection-optimised, resulting in reduced heat-up due to solar radiation and increased resistance to cracking on the substrate. It is used on new, pure white rendering/plastering systems when the colour shade of the finish coat has a luminosity of < 20.

Fassadol
Fassadol is a highly permeable, matt and highly colour shade fast silicone-reinforced façade paint. It is ideally suited as two paint coats for intensive colour shades on mineral and organically bound renders, as well as a top coat in case of different shades of finishing coat and paint.

Fassadol TSR
Fassadol TSR is a reflection-optimised, diffusion permeable, highly colour shade fast and high coverage siloxane-reinforced façade paint with a satin-matt appearance. It is is suitable for applying two coats on white, mineral and organic bonded plaster systems if the colour shade of the finish coat should have a luminosity of < 20.

Minerol
Minerol is a highly permeable, matt, premium silicate façade paint with organic stabilisers. It is ideally suited as a texture-retaining two coat paint on mineral substrates. Minerol bonds by silification with the substrate and is an ideal coating on mineral renders in case of different shades of finishing coat and paint.

MineralAktiv Fassadenfarbe paint
MineralAktiv Fassadenfarbe paint is a texture preserving, mineral façade paint on a hybrid binder basis without addition of film preservation. The optimised moisture management ensures that MineralAktiv Fassadenfarbe façade paint in a system with MineralAktiv finish coats is ideal in preventing growth of algae and mould. It has a high yield and an elegant mineral appearance.

Comparison of Knauf façade paints

Criteria	Mineral based		Organic		
	Silicate based dispersion **Minerol**	Hybrid façade paint **MineralAktiv Fassadenfarbe paint**	Silicone resin paints **Autol, Autol TSR**	**Siliconharz-EG-Farbe paint**	Pure acrylic paint **Fassadol, Fassadol TSR**
Binder	Potassium silicate, dispersion	Hybrid binder	Silicone resin emulsion, dispersion	Silicone resin emulsion, dispersion	Pure acrylic
Hydrophobic (water-repellent)	●●●	●●●	●●●●	●●●●	●●●●
Diffusion properties	●●●●	●●●●	●●●●	●●●	●●
Colour shade range	●●	●●	●●●	●●	●●●●
Resistance to ageing	●●●●	●●●●	●●●●	●●●●	●●●●
Hiding power	●●●	●●●●	●●●●	●●●	●●●●

●●●● *Ideal*
●●● *Ideal to very well suited*
●● *Very suitable*

Knauf Farbcenter (colour center)

The Knauf Farbcenter provides information on the feasibility and luminosity of colour shades for Knauf paints and plasters: knauf.de/farbcenter.

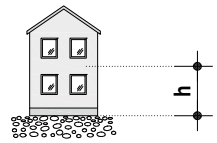
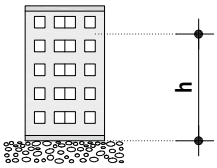
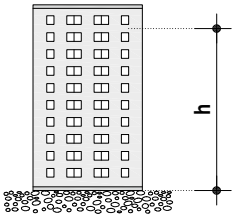
Explanation of colour code

B P 2 5 7
- 7 – Luminosity range (here: 70 to 79)
- 5 – Brightening
- 2 – Greying
- P – Colour shade with English designation abbreviations (in this case: Blue Purplish)
- B

Fire resistance requirements acc. to building regulation bye-laws

The demands on the fire behaviour of the façade lining are defined in the state building codes (LBO) and the corresponding fire prevention regulations of the German states. They are differentiated in dependence on the building height and/or building classes.

Additional special guidelines or regulations must be observed for special constructions and buildings such as hospitals, meeting halls, residential care homes, schools, shopping centres, etc. ETICS in scenarios such as firewalls building party walls, access galleries, escape routes, fire service passage routes, etc. must be designed as non-combustible according to the state building codes (building material class A according to DIN 4102-1).

Height range		Upper edge of the floor[1)]	Required fire behaviour of ETICS	Building material class of ETICS Acc. to DIN 4102-1
	Building class 1 – 3 (Low height buildings)	**h = 0 – 7 m**	Flammable	**B2**
	Building class 4 – 5 (Medium height buildings)	**h > 7 – 22 m**	Not easily flammable	**B1**
	High-rise buildings	**h > 22 m**	Non-combustible	**A**

1) The specified heights are defined differently in the individual German states. They can be found in the respective state building codes. The height specifications refer to the dimension of the upper edge of the highest floor on which common rooms can be built, measured from the average terrain height (clause 2, paragraph 3 of the Musterbauordnung [German model building code] as well as the respective state building code).

Building regulation minimum requirements with other building types: see “Technische Systeminformation – WDVS und Brandschutz - Technical system information - ETICS and fire resistance” of the VDPM (German association for insulation systems, plaster and mortar (German only).

Reaction to fire

When using Knauf WARM WALL Systems with EPS insulation panels in timber construction, fire protection measures are necessary should the external thermal insulation composite system be configured as a not easily flammable system (B1) according to the building regulation bye-laws. The fire protection measures are intended to protect the not easily flammable façade against fires from the exterior (plinth fires) and from the interior (room fires).

Reaction to fire Knauf WARM WALL Basis EPS in Timber Construction

Adhesive	Basecoat	Finish coat	Insulation material thickness	Reinforcement mesh	Reaction to fire of ETICS without additional measures	Total plaster thickness (basecoat / finish coat)	Fire protection measures			Reaction to fire of ETICS with additional measures
							Plinth fire	Room fire		
								Fire brakes: Lintel	Fire brakes: Lintel + reveal	
Mineral / organic	Mineral based	Mineral / organic	40 – 100	4x4 mm / 5x5 mm	Flammable B2	≥ 4 mm	●			Not easily flammable B1
			> 100 – 200	4x4 mm / 5x5 mm	Flammable B2	≥ 8 mm[1])	●	●	●	Not easily flammable B1
	Pastol (organic)	Organic	40 – 100	Pastol	Flammable B2	≥ 4 mm[2])	●			Not easily flammable B1
			> 100 – 200	Pastol	Flammable B2	Any				–
	Pastol Dry (organic)	Organic	40 – 200	Pastol	Flammable B2	Any				–

1) Thick adhesive ≥ 6 mm, thickness finish coat ≥ 2 mm, application quantity or organic finish coat 3.0 kg/m²

2) Thickness finish coat ≥ 2 mm, application quantity 3.0 kg/m²

Notes	
	The fire brakes must be mineral wool lamellae. If necessary, an additional fire break must be arranged a maximum of 1.0 m underneath the flanking, combustible construction products (e.g. on the upper termination of the ETICS underneath the roof) in the insulation level of the ETICS, see the construction design on page 16.

Fire resistance measures against fire from the exterior (plinth fire)

These measures are required for insulation thickness from 40 mm.
The fire resistance measures described here refer exclusively to the ETICS construction type described in this System Data Sheet. Demands placed on the supporting structure, for example, by the Model Directive on technical requirements for fire protection pertaining to highly fire-retardant building components in timber constructions (German designation: M-HFHHolzR) are to be observed separately.

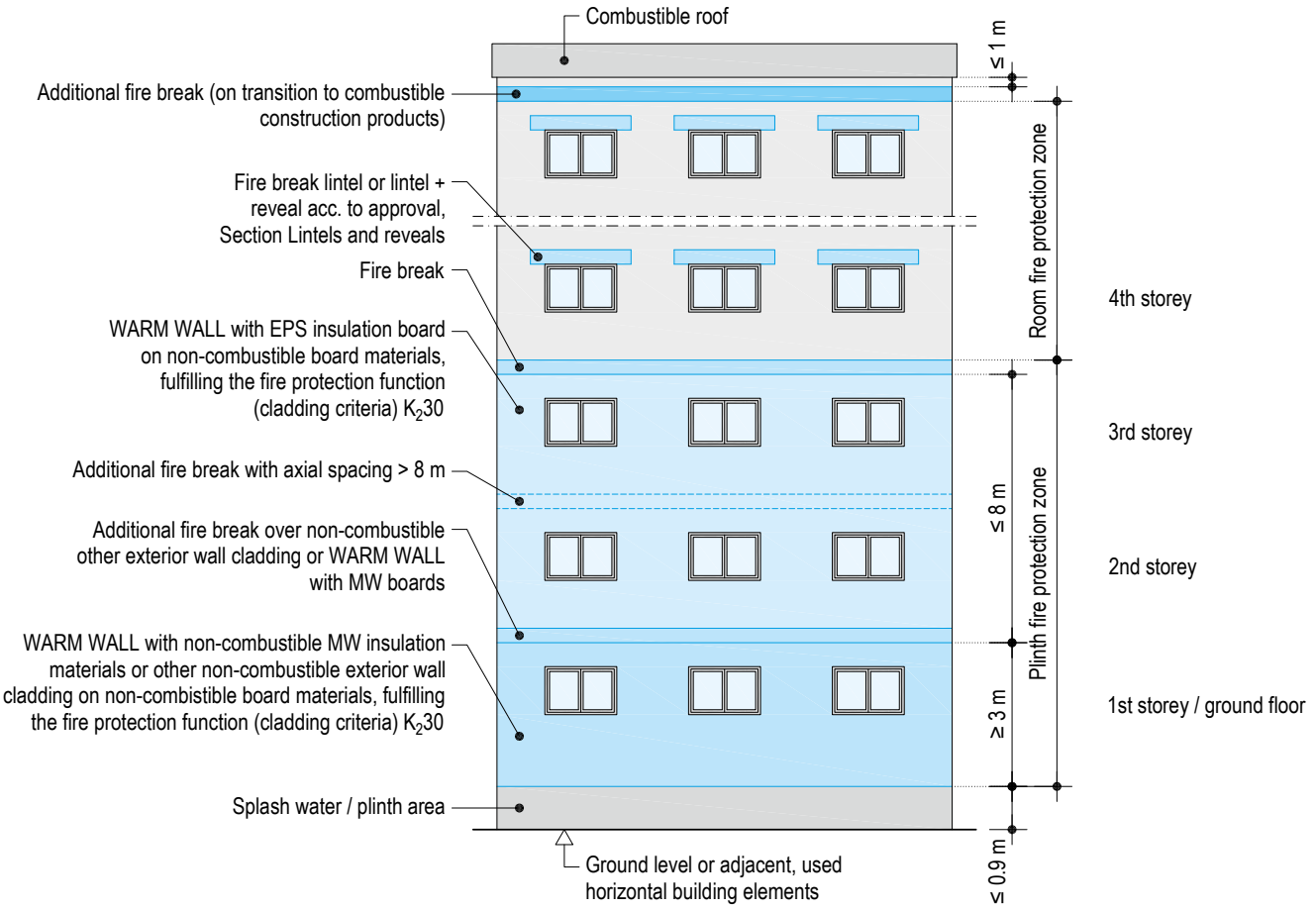
Structural fire protection measures

- Exterior board materials up to the height of the 3rd storey above ground level or adjacent, horizontal building elements (e.g. roof parking, etc.) must be made of non-combustible materials (A1 or A2-s1, d0 acc. to EN 13501-1), which fulfil the fire protection function (cladding criteria) $K_2$30 acc. to EN 13501-2.
- Apply WARM WALL materials on board material with non-combustible mineral wool insulating material or a non-combustible other exterior wall cladding above a maximum 90 cm high splash water area above ground level or adjacent, horizontal building elements (e.g. roof parking, etc.) used up to the height of the ceiling above the 1st storey, however, the height must be at least 3 m, constructional dowelling applied with a Schraubdübel STR H A2 dowel per mineral wool lamella is recommended.
- Apply a fire break on the lower edge of the WARM WALL Basis EPS adhesively bonding it on the full surface and apply constructional dowelling with two STR H A2 dowels per element (recommendation), if a non-combustible other exterior wall cladding has been applied above the splash-water zone or a system has been applied using WARM WALL with mineral wool boards.
- Apply a fire break with full surface adhesive and dowelling at the height of the ceiling of the 3rd storey above ground level or adjacent, horizontal building element (roof top parking) and apply constructional dowelling with two Schraubdübel STR H A2 dowels per element (recommended) at axial spacing ≤ 8 m to the fire break arranged below it or WARM WALL with non-combustible mineral wool board materials. If the spacing is greater, additional fire breaks must be installed.
- Apply adhesive to the full surface and fix structurally with two Schraubdübeln STR H A2 dowels per element (recommendation) for further fire breaks at transitions to horizontal, protruding surfaces (e.g. from openings, passages, arcades), in the area of the 1st to 3rd storey.
- From the bottom edge of the ETICS to the fire break at the height of the ceiling of the 3rd storey above ground level or adjacent horizontal building sections, Panzereckwinkel reinforced corner angles 70/90 are to be used as building inside corners (see page 18); the minimum thickness of the plaster system (reinforcement layer and finish coating) must be taken from the table on page 15.

Additional fire break

In case a flammable constructional component is located above the ETICS, a fire break at spacing of 1 m to the constructional product must be arranged in the insulation level of the ETICS. The material corresponds with that of the plinth fire break. The fire break is adhesively bonded along the entire surface with a mineral-based adhesive and attached with two Schraubdübel STR H A2 dowels per element (recommended) – see page 18.

Note	In each case, the maximum respective spacing between the lower edge of the lintels and the lower edge of the fire break of at least 0.5 m must be observed.

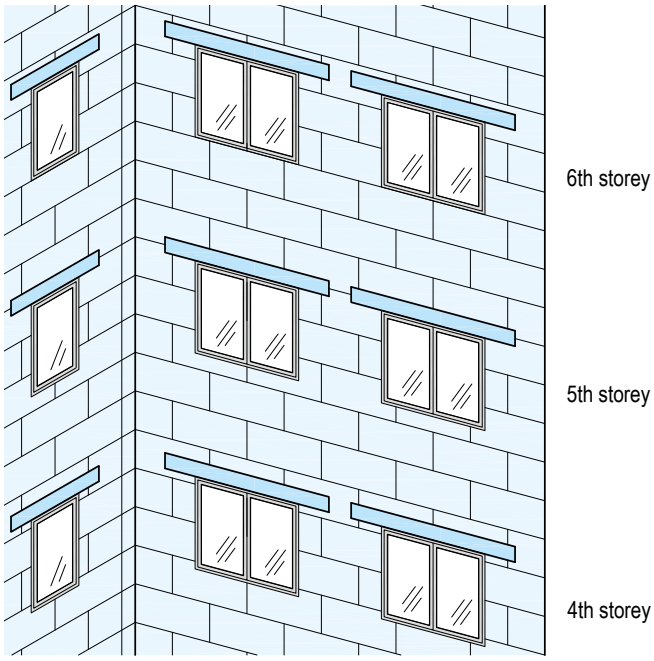


Fire resistance against fire from the interior (room fire)

These measures are required for insulation thickness > 100 mm.

Arrangement of the fire break

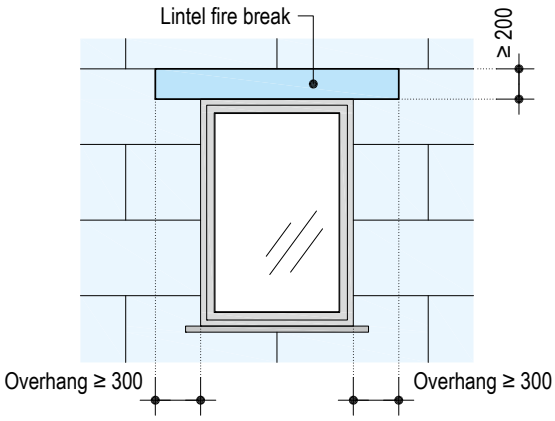
- Above the fire break at the height of the ceiling of the 3rd storey above ground level or adjacent horizontal building sections, consider fire resistance measures necessary against a room fire (see scheme drawing on page 16). See general type approval / approval, section 3.2.5.3: Lintels and reveals. The building area with fire protection measures against exterior fires has already included fire protection measures against interior fires.
- Fire break lintel made of MW Volamit 040 (mineral wool lamella) must always be adhesively bonded for the full surface with mineral adhesive and using two Schraubdübel STR H A2 dowels per element (recommendation).
- Edge areas located directly near openings require an additional reinforcement with Gewebeeckwinkel mesh corner angles.
- Alternatively, the use of a three-sided encapsulation of wall openings with fire breaks acc. to general type approval / general approval in section 3.2.5.3 is possible (for more see "Technische Systeminformation – WDVS und Brandschutz - *Technical system information - ETICS and fire resistance*" of the VDPM (association for insulation systems, plaster and mortar (German only).



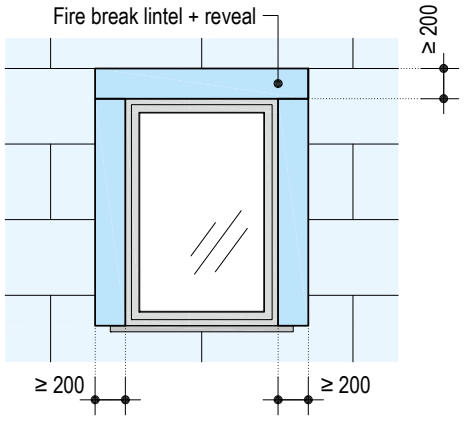
Scheme drawings I Dimensions in mm

Views

Window frame flush and centered in the wooden stud frame



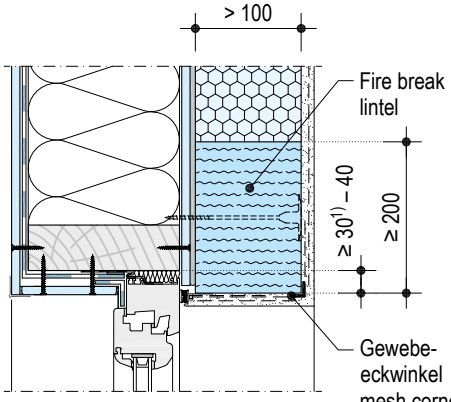
Window frame projected or partly in the insulation level
(> 40 mm before the wooden stud frame)



Details

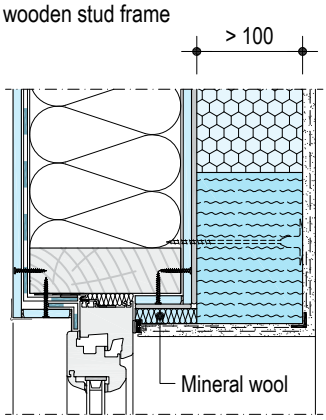
Scale 1:10 I Dimensions in mm

Window frame flush in the wood frame

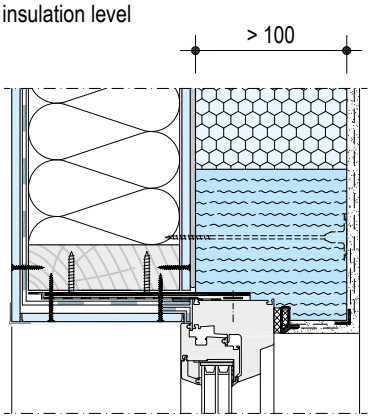


1) See DIN 4108 amendment 2

Window frame in the middle of the wooden stud frame



Window frame projected or partly in the insulation level



Fire protection measures - material, anchoring

Board materials over the height of the 3rd storey

Exterior, non-combustible board materials (A1 or A2-s1, d0 acc. to DIN EN 13501-1) up to the height of the ceiling of the 3rd storey above ground level or adjacent, horizontal building elements, which fulfil the fire protection function (cladding criteria) $K_2$30 acc. to DIN EN 13501-2 (see also technical brochures on Knauf multi-storey timber construction):

- Expert Report GS 3.2/09-048
- National Technical Test Certificate P-SAC-02/III-392
- National Technical Test Certificate P-SAC-02/III-599

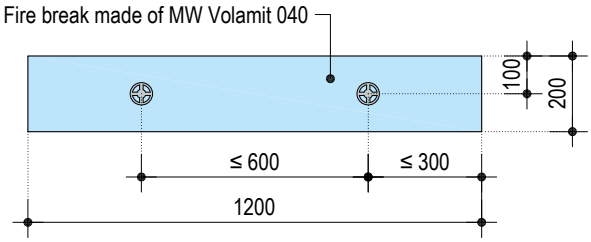
Exterior wall over the 1st storey

Apply WARM WALL on board materials with non-combustible mineral wool insulating material or non-combustible exterior wall cladding above a maximum 90 cm high splash water area above ground level or adjacent, horizontal building sections (e.g. roof parking, etc.) used up to the height of the ceiling above the 1st storey, however, the height must be at least 3 m. Use of constructional dowelling with a Schraubdübel STR H A2 dowel per mineral wool lamellae is recommended.

Fire brakes

- Fire break made of MW Volamit 040 (mineral wool lamellae), installed horizontally around the building, fire break height ≥ 200 mm.
- Full surface adhesion with permissible, mineral-based adhesive, e.g. SM300 or SM700 Pro and constructional dowelling applied for a Schraubdübel STR H A2 dowel per element (recommended)

Dimensions in mm

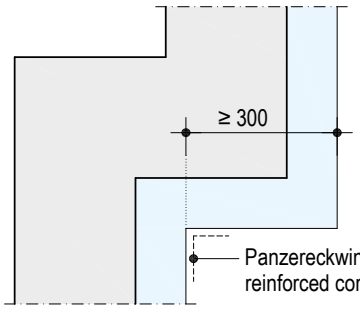


Construction examples and possible divergences are described in detail in the "Technical system information – ETICS and fire resistance" of the VDPM (Fachverband Wärmedämm-Verbundsysteme e. V. - Association for insulation systems, plaster and mortar) (German only).

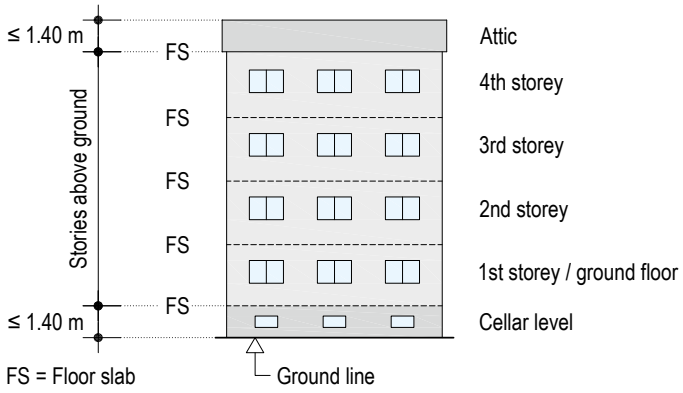
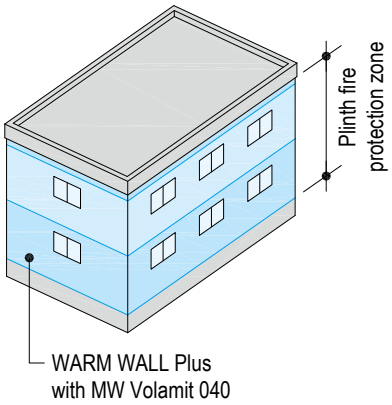
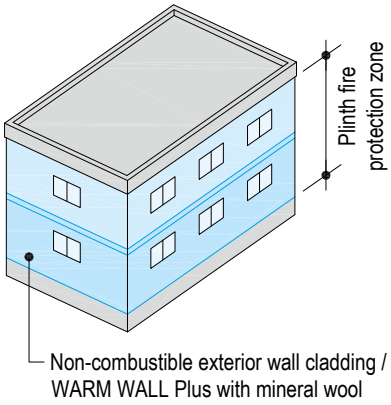
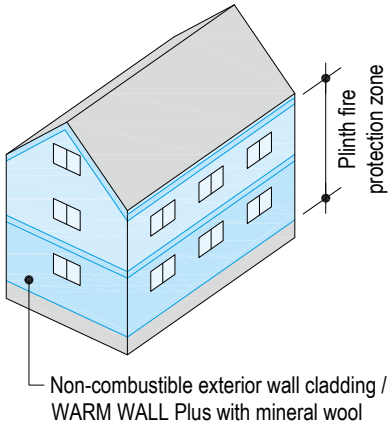
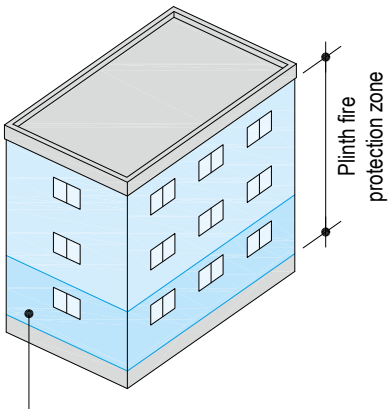
Inside corners

From ground level or the foot of other adjacent horizontal building elements up to the upper edge of the fire break at the height of the ceiling of the 3rd storey, Panzereckwinkel reinforced corner angles 70/90 are to be used with building inside corners. The thickness of the reinforcement layer should be taken from the general type approval / general approval. If a plinth is offset to the rear when compared to the ETICS to which it is connected above it, you can omit the Panzereckwinkel reinforcing corner angle in the plinth area.

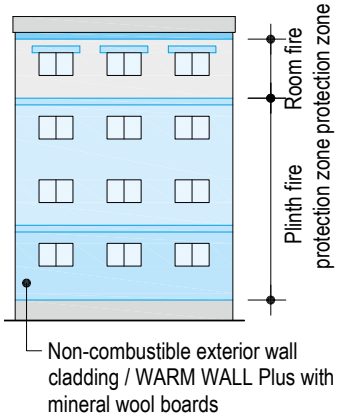
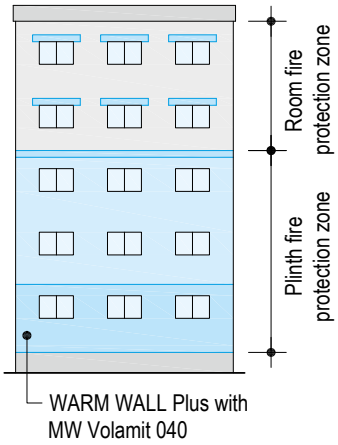
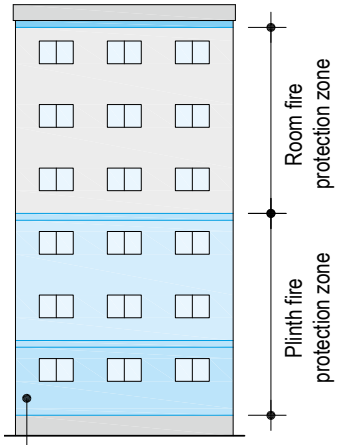
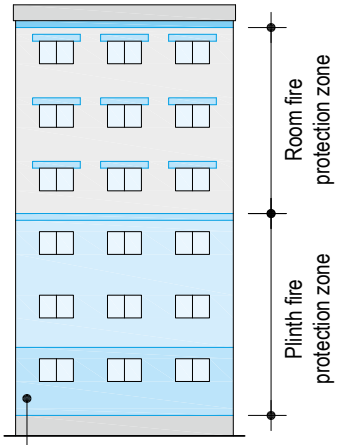
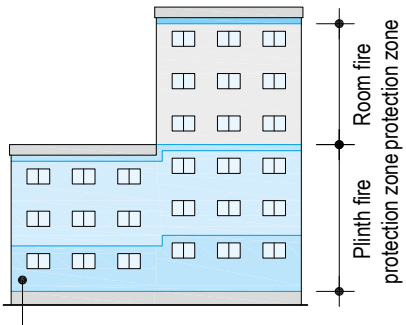
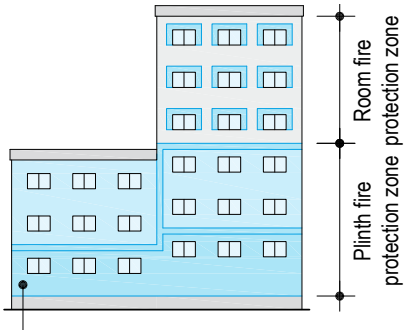
Dimensions in mm



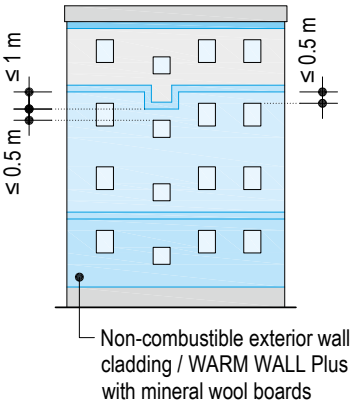
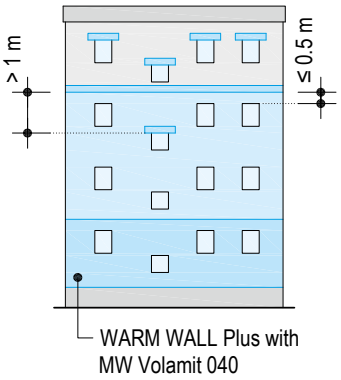
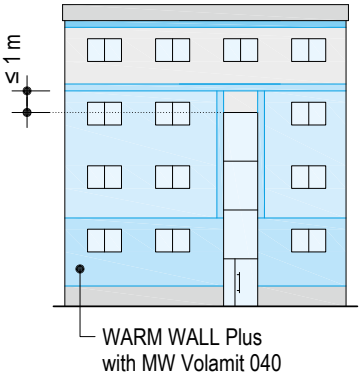
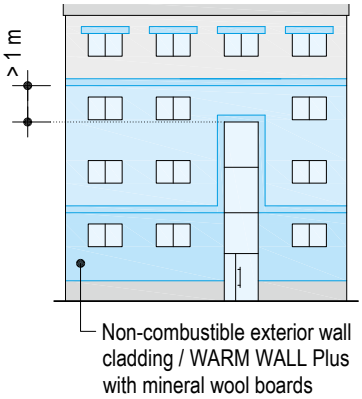
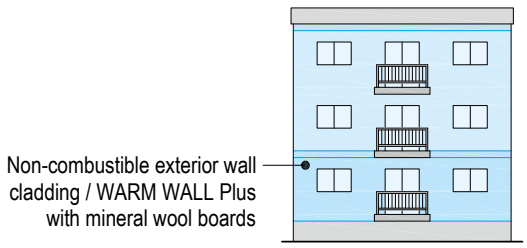
Position of the fire break on the building

Remark	Scheme drawings
Definition of stories	
Stories above ground acc. to clause 2 (6) of the German Model Building Code (MBO). Cellar levels, where the mean cellar ceiling does not extend more than 1.40 metres above ground level, shall not be considered as a floor level (storey), as well as hollow areas (jamb walls) between the top floor and the roofing that cannot be used as common rooms. The height specifications can diverge from one another in the different state building codes	
Two-storey building	
On low height buildings (0 – 7 m, see also page 14), possibly excluding special constructions, no additional fire protection measures are required from the point of view of the building codes. In case the ETICS are still to be not easily flammable in design, additional fire protection measures against exterior fires (plinth fire) as well as an additional fire break on the connection to the combustible construction products (e.g. roof) are required. Fire protection measures against interior fires (room fire) are already incorporated due to the building height. In case the system WARM WALL Plus with mineral wool boards is used in the first storey, the transition to the system WARM WALL Basis EPS must be protected with a fire break.	With flat roof (Example: combustible)  With flat roof (Example: non-combustible) 
Three-storey building	
It is recommended that ETICS on buildings of classes 1 to 3 that are a maximum of three stories should be not easily flammable in their design. This necessitates the application of fire protection measures against an exterior fire (plinth fire) as well as an additional fire break at the connection to combustible construction products (e.g. roof). These provisions already cover fire protection measures against interior fires (room fire) due to the building height. In case the system WARM WALL Plus with mineral wool boards is used in the first storey, the transition to the system WARM WALL Basis EPS must be protected with a fire break.	With gabled roof (generally flammable)  With flat roof (Example: non-combustible) 

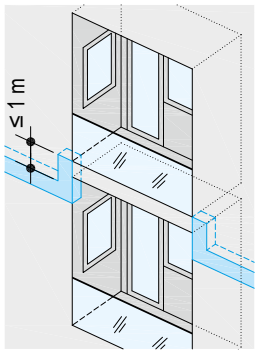
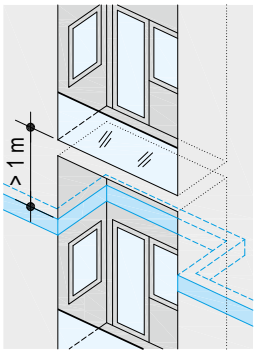
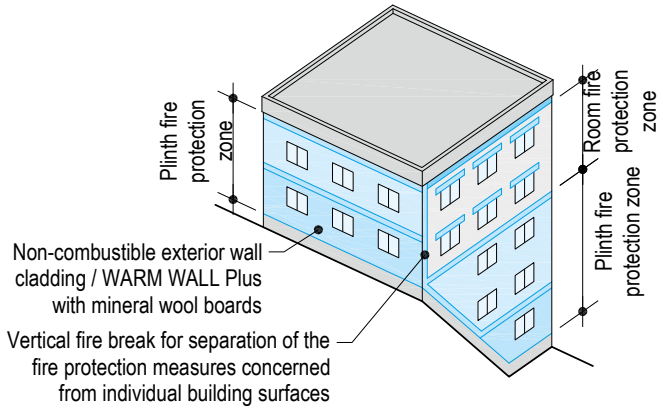
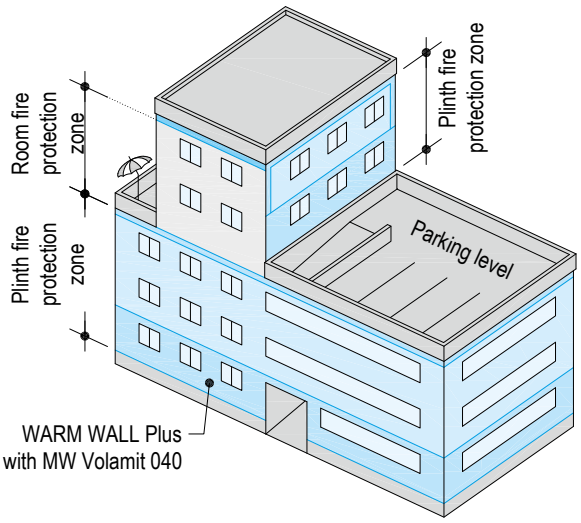
Position of the fire break on the building (continuation)

Remark	Scheme drawings	
Four- and five-storey buildings		
On higher buildings above the three-storey plinth fire protection zone, fire protection measures against a room fire are to be considered. An upper additional fire break is only required at the transition to combustible roof constructions. In case the system WARM WALL Plus with mineral wool boards is used in the first storey, the transition to the system WARM WALL Basis EPS must be protected with a fire break.	Insulation material thickness t > 100 mm, example: combustible roof 	Insulation material thickness t > 100 mm, Example: non-combustible roof 
Six-storey buildings and buildings up to the high-rise building limit		
Fire protection measures against interior fires (room fire) must be considered from an insulation thickness > 100 mm above the 4th storey above ground level or adjacent horizontal building section. An upper additional fire break is only required at the transition to combustible roof constructions. In case the system WARM WALL Plus with mineral wool boards is used in the first storey, the transition to the system WARM WALL Basis EPS must be protected with a fire break.	Insulation material thickness t ≤ 100 mm, Example: combustible roof 	Insulation material thickness t ≤ 100 mm, Example: combustible roof 
Different building section heights		
On building sections of different heights, the position of the fire break must be planned so that the fire break is at the same height in all parts of the building. Offsets up to a height of 1 m can be negotiated with an "upward" or "downward" offset. In case of an offset > 1 m a vertical separation of the ETICS up the the next non-combustible layer must be undertaken. In case the system WARM WALL Plus with mineral wool boards is used in the first storey, the transition to the system WARM WALL Basis EPS must be protected with a fire break.	Offset ≤ 1 m, insulation thickness t ≤ 100 mm, Example: combustible roof 	Offset > 1 m, insulation thickness t > 100 mm, Example: non-combustible roof, projected window 

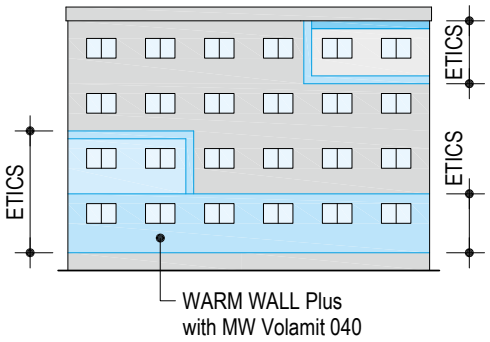
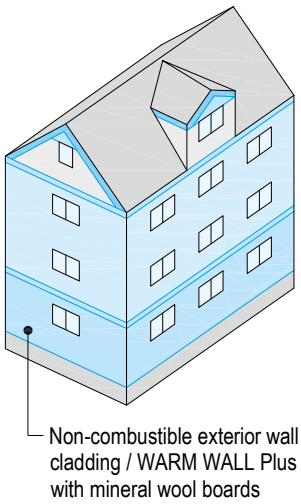
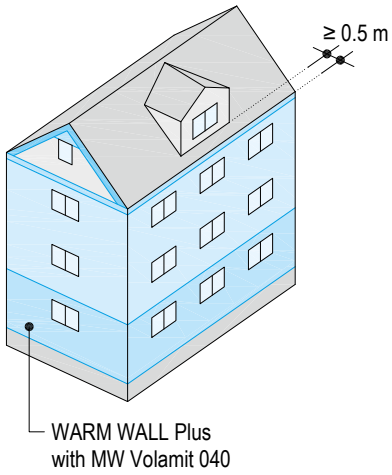
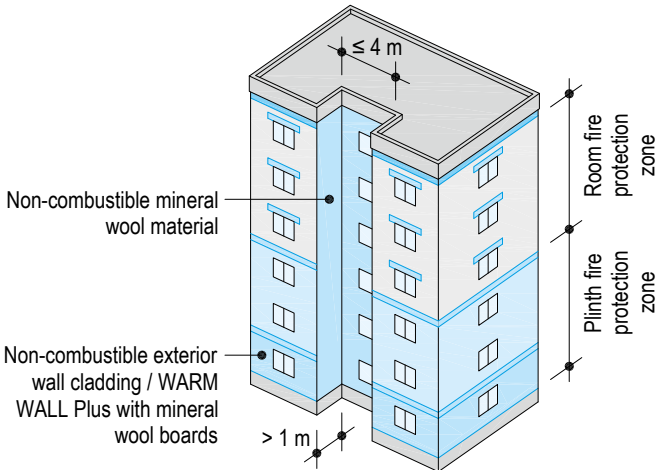
Position of the fire break on the building (continuation)

Remark	Scheme drawings	
Offset exterior wall openings		
Downward offset A local downward offset of the fire break, e.g. with a downward offset window, up to a maximum of 1 m is possible. The spacing of 0.5 m between the fire wall and window lintel may not be exceeded. With an offset > 1 m the window lintel is separately provided with a fire break. **Upward offset** In cases where the openings are directly in the horizontal path of the fire break, the fire break must be offset upwards around the opening. The height of the offset is limited to 1 m.	With downward offset, offset ≤ 1 m, insulation material thickness t ≤ 100 mm, Example: combustible roof  	Without downward offset, offset > 1 m, insulation material thickness t > 100 mm, Example: non-combustible roof 
Multi-storey, glazed stairwells		
If a building features a fire protection staircase acc. to clause 35 of the German Model Building Code (MBO) with cross-floor, multi-storey glazing, the cross-floor “exterior wall openings” must be fully surrounded along the perimeter with mineral wool strips at a minimum width of 200 mm in the same way as the surrounding fire break up to the reveal and lintel. If the spacing from the top edge of the lintel of the staircase glazing to the fire break above does not exceed1 m, then the vertical fire breaks can be connected directly to the continuous fire break.	Spacing lintel to fire break: ≤ 1 m, insulation material thickness t ≤ 100 mm, Example: combustible roof  	Spacing lintel to fire break: > 1 m, insulation material thickness t > 100 mm, Example: non-combustible roof 
Projected boards, e.g. of balconies and loggias		
Exterior areas that project out from the façade, such as slabs from balconies and loggias, and that interrupt the fully horizontal ETICS, assume the function of a fire stop, so that the additional inclusion of fire breaks in this area is unnecessary. The fire break must connect to the side at the level of the cantilever slab. The cantilever slabs must be solid and mineral-based and at least fire resistant (F30 acc. to DIN 4102-2 or alt. REI 30 acc. to EN 13501-2). The cantilever slabs must connect completely to the exterior wall without a gap or with load bearing thermal insulation elements (e.g. ISO-Korbs), that are fire resistance rated min. F30 acc. to DIN 4102-2 or alt. REI 30 acc. to EN 13501-2, connected with the exterior wall. Otherwise the fire break should be continued under the cantilever slab.	Example: flammable roof  	

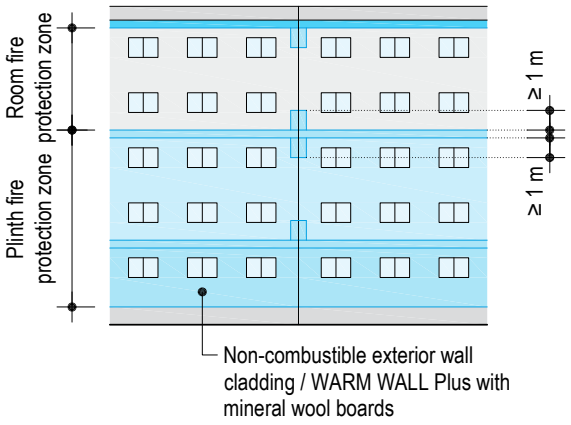
Position of the fire break on the building (continuation)

Remark	Scheme drawings	
Offsets of the fire break to cantilever slab		
With offset ≤ 1 m The fire break can be connected to the side of the cantilever slab by an upward or downward offset. **With offset > 1 m** Connection to the cantilever slabs is not possible. The fire break should be continued under the cantilever slab. If continuation of the fire break under the cantilever slab is not possible, e.g. due to an existing roller blind cassette, a non-combustible fire protection board that is at least 10 mm thick can be adhesively bonded and dowelled to the lower side of the cantilever slab in order to achieve the protective objective.	With offset ≤ 1 m 	With offset > 1 m 
Sloping site		
If the façade surfaces are at differing heights, e.g. on slopes, it may be useful to consider the sides of the building separately for fire protection purposes. This can be archived by a fire break that is implemented vertically along the entire height of the building at a spacing of maximum 1 m from the outer corner of the building. On the surfaces separated from one another the respective fire protection measures must be planned and implemented.	Insulation material thickness > 100 mm, Example: combustible roof 	
Staggered stories		
Fire protection measures against an exterior fire (plinth fire) must be implemented with staggered stories if on an adjacent area comparable fire loads such as on a building plinth can occur, e.g. on parking levels. For balconies, loggias or roof terraces used for residential purposes before staggered stories, fire protection measures must not be considered. The corresponding additional fire break is only required at the transition to combustible roofs.	Insulation material thickness ≤ 100 mm, Example: combustible roof 	

Position of the fire break on the building (continuation)

Remark	Scheme drawings
Mixed façades	
On mixed façades where different façade systems are applied (ETICS, back-ventilated curtain walls, facing masonry, etc.) adjacent to one another, it is possible that the fire can spread to the ETICS with EPS from the adjacent façade system. To prevent the spread of fire to the ETICS, areas of the ETICS must be protected continuously by horizontal fire breaks or vertical fire breaks and be separated from other façade systems.	Insulation material thickness t ≤ 100 mm, Example: combustible roof 
Dormer features	
Dormer windows are part of the roof if they are recessed by at least 0.5 m perpendicularly to the façade below them. Fire protection measures such as those for ETICS are then unnecessary. For practical building reasons, it can be advantageous to provide the entire gable or dormer features with non-combustible insulation materials.	< 0.5 m recessed offset, insulation material thickness > 100 mm, Example: combustible roof  ≥ 0.5 m recessed offset, insulation material thickness > 100 mm, Example: combustible roof 
Three-sided building recesses	
ETICS in three-sided building recesses, which are deeper than 1 m and do not exceed 4 m in width, should have non-combustible insulation material applied to the full surface. This applies in particular for window openings of stairwells located in these walls.	Insulation material thickness > 100 mm, Example: combustible roof 

Position of the fire break on the building (continuation)

Remark	Scheme drawings
Expansion joint without embedding firewall	
If an expansion joint interrupts a fire break without integrated fire wall, ETICS must be used. It should be filled completely with mineral wool at a height of at least 1 m above and below the fire break. A mineral wool strip with a total width of at least 200 mm must substitute the polystyrene rigid foam in the center above the expansion joint in this area. For external sealing of expansion joints against driving rain, materials can be used that are classified as flammable (EN ISO 13943).	Insulation material thickness ≤ 100 mm, Example: combustible roof 

Insulation material – bonding

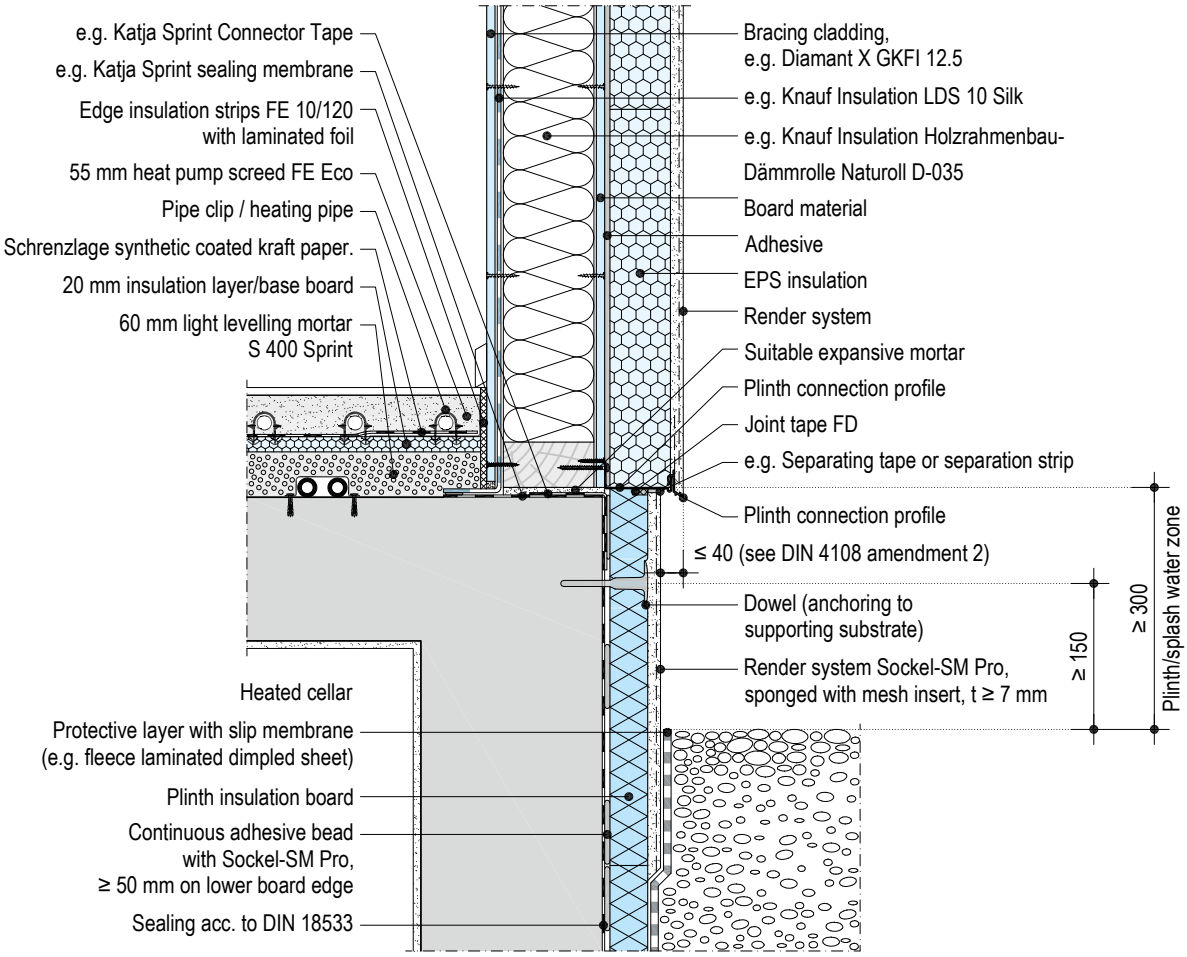
Application method	Glued surface	Application on
Manual	Full surface	Insulation material
By machine	Full surface	Substrate
Spray application (only for Pastol)[1)]	Full surface	Substrate (board material)

1) In case of industrial manufacturing, spray application directly on the insulation panel is possible.

Implemented with perimeter insulation

WE201.de-SO-V1 Recessed plinth application

Scale 1:10 I Dimensions in mm

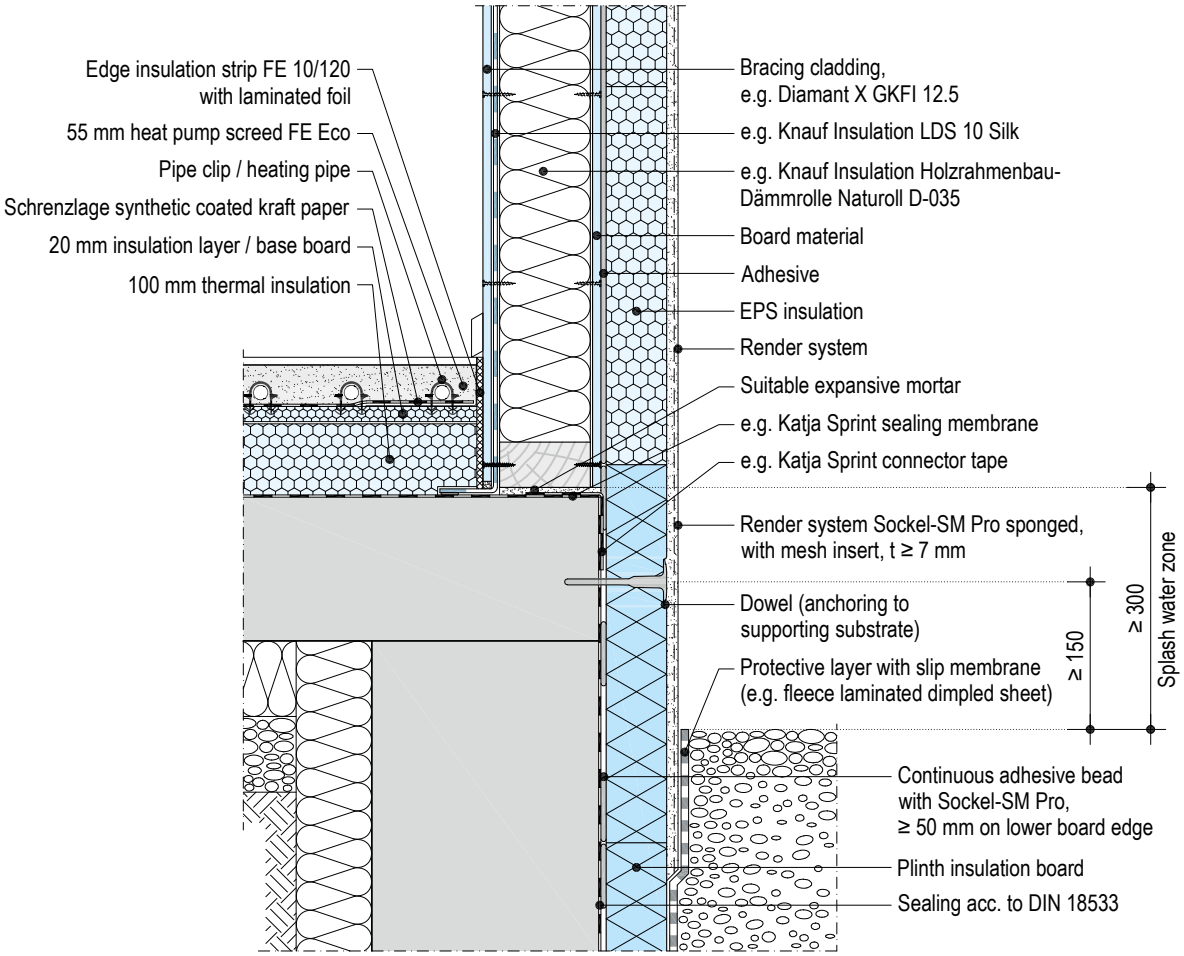


Implemented with perimeter insulation (continued)

Scale 1:10 I Dimensions in mm

WE201.de-SO-V2 Flush plinth application

Application with floor slab

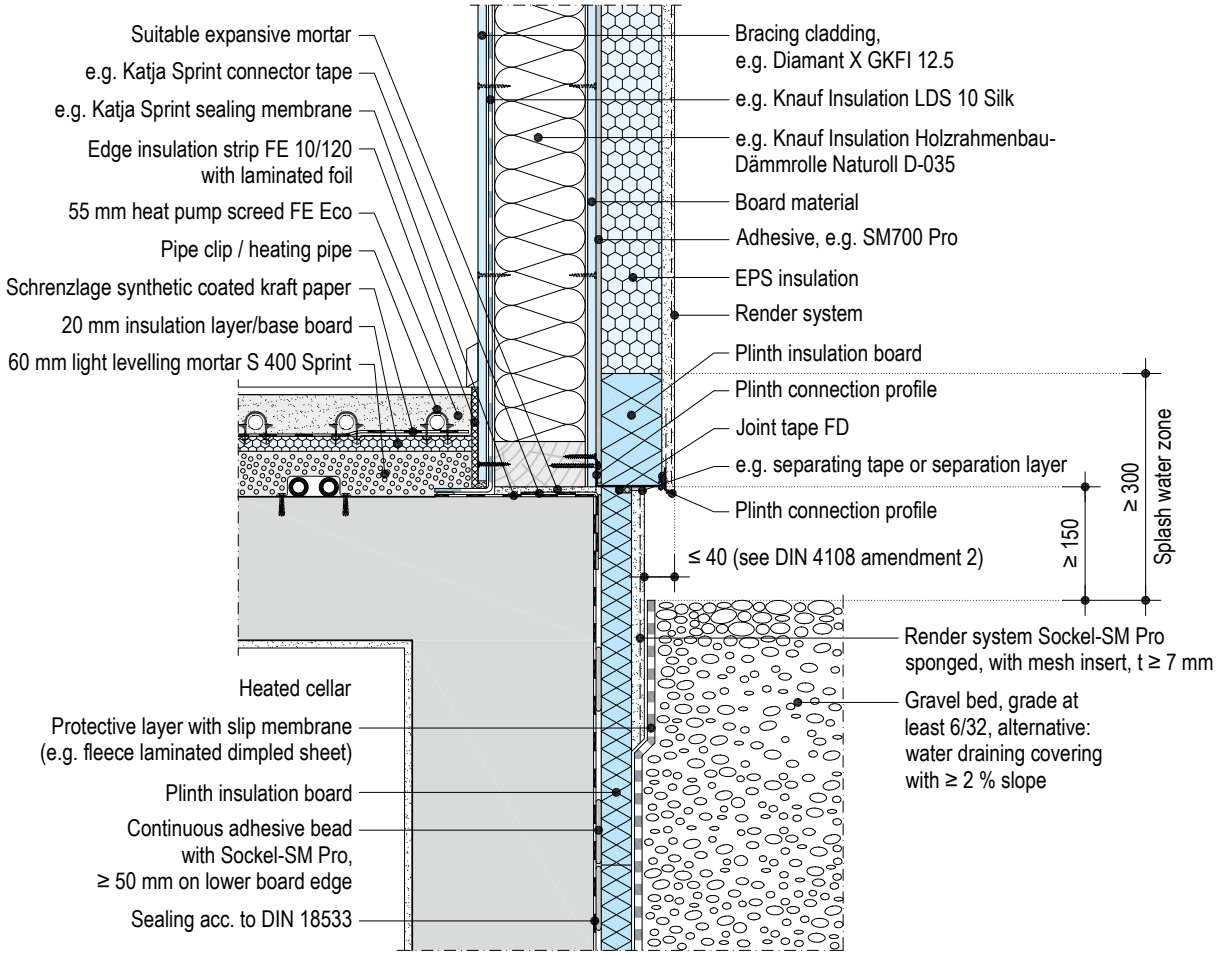


Implemented with perimeter insulation (continued)

Scale 1:10 I Dimensions in mm

WE201.de-SO-V3 Recessed plinth application

Taking consideration of special measures acc. to DIN 68800-2

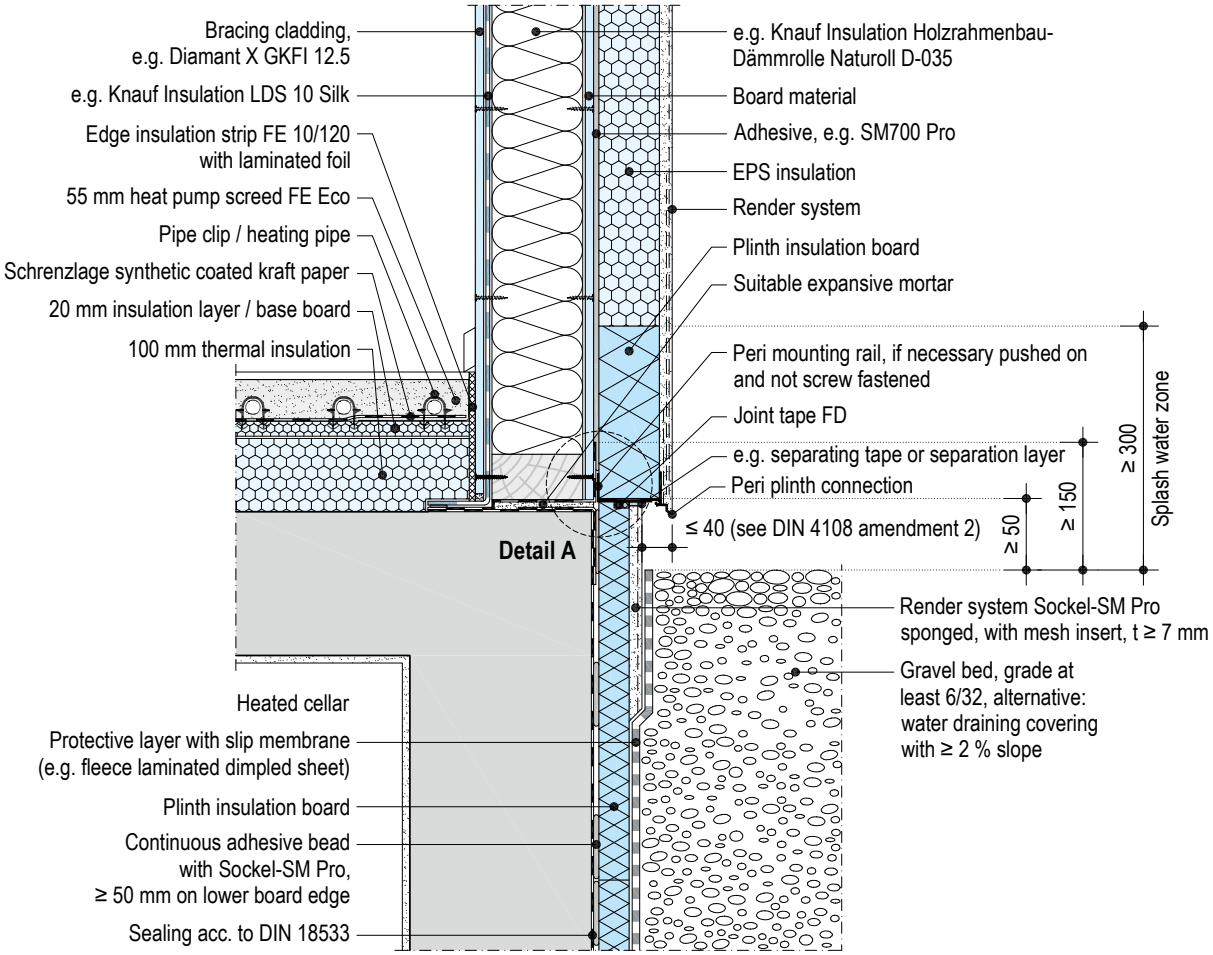


Implemented with perimeter insulation (continued)

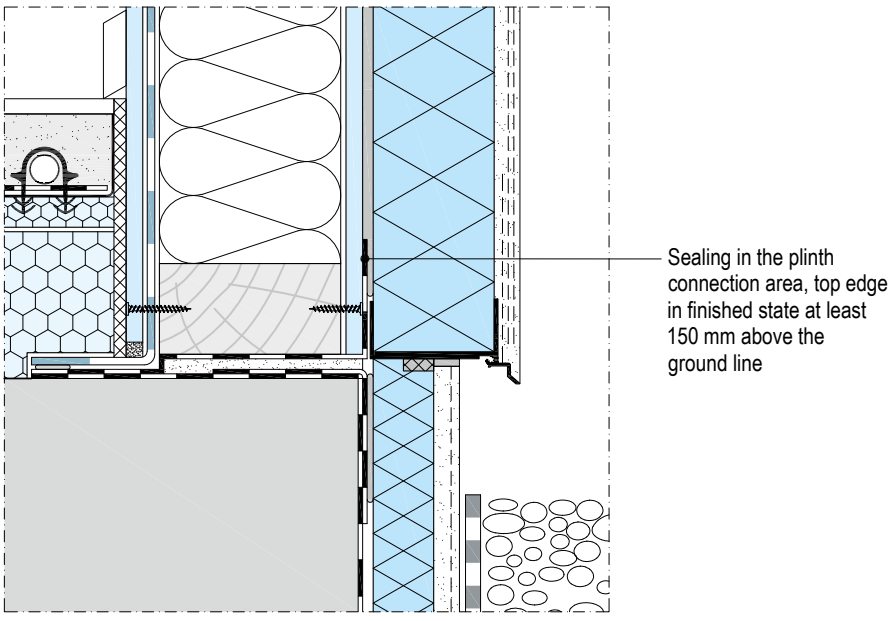
Scale 1:10 I Dimensions in mm

WE201.de-SO-V4 Recessed plinth application

Taking consideration of special measures acc. to DIN 68800-2



Detail A Scale 1:5



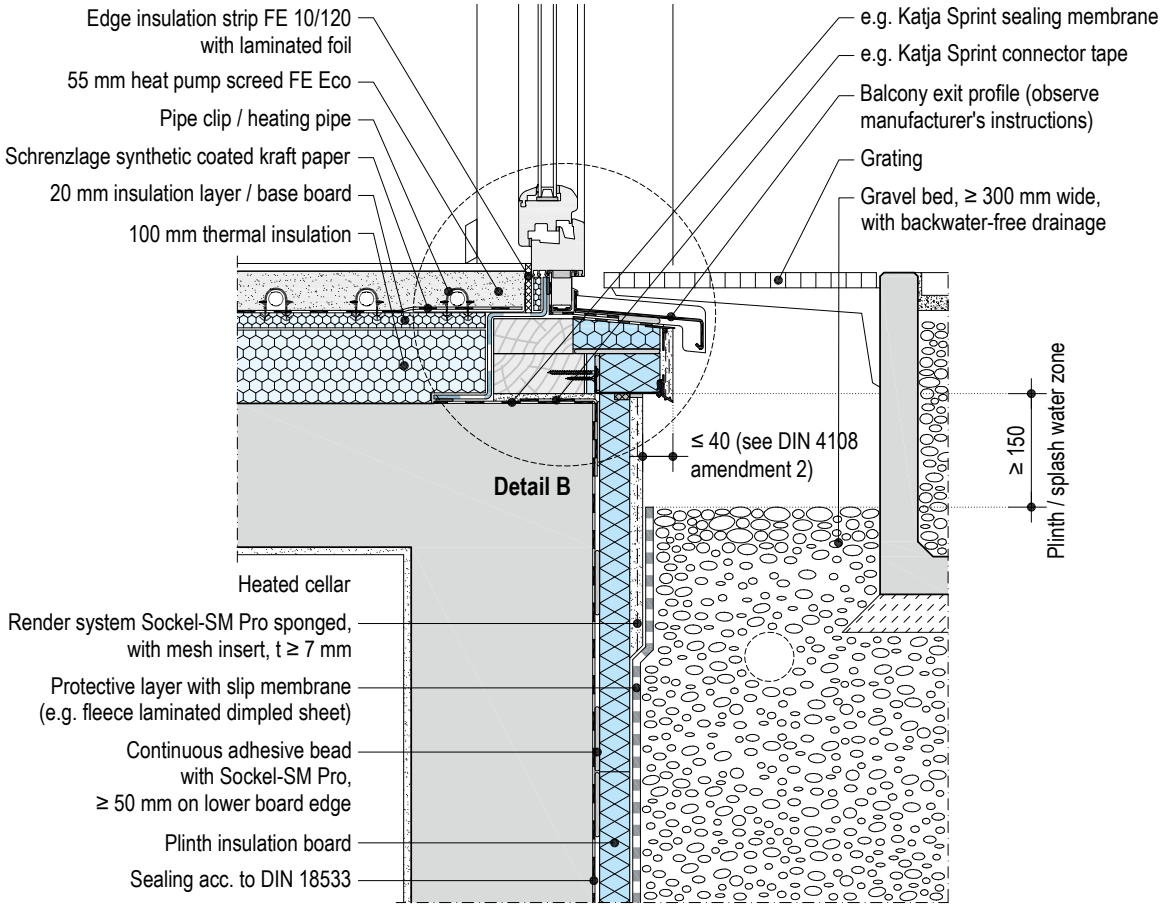
Note	Penetration of the building waterproofing should be avoided.

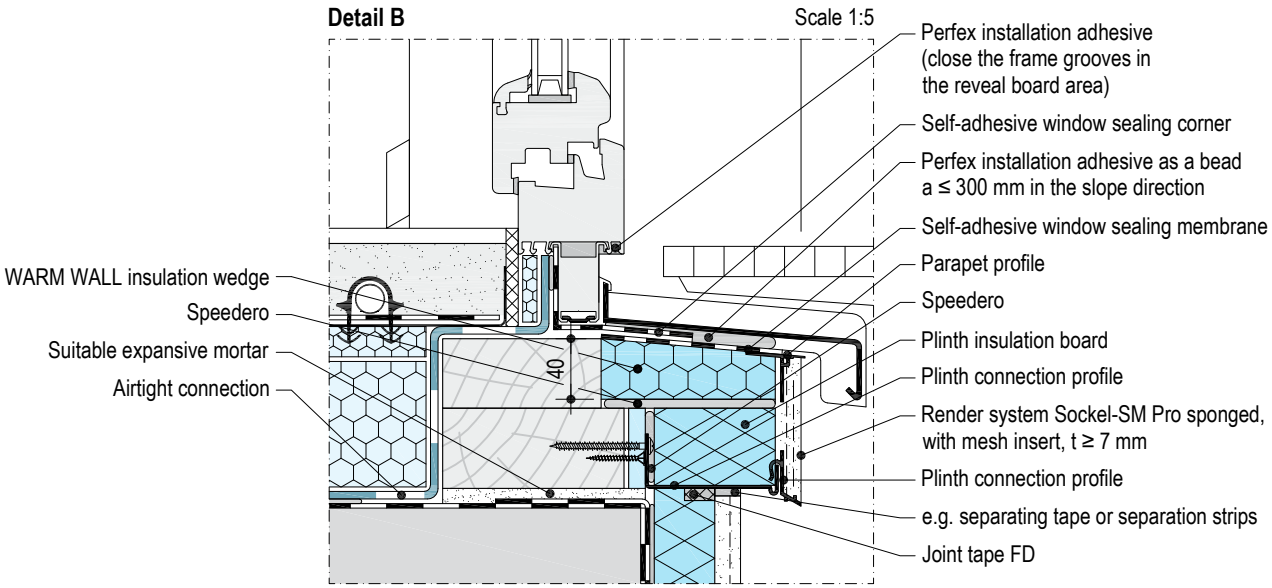
French door connections

Scale 1:10 I Dimensions in mm

WE201.de-SO-V5 Recessed plinth application

French door exterior flush with wooden studs, not barrier free





Notes

Take care to ensure fully sealed openings (interface gaps) and ensure that filling is applied under window frames.

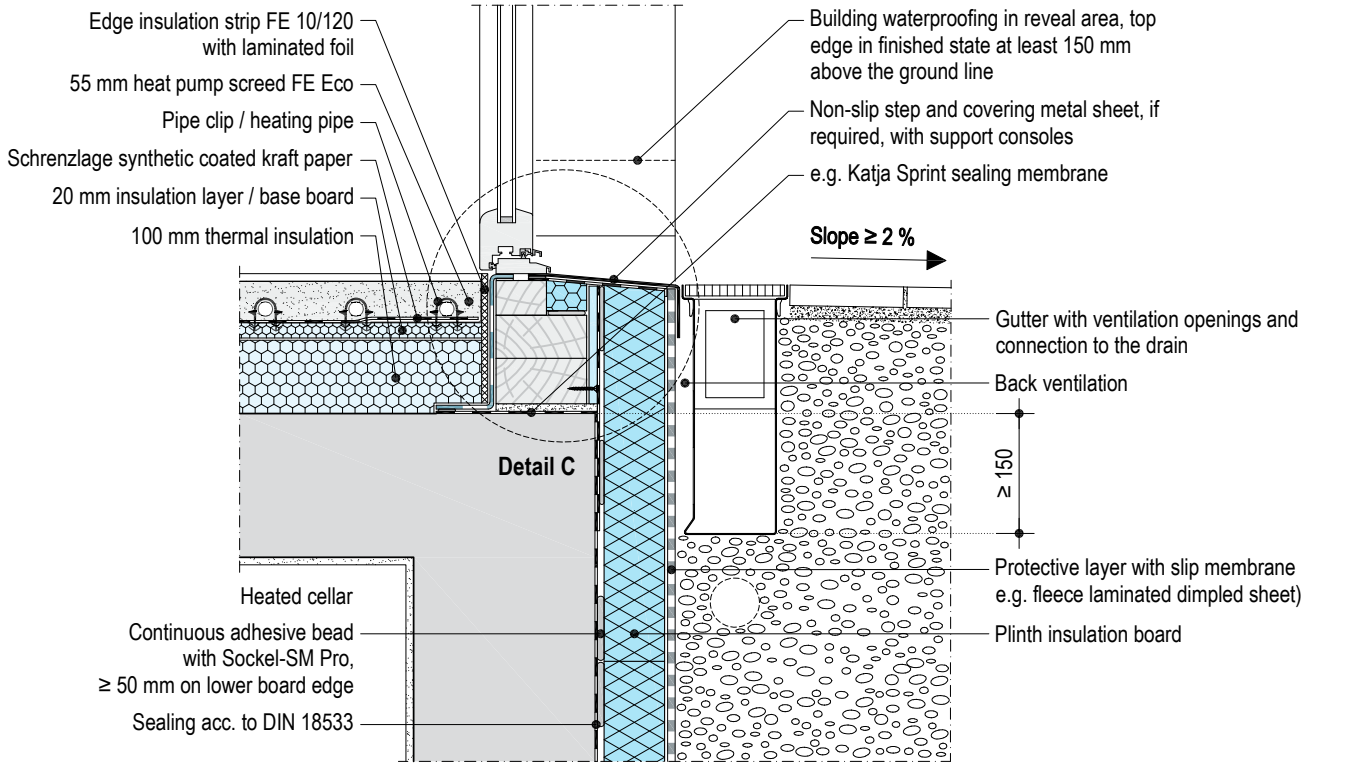
The window installation and seals are represented schematically, refer to “Guideline on the installation of windows and doors” from the RAL-Gütegemeinschaft Fenster und Haustüren e.V. (German Quality Assurance Association Windows and Doors) or the guideline “Connection of windows and roller blinds with plaster, drywall and external thermal insulation composite systems” (German only) from the Fachverband der Stuckateure für Ausbau und Fassade Baden Württemberg, Germany. The construction details shown only apply for the implementation of a second water channelling level, e.g. with Knauf WARM WALL window sealing system, see Installation Instructions P651-A01.de.

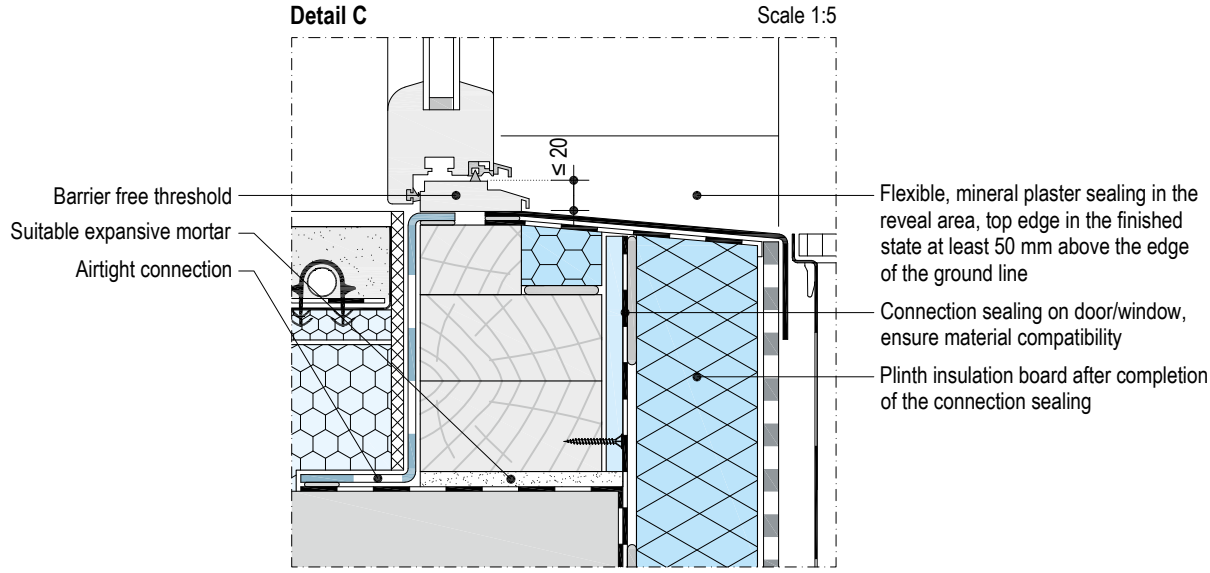
French door connections (continued)

Scale 1:10 I Dimensions in mm

WE201.de-SO-V6 Flush plinth application

French door interior flush with wooden studs, barrier free





Notes

Ground level or barrier free entrance from the terrace should be agreed with the contractors. With the regulations governing barrier-free access, the threshold heights and non-slip surfaces, etc. must be observed. Furthermore, the investor must be informed about non-compliance to the regulations as set down in the DIN 18533 in the area of the cross-over between buildings (height at house door or French door maximum 20 mm). Also refer to the BDF leaflet 03-04 “Plinth constructions acc. to DIN 68800-2, classification in usage class GK 0”. Refer to the guideline “Façade plinth render/External components” (German only), issued by Fachverband der Stuckateure für Ausbau und Fassade Baden-Württemberg, flat roof guideline of the German roofers association or in individual cases the green roof guideline of the respective associations. Take care to ensure fully sealed openings (interface gaps) and ensure that filling is applied under window frames.

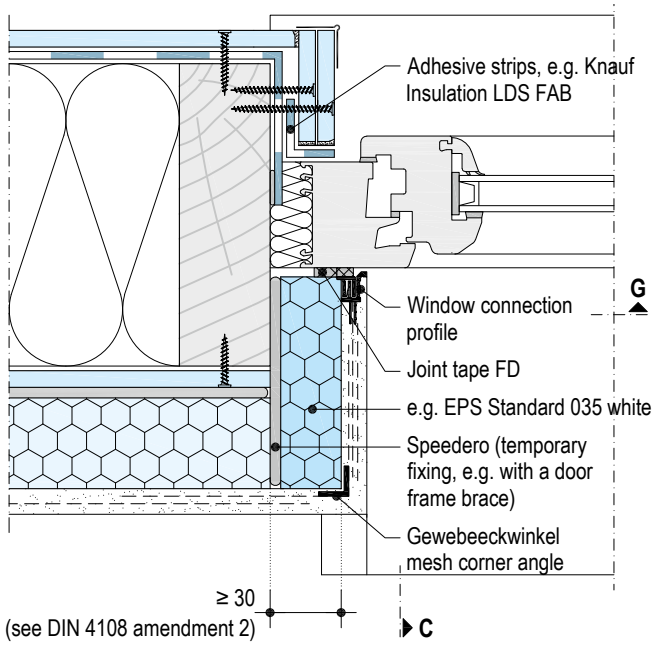
The window installation and seals are represented schematically, refer to “Guideline on the installation of windows and doors” from the RAL-Gütegemeinschaft Fenster und Haustüren e.V. (German Quality Assurance Association Windows and Doors) or the guideline “Connection of windows and roller blinds with plaster, drywall and external thermal insulation composite systems” (German only) from the Fachverband der Stuckateure für Ausbau und Fassade Baden Württemberg, Germany. The construction details shown only apply for the implementation of a second water channelling level, e.g. with Knauf WARM WALL window sealing system, see Installation Instructions P651-A01.de.

Window centred with wooden studs

Scale 1:5 I Dimensions in mm

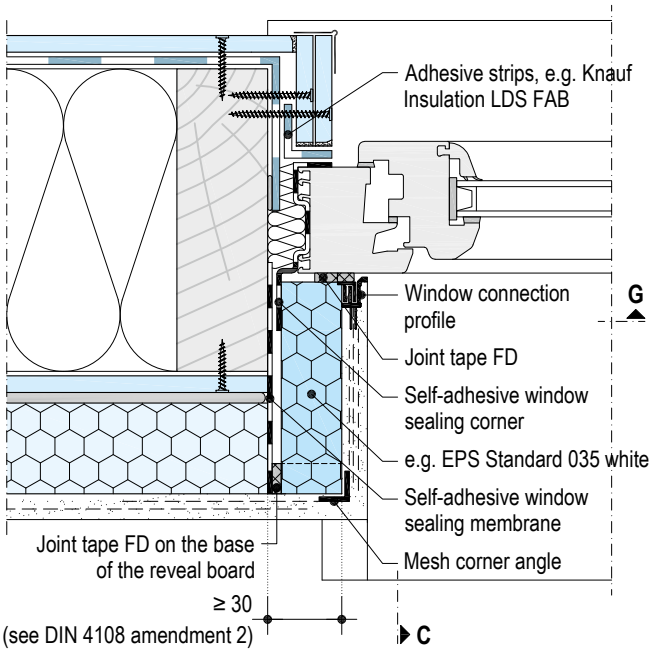
WE201.de-FE-H1 Horizontal section

Section A



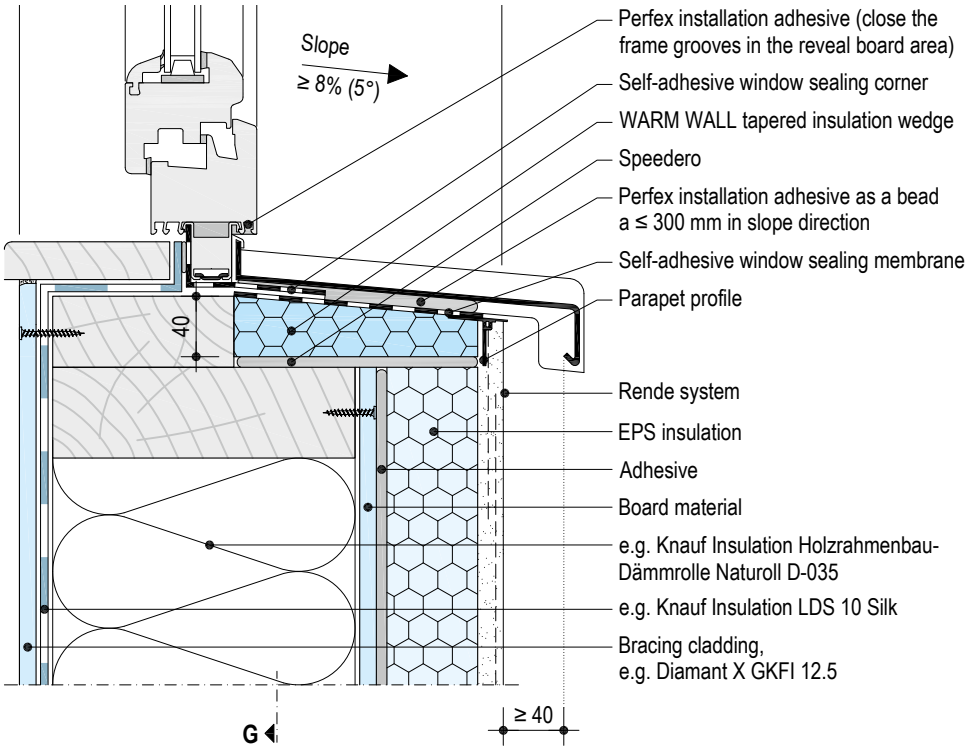
WE201.de-FE-H2 Horizontal section

Section B (base)



WE201.de-FE-V1 Vertical section

Section C



To facilitate drainage of any water present, a second water channeling level between the front edge of the façade insulation and the lower side of the window sill may not have any Fugendichtband FD joint sealing tape installed.

Notes

Take care to ensure fully sealed openings (interface gaps) and ensure that filling is applied under window frames.

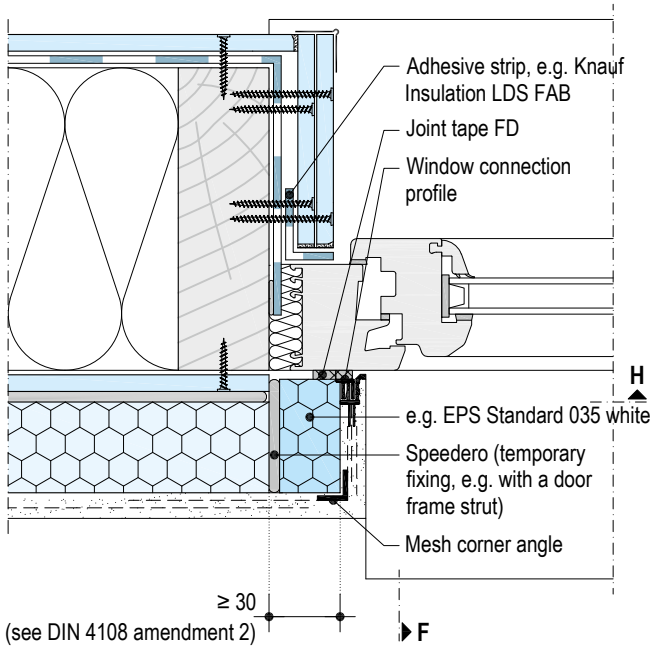
The window installation and seals are represented schematically, refer to “Guideline on the installation of windows and doors” from the RAL-Gütegemeinschaft Fenster und Haustüren e.V. (German Quality Assurance Association Windows and Doors) or the guideline “Connection of windows and roller blinds with plaster, drywall and external thermal insulation composite systems” (German only) from the Fachverband der Stuckateure für Ausbau und Fassade Baden Württemberg, Germany. The construction details shown only apply for the implementation of a second water channelling level, e.g. with Knauf WARM WALL window sealing system, see Installation Instructions P651-A01.de.

Window exterior flush with wooden studs

Scale 1:5 I Dimensions in mm

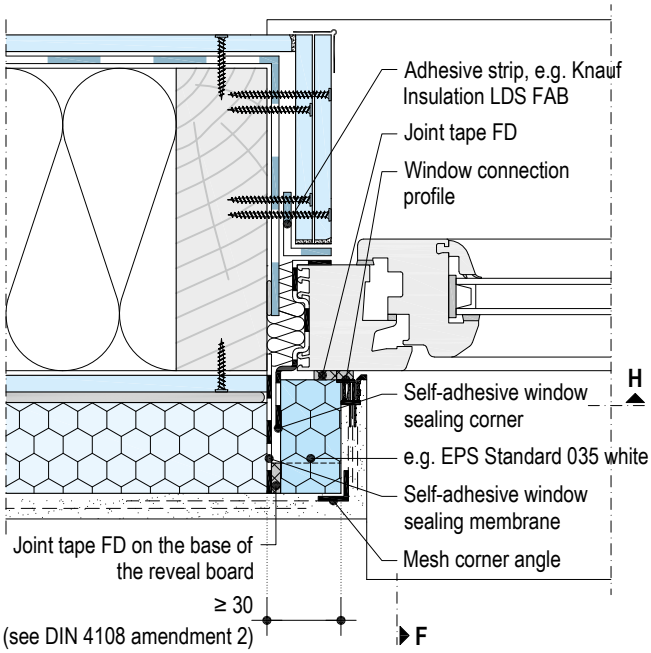
WE201.de-FE-H3 Horizontal section

Section D



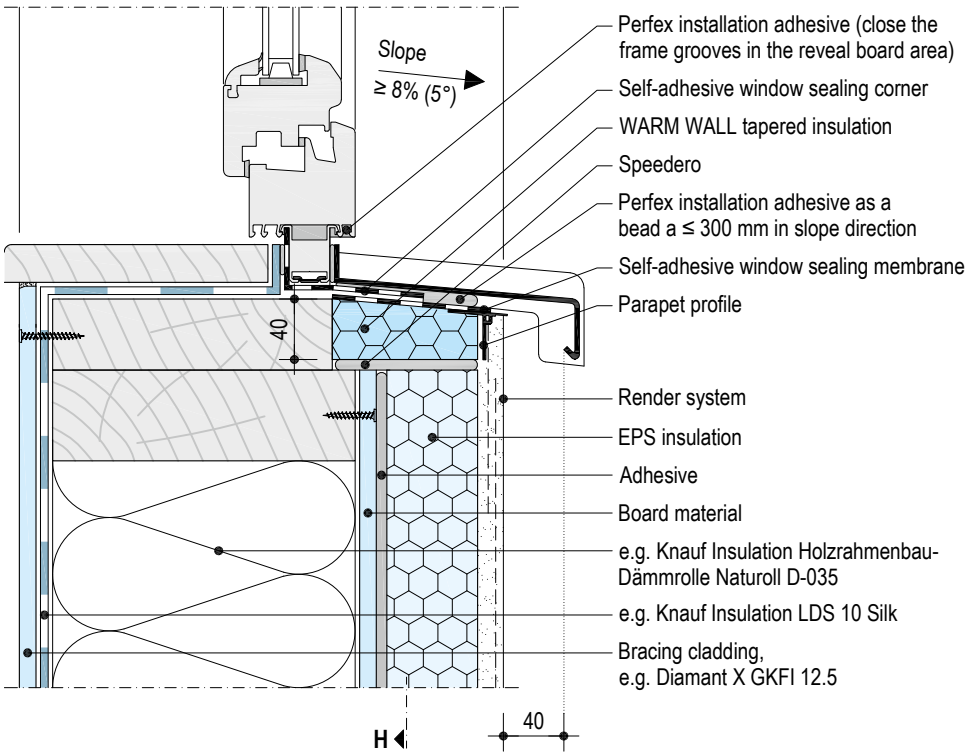
WE201.de-FE-H4 Horizontal section

Section E (base)



WE201.de-FE-V2 Vertical section

Section F



To facilitate drainage of any water present, a second water channeling level between the front edge of the façade insulation and the lower side of the window sill may not have any Fugendichtband FD joint sealing tape installed.

Notes

Take care to ensure fully sealed openings (interface gaps) and ensure that filling is applied under window frames.

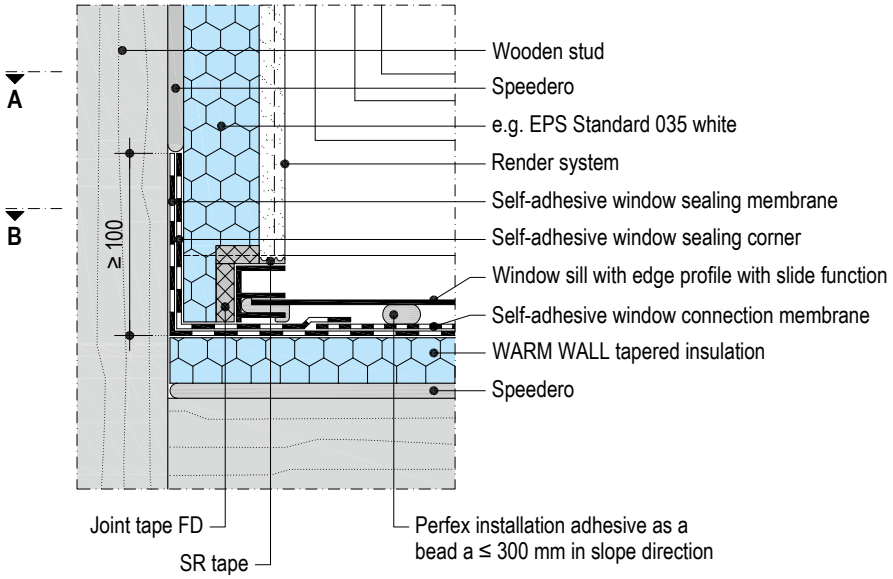
The window installation and seals are represented schematically, refer to “Guideline on the installation of windows and doors” from the RAL-Gütegemeinschaft Fenster und Haustüren e.V. (German Quality Assurance Association Windows and Doors) or the guideline “Connection of windows and roller blinds with plaster, drywall and external thermal insulation composite systems” (German only) from the Fachverband der Stuckateure für Ausbau und Fassade Baden Württemberg, Germany. The construction details shown only apply for the implementation of a second water channelling level, e.g. with Knauf WARM WALL window sealing system, see Installation Instructions P651-A01.de.

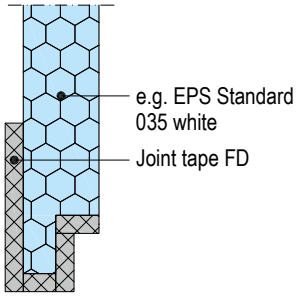
Connection to window sill side section

Scheme drawings I Dimensions in mm

WE201.de-FE-V3 Connection to window sill including edge profile with slide function

Section G

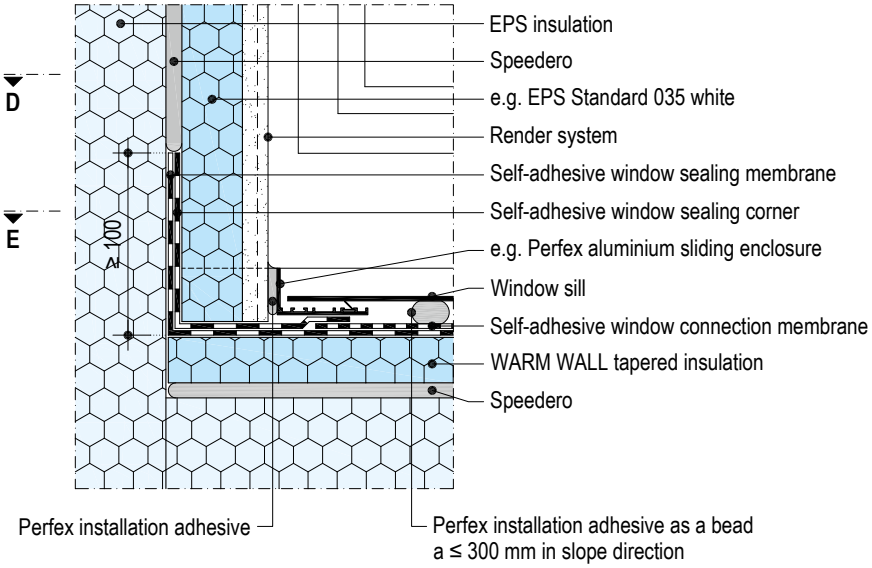


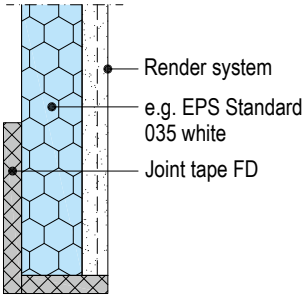


Design of the front edge of the reveal board

WE201.de-FE-V4 Connection to window sill – subsequent window sill installation

Section H





Design of the front edge of the reveal board

Notes

The construction details shown only apply for the implementation of a second water channelling level, e.g. with Knauf WARM WALL window sealing system, see Installation Instructions P651-A01.de.

At the foot of the reveal insulation panel as well as the render system, a joint is mandatory in the connection area to the window sealing corner/window sealing membrane, to prevent waterlogging underneath the reveal board. This is achieved by attachment of the joint sealing tape FD to the base of the reveal board.

When retrofitting the window sill, do not apply full surface adhesive to the sliding closure to guarantee the water flow direction of the window sill front edge.

See also the video “Knauf – Abdichtung für Fenster bei WDVS” (German) (Sealing for windows with ETICS) at youtube.com/knauf.

Connection to window sill side section (continued)

Recommendation for the lateral render spacing for window sills with edge profile

Window sill colour	Window sill length	Expected movement	Lateral plaster spacing	
			Edge profile without slide function	Edge profile with slide function[1)]
	m	mm	mm	mm
Natural, white	1	± 0.5	≥ 1	≥ 1
	3	± 1.5	≥ 2	≥ 1
Dark	1	± 1.0	≥ 2	≥ 1
	3	± 2.5	≥ 3	≥ 1

Not recommended

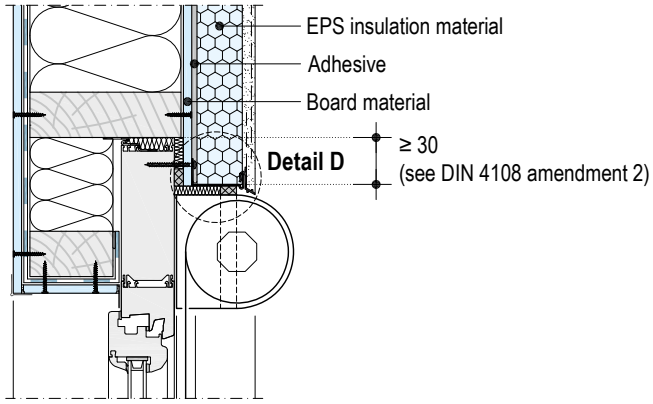
1) The constraint-free movement absorption between the edge profile and window sill must provide at least the expected range of motion.

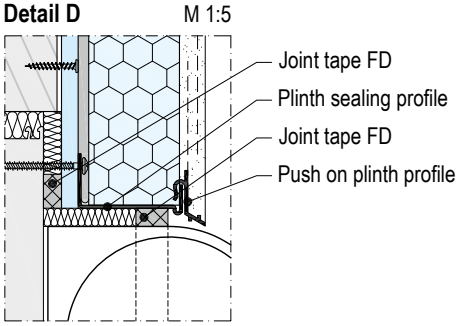
The installation of window sills with edge profile featuring a slide function; recommended when retrofitting window sills with sliding closures.

Connection to sun screening

Scale 1:10 I Dimensions in mm

WE201.de-FE-V5 Projection roller blind unit





Notes

When installing the projection roller blind unit a driving-rain proof application should be observed (connection of the plaster façade with Fugendichtband FD joint sealing tape).

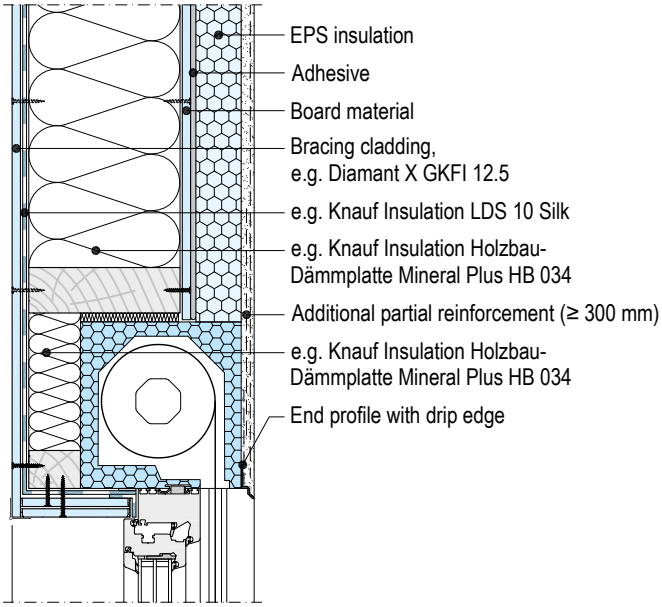
Ensure that all openings (interface gaps) are sealed.

The window installation and seals are represented schematically, refer to “Guideline on the installation of windows and doors” from the RAL-Gütegemeinschaft Fenster und Haustüren e.V. (German Quality Assurance Association Windows and Doors) or the guideline “Connection of windows and roller blinds with plaster, drywall and external thermal insulation composite systems” (German only) from the Fachverband der Stuckateure für Ausbau und Fassade Baden Württemberg, Germany.

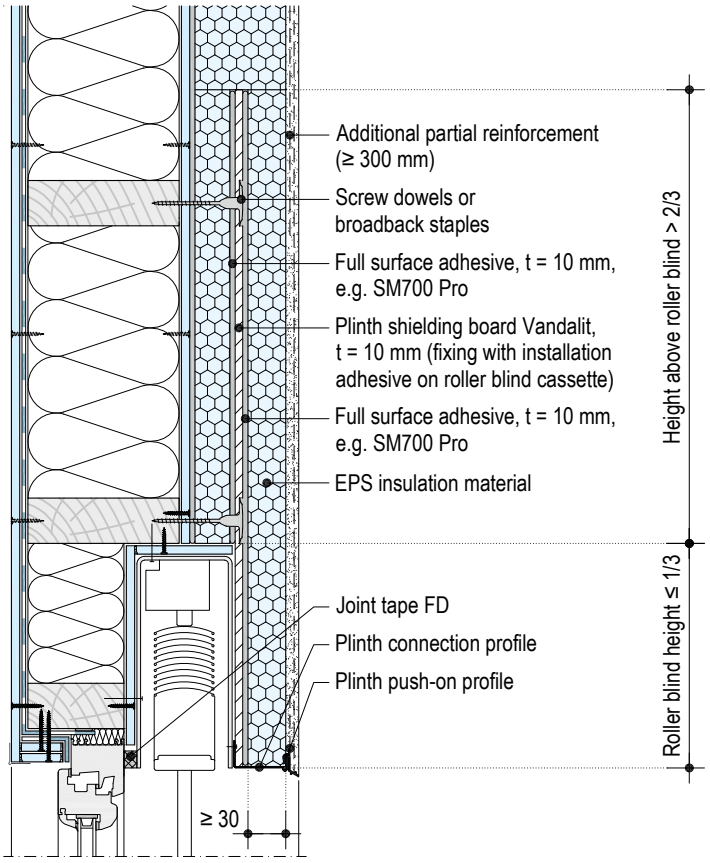
Connection to sun screening (continued)

Scale 1:10 I Dimensions in mm

WE201.de-FE-V6 Integrated roller blind unit



WE201.de-FE-V7 Roller blind

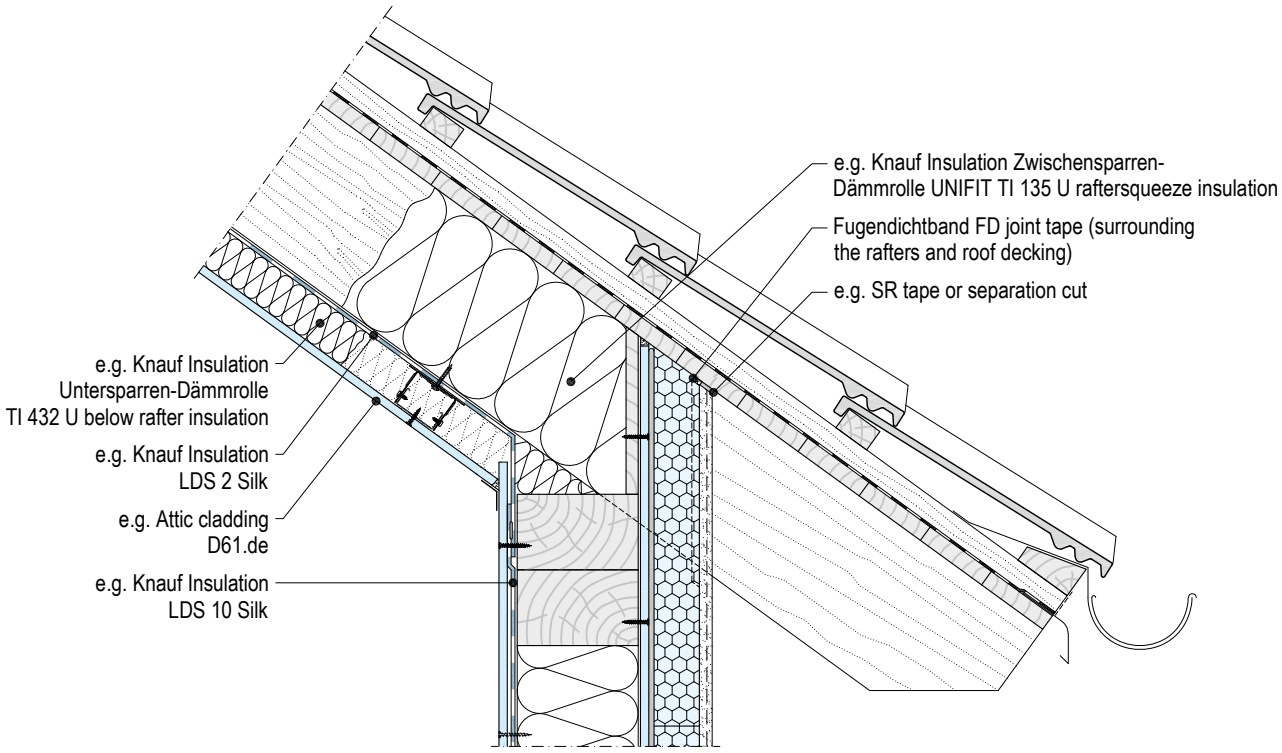


Notes	Rear-side coating of the plinth protection board Vandalit as moisture protection is recommended. Ensure that all openings (interface gaps) are sealed. The window installation and seals are represented schematically, refer to “Guideline on the installation of windows and doors” from the RAL-Gütegemeinschaft Fenster und Haustüren e.V. (German Quality Assurance Association Windows and Doors) or the guideline “Connection of windows and roller blinds with plaster, drywall and external thermal insulation composite systems” (German only) from the Fachverband der Stuckateure für Ausbau und Fassade Baden Württemberg, Germany.

Connections to roof

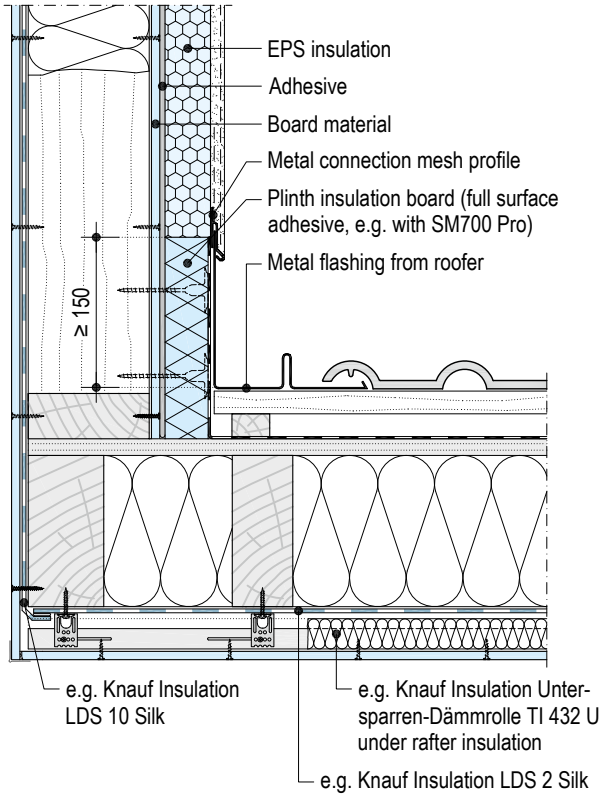
Scale 1:10 I Dimensions in mm

WE201.de-DA-V1 Eaves connection to roof weatherboarding



WE201.de-DA-V3 Connection to rising wall - dormer wing

With metal connection mesh profile



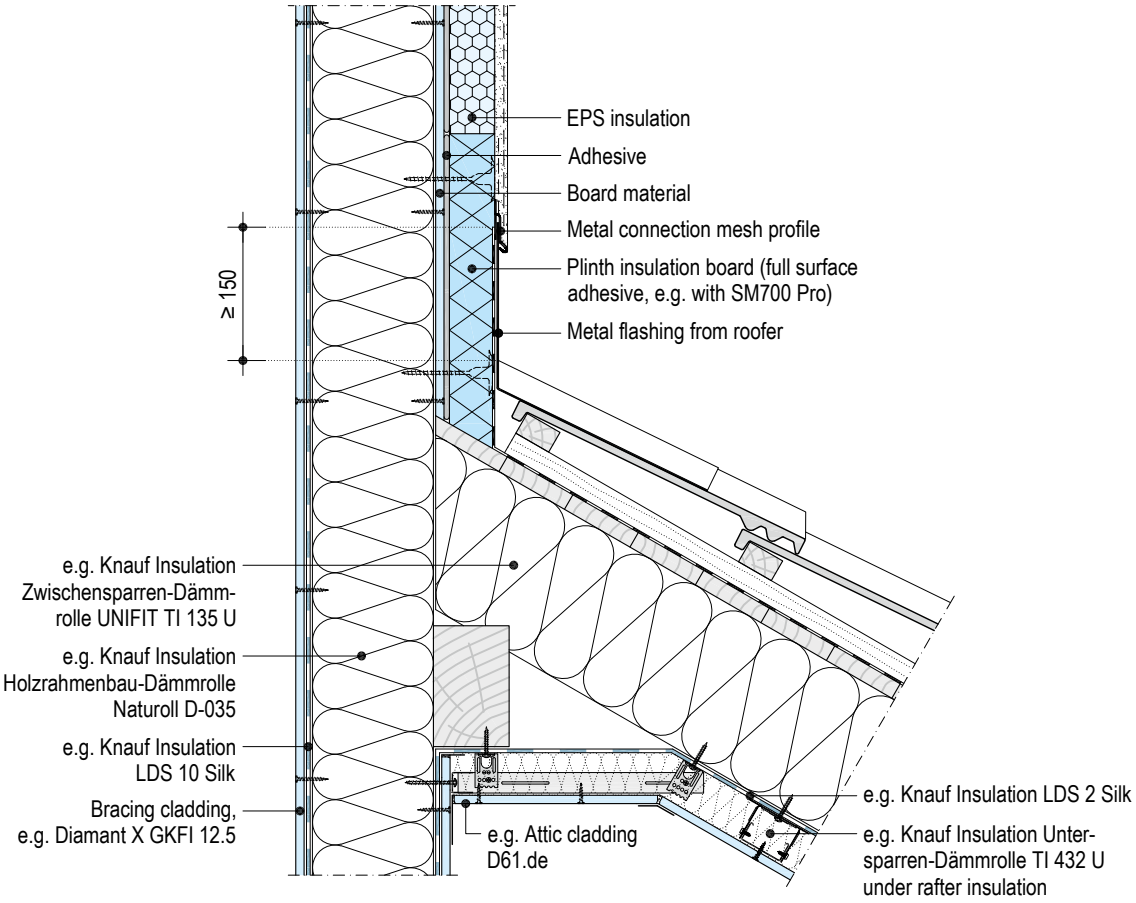
Note	Observe guideline “Metallanschlüsse an Putz und Wärmedämm-Verbundsysteme - *Metal connections to render and external thermal insulation composite systems*”, (German only) from the Fachverband der Stuckateure für Ausbau und Fassade Baden Württemberg, Germany as well as the DIN 18531.

Connections to roof (continued)

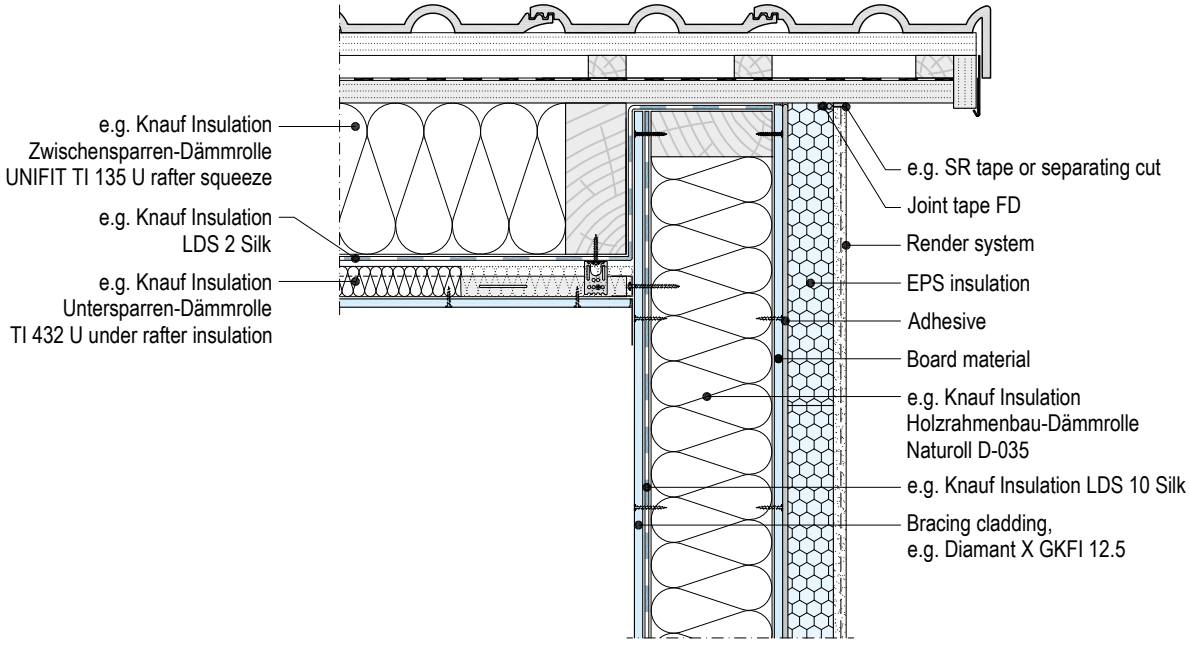
Scale 1:10 I Dimensions in mm

WE201.de-DA-V6 Pitched roof connection to rising wall

With metal connection mesh profile



WE201.de-DA-V5 Bargeboard connection



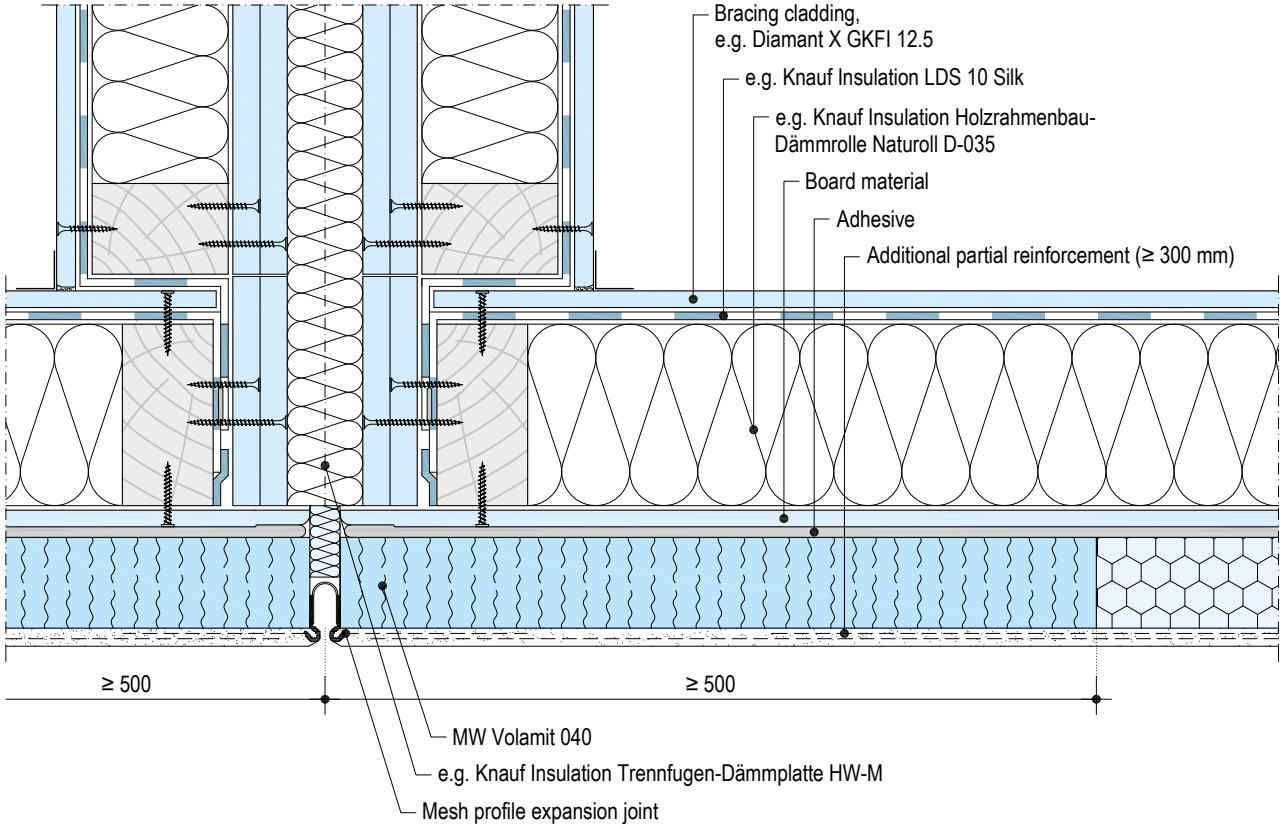
Note	Observe guideline “Metallanschlüsse an Putz und Wärmedämm-Verbundsysteme - *Metal connections to render and external thermal insulation composite systems*”, (German only) from the Fachverband der Stuckateure für Ausbau und Fassade Baden Württemberg, Germany as well as the DIN 18531.

Expansion and connection joints

Scale 1:5 I Dimensions in mm

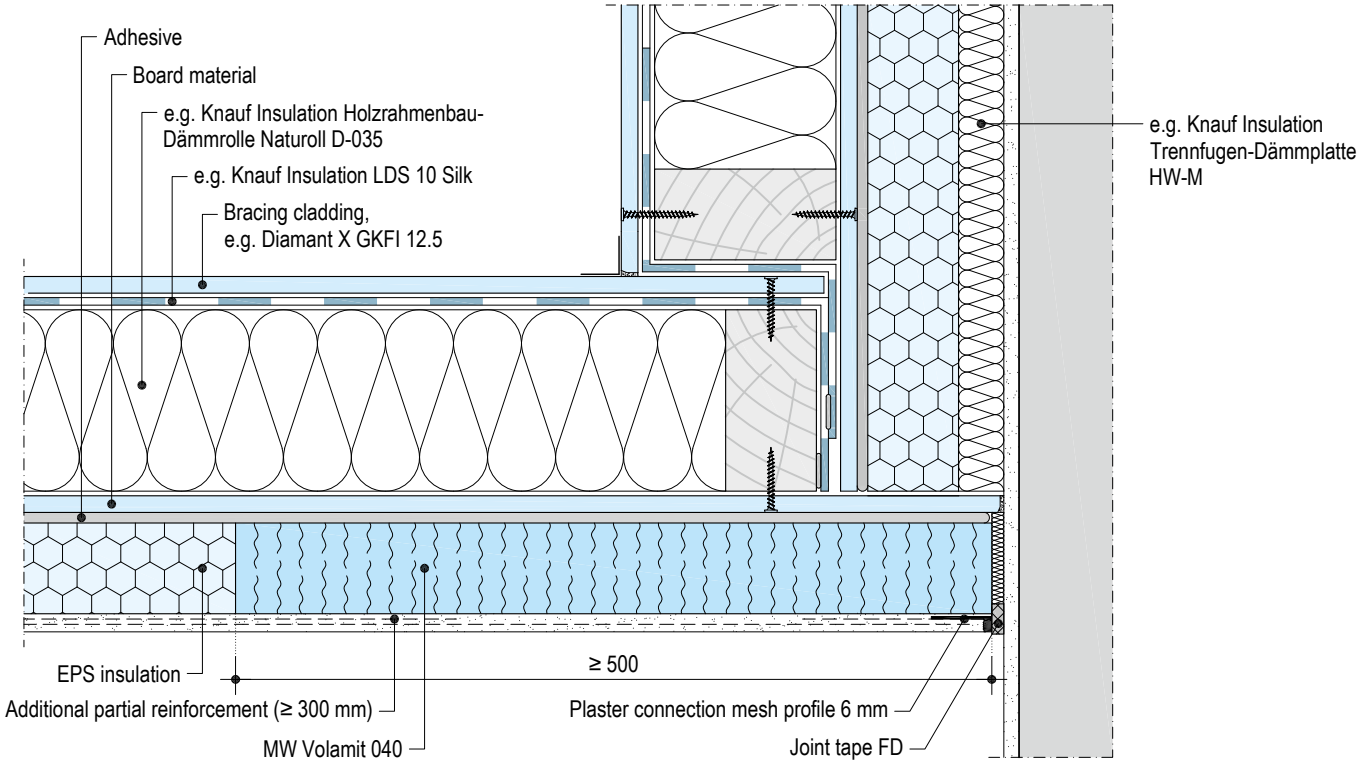
WE201.de-FU-H1 Building Party Wall – Semidetached house

Fire flashover area with mineral wool



WE201.de-FU-H2 Connection to existing constructional component

Fire flashover area with mineral wool

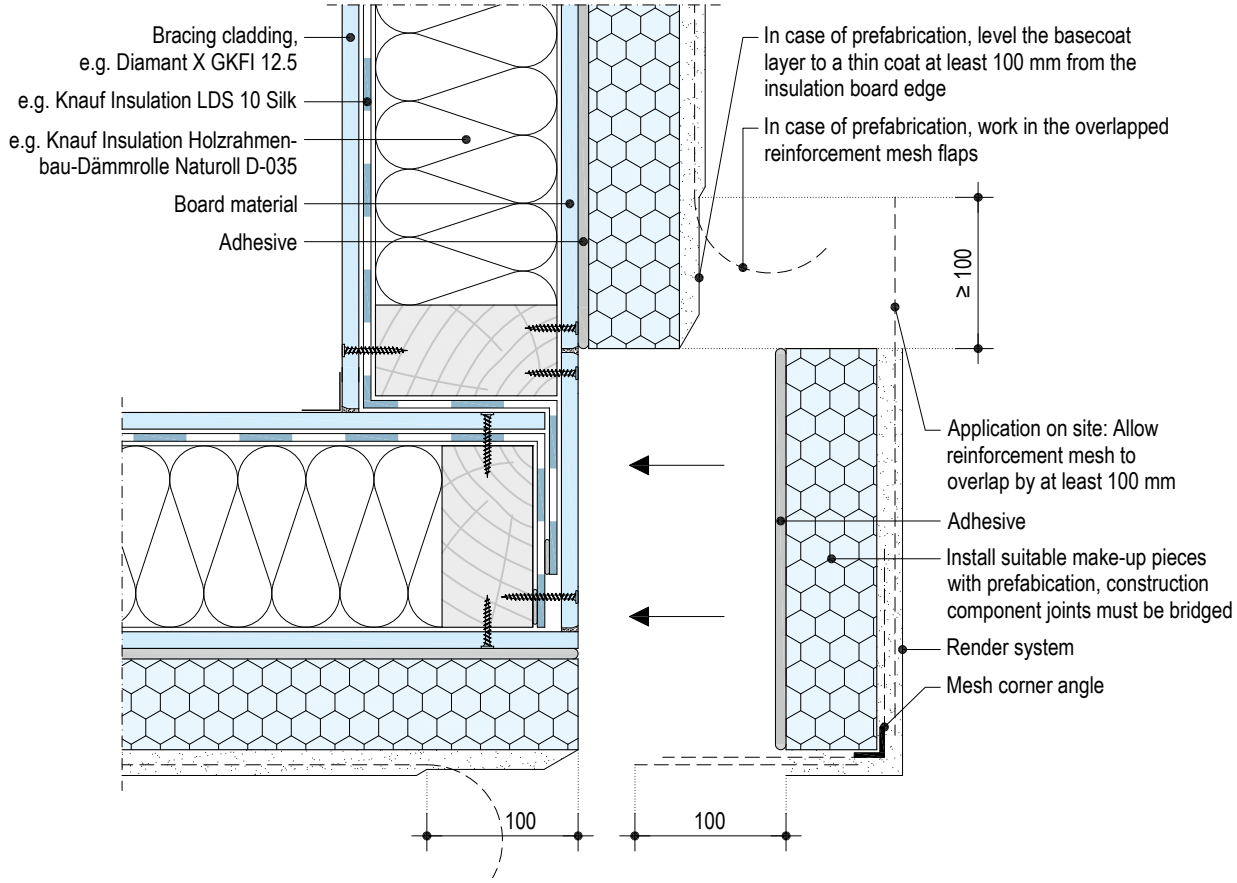


Note	The application in terms of materials and dimensions is based on the guidelines of the applicable state building code. An existing fire protection concept must be observed.

Connection to building corner

Scale 1:5 I Dimensions in mm

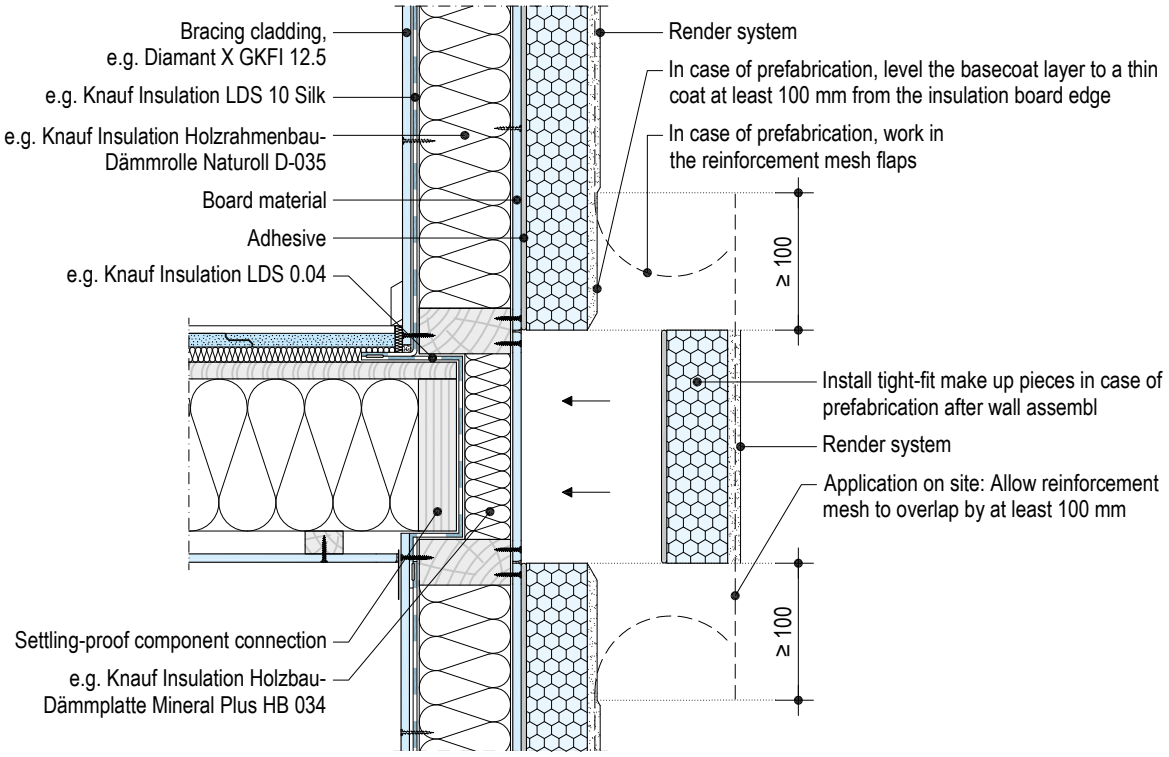
WE201.de-EX-H1 Connection to building corner



Junction between stories

Scale 1:10 I Dimensions in mm

WE201.de-EX-V1 Connection to junction between stories

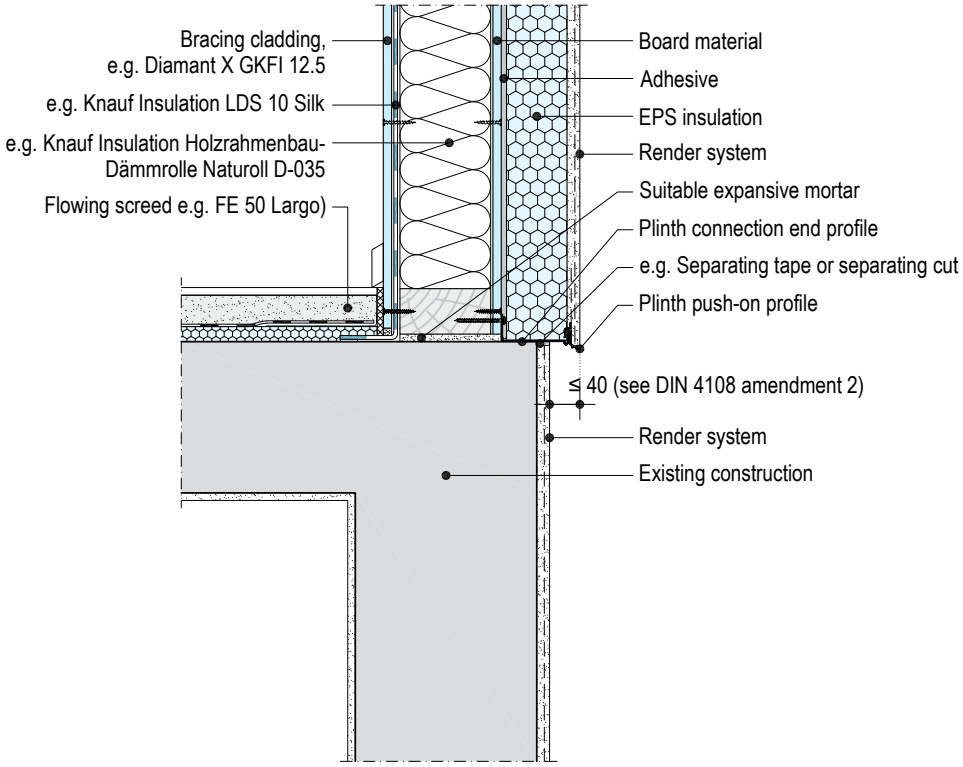


Vertical extension

Scale 1:10 I Dimensions in mm

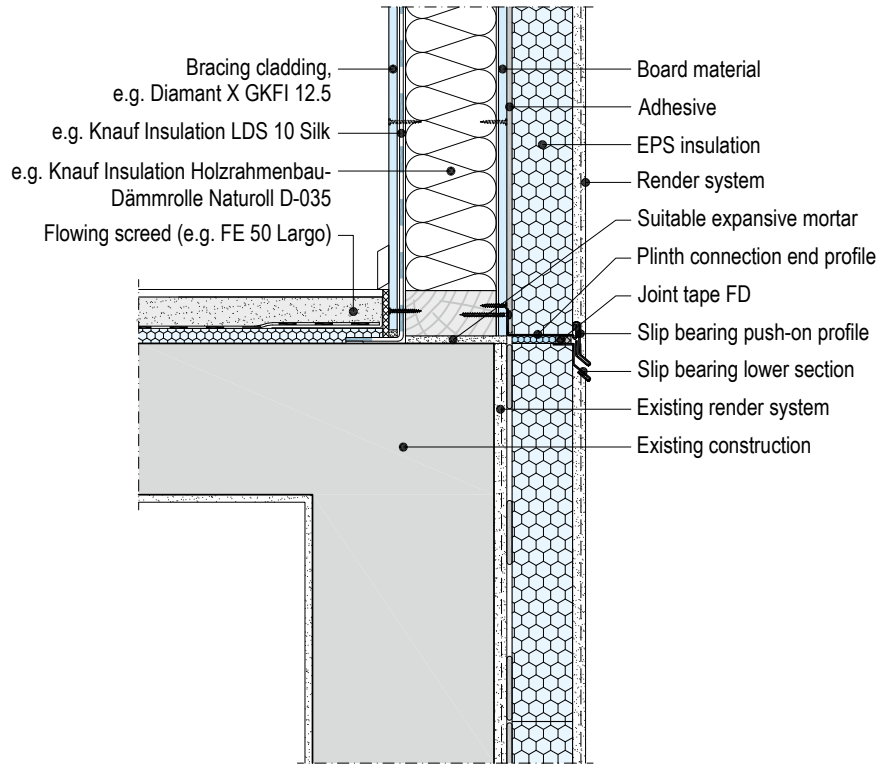
WE201.de-EX-V2 Vertical extension on existing storey

Existing building not remodelled, up to building class 3



WE201.de-EX-V3 Vertical extension on existing storey

Existing building remodelled, up to building class 3

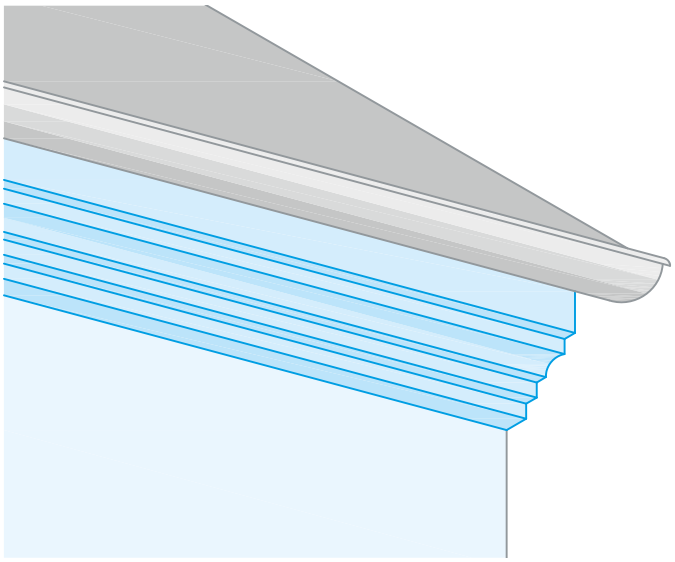


Cornice profile, ashlar profile

Application Instructions

EPS profiles with paintable surface coatings must be adhesively bonded with Flex tile adhesive or Duo-Kleber adhesive in an edge ribbon and dab bonding method (adhesive surface share ≥ 60 %) on a sufficiently set, dry and even reinforcement layer. Seal the transitions.
Adhesively bond profile joints with Perfex assembly adhesive, apply self-adhesive mesh strips (in scope of delivery) and fill the joints with a paste-like joint filler (in scope of delivery).
With a projection > 50 mm, a sheet metal cover should be adhesively bonded onto coated profile surface using Perfex assembly adhesive.
Adhesive bonding and fixing of the profiles only on wall surfaces, no connection, e.g. with roof connection.
Paint profiles with at least two coats of Autol.
Do not use materials that contain solvents.

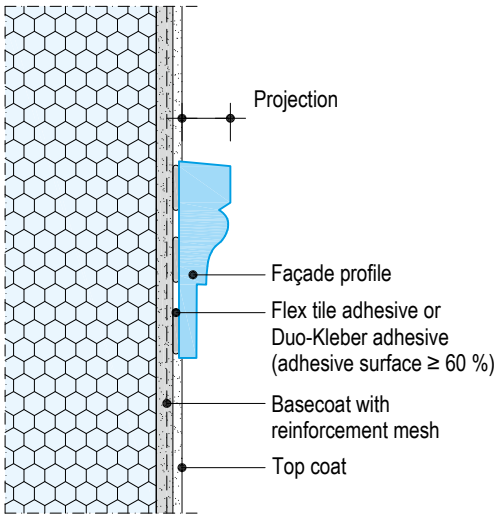
Example of a stylish façade design



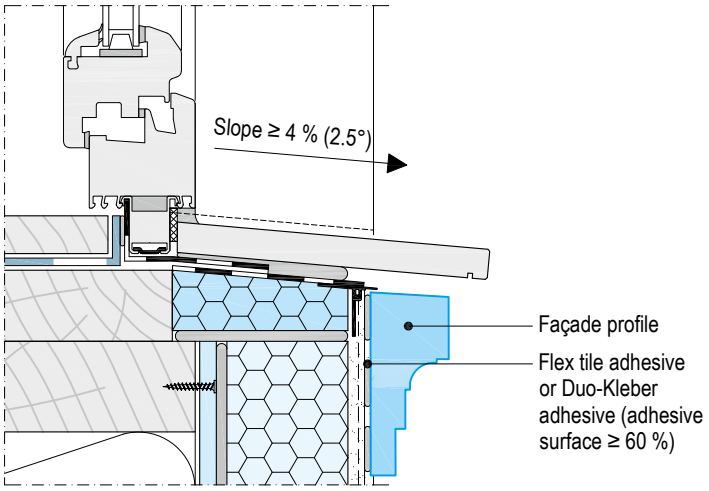
Details

Scale 1:5 I Dimensions in mm

WE201.de-EX-V4 Cornice profile, façade area

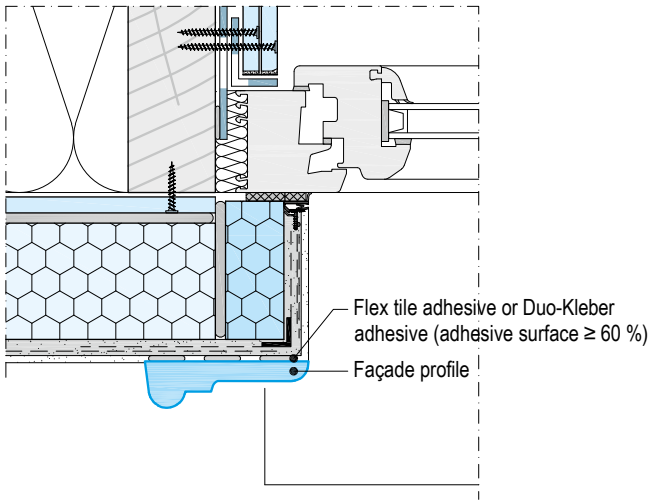


WE201.de-EX-V5 Cornice profile, window sill



Window sill holder recommended

WE201.de-EX-H2 Cornice profile, window opening



Preconditions

All connections and detail features must be clarified before application.

All substrates must be stable, dry and even and feature a bond strength of at least ≥ 0,08 N/mm^2. For this purpose, bond strength tests of the adhesive to be used on the board material must be performed after storage in climatic chambers. The existing coatings need to be professionally assessed for their permanent compatibility with the adhesive.

The construction timbers or exterior wall components must have a moisture level in the wood of ≤ 20 %. The substrate must be protected against detrimental moisturization before the application of ETICS.

Butt joints of the board substrate must be sealed acc. to manufacturers specifications, for example, using joint tape and jointing compound before ETICS are applied.
Unevenness up to 10 mm may be covered.

Rising damp may not be present.
Plan all applied connections as driving-rain proof with Fugendichtband FD joint sealing tape. When using driving-rain proof window connection profiles, back with additional FD joint sealing tape.
Ensure that all openings (interface gaps) are sealed.
The internal plastering and screed works as well as the introduction of loose infill insulation should be completed and the components should be dry enough so that an excessive accumulation of moisture is avoided.

The contractor is solely responsible for inspecting the condition of the substrate and the on-site conditions. The ambient temperature, substrate and material temperature must be at least +5 °C and may not exceed +30 °C during the entire application, drying and setting phase.

Stored insulation materials on building sites must be protected against moisture and direct sunlight. When glueing and applying plaster, suitable protection measures against precipitation and UV-radiation on the façade must be provided.

Only cold, clean water (drinking water quality) may be used as mixing water. Water up to a temperature of +30 °C may be used on building sites in spring and autumn.

Cover or apply a watertight covering to easily-soiled building components (e.g. window sills) prior to application. Observe the Code of Practice "Abklebe- und Abdeckarbeiten für Maler- und Stuckateurarbeiten - *Masking and covering for painting and stucco work*" issued by the German Bundesverband Ausbau und Fassade. Protect surfaces from precipitation and direct sunlight.

Please note that with the existing construction type, movements may occur due to

- drying out of materials applied when damp,
- thermal and moisture deviations within the building materials and the corresponding shrinkage and expansion behaviour,
- dynamic deformation from horizontal loads (wind load).

These influences may cause stresses in the rendering that may lead to hairline cracks in individual cases.

Building expansion joints must be implemented in ETICS including the cladding and designed accordingly so that the same movement is possible at the same location without any hinderance. The joints must be sealed to be driving-rain proof. The ETICS is unsuitable for exposure to compressive loads due to deformation in the substructure. As long as this cannot be excluded with certainty, suitable measures (e.g. expansion joints) must ensure that they can be accepted.

Machine technology from Knauf PFT for the application of ETICS

Product	Mixing pump / feed pump	Stator / rotor	Mortar hoses	Wet mortar pumping distance
Bonding and reinforcement mortar				
SM700 Pro	G 4	D4-3 with Rotoquirl	Ø 25 mm	Up to 30 m
	RITMO L plus	B4-2L with Rotomix	Ø 25 mm	Up to 20 m
SM300	G 4	D4-3	Ø 25 mm	Up to 30 m
	RITMO L plus	B4-2L	Ø 25 mm	Up to 20 m
	PuMax	ex-works	Ø 35 + 25 mm	Up to 65 m
Sockel-SM Pro, Sockel-SM	G 4	D4-3 with Rotoquirl	Ø 25 mm	Up to 30 m
	RITMO L plus	B4-2L with Rotomix	Ø 25 mm	Up to 15 m
Pastol	RITMO L plus	B4-2L	Ø 25 mm	Up to 20 m
	SWING M	C4-2	Ø 25 mm	Up to 20 m
	SWING L	D6-3 Twister	Ø 25 mm	Up to 30 m
	RITMO XL	D6-3 Twister	Ø 25 mm	Up to 30 m
Pastol Dry	RITMO L plus	B4-2L	Ø 25 mm	Up to 20 m
	G4	D3-4	Ø 25 mm	Up to 25 m
Luis	G 4	D4-3 1/2 capacity	Ø 25 mm	Up to 40 m
Finishing plasters				
Mineral, thin-layer finishing coats (e.g. SP 260 Pro, RP 240 , MineralAktiv Scheibenputz Dry floated render etc.)	G 4	D4-3	Ø 25 mm	Up to 30 m
	RITMO L plus	B4-2L	Ø 25 mm	Up to 20 m
Paste-like finishing plasters (e.g.Addi S, Conni S, MineralAktiv Scheibenputz floated render)	SWING	C4-2	Ø 25 mm	Up to 20 m
	RITMO L plus	B4-2L	Ø 25 mm	Up to 20 m

For further information on machine engineering see pft.net

Insulation material – bonding

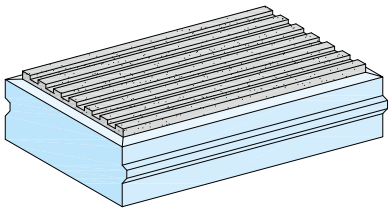
Adhesive side of the insulation materials

- EPS Standard: Side can be freely selected
- EPS Nut&Feder Side with tapered edges (dabs of mortar)
- EPS SunJa 032: Grey side

Manual adhesive application on insulation panel

Full-surface bonding

On even substrates, it is possible to apply the adhesive mortar on the entire surface of the insulation panel with a notched trowel.



Machine applied adhesive application on substrate

Full-surface bonding

Alternatively, the adhesive can be applied to the full surface directly on even substrates. Apply the insulation panels immediately by pushing, floating and pressing. Only apply a maximum of 3 m of adhesive mortar in advance. Run a notched trowel through the adhesive directly before applying the insulation panels.

Spray application (with Pastol adhesive)

Full-surface bonding

During factory manufacture, the Pastol adhesive can also be evenly applied to the substrate (board material) by spray application. Machine spray on the adhesive directly before applying the insulation panels. Apply the insulation panels immediately to the fresh adhesive by pushing, floating and pressing.

Notes	The insulation panel edges may not be coated or soiled to avoid thermal bridges. No adhesive may be applied to the joints. The insulation panels may be held in place in addition to the fixation by using suitable mechanical fasteners (e.g. stainless steel broadback staples). Please ensure that the setting process of the adhesive is not affected by dynamic effects.

Plinth and splash water zone

Inspect / supplement the building waterproof sealing before insulation work. The insulated plinth insulation panels with plinth splash water zone must be up to a height of at least 300 mm above ground level insulation panels. When configured as not easily flammable ETICS and the associated observance of the plinth fire protection zone, the plinth insulation panels can be applied up to a height of 0.9 m above the edge of the ground line.

Adhesively bond plinth insulation panels with adhesive mortar on mineral or bituminous waterproofing of buildings. The adhesive application is across the entire surface or using an edge ribbon and dab bonding method with an adhesive surface of at least 40 %. The lower edge of the plinth insulation panel must have a continuous strip applied at least 50 mm wide. The lower edge of the plinth insulation panel can be taper cut with a minimal integration depth in the soil (up to 500 mm under the ground level), according to guideline “Facade plinth render/External components” (German only), issued by Fachverband der Stuckateure für Ausbau und Fassade Baden-Württemberg.
Allow a setting time of at least 48 hours before continuing work.

Adhesive bonding on bituminous substrates

In case of mineral adhesives (not necessary with Sockel-SM Pro), apply Sockel-Dicht on two component, bituminous substrates as a bonding layer and roughen the surface with a broom. Allow to dry and set fully before continuing.
Insulation material from 150 mm above the edge of the ground line requires additional dowels.

Further information

For further information on the installation and application of insulation panels and plaster system in the plinth area, see pages 45 to 51.

Observe the following guidelines:

- Guideline “Façade plinth render/External components” (German only), issued by Fachverband der Stuckateure für Ausbau und Fassade Baden-Württemberg
- DIN 18533
- DIN 68800-2
- BDF leaflet 03-04 “Plinth constructions acc. to DIN 68800-2” of the German Bundesverband Deutscher Fertigbau e. V.
- DHV leaflet “Praxisgerechte Sockelausbildung - practical plinth design ” of the German association Deutschen Holzfertigbau-Verbandes e. V.
- “Informationsdienst Holz – Holzrahmenbau - *information service on wood and wood frame construction*” from the German Informationsvereins Holz e. V.

Insulation material – application

The substrate must be stable, dry and even.
The construction timbers or exterior wall components must have a moisture level in the wood of ≤ 20 %.

Install the plinth connection end profile horizontally and fix using suitable fasteners at spacings of approx. 300 mm. Connect the joints and the plinth connection end profiles with H connectors. Provide the outside corners with the appropriate mitring. Push on plinth profile made of plastic with drip edge and integrated reinforcement mesh strips on the plinth connection end profile ensuring joint offsetting to the insulation panel and plinth connection end profile.

When connecting perimeter / plinth insulation panels to existing ETICS or when using a plinth connection end profile, a joint sealing tape FD is inserted between the perimeter / plinth insulation panel and plinth connection end profile. If the ETICS are applied on existing perimeter / plinth insulation panels, use of a Sockel-Abschlussprofil Peri plinth connection profile is recommended. Application of a joint sealing tape is unnecessary. As an alternative for a thermal-bridge free plinth connection apply the Peri mounting rail with a suitable fastener (see page 50). Peri plinth connection profile is inserted between the perimeter insulation and the façade insulation panel.

Apply insulation panels immediately to the fresh adhesive by pushing, floating and pressing. Apply the insulation panels precisely and continuously starting from the bottom with the joints staggered at ≥ 100 mm (half board length recommended for joint staggering).

Avoid cross joints, e.g. on opening corners. At corners of openings (windows, doors), the insulation boards are to be laid in such a way that the butt joints are preferably not present in the immediate corner.
Adhesive bonding of insulation panels up to a thickness of 200 mm without corner grooving is possible

Adhesive may not be applied to the insulation panel joints. Open joints must be filled. Joints up to 5 mm in width can be filled with B1 foam, panel joints > 5 mm or skips can be cleanly sealed using equivalent insulation material strips. It is recommended that the lower, upper and side edges are applied by a continuous strip of adhesive to ensure that back ventilation is excluded.

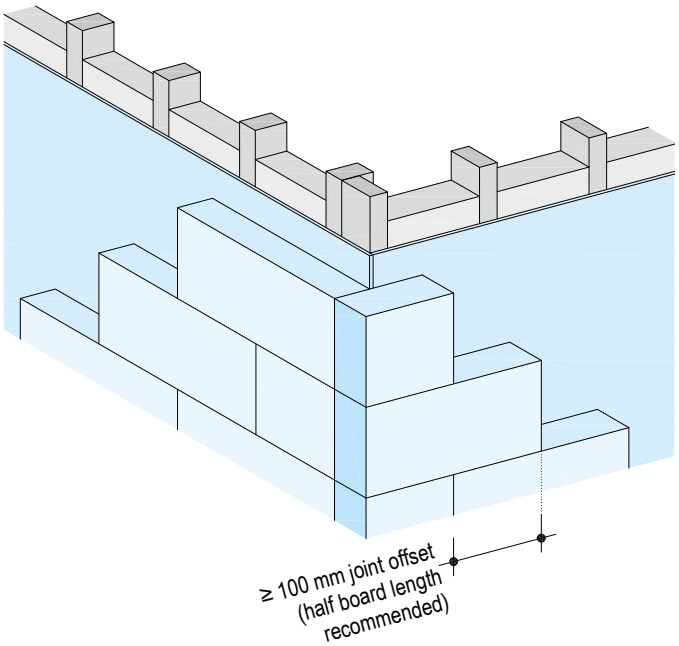
The EPS insulation panels may be applied up to 300 mm above the ground line. The DIN 68800-2 must be observed if the spacing to the ground line is reduced. Connections to adjacent constructional components should be made driving-rain proof with joint sealing tape FD. Connections, e.g. to window sills, should generally be carried out so that a second water draining or sealing level is provided (see Installation Instructions P651-A01.de). In order to allow any resulting water to drain to the exterior, no joint sealing tape FD may be used between the front edge of the façade insulation and the window sill with the second water channelling level. Furthermore, window sills must be rain-proof, e.g. with the aid of plastered in edge profiles featuring a sliding function.
Allow a setting time of at least 48 hours before continuing work.

Plinth and splash water zone

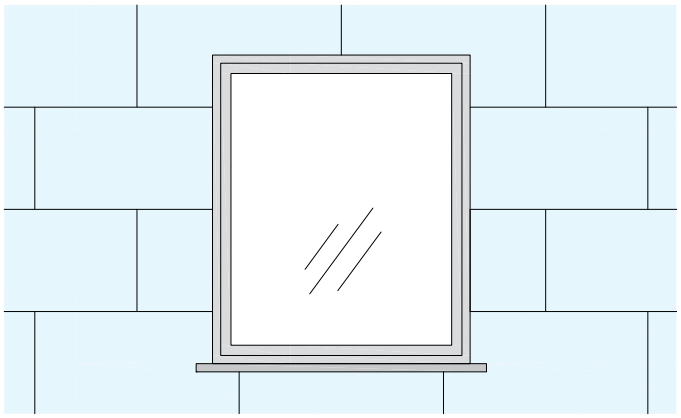
Apply additional constructional, mechanical fixing of the plinth insulation boards from a height of 150 mm measured above the edge of the ground line, e.g. for bituminous or painted substrates with general building authority approved dowels (2 dowels per board).

Corner configuration

Up to 200 mm insulation material thickness without corner grooving



Window and door openings



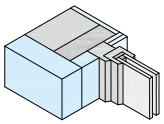
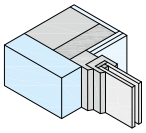
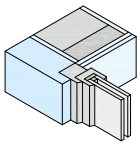
Avoid cross joints

Driving-rain proof window connection profile

Selection criteria

Window connection profiles	Features	Total plaster thickness
Duo G10	With shadow gap, two-part profile	6 – 15 mm
Duo G6	With shadow gap, two-part profile	6 – 12 mm
Milano	With protective lip, two-part profile	6 – 10 mm
Universal Pro	With shadow gap and integrated PUR sealing tape	6 – 12 mm
Roma	With shadow gap, two-part profile for roller blind guide rails	6 – 10 mm

Application

Window connection profiles	Movement absorption capacity	Window position in wooden stud								
		Centred			Flush			Projected (plasterable reveal necessary)		
										
		Maximum insulation material thickness in mm with window size								
		≤ 6 m²	≤ 10 m²	≤ 15 m²	≤ 6 m²	≤ 10 m²	≤ 15 m²	≤ 6 m²	≤ 10 m²	≤ 15 m²
Duo G10	A	200	200	–	200	200	–	200	200	–
Duo G6	B	200	200	–	200	200	–	200	200	–
Milano	A	200	200	–	200	200	–	200	200	–
Universal Pro	A	200	200	200	200	200	200	200	200	200
Roma	A	200	200	–	200	200	–	200	200	–

Notes

Always apply window connection profiles in timber construction with additional joint sealing tape FD.

When using window connection profiles, the current VDPM leaflet "Formation of details with profiles and joint sealing tapes in external rendering and ETICS" (German only) and the current window guideline of the Fachverband der Stuckateure "Connections to windows and roller shutters in rendering, external thermal insulation composite system and drywalling" (German only) must be observed.

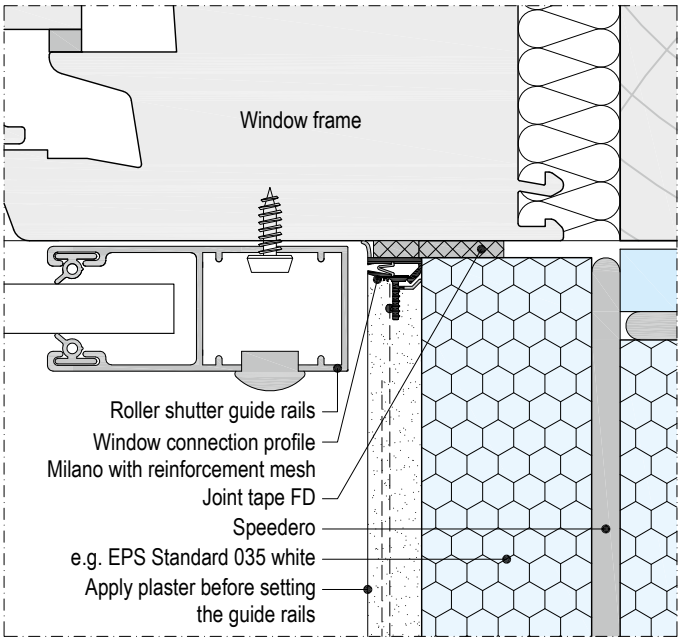
For coloured metal and plastic windows, the use of profiles with high shear resistance (higher movement class, e.g. instead of class B → class A) is recommended.

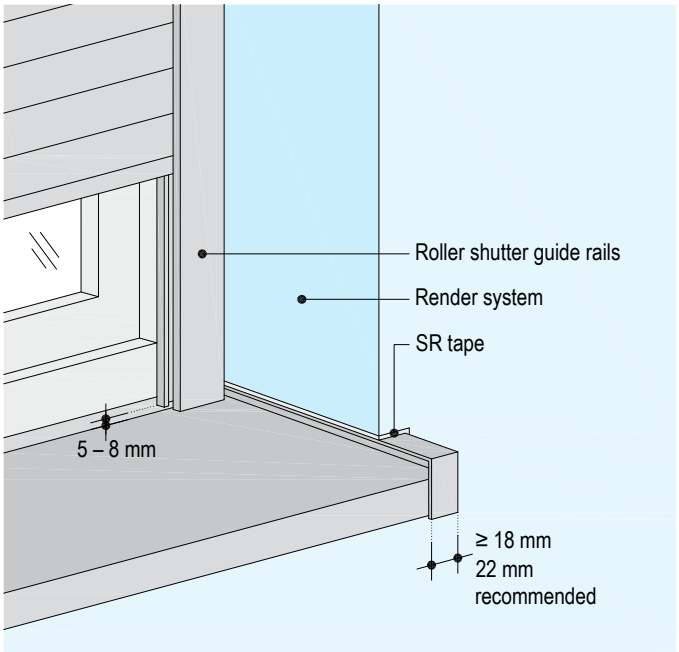
Use of adhesively bonded window connection profiles

An adhesive bonding test must be performed before the use of adhesively bonded window connection profiles. For this purpose, clean a concealed location with a clean and dry cloth (without cleaning agent). The substrate should be level, dry and dust free. Residues that can affect bonding must be removed. The temperature must be between +5 °C and +40 °C. Cut off a short section of the profile (approx. 100 mm), peel off the protective paper of the PE-Dichtband sealing tape and push the profile section firmly on. Wait 10 minutes and then tear the profile with force away from the substrate. The self-adhesive PE-Dichtband sealing tape must on the one hand remain completely attached to the profile and on the other hand completely to the substrate (continuous foam rupture). Thus the substrate is suitable for adhesive bonding. Should this not be the case, the window connection profile Universal Pro with PUR sealing tape must be used.

Driving-rain proof window connection profiles (continued)

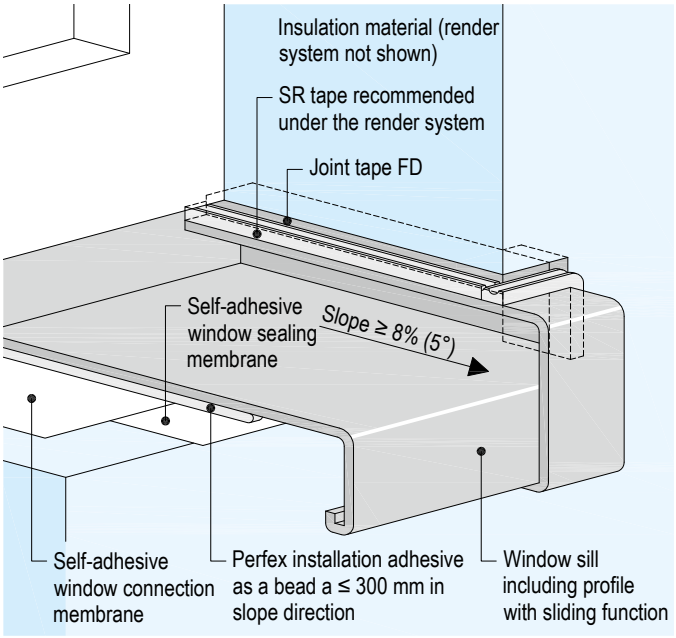
Window connection with roller blind guide rails





Scheme drawings

Connection to window sill side section

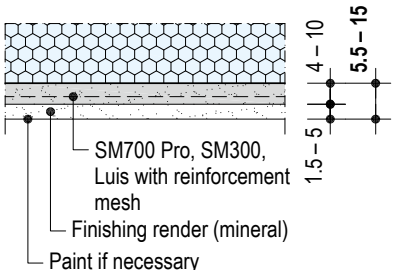


Example: Application in conjunction with a second water channelling level

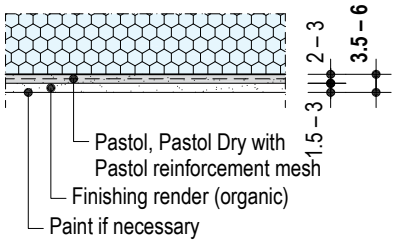
Applied render system

Dimensions in mm

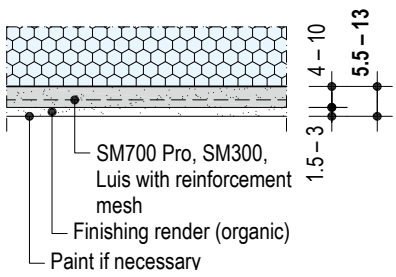
Mineral based



Organic



Mineral / organic



Reinforcement (basecoat) layer

Façade reinforcement

System	Basecoat	Layer thickness	Reinforcement mesh	Mesh arrangement in the reinforcement layer	Mesh reinforcement joint overlap
Mineral based Mineral / organic	SM700 Pro	5 – 10 mm	Reinforcing mesh 4x4 mm or 5x5 mm	■ Up to 4 mm: at centre ■ > 4 to 7 mm: upper half ■ > 7 mm: in the upper third	≥ 100 mm
	SM300	5 – 7 mm			
	Luis	4 – 5 mm			
Organic	Pastol, Pastol Dry	2 – 3 mm	Reinforcing mesh Pastol	Centred	

With Noblo 1.5 mm an additional mesh layer is recommended.

Reinforcement in dependence on the finishing plaster and luminosity of the finish coating

Finish coat	Graining	Luminosity of the finish coating Siliconharz-EG-Farbe paint, Autol, Fassadol, Minerol, MineralAktiv Fassadenfarbe paint			Autol TSR[1)] Fassadol TSR[1)]
	mm	**100** to **30**	**29** to **25**	**24** to **20**	**< 20**
Noblo Filz, SM700 Pro	1.0	●	●	●●	●●
Noblo Filz	1.5	●	●	●●	●●
Noblo	1.5	●●	●●	●●	●●
	2.0 – 3.0	●	●	●	●
RP 240, SP 260 Pro	2.0 – 5.0	●	●	●	●
MineralAktiv Scheibenputz floated render	1.5 – 3.0	●	●	●	–
MineralAktiv Scheibenputz Dry floated render	2.0 – 3.0	●	●	●	–
Conni S, Addi S	1.5 – 3.0	●	●	●	●

1) Functionality only on white, newly created finish coats is guaranteed in combination with an at least 5 mm thick, mineral reinforcement layer.

● *Single-layer mesh reinforcement*

●● *Double-layer mesh reinforcement*

Reinforcement layer (continued)

At the inside corners of openings (e.g. window reveal - lintel), embed reinforcement mesh strips or mesh corner angle reinforcement fully into the basecoat. Subsequently apply Gewebeeckwinkel mesh corner angles perpendicular and flush. Apply the reinforcement layer and level it. Except when using Gewebeeckwinkel Sturzecke mesh corner angle for lintel corner, extending diagonally from all opening corners embed Gewebeeckpfeile mesh corner arrows or approx. 300 x 500 mm strips of reinforcement mesh in the fresh mortar. Subsequently embed Armiergewebe reinforcement mesh on the entire surface with at least a joint overlap of 100 mm fresh-in-fresh in the basecoat layer. Apply a full covering of basecoat to the mesh.

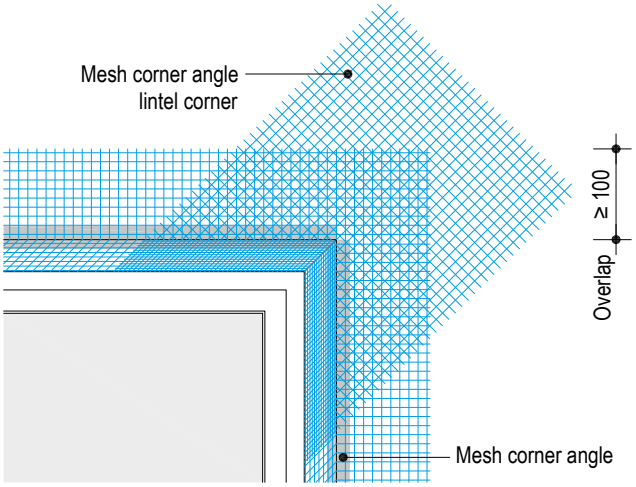
The mesh is arranged in the centre when the basecoat thickness is up to 4 mm, for > 4 to 7 mm layer thickness it is in the upper half of the basecoat layer and for > 7 mm in the exterior third.

If a double reinforcement is necessary (see table on page 48), the lower reinforcing mesh is applied with a respective overlap of approx 100 mm in the first basecoat layer of 2 to 3 mm without creases. After the basecoat layer has hardened, the second basecoat mesh is embedded with a joint overlap of ≥ 100 mm to the first mesh and a joint overlap to one another of ≥ 100 mm in the second layer of the basecoat. The position of the second mesh corresponds to the position of a simple reinforcement with a mesh. Alternatively, the second reinforcement layer can also be applied onto the fresh first reinforcement layer. For this purpose, apply basecoat as wet plaster on wet plaster onto the first basecoat layer and apply reinforcement mesh with staggered joints. The diagonal reinforcements are embedded before the second mesh layer.

Avoid excessive smoothing of the reinforcement layer to prevent a concentration of fine particles or formation of a sinter layer on the surface. Rub off any burrs that have formed when drying.
Plaster connections should be separated from the constructional components with a separating strip (e.g. SR band), separation cut, profiles or similar.

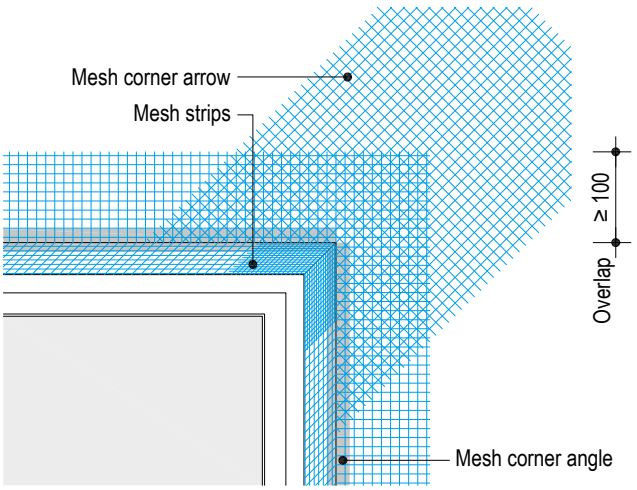
Reinforcement of window lintel/reveal Dimensions in mm

Image 1



The lintel / reveal corner areas require additional Gewebeeckwinkel Sturzecke mesh corner angle reinforcement.

Image 2



Alternatively, the lintel / reveal corner areas can be reinforced with Gewebeeckpfeile mesh corner arrow or reinforcement mesh strips.

Basecoat drying time

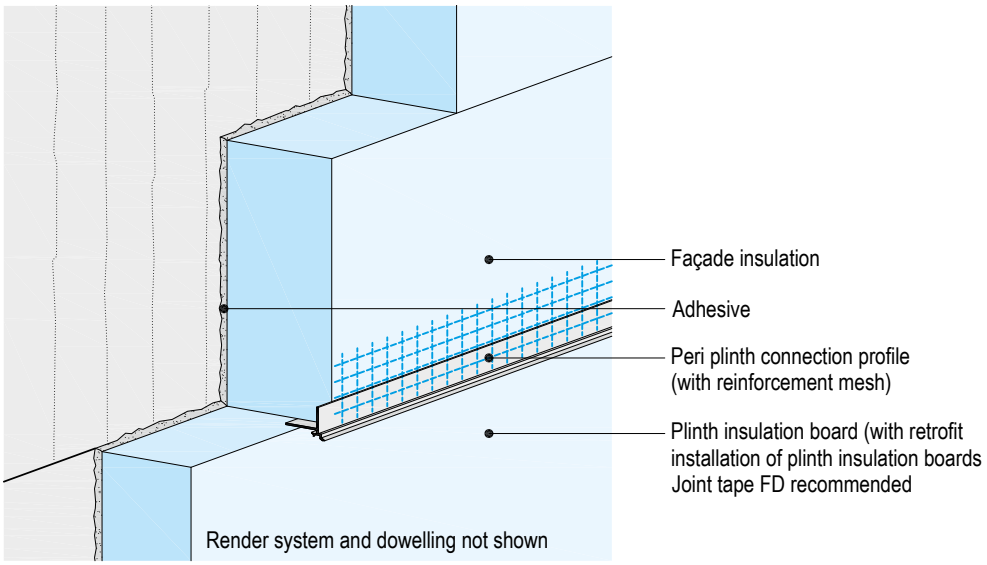
Before application of a further coating (primer/basecoat) it is important to ensure that the basecoat is fully dry. The minimum drying time is generally approx. 1 day/mm layer thickness. In case of Pastol or Pastol Dry, the weather dependent drying time is at least 3 days. With unfavourable weather conditions (e.g. high levels of air humidity or low temperatures) the drying time is extended, e.g. the drying time at +5 °C is around double so long. For further information please refer to the product data sheets of the following coatings.

Plinth and splash water zone

Apply preferably at least 5 mm basecoat covering the full surface and embed reinforcement mesh 4x4 mm or 5x5 mm to the entire surface in the upper third of the basecoat. Stagger the joints by at least 100 mm.
When insulation is applied in areas contacting the soil, the reinforcement layer ends underneath the edge of the future ground line.

Reinforcement layer (continued)

Thermal bridge free Peri plinth end profile



Apply the basecoat on the insulation material, push in the Peri plinth connection profile between the perimeter / plinth insulation or Peri installation rail and the façade insulation, align flush and embed the reinforcement mesh.
Connect the profiles with the supplied connectors. Provide the outside corners with the appropriate mitring or suitable corner elements.
Constructional separation of the plinth plaster, e.g. by using a separating strip (SR Band), separation cut, profile or similar. When implementing the transition between the façade insulation and the plinth insulation, driving-rain proofing must be observed. If necessary apply a Fugendichtband FD joint sealing tape.

Finish coat

Primers

Stir the contents of the container thoroughly and repeat occasionally.
With thin-layer mineral-based finishing coats when required undiluted Quartzgrund Pro, or undiluted Isogrund, diluted 1:1 with clean water and apply uniformly with a roller to the entire surface or apply using a suitable spray device. With Conni and Addi: Apply undiluted Quarzgrund Pro uniformly using a roller or brush and spread crosswise. Avoid streaking.
When applying pigmented Conni and Addi, Quarzgrund Pro pigmented in the same or similar colour shade is recommended.
Allow a drying time of at least 2 hours before applying the finishing coat with Quarzgrund Pro and at least 12 hours for Isogrund.

Plaster application

Finish coat	Layer thickness in mm
Façade	
Noblo Filz (freely styled texture)	3 – 5
Noblo Filz	2 – 5
Noblo, SP 260 Pro, RP 240	Grain size
SM700 Pro (sponged / freely styled texture)	3
Conni S, Addi S	Grain size
MineralAktiv Scheibenputz floated render, MineralAktiv Scheibenputz Dry floated render	Grain size
Plinth area	
Sockel-SM Pro (sponged)[1)] Sockel-SM (sponged)[2)]	2
Butz	2

1) Only in conjunction with Sockel-SM Pro as a basecoat. Sockel-Dicht is unnecessary in case Sockel-SM Pro is used as a render system (basecoat and finish coat) in a total thickness ≥ 7 mm.

2) Only in conjunction with Sockel-SM as a basecoat.

Required water quantity and mixing of the mortar in acc. with the current product data sheet.
Check the containers before use to ensure that the colour shades are correct. When applying a shaded finish coat, ensure that the batch numbers are the same or only mix sufficient render required to finish a full rendered surface. Slight differences in colour hues can occur due to the use of natural aggregates. When reordering, always state the consignment number of the previous delivery.
Ensure uniform grain distribution.

The type of tool used influences the surface roughness and it is therefore essential to use the same tool for a consistent finish. Ensure that there are sufficient workers available on every scaffolding level to avoid bothersome structural effects. Work quickly fresh in fresh and do not rework hardened surfaces. Avoid interruptions when working on continuous surfaces and always complete the work on self-contained surfaces.

Observe Code of Practice no. 26 “Farbveränderungen von Beschichtungen im Außenbereich - *Colour changes in exterior coatings*” of the Bundesausschuss Farbe und Sachwertschutz (Federal Paint and Property Protection Committee).
The plaster connections should be separated from the constructional components with a separating strip (e.g. SR band), separation cut, profiles or similar.

Finish coat (continued)

Noblo Filz

Apply a fully covering coat of Noblo Filz in grain thickness, allow to stiffen and then apply a second coat in grain thickness, and immediately sponge / felt, without using water. Apply approx. 3 to 5 mm for free textures, spread flush and texture immediately with the required tool.

Noblo, SP 260 Pro, RP 240

Apply the render with a stainless steel finishing trowel or trowel, spread flush in grain size and structure immediately as required using a suitable tool.

SM700 Pro

Apply SM700 Pro for sponged surfaces with a layer thickness of approx. 3 mm to the basecoat. The drying time of the basecoat can be reduced to 1 day if the basecoat layer is applied with SM700 Pro. Start sponging or free texturing with initial setting of the SM700 Pro.

MineralAktiv Scheibenputz floated render, MineralAktiv Scheibenputz Dry floated render

Knauf MineralAktiv Scheibenputz floated render is applied over the entire surface in grain thickness with a stainless steel trowel, and directly after application it is worked uniformly and without interruption to the desired texture using a hard plastic trowel. A sponge rubber float produces a coarser more rustic texture finish.

Conni S, Addi S

Ready-to-use, paste-like finish coat must be mixed thoroughly. When necessary, a small quantity of water may be added to set the application consistence. Apply Conni S or Addi S (floated render texture) with a stainless steel trowel in grain size to the entire surface and trowel smooth with circular movements without interruption using a hard plastic trowel.

Plinth and splash water zone

Apply a primer to suit the selected top coat, observe the required drying times. Apply plinth renders, e.g. Sockel-SM Pro or Sockel-SM on the following day on the system-compatible reinforcement layer and sponge.

Sockel-SM

After the top coat in the area contacting the soil has dried, apply moisture protection. For this purpose, the Sockel-Dicht is applied in two layers in a minimum thickness of 2.5 mm, commencing with the building sealing (overlapping approx. 50 mm to 100 mm) up to at least 50 mm above the edge of the ground line over the perimeter / plinth insulation panels and the subsequent finish coat.

Sockel-SM Pro

When applying with Sockel-SM Pro render system in a total layer thickness (basecoat and finish coat) of at least 7 mm, additional moisture protection with Sockel-Dicht is unnecessary.

Butz

Allow a drying time of at least 2 hours before applying Butz on Quarzgrund Pro. Mix the contents of the container well, apply using a stainless steel trowel slightly thicker than the grain size and level in one direction.

Mechanical protection in the plinth area

As protection for the plinth in the area contacting the soil against mechanical influences of the soil or gravel bed, use of a fleece laminated dimpled sheet up to the edge of the ground line is recommended.

Coats

Primers

A suitable primer for a façade paint can be found in the product data sheets for the façade paints.

Casiol Grund is a ready-to-use, white pigmented, highly permeable, mineral calcium silicate primer for reducing the risk of lime efflorescence, as well as for equalising the suction properties on alkaline finishing renders before applying paint coats (medium to intensive colour shades).

Façade paint

Use a trial coat to ensure the colour shade is correct. Never apply the content from different buckets together on a common wall. Mix the contents together in a clean bucket beforehand. Stir the contents of the bucket thoroughly.

The application consistence can be modified in acc. with the product data sheet.

Apply a thin and even paint coat crosswise without joints on the fully hardened and dried finish coat.

Always complete surfaces that can be viewed together on the same day.

Notes	All the products listed here are formulated, so that a preventative and retarding action against soiling is in effect. Permanent protection against soiling caused by microorganisms such as algae and fungus cannot be guaranteed. The susceptibility depends on the local and environmental conditions. Loss of the technical function of the finish coat and/or the paint coat due to fouling of the surface with mould and mildew is practically excluded. Refer to “Guideline on inspection obligations upon delivery of ceramic / pottery goods within the scope of the duty to inspect and give notice of defects (§ 377 HGB)” (German only), also refer to vdpm.info/services/downloads/leitfaden. http://vdpm.info/services/downloads/leitfaden Observe the Code of Practice "Egalisationsanstriche auf Edelputzen – Farbtonegalisierende Beschichtung - Equalization coats on finishing plasters”, see also vdpm.info/services/downloads/broschueren-und-merkblaetter.

Maintenance

Maintenance of the façade surface should be performed at regular intervals taking the size, architecture and location into consideration.
Maintenance is understood to mean cleaning, painting or, if required, renewing of connections (maintenance joints) on the intact External Thermal Insulation Composite Systems (ETICS). It is necessary to undertake corrective measures as quickly as possible if a maintenance issue is identified in order to assure the ETICS service life and protect the visual appearance. We generally recommend consulting experienced and qualified specialist companies if a maintenance issue is identified.

Plaster surfaces

Perform an inspection of the plaster surfaces on the basis of the DIN 18550-1 standard. In every case, the driving-rain proof protection of the exterior wall and the permanent weather resistance of the overall system must be assured.

Inspect for	Technical instructions and measures
Soiling	Clean using a high-pressure water jet (water temperature below +60 °C, observe the regional wastewater discharge regulations) and if required, apply a new coat of paint to the façade with a system-conform paint once sufficiently dry.
Microbiological growth (e.g. algae, mould)	Clean using a high-pressure water jet (water temperature below +60 °C, observe the regional wastewater discharge regulations), apply Algizid (ready-to-use remediation solution) and if required, apply a new coat of paint to the façade with a system-conform paint once sufficiently dry.
Sealing of elastic connections (windows, doors, expansion joints, façade penetrations)	Joints applied with permanently-elastic materials are maintenance joints and should be inspected and replaced at regular intervals, if required, or sealed to repel moisture.
Mechanical damage	Fill with equivalent insulation materials, reapply the render including the reinforcement mesh, and if necessary, apply a new coat of paint with a system-conform paint. Repairs to small areas and spots may stand out visually from the rest of the surface. Differences to texture and colour of the finishing coat may be visible.

Material requirement without allowance for loss and waste

Plinth	Façade	System components	Remark	Unit	Quantity as average value WE201a.de Mineral based	WE201b.de Organic	WE201c.de Mineral / organic
Bonding layer per m² plinth, e.g. on bituminous waterproof sealing							
●[1]		Sockel-Dicht	Full surface application	kg	3.8		
Adhesive per m²							(100 % adhesive area ratio)
●	●	SM700 Pro	Full surface notched trowel surface	kg	4.5		
●	●	SM300		kg	4.3		
●		Sockel-SM		kg	8.0		
●[2]		Sockel-SM Pro		kg	8.0		
	●	Luis		kg	3.5		
	●	Pastol		kg	2.8		
	●	Pastol Dry		kg	2.4		
Insulation material per m²							
●		Plinth insulation panel	Insulation material thickness: Up to 200 mm → Integration into the soil: Up to 3 m	m²	1		
	●	EPS Standard 035 white	Thickness 40 – 200 mm	m²	1		
	●	EPS Standard 034	Thickness 40 – 200 mm	m²	1		
	●	EPS Standard 032	Thickness 40 – 200 mm	m²	1		
	●	EPS Standard 031	Thickness 40 – 200 mm	m²	1		
	●	EPS SunJa 032	Thickness 80 – 200 mm	m²	1		
	●	EPS Nut&Feder 032[3]	Thickness 60 – 200 mm	m²	1		
Plinth connection per m							Only with recessed plinth
	●	Plinth connection profile	Projection of 30 to 200 mm	m/m	1		
	●	Plinth profile	Plinth profile with drip edge and reinforcement mesh for layer thickness 6 mm, 10 mm or 14 mm	m/m	1		
	●	Assembly kit plinth end profiles	Fasteners	Set/m	0.04		
	●	Peri plinth end profile	For layer thickness 3 mm or 7 mm	m/m	1		
	●	Peri installation rail	Plastic profile for supporting Peri plinth connection profile, projection of 50 to 200 mm	m/m	1		
Fasteners per m² façade insulation material[4]							
●		Schlagdübel CNplus 8 insulation anchor nail	Anchoring depth s ≥ 35 mm, ≥ 55 mm for use category D and E	pcs.	2 dowels per plinth insulation panel from a height of 150 mm above the edge of the ground line on solid substrates		
●		Schraubdübel STR U 2G dowel	Anchoring depth s ≥ 25 mm, ≥ 65 mm for category E				

1) *When bonding on bituminous waterproofing apply Sockel-Dicht as a bonding layer, in case Sockel-SM Pro is not used.*
2) *Sockel-Dicht as a bonding layer is not required when using Sockel-SM Pro as an adhesive on bituminous sealants.*
3) *Cover dimension 485 x 1000 mm*
4) *Plinth insulation panels that are adhesively bonded to the building waterproofing must be anchored with 2 dowels/panel from a height of 150 mm above the top edge of the ground line.*

Material requirement without allowance for loss and waste (continuation)

Plinth	Façade	System components		Remark	Unit	Quantity as average value WE201a.de Mineral based	 WE201b.de Organic	 WE201c.de Mineral / organic
Fasteners per m² façade insulation material[1]								
●[2]	●	Schraubdübel STR H A2 dowel		Anchoring depth s ≥ 35 mm or ≥ thickness of board material + 10 mm	pcs.	4 dowels/m² for a possible constructional attachment of the insulation panels and for the attachment of the fire break for the prevention of a plinth and room fire to the board substrates		
Basecoat per m²								
●	●	SM300		Layer thickness 5 – 7 mm, 7 mm in case of scratch render	kg	7.6 – 10.5	–	7.6 – 10.5
●	●	SM700 Pro		Layer thickness 5 – 10 mm	kg	7.0 – 13.0	–	7.0 – 13.0
●		Sockel-SM		Layer thickness 5 – 7 mm	kg	7.0 – 10.0	–	7.0 – 10.0
●[3]		Sockel-SM Pro		Layer thickness 5 mm	kg	8.0	–	8.0
	●	Luis		Layer thickness 4 – 5 mm	kg	7.2	–	7.2
●	●	Pastol		Layer thickness 2 – 3 mm	kg	–	2.8 – 4.2	–
●	●	Pastol Dry		Layer thickness 2 – 3 mm	kg	–	2.4 – 3.2	–
Reinforcement mesh per m²								
●	●	Reinforcement mesh 4x4 mm		100 mm joint overlap	m²	1.1	1.1	1.1
●	●	Reinforcement mesh 5x5 mm			m²	1.1	1.1	1.1
●	●	Reinforcing mesh Pastol			m²	–	1.1	–
Primer per m²								
●	●	Isogrund (recommended)		Diluted: 1:1 with water	kg	(0.1)	–	–
●	●	Quarzgrund Pro[4]		Undiluted	kg	0.17	0.17	0.17
Finish coat per m²								
●	●	SM700 Pro Sponged / freely styled texture	**Grain size** 1.0 mm	Layer thickness 3 mm	kg	4.2	–	–
●	●	SM 260 Pro	2.0 mm 3.0 mm 5.0 mm	Layer thickness 2 mm Layer thickness 3 mm Layer thickness 5 mm	kg kg kg	3.2 3.4 5.0	– – –	– – –
●	●	RP 240	2.0 mm 3.0 mm 5.0 mm	Layer thickness 2 mm Layer thickness 3 mm Layer thickness 5 mm	kg kg kg	3.1 3.8 5.0	– – –	– – –
●	●	Noblo	1.5 mm[5] 2.0 mm 3.0 mm	Layer thickness 1.5 mm Layer thickness 2 mm Layer thickness 3 mm	kg kg kg	2.3 2.8 3.4	– – –	– – –

1) *Plinth insulation panels that are adhesively bonded to the building waterproofing must be anchored with 2 dowels/panel from a height of 150 mm above the top edge of the ground line.*
2) *For the plinth area with wooden substructure and plinth insulation panel.*
3) *In conjunction with Sockel-SM Pro as a finish coat. With total layer thickness ≥ 7 mm moisture protection woth Sockel-Dicht is unnecessary.*
4) *With a coloured finishing top coat Quarzgrund Pro in the same colour shade is recommended.*
5) *Additional mesh layer in basecoat is recommended.*

Material requirement without allowance for loss and waste (continuation)

Plinth	Façade	System components		Remark	Unit	Quantity as average value WE201a.de Mineral based	 WE201b.de Organic	 WE201c.de Mineral / organic
Finish coat per m²								
			Grain size					
●	●	Noblo Filz	1.0 mm 1.5 mm	Layer thickness 2 mm Layer thickness 3 mm	kg kg	3.2 4.6	– –	– –
●	●	MineralAktiv Scheibenputz floated render	1.5 mm 2.0 mm 3.0 mm	Layer thickness 1.5 mm Layer thickness 2 mm Layer thickness 3 mm	kg kg kg	2.4 3.2 4.2	– – –	– – –
●	●	MineralAktiv Scheibenputz Dry floated render	2.0 mm 3.0 mm	Layer thickness 2 mm Layer thickness 3 mm	kg kg	2.4 3.4	– –	– –
●	●	Conni S	1.5 mm 2.0 mm 3.0 mm	Layer thickness 1.5 mm Layer thickness 2 mm Layer thickness 3 mm	kg kg kg	– – –	– 2-8 –	2.2 2.8 3.7
●	●	Addi S	1.5 mm 2.0 mm 3.0 mm	Layer thickness 1.5 mm Layer thickness 2 mm Layer thickness 3 mm	kg kg kg	– – –	– 2-8 –	2.2 2.8 3.7
●[1]		Sockel SM Pro (sponged)	1.0 mm	Layer thickness 2 mm	kg	3.0	–	–
●[2]		Sockel SM (sponged)	1.0 mm	Layer thickness 2 mm	kg	3.0	–	–
●		Butz	2.0 mm	Layer thickness 2 mm	kg	–	4.5	4.5
Moisture protection per m²								
●		Sockel-Dicht		Layer thickness min. 2.5 mm (two coats)	kg	3.8	3.8	3.8
Primer per m²								
●	●	Casiol Grund		Undiluted	l	0.17	–	–
Coat per m²								
●	●	Siliconharz-EG-Farbe paint		Single coat[3]	l	0.17 – 0.22	–	–
●	●	Autol		Double coat	l	0.25 – 0.40	0.25 – 0.40	0.25 – 0.40
●	●	Autol TSR[4]		Double coat	l	0.25 – 0.40	0.25 – 0.40	0.25 – 0.40
●	●	Fassadol		Double coat	l	0.30 – 0.45	0.30 – 0.45	0.30 – 0.45
●	●	Fassadol TSR[4]		Double coat	l	0.35 – 0.45	0.35 – 0.45	0.35 – 0.45
●	●	Minerol		Double coat	l	0.25 – 0.40	–	–
●	●	MineralAktiv Fassadenfarbe paint		Double coat	l	0.28 – 0.40	0.28 – 0.40	0.28 – 0.40

1) Only in conjunction with Sockel-SM Pro as a basecoat.

2) Only in conjunction with Sockel-SM as a basecoat.

3) Recommendation: Double coat for enhanced weather-proofing (see "Code of Practice No. 9 - Coatings on mineral renders" from the German Bundesausschuss Farbe und Sachwertschutz).

4) Functionality only on at least 5 mm thick mineral reinforcement layer and only on white, newly created finish coats possible.

Information on sustainability

Knauf WARM WALL Basis EPS in Timber Construction

Information on the sustainability of Knauf WARM WALL Basis EPS in Timber Construction

Building assessment systems ensure the sustainable quality of buildings and constructional structures by a detailed assessment of ecological, economic, social, functional and technical aspects.

In Germany, the following certification systems are of particular relevance:

- DGNB System
  German seal of approval for environmentally sustainable building from the DGNB (German association for environmentally sustainable building)
- BNB
  (Bewertungssystem Nachhaltiges Bauen - Quality rating system for environmentally sustainable building)
- LEED
  (Leadership in Energy and Environmental Design).

Knauf WARM WALL systems can positively influence many of these criteria.

DGNB/BNB

Ecological quality

- Criterion: Total primary energy requirement
  Reduction of the building energy requirement over the entire lifecycle due to efficient WARM WALL systems

Economic quality

- Criterion: Building related life-cycle costs
  Reduction of the operating costs due to cost-effective WARM WALL systems

Sociocultural and functional quality

- Criterion: Thermal comfort in summer or winter
  Cozy room climate with WARM WALL systems

Technical quality

- Criterion: Premium quality thermal and moisture protection for the building shell
  With WARM WALL systems significantly exceeding the GEG requirements

LEED

Materials and Resources

- Credit: Regional materials
  Availability depending on location of building. Information on request

Videos for Knauf systems and products can be found under the following link:
youtube.com/knauf

Find the right system for your requirements!
knauf.de/systemfinder

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knauf-direkt@knauf.com

www.knauf.de

Knauf Gips KG Am Bahnhof 7, 97346 Iphofen, Germany

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The stated constructional and structural design specifications and characteristics of building physics of Knauf systems can only be ensured with the exclusive use of Knauf system components, or other products expressly recommended by Knauf.