



Specialists in Roofing
and Waterproofing

ProTherm
Quantum[®]
PLUS⁺

The world's thinnest inverted roof insulation

What is Quantum[®] PLUS⁺?



ProTherm Quantum[®] PLUS⁺
is the first coated VIP in
the world to achieve BBA
Certification.

The limitation of traditional inverted roof insulation products can make it difficult for a designer to insulate above a habitable space against the backdrop of increasing thermal requirements whilst meeting the desire to maximise the glass façade and cater for a level threshold; creating a near impossible task prior to the development of the ProTherm Quantum Inverted Roof Systems.

In 2016 the BBA certified ProTherm Quantum[®] VIP Inverted Roof Systems, making it the first Vacuum Insulated Panel system to achieve such an accolade. Since then ProTherm Quantum VIP has undergone continual development, resulting in the BBA certifying **ProTherm Quantum[®] PLUS⁺ VIP Inverted Roof Systems** in 2020. ProTherm Quantum PLUS⁺ can dramatically reduce the thickness of inverted roofing systems without compromising thermal performance whilst still achieving level thresholds. Suitable for use in roofs, roof terraces, podiums, enclosed balconies over heated space, insulated walkways, green roofs and blue roofs ProTherm Quantum PLUS⁺ provides the thinnest and most robust state of the art insulation system for inverted roof construction.

The power behind the elastomeric coated high thermal efficiency, the **ProTherm Quantum[®] PLUS⁺ VIP Inverted Roof Insulation System**, is a rigid Vacuum Insulation Panel (VIP) factory encapsulated in a solvent free polyurethane waterproof coating. The resulting VIP panel gives an outstanding thermal conductivity, providing the thinnest possible inverted roof insulation solution currently available.

Whether designing an inverted roof to achieve the lowest possible Surface Slab Level to Finished Floor Level (SSL-FFL), or rectifying unexpected slab or floor level issues, **ProTherm Quantum[®] PLUS⁺ VIP Inverted Roof Insulation System** is rapidly becoming the system of choice for inverted roofs, podiums, roof terraces and balconies.

ProTherm Quantum[®] PLUS⁺ is not suitable for use in inverted roof applications on 'specified attachments' such as projecting open balconies, projecting enclosed balconies, recessed open balconies or recessed enclosed balconies as defined in BS 8579:2020 Guide to the design of balconies and terraces.



Lose height, gain value

Developed by Radmat's roofing experts to solve regularly occurring challenges created by the drive for more thermally efficient buildings, safer access and more external space, the **ProTherm Quantum[®] PLUS⁺ VIP Inverted Roof Insulation System** enables architects to dramatically reduce the depth of a finished floor system; providing the solution to counter low upstands against the increasing thickness of traditional Extruded Polystyrene and Expanded Polystyrene products specified in order to meet more stringent thermal demands.

Where is it best used?

On roofs, roof terraces, balconies over heated space and insulated walkways in an inverted roof construction where there is a requirement for thermal performance, and insulated areas where depth is critical to the overall construction.*

What can it help to deliver?

Part M Compliance: Level threshold to roof terrace, podium or balcony over heated space. ✓

Part L Compliance: Exceptional thermal performance. ✓

NHBC Chapter 7.1 Compliance: Insurance and warranty requirement of 75mm threshold achievement. ✓

What does it save?

ProTherm Quantum[®] PLUS⁺ delivers an exceptional reduction in overall depth compared to a traditional inverted system. The image below highlights the impressive thermal performance.



The depth of board to achieve an R-value of 6.250m²K/W – rounded up to the nearest standard depth.

Scan the code or visit the Quantum[®] website at:

prothermquantum.com



The Quantum[®] Systems

The most popular VIP inverted roof system solution, **ProTherm Quantum[®] PLUS⁺ Hybrid**, uses a layer of Quantum PLUS⁺ VIP overlaid with a layer of XPS to deliver a market leading thermal outcome without compromising the 75mm minimum internal upstand height; delivering the ability to maintain a level floor between the internal and external spaces.

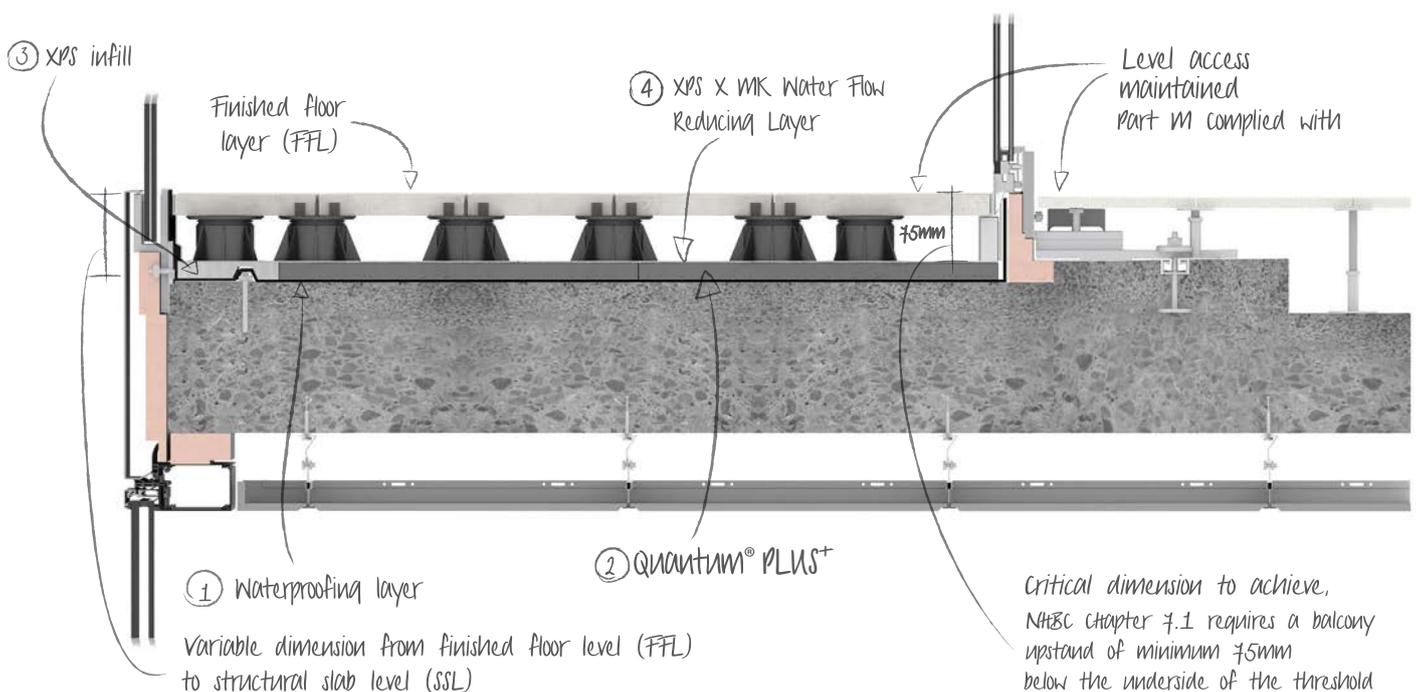
ProTherm Quantum[®] PLUS⁺ Pure inverted roof system achieves exceptional thermal performance per mm thickness, delivering the thinnest possible solution, making it an ideal solution where a severe lack of space makes it a challenge to meet u-value requirements.

Quantum[®] Performance

All **ProTherm Quantum[®] PLUS⁺** systems are designed to achieve a minimum 75mm upstand at thresholds in accordance with BS 6229: 2018 Flat roofs with continuously supported flexible waterproof coverings. Code of practice as shown in the sectional image below. Examples of the Structural Slab Level to Finished Floor Level (SSL-FFL) that can be achieved for a given U-value are provided in the table on the next page,

Quantum[®] Installation

The **ProTherm Quantum[®] PLUS⁺ System** consists of VIP insulated panels factory encapsulated in a solvent free polyurethane waterproof coating. The exceptional performance of the Quantum PLUS⁺ VIP is achieved by the retained vacuum; requiring the Quantum PLUS⁺ panels to be used in their supplied size only i.e., they cannot be cut under any circumstances. Due to this restriction Radmat's in-house **Quantum Design Team** create a bespoke optimised laying pattern for every project, utilising a range of panel sizes from 300 x 300mm to 1200 x 600mm. Where a ProTherm Quantum PLUS⁺ panel cannot be used, such as at rainwater outlet positions, curves, upstands and penetrations, high performance XPS '**ProTherm XPS Infill**' panels are used.





To ensure every project achieves an optimal solution Radmat's in-house **Quantum Design Team** provide a full service, from initial outline design and thermal calculation to pre-delivery site survey, providing a final design solution with layout drawings for sign off. This comprehensive process considers the insulation thickness requirements early in the design process, highlighting potential threshold issues and providing the most cost effective solution to meet the target U-value.

Calculating the U-value accurately requires a good understanding of the roof dimensions and the location of anything bridging the insulation zone. Examples being: fall arrest and balustrade posts, plinths, rooflights, soil vent pipes etc. The location of these bridging elements will have an effect on the percentage of XPS Infill required, this percentage is then considered when calculating the U-value for the roof area by an 'area weighted U-value calculation'.

To illustrate the effect on the thermal performance of the flex percentage please see below three examples using the same thickness of Quantum® PLUS+ with a range of XPS Infill percentages:

Quantum PLUS+ thickness 80mm*

XPS Infill percentage	10%	15%	20%	25%
Area weighted U-value (W/m²K)	0.11	0.12	0.13	0.14

*80mm Quantum PLUS+, Hotmelt waterproofing, 150mm concrete deck

ProTherm Quantum® PLUS+ System, U-values based on 12% XPS Infill installed over a 150mm concrete deck						
	1	2	3	4	5	6
	U-value W/m²K	SSL-FFL (mm)	Quantum System Height (mm)	XPS Overlay (mm)	Quantum® PLUS+ (mm)	Waterproofing* (mm)
ProTherm Quantum® PLUS+ Pure	0.18	135	50	-	50	10
	0.15	145	60	-	60	10
	0.13	155	70	-	70	10
	0.11	165	80	-	80	10
	0.10	185	100	-	100	10
ProTherm Quantum® PLUS+ Hybrid	0.19	165	80	50	30	10
	0.17	190	105	75	30	10
	0.15	195	110	80	30	10
	0.13	220	135	105	30	10
	0.14	185	100	50	50	10
	0.12	210	125	75	50	10
	0.11	215	130	80	50	10
	0.10	240	155	105	50	10

These U-values are based on the construction shown on the 2D section, however to obtain a specific thermal performance for your project please contact our technical department on 01858 410372 or email Quantum@radmat.com



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This information given in good faith being based on the latest knowledge available to Radmat Building Products Ltd. Whilst every effort has been made to ensure that the contents of the publication are current while going to press, customers are advised that products, techniques and codes of practice are under constant review and liable to change without notice.

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Back Cover:

22 Bishopsgate, London EC2

To meet a U-value of 0.17w/m²K

ProTherm Quantum PLUS⁺ is being installed on various roof levels to achieve the thinnest possible depth whilst still maintaining the required finish floor levels and a 75mm exposed upstand at all door thresholds.

Front Cover:

100 Liverpool Street, London EC2

To meet a U-value of 0.13w/m²K

ProTherm Quantum PLUS⁺ was installed at various roof levels, careful consideration was taken to the setting out and the junction details especially at Level 8 where it followed the curvature of the façade below. In order to insulate this area, the plan layout was staggered/faceted adjacent to the curves.

