IRISH AGRÉMENT BOARD
CERTIFICATE NO. 26/0450
POLYCHEM SYSTEMS Sp. z o.o.,
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Polychem Systems

Spray Foam Insulation

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

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 and subsequent revisions.**

PRODUCT DESCRIPTION:
This Certificate relates to the PUREX NG OC500 open cell spray foam insulation (formerly known as PUREX NG 0810 NF P) and PUREX NG CC2000 closed cell spray foam insulation (formerly known as PUREX NG 0428 NS). PUREX NG OC500 open cell spray foam is a low-density spray-applied expanding Polyurethane open celled insulation foam for use in new and existing buildings. PUREX NG CC2000 closed cell spray foam is a closed celled spray-applied rigid Polyurethane insulation foam for use in new and existing buildings.

In the opinion of NSAI, PUREX NG OC500 & PUREX NG CC2000 spray foam insulation products, as described in this Certificate, comply with the requirements of the Building Regulations.

PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam are manufactured in Poland by POLYCHEM SYSTEMS Sp. z o.o. (hereafter referred to as Polychem) and distributed in Ireland by approved suppliers. Polychem are responsible for the design and supply of all components to approved specifications, in accordance with the Polychem approved supplier system.

USE:
The product is used as a thermal insulation, and contributes to the thermal performance of:

- Pitched roof constructions with insulation on slope and roof underlay combined with adequate ventilation and Vapour Control Layer.

- Pitched roof constructions in retrofit situations where underlay is breathable or non-breathable with use of a breather card.

- Pitched roofs in new build situations where it is sprayed onto the underside of a taut breathable low resistant underlay provided the natural drape of the underlay is retained and provided adequate ventilation is provided above the low-resistant underlay through the provision of a batten and counter batten or air permeable finishes.
- Pitched roof constructions with insulation at ceiling level where the attic space is non-habitable.

Further detailed information can be found in Section 2 of this Certificate.

MANUFACTURE AND MARKETING:
The product is manufactured by

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and distributed by

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1.1 ASSESSMENT

In the opinion of NSAI Agrément, PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray insulation, if used in accordance with this Certificate, meet the requirements of the Building Regulations as indicated in Section 1.2 of this Certificate.

1.2 Building Regulations

REQUIREMENTS:

Part D – Materials and Workmanship
D1 – Materials & Workmanship
PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation, as certified in this Certificate, meet the requirements of the Building Regulations for workmanship.

D3 – Proper Materials
PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation, as certified in this Certificate, are comprised of proper materials fit for their intended use (See Part 4 of this Certificate).

Part B – Fire Safety
B3 – Internal Fire Spread (Structure)
Part B Volume 2 – Fire Safety
B8 – Internal Fire Spread (Structure)
Walls using PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation meet the requirements, provided the completed walls comply with the conditions described in Section 4.1 of this Certificate.

Part B – Fire Safety
B4 – External Fire Spread
Part B Volume 2 – Fire Safety
B9 – External Fire Spread
PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation will not affect the external fire rating of any building construction in which it is incorporated.

Part C – Site Preparation and Resistance to Moisture
C4 – Resistance to Weather and Ground Moisture
PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation meet the requirements of this regulation when installed as indicated in Section 2.3, pitched roofs constructed in compliance with Part 3 of this Certificate.

Part F – Ventilation
F1 – Means of Ventilation
PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation can meet the requirements of this regulation, when installed in accordance with Section 2.4 and Part 3 of this Certificate.

F2 – Condensation in Roofs
PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation meet the requirements of this regulation, when designed and installed in accordance with Section 2.4 and Part 3 of this Certificate.

Part J – Heat Producing Appliances
J3 – Protection of Building
PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation, if used in accordance with this Certificate, meet the requirements of the Building Regulations.

Part L – Conservation of Fuel and Energy
L1 - Conservation of fuel and energy
Based on the measured thermal conductivity's (See Part 4 of this Certificate), pitched roofs incorporating PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation can meet elemental U-value requirements of the Building Regulations. (see Section 4.3 of this Certificate and the certificate holder's technical manual).

When PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation are incorporated into buildings in accordance with the Certificate holders approved installation details there shall be no risk of mould growth arising from surface condensation.

2.1 PRODUCT DESCRIPTION

2.1.1 PUREX NG OC500 open cell spray foam

PUREX NG OC500 open cell spray foam is a low-density open celled Polyurethane spray foam insulation product. The insulation is spray-applied in a liquid form and expands in seconds using a carbon dioxide blowing agent which is formed during a reaction between water contained in Component A and Isocyanate in Component B of the mixture to provide a flexible foam blanket with a thickness to meet the required U-Value. The thickness should be determined in accordance with EN 14315-2:2013(7). The foam should be sprayed in layers in typically in the range of 75 to 100mm. PUREX NG OC500 open cell spray foam has an approximate free rise density of 7-9 Kg/m³.

2.1.2 PUREX NG CC2000 closed cell spray foam

PUREX NG CC2000 closed cell spray foam is a high-density closed celled Polyurethane spray foam insulation product. The insulation is spray-applied in a liquid form and expands in seconds using a mixture of HFO & HFC compounds as a blowing agent to provide a rigid foam blanket. The thickness should be determined in accordance with EN 14315-2:2013(7). The foam should be sprayed in layers typically in the range of 15 to 25mm. PUREX NG CC2000 closed cell spray foam has an approximate free rise density of 28-32Kg/m³.

2.1.3 General

Both foams are prepared from two liquid components: the "A-side" component is a polyol with additives and the "B-side" component is a polymeric diphenylmethane diisocyanate (PMDI). After agitation and at a predefined temperature and pressure, component A & B are mixed within the nozzle of the spray gun during the application process.

PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam is recommended to be applied to substrates with a surface temperature between 15-30°C for maximum yield and efficiency.

PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulations have low thermal conductivity values. No VOC's, CFC's, HCFC's, HFC's or Urea formaldehyde are used in the manufacture of PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulations and neither product provide a food source or nutritional value for rodents or insects.

VOC emissions of the PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam have been tested according to EN 16516(30) and Parts 3,6 and 9 of ISO 16000(31). For both products, the testing found no exceedances of the permissible concentrations of substances hazardous to health in habitable rooms.

On-site quality checks include density and appearance.

Ancillary components consist of

- Rafter slider/breathable card
- Proprietary roof tile ventilators
- Proprietary soffit vents
- Vapor Control Layer (VCL), tapes and sealants

2.2 DELIVERY, STORAGE AND MARKING

The two components, polyol (A-side) and (B-side) are delivered to site in steel drums, each drum bearing the product name, batch number, expiry date, designation code, thermal resistance and reaction to fire classification.

Drums should be stored in a cool well-ventilated area, away from possible ignition sources. The drums must always be protected from frost. The system components are sensitive to humidity and must be stored in sealed drums or containers. The storage temperature for all components must be maintained between 15 and 25°C for the system.

It is recommended that the drums remain factory-sealed with gaskets in place until they are to be used, to reduce the chance of contamination of the chemicals and spillage of chemicals while moving the drums. Protective clothing must always be worn when handling and moving the drums. For PUREX NG OC500 , the shelf life of component A (polyol) is 6 months and is also 6 months for the component B, for PUREX NG CC2000, the shelf life of component A (polyol) is 3 months and is 6 months for component B.

Drums must be completely empty of liquid components before disposal. Drums must not be re-used once emptied. The drums can be reconditioned and recycled.

Diisocyanate and polyol are classified as 'harmful' and 'irritant', and the packaging bears the appropriate hazard warning labels. Direct contact with the raw material must be avoided and operatives must be equipped with the appropriate protective clothing. When fully reacted and cured, PUREX NG OC500 open cell spray foam nor PUREX NG CC2000 closed cell spray foam constitute a hazard.

2.3 INSTALLATION

2.3.1 Precautions

In general, the recommendations of I.S. EN 14315-2:2013[7] should be observed.

Table 1: Product Performance Characteristics

Processing Data	Open Cell	Closed Cell
Cream time	3 - 5	4 – 7
Gel time	7 - 9	8 - 10
Tack free time	10 - 14	11 - 17
Free rise density (core) (kg/m3)	7 - 9	28 - 32
Installed Density(kg/m3)	8 - 15	34 - 40

To comply with the requirements of the Safety, Health and Welfare at Work Act 2005 a full site-specific risk assessment must be carried out prior to installation. As part of this process, it is essential that there is an exchange of information between the client and the installer before spray operations commence on any site. Safety hazards likely to be brought into the client's environment, such as the supply line to the spray gun, should be discussed and measures agreed to deal with such hazards both safely and effectively.

The process for the installation of PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulations require worker controls for exposure to vapours. Applicators must wear full personal protection equipment when working with the product, including full-face fresh-air supplied respirators, protective clothing and gloves. Other trades and personnel must vacate all spaces in which spraying is taking place. In addition, supplemental ventilation, in the form of natural ventilation or mechanical ventilation is required to minimize inhalation risks.

Vapours given off by certain components of the system, e.g. Diisocyanate, are generally heavier than air and will tend to move to lower parts of the building. These parts must be ventilated by opening windows and doors to prevent the build-up of toxic vapours. A minimum 24-hour waiting period prior to re-occupancy is required for buildings that are already occupied. Certain applications, e.g. confined roofs, require the use of extractor fans or mechanical ventilation as recommended by the Certificate holder.

Care should be taken to minimise the degree of overspray generated whilst spraying. This is in the form of a fine mist of particles that can travel considerable distances and will adhere strongly to surfaces they land on.

To prevent the product from entering occupied space, for example during installation in the loft area, the loft hatch must be kept closed during the spraying process. Protective covers must be placed over water tanks to prevent contamination during application and for potentially harmful vapours to be ventilated from the roof space.

2.3.2 General

Installation of PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation must be carried out by installers who have been approved and trained by the Certificate holder and are also registered spray foam applicators to any national installer scheme that is applicable and active at the time of installation. The requirements of the Polychem Installer Training Manual must always be followed.

2.3.3 Procedure

Building elements to be insulated must be surveyed for their suitability and any necessary repairs carried out prior to installing PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation. The positioning and access to services should also be considered. Areas that are not to be sprayed with PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation must be masked off by taping plastic sheeting in place, as overspray will stick to most surfaces and cannot be removed without damaging that surface.

The product should be spray applied to clean and dry substrates, and built-up in layers with successive passes as described in the Polychem Installer Training Manual. Once the foam has fully cured, the product can then be covered with a VCL and lining board when required.

2.3.4 On-Site Quality Control testing

Density and appearance are the two key on-site quality control items. Prior to commencing installation, a density check is carried out and the results are recorded. If the density is found to be within the acceptable installed density range, the foam installation can proceed. This installation period ends when the machinery is switched off, when either barrel is changed, if off ratio spraying is observed, if climatic conditions i.e. temperatures drop outside allowable levels, or if problems arise with equipment. The final cured density of the foam is the most important on-site quality control check performed.

Additional on-site quality control tests include:

- A visual inspection of the fine cell structure.
- A visual inspection on colour consistence.
- A physical inspection of the final cured foam. Trained installers will recognise excessively spongy or brittle products which can be as a result or substandard or defective product/ installation.

2.3.5 Maintenance Access

When placing foam insulation at ceiling level within an attic, complete encapsulation of the timber ceiling joist, without the provision of raised timber walkways to provide safe access for maintenance of services such as water tanks must be avoided.

When placing foam insulation at ceiling level within an attic, attic hatches must be modified such that they have equivalent thermal resistance to that of the upgraded ceiling.

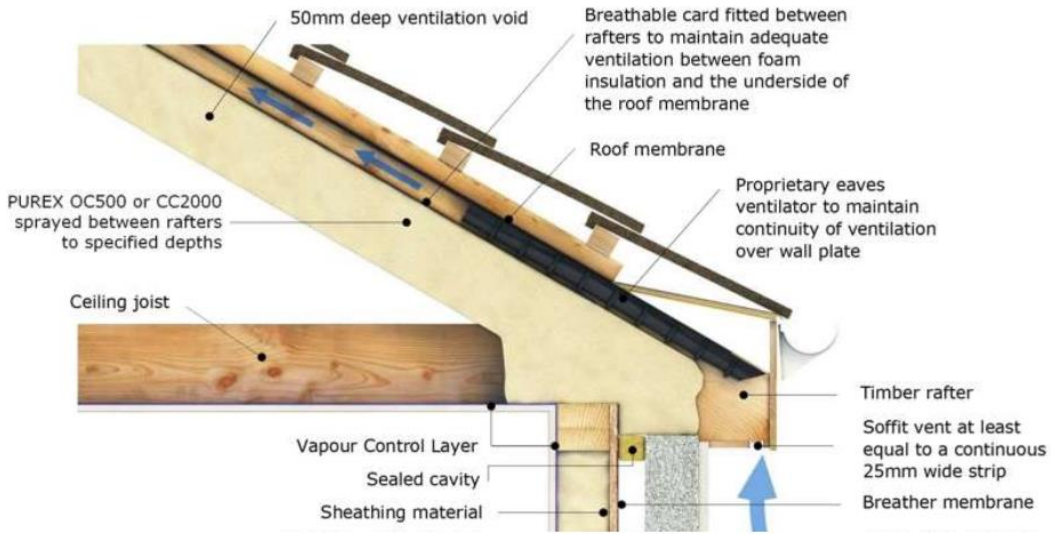


Figure 1 - Pitched roof, insulation on slope

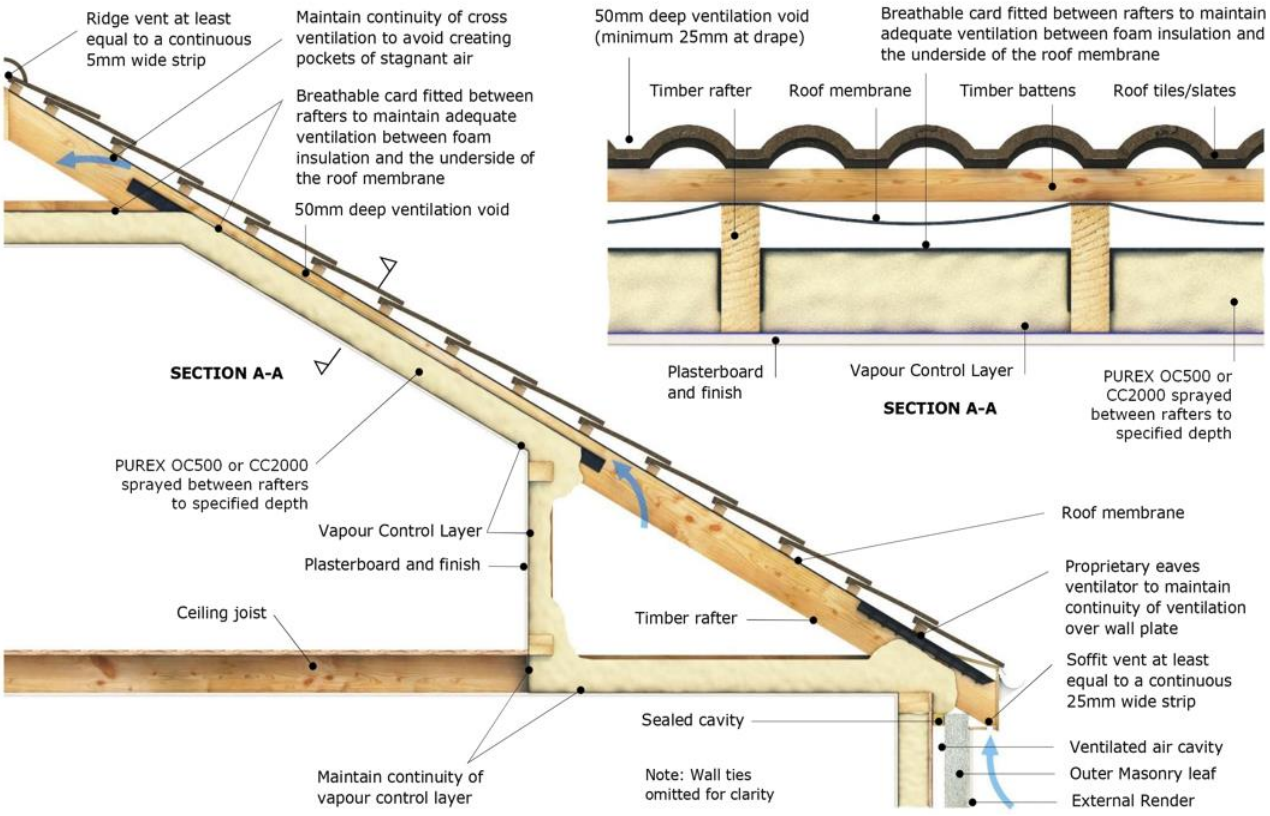


Figure 2 - Pitched roof, habitable roof space

2.4 BUILDING INSTALLATIONS

Attention must be paid to limit thermal bridging for all installation applications. It is essential that adequate ventilation be provided in accordance with TGD Part F to the Building Regulations[5], for all installations. In retrofit situations recommendations outlined in S.R. 54:2022[3] must be observed.

2.4.1 Pitched Roof – insulation on slope

2.4.1.1 General

Pitched roofs are defined as a roof having a pitch between 15° - 75°. When installing PUREX NG OC500 open cell spray foam or PUREX NG CC2000 closed cell spray foam insulations into a pitched roof it is essential that careful consideration be given to the **provision of adequate roof ventilation and the control of vapour migration into the roof structure.** Moisture in the form of vapour moves within a building structure by a combination of vapour diffusion through materials and by convection through gaps and cracks in VCL's, at service penetrations or at attic hatches. In all installations it is recommended that a VCL be installed on the warm side of the insulation. The foam insulation is trimmed flush with the inside face of the roof rafters prior to installing a VCL and plaster board finish.

In refurbishment works, in non-habitable roof spaces, where it is not practicable to install a VCL and where the existing plasterboard and ceiling finishes are being relied upon to perform the vapour control function, further care must be exercised to ensure that moisture vapour from the dwelling below is restricted. The following guidance should be considered:

- Providing the means to remove moisture vapour at source i.e. ensure that adequate ventilation is present in the rooms below the attic space.
- Providing a well-sealed airtight ceiling.
- Services which penetrate the ceiling should be made airtight and should be kept to a minimum.
- Recessed down-lighters should be avoided.
- Installing an effective sealed VCL where possible.
- Water tanks in the loft space must have a permanent cover.
- Existing ceiling level insulation should not be left in place where the pitched roof is to be insulated with spray foam.

When insulating along the pitch, a **ventilation void must be provided on the external side of the spray foam insulation.** This can be provided through the introduction of a breathable rafter card, with a water vapour resistance not greater than 0.25 MN.s/g, fitted between the existing rafters above the insulation as described in Clause 2.4.1.3 and 2.4.1.4.

It is necessary to maintain continuity of cross ventilation and ventilation must be designed to avoid creating pockets of stagnant air. To satisfy the requirements of TGD Part F[5], a continuous 25mm ventilation strip must be provided along the eaves and a 5mm strip along the apex. At the apex, it is recommended that the foam insulation be carried across the line of the collar tie to allow individual ventilated voids between rafters mix together at the apex. This space can be ventilated using several propriety vent tiles, staggered either side of the apex, rather than a continuous 5mm strip.

Air permeable roof coverings, as defined in BS 5250:2021[1], typically consist of natural slates, clay and concrete tiles whereas man-made slates would be considered as an impermeable roof covering.

In all roof types, continuity of insulation from rafter to wall must be maintained at eaves level. This will serve to limit thermal bridging at this junction. Designers and specifiers should refer to the certificate holder's installation details manual for best practice at all building junctions.

2.4.1.2 Existing and new roof – HR Underlay

When installing PUREX NG OC500 open cell spray foam or PUREX NG CC2000 closed cell spray foam insulations into a pitched roof with a non-breathable HR[1] (high resistance) underlay, a 50mm deep ventilation void must be created between the foam insulation and the underside of the roof underlay. Provisions for ventilation and VCL's as described in Clause 3.5 & 4.2.1 must be observed.

2.4.1.3 Existing roof – LR Underlay

When installing PUREX NG OC500 open cell spray foam or PUREX NG CC2000 closed cell spray foam insulations into a pitched roof with a breathable LR[2] (low resistance) underlay, a 50mm deep ventilation void must be created between the foam insulation and the underside of the roof underlay. In the case where a 50mm ventilated void exists between the LR underlay and the underside of the roof tiles, through the provision of a batten and counter batten or the roof finishes are considered to be air permeable, the breathable rafter card can be placed up to the underside of the LR membrane. Placement of the breathable rafter card and subsequent installation of foam must not encroach on the natural drape of the LR membrane. Provisions for ventilation and VCL's as described in Clause 3.5 & 2.4.1.1 must be observed.

2.4.1.4 New roof – LR Underlay

When installing PUREX NG OC500 open cell spray foam or PUREX NG CC2000 closed cell spray foam insulations into a new build pitched roof with a taut breathable LR underlay, the product can only be directly applied to the underlay with the written approval of the underlay manufacturer. The natural drape of the underlay must be retained in all cases. If there is no approval from the LR underlay

[1] *HR underlay are defined as membranes with a water vapour resistance greater than 0.25 MN.s/g*

[2] *LR underlay are defined as membranes with a water vapour resistance not exceeding 0.25 MN.s/g*

manufacturer, a breather card, with a water vapour resistance of no greater than 0.25MN.s/g, must be installed between the rafters to provide adequate separation gap between the foam and the LR underlay. Adequate ventilation must be provided above the LR underlay through the provision of a batten and counter batten or air permeable roof finishes.

2.4.1.5 LR Underlay on a sarking board

PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation can be applied into the cavity formed by roof rafters and a continuous sarking board when the following ventilation requirements are met. The roof coverings above the sarking board and breathable LR roof underlay are air permeable or, in the case of impermeable roof coverings, adequate ventilation through the provision of a tiling batten and counter batten exists between the underlay and the roof finishes. Continuity of cross ventilation must be maintained, and consideration must be given to avoid creating pockets of stagnant air.

2.4.2 Attic Floors, Insulation at Ceiling level

The product is sprayed into the cavity formed by the ceiling joists and the attic floor (lining board). Care must be taken to ensure that ventilation is maintained at eaves level through the correct installation of an eaves tray. Provision must be made for adequate ventilation as outlined in TGD Part F of the Building Regulations[5].

Attic hatches/ trap door must be insulated such that they will have an equivalent thermal resistance to that of the upgraded ceiling. To limit moisture laden air entering the unheated loft space, every effort should be made to ensure an airtight seal is achieved when the attic hatch is closed.

When the depth of insulation exceeds the depth of the ceiling joists, access platforms must be provided to allow for safe access for maintenance (i.e. water tanks).

When insulating at ceiling level, appropriate measures must be taken to ensure that services which are above the line of the insulation are not susceptible to freezing. Water tanks and associated distribution pipe work must be fully insulated.

Existing electrical cables should be raised above the level of the foam insulation where possible (See Clause 4.6 of this certificate).

Figure 3 - Recessed down-lighters

It is not recommended to install recessed lights in conjunction with PUREX NG OC500 open cell spray foam or PUREX NG CC2000 closed cell spray foam insulation at ceiling level. Where recessed down-lighters exist, guards should be fitted to keep the insulation at least 75mm from the heat source. When used with down-lighters and recessed light fittings, the guard should be open-topped or ventilated by drilling holes in the top of the guard. Guards should be made of rigid boards, light gauge non-magnetic metal; terracotta plant pots can also be used, provided they are of appropriate diameter (i.e. keep insulation 75mm away from heat source).

3.1 GENERAL

PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulations are satisfactory for use in reducing the U-value of the pitched roofs of a building. To satisfactorily incorporate PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulations the guidance given in BS 5250:2021[(1)] must be considered.

The product can be used:

- Between timber rafters in pitched roofs constructed in accordance with SR 82:2017[(2)] with a breathable roof underlay where the space beneath the roof tiles is ventilated by means of timber battens and the underlay is separated by a breathable card, or where rafters have been covered by a timber sarking board (i.e. roof underlay is fully supported).

- Between attic floor joists onto existing dry-lined ceiling of room below (where attic is non-habitable).

In all situations, the product must be covered by suitable internal lining boards and a VCL.

In the case where the product has been applied between rafters in a non-habitable roof space, if the covering is deemed to be provided by the lining board of the ceiling below, an assessment to BS 5250:2021[(1)] establishing same is required (see also Clause 2.4.1.1 of this certificate).

New constructions must be designed in accordance with the relevant requirement of the Eurocodes.

3.2 PRE-INSTALLATION SURVEY

Existing buildings must be in a good state of repair with no evidence of underlying defects, rain penetration or dampness. If defects are found, remedial action to rectify such defects must take place prior to installation of PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam.

Defects such as rain penetration or elevated levels of condensation can give rise to excessively high levels of moisture content within building materials. Following any remedial works, all materials, in particular timber must be allowed to dry out prior to installation of PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam. A moisture probe survey should be used to establish if moisture levels have returned to suitable levels.

3.3 CONDENSATION RISK

It is essential that all building elements are designed and constructed in a robust manner to eliminate the risk of moisture ingress and surface condensation occurring.

Acceptable construction details should be followed for limitation of thermal bridging (see Section 1.3.3.2 of TGD to Part L of the Building Regulations[(4)]). Designers should also refer to the certificate holders approved installation details. Refer out to clause 4.2 of this certificate.

3.4 LOADING

All buildings must be designed to the relevant Eurocodes. PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam cannot be considered to contribute in any way to the structural performance of a building.

3.5 VENTILATION

It is essential that adequate room ventilation be provided in accordance with TGD Part F of the Building Regulations[(4)], to limit the moisture content of air within the dwelling. Adequate room ventilation will contribute to reducing the risk of condensation and mould growth.

Adequate provision for ventilation must be provided to prevent build-up of condensation in building elements. Cross roof ventilation systems must also be designed to avoid creating pockets of stagnant air.

3.6 CE MARKING

The manufacturer has taken the responsibility of CE marking the products in accordance with harmonised standard I.S. EN 14315-1:2013[(7)].

An asterisk (*) appearing in this Certificate indicates that data shown is given in the manufacturer's Declaration of Performance (DoP). Reference should be made to the latest version of the manufacturers DoP for current information on any essential characteristics declared by the manufacturer.

4.1 BEHAVIOUR IN FIRE

PUREX NG OC500 & NG CC2000 have a fire classification of Class F and Class E respectively when assessed in accordance with I.S. EN 13501-1:2018[8]. Class E & Class F products are combustible and must be protected from naked flames and other ignition sources during and after installation. When used in the context of this certificate the increase in fire load in the building consequent to its use is negligible.

Once installed, the insulation must be contained by a suitable lining board, e.g. 12.5mm plasterboard, with joints fully sealed and supported by rafters or studs. The one exception where an installation will not require containment by suitable lining boards will be when the product is installed in an unoccupied loft area which is, in itself, contained from the habitable section of the dwelling.

Care must be taken to ensure continuity of fire resistance at junctions with fire-resisting elements, in accordance with the relevant provisions of the Building Regulations.

Elements must incorporate cavity barriers at edges, around openings, at junctions with fire-resisting elements and in extensive cavities in accordance with the relevant provisions of the Building Regulations. The design and installation of cavity barriers must take into account any anticipated differential movement which may occur.

4.1.1 Roofs

The use of the product in a tiled pitched roof will not affect its external rating when evaluated by fire assessment or test to EN 13501-1:2018[8].

The product must not be applied over junctions between roofs and walls required to provide a minimum period of fire resistance.

4.1.2 Protection of Building from Heat Producing Appliances

Combustible wall insulation material should be separated by solid non-combustible material not less than 200mm thick, from any heating appliance or from any flue pipe or opening to a heating appliance. Details are given in Diagrams 5 - 14 of the TGD Part J Building Regulations[11]. It should also be separated by 40mm from the external surface of a masonry chimney. For chimneys covered by EN 1856-1:2009[15], separation between this product and the external surface of the chimney shall be determined in accordance with TGD J to the Building Regulations[11].

4.2 CONDENSATION RISK

Areas where there is a significant risk of condensation due to high levels of humidity should be identified during the initial site survey.

4.2.1 Interstitial Condensation

A VCL is required on the warm side of PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation unless an assessment to BS5250:2021[1] indicates that it is not necessary for a particular construction.

PUREX NG OC500 has a vapour resistivity value (μ-value) of 3-4 and PUREX NG CC2000 closed cell spray foam has a vapour resistivity value of 50-60 when tested to I.S. EN 12086:2013[14].

When building elements do not follow the principles of BS 5250:2021[1] a robust hygrothermal assessment to either I.S. EN 15026:2023[19] or I.S. EN ISO 13788:2012[26] must be considered.

Care should be taken to provide adequate ventilation, particularly in areas expected to experience high humidity, and to ensure the integrity of vapour control layers and linings against vapour ingress.

4.2.2 Internal Surface condensation

When improving the thermal performance of the external envelope of an existing building, designers need to consider the impact of these improvements on other untouched elements of the building.

Likewise, as discussed in Clause 4.4 of this certificate, thermally bridged sections of the envelope such as the 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 i.e. access to eaves and around wall plates.

When bridged junctions meet the requirements of TGD Part L, Appendix D[4], the coldest internal surface temperature will satisfy the requirements of section D2, namely that the temperature factor (f_{Rsi}) shall be equal to or greater than 0.75. As a result, best practice will have been adopted to limit the risk of internal surface condensation which can result in dampness and mould growth.

When site limiting factors give rise to sub-standard level of insulation at bridged junctions, guidance should be sought from the Certificate holder as to acceptable minimum requirements (see Clause 4.4 for further guidance).

When insulating buildings, the recommendations of BS 5250:2021[1] should be followed to minimise the risk of condensation within the building elements and structures.

Roofs will adequately limit the risk of surface condensation where the thermal transmittance (U-value) does not exceed 0.16 W/m²K at any point, as per Table 1 TGD L column 3 - upper U-value of 0.3W/m²K outlined. Openings and junctions with other elements are designed in accordance with the DHLGH publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details (ACD)* [27].

4.3 THERMAL INSULATION

Calculations of the thermal transmittance (U-value) of specific constructions should be carried out in accordance with I.S. EN ISO 6946:2021[17]. or I.S. EN ISO 13370:2017[18] using a thermal conductivity (λ-value).

The U-value of a construction will depend on the materials used and the design. U-value charts for a range specific construction are given in Tables 3 - 8 of this certificate.

The certificate holder has carried out U-value calculations for a wide range of existing building installations. A full listing of U-value calculations, along with robust installation details are contained within the Certificate holders Technical Training Documentation.

For retrofit installations on existing dwellings such as drylining or attic installations, end users should seek guidance from the certificate holder on U-values as the actual U-value of installation will depend on the construction of the existing building elements.

Certificate holder approved installers are required to carry out a preliminary site survey to establish existing building details and insulation levels. On completion of the works, installers will provide a job specific sign off sheet and this records' both initial and final building element U-values.

The product can contribute to maintaining continuity of thermal insulation at junctions between elements and around openings. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in the DHLGH publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details*[27].

4.4 LIMITING THERMAL BRIDGING

The linear thermal transmittance Ψ (Psi) describes the heat loss associated with junctions and around openings. The certificate holder has carried out an assessment of salient building junctions and has established minimum thickness of both PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation to limit thermal bridging at these junctions. The specified thermal resistances are equal to or greater that the target thermal resistances provided for in the *Acceptable Construction Details (ACD's)* [27].

A full listing of assessed building junctions along with building details are contained within the Certificate holders Technical Training Document.

When all building junctions, are shown to be equivalent or better than junctions detailed in either, certificate holders Technical Training Document or DHLGH publication *Limiting Thermal Bridging & Air Infiltration – Acceptable Construction Details*[27], then it is acceptable to use the linear thermal transmittance values outline in Table D1-D6 of Appendix D of TGD to Part L of the Building Regulations[4]. When **all** bridged junctions within a building comply with the requirements of Table D1-D6 of appendix D of TGD to Part L[4], the improved 'y' factor of 0.08 can be entered into the Dwelling Energy Assessment Procedure (DEAP) Building Energy Rating (BER) calculation.

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 junctions outside the scope of this Certificate should be assessed by an NSAI registered Thermal Modeller or equivalent competent person in accordance with the 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*[22].

The certificate holders approved installation details and published Psi-values can be used to calculate the overall building heat transmission due to thermal bridging or the building y-value for inclusion in DEAP.

4.5 VENTILATION

Adequate room and roof ventilation must be provided in accordance with TGD Part F[4]. of the Building Regulations, for all installations and as described in Clause 3.5 of this certificate.

4.6 MATERIALS IN CONTACT WITH ELECTRICAL WIRING

Where the foam is likely to be in contact with electric cables, suitable conduit or trunking should be used. The positioning and future access to electrical cabling services should be carefully considered.

In attic areas, existing electrical cable at ceiling level should be raised above the level of the foam insulation where possible. Encapsulating cables presents an obstruction when tracing and locating faults in a circuit. Electrical cabling when embedded within the foam insulation should be run in conduits to facilitate repairs.

Electrical installations should be in accordance with I.S.10101:2020+A1:2024 National Rules for Electrical Installations [28].

4.7 CORROSION DEVELOPING CAPACITY ON METAL CONSTRUCTIONS

An evaluation of corrosion developing capacity on zinc and copper was carried out to EN 15101-1:2019[21].

PUREX NG OC500 open cell spray foam and PUREX NG CC2000 closed cell spray foam insulation is compatible with all metals, with the exception of zinc. In all situations when the foam is in contact with Zinc, the Zinc must be separated from the foam by covering the Zinc plate with a protective coating.

4.8 SUSCEPTIBILITY OF MOULD GROWTH

The susceptibility to mould growth test report indicates that the foam failed to produce a carbon source that would sustain fungal growth.

4.9 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- Density
- Water vapour permeability
- Dimensional stability
- Thermal conductivity
- Suitability of foam insulation in contact with timber.
- Adhesion spray foam insulation to timber.
- REACH-compliance (Registration, Evaluation, Authorisation and Restriction of Chemicals) [29].
- Safety Data Sheets
- Assessment of Spray Rig information
- Adequacy of fill
- Safe storage

4.10 OTHER INVESTIGATIONS

(i) Existing data on product properties in relation to fire, toxicity, thermal conductivity and dimensional stability were assessed.

(ii) The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used. The manufacture has both ISO 9001:2015 *Quality Management System* and[9]ISO 14001:2015 *Environmental Management Systems* accreditation[20].

Performance to EN 14315-1:2013	Test method	NG OC500	NG CC2000
Rection to Fire	EN 13501 -1:2018	Class F	Class E
Water permeability (short term)	EN 1609:2013	Wp≤22kg/m2*	W 0.14*
Thermal conductivity	EN 12667:2002 (λ90/90)	0.038W/mK*	(0.029W/mK@<80mm) (0.028W/mK@80-120mm) (0.027W/mK@>120mm)
Water vapour permeability: water vapour resistance factor	EN 12086:2013	MU3*	MU50*
Compressive strength at 10% deformation	EN 826:1998	NPD*	(CS(10\Y)150*)
Durability of thermal resistance against aging /degradation	4.2.5.3 of 14315-1:2013	Stable in 25years*	Stable in 25years*
Durability of compressive strength against aging /degradation	4.2.5.4 of 14315-1:2013	NPD*	Compression strength does not degrade over time*
Durability of reaction to fire against aging /degradation	4.2.5.2 of 14315-1:2013	Does not decrease with time*	Does not change with time*
Continuous glowing combustion	4.3.10 of 14315-1:2013	NPD*	NPD*
	* indicates that data shown is taken from the manufacturer's Declaration of Performance.		

Table 2 – Polychem Systems - Polyurethane Characteristics

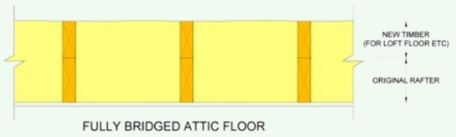
Pitched Roof -Insulation at Ceiling Level	
Fully Bridged	
	
U-values for tiled or slated pitched roof, ventilated roof space, insulation placed between joists at ceiling level	
Thickness of Insulation	**U-Value (W/m^2K)**
100 mm	0.31
140 mm	0.23
180 mm	0.19
220 mm	0.16
Note:- construction (external to internal): - Conventional tiled or slated pitched roof - Ventilated roof space - Insulation (92%)/timber rafters (8%) - AVCL - Plasterboard – 12.5mm - 3mm gypsum skim coat finish Correction for air voids $\Delta U''$ = level 1 applied to bridged layer	

Table 3 – Closed Cell

Pitched Roof - Insulation at Sloping Level	
New Construction- Bridged	
U-values for tiled or slated pitched roof with 50mm ventilated space over breathable roofing felt, insulation placed against roofing cards between rafters at sloping level	
Thickness of Insulation	**U-Value (W/m^2K)**
280 mm	0.13
300 mm	0.12
Note:- construction (external to internal): - Conventional tiled or slated pitched roof. - Roof membrane - 50mm ventilated space under roof membrane - Roofing cards placed between rafters. - Insulation (92%)/timber rafters (8%) (timber battens added to rafters to achieve depths as indicated above) - AVCL - Plasterboard – 12.5mm - 3mm gypsum skim coat finish Correction for air voids $\Delta U''$ = level 1 applied to bridged layer	

Table 4 – Closed Cell

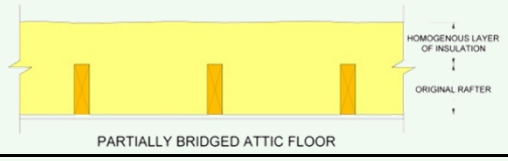
Pitched Roof - Insulation at Ceiling Level	
Partially Bridged 	
U-values for tiled or slated pitched roof, ventilated roof space, insulation placed between **and over** joists at ceiling level	
Thickness of Insulation Joist Depth + Over Joist	**U-Value (W/m^2K)**
150 mm + 50 mm	0.16
150 mm + 90 mm	0.13
150 mm + 130 mm	0.11
Note:- construction (external to internal): - Conventional tiled or slated pitched roof - Ventilated roof space - Homogeneous layer of insulation over joist - Inhomogeneous layer Insulation (92%)/timber rafters (8%) (150mm deep joists) - AVCL - Plasterboard – 12.5mm - 3mm gypsum skim coat finish	

Table 5 – Closed Cell

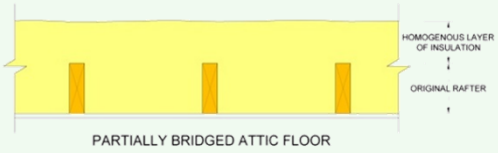
Pitched Roof - Insulation at Ceiling Level	
Partially Bridged 	
U-values for tiled or slated pitched roof, ventilated roof space, insulation placed between **and over** joists at ceiling level	
Thickness of Insulation Joist Depth + Over Joist	**U-Value (W/m^2K)**
150 mm + 90 mm	0.16
150 mm + 125 mm	0.14
150 mm + 225 mm	0.10
Note:- construction (external to internal): - Conventional tiled or slated pitched roof - Ventilated roof space - Homogeneous layer of insulation over joist - Inhomogeneous layer Insulation (92%)/timber rafters (8%) (150mm deep joists) - AVCL - Plasterboard – 12.5mm - 3mm gypsum skim coat finish	

Table 6 – Open Cell

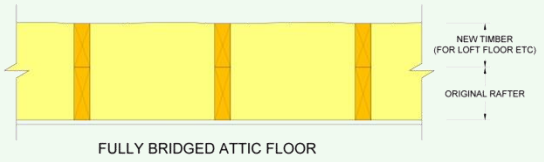
Pitched Roof -Insulation at Ceiling Level	
Fully Bridged 	
U-values for tiled or slated pitched roof, ventilated roof space, insulation placed between joists at ceiling level	
Thickness of Insulation	**U-Value (W/m^2K)**
280 mm	0.16
320 mm	0.14
475 mm	0.10
Note:- construction (external to internal): - Conventional tiled or slated pitched roof - Ventilated roof space - Insulation (92%)/timber rafters (8%) - AVCL - Plasterboard – 12.5mm - 3mm gypsum skim coat finish Correction for air voids $\Delta U''$ = level 1 applied to bridged layer	

Table 7 – Open Cell

Pitched Roof - Insulation at Sloping Level	
New Construction- Bridged	
U-values for tiled or slated pitched roof with 50mm ventilated space over breathable roofing felt, insulation placed against roofing cards between rafters at sloping level	
Thickness of Insulation	**U-Value (W/m^2K)**
280 mm	0.16
325 mm	0.14
Note:- construction (external to internal): - Conventional tiled or slated pitched roof. - Roof membrane - 50mm ventilated space under roof membrane - Roofing cards placed between rafters. - Insulation (92%)/timber rafters (8%) (timber battens added to rafters to achieve depths as indicated above) - AVCL - Plasterboard – 12.5mm - 3mm gypsum skim coat finish Correction for air voids $\Delta U''$ = level 1 applied to bridged layer	

Table 8 – Open Cell

Part Five / Conditions of Certification 5

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 or revision date so long as:

(a) the specification of the product is unchanged.

(b) the Building Regulations 1997 and subsequent revisions. 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 NSAI Agrément 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 and must remove them from the products already marked.

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 thereunder, 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

NSAI Agrément

This Certificate No. **26/0450** is accordingly granted by the NSAI to **POLYCHEM SYSTEMS Sp. z o.o** on behalf of NSAI Agrément.

Date of Issue: **18th June 2026**

Signed

Kevin D. Mullaney
Director of Certification, NSAI

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.nsai.ie

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[6] I.S. EN 14315-1:2013, *Thermal insulating products for buildings - In-situ formed sprayed rigid Polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation*

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[22] BRE IP1/06, *Assessing the effects of thermal bridging at junctions and around openings*

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[24] GN22: 2024 BREEAM Recognised Scheme for VOC Emissions for Building Products.

[25] Technical Guidance Document (TGD) to Part C of the Building Regulations 1997 and subsequent revisions.

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