C12 insulation

Independent Internal Wall Insulation Systems

technical manual

(England & Wales)

version 1.0.0

publication date: March 2025

Independent Internal Wall Insulation (IWI) Systems

technical manual

version: **1.0.0**
published: **March 2025**

Contents

Contents

technical services
technical@c12insulation.co.uk

Overview

The C12 Independent Internal Wall Insulation (IWI) systems are designed to offer an innovative and highly compliant solution for the internal insulation of solid masonry and cavity walls.

Unique partnerships

We have partnered with two of the leading insulation and drywall system manufacturers in the U.K. - **Superglass Insulation** & **Siniat** to bring to market an intelligent IWI system that is unparalleled in the industry.

Complete Fire Safety

All specified components used in the system have a fire classification of either Class A1 or A2-s1,d0 (plasterboard elements only) and they are manufactured to the highest British and harmonised standards (BS EN).

Complete Compliance

The IWI system has been designed to ensure complete compliance with the The Building Regulations 2010 including Approved Documents 7 (2013), B (2019), C (2013) & L (2021).

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

25 Year System Warranty

Approved installers can obtain a 25 year sysem warranty for our IWI systems. This must be applied for after the installation is complete.

Insurance backed guarantee through Qualitymark Protection

As an accepted System Designer with Qualitymark Protection, approved installers can also apply for 25 year insurance backed guarantees on every system installed.

TrustMark Registered Businesses are expected to provide their customers with the appropriate level of financial protection. Qualitymark Protection is approved by TrustMark to offer approved financial protection mechanisms in the form of insurance backed guarantees.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Safe to use under Government Schemes

To tackle fuel poverty and decarbonise the U.K.'s housing stock, the Government has several schemes. These include the Energy Company Obligation (ECO4), the Great British Insulation Scheme (GBIS) and the Social Housing Decarbonisation Fund (SHDF).

TrustMark Statement on Products

The quality assurance of any work completed under these schemes is overseen by TrustMark, which is the only government endorsed quality scheme for domestic retrofits.

Any product installed within ECO or a Government scheme, that requires work to be completed in accordance with PAS 2035 must have:

» suitable financial protection to protect the consumer, and
» meet the requirements specified in the TrustMark Framework Operating Requirements.

4 Key Principles on Product Suitability

Section 15 of the TrustMark Framework Operating Requirements requires 4 key principles on product suitability to be adhered to, called the **Key Principles of Product Suitability.**

Principle 1 (15.1.1)
All goods and services supplied are in line with the Consumer Rights Act 2015.

Principle 2 (15.1.2)
All products meet the relevant safety standards.

Principle 3 (15.1.3)
All products and systems meet the relevant requirements of the Building Regulations/Standards as applicable in the respective geographical region.

Principle 4 (15.1.4)
All products meet their product claims and are suitable for the applications they are being proposed for.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Statement of compliance with Section 15.1

C12 Insulation have released the following statement on the suitability of their Independent IWI Systems for use under Government Schemes in compliance with section 15.1 of the TrustMark Framework Operating Requirements.

Statement of Compliance

C12 Independent Internal Wall Insulation Systems comply with the key requirements and principles of section 15.1 of the TrustMark Framework Operating Requirements

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Compliance

Compliance with all applicable guidance, legislation and industry standards is at the heart of the design and development of C12 Insulation's products. The C12 Independent IWI Systems are compliant with the following regulations, standards and best practice guidance.

Key Documents

Retrofit Internal Wall Insulation: Guide to Best Practice (BEIS, Sept 2021)

The Building Regulations 2010 including Approved Documents 7 (2013), B (2019), C (2013) & L (2021)

BS EN 13501-1:2018 & BS EN 13501-2:2023 Fire classification of construction products and building elements

BS EN 14195:2014 Metal framing components for gypsum board systems. Definitions, requirements and test methods

BS 5250:2021 Management of moisture in buildings

The Building Regulations 2010

Our IWI systems are compliant with the following essential sections of the Building Regulations 2010.

The Building Regulations 2010 (England and Wales) (as amended)

Requirement: C2(c) Resistance to moisture

Requirement B2: Internal fire spread (linings)

Requirement B3: Internal fire spread (structure)

Requirement: L1(a)(i) Conservation of fuel and power

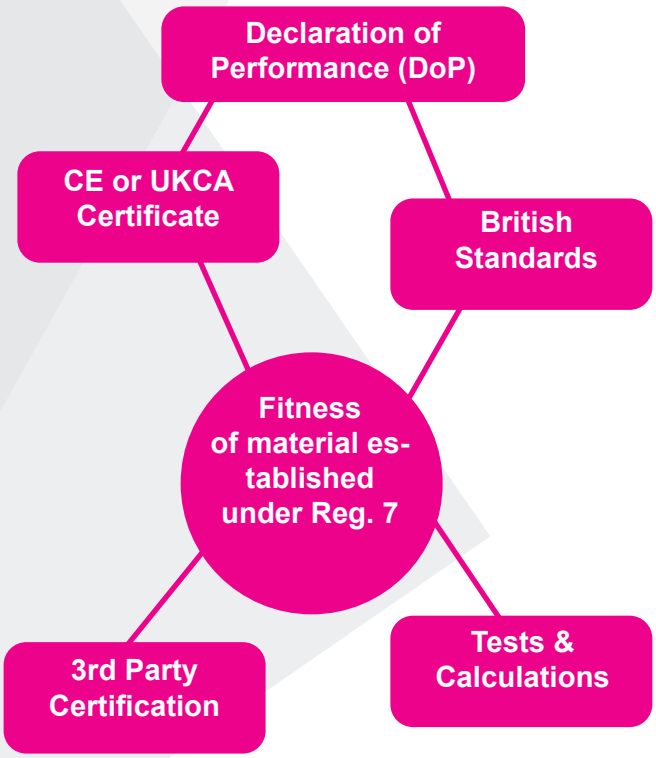
Regulation: 7 Materials and workmanship

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Regulation 7 use of proper materials

Regulation 7 of the Building Regulations 2010 states that “Building work shall be carried out - (a) with adequate and proper materials.” (Regulation 7.1(a))



Ways of establishing the fitness of materials

Approved Document 7 (2013) explains that the suitabillity of a material for specific building work can be assessed in four ways (para 1.2), shown below.

CE or UKCA Certificate

Products that have a CE or UKCA marking show that it meets the standard of a particular harmonised European standard or British designated standard (para 1.3). This alone does not necessarily indicate that the material is suitable for building work (para 1.4).

The Declaration of Performance (DoP) of the material should also be inspected to ensure the material is suitable for the particular building work that is being carried out.(para 1.5).

British Standards

Where a product has been made and assessed in accordance with one or more British Standards, this can also show the product is suitable for its intended use (para 1.13).

Tests & Calculations

Tests can be performed on the materials to ascertain their fitness e.g. fire classification testing. Any testing should be performed by laboratories that are UKAS or equivalent accredited (para 1.17).

Independent Certification Schemes

Third party certification by organisations like the BBA or KIWA can also be used in addtion to CE or UKCA marking (para 1.15).

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Our IWI system is a fit and proper material under Reg. 7

The route to compliance with Regulation 7 for our IWI systems are through CE and UKCA marking combined with manufacturer Declarations of Performance (DoP).

All components of our IWI systems have a CE or UKCA Certificate that shows compliance with a European harmonised or British designated standard. Each component also has a DoP that shows it is adequate and proper for its intended use under Regulation 7.

UKAS accredited laboratory tested

All components of the system have been given a fire classification using UKAS accredited laboratories. The systems with 30 minutes and 60 minutes fire resistance ratings have also been rigorously tested using UKAS accredited laboratories.

Harmonised Standards & British Standards

Below is a list of some of the standards our IWI system has been tested to:

BS EN 520:2004+A1:2009
BS EN 13501-1:2018
BS EN 13501-2:2023
BS EN 14195:2014
BS EN 13162:2012 + A1:2015

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

BEIS's Retrofit Internal Wall Insulation: Guide to Best Practice

The Retrofit Internal Wall Insulation: Guide to Best Practice (BEIS, Sept 2021) provides a definitive best practice guide for the design and installation of internal wall insulation on dwellings in the U.K.

Our IWI Systems comply with all aspects of this guidance as the table below shows

Standard	Best Practice Guidance	Our IWI Systems' Standard	Does our IWI System comply?
Thermal Bridging	Clause 31: All thermal bridges should be considered and assessed when installing internal wall insulation. Clause 33: All thermal bridges should be mitigated to ensure a surface temperature factor (Frsi) > 0.75.	» Architectural junction details of the system are designed to mitigate thermal bridging. » The innovative internal "cavity" space created by the system ensures a continuous layer of insulation on the cold side. » All metal structural stud & track framework elements are thermally broken to mitigate fully against any thermal bridging. » Thermal conductivity of all thermal elements is universal and continuous across the system.	 
Airtightness layer	Clause 36: An air barrier shall be installed in all internal wall insulation systems on the warm side. Clause 37: Any air barrier shall be specified such that is consistent with the moisture strategy of the system as outlined above.	» Airtight membranes have been carefully selected and are recommended for use with the system. These guarantee a resistance to air penetration of between 0.01 m³/(m² h 50Pa) and 2.0 m³/(m² h 50Pa) for vapour open systems and to >2000s for vapour closed systems (membranes to be specified by others). » Recommended airtight membranes include both vapour open and vapour closed (AVCL) types (membranes to be specified by others).	 

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Standard	Best Practice Guidance	Our IWI Systems' Standard	Does our IWI System comply?
Airtightness layer	Clause 38: Air barriers shall be designed to continue around junctions, edges and corners ... proprietary airtightness tapes, adhesives or paints shall be specified that are appropriate to the situation.	» We have specified a range of proprietary airtightness tapes and adhesives for use with the system. Including the innovative *FlexWrap* tape which is a flexible self-adhesive flashing tape which creates airtight and watertight seals around windows, doors, chimney breasts, pipe penetrations and any custom shapes.	
Moisture Management	Clause 40: The internal wall insulation must consider the current moisture strategy of the Building. Clause 45: A moisture open internal wall insulation build-up is recommended in the insulation of solid walls.	» We recommend that site/property specific Hygrothermal modelling should be used to assess moisture risk as advised in BS5250 prior to installing internal wall insulation. This should inform decisions about the specification of the system to be installed, membrane type, wall finish etc. » The C12 Independent IWI system is a non-capillary active system that is inherently moisture open and so is highly recommended for the internal insulation of solid walls. Recommended airtightness membranes have been selected that are moisture open with water vapour transmission (sd) values as low as 0.005 (m) (depending on the choice of membrane, others to specify). » For vapour closed systems we recommend the installation of the DuPont AirGuard A2 FR AVCL which is A2 fire rated.	  

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Standard	Best Practice Guidance	Our IWI Systems' Standard	Does our IWI System comply?
Moisture Management	Clause 52. BS5250 Code of practice for control of condensation in buildings should be adhered to in the assessment, design and implementation of IWI.	» The C12 Independent IWI system has been designed to allow full compliance with the BS5250 Code of practice for control of condensation in buildings.	
Fire rating	Clause 28, Table 2: Do the materials have the appropriate fire rating? Consider if the materials have the correct fire classification for the location and overall building height.	» All specified components of the C12 Independent IWI system have a fire classification of either Class A1 or A2-s1,d0.	

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Fire protection & performance

C12 are committed to using the latest standards to reduce the level of risk in installing internal wall insulation and to meet stringent fire regulations. This approach helps ensure that our IWI systems are one of the safest parts of a building specification, offering 'built-in' fire resistance and reducing overall project risk.

Approved Document B of the Building Regulations, Appendix B: Performance of materials, products and structures, requires two types of fire testing on products and materials:

1) Reaction to fire; and
2) Resistance to fire.

The difference between a product's reaction to fire and its resistance to fire is explained below. All fire reaction data and fire resistance performances must be 3rd Party classified using the official EN classification standard, BS EN 13501-1 or BS EN 13501-2 or using another accepted BS EN standard.

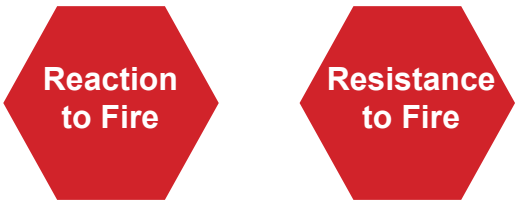
Reaction to Fire Classification

All specified product elements of the C12 Independent IWI system have been tested to either BS EN 13501-1:2018, BS EN 13501-2:2023 (Fire classification of construction products and building elements) or BS EN 14195:2014 (Metal framing components for gypsum board systems. Definitions, requirements and test methods) standards.

In line with our approach to managing fire risk, all specified components of our IWI system have a reaction to fire classification of Class A1 or Class A2-s1,d0 for plasterboard finishes (the highest fire classification possible for gypsum plasterboard).

It is recommended that all other non-specified elements of our system have a minimum reaction to fire classification of Class A2 or as required by the Building Regulations for that setting (finish gypsum boards that are specified in the fire-rated systems have a mandatory classification of Class A2).

All specified components of our IWI system have a reaction to fire classification of Class A1 or Class A2-s1,d0 (plasterboard elements only)



Product fire testing required by Approved Document B

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Requirement B2: Internal fire spread (linings)

Requirement B2 of Schedule 1 to the Building Regulations 2010 requires that in order to inhibit the spread of fire within the building, the "internal linings shall: (a) adequately resist the spread of flame over their surfaces; and (b) have, if ignited, either a rate of heat release or a rate of fire growth, which is reasonable in the circumstances."

Requirement B2(2) defines "internal linings" as "the materials or products used in lining any partition, wall, ceiling or other internal structure."

Table 4.1 of Approved Document B (Volume 1, 2019 edition) requires the following minimum reaction to fire classifications for internal linings in dwellings.

Table 4.1 Classification of linings

Location	Classification
Small rooms of maximum internal floor area of 4m²	D-s3, d2
Garages (as part of a dwellinghouse) of maximum internal floor area of 40m²	
Other rooms (including garages)	C-s3, d2
Circulation spaces within a dwelling	
Other circulation spaces (including the common areas of blocks of flats)	B-s3, d2[1]

NOTE:

1. Wallcoverings which conform to **BS EN 15102**, achieving at least class C-s3, d2 and bonded to a class A2-s3, d2 substrate, will also be acceptable.

All components of our IWI system have either an A1 or A2-s1,d0 reaction to Fire Classification which complies with Requirement B2 of Schedule 1 to the Building Regulations 2010

The minimum **reaction to Fire** classification for products used in wall linings required by Approved Document B is **D-s3, d2**.

Resistance to Fire

Common to all components of the C12 Independent IWI System is the provision for adequate fire resistance. Fire resistance is a measure of a structural element's (1) resistance to collapse (loadbearing capacity), (2) resistance to fire penetration (integrity), (3) resistance to the transfer of excessive heat (insulation). Fire resistance is measured in minutes.

To determine an element's fire resistance, a 3rd party UKAS Accredited notified laboratory conducts the test to the EN 1364-1 standard 'Fire resistance tests for non-loadbearing elements – Walls'. Approved Document B requires that fire resistance of building elements should be classified in accordance with BS EN 13501-2 (national classification to BS 476 is also acceptable).

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

All C12's fire-rated IWI systems have an accompanying 3rd party classification report to this standard. They are rated as either 30 minute or 60 minute systems.

The test report contains:

- Details of test build-up
- Test results
- Fire classification
- System extensions allowed

Our fire-rated IWI systems have a resistance to fire of EI 30 minutes or EI 60 minutes classified to BS EN 13501-2

Promat passive fire protection technology

Both the EI 30 minutes and EI 60 minutes fire rated IWI systems incorporate **Promat** passive fire protection technology. Promat are one of the leading passive fire protection specialists in the U.K.

Promat

Minimum Periods of Fire Resistance

Table B3 and Table B4 of Approved Document B (Volume 1, 2019 edition) provides minimum periods of fire resistance for elements of structure of dwellings and for residential dwellinghouses. Where the IWI system is part of an element of the building's structure, it is recommended that these minimum periods of fire resistance should be adhered to when deciding which fire-rated Independent IWI system to install. In particular, the height of the dwelling (height (m) of top floor above ground) is determinative of whether to install a 30 minute or 60 minute fire-rated system. Basements also require a minimum period of fire resistance

Table B4 Minimum periods of fire resistance

Purpose group of building	Minimum periods of fire resistance[1] (minutes) in a:						
	Basement storey* including floor over		Ground or upper storey				
	Depth (m) of the lowest basement		Height (m) of top floor above ground, in a building or separated part of a building				
	More than 10	Up to 10	Up to 5	Up to 11	Up to 18	Up to 30	More than 30
1. Residential:							
a. Block of flats							
– without sprinkler system	90 min	60 min	30 min†	60 min+§	Not permitted[2]	Not permitted[2]	Not permitted[2]
– with sprinkler system[3]	90 min	60 min	30 min†	60 min+§	60 min+§	90 min+	120 min+
b. and c. Dwellinghouse	Not applicable[4]	30 min*†	30 min†	60 min[5]	60 min[5]	Not applicable[4]	Not applicable[4]

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Cavity Barriers

Cavities in buildings present a particular fire risk as they provide a ready route for the spread of smoke and flame, this can present a greater danger as any spread is concealed. According to Approved Document B, para 5.16, “a cavity is considered to be any concealed space.” As our independent IWI system creates a concealed space behind the framed section, this can be considered a cavity for the purposes of the Building Regulations.

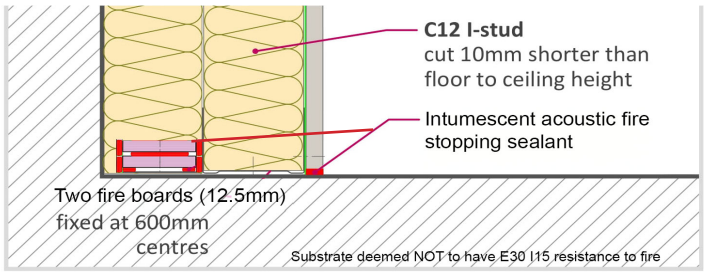
Para 5.17 of Approved Document B, specifies that to reduce the potential for fire spread, cavity barriers should be provided for both of the following: a) To divide cavities, and b) To close the edges of cavities.

And para 5.18 specifies the locations where cavity barriers should be placed. This includes, “At the edges of cavities, including around openings (such as windows, doors and exit/entry points for services).”

Fire resistance of cavity barriers

Para 5.20 of Approved Document B makes it clear that cavity barriers, tested from each side separately, should provide a minimum of both of the following: a) 30 minutes’ integrity (E 30), and b) 15 minutes’ insulation (I 15). For cavity barriers around openings (or in a stud wall or partition), para 5.21 states that they may be formed of any of the following: a) Steel, a minimum of 0.5mm thick, b) Timber, a minimum of 38mm thick, c) Polythene-sleeved mineral wool, or mineral wool slab, under compression when installed in the cavity, or d) Calcium silicate, cement-based or gypsum-based boards, a minimum of 12mm thick. These do not necessarily need to achieve the performance specified in paragraph 5.20. To comply with this requirement, all openings in our independent IWI system (around windows, doors or for service penetrations) require a cavity barrier made of the materials listed in para 5.21 a) to d). We recommend the use of a 12.5mm gypsum-based board (plasterboard) or calcium silicate board.

Where the base or head substrate has a resistance to fire of 30 minutes’ integrity (E 30), and 15 minutes’ insulation (I 15) this will be a sufficient cavity barrier for the ‘cavity’ created in the concealed space behind the framed section. Otherwise a cavity barrier should be fixed to the base and head substrate. This should be two 12.5mm fire rated plasterboards, fixed into the floor or ceiling joists at 600mm centres using recommended fixings and cut narrower than the cavity.



The boards should be bedded on intumescent acoustic sealant as recommended, including both beneath the boards and between the final board and substrate. The edges of the boards should have a bead of intumescent sealant to the edge (leaving sufficient gap between the wall) and between the head and base track. The steel head and base tracks provide sufficient cavity barriers for the concealed cavity inside the frame section itself.

Fire stopping

Para 9.1 of Approved Document B states that, “Every joint, imperfect fit and opening for services through a fire-separating element should be sealed with fire-stopping to ensure that the fire resistance of the element is not impaired. Fire stopping delays the spread of fire and, generally, the spread of smoke as well.”

A fire-separating element is defined as “A compartment wall, compartment floor, cavity barrier and construction that encloses a protected escape route and/or a place of special fire hazard.” (Approved Document B p. 117) Penetrations, imperfect fit, joints and openings for services in cavity barriers that form part of our IWI system should be sealed using a proprietary firestopping sealant or foam. This includes around window reveals, door openings and the head and base of the system as specified in the system install guidance.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Insulation & thermal performance

The C12 Independent IWI systems' innovative design ensures the thermal performance of all the systems. We have partnered with one of the leading manufacturers of glass mineral wool insulation in the U.K., Superglass Insulation, to incorporate a versatile insulation element to our system.

Superglass Adapt Slab 32

The insulation product of choice for our system is Superglass Adapt Slab 32 which is a non-combustible glass mineral wool insulation slab. The flexible slab is supplied at 600mm width to allow friction fitting between the metal stud elements of the system, minimising gaps at joints and reducing on-site cutting & waste. Superglass Adapt Slab 32 is designed to provide both thermal and acoustic insulation.

Fire Classification

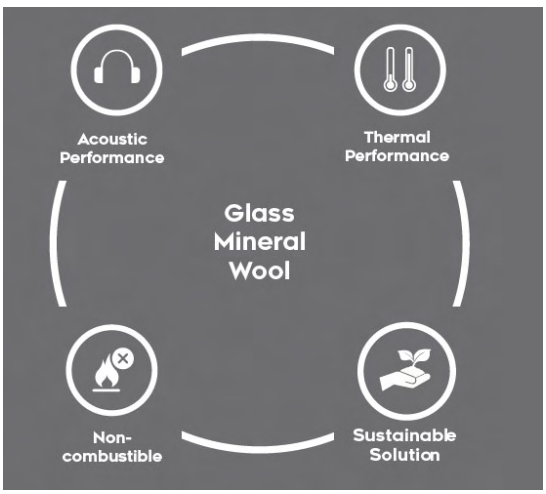
Deemed non-combustible with a fire classification of Euroclass A1 (the highest possible rating) when tested to BS EN 13501-1:2018 Reaction to Fire.

Performance

The Adapt Slab 32 has a declared thermal conductivity (lambda (λ) value) of 0.032W/mK. With an industry leading thermal conductivity for glass mineral wool products, this ensures the thermal performance of the system.

Sustainability

The Superglass glass mineral wool insulation is made from up to 84% recycled waste glass and contains no ozone-depleting substances or greenhouse gases, helping to achieve a generic BRE Green Guide rating of A+.



version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

U-values

The C12 Independent IWI system is designed so that the depth of the thermal element can be varied to incorporate any depth of insulation. Therefore, with a declared thermal conductivity (lambda (λ) value) of 0.032W/mK it is possible to achieve any of the required U-values set in Tables 4.1, 4.2 and 4.3 of Approved Document L (Volume 1, 2021 edition) on a range of substrates. This includes the improved U-value of 0.30 W/(m2·K) listed in Limiting U-values for existing elements in existing dwellings in Table 4.3.

The system's ability to be adjusted to incorporate any depth of insulation means that it is possible to achieve any of the U-value requirements of Part L1(a) of Schedule 1 to the Building Regulations 2010

Requirement C2 of the Building Regulations 2010

Requirement C2 of the Building Regulations 2010 addresses resistance to moisture. It states that the "walls, floors and roof of the building shall adequately protect the building and people who use the building from harmful effects caused by: (a) ground moisture; (b) precipitation including wind-driven spray; (c) interstitial and surface condensation; and (d) spillage of water from or associated with sanitary fittings or fixed appliances."

It is recommended that a Condensation Risk Analysis (calculation method to ISO 13788) is completed for each individual install that takes account of weather data specific to that postcode or location. This will show whether there is a risk of interstitial and surface condensation from the wall build-up specified.

Para 5.10 of Approved Document C, internal insulation of solid walls

This paragraph of Approved Document C deals specifically with the insulation of solid external walls and restricting the path of moisture across the wall.

Our system complies fully with this requirement by creating a cavity between the internal steel frame lining and the substrate of the solid external wall. The BEIS Best Practice Guide has since elaborated on the requirements for an internal cavity space, making it clear that this should be filled with insulation to avoid air gaps.

"A solid external wall may be insulated on the inside or on the outside. Where it is on the inside a cavity should be provided to give a break in the path for moisture."

Para 5.10 of Approved Document C to the Building Regulations 2010

Diagram 11 **Insulated external walls: examples (see paragraphs 5.10, 5.13 and 5.17)**

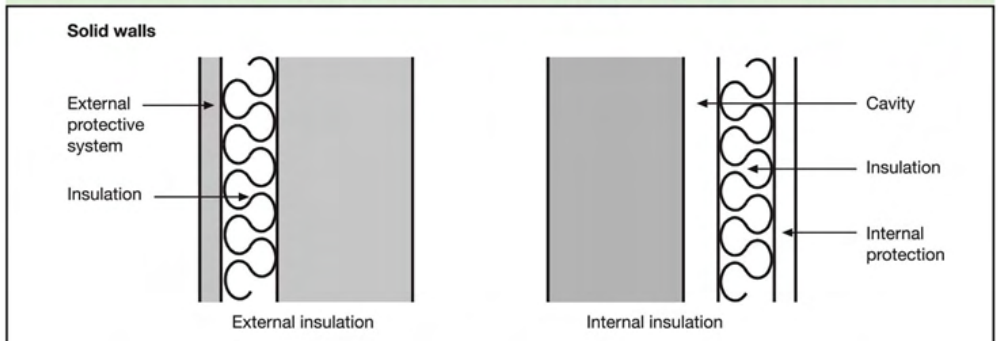


Diagram 11 shows clearly where this cavity should be.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Moisture Management

The standard for managing moisture in buildings is BS 5250:2021 Management of moisture in buildings. Our IWI system is flexible enough to accommodate a range of moisture management approaches that are compliant with this standard. The system is designed inherently as a non-capillary active, vapour open system. This can be modified by the installation of a vapour control layer to make the system a vapour closed system.

Airtightness layer

In all cases when installing the IWI system, an air barrier or airtightness layer must be installed on the warm side of the insulation. This will protect the system and substrate (external wall) from interstitial condensation which can be very damaging to a building's fabric.

The C12 Independent IWI systems are desinged as non-capillary active, Vapour Open systems.

Property specific assessment

We recommend that site/property specific hygrothermal modelling should be used to assess moisture risk as advised in BS5250 prior to installing the system. This should inform decisions about the moisture management approach to be taken i.e. whether it is to be vapour open or vapour closed.

A choice of membranes

We recommend a range of membranes that can be installed with the system to ensure that it is consistent with the current moisture strategy of the building. It is the responsibility of the system installer or site-specific system designer to ensure that moisture management is consistent with the requirements of BS 5250:2021 and the BEIS Guide to Best Practice

A vapour open approach is recommended for solid walls

(Guide to Best Practice, clause 45)

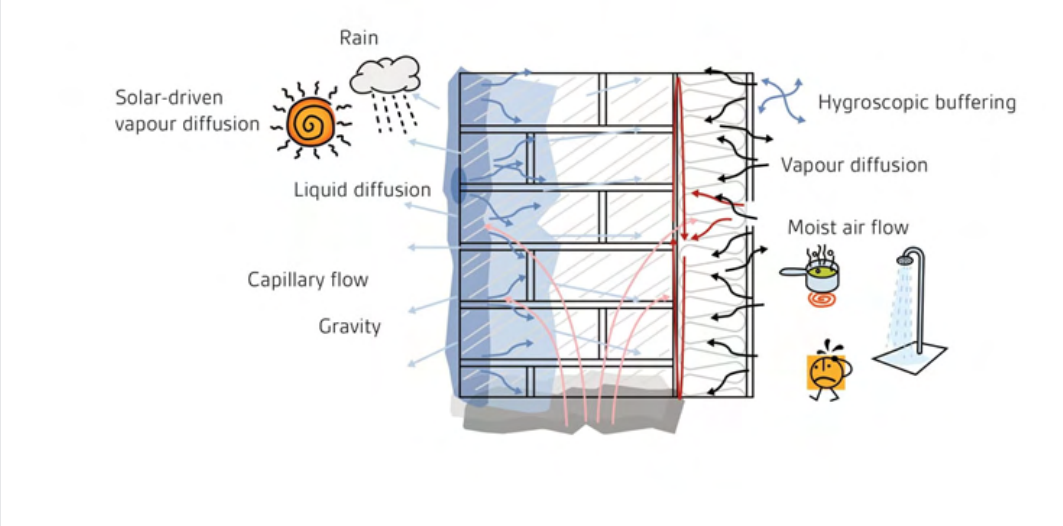
version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Moisture Risk

The BSI White Paper, “Moisture in buildings: an integrated approach to risk assessment and guidance” (May & Sanders, 2017) says “Consideration of moisture risk must take into account mechanisms by which moisture is spread. These include vapour diffusion, liquid flow through material pores, capillary flow, hygroscopic buffering and air movement. Temperature and vapour pressure gradients through materials, due to heat input from solar gain or the occupancy of the building, as well as gravity in certain situations, all affect moisture movement. The interactions between these mechanisms must be considered as part of an integrated dynamic process.”

The diagram below shows some of the moisture interactions that can occur in an internal wall insulation system (taken from the BSI White Paper, May & Sanders, 2017, page 5).



Drilling the Substrate

We advise that drilling into the substrate of solid walls should be avoided as this can increase the capillary flow of water through the solid wall. This interferes with the delicate moisture balance of the wall. Further if drilling is carried out near the base of the solid wall, this can breach the damp course which can lead to rising damp. This would also be contrary to requirement C2 of the Building Regulations 2010 which states that people must be protected from the “harmful effects caused by: (a) ground moisture (et al).” The C12 Independent IWI System avoids drilling into the substrate as it is completely independent of it.

Use of Smart Membranes

We emphasise the position stated in the BEIS Guide to Best Practice with respect to the use of Intelligent or Smart Membranes to control moisture across our system. The guidance states that: “This approach should be applied with caution, following the guidance from the manufacturer of the membrane for use in this specific situation. Hygrothermal modelling may be necessary to support this design approach” (page 30, footnote 7).

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

C12 Independent Internal Wall Insulation (IWI) Systems

The C12 Independent Internal Wall Insulation (IWI) system is an innovative wall insulation system that is safe, adaptable and compliant. It is completely separated from the underlying substrate. This gives it several advantages over other wall insulation systems and makes it ideal for the insulation of solid wall properties.

From an installer's perspective it is also lightweight and easy to install, providing both speed and flexibility. It has been designed by installers for installers.

The system combines standard gypsum plasterboard with C12 I-studs or C-studs. The cavity created behind can be of any depth allowing for varying thicknesses of insulation, creating a range of U-values. Once complete, the system provides a clean, flat and easy to finish plasterboard surface.

Where to use?

- Ideal for commercial projects where deep continuous cavities behind boards are needed to correct or isolate substrates and accommodate services.
- Particularly suited to substrates which may not be suitable for direct fixing, e.g. metal cladding and other modern methods of construction.
- Ideally suited for solid wall properties where the moisture balance of the existing wall should not be interfered with.

Features & Benefits

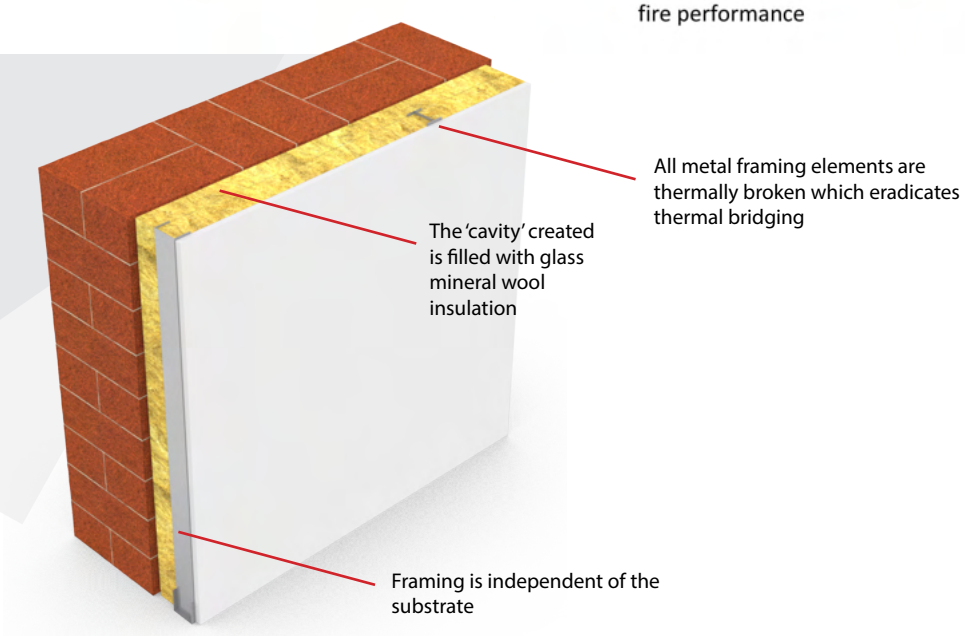
Features	Benefits
Completely independent from substrate	No thermal bridging Quick & easy to install Doesn't interfere with the moisture / hygrothermal balance of the existing wall Doesn't create capillary active 'weep' holes by drilling the substrate that can lead to water / damp ingress Can be installed over any substrate to give flat, level finish

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Features	Benefits
Creates internal cavity with variable cavity depth	The cavity can incorporate a range of services or ducting The cavity allows a continuous unbroken depth of insulation of the same thermal conductivity which eliminates thermal bridging The insulated cavity means that all metal structural elements are thermally broken The variable cavity depth allows for a range of U-values to be achieved
Lightweight galvanized steel stud and track system	Quick and easy to install A1 reaction to Fire classification of all components Structurally sound and robust Commonly used for partition walls and suspended ceilings across the industry Can achieve a range of heights Can install plywood pattresses beneath lining boards to take the weight of TVs, cupboards etc with no diminution to fire integrity Framing allows for installation of airtight membranes or AVCL's to create moisture open or closed systems
Plasterboard finish	Depending on the thickness and number of boards used, can achieve 30 minute or 60 minute resistance to fire rating Easy to decorate flat surface

C12 Independent IWI System



version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

System Components

specified system components

boards*

C12 or Siniat boards
Gypsum plasterboards provide EI 30 minutes or EI 60 minutes fire resistance

StB/ or AqB/ or FB/ or dBB/ or MB/ or VB/

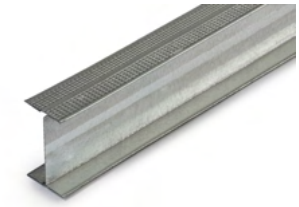
insulation

Superglass Adapt Slab 32
Non-combustible glass mineral wool insulation slab

AS32/

* specified for fire-rated systems only

metal frame



C12 I-stud
Metal profile for vertical frame elements.

IS50/

C12 C-stud
Metal profile for vertical frame elements.

CS50/

C12 U-track
Metal profile for head and base frame elements.

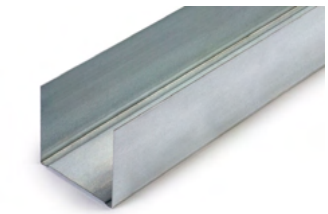
UT50 or UT52

C12 U-track Deep
Used for linings with heights exceeding 4.2m.

UTD50 or UTD52

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

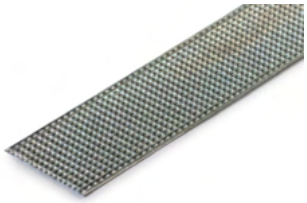


C12 U-track Extra Deep
Used for linings with heights exceeding 4.2m.

UTXD50 or UTXD52

C12 Metal Angle
Multi-purpose galvanised metal angle section.

A19 or A25 or A5025 or A50



C12 Flat Strap
Provide support for plasterboard joints and fixtures.

FS50/RX or FS90/W

fixings

C12 Drywall Screws (as appropriate)
For mechanical fixing of boards to metal frame.

C12 Wafer Head Self drilling screws
Used for mechanical fixing of metal frame sections where required.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

recommended system components

airtightness membranes

DuPont™ Tyvek® FireCurb® Breather Membrane (BBA 90/2548)
Vapour open airtightness membrane with advanced fire retardency

DuPont™ Tyvek® Trifecta™ Breather Membrane - A2 fire rated
Vapour open airtightness membrane with superior airtightness and reaction to fire of A2-s1, d0

sealant

DuPont™ AirGuard® A2 FR
(BBA 08/4548)
Vapour closed AVCL with superior airtightness and moisture resistance and
and reaction to fire of A2-s1, d0

DuPont™ AirGuard® Sealant
Air tight sealant for use around penetrations in the membrane, around services and sealing edges of boards etc.

tapes

DuPont™ AirGuard® FR System Tape
Fire retardant, single-sided tape, with A2 Fire classification. Specially formulated for use with DuPont™ AirGuard® A2 FR AVCL for sealing horizontal and vertical laps and penetrations.

Tyvek® Window Tape (1310PT)
A high performance airtight and moisture adaptive carrier tape that can be plastered over. It seals difficult areas like windows, doors and timber to block connections
.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

System Install Guidance

Prior to installation a fully completed retrofit assessment and pre installation building survey should be completed. This should include a condensation risk analysis. Where necessary hygrothermal modelling should be used to assess moisture risk as advised in BS5250. A property specific design should be completed by a suitably qualified professional. This should inform the approach to moisture management, fire resistance requirements, U-values to be achieved (and therefore depth of insulation to be installed) and the size and type of metal framing components required. The survey should also highlight services that are present and any penetrations to the IWI system.

Substrate

The C12 Independent IWI systems are fully independent of the substrate. Where the substrate is a solid external wall (no cavity) it is recommended **not** to drill into the substrate as this can disturb the moisture balance of the existing external wall. This can increase the capillary flow of water into the building and lead to damp problems.

C12 Steel frame installation

The steel frame is simple to design and install. It is made up primarily of three components:

(1) C-stud (2) I-stud, and (3) U-track

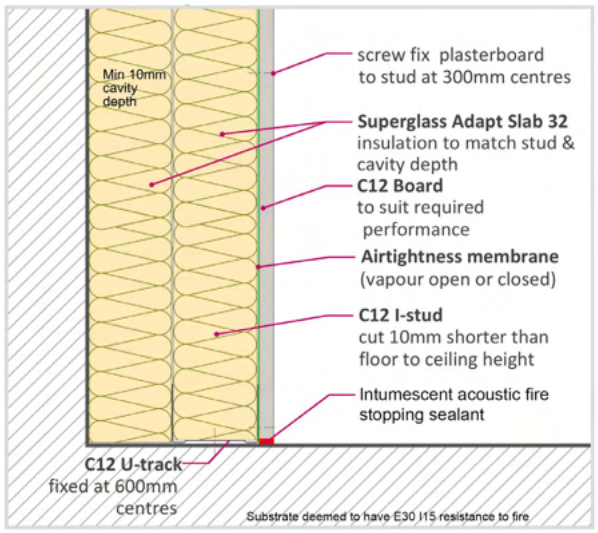
I-studs are generally stronger than C-studs and as such have a greater maximum height. The design should take account of the height of the room to determine which C-stud and I-stud sizes are appropriate for use in the system. Performance tables should be consulted to view the maximum heights for each component. Fire resistance requirements should also be considered. Maximum heights vary depending on whether the studs are positioned (and therefore boards fixed) at 600mm, 400mm or 300mm centres.

C12 C-studs to be fixed as starter studs with web flat to the side/party walls (adjacent to the external wall being insulated) using recommended fixings at maximum 600mm centres.

C12 U-track to be fixed next to the floor using recommended fixings at maximum 600mm centres and positioned a minimum of 10mm from the substrate (vary according to insulation depth required). For suspended timber floors, fix into floor joists.

The next step is to fix C12 U-track to the ceiling (or substrate above) using recommended fixings at maximum 600mm centres and positioned a minimum of 10mm from substrate (vary according to insulation depth required). The head cannot be fixed to suspended ceilings or other non-permanent structures. For suspended timber ceilings, fix into ceiling joists. Where there is the possibility of deflection from the floor above (manifest through the ceiling) a deflection head should be fitted that is appropriate to the degree of deflection (calculated by others). See our guidance for fitting a fire rated deflection head.

Standard System - base detail



version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

All C12 Studs to be 10mm shorter than floor to ceiling height except in case of deflection requirements for fire-rated systems or other deflection requirements.

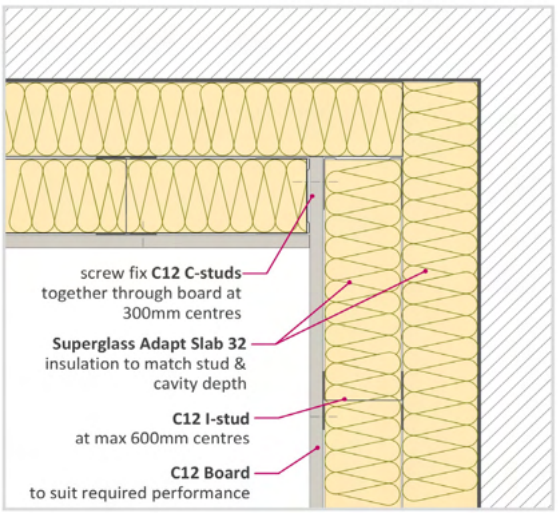
Intermediate studs should be friction fitted to allow for adjustment during boarding.

C12 studs to be at centres required to achieve the desired performance and at a maximum of 600mm centres. See system performance tables. To prevent thermal bridging, suspended timber floors should be insulated below where the base and head track are fixed in the sub floor voids using the C12 Underfloor insulation system. For solid floors a strip of C12 Floor thermal insulation board (depth 50mm, Euroclass A1 fire rating) should be fixed beneath the base track and sealed with intumescent fire stopping sealant. The same can be done for the head track.

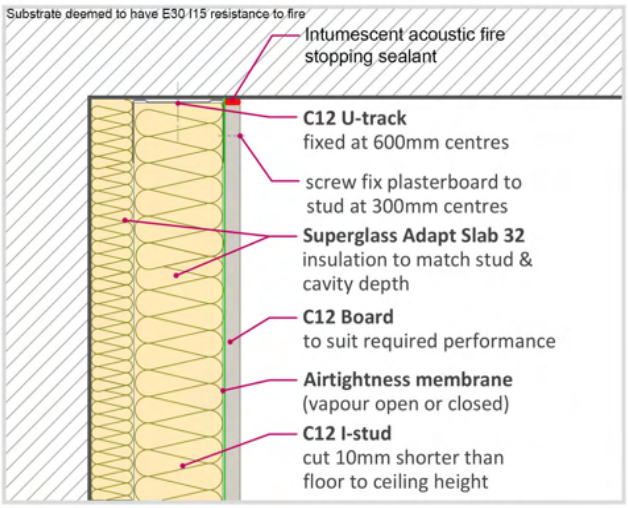
Corners & Junctions

By abutting partitions to coincide with the studs you can install additional intermediate 'pick-up' studs if required. Connect studs through plasterboards at corners and junctions at 600mm vertical centres using appropriate C12 drywall screws. See architectural details diagrams opposite for further guidance on arrangement and fixing.

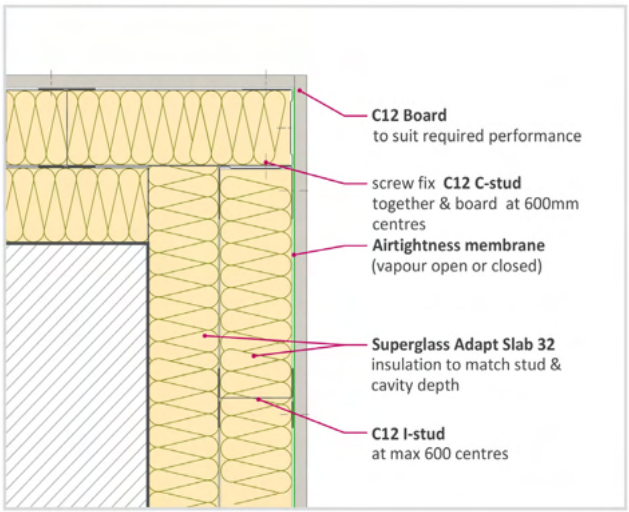
Standard System - Internal corner



Standard System - Head detail



Standard System - External corner



Cavity Barriers

Where the floor or ceiling substrates are deemed not to have a fire resistance of 30 minutes' integrity (E 30), and 15 minutes' insulation (I 15), then a cavity barrier should be installed in the cavity between the frame and substrate following the guidance set out on page 16 of this manual. Installers should consult a suitably qualified professional where they are uncertain as to the fire resistance of the floor and ceiling substrates on site.

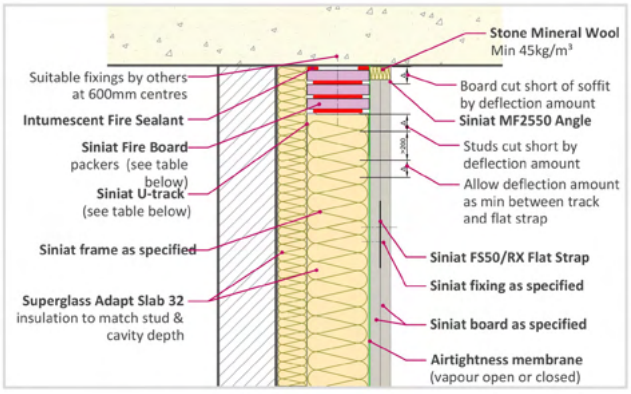
version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Fire rated deflection head

For fire rated systems please follow the guidance for installing a 30 minute or 60 minute deflection head. This includes installing either two or three Siniat fire-boards in strips above the U-track to create a fire resistant deflection head. Fire rated intumescent sealant should be used to seal the deflection head as specified.

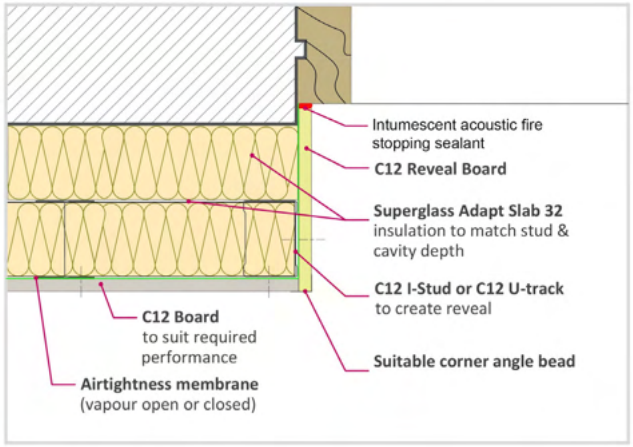
30 Minute System & 60 Minute System - Deflection head to BS EN standards



Windows, doors & other openings

The C12 steel frame is flexible to accommodate windows, doors and other openings. The C12 U-track can be snipped on the vertical uprights (flanges) using tin snips, leaving the horizontal metal track intact. The U-track can then be bent easily to create a 90° bend without any loss of structural integrity. The U-track can be cut and bent in this way to replicate the reveals and sill of any window opening. C-studs or I-studs are used to support this opening.

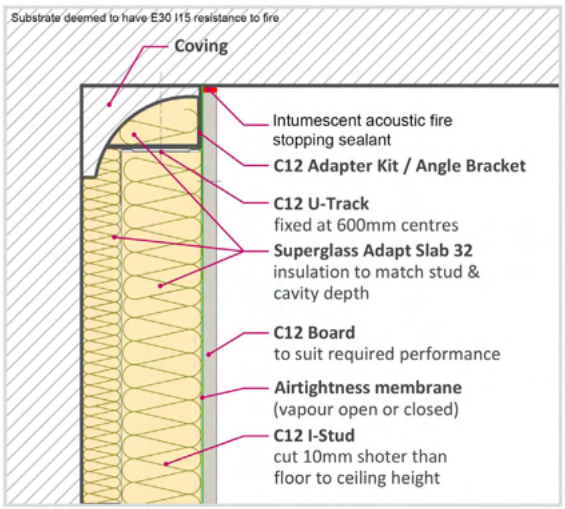
Standard System - Window reveal



Coving or cornice present

Coving and cornices should be removed as a rule unless removal will adversley affect the moisture balance of the wall. Where the ceiling has coving or a cornice that is to remain and that prevents the U-track being fixed, use the C12 Adapter Kit which is a quick and easy way to cover coving or cornices to fix the C12 U-track.

Standard system - Head detail with coving



version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Insulation fitting

Superglass Adapt Slab 32 should be fitted to the system in the following way. The overall depth of the insulation to be installed should conform to the U-values to be achieved. Consult the thermal performance tables for that system or have a suitably qualified professional complete a U-value calculation.

Superglass Adapt Slab 32 should be fitted in two stages: (1) In the 'cavity' behind the steel stud frame; (2) In between the steel studs.

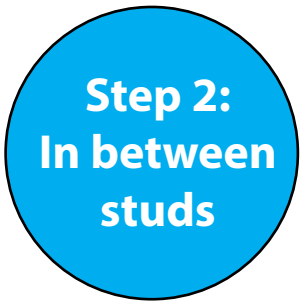
Step 1 - Insulate the 'cavity'

The depth of Adapt Slab 32 to be installed in the cavity should match the cavity depth specified in the design and should fill the entire cavity. Cavity depths should be a minimum of 10mm. It is acceptable to have a cavity depth that is less than the depth of the Adapt Slab 32 as the insulation can be compressed to fit in the cavity without altering its thermal conductivity (final U-value will change).

There should be no air gaps between the substrate and insulation. Insulation slabs should butt up tight to each other. It is recommended to have the joints between slabs of insulation that are staggered and that are not directly behind the steel studs. Insulation should be continuous throughout the cavity.

The rating of all electrical wiring or circuits in the insulated cavity space should conform to BS 7671:2018+A2:2022.

Insulate in 2 stages



Step 2 - In between the studs

Superglass Adapt Slab 32 should be friction fitted between the studs leaving no air gaps between the cavity layer or in the recesses of the steel stud. The depth of the insulation should be no smaller than the depth of the steel frame stud.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Airtightness layer

An air barrier should be installed in all IWI systems on the warm side. This protects the building fabric from interstitial condensation. This air barrier should take the form of an airtightness membrane.
However, the PassivHaus Trust in their Good Practice Guide (see "Demystifying Airtightness: Good Practice Guide: June 2020, pp.10-11) has stated that an airtight barrier maybe created using wet plaster that is applied in a thickness >5mm (i.e. 6mm depth plus). We recommend the use of one of our airtightness membranes in all cases even when using a wet plaster finish.

Consistent moisture stategy

If an airtightness membrane is selected, it should be consistent with the moisture strategy of the wall. So, where an existing solid wall is moisture open, the airtightness membrane must also be moisture open or vapour permeable. Where the system is designed to be vapour closed, an air and vapour control layer (AVCL) should be used. For solid wall properties, a moisture open approach is almost always recommended.

Airtightness membranes should be consistent with the wall's current moisture strategy.

Recommended membranes

We recommend that the following membranes be used in our IWI systems. The selection of which is dependent on pre-installation surveys and condensation risk assessments as mentioned above. They are industry leading airtightness membranes offering unrivalled fire protection.

All membranes should be fitted in accordance with the manufacturer's instructions. Proprietary airtight seals and tapes recommended for use with these membranes by the manufacturer must be used to seal around the perimeter of the system and all penetrations.

Name	Moisture Strategy	Vapour Resistance (MNs/g)	Air Permeability ($m^3/(m^2\ h\ 50Pa)$)	Reaction to Fire Classification (to BS EN 13501-1)
DuPont™ Tyvek® FireCurb® Breather Membrane (BBA 90/2548)	Vapour open	0.075	2	B-s1,d0
DuPont™ Tyvek® Trifecta™ Breather Membrane	Vapour open	0.40	<0.01	A2-s1, d0
DuPont™ AirGuard® A2 FR (BBA 08/4548)	Vapour closed	24,500	Gurley airpermeability (s): >2000	A2-s1, d0

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Boarding

The C12 Independent IWI system is suitable for single, double and multiple layer boarding. Select the number and type of boards to finish the system by consulting the system performance tables on pages 32 to 40 of this technical manual.

Boards should be mechanically fixed to studs at 300mm centres using appropriate drywall screws. Do not fix to the base or head track as this will prevent deflection of the head. Base layers of boarding may be temporarily fixed at 600mm centres providing the final layer is fixed through to stud at 300mm centres. Board edges should be centred over the studs. Stagger all board joints between layers.

Over-height single layer boarding only: Where stud frame height exceeds board height, fix boards to continuous band of C12 Flat Strap FS90/W behind all horizontal joints.

Over-height multiple layer boarding only: Where stud frame height exceeds board height for double or multiple layer boarding, fix outer layer of boards to continuous band of C12 Flat Strap FS50/RX behind all horizontal joints.

Sealing joints, penetrations & service openings

It is essential that every joint, imperfect fit and opening for services through i) the airtightness layer, and ii) the fire resistance layer, be sealed.

1. Airtightness layer

The airtightness layer in our IWI system is provided by the proprietary membrane as specified in the site specific design. It is essential that all laps, junctions, joints and penetrations in this membrane are sealed using the recommended airtight tape. For vapour closed systems, this tape is the DuPont™ AirGuard® FR System Tape 1310FR. For vapour open systems, this is the DuPont™ Tyvek® Window Tape. Ensure that tape is applied to all edges of the membrane and overlaps onto the substrate a minimum of 30mm. For penetrations in the membrane, use the above tapes to make airtight, alternatively use DuPont™ AirGuard® Sealant.

2. Fire resistance layer (system lining)

The primary fire resistance layer is provided by the system lining (gypsum plasterboards). It is essential that this is sealed at all edges, junctions and penetrations using an intumescent, fire-stopping sealant suitable for linear gap seals and penetration seals. We recommend PFC Corofil Acoustic Intumescent Sealant CAIS which should be installed according to the manufacturer's instructions. Similarly, all penetrations and service openings should be sealed using the same sealant.

System Performance Tables

System performance tables have been written to show performance data for the key metrics of:
1) Thermal performance;
2) Fire performance.

Displayed data

Each system displayed includes:

» Build-up
» Fire performance to BS EN
» Max heights (cold and BS EN fire state)
» System weight
» Nominal thickness

System Identification Codes

Each system has a unique identification code that identifies the system build-up:

Framing - Boarding - Insulation

Example

C12 Independent IWI System
IS50(400)-StB/12-AS32/50

- C12 I-stud IS50

- 400mm stud centres*

- 1 x gypsum Standard plasterboard of 12.5mm

- Superglass Adapt Slab 32 insulation of 50mm depth

*The number in brackets denotes the stud spacing. No number denotes the default spacing of 600mm.

Performance Notes

'BS EN Fire State Height' is the highest permissible 'fire state' height (maximum permitted height under fire conditions) calculated according to the following BS EN standards, as required to comply with Approved Document B, and where these heights are no greater than the 'cold state' mechanical height. The fire state height is derived from extension rules in BS EN 1364-1 (DIAP).

Performance values are for imperforate, jointed systems using C12 or Siniat components (metal studs and tracks, boards, metal accessories, screws and finishing systems) and specified Superglass Adapt Slab 32 insulation glass mineral wool (type and thickness) and installed to C12 or Siniat specification and installation guides.

All maximum cold state heights are calculated with a uniform lateral pressure of 200Pa or 0.2kN/m2. The maximum height is based on there being a maximum deflection of height/240 (L/240) at mid-height.

It may be possible to increase cold state heights from those quoted in the system tables where different deflection limits or pressure criteria are acceptable.

Calculations of thermal transmittance (U value) have been carried out in accordance with BS EN ISO 6946: 2017, BRE Digest 465:2002 and BRE Report BR 443: 2006, using the thermal conductivities from Table 2.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

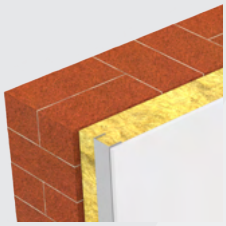
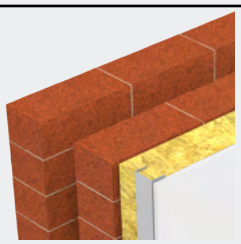
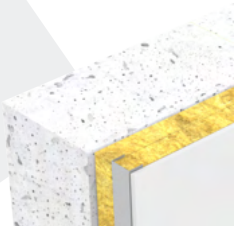
Standard System

The standard C12 Independent IWI system has specified components that all have a fire classification of Class A1 or Class A2-s1,d0 (plasterboard finishes only).

Thermal Performance Table

The calculations below are based on the standard C12 Independent IWI system using 1 x 12.5mm standard plasterboard with thermal conductivity (λ) of 0.25 and Superglass Adapt Slab 32 (λ=0.032 W/mK).

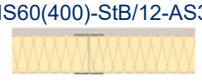
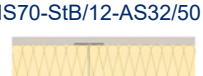
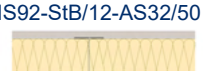
Calculations of thermal transmittance (U value) have been carried out in accordance with BS EN ISO 6946: 2017, BRE Digest 465:2002 and BRE Report BR 443: 2006, using the thermal conductivities from Table 2.

Overall Insulation depth (mm)	 215mm Solid Brick (λ=0.77 W/mK) Base U-Value = 2.23 W/m²K System U-value (W/m²K)	 Uninsulated Cavity Wall 102mm brick (λ=0.77 W/mK) 50mm air cavity 102mm brick (λ=0.56 W/mK) Base U-Value = 1.50 W/m²K System U-value (W/m²K)	 215mm dense concrete block (λ=1.33 W/mK) Base U-Value = 3.02 W/m²K System U-value (W/m²K)
60mm	0.43	0.40	0.45
65mm	0.41	0.38	0.42
75mm	0.36	0.34	0.38
80mm	0.34	0.33	0.36
90mm	0.31	0.30	0.32
95mm	0.30	0.29	0.31
100mm	0.29	0.27	0.30
130mm	0.23	0.22	0.24
150mm	0.20	0.20	0.21

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Fire Performance Table

Build-up ID	Facing layers	Frame	Insulation Glass mineral wool between studs (mm)	Fire resist. BS EN 1364-1 & BS EN 13501-2 (mins) [1]	Max. height cold state (m) [2]	Max. height BS EN fire state (m) *	Nominal thickness (mm)	Weight ((kg/m²)
IS50-StB/12-AS32/50 	1 x 12.5mm Standard plasterboard	C12 I-stud IS50 at 600mm centres	50	-	2.7	-	62.5	9.0
IS50(400)-StB/12-AS32/50 	1 x 12.5mm Standard plasterboard	C12 I-stud IS50 at 400mm centres	50	-	3.1	-	62.5	10.0
IS60-StB/12-AS32/50 	1 x 12.5mm Standard plasterboard	C12 I-stud IS60 at 600mm centres	50	-	3.5	-	72.5	10.0
IS60(400)-StB/12-AS32/50 	1 x 12.5mm Standard plasterboard	C12 I-stud IS60 at 400mm centres	50	-	4.0	-	72.5	10.0
IS70-StB/12-AS32/50 	1 x 12.5mm Standard plasterboard	C12 I-stud IS70 at 600mm centres	50	-	4.0	-	82.5	10.0
IS70(400)-StB/12-AS32/50 	1 x 12.5mm Standard plasterboard	C12 I-stud IS70 at 400mm centres	50	-	4.5	-	82.5	10.0
IS92-StB/12-AS32/50 	1 x 12.5mm Standard plasterboard	C12 I-stud IS92 at 600mm centres	50	-	4.7	-	104.5	10.0
IS92(400)-StB/12-AS32/50 	1 x 12.5mm Standard plasterboard	C12 I-stud IS92 at 400mm centres	50	-	5.4	-	104.5	11.0

[1] Fire Resistance performance in one direction only - from boarded side. [2] Maximum height calculated with deflection limit of L/240.
*Use BS EN Fire State height unless otherwise stated. EN 1364-1 — Fire resistance tests for non-loadbearing elements – Part 1: Walls.

It is recommended that for heights between 4200mm and 8000mm, the C12 U-track Deep should be used. For heights above 8000mm, the C12 U-track Extra Deep should be used.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

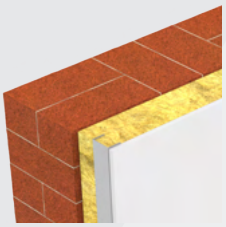
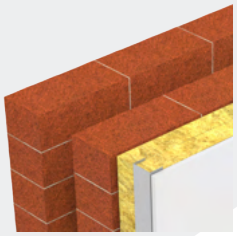
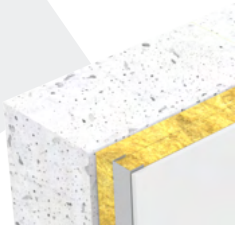
30 Minutes System

The 30 Minutes Independent IWI system has specified components that all have a fire classification of Class A1 or Class A2-s1,d0 (plasterboard finishes only) and have a resistance to fire rating of EI 30 minutes to BS EN 13501-2.

Thermal Performance Table

The calculations below are based on the 30 Minutes Independent IWI system using 2 x 12.5mm fire rated plasterboards with thermal conductivity (λ) of 0.25 and Superglass Adapt Slab 32 (λ=0.032 W/mK).

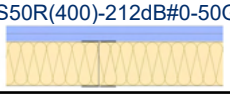
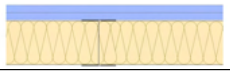
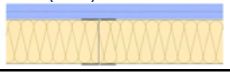
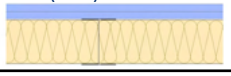
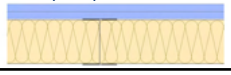
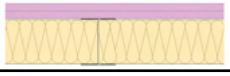
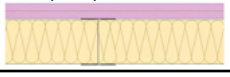
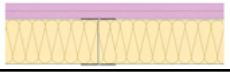
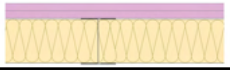
Calculations of thermal transmittance (U value) have been carried out in accordance with BS EN ISO 6946: 2017, BRE Digest 465:2002 and BRE Report BR 443: 2006, using the thermal conductivities from Table 2.

Overall Insulation depth (mm)	 215mm Solid Brick (λ=0.77 W/mK) Base U-Value = 2.23 W/m²K System U-value (W/m²K)	 Uninsulated Cavity Wall 102mm brick (λ=0.77 W/mK) 50mm air cavity 102mm brick (λ=0.56 W/mK) Base U-Value = 1.50 W/m²K System U-value (W/m²K)	 215mm dense concrete block (λ=1.33 W/mK) Base U-Value = 3.02 W/m²K System U-value (W/m²K)
60mm	0.42	0.40	0.44
65mm	0.40	0.37	0.42
75mm	0.36	0.34	0.37
80mm	0.34	0.32	0.35
90mm	0.31	0.29	0.32
95mm	0.29	0.28	0.30
100mm	0.28	0.27	0.29
130mm	0.23	0.22	0.23
150mm	0.20	0.20	0.21

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

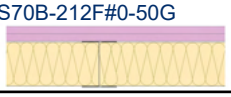
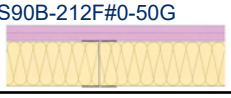
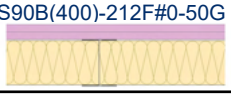
Fire Performance Table

Build-up ID	Facing layers	Frame	Insulation Glass mineral wool between studs (mm)	Fire resist. BS EN 1364-1 & BS EN 13501-2 (mins) [1]	Max. height cold state (m) [2]	Max. height BS EN fire state (m) *	Nominal thickness (mm)	Weight ((kg/m²)
IS50R-212dB#0-50G 	2 x 12.5mm Siniat dB plasterboard	IS50/Rx at 600mm centres	50	EI 30 mins	2.8	2.8	75.0	23.0
IS50R(400)-212dB#0-50G 	2 x 12.5mm Siniat dB plasterboard	IS50/Rx at 400mm centres	50	EI 30 mins	3.2	3.2	75.0	24.0
IS60B-212dB#0-50G 	2 x 12.5mm Siniat dB plasterboard	IS60/B at 600mm centres	50	EI 30 mins	3.6	3.6	85.0	24.0
IS60B(400)-212dB#0-50G 	2 x 12.5mm Siniat dB plasterboard	IS60/B at 400mm centres	50	EI 30 mins	4.1	4.0	85.0	24.0
IS70B-212dB#0-50G 	2 x 12.5mm Siniat dB plasterboard	IS70/B at 600mm centres	50	EI 30 mins	4.0	4.0	95.0	24.0
IS70B(400)-212dB#0-50G 	2 x 12.5mm Siniat dB plasterboard	IS70/B at 400mm centres	50	EI 30 mins	4.6	4.0	95.0	24.0
IS90B-212dB#0-50G 	2 x 12.5mm Siniat dB plasterboard	IS90/B at 600mm centres	50	EI 30 mins	4.8	4.0	115.0	24.0
IS90B(400)-212dB#0-50G 	2 x 12.5mm Siniat dB plasterboard	IS90/B at 400mm centres	50	EI 30 mins	5.5	4.0	115.0	25.0
IS50R-212F#0-50G 	2 x 12.5mm Siniat Fire board	IS50/Rx at 600mm centres	50	EI 30 mins	2.8	2.8	75.0	23.0
IS50R(400)-212F#0-50G 	2 x 12.5mm Siniat Fire board	IS50/Rx at 400mm centres	50	EI 30 mins	3.2	3.2	75.0	24.0
IS60B-212F#0-50G 	2 x 12.5mm Siniat Fire board	IS60/B at 600mm centres	50	EI 30 mins	3.6	3.6	85.0	24.0
IS60B(400)-212F#0-50G 	2 x 12.5mm Siniat Fire board	IS60/B at 400mm centres	50	EI 30 mins	4.1	4.0	85.0	24.0

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Fire Performance Table ctd.

IS70B-212F#0-50G 	2 x 12.5mm Siniat Fire board	IS70/B at 600mm centres	50	EI 30 mins	4.0	4.0	95.0	24.0
IS70B(400)-212F#0-50G 	2 x 12.5mm Siniat Fire board	IS70/B at 400mm centres	50	EI 30 mins	4.6	4.0	95.0	24.0
IS90B-212F#0-50G 	2 x 12.5mm Siniat Fire board	IS90/B at 600mm centres	50	EI 30 mins	4.8	4.0	115.0	24.0
IS90B(400)-212F#0-50G 	2 x 12.5mm Siniat Fire board	IS90/B at 400mm centres	50	EI 30 mins	5.5	4.0	115.0	25.0

¹ Fire Resistance performance in one direction only - from boarded side. ² Maximum height calculated with deflection limit of L/240.
*Use BS EN Fire State height unless otherwise stated. EN 1364-1 — Fire resistance tests for non-loadbearing elements – Part 1: Walls.

It is recommended that for heights between 4200mm and 8000mm, the Siniat U-track Deep should be used. For heights above 8000mm, the Siniat U-track Extra Deep should be used.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

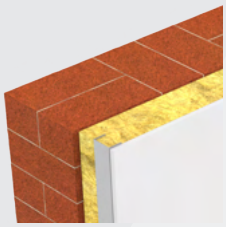
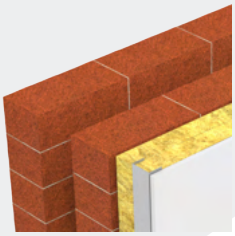
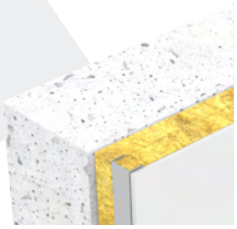
60 Minutes System

The 60 Minutes Independent IWI system has specified components that all have a fire classification of Class A1 or Class A2-s1,d0 (plasterboard finishes only) and have a resistance to fire rating of EI 60 minutes to BS EN 13501-2.

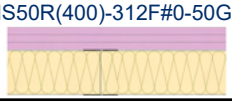
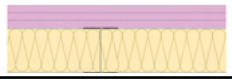
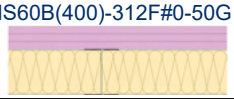
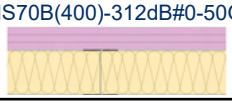
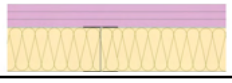
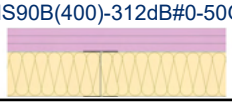
Thermal Performance Table

The calculations below are based on the 60 Minutes Independent IWI system using 3 x 12.5mm fire rated plasterboards with thermal conductivity (λ) of 0.25 and Superglass Adapt Slab 32 (λ=0.032 W/mK).

Calculations of thermal transmittance (U value) have been carried out in accordance with BS EN ISO 6946: 2017, BRE Digest 465:2002 and BRE Report BR 443: 2006, using the thermal conductivities from Table 2.

Overall Insulation depth (mm)	 215mm Solid Brick (λ=0.77 W/mK) Base U-Value = 2.23 W/m²K System U-value (W/m²K)	 Uninsulated Cavity Wall 102mm brick (λ=0.77 W/mK) 50mm air cavity 102mm brick (λ=0.56 W/mK) Base U-Value = 1.50 W/m²K System U-value (W/m²K)	 215mm dense concrete block (λ=1.33 W/mK) Base U-Value = 3.02 W/m²K System U-value (W/m²K)
60mm	0.41	0.39	0.43
65mm	0.39	0.37	0.41
75mm	0.35	0.33	0.36
80mm	0.33	0.32	0.35
90mm	0.30	0.29	0.31
95mm	0.29	0.28	0.30
100mm	0.28	0.27	0.29
130mm	0.23	0.22	0.23
150mm	0.20	0.19	0.20

Fire Performance Table

Build-up ID	Facing layers	Frame	Insulation Glass mineral wool between studs (mm)	Fire resist. BS EN 1364-1 & BS EN 13501-2 (mins) [1]	Max. height cold state (m) [2]	Max. height BS EN fire state (m) *	Nominal thickness (mm)	Weight ((kg/m²)
IS50R-312F#0-50G 	3 x 12.5mm Siniat Fire board	IS50/Rx at 600mm centres	50	EI 60 mins	2.9	2.9	87.5	32.0
IS50R(400)-312F#0-50G 	3 x 12.5mm Siniat Fire board	IS50/Rx at 400mm centres	50	EI 60 mins	3.3	3.3	87.5	32.0
IS60B-312F#0-50G 	3 x 12.5mm Siniat Fire board	IS60/B at 600mm centres	50	EI 60 mins	3.6	3.6	97.5	32.0
IS60B(400)-312F#0-50G 	3 x 12.5mm Siniat Fire board	IS60/B at 400mm centres	50	EI 60 mins	4.1	4.0	97.5	32.0
IS70B-312dB#0-50G 	3 x 12.5mm Siniat Fire board	IS70/B at 600mm centres	50	EI 60 mins	4.0	4.0	107.5	32.0
IS70B(400)-312dB#0-50G 	3 x 12.5mm Siniat Fire board	IS70/B at 400mm centres	50	EI 60 mins	4.6	4.0	107.5	33.0
IS90B-312dB#0-50G 	3 x 12.5mm Siniat Fire board	IS90/B at 600mm centres	50	EI 60 mins	4.8	4.0	127.5	32.0
IS90B(400)-312dB#0-50G 	3 x 12.5mm Siniat Fire board	IS90/B at 400mm centres	50	EI 60 mins	5.5	4.0	127.5	33.0

[1] Fire Resistance performance in one direction only - from boarded side. [2] Maximum height calculated with deflection limit of L/240.
*Use BS EN Fire State height unless otherwise stated. EN 1364-1 — Fire resistance tests for non-loadbearing elements – Part 1: Walls.

It is recommended that for heights between 4200mm and 8000mm, the Siniat U-track Deep should be used. For heights above 8000mm, the Siniat U-track Extra Deep should be used.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Summary

The C12 Independent IWI Systems provide an innovative, safe and compliant solution for the insulation of internal walls in a variety of domestic and non-domestic settings and for a range of substrates.

Summary of the benefits include:

- Completely independent of the substrate so no interference with the delicate moisure balance of the wall.
- Quick and easy to install using a proven system which is widely used across the industry.
- Variable cavity depths allow for a broad spectrum of U-values to be achieved.
- All specified components have A1 reaction to fire classification (A2-s1,d0 for plasterboard components).
- Fire resistance ratings of either EI 30 minutes or EI 60 minutes systems to BSEN13501-2 standards.
- Superior compliance with BEIS Guide to Best Practice.
- Fully compliant with The Building Regulations 2010 including Approved Documents 7 (2013), B (2019), C (2013) & L (2021).
- Adaptive for different moisture strategies of either vapour open or vapour closed.
- Structural integrity and system strength.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Glossary of Terms

Air barrier – A building material with properties that aim to prevent the passage of air through it. An air barrier may also be a VCL or a vapour barrier, but it may be specified to have a very low resistance to the passage of vapour.

Capillary active – Used to describe the mechanism by which a material can exhibit hygrothermal buffering. It is often used in place of the term hygrothermal buffering.

CWI – Cavity wall insulation. Insulation that is installed in a cavity within an external wall. Usually between two masonry structures that are tied together.

EWI – External wall insulation. Insulation that is installed on the cold side of a wall
Hygrothermal – Refers to the movement of moisture and heat through buildings and building materials.

Hygrothermal buffering – A material, such as wood fibre or wood that has the ability to absorb moisture from the air when relative humidity is high, and release moisture back into the air when relative humidity is low

Interstitial Condensation – Is a type of condensation that may occur within an enclosed wall, roof or floor cavity structure, which can create moisture issues.

IWI – Internal wall insulation. Insulation that is installed on the warm side of a wall.

Moisture balanced – A term used to describe a moisture open building construction that does not get wet for prolonged periods and does not have any moisture related issues such as mould or fungus growth, spalling or otherwise.

Moisture closed – A building construction that prevents moisture (vapour & liquid) from moving in and out of it.

Moisture open – A building construction that allows moisture (vapour & liquid) to freely move in and out of it.

PIV – Positive Input Ventilation. A type of continuous ventilation system that pulls fresh air into a property in a central location.

Spalling – Where the cold facing side of brick, stone or concrete walls has flaked, cracked or ‘blown’ off usually as a result of freezing water within the construction.

Thermal bridge – Area of the building envelope where the insulation is:
a) discontinuous or thinner than the adjacent insulation;
b) has higher thermal conductivity than the adjacent insulation; or
c) has reduced effectiveness due to the building geometry;
leading to locally increased heat loss and therefore locally reduced internal surface temperature

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Glossary of Terms ctd.

Thermal bypass – Unintended penetration or circulation of external air on the warm side of the insulation layer in a construction, rendering the insulation ineffective.

Vapour barrier – A building material (usually a membrane) with properties that aim to prevent the passage of moisture through it.

Vapour impermeable – Prevents the passage of water vapour by diffusion

Vapour permeable – Allows the passage of water vapour by diffusion

VCL – Vapour Control Layer. A building material (usually a membrane) with properties that control the passage of vapour through it.

version: 1.0.0
publication date: March 2025

technical services
technical@c12insulation.co.uk

Contact

GB orderline

For placing orders and delivery enquiries:
0333 772 2820 (select option 1)
sales@c12insulation.co.uk

Customer support

0333 772 2820 (select option 2)
customer.support@c12insulation.co.uk

Technical services

For technical guidance and advice
0333 772 2820 (select option 3)
technical@c12insulation.co.uk

The C12 Training Centre

For all drywall training needs from basic introduction to advanced skills and development.
0333 772 2820 (select option 4)
training@c12insulation.co.uk