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Certificate No C-9190-12
Issued December 3, 2012
Updated December 14, 2018

PRODUCT CERTIFICATE

NAME OF PRODUCT

HCONTROL HYBRID

MANUFACTURER

ACTIS SA
30 Avenue de Catalogne
11300 Limoux
France

PRODUCT DESCRIPTION

HCONTROL HYBRID is a vapour control multifoil product, which also acts as insulation material due to its thermal resistivity and high reflective properties.

HCONTROL HYBRID consists of layered metal-coated polyolefin films, polyolefin foam sheets and polyester wadding. The internal layers are fastened together by ultrasonic welding or by stitching and the surface layer, which is made of metal-coated reinforced polyolefin film, is glued on both sides of the product.

The width of HCONTROL HYBRID is 1,6 m and the thickness 45 mm. The product is delivered in rolls covering 10 m^2.

HCONTROL HYBRID is used as a vapour control product and thermal insulation on the warm side of the building fabric in roofs, walls and ceilings. The low emissivity of the two outer faces may contribute to the thermal performance of the construction build-up when accompanied by air gaps.

Manufacturer has CE-marked the product according to EN 13984.

CERTIFICATION PROCEDURE

This certificate is based on Eurofins Expert Services Oy certification criteria SERT R007 including initial type assessment of the product, initial inspection of the factory and the factory production control and continuous surveillance. The general certification procedures are based on the certification system of Eurofins Expert Services Oy.

The conditions of validity of this certificate are described in section 15.

TABLE OF CONTENTS

REGULATIONS, STANDARDS AND INSTRUCTIONS

1 Regulations

In the opinion of Eurofins Expert Services Oy, HCONTROL HYBRID, if used in accordance with the provisions of this certificate, will contribute to meet the relevant requirements of the Finnish building legislation as stated in the following:

782/2017 Ministry of the Environment *Decree on the moisture performance of buildings*

The requirements given in Finnish national decree 848/2017, Decree on the fire safety of buildings, shall be attested case-by-case basis, taking into account the properties and the use of the building. Reaction to fire characteristics of HCONTROL HYBRID have not been determined.

Finnish national decree 745/2017, *Decree on the structures and fire safety of small chimneys*, gives requirements for insulation of chimney penetrations. In this certificate, installation details for chimney penetrations are not presented.

Since the regulations are not harmonised, the user is recommended to consider separately the relevant national regulations regarding the intended use.

2 Standards and instructions

EN 13984 Flexible sheets for waterproofing. Plastic and rubber vapour control layers. Definitions and characteristics

EN 16012 Thermal insulation for buildings. Reflective insulation products. Determination of the declared thermal performance.

PRODUCT INFORMATION

3 Product description, marking and quality control

HCONTROL HYBRID is a multilayer reflective water vapour barrier and thermal insulation product consisting of coated and metal reinforced polyolefin films, polyolefin foam layers and layers of polyester fibre wadding. The low emissivity of the two outer faces contributes to the thermal performance of the product when accompanied by two airtight air gaps (see section 9 for more details concerning the thermal performance of the product).

HControl Hybrid is available with or without a built in self-adhesive flap, which facilitates sealing of joints between adjacent sheets.

Product dimensions are:

Property	HCONTROL HYBRID
Thickness	45 mm
Weight	850 g/m^2 ± 10 %
Roll length	6,25 m
Width	1600 mm

Internal quality control consists of process control, control of raw materials, visual inspection of the product and control of thickness, weight per square meter, tensile properties, thermal resistance and emissivity.

External quality control is carried out according to the contract on quality control between the manufacturer and Eurofins Expert Services Oy.

4 Delivery and storage on site

The product is delivered to site in rolls of 10 m². Each roll is labelled with the product name, the name of the manufacturer, the dimensions of the product and manufacturing date.

The product shall be stored in clean and dry conditions in such a way that dirt and dust cannot adhere to the product surfaces. The product shall be protected from being dropped or crushed. It shall also be protected from sunlight exposure, direct heat sources, sparks and open flames, and it shall be stored away from flammable materials, e.g. solvents.

DESIGN INFORMATION

5 General

The design information given in this certificate is based on the assumption that the structural solutions, fastening methods and other initial data are accordant to this certificate and the given requirements, instructions and standards are followed.

6 Installation

HCONTROL HYBRID can be installed on both sides of rafters and/or timber studs and/or joists (see more details in Appendix A). Installation can be performed in ordinary temperature conditions for building works.

HCONTROL HYBRID can be installed and fixed vertically or horizontally. All joints shall have an overlap of at least 50 mm when installed vertically and 100 mm when installed horizontally. To prevent water and air infiltration, all joints shall be sealed with a proprietary ACTIS reflective tape or by using the built in sealing flap, if that version of the product is used. The product can also be butt-jointed and sealed with the recommended ACTIS reflective tape.

Joints around openings such as roof windows and ventilation pipes shall be sealed with the adhesive tape recommended for the product. The joint between walls and the floor shall be sealed with a sealing mastic.

HCONTROL HYBRID must not be in contact with a chimney, fire or any other ignition source. Finnish national decree 745/2017 defines distances from chimney's external surface that shall be insulated with class A1 building material.

In the case of horizontal installation, cross battens or noggins between rafters are recommended. The product overlapping is made by placing the upper layer over the lower layer. After that, the product is stapled or nailed at 50 mm increments on to the cross battens. To ensure effective overlap jointing of HCONTROL HYBRID, corrosion protected staples or nails should be used. After stapling or nailing, the overlaps must be covered with a reflective adhesive tape so that it covers the staples or nails to ensure a hermetic seal. In the case of horizontal installation intermediate battens or noggins are recommended to support overlap joints.

A reflective adhesive tape should also be used when a joint is made between HCONTROL HYBRID and another building element such as a wall or floor.

All finished edges should be folded under by minimum 50 mm, stapled at 50 mm increments and secured with a final batten.

Minor tears in the product should be repaired with reflective adhesive tape.

Sharp blade or scissors are recommended for cutting HCONTROL HYBRID to the desired dimensions.

7 Structural performance

HCONTROL HYBRID is a non-load bearing product. It will resist normal loads associated with installation and use. The product does not withstand walking-related loads.

8 Performance in relation to moisture

HCONTROL HYBRID is water vapour tight and acts as a vapour barrier. The water vapour permeability value is presented in Table 2.

HCONTROL HYBRID is watertight and it resists accidental wetting. Continuous exposure to wetting for more than two days should be avoided.

9 Performance in case of fire

Finnish national decree 848/2017, Decree on the fire safety of buildings, gives requirements for fire safety of buildings and building products.

Reaction to fire class of HCONTROL HYBRID has not been determined.

The installation of HCONTROL HYBRID must not be carried over junctions between roofs and compartment walls requiring minimum period of fire resistance. A safe distance from a chimney or flue must be made using A1 material as specified in decree 848/2017.

10 Thermal insulation performance

The thermal performance and outer surfaces emissivity of HCONTROL HYBRID has been determined according to standards EN ISO 8990 and EN 16012. The results are given in Table 1.

Table 1. Thermal performance of HCONTROL HYBRID

Characteristics		**Unit**	**Value**	**Standard**
Declared Emissivity		-	0,06	EN 16012
Declared R-value	R value of HCONTROL HYBRID insulation system with unvented air cavities of 25 mm on both sides of the product	m^2K/W	3,2	EN ISO 8990 EN 16012
	Core R value of HCONTROL HYBRID	m^2K/W	1,9	

The ultimate thermal performance of the product will depend on the construction of the roof or wall on which it is installed. It may be necessary to combine HCONTROL HYBRID with other insulation products to achieve the design U-value required.

Calculations of the thermal transmittance (U-value) of specific roof or wall constructions incorporating HCONTROL HYBRID insulation should be carried out in accordance with EN ISO 6946 and using the values given in Table 1.

When compressed between rafters/studs and battens, the compressed nominal thickness of HCONTROL HYBRID has been determined as minimum 9 mm. The related R-value of the 9 mm compressed product is 0,33 m^2K/W (determined by the manufacturer in accordance with EN 12667).

11 Durability

When installed as specified, HCONTROL HYBRID will have a working life equivalent to that of the structure in which it is incorporated.

Considering the function as vapour barrier, ageing behaviour of HCONTROL HYBRID has been tested according to the requirements of the standard EN 13984, "Flexible sheets for waterproofing. Plastic and rubber vapour control layers. Definitions and characteristics". The results are given in Table 2.

INSTRUCTIONS FOR INSTALLATION AND USE

12 Manufacturer's instructions

Installation is performed according to the manufacturer's instructions. The instructions shall be carefully followed in order to achieve the intended functional performance of the construction.

TECHNICAL SURVEY

13 Initial assessment

Eurofins Expert Services Oy has performed evaluation based on manufacturer's documentation (declaration of performance) and test results. The characteristics of HCONTROL HYBRID are presented partly in the text and partly in Table 2.

Table 2. Characteristics of HCONTROL HYBRID

PROPERTY	TEST METHOD	UNIT	VALUE
Thickness (25 Pa load)	EN 823	mm	45
Weight/m²	EN 1849-2	g/m²	850 ± 10 %
Length	EN 1848-2	m	6,25
Width		m	1,6
Declared Thermal Performance			
R-value of HCONTROL HYBRID + 2 air cavities	EN ISO 8990	m²K/W	3,2
R-value of material			1,9
Declared Emissivity	EN 16012		0,06
Tensile Strength*			
Longitudinal direction	EN 12311-1, EN 13859-1 Annex A	N/50mm	> 300
Transversal direction		N/50mm	> 200
Elongation (longitudinal)		%	> 20
Elongation (transverse)		%	> 5
Resistance to tearing, nail shank*			
Longitudinal direction	EN 12310-1, EN 13859-1 Annex B	N	> 150
Transverse direction		N	> 150
Joint strength*	EN 12317-2	N/50mm	50
Water vapour transmission*			
Permeability (W)	EN 1931 set C	kg/m²sPa	$7{,}5 \cdot 10^{-13}$
Vapour resistance (Z)		MNs/g	≥ 1000
Diffusion eq. air layer thickness (s_d)		m	≥ 200
Watertightness*	EN 1928 method A (2 kPa water pressure / 24 h)	-	Watertight
Air permeability	EN 12114		Airtight
Resistance to Impact	EN 12691, method A	Drop height, mm	300
Reaction to fire*			No performance determined
After ageing			
Water vapour transmission			
Permeability (W)	EN 1931 set C	kg/m²sPa	$6{,}7\ 10^{-13}$
Vapour resistance (Z)		MNs/g	≥ 1000
Diffusion eq. air layer thickness (s_d)		m	≥ 200

* Declared by the manufacturer in declaration of performance, DoP

VALIDITY OF THE CERTIFICATE

14 Validity period of the certificate

This certificate is valid until December 13, 2023.

The validity of the certificate can be confirmed at Eurofins Expert Services Oy web pages.

15 Conditions of validity

The certificate is valid assuming that no fundamental changes are made to the product, and that the manufacturer has a valid contract on quality control.

16 Other conditions

The references made in this certificate to standards and instructions are valid in the format used at the time the certificate was signed.

The recommendations in this certificate concerning the safe use of this product are minimum requirements that shall be satisfied when using the product. The certificate does not override current or future requirements imposed by laws and statutes. In addition to the issues presented in this certificate, design, manufacturing and use shall follow appropriate construction methods.

The manufacturer is in charge of the product's quality and factory production control. In awarding this certificate, Eurofins Expert Services Oy does not bind itself to indemnification liability concerning personal injury or other damage that may directly or indirectly result from using the product described in this certificate.

This updated certificate C-9190-12 (issued first on December 3, 2012) has been granted as described above to ACTIS SA.

On behalf of Eurofins Expert Services Oy on December 14, 2018

Tiina Ala-Outinen
Business Unit Manager

Tiina Tirkkonen
Senior Expert

This document has been signed electronically

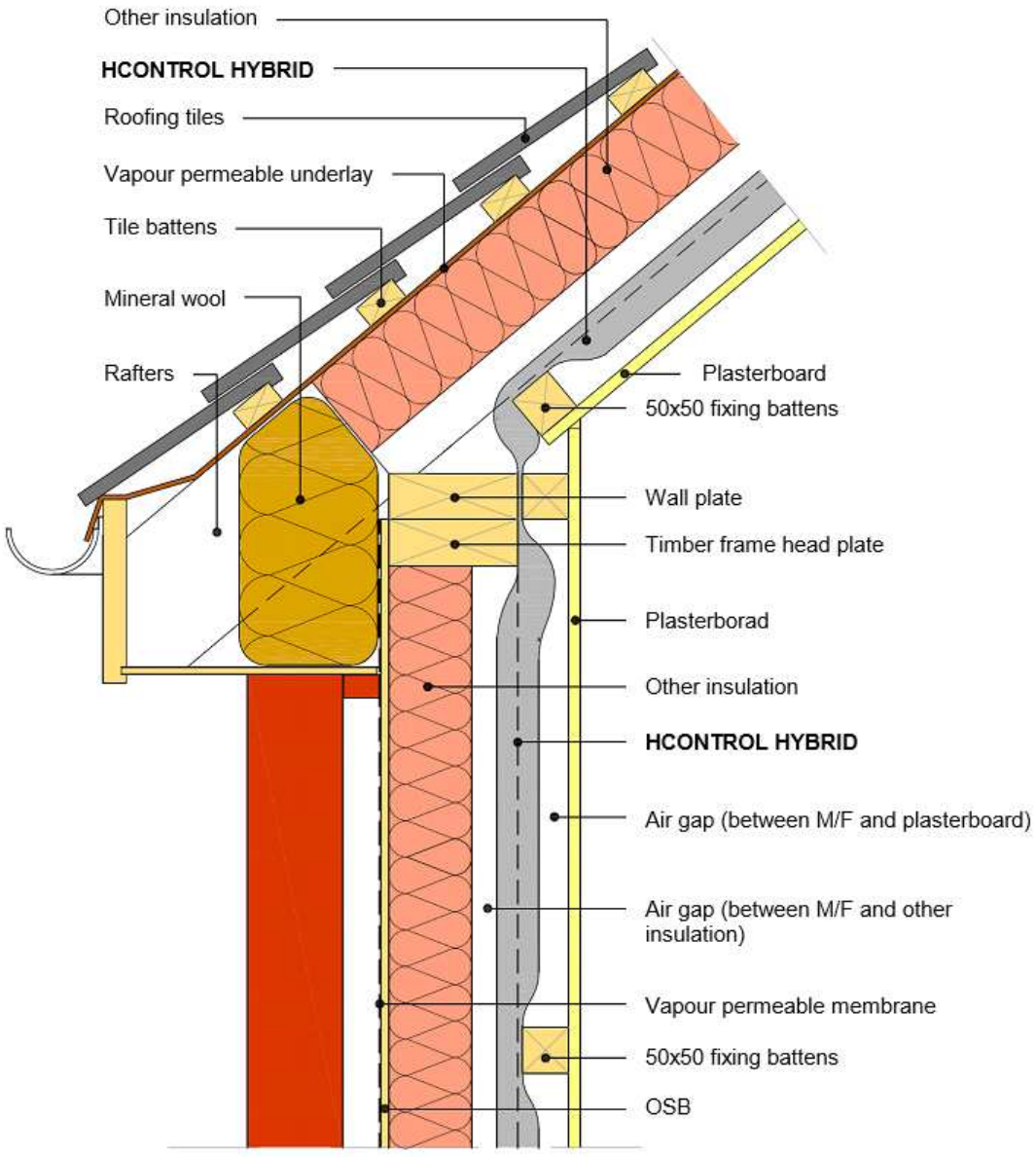
APPENDIX A: Insulation procedure

1. Installation of HCONTROL HYBRID in roof systems

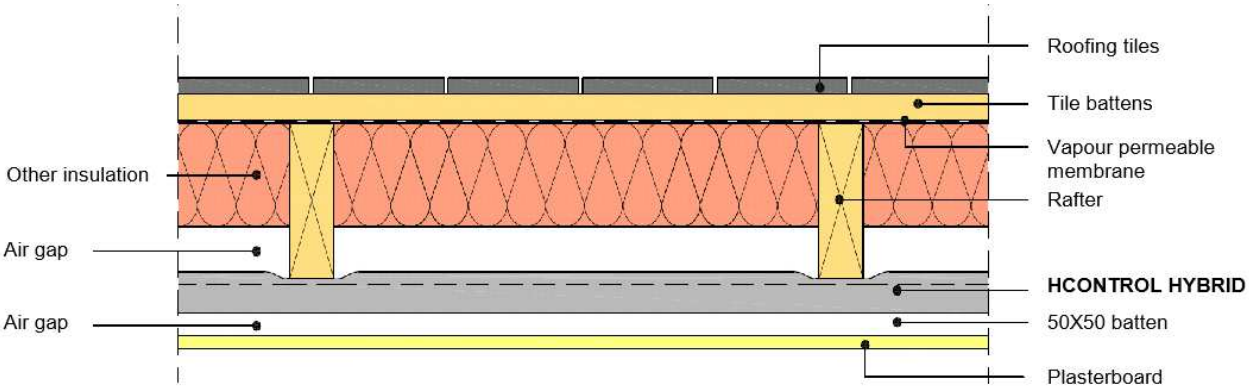
The product is for use over and / or under rafters.

1.1 Installation of HCONTROL HYBRID under rafters

When installed under rafters, HCONTROL HYBRID also performs as a vapour barrier in the roof system. The use of a vapour permeable roof tile underlay in conjunction with HCONTROL HYBRID is then recommended to ensure a non-ventilated air gap above the product. Typical examples of HCONTROL HYBRID installation under rafters is given in Figure 1 (a, b) and Figure 2 (a, b).



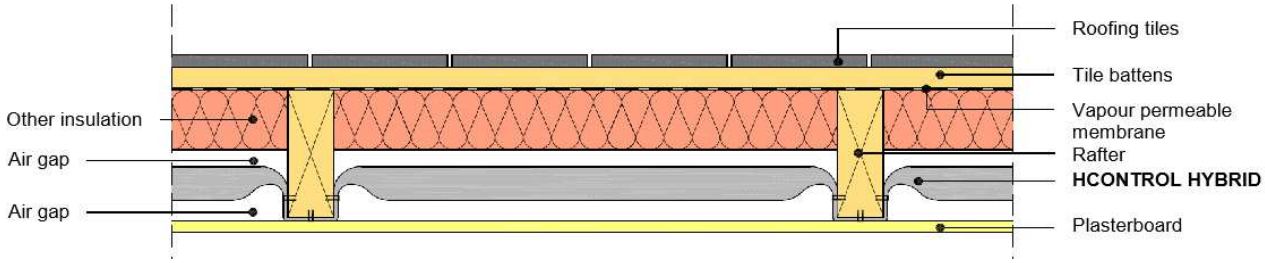
a) Eaves detail - under rafter and timber frame wall with additional insulation



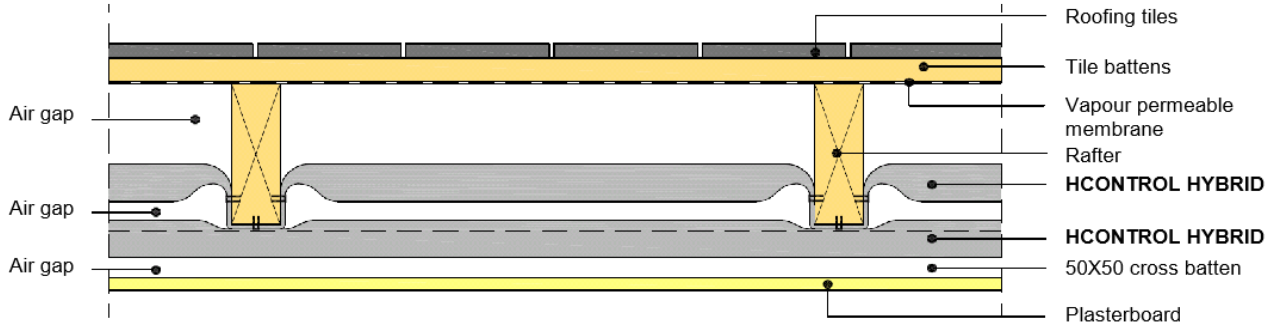
b) under rafter installation

Figure 1: Installation procedure of HCONTROL HYBRID under rafters

If required, HCONTROL HYBRID can be used in conjunction with another insulation product to achieve the design U-value. In case of using HCONTROL HYBRID in conjunction with a fibrous insulation, if the fibrous insulation includes an integrated vapour barrier layer, then that vapour barrier layer must be slashed or removed.



a) Under rafter installation with no battens

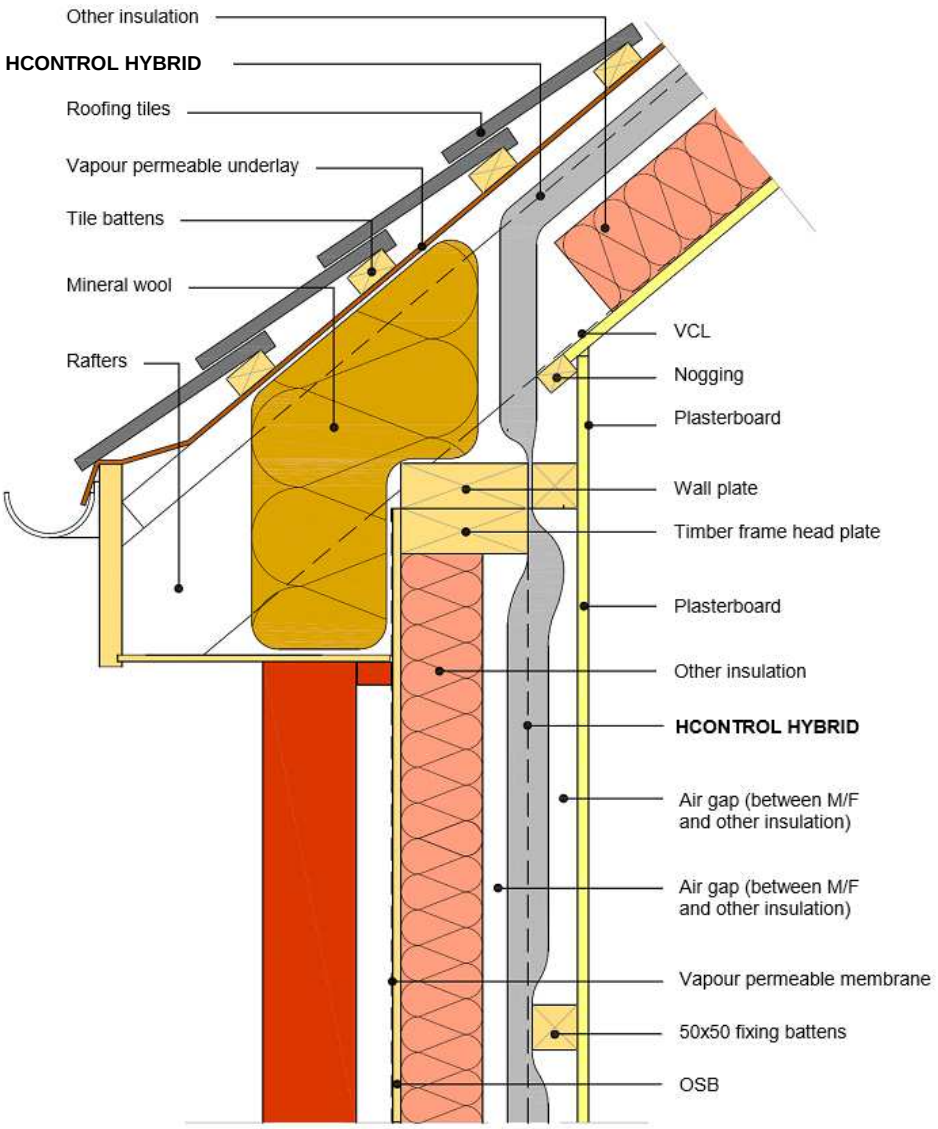


b) Two layer installation

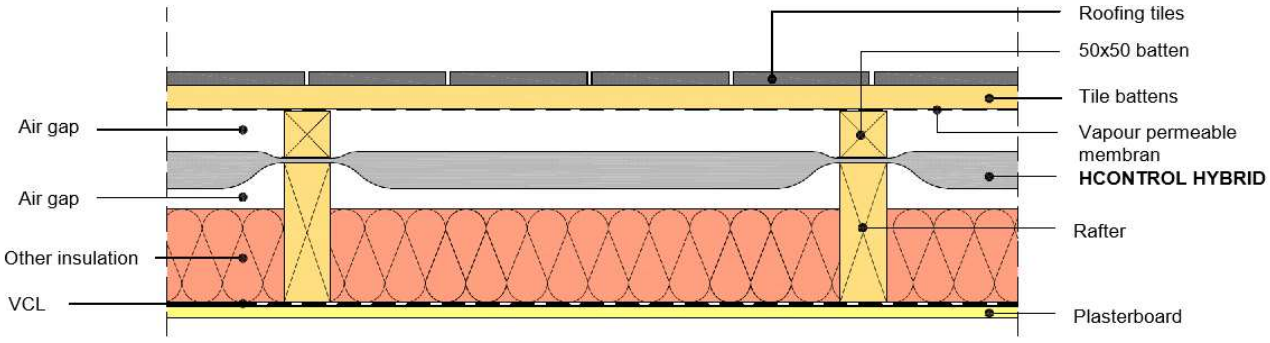
Figure 2. Installation of HCONTROL HYBRID below rafters a) with no battens and b) in two layers

1.2 Installation of HCONTROL HYBRID over the rafters

HCONTROL HYBRID can also be installed over the rafters. The use of a vapour permeable roof tile underlay in conjunction with HCONTROL HYBRID is then recommended to ensure a non-ventilated air gap above the product.



a) Eaves detail - over rafter and timber frame wall with additional insulation



b) Over rafter installation

Figure 3. Installation of HCONTROL HYBRID over the rafters

If required, HCONTROL HYBRID can be used in conjunction with another insulation product to achieve the design U-value.

2. Installation of HCONTROL HYBRID in wall systems

The product can be installed on timber studs or battens either horizontally or vertically.

All joints must have an overlap of at least 50mm when installed vertically and 100mm when installed horizontally. The product is fastened with corrosion-protected nails or staples and it must be sealed with the reflective tape recommended for the product. To prevent water and air infiltration, all joints shall be sealed with a proprietary ACTIS reflective tape or by using the built in sealing flap, if that version of the product is used. The product can also be butt-jointed and sealed with the recommended ACTIS reflective tape.

2.1 Installation of HCONTROL HYBRID on timber frame walls

HCONTROL HYBRID also performs as a vapour barrier in the wall system.

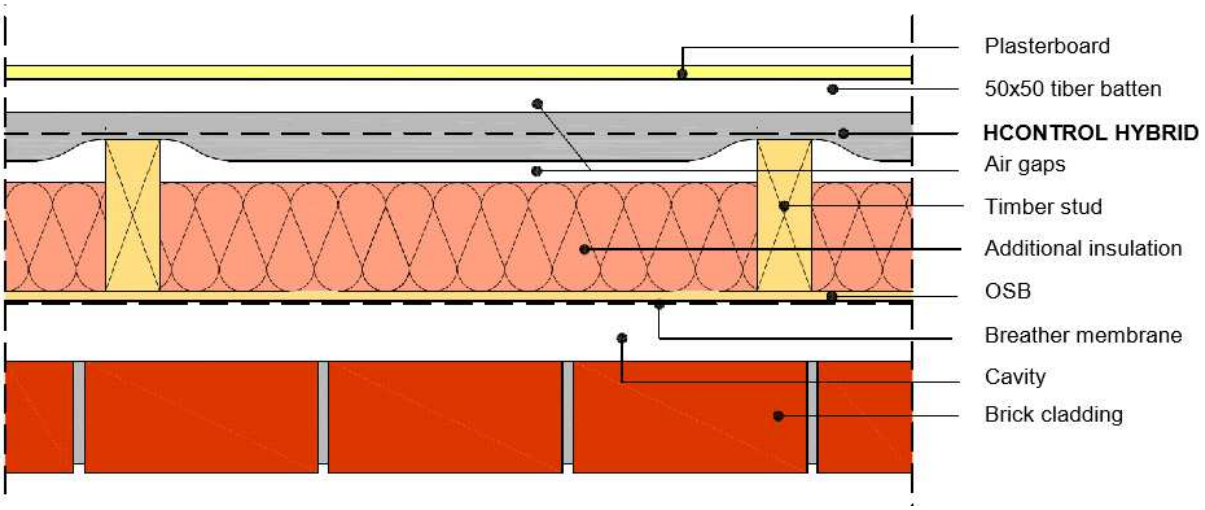


Figure 4. Installation of HCONTROL HYBRID on timber frame wall

If the design U-value is not achieved, HCONTROL HYBRID can be used in conjunction with another insulation product. In case of using HCONTROL HYBRID in conjunction with a fibrous insulation, if the fibrous insulation integrates a vapour barrier layer, then that vapour barrier layer must be slashed or removed. HCONTROL HYBRID must be always on the inner side of the wall.

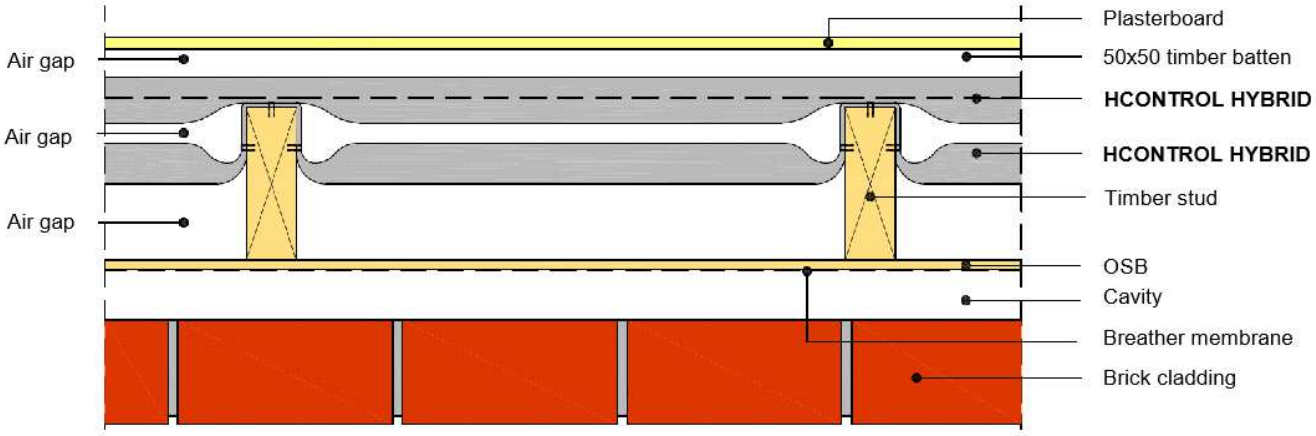


Figure 5. Installation of two layers of HCONTROL HYBRID on timber frame wall

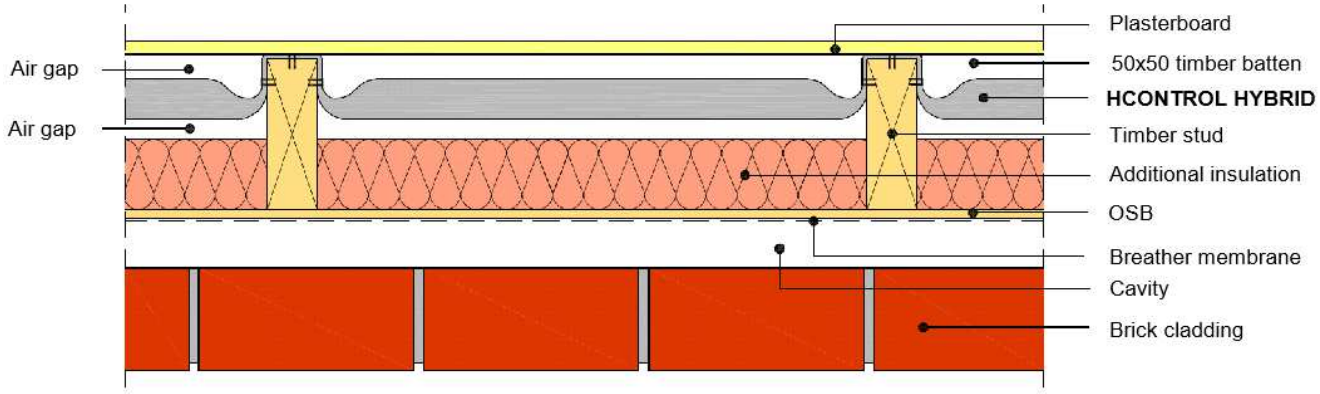


Figure 6. Installation of HCONTROL HYBRID with no battens on timber frame wall

2.2 Installation of HCONTROL HYBRID on masonry walls

The installation of HCONTROL HYBRID on masonry walls is preceded by the installation of support battens (see Figure 7).

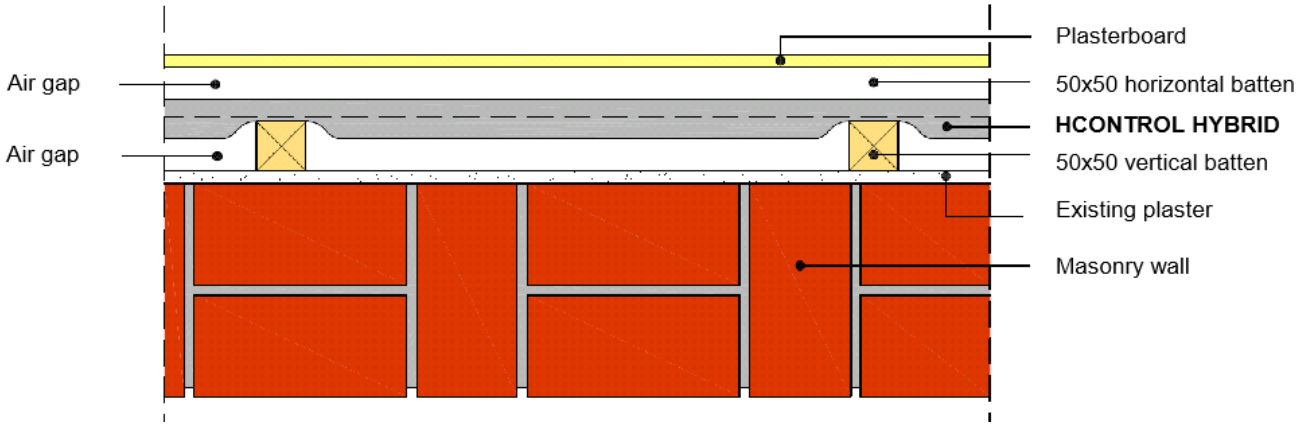


Figure 7. Installation of HCONTROL HYBRID on masonry wall

3. Installation of HCONTROL HYBRID in floor systems

The product can be installed in suspended timber floors across timber joists.

All joints must have an overlap of at least 50 mm. The product is fastened with corrosion-protected nails or staples. To prevent water and air infiltration, all joints shall be sealed with a proprietary ACTIS reflective tape or by using the built in sealing flap, if that version of the product is used. The product can also be butt-jointed and sealed with the recommended ACTIS reflective tape.

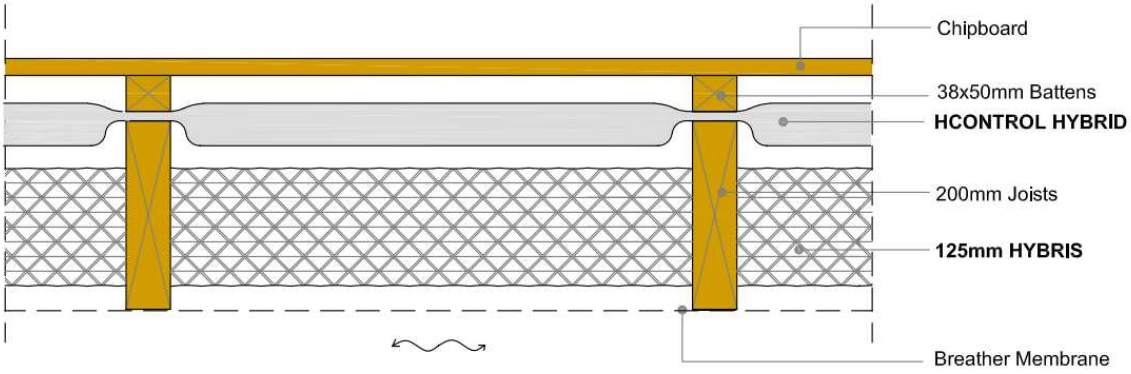


Figure 8. Installation of HCONTROL HYBRID in floor systems