

pavatex
by **SOPREMA**

Woodfibre Insulation



Natural
Building
Technologies



FIRE PROTECTION

SOPREMA
GROUP

PAVATEX - Fire protection test, an overview

Whether it is roof, external, internal wall, facade or floor: PAVATEX offers you complete system solutions from a single source. With our installation-friendly insulation and sealing systems, you have the entire building envelope under control.

And best of all, our unique system warranty gives you additional security through a variety of guarantees.



PAVATEX Wood fiber insulation materials are verified and certified quality products.



FIRE PROTECTION TESTING ENSURES SAFETY	4
ROOF	6
REI 45 - One-sided, from inside Overrafter insulation with PAVATHERM and PAVATHERM-PLUS.....	6
WALL - TIMBER FRAME	7
REI 30 - From inside. Frame filled with PAVAFLEX and ISOLAIR externally (ventilated clad facade).....	7
REI 60 + REI 45- From outside and inside. Frame filled with ISOFLOC and DIFFUTHERM externally (without render)	8
REI 60 - From outside Frame filled with PAVAFLEX and DIFFUTHERM externally rendered with Knauf-Marmorit render.....	9
REI 90 - From outside Frame filled with PAVATHERM and DIFFUTHERM externally rendered with Knauf-Marmorit render.....	10
REI 90 - From outside. Frame filled with PAVAFLEX and DIFFUTHERM externally rendered with Baunit or Knauf render.....	11
REI 90 - From outside. Frame filled with PAVATHERM and DIFFUTHERM externally rendered with Baunit or Knauf render	12
REI 60 + REI 60 - From outside. Frame filled with PAVAFLEX and ISOLAIR externally (with Knauf render).....	13
REI 60 + REI 60 - From outside. Frame filled with PAVAFLEX and ISOLAIR (ventilated clad facade)	14



Wall Construction

In the current DIN 4102-4: 2016-5 paragraph 9, building materials and components are classified on the basis of DIN 4102-1. Further fire protection tests are not required by the assignment to the building material classes according to DIN 4102.

Fire Protection testing Ensures Safety

In Germany, building regulations place stringent requirements on the fire protection of buildings and building materials.

The performance of PAVATEX building materials and the constructions that use them are covered by various testing and classification reports.

The normative basis for findings and assessment of construction performance (Fire resistance is covered by DIN EN 13501-2).

According to the stipulations of German building regulations, the following classifications are documented:

Fire resisting	min. 90 Minutes
Highly fire retardent	min. 60 Minutes
Fire retarding	min. 30 Minutes

This information indicates for how long the tested component has withstood fire exposure. The time information is expanded with detailed information about the performance of the construction.

In terms of the building envelope, the primary properties are:

-the load-bearing capacity R

Here, the security of structural stability is calculated for the relevant test duration. Criteria depend on the building component e.g. the buckling of a wall construction or the maximum permissible sagging (e.g. in roof constructions).

-the room isolations (Integrity) E

The test criteria here is the ability of a room-dividing construction component to prevent the passage of fire effectively. Besides temperature on the side away from the fire, criteria are also the size and type of openings resulting from fire stress and an open flame on the side away from the fire.

-thermal insulation I

A significant endangerment of neighbouring buildings or rooms arises in case of fire through a massive temperature increase on the side away from the fire which increases the risk of ignition of fixtures or building parts.

This characteristic is assessed through temperature measurements on the side away from the fire. It is imperative that these remain below a stated maximum temperature for longer than the entire test duration.

Domestic fires in houses and apartments present a particularly serious hazard for inhabitants. The need for protection and safety in case of fire is correspondingly high. It is important here to minimise the hazards both from the fire source and from the gases released by burning items. Wood-fibre insulating materials from PAVATEX offer particularly good qualities here. They reduce fire hazards and fulfil the highest legal requirements for fire protection. With its generous combustion behaviour, it enables the

construction of components with highly effective fire resistance, gaining time that can be crucial in serious cases until the arrival of the emergency services.

High component fire resistances

In case of fire, an ash layer forms on the surface of the PAVATEX insulation sheets, which acts like a protective blanket and prevents oxygen feed-in, thus preventing the rapid spreading of the fire. In this way, PAVATEX products can be used to make components that are very highly fire resistant.

Fire resistance classes of up to REI 90 can be achieved. This means that a fire would need 90 minutes to exceed the safety requirements relevant to the construction.

Another advantage is that, in case of fire, PAVATEX insulation systems do not release hazardous gases into the air. At the same time, the insulation panels heat up much more slowly than other construction and insulation materials. This means that ignition of neighbouring construction components occurs much later than for mineral-fibre insulation materials because the side away from the fire remains cold for a long time. Furthermore, in case of fire, PAVATEX insulation material does not generate the burning drips that can be associated with polystyrene insulation.

PAVATEX insulation systems with fire protection testing

PAVATEX takes its fire protection responsibilities seriously and is subject to continuous fire protection tests on roof and wall constructions, for example at the respected Institute of Building Materials, Concrete Construction and Fire Safety (iBMB) at the Technical University in Braunschweig, Germany. Under controlled conditions, different components are subjected to fire and their resistance is measured. The load-bearing capacity (R), the room isolating function (E), the thermal insulation (I) and other properties are assessed here. The performance time is then given in minutes. For example, an assessment to REI 90 means that the component can fulfil its requirements as regards load-bearing capacity, room isolation and thermal insulation for up to 90 minutes.

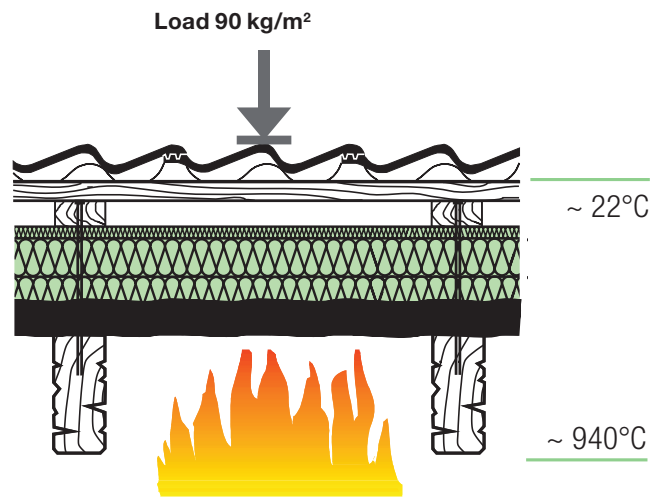
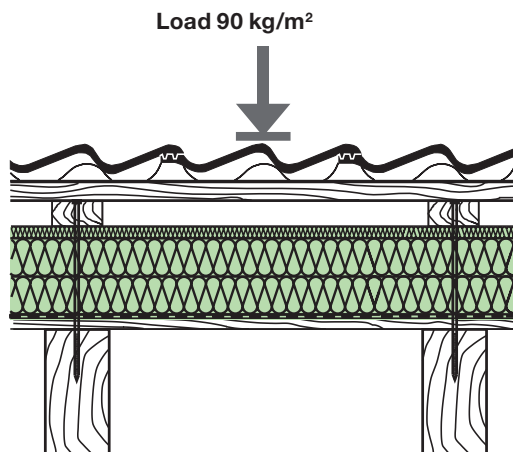
Safe and sound even in case of fire

Tests show that although wood-fibre insulation is classified as a normally inflammable construction material of B2/Euroclass E, the PAVATEX insulation systems make a significant contribution to fire resistance and maintain the protection function of building components. Additional safety is provided by the high storage capacity of the insulation panels, which almost completely prevents heat penetration. This is shown clearly in the temperature gradients, for example in the roof area: during a fire, the temperature at the fire source reaches up to 940°C, while the temperature on the upper surface of the roof remains a mere 18°C.



Fire safety

Very high fire resistances can be achieved in components for roof and wall construction with the PAVATEX wood-fibre insulation systems. These make an incredibly valuable contribution to fire safety, as proven by numerous successfully implemented fire tests.



Over-rafter insulation made from PAVATHERM and PAVATHERM-PLUS

Test set-up from outside to inside:*

- Roof cladding
- Tile Battens
- Counter battens
- 60mm PAVATHERM-PLUS under-roof panels
- 60mm PAVATHERM wood-fibre insulation panels
- Roofing membrane
- 18mm Timber cladding tongue + groove
- Solid wood beams (120 x 240)

*Beam spacing = 100cm

Component condition and temperatures after a 50 minute test

The wooden beams were sized to comply with DIN 4102-4 for REI 45 but retained their load-bearing capacity through the entire duration of the test.



REI 45

„one-sided, from inside”

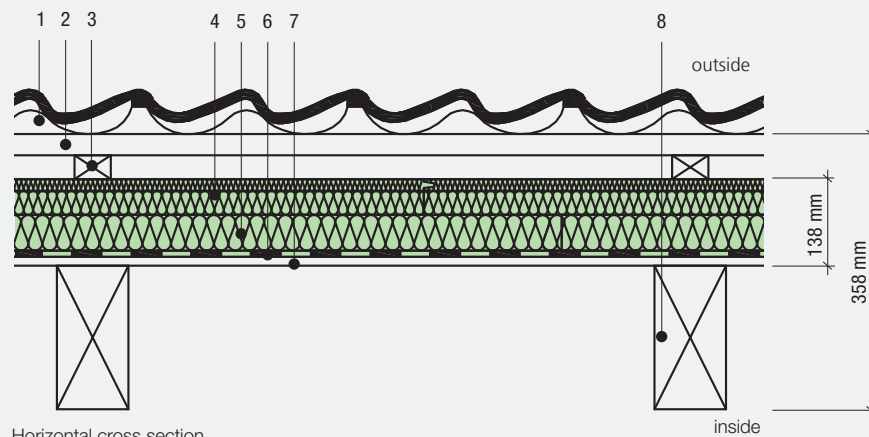
Appendix to Classification Report K-3531/791/10-MPA BS

- Load-bearing, roof construction
- Section cladding
- **Over-rafter insulation PAVATHERM and PAVATHERM-PLUS wood-fibre insulation panels.**



Tested construction composition

According to test report (3251/004/09)-Wsp dated 05.07.2010



Horizontal cross section

1. Roof cladding (concrete roof tiles)
2. Main battens 40/60mm
3. Counter battens 60/60mm
4. Over-rafter insulation 60mm made from PAVATHERM-PLUS (2nd layer)
5. Over-rafter insulation 60mm made from PAVATHERM (1st layer)
6. Roofing membrane PAVATEX DSB 2
7. 8mm tongue and groove board
8. 120/240mm solid timber rafters (S10/TS or C24)



REI 30

„one-sided, from inside”

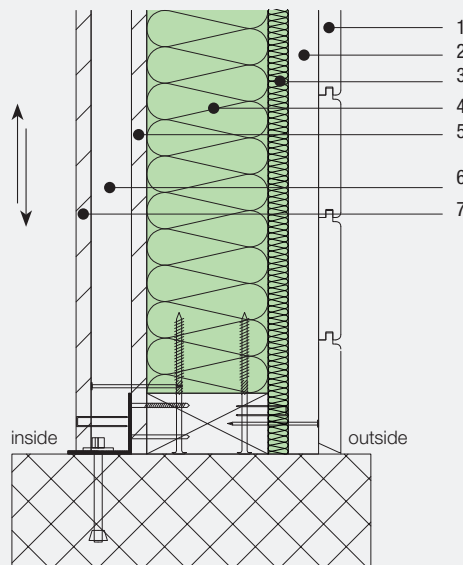
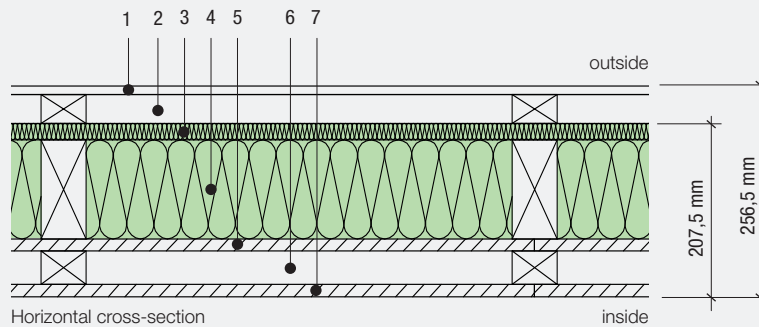
Appendix to Classification Report K-3529/789/10-MPA BS

- Load-bearing, external wall construction (timber frame construction)
- One-sided “FERMACELL” gypsum fibre board panelling
- **Between studs - PAVAFLEX flexible woodfibre insulation**
- **ISOLAIR tongue and groove woodfibre insulation**



Tested construction composition

According to test report (3252/005/09)-Wsp dated 05.07.2010



1. Tongue and groove timber cladding 19 mm
2. Ventilation cavity 30mm with timer counter batten 30/50 mm, at 625 mm centers
3. ISOLAIR 20 mm
4. PAVAFLEX 120 mm (filled between 60/120 mm timber studs at 625mm centers)
5. OSB 12,5 mm
6. Service void 40 mm with 40/60 mm timber battens, at 625mm centers
7. Gypsum Plaster board 15 mm





REI 60 from outside / **REI 45** from inside
„two sided test“

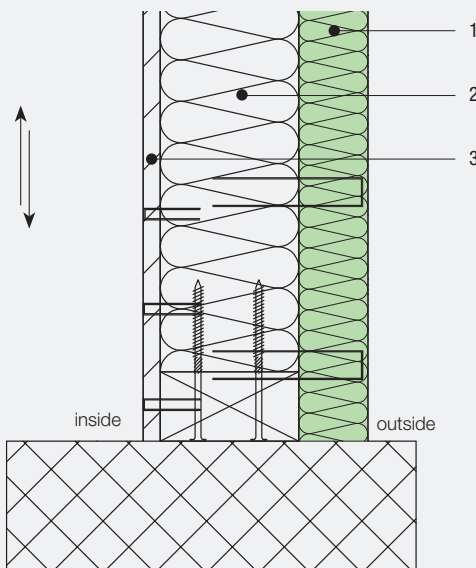
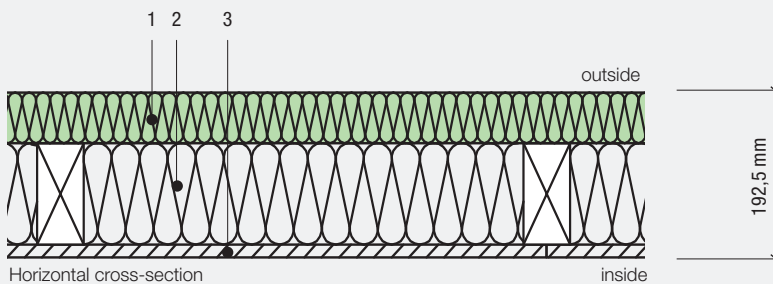
**Appendix to Classification Report
KB 3.2/14-108-03 MPA Leipzig**

- Load-bearing, external wall construction (timber frame-construction)
- Between studs, Isofloc cellulose insulation
- **DIFFUTHERM tongue and groove woodfibre insulaiton fixed externally**



Tested construction composition

According to test report (PB 3.2/14-108-1; PB 3.2/14-108-2) dated 18.12.2014



1. DIFFUTHERM 60 mm
2. Isofloc cellulose insulation 120 mm (filled between 60/120 mm timber studs ≤ 625mm centers)
3. Fermacell board 12,5mm

Vertical cross-





REI 60

„one-sided, from outside“

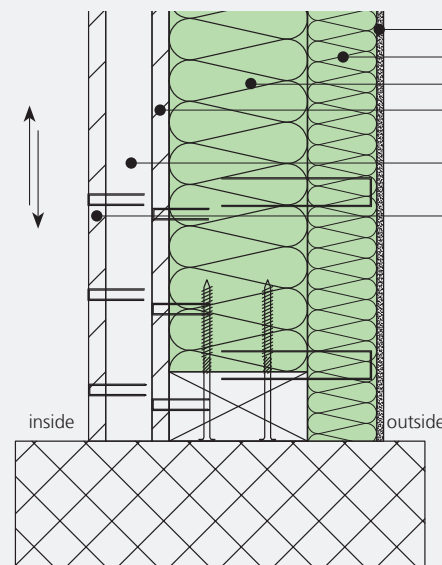
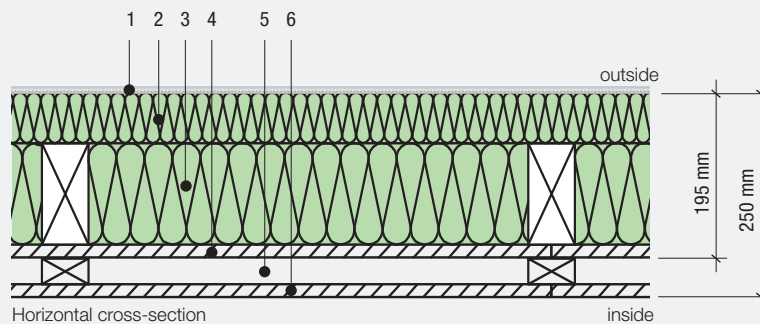
Appendix to Classification Report K-3252/502/10-MPA BS

- Load-bearing, external wall construction (timber frame construction)
- **Between studs - PAVAFLEX flexible woodfibre insulation**
- **DIFFUTHERM tongue and groove woodfibre insulation fixed externally**
- Render „Knauf-Marmorit“



Tested construction composition

According to test report (3253/006/09)-Wsp dated 13.08.2010



1. Knauf Marmorite 8-10mm fully meshed render system.
2. DIFFUTHERM 60 mm
3. PAVAFLEX 120 mm (filled between 60/120 mm timber studs \leq 625mm centers)
4. OSB 15 mm
5. Service void 40 mm with 40/60 mm timber battens, \leq 625mm centers
6. Gypsum Plaster board 15 mm





REI 90 „one-sided, from outside”

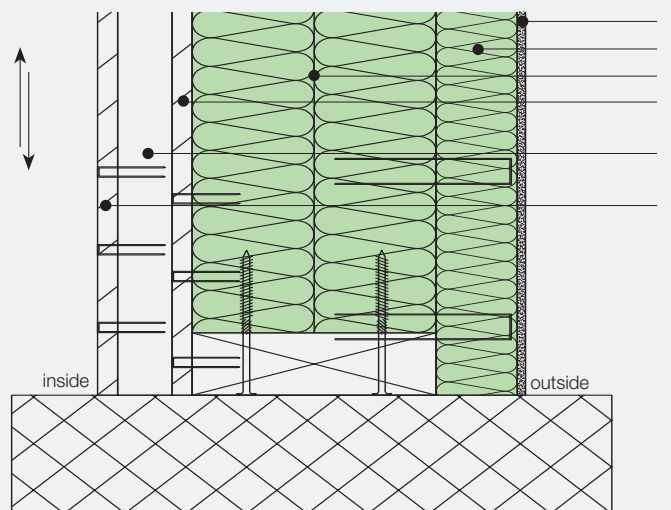
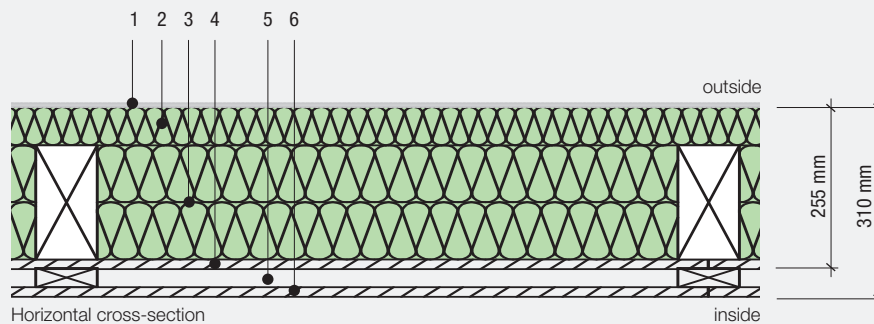
Appendix to Classification Report K-3254/504/10-MPA BS

- Load-bearing, external wall construction (timber frame construction)
- **Between studs - PAVATHERM square edge woodfibre insulation**
- **DIFFUTHERM tongue and groove woodfibre insulation fixed externally**
- Render „Knauf-Marmorit“



Tested construction composition

According to test report (3160/611/10)-Wsp dated 16.08.2010



1. Knauf Marmorite 8-10mm fully meshed render system.
2. DIFFUTHERM 60mm
3. PAVATHERM 180mm (2-layers) (filled between 60/180mm timber studs ≤ 625mm centers)
4. OSB 15mm
5. Service void 40mm with 40/60mm timber battens, ≤ 625mm centers
6. Gypsum Plaster board 15mm





REI 90

„one-sided, from outside”

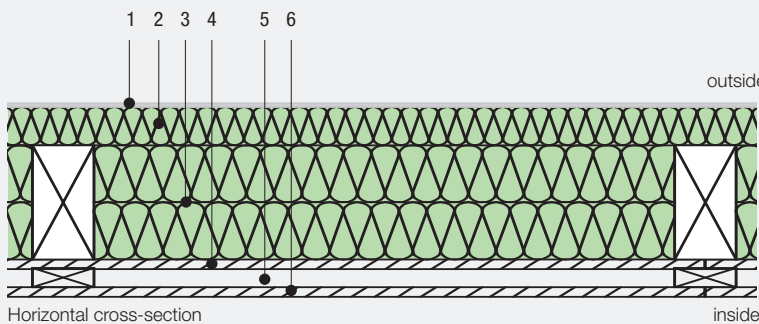
Appendix to Classification Report KB-3.2/15-269-1

- Load-bearing, external wall construction (timber frame construction)
- **Between studs - PAVAFLEX flexible woodfibre insulation**
- **DIFFUTHERM tongue and groove woodfibre insulation fixed externally**
- Render „Baumit or Knauf“.



Tested construction composition

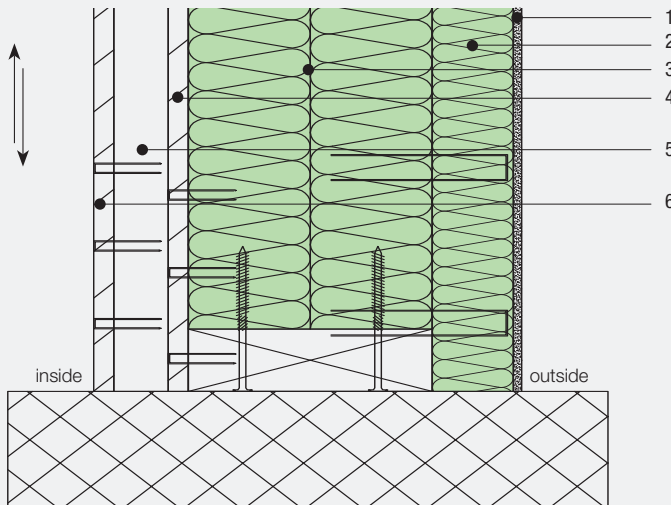
According to test report (3160/611/10-WSP bzw. 3754/1030/13-NB) dated 30.07.2015



Horizontal cross-section

outside

inside



Vertical cross-section

1. Baumit or Knauf 8-10mm fully meshed render system.
2. DIFFUTHERM 80 mm
3. PAVAFLEX 160 mm (2-layers) (filled between 60/160 mm timber studs ≤ 625mm centers)
4. OSB 15 mm
5. Service void 40 mm with 40/60 mm timber battens, ≤ 625mm centers
6. Fermacell board 15 mm





REI 90 „one-sided, from outside”

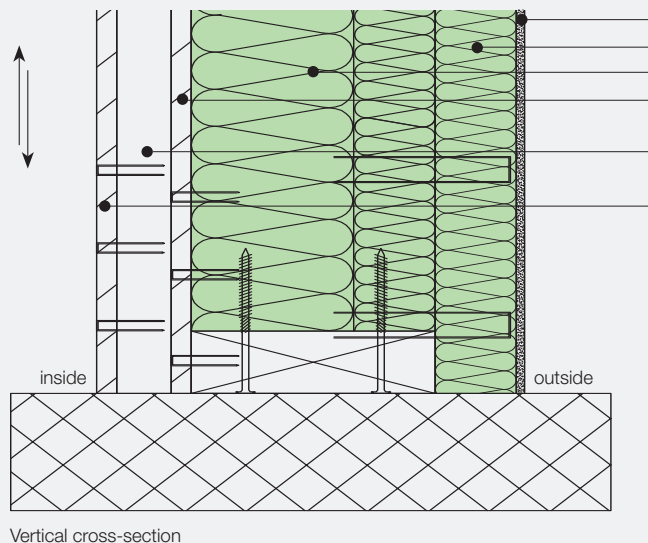
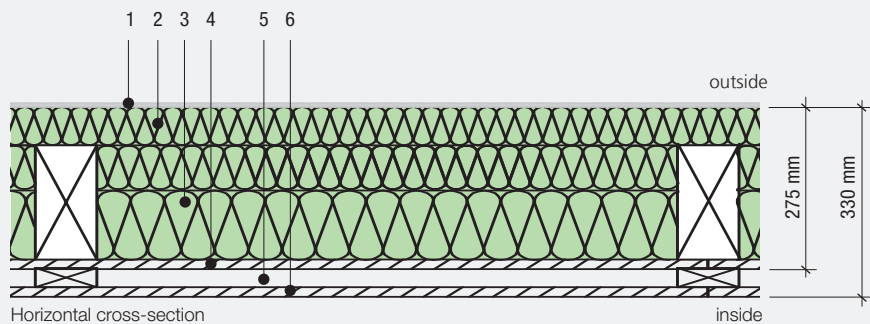
Appendix to Classification Report KB-3.2/15-269-1

- Load-bearing, external wall construction (timber frame construction)
- **Between studs - PAVATHERM square edge woodfibre insulation**
- **DIFFUTHERM tongue and groove woodfibre insulation fixed externally**
- Render „Baumit or Knauf“.



Tested construction composition

According to test report (3160/611/10-WSP bzw. 3754/1030/13-NB) dated 30.07.2015



1. Baumit or Knauf 8-10mm fully meshed render system.
2. DIFFUTHERM 80 mm
3. PAVATHERM 180 mm (2-layers) (filled between 60/180 mm timber studs ≤ 625mm centers)
4. OSB 15 mm
5. Service void 40 mm with 40/60 mm timber battens, ≤ 625mm centers
6. Gypsum plaster board 15 mm





REI 60 from outside / **REI 60** from inside
„from both sides”

- Load-bearing, external wall construction (timber frame construction)
- **Between studs - PAVATHERM square edge woodfibre insulation**
- **ISOLAIR tongue and groove woodfibre insulation fixed externally**
- Render, „Knauf“.

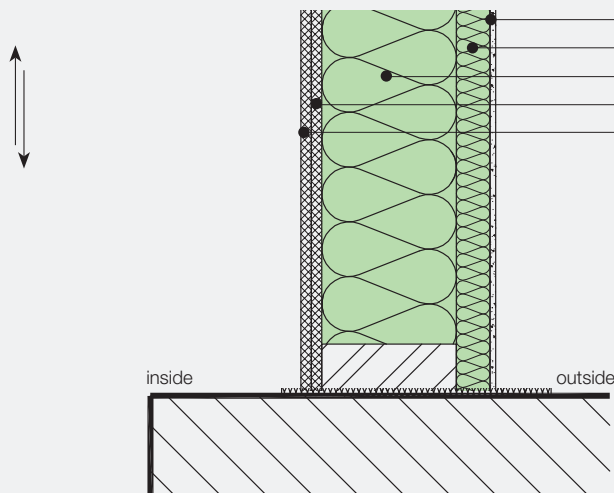
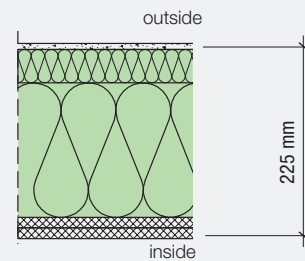
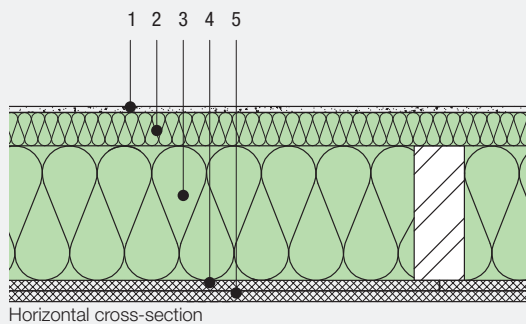
New 2017
tested on both sides



AbP applied for

Tested construction composition

According to test report (PB 3.2/16-212-3 bzw. PB 3.2/16-212-4 MFPA Leipzig) dated 09.02.2017



Vertical cross-section

1. Baunit or Knauf 8-10mm fully meshed render system.
2. ISOLAIR 40mm
3. PAVAFLEX 160 mm (filled between 60/160 mm timber studs ≤ 625mm centers)
4. Gypsum plaster board X 12.5 mm
5. Gypsum plaster board X 12.5 mm





REI 60 from outside / **REI 60** from inside
„from both sides”

- Load-bearing, external wall construction (timber frame construction)
- **Between studs - PAVATHERM square edge woodfibre insulation**
- **ISOLAIR tongue and groove woodfibre insulation fixed externally**

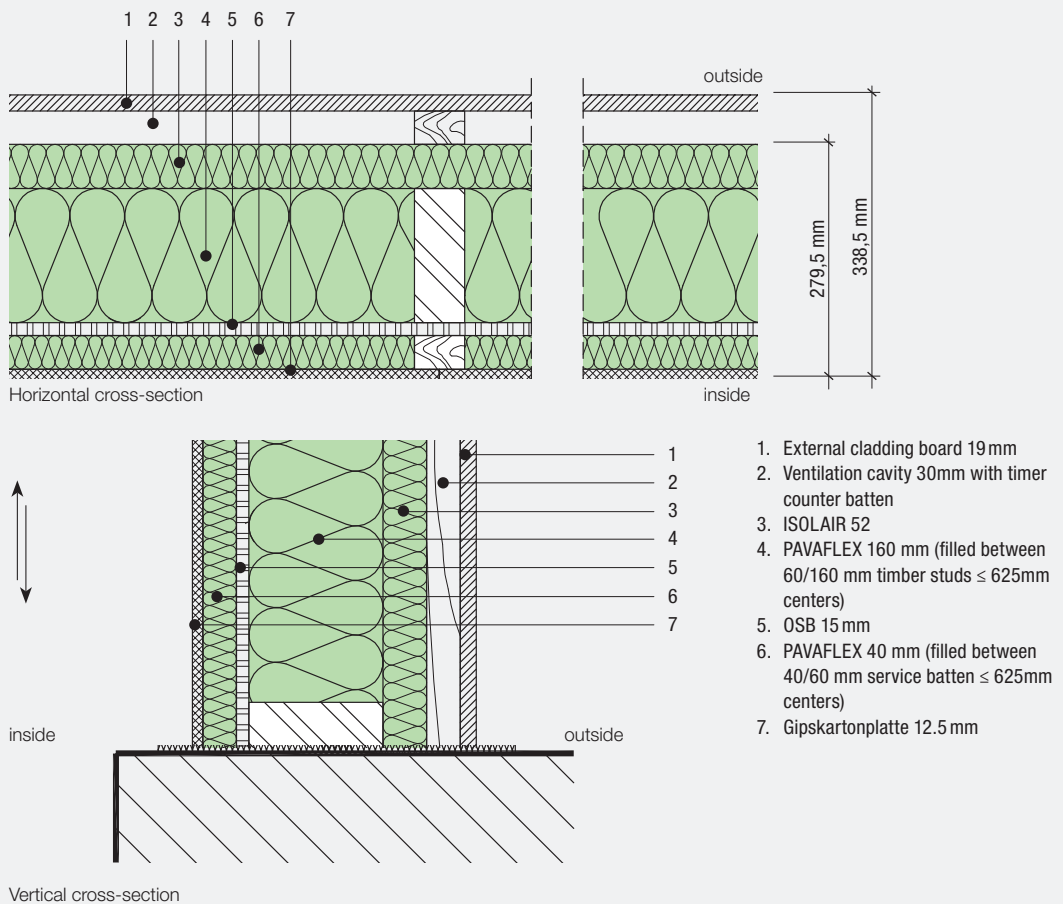
**Neu 2017
beidseitig geprüft**



AbP applied for

Tested construction composition

According to test report (PB 3.2/16-212-1 bzw. PB 3.2/16-212-2 MFPA Leipzig) dated 09.02.2017



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