

Section 3.1.2

Timber Frame Walls

Single layer – between studs

Product: Earthwool FrameTherm Rolls and Slabs

Tf01



Single layer – between studs with service void

Product: Earthwool FrameTherm Rolls and Slabs

Tf02



Between studs with insulated lining

Products: Earthwool FrameTherm Rolls and Slabs and Knauf PIR Laminate

Tf03



Between studs and to exterior of sarking

Products: Earthwool FrameTherm Rolls and Slabs and Earthwool DriTherm Cavity Slab 32 Ultimate

Tf04



Blow in, between studs

Product: Supafil Frame

Tf05



Timber frame walls

Timber frame design

Overview

Insulated external timber frame walls can provide better insulation performance than masonry walls of comparable thickness. Timber frame is also widely recognised as the most environmentally friendly construction method – a construction with extremely low ‘embodied energy’. This is the energy required to manufacture a building component or material, deliver it to site and install or construct it. In this respect timber frame performs much better than standard masonry cavity wall construction. Timber frame offers unique advantages to home owners, builders and contractors:

- Reduced construction time
- A wide range of U-values can be achieved depending on the required level of thermal performance
- Excellent thermal efficiency
- Potential for easy future renovation
- Pre-fabrication enhances quality control due to off site manufacture, thereby reducing the risk of on-site workmanship problems
- Light weight requiring reduced footings and foundations compared to masonry construction

The importance of condensation control

A vapour control layer is essential on the ‘warm’ side of the insulation to reduce the risk of condensation forming within the timber frame. The vapour control layer may be incorporated within the plasterboard or installed separately. Joints should be as few as possible and sealed, with special care taken around penetrations for services.

A vapour permeable membrane on the outside of the sheathing board is also necessary to protect the timber frame from water penetration whilst allowing water vapour to escape.

As a rule of thumb, the vapour resistance of the materials on the ‘warm’ side of the insulation should have at least five times the vapour resistance of the materials on the ‘cold’ side of the insulation. Alternatively, calculations should be carried out to assess the risk of interstitial condensation by referring to BS 5250 : 2011.

In some timber framed systems, such as the Knauf Insulation Twin Insulated System, the insulation in the cavity maintains the timber frame above the dewpoint temperature thus reducing the condensation risk even further and also providing an extra layer of protection against water penetration. If in doubt call the Knauf Insulation Technical Advisory and Support Centre for a free condensation risk calculation.

Timber frame and fire performance

A half hour fire resistance in domestic external walls is required by the Building Regulations. Timber frame walls filled with mineral wool insulation are ideal for meeting this requirement. In most timber frame constructions, cavity barriers must be used to divide up the external cavity in order to reduce the risk of fire spread

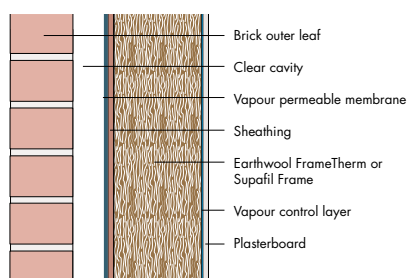
Twin insulated solution

This solution has been developed to meet demand for higher insulation values in timber frame construction. It consists of a standard timber frame wall on the inside, a cavity, partially filled with Earthwool DriTherm Cavity Slab 32 Ultimate and an outer leaf of brickwork cladding.

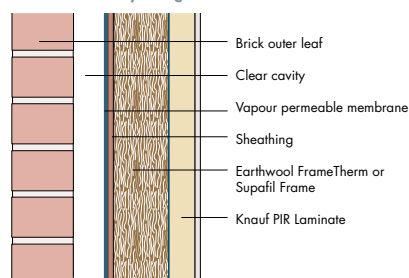
This solution complies with the requirements of the NHBC Standards due to the breathable nature of Earthwool DriTherm Cavity Slab 32 Ultimate which also provides additional weather protection to the structural timber frame. See Tf04 for further details.

Three methods for insulating timber frame construction using either built-in or premium blown glass mineral wool

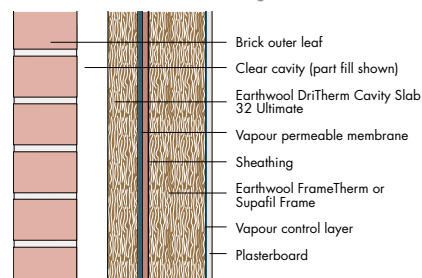
1) Single Layer - insulation between the studs



2) Double layer - insulation between the studs and insulated dry lining



3) Twin Insulated - insulation between the studs and external to sheathing



Solution optimiser and pathfinder

Knauf Insulation solution

Single layer – between studs
Product: Earthwool FrameTherm Rolls and Slabs

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Tf01



Single layer – between studs with service void
Product: Earthwool FrameTherm Rolls and Slabs

See page: 140

Tf02



Between studs with insulated lining
Products: Earthwool FrameTherm Rolls and Slabs and Knauf PIR Laminate

See page: 142

Tf03



Between studs and to exterior of sarking
Products: Earthwool FrameTherm Rolls and Slabs and Earthwool DriTherm Cavity Slab 32 Ultimate

See page: 144

Tf04



Blow in, between studs
Product: Supafil Frame

See page: 146

Tf05



U-values

0.46 0.40 0.35 0.30 0.25 0.20 0.14



Key

- Thermal insulation achievable by constructions within this document.
- Find online. Visit knaufinsulation.co.uk and key in construction code to find the most up to date information on your chosen solution.

Timber frame walls

Single layer – between studs

Earthwool FrameTherm Rolls and Slabs



Tf01

- Friction fitting between timber studs closes joints, preventing air movement and infiltration through or around the insulation
- Much quicker to install than rigid foam boards which require very accurate cutting
- Flexible products which accommodate movements in timber frame ensuring all joints remain closed

Earthwool FrameTherm Rolls and Slabs

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)



Products

Earthwool FrameTherm Rolls and Slabs are lightweight glass mineral wool products available in a range of thermal conductivities, their manufacture has a very low impact on the environment.

Typical construction

Inner leaf comprising 12.5mm plasterboard, vapour control layer, Earthwool FrameTherm Roll/Slab between studwork, plywood sheathing and a vapour permeable membrane. A 50mm cavity separates the timber frame from the outer leaf, typically of brick. Other cladding options, such as tile hanging and timber boarding can also be utilised.

Installation

Earthwool FrameTherm Rolls and Slabs are dimensioned to suit 90mm or 140mm studs at standard 600mm centres. The nominal thickness of the insulation should not be greater than the nominal stud depth.

Earthwool FrameTherm Rolls and Slabs are friction fitted between studs at standard centres and are self supporting. Generally, two slabs fully fill the space between sole and head plates for standard floor to ceiling height.

A vapour control layer is stapled to the studs across the inner face of the wall before fixing the plasterboard. The vapour control layer should be free from holes, any gaps should be made good with any tears repaired and overlaps and apertures for services effectively sealed. Particular care is necessary around electric sockets and boxes.

A vapour permeable membrane or low emissivity vapour permeable membrane should be stapled or nailed to the sheathing board in accordance with the manufactures instructions. It should be lapped so that each joint is protected, with upper layers lapped over lower layers to shed water away from the sheathing board.

Generally, horizontal laps should be at least 100mm wide and the membrane should extend below the lowest timber member. Vertical laps should be at least 150mm and be staggered.

Timber frame walls

Single layer – between studs with service void

Earthwool FrameTherm Rolls and Slabs

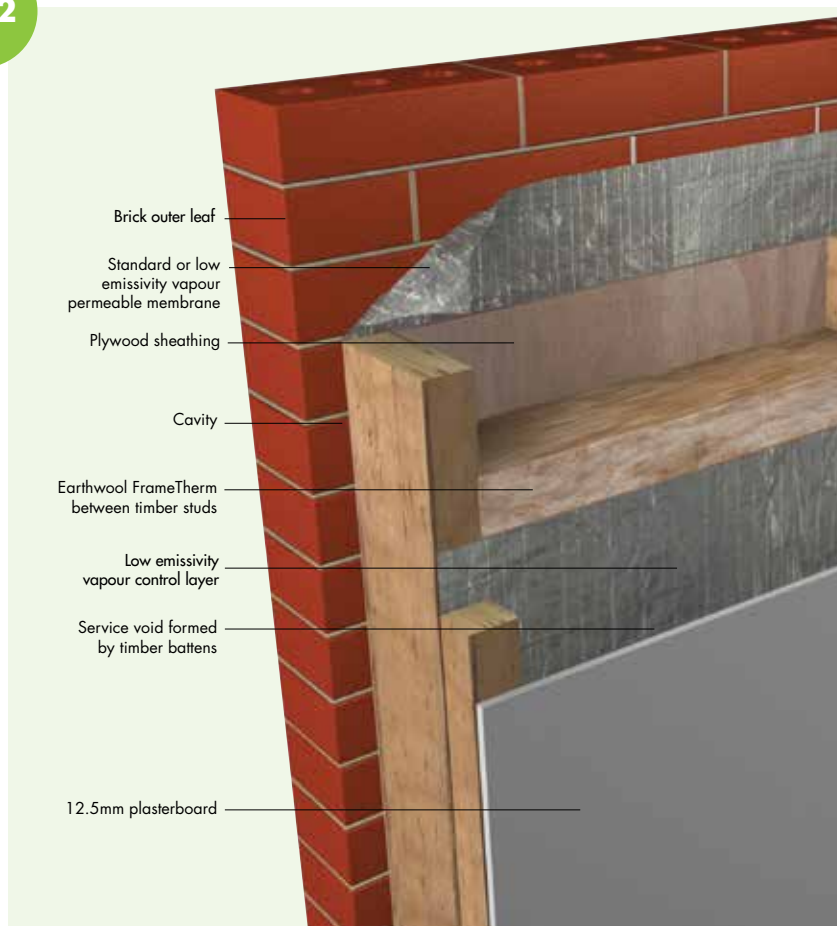


Tf02

- Friction fitting between timber studs closes joints, preventing air movement and infiltration through or around the insulation
- Much quicker to install than rigid foam boards which require very accurate cutting
- Flexible products which accommodate movements in timber frame ensuring all joints remain closed

Earthwool FrameTherm Rolls and Slabs

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)



Products

Earthwool FrameTherm Rolls and Slabs are lightweight glass mineral wool products available in a range of thermal conductivities, their manufacture has a very low impact on the environment.

Typical construction

Standard timber frame construction, with a brick outer leaf and a low emissivity vapour control layer to the inner face of the timber frame. A service duct is formed by nailing 50x25mm timber battens to the timber frame before fixing the 12.5mm plasterboard internal lining.

Other cladding options, such as tile hanging and timber boarding can be utilised.

Installation

Earthwool FrameTherm Rolls and Slabs are dimensioned to suit 90mm or 140mm studs at standard 600mm centres. The nominal thickness of the insulation should not be greater than the nominal stud depth.

Earthwool FrameTherm Rolls and Slabs are friction fitted between studs at standard centres and are self supporting. Generally, two slabs fully fill the space between sole and head plates for standard floor to ceiling height.

A low emissivity vapour control layer is stapled to the studs across the inner face of the wall with the low emissivity side facing internally. 50x25mm vertical timber battens are nailed to the timber studs before fixing the plasterboard. The vapour control layer should be free from holes, any gaps should be made good, with tears repaired and overlaps sealed with aluminised tape.

A vapour permeable membrane or low emissivity vapour permeable membrane should be stapled or nailed to the sheathing board in accordance with the manufacturers instructions. It should be lapped so that each joint is protected, with upper layers lapped over lower layers to shed water away from the sheathing board.

Generally, horizontal laps should be at least 100mm wide and the membrane should extend below the lowest timber member. Vertical laps should be at least 150mm and be staggered.

Typical junction of external and party wall

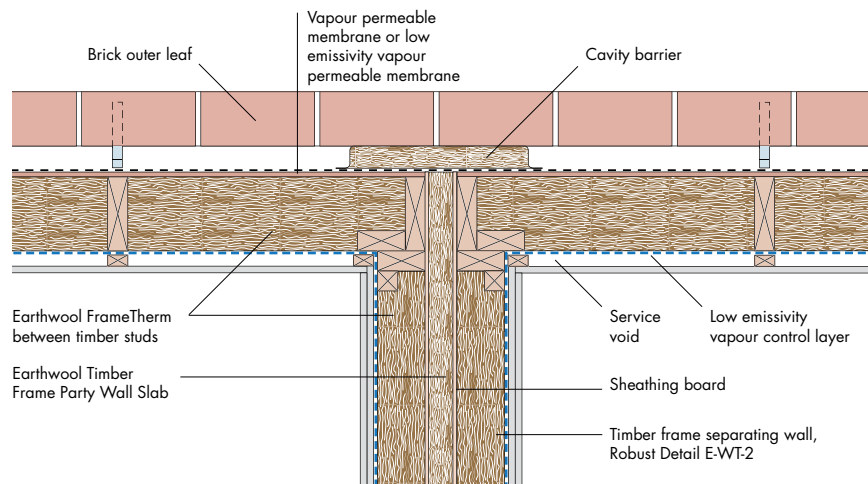


Table 7 - Typical U-values for prefabricated timber framed walls with a service void and insulation between the studs

Membrane Type			U-values (W/m ² K)		
Thickness (mm)	Low E membrane	Vapour permeable membrane	Product	Masonry outer leaf	Tile/timber clad outer leaf
140	✓		Earthwool FrameTherm 32	0.19	0.23
			Earthwool FrameTherm 35	0.20	0.24
			Earthwool FrameTherm 38	0.20	0.24
			Earthwool FrameTherm 40	0.21	0.25
140		✓	Earthwool FrameTherm 32	0.21	0.23
			Earthwool FrameTherm 35	0.22	0.24
			Earthwool FrameTherm 38	0.23	0.25
			Earthwool FrameTherm 40	0.24	0.25
90	✓		Earthwool FrameTherm 35	0.30	0.33
			Earthwool FrameTherm 37	0.31	0.35
			Earthwool FrameTherm 40	0.32	0.35
90		✓	Earthwool FrameTherm 35	0.33	0.35
			Earthwool FrameTherm 37	0.34	0.37
			Earthwool FrameTherm 40	0.35	0.38



Notes: Timber bridging is assumed as 15% and the stud depth is taken to be the same as the thickness of insulation specified. Thermal conductivity of timber studs is 0.120W/mK. Ventilated low emissivity airspace assumed to increase the R-value of the cavity to 0.29 m²K/W and unventilated low emissivity airspace assumed to increase R-value of cavity to 0.77m²K/W, low emissivity airspace assumed to increase R-value of service void to 0.78 m²K/W.

Typical specification

External wall panels to be insulated between studs using Earthwool FrameTherm Rolls* or Slabs* - 40*/38*/35*/32*/ mm thick.

Form service void with 50x25mm timber battens as shown on the drawings.

Insulation to be cut as necessary and friction fitted between studs. The vapour permeable membrane stapled*/nailed* to the sheathing and extending below the lowest timber member. (*delete as appropriate).

Cavity barriers and fire stops should be installed as required to meet the Building Regulations.

Alternatively, consult the National Building Specifications, Standard version clause/clauses... P10/210 and 310.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Performance

Thermal performance

Earthwool FrameTherm Roll 40 – 0.040 W/mK.
Earthwool FrameTherm Slab 38 – 0.038 W/mK.
Earthwool FrameTherm Roll/Slab 35 – 0.035 W/mK.
Earthwool FrameTherm Roll/Slab 32– 0.032 W/mK.

Fire performance

Earthwool FrameTherm Rolls and Slabs are classified as Euroclass A1 to BS EN 13501-1.
Please contact Knauf Insulation Technical Advice and Support Centre for calculations that include specific products.

Timber frame walls

Between studs with insulated lining

Earthwool FrameTherm Rolls and Slabs

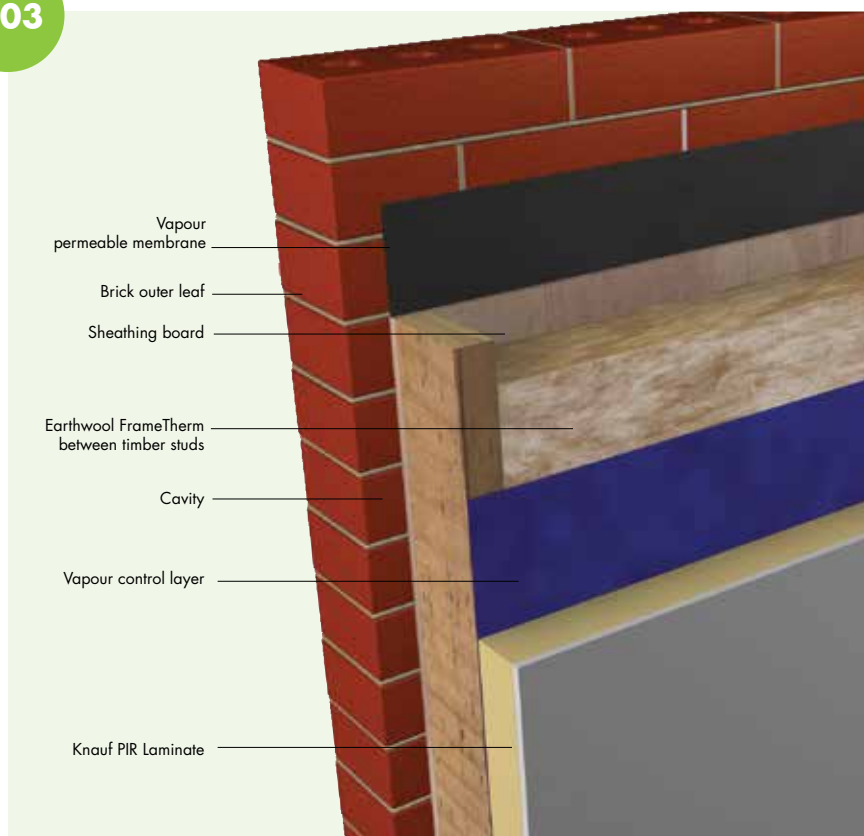


Tf03

- Friction fitting between timber studs closes joints, preventing air movement and infiltration through or around the insulation
- Much quicker to install than rigid foam boards which require very accurate cutting
- Flexible products which accommodate movements in timber frame ensuring all joints remain closed
- Inclusion of Knauf PIR laminate improves thermal performance

Earthwool FrameTherm Rolls and Slabs

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming potential (GWP)



Products

Earthwool FrameTherm Rolls and Slabs are lightweight glass mineral wool products available in a range of thermal conductivities, their manufacture has a very low impact on the environment.

Knauf PIR Laminate* is comprised of 9.5mm taper edged plasterboard bonded to a polyisocyanurate (PIR) board.

*Knauf PIR Laminate is available from Knauf Drywall.

Typical construction

A timber frame stud wall infilled with Earthwool FrameTherm and faced internally with Knauf PIR Laminate and externally with plywood sheathing and a vapour permeable membrane. The use of a thermal laminate improves the thermal performance and reduces thermal bridging through the timber studs. A 50mm cavity separates the timber frame from the outer leaf, typically of brick.

Installation

Knauf Insulation products are dimensioned to suit studs of 90 or 140mm at standard 600mm centres. The nominal thickness of the insulation should not be greater than the nominal stud depth.

Earthwool FrameTherm is friction fitted between studs at standard centres and is self supporting. A vapour control layer is stapled to the studs across the inner face of the wall before fixing the plasterboard. The vapour control layer should be free from holes, any gaps should be made good with any tears repaired and overlaps and apertures for services effectively sealed. Particular care is necessary around electric sockets and boxes.

Subsequently, Knauf PIR Laminate is screwed to the timber frame at maximum 150mm centres. The boards are taper edged and should be finished using standard drylining techniques.

A vapour permeable membrane should be stapled or nailed to the sheathing board at maximum 500mm centres. It should be lapped

so that each joint is protected, with upper layers lapped over lower layers to shed water away from the sheathing. Horizontal laps should be at least 100mm wide and the membrane should extend below the lowest timber member. Vertical laps should be at least 150mm and be staggered.

Performance

Thermal performance

Earthwool FrameTherm Roll 40 – 0.040 W/mK.

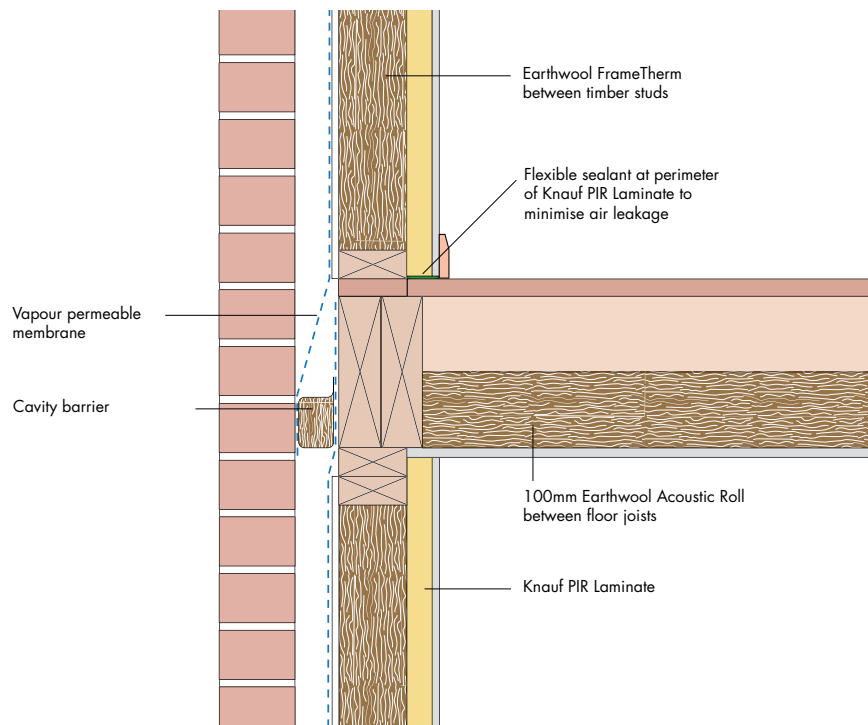
Earthwool FrameTherm Slab 38 – 0.038 W/mK.

Earthwool FrameTherm Roll/Slab 35 – 0.035 W/mK.

Earthwool FrameTherm Roll/Slab 32 – 0.032 W/mK.

The insulation component of Knauf PIR Laminate has a thermal conductivity of 0.022 W/mK and the plasterboard has a thermal conductivity of 0.21W/mK.

Typical junction of external wall and upper floor



Typical specification

External wall panels to be insulated between studs using Earthwool FrameTherm Roll* / Slab* 40*/38*/35*/32*.....mm thick.

The wall panels to be lined internally with Knauf PIR Laminate,mm thick with integral 9.5mm plasterboard screwed to the timber studs at maximum 150mm centres.

A vapour permeable membrane stapled* / nailed* to the sheathing and extending below the lowest timber member.

(*Delete as appropriate).

Cavity barriers and fire stops should be installed as required to meet the Building Regulations.

Alternatively, consult the National Building Specifications, Standard version clause/clauses... P10/210 and 310 and K10/205.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Fire performance

Earthwool FrameTherm is classified as Euroclass A1 to BS EN 13501-1

Building Regulations state that external walls in domestic construction shall achieve half hour fire resistance. To meet the half hour requirement using Knauf PIR Laminate it will be necessary to line the wall with 12.5mm plasterboard before installing the Knauf PIR Laminate.

Table 8 - Typical U-values for pre-fabricated timber framed walls with an internal lining

Thickness (mm)	Knauf PIR Laminate thickness (mm)	Product	U-values (W/m ² K)	
			Masonry outer leaf	Tile/timber clad outer leaf
140	50	Earthwool FrameTherm 32	0.17	0.18
		Earthwool FrameTherm 35	0.18	0.19
		Earthwool FrameTherm 38	0.19	0.19
		Earthwool FrameTherm 40	0.19	0.20
140	35	Earthwool FrameTherm 32	0.20	0.21
		Earthwool FrameTherm 35	0.21	0.22
		Earthwool FrameTherm 38	0.21	0.22
		Earthwool FrameTherm 40	0.22	0.23
90	50	Earthwool FrameTherm 32	0.22	0.23
		Earthwool FrameTherm 35	0.22	0.24
		Earthwool FrameTherm 38	0.23	0.24
		Earthwool FrameTherm 40	0.23	0.25
90	35	Earthwool FrameTherm 32	0.26	0.27
		Earthwool FrameTherm 35	0.26	0.28
		Earthwool FrameTherm 38	0.27	0.29
		Earthwool FrameTherm 40	0.28	0.30

Timber frame walls

Between studs and to exterior of sarking

Earthwool FrameTherm Rolls and Slabs and Earthwool DriTherm Cavity Slabs



Tf04

- Installing Earthwool DriTherm Cavity Slab in the cavity provides secondary protection to the frame and improves thermal performance
- Friction fitting between timber studs closes joints, preventing air movement and infiltration through or around the insulation
- Partial fill system accepted by National House Building Council

Earthwool FrameTherm Rolls and Slabs and Earthwool DriTherm Cavity Slabs

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential

Brick outer leaf

Earthwool DriTherm Cavity Slab 32 Ultimate

Vapour permeable membrane

Plywood sheathing

Earthwool FrameTherm between timber studs

Vapour control layer

12.5mm plasterboard

Products

Earthwool FrameTherm Rolls and Slabs are lightweight glass mineral wool products available in a range of thermal conductivities.

Earthwool DriTherm Cavity Slab 32 Ultimate is a lightweight, rigid, non-combustible glass mineral wool slab containing a water-repellent additive.

The manufacture of both products has a very low impact on the environment.

Typical construction

Inner leaf comprising 12.5mm standard plasterboard, vapour control layer, Earthwool FrameTherm between studwork, 9.5mm plywood sheathing and a vapour permeable membrane. Cavity between timber frame and outer leaf part filled with Earthwool DriTherm Cavity Slab 32 Ultimate. Outer leaf typically of brick, timber cladding or tiles.

Installation

The installation of Earthwool FrameTherm, vapour control layer and a vapour permeable membrane are the same as for solution Tf01. If a service void is to be included then refer to Tf02. The principles for installing Earthwool DriTherm Cavity Slab 32 Ultimate in a twin insulated wall are essentially the same as for installation in a masonry cavity wall when the inner block leaf is constructed first.

The instructions to be found in British Board of Agrément (BBA) Certificate 95/3212 apply to the use of Earthwool DriTherm Cavity Slabs in masonry wall constructions and can therefore be deemed relevant to this application. The BBA Certificate does not cover the specific use of Earthwool DriTherm Cavity Slab 32 Ultimate in timber frame walls.

Installation sequence – part fill

The timber frame is erected in the normal manner. The sequenced method is the same as for conventional timber frame except that a wider cavity than normal is used.

This will require longer than normal wall ties with a clip to hold the Earthwool DriTherm Cavity Slab 32 Ultimate back to the timber frame wall. Small cavity barriers should be installed to the full width of the cavity. Earthwool DriTherm Cavity Slab 32 Ultimate is installed to the same standard as for full-fill, but should be fully clipped back to the timber frame wall.

The National House Building Council (NHBC) will accept this form of construction providing a 50mm residual cavity between Earthwool DriTherm Cavity Slab 32 Ultimate and masonry outer leaf is maintained.

Performance

Thermal performance

Earthwool DriTherm Cavity Slab 32 Ultimate has a thermal conductivity of either 0.032 W/mK.

Earthwool FrameTherm Roll/Slab 32 has a thermal conductivity of 0.032 W/mK.

Earthwool FrameTherm 35 Roll/Slab has a thermal conductivity of 0.035 W/mK.

Earthwool FrameTherm Slab 38 has a thermal conductivity of 0.032 W/mK.

Earthwool FrameTherm Roll 40 has a thermal conductivity of 0.040 W/mK.

Fire performance

Earthwool FrameTherm Rolls and Slabs and Earthwool DriTherm Cavity Slab 32 Ultimate are classified as Euroclass A1 to BS EN 13501-1.

Typical junction with timber ground floor

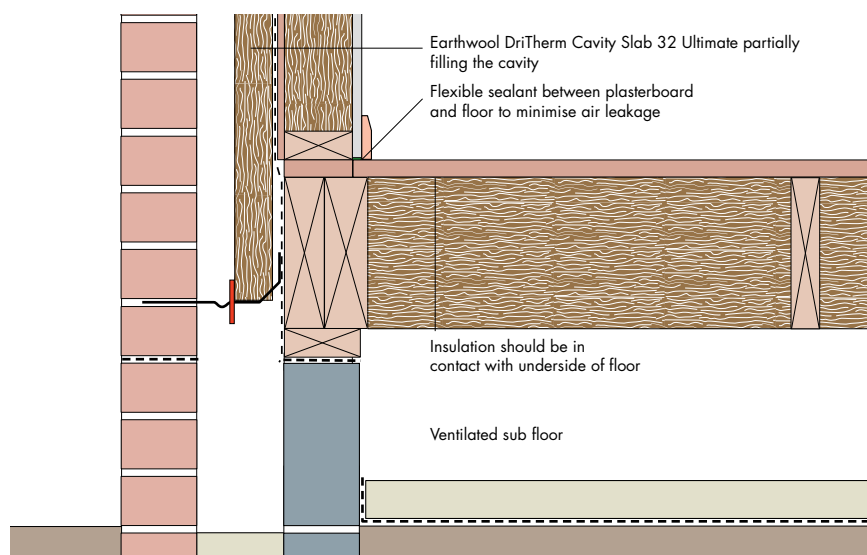


Table 9 - Typical U-values for Earthwool Twin insulated wall – partial fill

Thickness (mm)	Earthwool DriTherm Cavity Slab 32 Ultimate (mm)	Product	U-values (W/m ² K)	
			Masonry outer leaf	Low e service duct
140	65	Earthwool FrameTherm 32	0.17	0.16
		Earthwool FrameTherm 35	0.17	0.16
		Earthwool FrameTherm 38	0.18	0.17
		Earthwool FrameTherm 40	0.18	0.17
140	50	Earthwool FrameTherm 32	0.18	0.17
		Earthwool FrameTherm 35	0.19	0.17
		Earthwool FrameTherm 38	0.20	0.18
		Earthwool FrameTherm 40	0.20	0.18
90	65	Earthwool FrameTherm 32	0.21	0.19
		Earthwool FrameTherm 35	0.21	0.19
		Earthwool FrameTherm 38	0.22	0.20
		Earthwool FrameTherm 40	0.22	0.20
90	50	Earthwool FrameTherm 32	0.23	0.21
		Earthwool FrameTherm 35	0.24	0.21
		Earthwool FrameTherm 38	0.24	0.22
		Earthwool FrameTherm 40	0.25	0.22



Notes: Timber bridging is assumed as 15% and the stud depth is taken to be the same as the thickness of insulation specified. Thermal conductivity of timber studs is 0.12W/mK.

Typical specification

Twin insulation full-fill system:

External wall panels to be insulated between studs using Earthwool FrameTherm 32*/35*/38*/40*mm thick

(*Delete as appropriate)

Insulation to be cut as necessary and friction fitted between studs. The breather membrane stapled*/nailed* to the sheathing and extending below the lowest timber member (*Delete as appropriate)

Cavity formed between internal and external leafs to be fully filled with Earthwool DriTherm Cavity Slab 32 Ultimate.....mm thick. The lowest run of wall ties to be located at 600mm centres horizontally. Ties thereafter to be at 450mm centres vertically and at 600mm centres horizontally. All work to be in accordance with manufacturers instructions.

Twin insulated part fill system:

External wall panels to be insulated between studs using Earthwool FrameTherm Rolls* or Slabs32*/35*/38*/40*mm thick

(*Delete as appropriate)

Insulation to be cut as necessary and friction fitted between studs. The breather membrane stapled*/nailed* to the sheathing and extending below the lowest timber member (*Delete as appropriate).

Earthwool DriTherm Cavity Slab 32 Ultimate.....mm thick to be fitted against the breather membrane on the face of the sheathing and held back using insulation retaining clips fixed to the wall ties.

The lowest run of wall ties to be located at 600mm centres horizontally. Wall ties thereafter to be at 450mm centres vertically and at 600mm centres horizontally. All work to be in accordance with manufacturer's instructions.

Cavity barriers and fire stops should be installed as required to meet the Building Regulations.



Alternatively, consult the National Building Specifications, Standard version clause/clauses...

P10/210 and 310 and F30/10 and 150 and F30/12 and 155.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Timber frame walls

Blow in, between studs

Supafil Frame

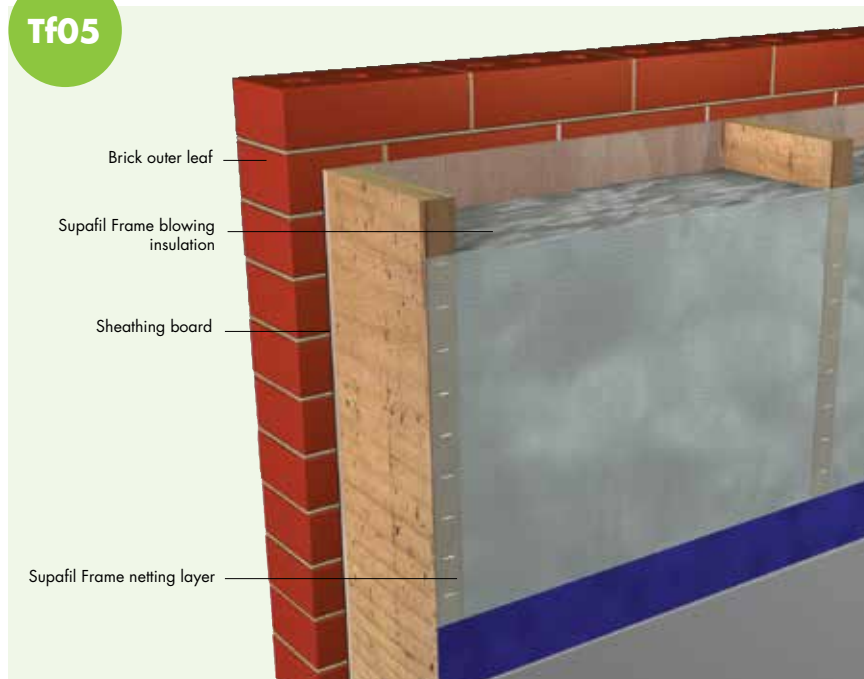


- Fully fills the timber stud void, preventing air movement and infiltration through or around the insulation
- Installed quickly between studs of any width with no product wastage
- Installed by trained and approved technicians monitored by the BBA

Supafil Frame

- Non-combustible with a Euroclass A1 reaction to fire rating
- A+ Generic BRE Green Guide rating
- Zero Ozone Depletion Potential (ODP)
- Zero Global Warming Potential (GWP)

Tf05



Products

Supafil Frame blowing insulation is an unbonded glass mineral wool which is blown into the cavities between the frames in timber frame walls. It requires no mixing on site and is dry when installed, adding no water to the building.

Earthwool DriTherm Cavity Slab 32 Ultimate is a lightweight, rigid slab of glass mineral wool with a water repellent additive. It is manufactured to fit between wall ties at standard vertical spacings.

The manufacture of both products has a very low impact on the environment.

Supafil Frame blowing insulation is the insulation component of the Supafil Frame Blow-in-Blanket System. This system is installed by a network of nationwide approved installers. The Blow-in-Blanket system also includes an insulation netting layer that retains the insulation in the frame cavity during the blowing process and before the wall is lined with the vapour control layer and plasterboard.

Typical construction

Inner leaf comprising 12.5mm standard plasterboard, vapour control layer, Supafil Frame Blow-in-Blanket System consisting of the Supafil Frame netting layer and Supafil Frame blowing insulation blown between studwork, plywood sheathing and a vapour permeable membrane. A 50mm cavity separates the timber frame from the outer leaf, typically of brick. Alternatively, the cavity can be partially filled with Earthwool DriTherm Cavity Slab 32 Ultimate. Other cladding options, such as tile hanging and timber boarding can also be utilised.

Installation

The Supafil Frame netting layer is stapled across the entire wall area creating discrete cavities of each stud void. A hole is then cut in the netting just large enough to accommodate the nozzle of the Supafil Frame Blow-in-Blanket System. The nozzle is inserted into the cut and the cavity is filled with Supafil Frame blowing insulation. The Supafil Frame Blow-in-Blanket System includes sensors that determine when the cavity has been filled to the required density and cuts off the flow automatically. Continue filling all the cavities until the entire wall area is insulated.

A vapour control layer is stapled to the studs across the inner face of the wall before fixing the plasterboard. The vapour control layer should be free from holes, any gaps should be made good with tears repaired and overlaps and apertures for services effectively sealed. Particular care is necessary around electrical boxes.

A vapour permeable membrane or a low emissivity vapour permeable membrane should be stapled or nailed to the sheathing board in accordance with manufacturers instructions.

It should be lapped so that each joint is protected, with upper layers lapped over lower layers to shed water away from the sheathing. Horizontal laps should be at least 100mm wide and the membrane should extend below the lowest timber member. Vertical laps should be at least 150mm and be staggered.

Earthwool DriTherm Cavity Slab 32

Earthwool DriTherm Cavity Slab 32 Ultimate can be used within the cavity in the same manner as shown in Tf03 on pages 142 - 143.



Installed by approved
installing technicians

Typical junction of external and party wall

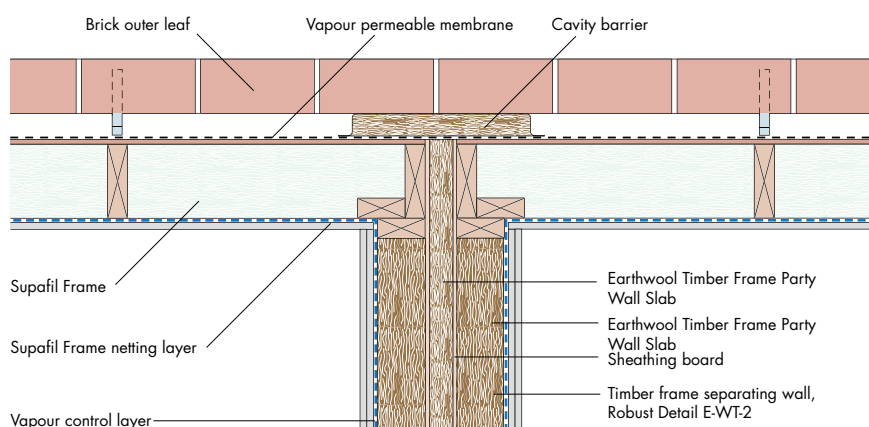


Table 10 - Typical U-values for timber frame walls with Supafil Frame

Product		U-values (W/m ² K)		
Timber studs filled with:	Thickness (mm)	Vapour permeable membrane	Masonry outer leaf	Tile/timber clad outer leaf
Supafil Frame	200	✓	0.21	0.22
	140	✓	0.27	0.29
	200	Low E	0.18	0.21
	140	Low E	0.23	0.28

Table 11 - Typical U-values for Supafil Frame Twin insulated wall - partial fill

Product		U-values (W/m ² K)			
	Timber stud (mm)	Earthwool DriTherm Cavity Slab 32 Ultimate (mm)	Service void	Masonry outer leaf	Tile/timber outer leaf
Supafil Frame	90	50	n/a	0.23	0.25
		65	n/a	0.21	0.22
		75	n/a	0.20	0.21
		85	n/a	0.19	0.19
	140	50	n/a	0.19	0.19
		65	n/a	0.17	0.18
		75	n/a	0.16	0.17
		85	n/a	0.15	0.16
	90	50	Low E	0.21	0.22
		65	Low E	0.19	0.20
		75	Low E	0.18	0.19
		85	Low E	0.17	0.18
	140	50	Low E	0.17	0.18
		65	Low E	0.16	0.16
		75	Low E	0.15	0.16
		85	Low E	0.14	0.15



Notes: Timber bridging is assumed as 15% and the stud depth is taken to be the same as the thickness of insulation specified. Thermal conductivity of timber studs is 0.12W/mK. Ventilated low emissivity airspace assumed to increase the R-value of the cavity to 0.29m²K/W and unventilated low emissivity airspace assumed to increase R-value of cavity to 0.77m²K/W.

Typical specification

External wall panels to be insulated between studs using Supafil Frame Blow-in-Blanket System. The vapour permeable membrane stapled*/nailed* to the sheathing and extending below the lowest timber member (*Delete as appropriate).

Cavity barriers and fire stops should be installed as required to meet the Building Regulations.

All external walls to be insulated during construction by partially filling the cavities with Earthwool DriTherm Cavity Slab 32 Ultimatemm thick.

The first run of wall ties to be located at 600mm centres horizontally at a level to be determined by the specifier. Subsequent runs of wall ties to be at not more than 900mm centres horizontally (or as otherwise required by the structure) and at 450mm vertically.

All work under construction must be protected overnight and during adverse weather conditions in accordance with BS 5628: Part 3: 2005.



Alternatively, consult the National Building Specifications, Standard version clause/clauses... P10/200 and 310.....

Knauf Insulation specification clauses can be downloaded from knaufinsulation.co.uk/nbs

Performance

Thermal performance

Supafil Frame blowing insulation has a thermal conductivity of 0.034 W/mK.

Earthwool DriTherm Cavity Slab 32 Ultimate has a thermal conductivity of 0.032 W/mK.

Fire performance

Supafil Frame blowing insulation and Earthwool DriTherm Cavity Slab 32 Ultimate are classified as Euroclass A1 to BS EN 13501-1.

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