

NSAI

Agrément

IRISH AGRÉMENT BOARD CERTIFICATE NO. 12/0373

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Isover Optima Insulated Internal Wall System

Isolation Wärmedämmung

NSAI Agrément (Irish Agrément Board) is designated by Government to carry out European Technical Approvals.

NSAI Agrément Certificates establish proof that the certified products are 'proper materials' suitable for their intended use under Irish site conditions and in accordance with the **Building Regulations 1997 to 2017**.



PRODUCT DESCRIPTION:

This Certificate relates to the Isover Optima Insulated Internal Wall System which is a breathable dry lining system developed by Isover to improve thermal insulation performance with the added benefit of air tightness.

The system is comprised of:

- Cold formed wall lining, floor and ceiling channel sections,
- Polyamide support brackets, clips and connectors,
- Isover mineral wool Insulation,
- Isover Vario KM Duplex UV intelligent membrane,
- Plasterboard linings.

Isover Ireland is responsible for the design, manufacture and/or supply of all cold formed metal sections, brackets, Vario membrane, tapes, mastic and glass mineral wool insulation to approved specifications.

Technical support can be provided by Isover Ireland on a project specific basis.

Installations must be in accordance with the manufacturer's instructions and the design guidance given in this Certificate, by installers who have been trained by the Isover Ireland.

This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2017.

USE

The scope of this certificate relates to the use of Isover Optima Insulated Internal Wall System for the internal insulation of external walls of:

- a) New concrete or masonry dwellings or
- b) Existing concrete or masonry dwellings;
- c) New concrete or masonry commercial buildings or office areas within industrial buildings, which are designed in accordance with the Building Regulations 1997 to 2017.

The system is suitable for use in all buildings purpose groups as defined in Part B of the Building Regulations 1997 to 2017.

The system is not suitable for use in buildings with consistently high internal relative humidity such as commercial kitchens, canteens, laundries or swimming pools, etc. As a result, installations must be confined to building types which correspond to humidity classes 1-3 and class 4 where the relative humidity is less than 60% as defined in BS 5250:2011+A1:2016 *Code of practice for control of condensation in buildings*.

Typically a single intermediate fixing is required for installation up to 2.7m in height (see figure 2). For floor to ceiling heights greater than 2.7m, intermediate fixings are required at 1m intervals. The maximum internal height of use will be limited to 6 metres. Above this height Isover Ireland should be consulted for technical advice on any additional support mechanisms required.

This certificate does not cover the use of the system with timber frame or steel frame construction.

MANUFACTURE, DESIGN & MARKETING:

System Design, Project specific design support, sales, and installer training are performed by:

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1.1 ASSESSMENT

In the opinion of NSAI Agrément, the Isover Optima Insulated Internal Wall System, when installed in accordance with this Certificate and Isover Ireland specific design recommendations, can meet the requirements of the Building Regulations 1997 to 2017, as indicated in Section 1.2 of this Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2017**REQUIREMENTS:****Part D – Materials and Workmanship****D1 – Materials & Workmanship**

The Isover Optima Insulated Internal Wall System, as certified in this Certificate, meets the requirements for workmanship.

D3 – Proper Materials

The Isover Optima Insulated Internal Wall System, as certified in this Certificate, is comprised of 'proper materials' fit for their intended use (see Part 3 and 4 of this Certificate).

Part A - Structure**A1 – Loading**

The Isover Optima Insulated Internal Wall System, once appropriately designed and installed in accordance with this Certificate, has adequate strength and stability to meet the requirements of this Regulation (see Part 3 of this Certificate).

Part B – Fire Safety**B2 – Internal Fire Spread (Linings)****Part B Vol 2 – Fire Safety****B7 – Internal Fire Spread (Linings)**

The internal surface of the Isover Optima Insulated Internal Wall System is plasterboard which is designated Euroclass A2-S1, d0. It may therefore be used on the internal surfaces of buildings of every purpose group without restriction.

Part C – Site Preparation and Resistance to Moisture**C4 – Resistance to Weather and Ground Moisture**

When the Isover Optima Insulated Internal Wall System is used in accordance with this Certificate, the external walls will have adequate weather resistance in all exposures to prevent the passage of moisture from the external atmosphere into the building as specified in Parts 3 and 4 of this Certificate.

Part E – Sound**E1 – Airborne sound (Walls)**

The Isover Optima Insulated Internal Wall System as certified may improve the airborne sound performance of a wall. However in the assessment of the system, the reduction of airborne sound transmitted through a wall has not been assessed.

Part F – Ventilation**F1 – Means of Ventilation**

The Isover Optima Insulated Internal Wall System as certified can be incorporated into structures that will meet the requirements of this Regulation (see Parts 3 and 4 of this Certificate).

Part J – Heat Producing Appliances**J3 – Protection of Building**

When the Isover Optima Insulated Internal Wall System is used in accordance with this Certificate, wall lining, insulation and separation distances meet this requirement (see Part 4 of this Certificate).

Part L – Conservation of Fuel and Energy**L1 – Conservation of Fuel and Energy**

When the Isover Optima Insulated Internal Wall System is used in accordance with this Certificate the external walls can be readily designed to incorporate the required thickness of insulation to meet the Elemental Heat Loss method calculations for walls as recommended in Part L of the Building Regulations 1997 to 2017 (see Part 4 of this Certificate).

Part M – Access for people with Disabilities**M1 – Access and Use**

The Isover Optima Insulated Internal Wall System can be designed to meet the access, circulation and facilities requirements of this regulation. (see Part 4 of this Certificate).

M2 – Sanitary Conveniences

The Isover Optima Insulated Internal Wall System can be designed to meet the installation requirements for sanitary conveniences for people with disabilities. (See Part 4 of this Certificate).

2.1 PRODUCT DESCRIPTION

The Isover Optima Insulated Internal Wall System consists of fixing a galvanised steel 'U' channel to the floor and ceiling structure, fixing a horizontal steel 'C' section to the wall substrate at no more than 1.35m spacing for wall heights up to 2.7m (1.0m spacing for heights greater than 2.7m), then fixing bespoke polyamide brackets into the 'C' channel.

The Isover glass mineral wool insulation to I.S. EN 13162:2012+A1:2015, *Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification*, of required thickness is then installed over the bracket and then vertical galvanised 'C' sections are installed into the top and bottom channels at 600mm centres and restrained at mid height with the polyamide bracket locking device.

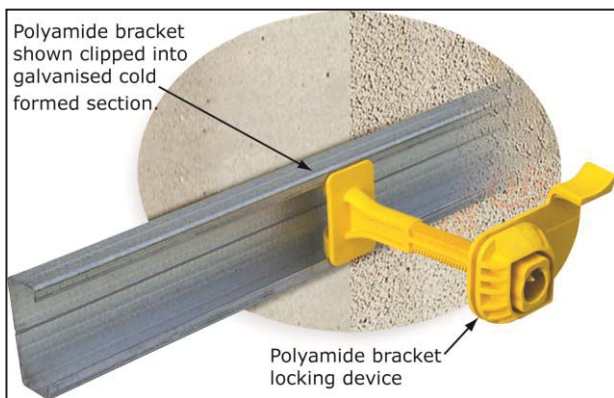


Figure 1

An Isover Vario KM Duplex UV intelligent – Airtightness membrane shall be installed and sealed to the Optima system and the existing structure.

The wall is then finished with plasterboards manufactured to I.S. EN 520:2004+A1:2009, *Gypsum plasterboards - Definitions, requirements and test methods*, which may be either skim plaster finished or tape and jointed prior to decoration.

The system can be applied on the internal face of a variety of new and existing external walls such as brick or blockwork masonry walls and concrete walls.

The Isover Vario intelligent climate membrane provides airtightness that minimises background or un-designed air leakage from dwellings. In addition, the membrane will also assist in limiting moisture from within the dwelling, entering the external wall structure hence reducing the risk of

interstitial condensation which can give rise to mould growth.

Isover Vario is an intelligent product that automatically adapts to climatic conditions. When the internal relative humidity is low, the molecular structure, of the membrane, changes to increase the diffusion resistance which limits moisture from inside diffusing into the structure. Then with higher internal temperatures and relative humidity the molecular structure of the membrane changes to lower the diffusion resistance and allow moisture that is trapped in the external wall substrate to diffuse back into the building interior.

The substrate on which the Isover Dry Lining Internal Insulation System will be used should have a reaction to fire class A1 or A2-s1, d0 in accordance with I.S. EN 13501-1.

This certificate does not cover the system for use with a timber frame or steel frame structure.

2.2 MANUFACTURE, SUPPLY AND INSTALLATION

Isover Ireland is responsible for the design, manufacture and/or supply of all Optima components to approved specifications.

Isover Ireland can provide when requested: Project specific design support in accordance with an approved design process (as outlined in section 3 of this certificate);

- Preliminary project assessment and advice to trained installers incorporating U-value calculations, dynamic condensation risk analysis, ventilation assessment, Radon mitigation measures, impact resistance, and external wall substrate suitability.
- Training of installers in accordance with approved training procedures;
- Product supply and documentation control;
- Technical support and installation inspection where required;

Installations must be in accordance with the manufacturer's instructions and the design guidance given in this Certificate, by installers who have been trained by the Isover Ireland.

2.2.1 Quality Control

Both the Manufacturer and the Certificate holder operate a quality management system, and a quality plan is in place for manufacture of the system components, delivery and customer complaints.

Isover Optima Dry Lining Internal Insulation System				
Components		Material Standard	Thickness (mm)	Packaging
Steel base & head 'U' Channels	25 x 20 x 0.53mm thick steel channel	DX51D +Z275 to I.S. EN 14195	0.53	2.35m lengths, pallet - 564m
Steel 'C' Sections & extension pieces	45 x 18 x 0.59mm thick steel 'C' section with 6mm lips	DX51D +AZ100 to I.S. EN 14195	0.59	2.4m lengths, pallet 960m. Extensions 300mm ,500mm
Optima Support & Optima Direct Polyamide Brackets, locking clips & connectors	Polyamide 6 injection moulded	Raw material is Akulon K224-PG8	To specification	Optima Support 75,100,120,140 – 50 pieces per box. Optima Direct Support 40 per box. Optima Connector 25 pieces per box.
Isover Glass Mineral Wool Insulation or similar approved	Metac mineral wool insulation, Comfort 32 or 35,	I.S. EN 13162	50,90,100,130, 150,180, 220 60,80,100,120, 140,200	Refer Isover
Vario KM Duplex UV Intelligent Membrane	Non-woven polypropylene membrane	Refer to Table 2	0.20	Roll 1.5m x 40m
Vario KB1	Single sided adhesive tape			Roll 60mm x 40m
Vario Protape	Double sided adhesive tape			Roll 25mm x 10m
Vario DS Mastic	Airtightness mastic sealant			300ml cartridge
Vario Multi tape SL	Single sided adhesive tape with split release strip			Roll 60mm x 25m
Plasterboard	Gyproc (Standard or Moisture Resistant) Wallboard, SoundBloc, DuraLine, Rigidur	I.S. EN 520: 2004+A1:2009	12.5mm minimum	Refer Gyproc

Table 1: Isover Optima Dry Lining Internal Insulation System Component Specification

2.3 DELIVERY, STORAGE AND HANDLING

The metal framing components should be stored on a level surface in a dry environment. Protective clothing and gloves must be worn when handling metal sections.

The insulation is delivered to site in packs. Each pack is marked with the manufacturer's details, product identification marks and batch numbers. Insulation should be stored on a firm, clean, dry and level base, which is off the ground. Avoid inhalation of insulation fibres by using face masks. Plasterboards, plasters and jointing materials should be stored on a stable level surface in a dry environment before use.

2.4 INSTALLATION

2.4.1 Approved Installers

It is recommended that installation shall be carried out by Isover Ireland trained installers who:

- 1) Are required to meet the requirements of an initial site installation survey as covered in the Isover Optima training course.

- 2) Have attended a Isover Optima System training course and are approved by Isover Ireland to install the product.
- 3) Have undertaken to comply with the Isover Ireland installation procedure, requirements of this Certificate, and the Optima Installation manual.

2.4.2 General

As described in section 3 of this certificate, Isover Ireland can prepare a site package for each project or can provide technical support to project Architects or designers on a project specific basis. Each site package must include U-value calculations, condensation risk analysis, installation manual, requirements for materials handling and storage, method statements for installation, building details, fixing requirements, provision for impact resistance, maintenance requirements, etc. This document forms part of the contract documentation for circulation to the home owner and the installer. Installers will be expected to adhere to the specification. A home owner's manual will be issued on successful completion and sign-off of completed projects.

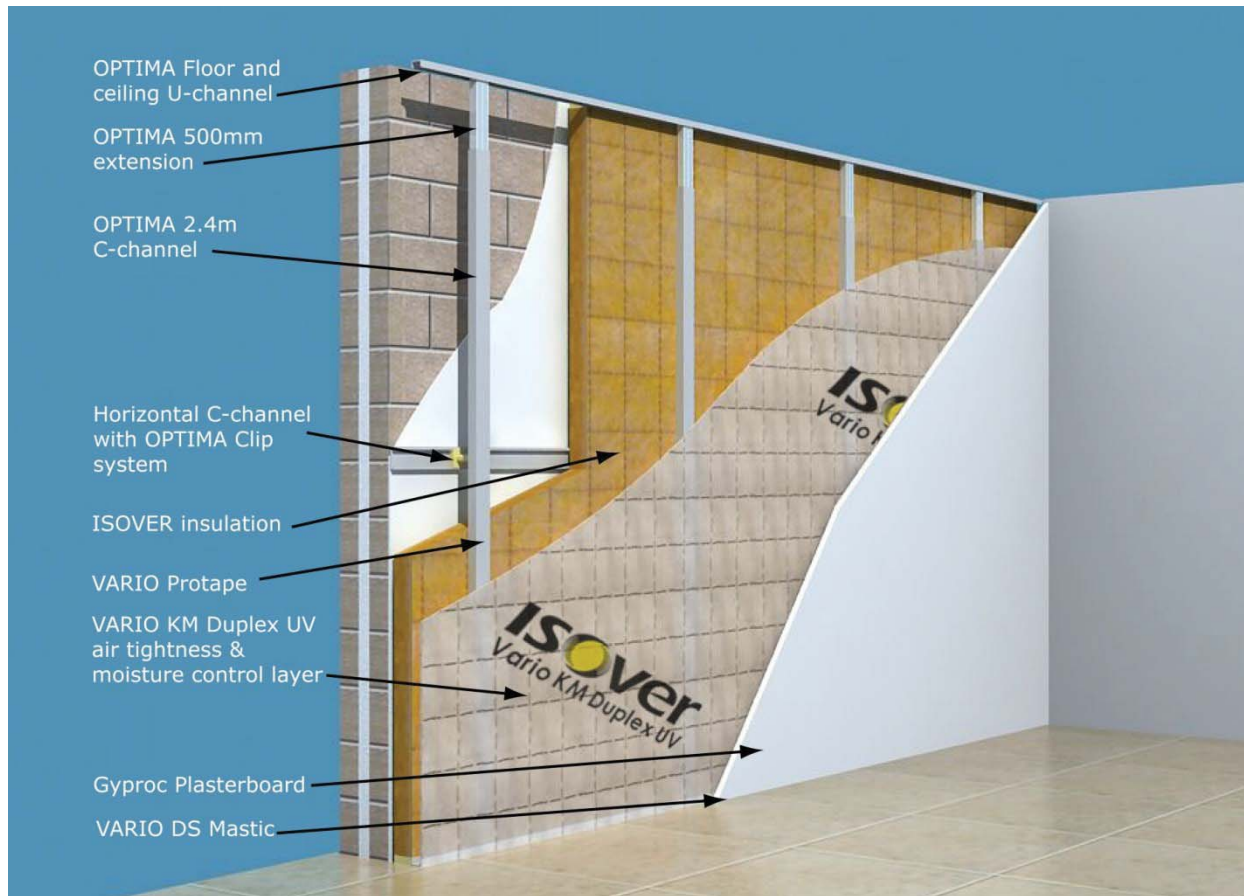


Figure 2

Isover Vario KM Duplex UV Intelligent Membrane		
Properties	Test Method	Typical performance values
Thickness	I.S. EN 1849-2	0.2mm
Mass per unit area	I.S. EN 1849-2	Approx 80 g/m ²
Roll Width	I.S. EN 1848-2	1.5m
Roll length	I.S. EN 1848-2	40m
Roll coverage		60m ²
Membrane		polyamide
Facing fabric		polypropylene
Reinforcement		polypropylene
Maximum Tensile Strength	I.S. EN 13859-1	≥ 110N/50mm
Nail tear resistance	I.S. EN 13859-1	≥ 50N
Fire Rating	EN 13501-1:2002	Euroclass E
Temperature Range	MDV*	-40 °C to +80 °C
Water Vapour transmission	I.S. EN 12572	Approx 109.7 g/m ² d to 6.6 g/m ² d
Resistance to water penetration	I.S. EN 13984	Class W1
Diffusion-equivalent air layer thickness (S _d value)	I.S. EN 12572	Variable: 0.3m ≤ S _d ≤ 5.0m (depending on humidity levels) Fixed: S _d = 2.5m can be used for steady state analysis
MDV* = manufacturer's declared value		

Table 2: Isover Vario KM Duplex UV specification

2.4.3 Site Survey and Preliminary Work

A comprehensive pre-installation site survey of the property shall be carried out by a suitably trained contractor and all key information shall be recorded on the site survey record sheets. The pre-installation survey is also used to price the project and identify all the relevant factors/technical information which need to be considered in the design of the Isover Optima system and important information to be included in the site specific pack. The survey will also establish the suitability of the external wall substrate, and whether the Isover Optima system is suitable for use on a particular project.

If the existing external wall substrate exhibits any signs of defects, weather tightness, structural, moisture ingress, lack of DPC or mould growth etc., remedial action must be carried out to address the underlying defect prior to installation of the Isover Optima system. After remedial works are complete, the pre-installation survey must be repeated with particular emphasis is placed on assessing the success of the remedial work i.e. checking moisture levels.

Isover Ireland can provide backup technical support to the contractor and designers on the technical suitability of the system for all projects.

2.4.4 Procedure for Installation

Prior to commencement of the works, installers or designers shall prepare a site specific pack as described in section 3 of this certificate. On completion of the work this information will be incorporated into the homeowner's manual information.

- At floor level, measure out from the face of the wall the thickness of insulation being used plus 20mm. Then use a chalk line to mark the front line of the U-channel.
- Screw fix at 400mm centres the U-channel to floor, ceiling and abutting walls. Locate sufficient grounds where required.
- Mechanically fix intermediate C-channel to wall at required centres, 1.35m for ceiling heights up to 2.7m or 1m centres for higher walls.
- Attach Isover Optima clips to C-channel (see figure 1) or use direct fix clip (see figure 3) at uneven substrates or to achieve greater depth.
- Install selected Isover mineral wool insulation and secure with end clip.
- Insert C-studs into top/bottom channel and clip into position. Plumb and adjust clip length as necessary.
- Stick Isover Vario Protape to studs. Neatly apply the Vario KM duplex UV intelligent membrane and seal to perimeter with DS mastic or Multi-tape as appropriate. Ensure all

joints are lapped min 100mm and sealed with Vario KB1 tape.

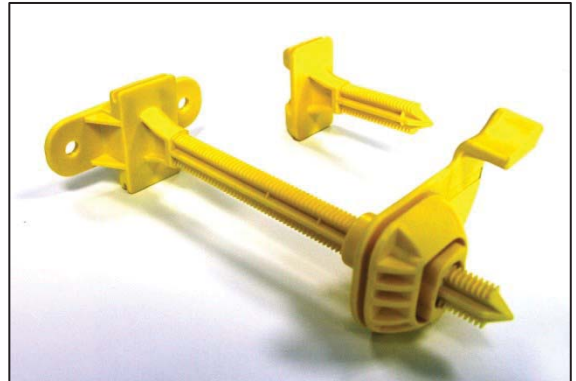


Figure 3 - Optima Direct Support Bracket

- Fix the required plasterboard of minimum 12.5mm thickness to the vertical Channels.
- The plasterboard is then both jointed and primed or skim plaster to receive a breathable paint finish.
- In order to limit thermal bridging, installation details must comply with the recommendations as outlined and detailed in the Acceptable Construction Details published by the Department of the Environment, Community and Local Government. Alternatively, for refurbishment and retrofit works, installers can use the Isover Optima system standard construction details.
- If existing windows have trickle vents the insulation must be of a thickness to ensure that the vent is not blocked or compromised.
- Refer to installer manual for guidance on finishing membranes at windows, electrical penetrations, provision of collars at vents/other penetrations and the use of support plates/grounds where necessary. Lightweight items can be hung onto the plasterboard using fixings as per Isover Optima installation manual. Heavy loads greater than 30 kg, such as wash basins, sanitary units and flat screen TV's should be fixed to the Optima metal framing. Additional framing/grounds may be need for this purpose. Gyproc Rigidur board or similar approved may be used to support heavier loads without the addition of extra metal framing. Above 2.7m, loads must be attached to the building structure. Consult with the Isover technical department for specific advice.
- All necessary post-installation inspections should be performed and the homeowner's manual completed and handed over to the homeowner accordingly.

3.0 GENERAL

The system is designed by the project Architect or designer on a project specific basis. Where the Isover Optima internal insulation system is being applied to improve the thermal performance of an existing building, Isover Ireland's technical department will help assess the specification and advise on how to maximise the benefits of the system for that building. The design will include for:

- a) The completion and recording of a site survey. For existing buildings, U-value calculations, condensation risk analysis, ventilation strategy, etc should be based on the existing structure.
- b) Evaluation of the suitability of the existing external wall substrate.
- c) Minimisation of the risk of condensation in accordance with the recommendations of I.S. EN 15026:2007, *Hygrothermal performance of building components and building elements - Assessment of moisture transfer by numerical simulation*. In addition the recommendations of BS 5250:2011+A1:2016, *Code of practice for control of condensation in buildings* must be observed. This includes the use of approved detailing as shown in the Optima standard construction details and incorporating the requirements of the Acceptable Construction Details published by the DoEHLG for new build situations.
- d) Thermal insulation provision to Part L of the Building Regulations 1997 to 2017.
- e) Resistance to impact.
- f) Ensuring that with the addition of the Optima insulated internal wall lining system in a retrofit situation the required minimum access widths for compliance with the building regulations Parts B and M are maintained and that windows used for fire escape access can open to the required minimum opening dimensions after the reveals have been insulated in accordance with thermal bridging requirements.

Detailing and construction must be to a high standard to achieve the design thermal performance, to avoid excessive thermal bridging at junctions with existing construction, to avoid the risk of interstitial condensation within the wall and to improve the air tightness of the external wall.

When designed and installed in accordance with this Certificate, the system will satisfy the requirements of Part L of the Building Regulations 1997 to 2017. The design shall include for the

elimination/minimisation of cold bridging at window and door reveals, eaves, floor junctions and at ground floor level in compliance with Acceptable Construction Details published by the DECLG.

Care must be taken to ensure that any existing ventilation openings remain un-obstructed. Refer to section 4.6.3 of this Certificate. In the event that there is sub-standard ventilation, designers must include ventilation upgrade works as part of their project specific design in order to comply with guidance document Part F to the Irish Building Regulations.

During the site survey it is essential to establish if an effective Radon membrane is present in the existing building. If the existence of an effective membrane is difficult to establish then designers are advised to carry out an assessment of Radon levels when the building is in normal use. One of the benefits of the Isover Optima internal insulation system is increased air tightness through the reduction of un-designed background ventilation of older more draughty buildings. This may lead to increase Radon levels. If the presence of contaminants is confirmed, appropriate remedial action must be undertaken. Upon completion of the works, Radon level must be re-tested to establish the effectiveness of remedial measures.

3.1 CE MARKING

The manufacturer has taken the responsibility of CE marking the products in accordance with harmonised standard I.S. EN 13162:2012+A1:2015, *Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification*. An asterisk (*) appearing in this Certificate indicates that data shown is given in the manufacturer's Declaration of Performance.

Reference should be made to the latest version of the manufacturer's DoP for current information on any essential characteristics declared by the manufacturer.

4.1 STRENGTH AND STABILITY

4.1.1 Structural Safety

The Isover Optima internal drylining system can withstand normal residential and commercial building internal wind pressures in accordance with the Building Regulations 1997 to 2017.

For wall heights up to 2.7m a horizontal line of support with Optima support brackets at mid-height i.e. a maximum of 1.35m centres is required to each vertical C-channel. For wall heights above 2.7m, horizontal lines of support will be required at a maximum of 1m centres above floor level.

For high wall heights greater than 6m seek design advice from the Isover Technical department as the plasterboard specification and Isover Optima configuration may require adjustment. The maximum permissible wind loading pressures are limited to 0.4 kN/m² for the system; therefore industrial or other premises with large external openings should be assessed for wind loads prior to installation.

The system is an internal drylining wall system and cannot be relied upon to assist in the structural design of a building for either vertical load transfer or lateral stability in the form of racking resistance.

All fixing must satisfy the minimum requirements of the Isover Optima installation manual. Isover Ireland technical department can advise on required fixing types for all materials.

4.1.2 Impact Resistance

The Isover Optima system used with Gyproc plasterboards and installed in accordance with the instructions contained within this certificate will give equivalent impact resistance to other internal steel drylining wall systems used with Gyproc plasterboards.

If areas requiring high impact resistance or areas required to support significant cantilevered or wall mounted vertical loads then a Gyproc Rigidur board is available. Refer to the Isover Optima technical department for advice on areas where high impact resistance is required.

4.2 BEHAVIOUR IN RELATION TO FIRE

The reaction to fire classification according to I.S. EN 13501-1:2007+A1:2009 *Fire classification of construction products and building elements – Classification using data from reaction to fire*

tests for the 12.5mm plasterboard faced system is A2- s1, d0.

The Isover Optima drylining system has not been considered or assessed as possessing any contributing fire resistance to the external wall of the building. The existing wall structure must possess the full fire resistance properties required in Part B of the building regulations for each particular building.

The toxicity risks in relation to the Vario intelligent membrane and the polyamide brackets and clips in the event of a fire are negligible in the wall construction.

When designing projects using the Isover internal insulation wall system care must be taken to ensure that minimum fire escape widths and escape window opening widths required in TGD Part B of the Building Regulations can be achieved with the addition of the system, especially in refurbishment situations.

4.3 PROXIMITY OF HEAT PRODUCING APPLIANCES

Combustible material must be separated from a brick or blockwork chimney by at least 200mm from a flue and 40mm from the outer surface of the brick or blockwork chimney, in accordance with Clause 2.15 of TGD to Part J of the Building Regulations 1997 to 2017. Metal fixings in contact with combustible materials should be at least 50mm from a flue.

4.4 THERMAL INSULATION

Assessments were carried out to verify that the requirements of Part L of the Building Regulations 1997 to 2017 can be achieved using the Isover Optima drylining system.

The Isover mineral wool insulations have been assessed by NSAI Agrément and are tested in accordance with I.S. EN 13162, *Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification* by accredited independent authorities. Table 5 shows typical insulation thicknesses to achieve a range of U-Values. The U-values have been calculated in accordance with I.S. EN ISO 6946:2017, *Building Components and Building Elements – Thermal Resistance and Thermal Transmittance – Calculation Method*.

Thermal modelling of a complete wall system with the polyamide brackets included has confirmed that the influence of the brackets is

negligible and that the thermal bridging of the brackets can be disregarded in U-value calculations.

Calculation of U-values will be required on individual projects to confirm a required U-value has been achieved, based on the wall construction and the insulation used. The thermal conductivity (λ) value of the insulation to be used in all U-value calculations must be the $\lambda_{90/90}$ value. Comfort 32 and Comfort 35 have a declared thermal conductivity of 0.032* W/mK and 0.035* W/mK respectively. Metac UF-034 mineral wool insulation has a declared thermal conductivity of 0.034* W/mK.

Ventilation to the building must be maintained in accordance with the requirements of TGD F. (See clause 4.6.3 of this certificate.)

4.5 LIMITING THERMAL BRIDGING

The linear thermal transmittance ' Ψ ' (Psi) describes the additional heat loss associated with junctions and around openings. As part of the assessment process, the Isover Optima Drylining System was applied to a range of typical external wall build-ups and both the Ψ -value and temperature factor (f_{Rsi}) were calculated for all junctions. The results of all acceptable installation details are contained in the Isover Optima construction details manual. When installed in accordance with these details thermal bridging will be minimised and local condensation problems will be mitigated.

When it is not possible to establish that all thermally bridged junctions within a dwelling meet with the requirements of appendix D of TDG Part L, then designers must use the default ' γ ' factor of 0.15 when account for the heat loss due to thermal bridging.

Alternatively, for new build situations, if **all** junctions can be shown to be equivalent or better than the Acceptable Construction Details published by the DoEHLG, then the improved ' γ ' factor of 0.08 can be used.

Where either of the above options are shown to be valid, or when the required values cannot be achieved, all relevant details should be recorded on the 'Certificate of Compliance' for that project for use in future BER calculations.

' Ψ ' values for other junction outside the scope of this certificate should be assessed by a NSAI registered Thermal Modeller or equivalent competent person in accordance with the requirements of BRE IP1/06, *Assessing the effects of thermal bridging at junctions and around openings* and BRE Report BR 497, *Conventions for calculating linear thermal transmittance and temperature factors*.

It is recommended that continuity of insulation be maintained to limit the instances of thermal bridging, to maintain internal surface temperatures at sufficiently high levels in order to minimise the risk of surface condensation and mould growth.

4.6 CONDENSATION RISK

The certificate holder has carried out a dynamic condensation and moisture risk analysis on different external wall substrates in two locations in Ireland using the method in I.S. EN 15026:2007 *Hygrothermal performance of building components and building elements - Assessment of moisture transfer by numerical simulation*.

The Isover Optima Drylining system will always require as part of the system a Vario KM Duplex UV intelligent membrane behind the plasterboard to act as a vapour control layer. The use of Vario is limited to situations where the R value of the insulation used is less than or equal to 4.5m²K/W and for normal internal climates corresponding to humidity classes 1-3 in BS 5250:2011+A1:2016. Where the U-value requires insulation with an R value greater than 4.5m²K/W or the humidity class is above 3 a different vapour control layer and possibly an external wall treatment will be needed. Technical advice and analysis from Isover Ireland must be sought and these situations are not covered by this certificate.

4.6.1 Internal Surface Condensation

When improving the thermal performance of the external envelope of a building through internal wall drylining insulation, designers need to consider the impact of these improvements on other untouched elements of the building. As discussed in Section 4.5 of this Certificate, thermally bridged sections of the envelope such as window jambs, sills, heads, internal wall and floor junctions and eaves will experience a lower level of increased thermal performance. The degree of improvement to these junctions can be limited due to physical restrictions on site and the practicality of improving these junctions i.e. positions of trickle vents, hinges for windows, desire to keep existing architectural features or lack of access to fit additional insulation.

When bridged junctions, are detailed with the minimum thermal resistance of insulation shown on the Optima construction details the coldest internal surface temperature will satisfy the requirements of Section D2 of Part L of the building regulations, namely that the temperature factor shall be equal to or greater than 0.75. As a result, best practice will have to be adopted in order to limit the risk of internal surface condensation which can result in dampness and mould growth.

When site limiting factors give rise to substandard levels of insulation at bridged junctions, guidance should be sought from the Certificate holder as to acceptable minimum requirements.

4.6.2 Interstitial Condensation

Where a specific condensation risk is identified at design stage, a condensation risk analysis can be carried out by the Isover technical department in accordance with BS 5250:2011+A1:2016 and the design modified as appropriate to reduce the risk of interstitial condensation to acceptable levels.

Alternatively a condensation risk analysis in accordance with I.S. EN 15026 can be used to predict one dimensional transient heat and moisture transfer in multi-layer building envelope components subjected to non-steady climate conditions on either side.

It is recommended that continuity of both insulation and vapour control layer be maintained. This is particularly important at the junction between external walls and both internal partition walls and floors (See Figure 4). Designers should refer to Isover Optima construction details manual for best practice installation details.

4.6.3 Ventilation

When installing the internal insulation system, the works to be undertaken must not compromise the existing ventilation provisions in the building. When these existing ventilation provisions do not meet the requirements of Part F of the Building Regulations, the homeowner should be informed and remedial action should be taken either before or during when the internal insulation system is installed.

4.7 ACCESS FOR PEOPLE WITH DISABILITIES

Building designs are required to provide minimum opening widths for doors and corridors, and minimum dimensions for rooms and circulation spaces to provide access for people with disabilities and access space in sanitary conveniences in accordance with the requirements of TGD Part M to the building regulations 1997 to 2017. These minimum dimensions must be complied with when designing retrofit existing buildings with the Isover Optima Drylining System.

Building designers must also comply with assess and escape width requirements described in TGD Part B and TGD Part K to the building regulations 1997 to 2017.

4.8 MAINTENANCE

The system shall be inspected and maintained in accordance with the Certificate holder's

instructions, as detailed in the Home Owner's Manual. There is no special maintenance procedures required other than those used with the normal redecoration of internal walls. It is important to ensure that any paints used to redecorate the walls of the system allow water vapour transmission.

4.9 WEATHERTIGHTNESS

The Isover Optima Drylining System does not add to the weather tightness of the external wall envelope and the system has not been assessed for weather tightness.

The existing wall cladding and substrate must be of sufficient integrity and weather tightness to ensure that no moisture can reach the Isover mineral wool insulation in contact with the inside face of the existing wall structure.

As part of the initial site survey of the building the weather tightness of the existing external wall structure must be assessed. Moisture ingress problems must be fully repaired and the repaired wall must be given time to fully dry out. After remedial works are complete, the pre-installation survey must be repeated and particular emphasis is placed on assessing the success of the remedial work i.e. checking moisture levels. The Isover technical department can give advice as to the suitability of the system for use on specific projects.

4.10 ELECTRICAL & PLUMBING SERVICES

Electrical installations should be in accordance with the ETCI publication *ET 207: 2003 Guide to the National Rules for Electrical Installations as Applicable to Domestic & Similar Installations*.

The Isover Optima drylining system has been assessed for its suitability to accommodate both new and existing electrical and plumbing services. As part of the survey of an existing building, all existing services whether mechanical or electrical must be identified and marked. Access panels to existing services such as rodding eyes or stop-cock must be maintained.

When designing and installing the Isover Optima Drylining System it is essential to take all precautions to avoid reduced thickness of insulation and to minimise penetrations through the Vario intelligent membrane. The membrane must be sealed around the service penetration as per instructions in the Optima installation manual and insulation replaced tight around the service after installation. Electrical cables should run vertically down in the air cavity between the Vario membrane and the plasterboard, hence avoiding any penetration of the Vario membrane. If electrical cables must pass through the insulation then run them directly through the insulation in conduits.

When soil pipes or down pipes are required to run within the depth of the Isover Optima drylining system, then the system should step around the obstruction in order to maintain a constant thickness of insulation at the service location.

4.11 DURABILITY AND DESIGN LIFE

An assessment of the design life of the Isover Optima drylining system was carried out. This included an assessment of:

- Design and installation controls;
- Material specifications and material safety data sheets, including steel sections, Vario membrane, insulation, plasterboard and fixing specifications;
- Construction details;
- Maintenance requirements.

The assessment indicates that the system should have a life comparable with other elements of internal wall construction that are protected from external exposure, providing that it is designed, installed and maintained in accordance with this Certificate. Regular maintenance shall be undertaken as outlined in Section 4.9 of this Certificate.

4.12 PRACTICABILITY

The practicability of installation and the adequacy of site supervision arrangements were assessed and considered adequate. The project specific designs and method statements for installation and maintenance given in the Optima installation manual were reviewed and found to be satisfactory.

4.13 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING

- Structural strength and stability
- Behaviour in fire
- Impact resistance
- Pull-out resistance of fixings
- Thermal resistance
- Hygrothermal behaviour
- Condensation risk
- Durability of components

4.14 OTHER INVESTIGATIONS

- Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed.
- The manufacturing process for the polyamide support brackets and clips was examined including the methods adopted for quality control, and details were obtained of

the quality and composition of the materials used.

- Specific building details for retrofit situations (e.g. ground floor level, window and door openings, etc.) contained in the Optima construction details were assessed and approved for use in conjunction with this Certificate.
- Site visits were conducted to assess the practicability of installation.

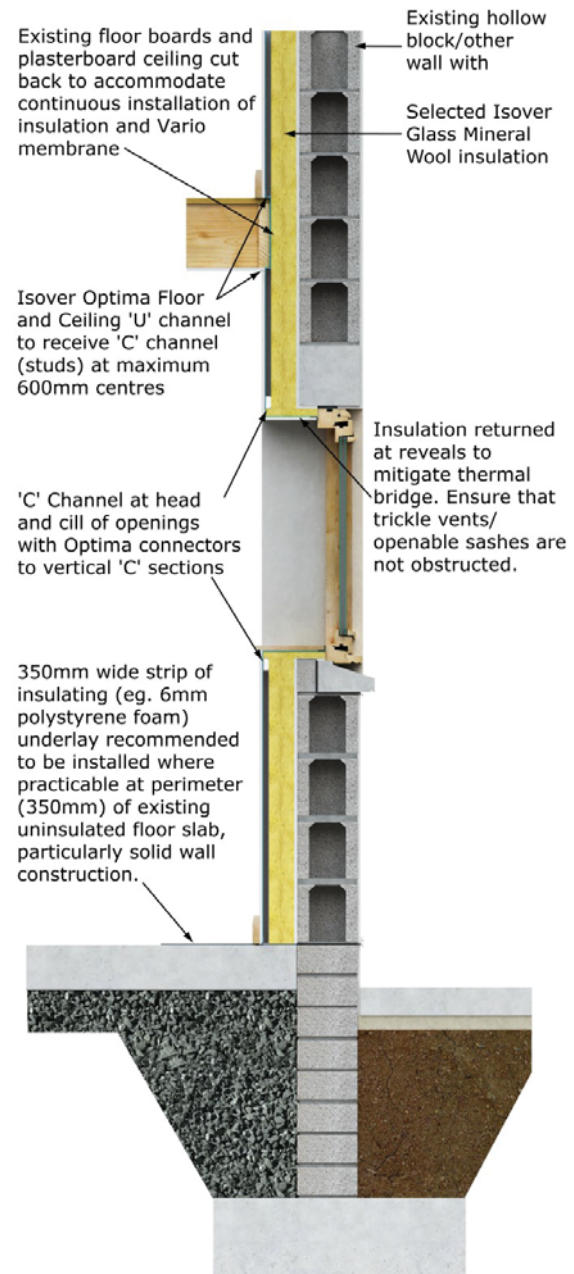


Figure 4

Existing Wall Structure	Insulation Type	Thermal Conductivity ($\lambda_{90/90}$) (W/mK)	U values (W/m ² K)	
			Existing wall	With Optima System Insulation
215mm Hollow Block 15mm external render + Insulation + Vario + plasterboard	120mm Comfort 32	0.032*	2.26	0.23
	140mm Comfort 32	0.032*	2.26	0.20
	120mm Comfort 35	0.035*	2.26	0.24
	140mm Comfort 35	0.035*	2.26	0.21
	160mm Comfort 35 [†]	0.035*	2.26	0.19
	180mm Comfort 35 [†]	0.035*	2.26	0.17
Partial fill Masonry Cavity Wall Construction 15mm external render + 100mm block + 50mm cavity + 50mm insulation ($\lambda =$ 0.038 W/mK) + 100mm block + 13mm plaster + Insulation + Vario + plasterboard	60mm Comfort 32	0.032*	0.54	0.26
	120mm Comfort 32	0.032*	0.54	0.18
	140mm Comfort 32	0.032*	0.54	0.16
	60mm Comfort 35	0.035*	0.54	0.27
	80mm Comfort 35	0.035*	0.54	0.24
	100mm Comfort 35	0.035*	0.54	0.21
Concrete Wall 15mm external render + 200mm concrete + 13mm internal plaster + Insulation + Vario + plasterboard	120mm Comfort 32	0.032*	3.39	0.24
	140mm Comfort 32	0.032*	3.39	0.20
	120mm Comfort 35	0.035*	3.39	0.26
	140mm Comfort 35	0.035*	3.39	0.23
	180mm Comfort 35	0.035*	3.39	0.18
	Single Brick Construction 100mm brick +13mm internal plaster + Insulation + Vario + plasterboard	60mm Comfort 32	0.032*	3.10
120mm Comfort 32		0.032*	3.10	0.24
140mm Comfort 32		0.032*	3.10	0.21
80mm Comfort 35		0.035*	3.10	0.37
100mm Comfort 35		0.035*	3.10	0.31
120mm Comfort 35		0.035*	3.10	0.26
	140mm Comfort 35	0.035*	3.10	0.23

[†]If the thermal resistance (R) of the insulation ≥ 4.5 m²K/W, designers should contact the certificate holder for specific technical support.

Table 5: Typical U-values (W/m²K)

5.1 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of issue so long as:

- (a) the specification of the product is unchanged.
- (b) the Building Regulations 1997 to 2017 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
- (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
- (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
- (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
- (f) the registration and/or surveillance fees due to IAB are paid.

5.2 The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number

5.3 In granting Certification, the NSAI makes no representation as to;

- (a) the absence or presence of patent rights subsisting in the product/process; or
- (b) the legal right of the Certificate holder to market, install or maintain the product/process; or
- (c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.

5.4 This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.

5.5 Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.6 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made there under, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

NSAI Agrément

This Certificate No. **12/0373** is accordingly granted by the NSAI to **Isover Ireland** on behalf of **NSAI Agrément**.

Date of Issue: **August 2012**

Signed



Seán Balfé
Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.nσαι.ie

Revision: **January 2018**

- 5 year review.