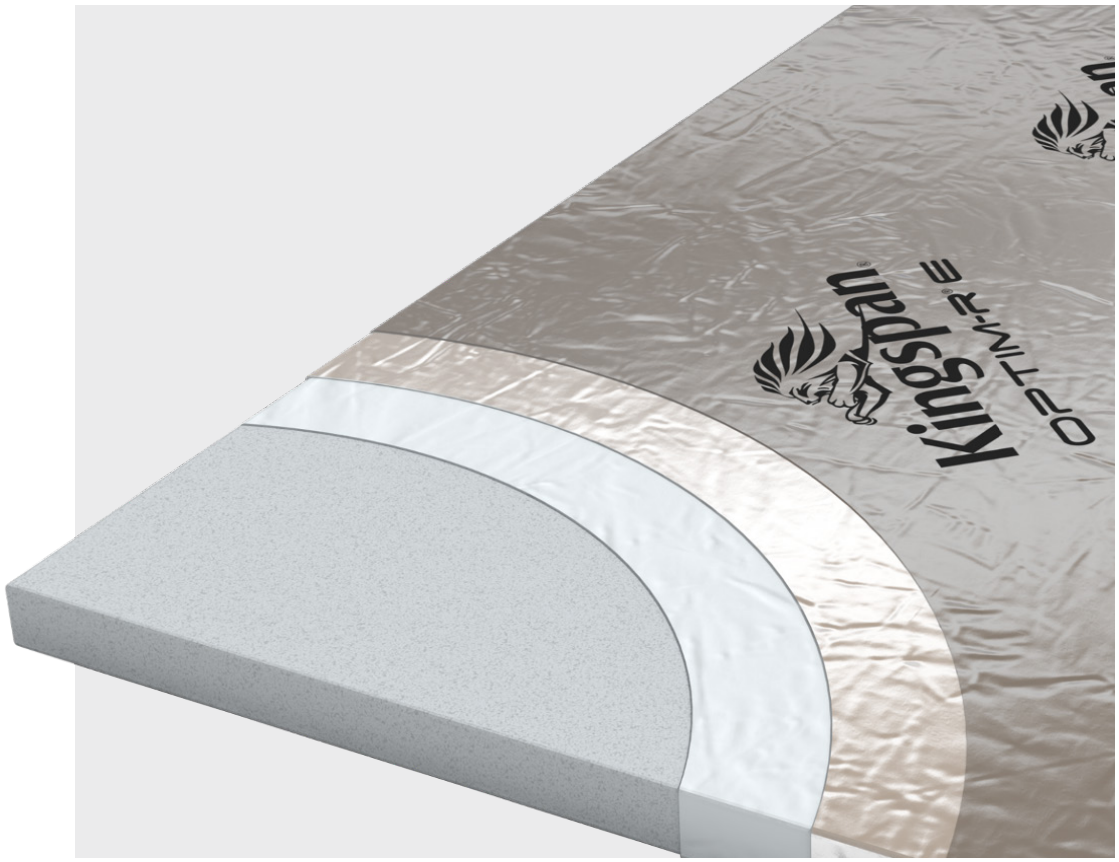
OPTIM-R® E

The Encapsulated Evolution of High R-Value Vacuum Insulated Panels



- R34.2 at 1 inch (Center of Panel)
- Protective coating for increased robustness and easier handling.
- Resistant to the passage of water vapor

Kingspan®

OPTIM-R® E

Next Generation Insulation Solutions

Description

OPTIM-R® E's proprietary encapsulation system builds on a reputation of reliability and is optimized to withstand the rigors of construction, reducing the risk of damage and rework while ensuring high thermal performance

Kingspan OPTIM-R E comprises a rigid vacuum insulation panel with a microporous core which is evacuated, encased and sealed in a thin, gas-tight envelope, giving an outstanding thermal resistance, with the thinnest possible solution to insulation problems. OPTIM-R E is then encapsulated within a polyurea coating to give increased compressive strength and protection from installation accidents.

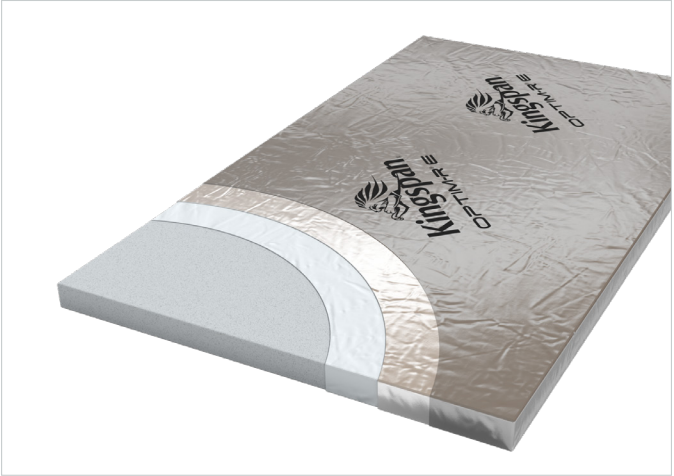


Figure 1: Kingspan OPTIM-R E

General

The vacuum insulation panels are installed with other insulation infill panels which can be cut to fit around problem areas such as sky lights or other roofing penetrations.

In retrofit applications Kingspan OPTIM-R E provides solutions for areas that previously would have remained un–insulated because of insufficient space available.

In new construction Kingspan OPTIM-R E can significantly enhance U–values / R–values in areas that would otherwise be accepted as diminishing the overall thermal performance.

The high level of thermal efficiency with minimal thickness, achieved with Kingspan OPTIM-R E provides solutions for applications where a lack of construction depth or space is an issue.

Applications

Kingspan OPTIM-R E can be used in a number of different applications and is available in a range of systems:

- Kingspan OPTIM-R E Conventional Roofing System
- Kingspan OPTIM-R E Inverted Roofing System

Kingspan OPTIM-R E panels should be accompanied with rigid insulation which can be cut to fit around problem areas.

Design Service

Each Kingspan OPTIM-R E system comes with a supporting design service which ensures the ratio of the Kingspan OPTIM-R E to the infill insulation maximizing each project. The panel layout will be designed quickly and effectively, ready for client approval. Each layout will illustrate the size, number and location of the Kingspan OPTIM-R E panels. For more details please contact the Kingspan Insulation Technical Service Department.

Standards & Approvals

Kingspan OPTIM-R E is manufactured to the highest standards under a management system certified to ISO 9001: 2015 (Quality Management Systems Requirements), ISO 14001: 2015 (Environmental Management Systems Requirements), ISO 45001: 2018 (Occupational Health and Safety Management Systems. Requirements) and ISO 50001: 2018 (Energy Management Systems Requirements).

UL

Optim-R® and Optim RE. File# R38653 are listed under UL Solutions Category Code: ULEX- UL Evaluation Reports for Thermal Protection at UL Solutions http://www.ul.com/erdirectory

Optim-R and Optim-R E Vacuum Insulation Panels are used as a roofing insulation as follows:

- Class A, B or C roof-covering assemblies UL Classified in accordance with UL 790 under the product category Roofing Systems, (TGFU).
- Roof Deck Construction 735 for UL Classification in accordance with UL 1256 under the product category Building Units for Roof Deck Construction, (TIAR).

OPTIM-R and OPTIM-R E are both designated by UL and FM as eligible to be marked as:

CLASSIFIED UL File R38653

FM APPROVED

Further details on accredited designs can be located on https://iq.ulprospector.com/ searching for either 'Kingspan Insulation LLC', the File No. R38653 or the 'CCN' referred to above. Alternatively please contact Kingspan Insulation's Technical Service Department (see rear cover for details).

OPTIM-R® E

Next Generation Insulation Solutions

Product Data		
Property	Test Method	Target
General		
Nominal Thickness (in / mm)		0.8 - 2.0 / 20 - 50
Standard Dimensions		
Width (in / mm)		15.6 - 23.6 / 400 - 600
Length (in / mm)		15.6 - 47.2 / 400 - 1200
Nominal Panel Mass (lbs per sq ft)		
20 mm thickness		0.8
25 mm thickness		1.0
30 mm thickness		1.2
40 mm thickness		1.4
50 mm thickness		1.6
Nominal Panel Weight (lbs per sq ft)		
20 mm thickness		1.1
25 mm thickness		1.3
30 mm thickness		1.58
40 mm thickness		2.1
50 mm thickness		2.6
Compressive Strength, Min. (psi) @ 10% deformation	ASTM C165	23

* Contact Kingspan Insulation for available non-stock sizes.

Density

The density of Kingspan OPTIM-R E falls within the range of 180 - 210 kg/m³. 11.2 - 13.1 pc when tested to BS EN 1602: 2013 (Thermal insulating products for building applications. Determination of the apparent density).

Durability

If installed correctly and protected from damage and penetration, Kingspan OPTIM-R E will provide reliable long-term thermal performance over the lifetime of the building.

OPTIM-R® E

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Thermal Resitance

ASTM C1667 (Standard Test Method for Using Heat Flow Meter Apparatus to Measure the Center-of-Panel Thermal Transmission Properties of Vacuum Insulation Panels) is the only test method designated by ASTM to be used specifically for testing center panel thermal resistance of Vacuum Insulated Panels. ASTM C1667 further states that Vacuum Insulated Panels fall outside the scope of test method ASTM C518. All of the below stated thermal resistance values are based on Certified ASTM C1667 testing.

Figure 2: Center Panel Thermal Resistance
Evaluates the performance of the panel without any size-dependent thermal bridging due to heat flow shunting around the panel envelope.

Figure 3: Effective Thermal Resistance
Takes thermal bridging into account and is numerically calculated from a center panel measurement due to the range of possible geometries.

ASTM C1667 Center Panel Thermal Resistance Properties	
Thermal Resistance (R-value)	ft².°F·hr/Btu
Center Panel	29 - 67
Effective	19 - 47
Project Specific	Project Dependant

*Refer to Kingspan Insulation for current stock and non-stock sizes.

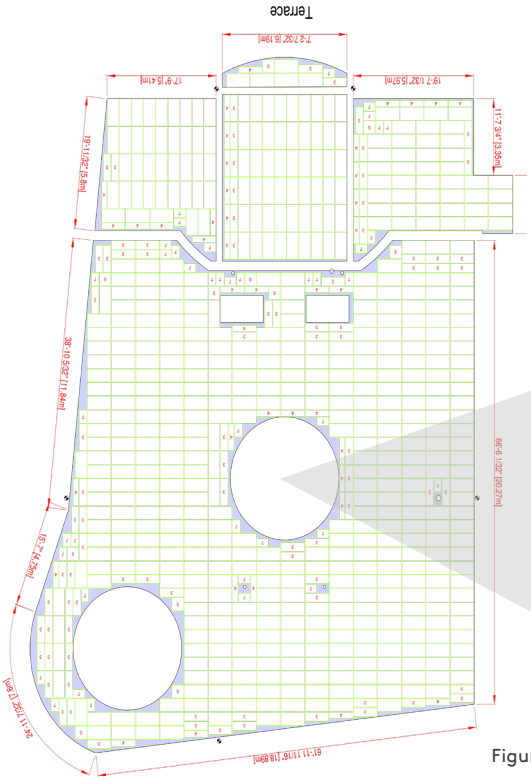


Figure 4

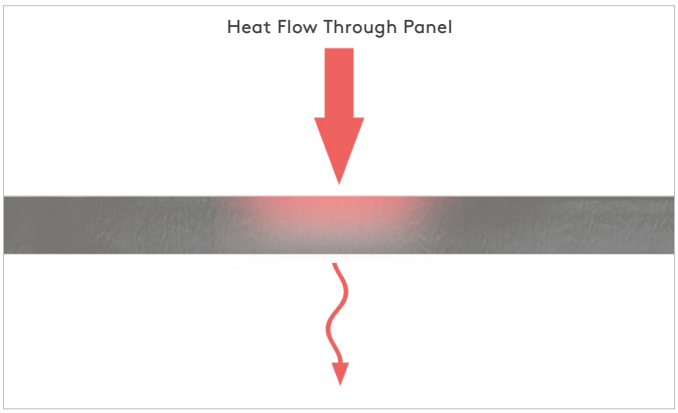


Figure 2: OPTIM-R E Center Panel Thermal Resistance

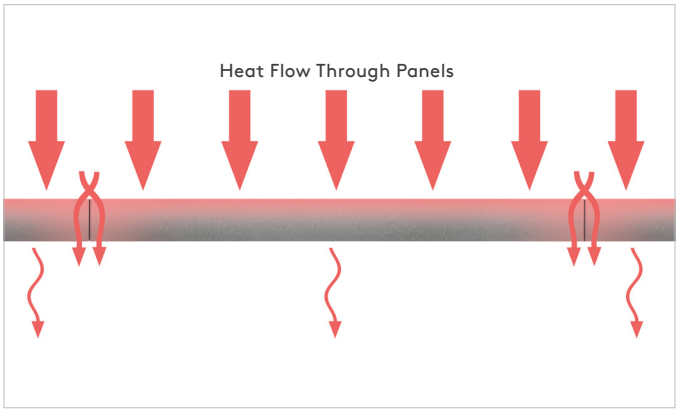
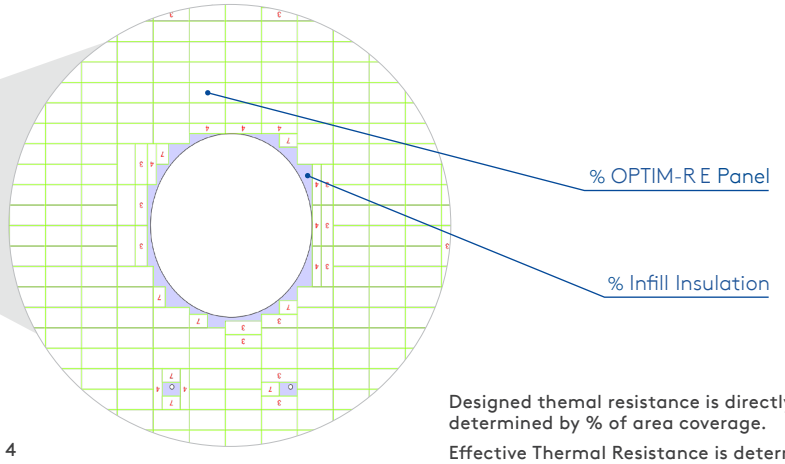


Figure 3: OPTIM-R E Effective Thermal Resistance

Project Specific

For OPTIM-R E projects, Kingspan will provide a custom panel layout drawing to achieve the best coverage of the vacuum insulation panel. Where panel is unable to cover, an infill insulation will be used. Due to the differences in R-Value between OPTIM-R E panels and the infill product(s), Kingspan will provide a custom weighted average R-Value thermal calculation to determine the true assembly R-Value.



Designed themal resistance is directly determined by % of area coverage.

Effective Thermal Resistance is determined by center panel and edge effect values.

Contact Details

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SCAN ME

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