



# ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup>

## Vacuum Insulated Panel (VIP)

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### General Information

**ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> Inverted Roof Insulation System** is a rigid Vacuum Insulation Panel (VIP). The VIP panel consists of a compressed fumed silica sand microporous core which is evacuated of air and moisture before being encased and sealed in a special thin, gas-tight, hybrid aluminium foil envelope, encapsulated in a solvent free polyurethane waterproof coating. The coating is a factory applied solvent free two component elastomeric polyurethane waterproofing membrane. The resulting panel gives outstanding thermal conductivity, with the thinnest possible insulation solution.

With a declared (aged) thermal conductivity ( $\lambda$ ) of 0.007 W/m.K, the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> VIP panel provides an insulating performance that is up to five times better than other commonly available insulation materials. This high level of thermal efficiency combined with minimal thickness enable the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> VIP Inverted Roof Insulation system to meet the requirements of Building Regulations Part L, Part M and NHBC Chapter 7.1.

### Suitable Applications

ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> is suitable for use in roofs, roof terraces, enclosed balconies over heated space and insulated walkways in an inverted roof construction. When used in the inverted roof constructions listed in the Fire Performance section below roof constructions incorporating ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> achieve Broof(t4) Classification to BS EN 13501-5 as required by Approved Document B 2019 edition, Section B4, Limitations on roof coverings.

ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> 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.

### Fire Performance

#### As a roofing system for roofs, roof terraces, enclosed balconies over heated space and insulated walkways

In accordance with Annex of Commission Decision 2000/553/EC, when used in an inverted roof specification including an inorganic covering of either loose laid gravel with a thickness of at least 50mm or a mass  $\geq 80$  kg/m<sup>2</sup>, sand/cement screed to a thickness of at least 30mm, or cast stone or mineral slabs of at least 40mm thickness a roof system incorporating ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> can be considered to be unrestricted under the national Requirements (Classification Broof(t4) to BS EN 13501-5:2016).

**BS EN 13501-5:2016** – When tested with a covering of 50mm thick concrete paving on 50mm high InStar plastic pedestal supports, or Dura Deck Resist composite decking on plastic pedestal supports with a 50mm ballast layer beneath a roof construction incorporating ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> achieved a classification of Broof(t4) and as such is unrestricted by the National Building Regulations.

**BS 476 Part 3: 2004** – When tested with a covering of 50mm thick concrete paving on 50mm high InStar plastic pedestal supports, or Dura Deck Resist composite decking on plastic pedestal supports with a 50mm ballast layer beneath a roof construction incorporating ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> achieved a classification of EXT.FAA and as such is unrestricted by the National Building Regulations.

#### As a product in isolation

**BS EN 13501-1:2016** – ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> VIP Inverted Roof Insulation achieves Euro Class E performance.

### Certificates

BBA Certified 20/5769

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### General Information (continued)

#### Installation Instructions

- Lay in accordance with the installation scheme provided by Radmat.
- Loose lay and gently butt all joint together.
- DO NOT cut the panels under any circumstances; use XPS Infill for areas requiring cut board.

#### Delivery conditions

##### Delivery form

Shrunk wrapped on a pallet, quantity depending on board thickness.

#### Storage and transport

During shipment, storage, installation and use, this material should not be exposed to flame or other ignition sources.

#### Product identification

Information on the pack;

Product name.

Approvals.

Dimensions.

Production date.

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## Vacuum Insulated Panel (VIP)

PRODUCT DESCRIPTION				
Appearance top side	Anthracite			
Core	Fumed Silica Sand			
Appearance bottom side	Anthracite			
DECLARED PERFORMANCE				
Essential Characteristics	Performance	Unit	EN Code	Standard
Ozone Depletion Potential	Zero	-	-	-
Global Warming Potential	<5	-	-	-
Density	180-210	kg/m <sup>3</sup>	-	BS EN 1602: 1997
Tensile Strength	60	kPa	-	BS EN 1607: 1997
<b>Dimensions and tolerances*</b>				
- Thickness	<b>22, 27, 32, 37, 42, 47, 52, 57, 62, 67, 72, 77, 82, 87, 92, 97, 102</b>	mm	-	BS EN 823
- Width	<b>302, 402, 502, 602</b>	mm	-	BS EN 822
- Length	<b>302, 402, 502, 602, 702, 802, 902, 1002, 1102, 1202</b>	mm	-	BS EN 822
<b>Thermal conductivity</b> (aged design value allowing for edge effect)	0.007	W/mK	-	EN 12667: 2001
<b>Thermal Resistance (R-Value)</b> Declared value <sup>(1)</sup>				
20mm	3.333	m <sup>2</sup> K/W	-	
25mm	4.167	m <sup>2</sup> K/W	-	
30mm	5.000	m <sup>2</sup> K/W	-	
40mm	6.667	m <sup>2</sup> K/W	-	
<b>Mechanical properties</b>				
- Compressive strength at 10% deformation	160	kPa	-	BS EN 826: 1996
<b>Linear thermal expansion coefficient</b>				
Longitudinal	0.08	mm/m.K	-	-
Transverse	0.06	mm/m.K	-	mm/m.K
<b>Surface temperature</b>	-40 to +80	°C	-	-
<b>Surface</b>	Anthracite coloured polyurethane waterproofing membrane	-	-	-
<b>Edge profile</b>	Butt	-	-	-

\*Panel sizes shown in bold are stocked items, all other dimensions are made to order and may be subject to additional lead time

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## Vacuum Insulated Panel (VIP)

DECLARED PERFORMANCE										
WEIGHT					Unit	EN Code	Standard			
Length x width		Weight								
1202 x 602mm		2.78	3.48	4.18	5.57	6.97	kg	-	-	
1202 x 402mm		1.85	2.32	2.78	3.72	4.65	kg	-	-	
1200 x 302mm		1.39	1.74	2.09	2.79	3.48	kg	-	-	
1002 x 602mm		2.33	2.92	3.5	4.67	5.84	kg	-	-	
1002 x 302mm		1.17	1.46	1.76	2.34	2.93	kg	-	-	
1002 x 402mm		1.56	1.95	2.34	3.12	3.90	kg	-	-	
602 x 602mm		1.39	1.74	2.09	2.79	3.48	kg	-	-	
602 x 402mm		0.93	1.16	1.39	1.86	2.32	kg	-	-	
402 x 302mm		0.46	0.58	0.7	0.93	1.16	kg	-	-	
302 x 302mm		0.35	0.44	0.52	0.7	0.87	kg	-	-	
COVERAGE					Unit	EN Code	Standard			
Length x width		Area								
1202 x 602mm		0.724					m <sup>2</sup>	-	-	
1202 x 402mm		0.483					m <sup>2</sup>	-	-	
1202 x 302mm		0.363					m <sup>2</sup>	-	-	
1002 x 302mm		0.302					m <sup>2</sup>	-	-	
1002 x 402mm		0.402					m <sup>2</sup>	-	-	
1002 x 602mm		0.603					m <sup>2</sup>	-	-	
602 x 602mm		0.362					m <sup>2</sup>	-	-	
602 x 402mm		0.242					m <sup>2</sup>	-	-	
402 x 302mm		0.121					m <sup>2</sup>	-	-	
302 x 302mm		0.091					m <sup>2</sup>	-	-	

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## Vacuum Insulated Panel (VIP)

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### ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> Pure Inverted Roof Insulation Handling and Installation

#### General Information

- The waterproofing system must be BBA Certified for inverted roof applications.
- The waterproofing system must be installed correctly, watertight and clean.
- The surface of the waterproofing should be clean, dry, level and free from projections.
- Where required the roof waterproofing should be inspected for guarantee purposes prior to the installation of the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> Inverted Roof Insulation system.
- ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> Inverted Roof Insulation systems should not be used in association with solvent-based adhesive systems, or be exposed to naked flames or excessive heat.

#### Delivery and site handling

- The product is delivered to site bearing the manufacturer's name
- The packaging of the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels should not be considered adequate for outdoor protection.
- During installation care should be taken to ensure the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels are not damaged by foot traffic or following trades.
- A protective foot or crawl board should be used during the installation process.
- Regupol RCM, XPS infill, XPS Layer and XPS X MK Water Flow Reducing Layer may be walked on during construction.
- ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels should not be cut or penetrated.
- Care must be taken to prevent contact with solvents and materials containing organic components.
- Where large volumes are stored, especially indoors, flammable material and ignition sources should not be permitted in the vicinity and adequate ventilation (at least two air changes per hour) should be ensured.

#### Site work

Before commencing read the layout drawing provided with the system to familiarise yourself with the installation methods and layout plan.

#### 1st Layer

Lay the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels on top of the finished waterproofing in accordance with the layout drawing provided, lightly butting panels together without gaps. During installation care should be taken to ensure the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels are not damaged by foot traffic or following trades.

Cut XPS Infill boards to fit around the perimeter, penetrations, rainwater outlets etc. in accordance with the layout drawing. Ensure accurate trimming of XPS Infill to achieve close-butting joints and continuity of insulation. XPS Infill should be cut with either a fine toothed saw or by scoring with a sharp knife and snapping the board over a straight edge before cutting the facing on the other side.

#### 2nd layer

Install the 2nd layer ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels over the 1st layer of ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> VIP panels, ensuring that the board joints are tightly butted together in relation to the first layer and in accordance with the layout drawing. During installation care should be taken to ensure the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels are not damaged by foot traffic or following trades.

#### 3rd Layer

Lay the XPS X MK Water Flow Reducing Layer sheet over the completed insulation layer ensuring a minimum 300mm side and end overlaps. Turn up at the edge of the roof insulation and seal under a flashing.

#### 4th Layer

Install surface finish (paving, ballast, decking or green roof) as specified.

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## Vacuum Insulated Panel (VIP)

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### ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> Hybrid Inverted Roof Insulation Handling and Installation

#### General Information

- The waterproofing system must be BBA Certified for inverted roof applications.
- The waterproofing system must be installed correctly, watertight and clean.
- The surface of the waterproofing should be clean, dry, level and free from projections.
- Where required the roof waterproofing should be inspected for guarantee purposes prior to the installation of the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> Hybrid Inverted Roof Insulation system.
- ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> Hybrid Inverted Roof Insulation systems should not be used in association with solvent-based adhesive systems, or be exposed to naked flames or excessive heat.

#### Delivery and site handling

- The product is delivered to site bearing the manufacturer's name
- The packaging of the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels should not be considered adequate for outdoor protection.
- The ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels should be stored inside a building and raised off the floor.
- During installation care should be taken to ensure the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels are not damaged by foot traffic or following trades.
- Regupol RCM, XPS infill, XPS Layer and XPS X MK Water Flow Reducing Layer may be walked on during construction.
- ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels should not be cut or penetrated.
- Care must be taken to prevent contact with solvents and materials containing organic components.
- Where large volumes are stored, especially indoors, flammable material and ignition sources should not be permitted in the vicinity and adequate ventilation (at least two air changes per hour) should be ensured.

#### Site work

Before commencing read the layout drawing provided with the system to familiarise yourself with the installation methods and layout plan.

##### 1st layer

Lay the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels on top of the completed waterproofing in accordance with the layout drawing provided, lightly butting panels together without gaps. During installation care should be taken to ensure the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels are not damaged by foot traffic or following trades.

Cut XPS Infill boards to fit around the perimeter, penetrations, rainwater outlets etc. in accordance with the layout drawing. Ensure accurate trimming of XPS Infill to achieve close-butting joints and continuity of insulation. XPS Infill should be cut with either a fine toothed saw or by scoring with a sharp knife and snapping the board over a straight edge before cutting the facing on the other side.

##### 2nd layer

Lay the XPS Layer across the roof area, ensuring that the board joints are staggered in relation to the first layer in accordance with the layout drawing. During installation care should be taken to ensure the ProTherm Quantum<sup>®</sup> PLUS<sup>+</sup> panels are not damaged by foot traffic or following trades.

##### 3rd Layer

Lay the XPS X MK Water Flow Reducing Layer sheet over the completed insulation layer ensuring a minimum 300mm side and end overlaps. Turn up at the edge of the roof insulation and seal under a flashing.

##### 4th Layer

Install surface finish (paving, ballast, decking or green roof) as specified.

This information given in good faith and is 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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