

# STRATEX Warm Roof System

Insulation and waterproofing for warm roofs and green roofs



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# STRATEX

## The cold liquid approach to warm roof systems

**STRATEX** from **KEMPER SYSTEM** is an integrated warm roof that offers exceptional performance and is supplied as a complete system of matched components from one of the world's leading roof waterproofing manufacturers.

Its unique tongue and groove insulation board and **KEMPEROL®** wet-on-wet cold liquid applied waterproofing - create a warm roof system that is easily specified, fully tested and and totally reliable.

STRATEX is an engineered system comprising all the elements for a warm roof specification - vapour barrier, insulation and waterproofing.

It is equally suited to concrete, timber and metal decks on new build projects as it is to refurbishing existing roofs. STRATEX is also ideal as a complete warm roof solution below an extensive green roof.

## Interlocking insulation boards

**KEMPERTHERM F** and **FR** (reinforced) are interlocking flat insulation boards that offer exceptional thermal performance by eliminating cold bridging. The tongue and groove construction also gives a more rigid, level finish for a smoother, more attractive appearance.

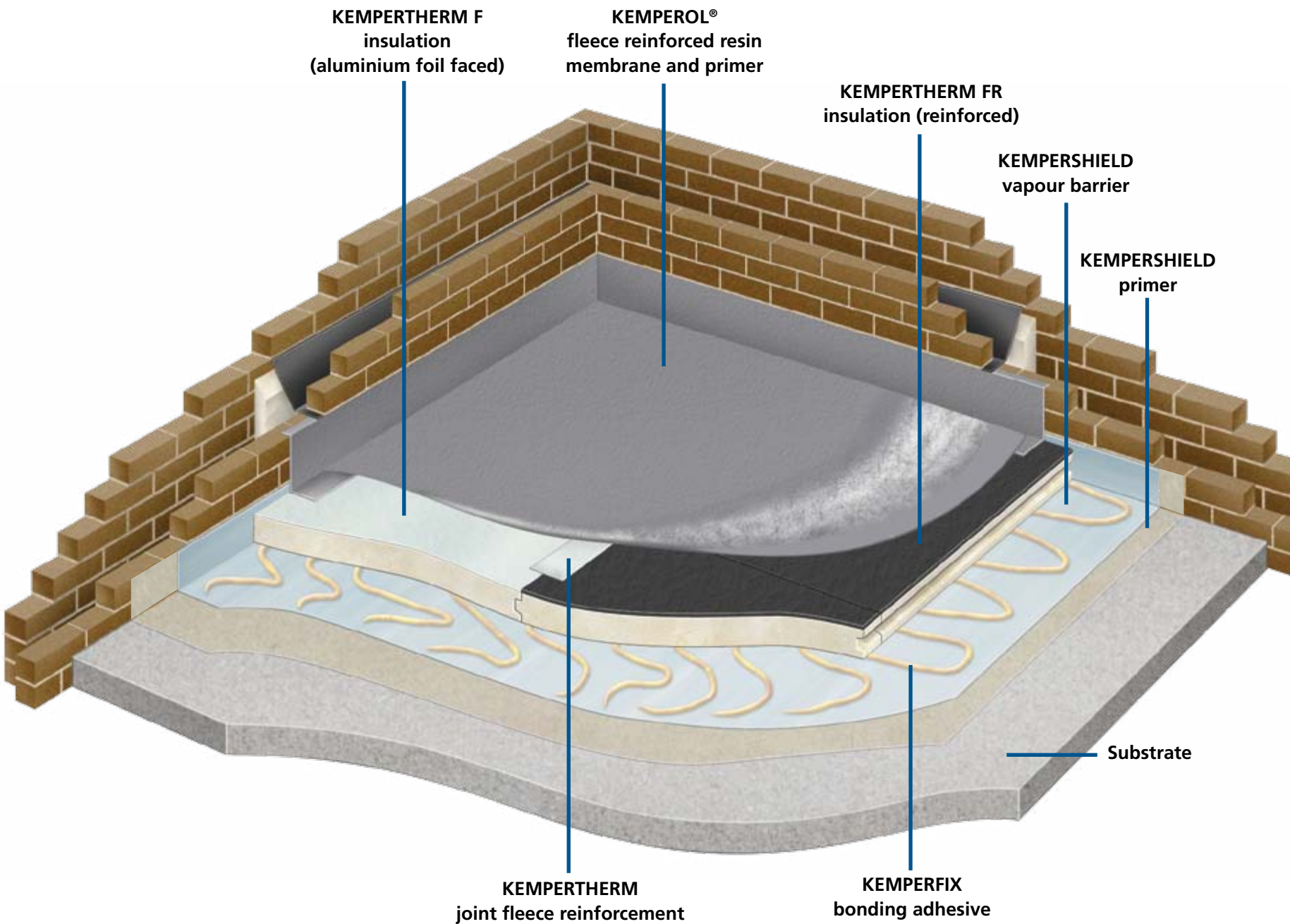
## Factory cut tapers

A key advantage of STRATEX is the ability to simplify design and installation of complex schemes whilst minimising waste.

**KEMPERTHERM T** and **TR** (reinforced) tapered insulation boards are supplied to site as a factory bonded single layer ready to fit.



# Warm roof system build up



## KEMPERTHERM

**KEMPERTHERM** is a specialist thermal insulation board manufactured by Gradient (part of the Recticel Group) and is the result of a joint development programme with **KEMPER SYSTEM**. This unique board is produced using the Kufe Technology laydown process to deliver a consistently smooth board ideal for the direct application of **KEMPEROL®** liquid waterproofing systems. This tightly controlled production process delivers a board that is free from the excessive pin holes and stitch lines associated with economy boards that are known to cause problems with the direct application of liquid waterproofing systems if a recovery layer is not used. **KEMPERTHERM** has a special face which aids bonding.

## Range of surface finishes

The **KEMPEROL®** waterproofing used in the **STRATEX** system has a self finish that is highly durable, but can also be treated using the **KEMPER SYSTEM** range of surfacing products or paving, timber decked, topped with landscape aggregate or integrated within the **KEMPERGRO** green roof system.



# STRATEX components - Insulation

## KEMPERTHERM F (flat boards)

KEMPERTHERM F is a rigid PIR insulation board which due to its dense closed cell structure and aluminium foil face has a particularly low thermal conductivity of just 0.023W/mK.

### Interlocking panels

Adjoining panels interlock using tongue and groove joints, a feature unique to STRATEX with flat board insulation. This reduces cold bridging and achieves a rigid base that, together with its excellent dimensional tolerances, creates a smooth, rigid and flat surface with stable joints.

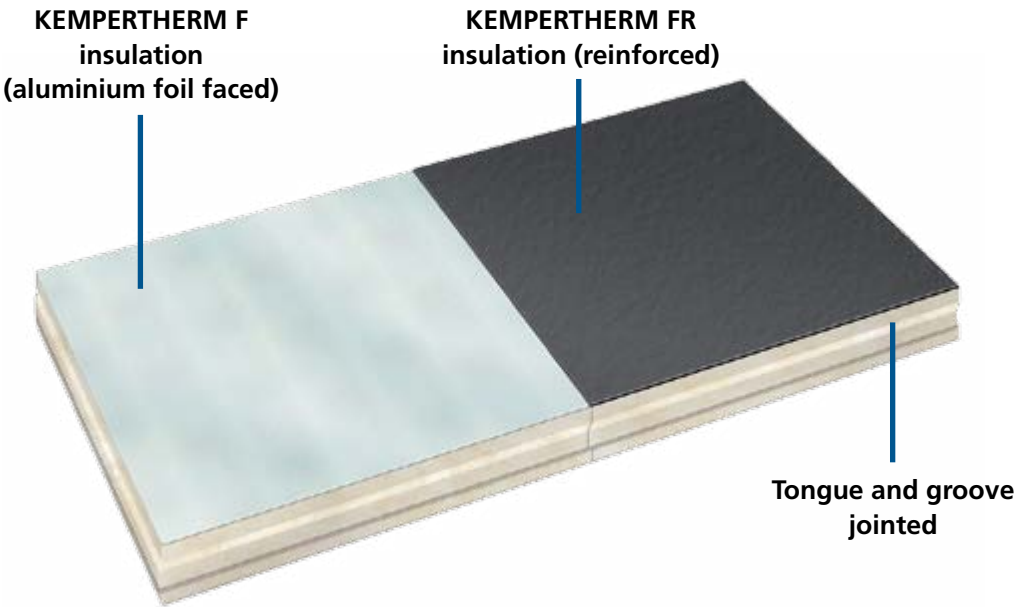
### Impressively strong

KEMPERTHERM has a unique cell structure that imparts excellent compressive strength.

KEMPERTHERM FR insulation board has a 3mm reinforced facing that can be used on areas subject to greater point loading or more frequent traffic. This offers a cost-effective solution for more frequently trafficked areas and avoids the labour and material costs of an additional plywood strengthening layer.



Board Profile: Flat		KEMPERTHERM F			KEMPERTHERM FR		
Description		CFC and HCFC free rigid PIR board			CFC and HCFC free rigid PIR board		
Facing		Water resistant multi-layer foil composite to upper and lower surfaces			3mm high density reinforced top face with multi-layer foil composite to lower surface		
Features		<ul style="list-style-type: none"><li>Flat board</li><li>Tongue and groove jointed</li><li>No carrier membrane needed</li></ul>			<ul style="list-style-type: none"><li>Flat board</li><li>Tongue and groove jointed</li><li>Increased point load resistance</li><li>No carrier membrane needed</li></ul>		
Applications and suitability		<ul style="list-style-type: none"><li>Roofs - New build and refurbishment</li><li>Maintenance foot traffic</li><li>KEMPERDUR coloured anti-slip finish</li><li>Paving slabs on spacers</li><li>Decking</li><li>Green roofs</li></ul>			<ul style="list-style-type: none"><li>Roofs - New build or refurbishment</li><li>Walkways or zoned areas of high load</li><li>Balconies and terraces</li><li>Areas with frequent foot traffic</li><li>KEMPERDUR coloured anti-slip finish</li><li>KEMPERDUR TC wear course</li><li>Paving slabs on spacers</li><li>Promenade tiles fully bonded</li><li>Decking</li><li>Green Roofs, biodiverse roofs and brown roofs</li></ul>		
Dimensions		Board Size and Thickness:			Board Size and Thickness:		
		1190mm x 1190mm (1.1461m²) = 50mm Thick All other boards (with 10mm increments available) = 1160mm x 1160mm (1.1345m²)			1190mm x 1190mm (1.1461m²) = 53mm Thick 93mm, 123mm and all other boards (with 10mm increments available) = 1160mm x 1160mm (1.1345m²)		
Typical build-up of Stratex System on common substrates (U-values W/m²K)		Concrete	Metal Deck	Timber Deck	Concrete	Metal Deck	Timber Deck
		0.19 110mm	0.19 110mm	0.19 110mm	0.19 113mm	0.19 113mm	0.19 113mm
		0.18 120mm	0.18 120mm	0.18 120mm	0.17 123mm	0.18 123mm	0.17 123mm
		0.16 130mm	0.17 130mm	0.16 130mm	0.16 133mm	0.16 133mm	0.16 133mm
		0.15 140mm	0.15 140mm	0.15 140mm	0.15 143mm	0.15 143mm	0.15 143mm
		0.14 150mm	0.14 150mm	0.14 150mm	0.14 153mm	0.14 153mm	0.14 153mm
		0.13 160mm	0.14 160mm	0.13 160mm	0.13 163mm	0.13 163mm	0.13 163mm
Maximum distributed load		20kN/m²			20kN/m²		
Environmental impact		<ul style="list-style-type: none"><li>All of our products have zero ozone depletion potential</li><li>All our products have a global warming potential of less than 5</li><li>Pentane blown polyurethane foams achieve an overall ‘A’ Rating in the Green Specification Guide</li></ul>					



# KEMPERTHERM T (tapered boards)

## Choice of falls

STRATEX warm roofs can be specified using tapered KEMPERTHERM T or TR (reinforced) to create falls of 1:40, 1:60, 1:80 or 1:120.

## Pre-cut hips and valleys

Factory-mitred boards for hips and valleys avoid cutting on site, reducing wastage and saving on installation time / costs. This gives more accurate detailing and also reduces thermal loss. Insulated hard edges are available for changes in level.

## Single operation

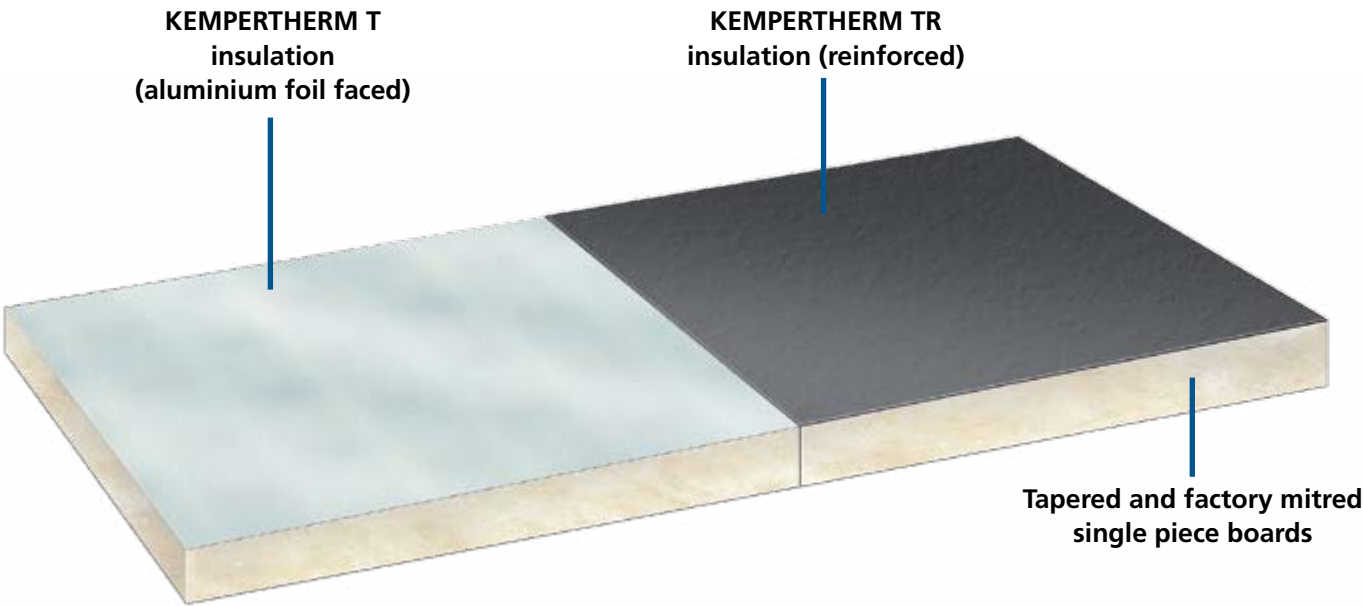
All tapered boards are labelled and supplied as a single layer ready for immediate laying.

## Technical support

Full technical support is provided at the design stage, including drawings, with tapered boards manufactured, numbered and labelled in accordance with the approved plans. Delivered direct to site, projects are installed only by experienced, KEMPER SYSTEM approved contractors.



Board Profile: Tapered	KEMPERTHERM T	KEMPERTHERM TR
Description	CFC and HCFC free rigid PIR board	CFC and HCFC free rigid PIR board
Facing	Water resistant multi-layer foil composite to upper and lower surfaces	3mm high density reinforced top face with multi-layer foil composite to lower surface
Features	<ul style="list-style-type: none"><li>Tapered board</li><li>No carrier membrane needed</li><li>Single layer - Factory bonded, no layered site build-up required</li><li>Factory mitred hips and valleys</li></ul>	<ul style="list-style-type: none"><li>Tapered board</li><li>Increased point load resistance</li><li>No carrier membrane needed</li><li>Single piece - Factory bonded, no layered site build-up required</li><li>Factory mitred hips and valleys</li></ul>
Applications and suitability	<ul style="list-style-type: none"><li>Roofs - New build and refurbishment</li><li>Maintenance foot traffic</li><li>KEMPERDUR coloured anti-slip finish</li><li>Paving slabs on spacers</li><li>Decking</li><li>Green roofs</li></ul>	<ul style="list-style-type: none"><li>Roofs - New build or refurbishment</li><li>Walkways or zoned areas of high load</li><li>Balconies and terraces</li><li>Areas with frequent foot traffic</li><li>KEMPERDUR coloured anti-slip finish</li><li>KEMPERDUR TC wear course</li><li>Paving slabs on spacers</li><li>Flooring tiles fully bonded</li><li>Decking</li><li>Green Roofs, biodiverse roofs and brown roofs</li></ul>
Dimensions	<div>Board size: 1200mm x 1200mm (1.44m²)</div> <div>Minimum Thickness: 1:40 80mm (30mm increase in height over 1.2m) 1:60 40mm (20mm increase in height over 1.2m) 1:80 50mm (15mm increase in height over 1.2m) 1:120 50mm (10mm increase in height over 1.2m)</div> <div>All boards delivered in single layers including thickest sections</div>	<div>1200mm x 1200mm (1.44m²)</div> <div>1:40 63mm (30mm increase in height over 1.2m) 1:60 23mm (20mm increase in height over 1.2m) 1:80 33mm (15mm increase in height over 1.2m) 1:120 33mm (10mm increase in height over 1.2m)</div> <div>All boards delivered in single layers including thickest sections</div>
Thermal performance	Typical lambda value 0.023W/mK (average)	Typical lambda value 0.023W/mK (average)
Maximum distributed load	20kN/m²	20kN/m²
Environmental impact	<ul style="list-style-type: none"><li>All of our products have zero ozone depletion potential</li><li>All our products have a global warming potential of less than 5</li><li>Pentane blown polyurethane foams achieve an overall 'A' Rating in the Green Specification Guide</li></ul>	

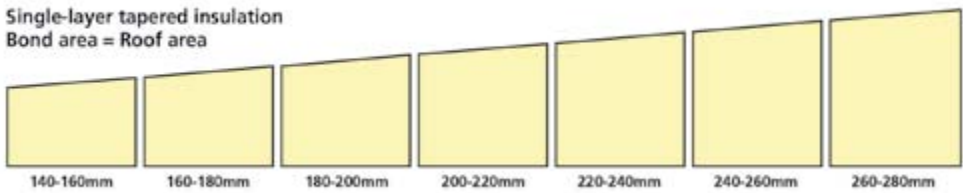




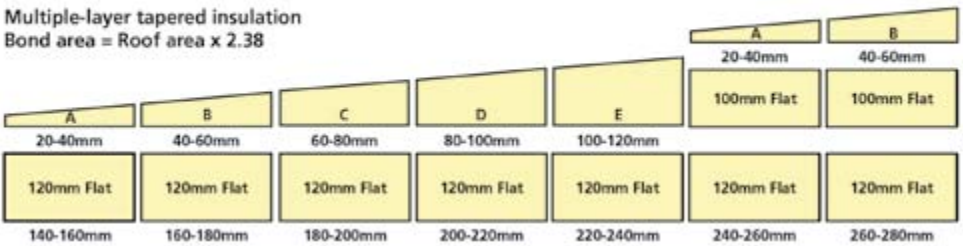
# Benefits of tapered insulation

A tapered insulation system is a method of providing effective thermal insulation and reliable drainage for a new build or roof refurbishment project. It comprises a series of bespoke components which combine to create the required insulation performance and drainage falls.

STRATEX is offered as a single-layer tapered insulation system. Carefully manufactured components are bonded together in factory conditions to form a bespoke solution. These are supplied ready to fit as a single scheme equivalent to the actual roof area and are simply installed as per the agreed plan and secured to the roof deck.



With a multi-layer system multiple components laid over flat 'packer' boards are bonded together, layer by layer, on-site. The total surface area to be bonded can be up to three times greater than the actual roof area. This can create increased time and cost penalties.



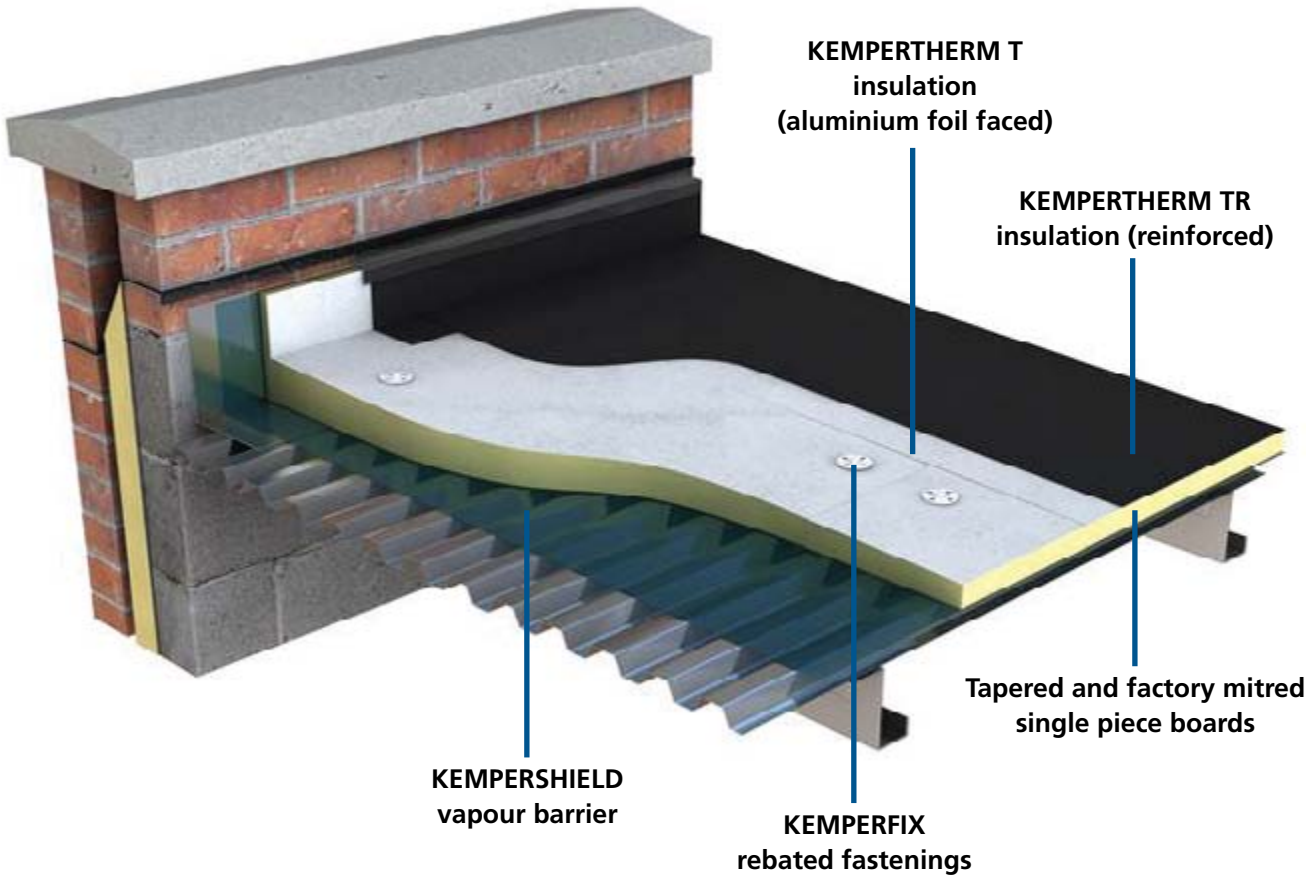
There are other methods of creating a tapered scheme; screed to falls and timber firings. However, these can add significantly to building load (screeds) and are often labour intensive to create, and rely heavily on other trades.

## Technical and cost benefits of single-layer tapered insulation systems

- A wide variety of falls available to suit the project.
- Any thickness possible to satisfy even the most demanding U-values.
- Compatible with KEMPEROL® liquid waterproofing membranes (including use in green roofs).
- Adhere to MMC principles – off-site manufacturing ensures:
  - Precise tolerances.
  - Reliable bonding under factory conditions.
  - Accurately pre-cut mitres.
  - Improved environmental characteristics – reduced waste both at the factory and on-site.
- Less time required to install.
- Lower overall materials and labour costs.
- No bonding between layers required on-site.
- An average 16% saving on insulation cost can be achieved compared to a multi-layer tapered equivalent.\*
- As the thickness of the insulation used increases so does the average saving that can be made.\*

\* Source – independent research carried out by construction consultancy, Davis Langdon

# Tapered insulation system components





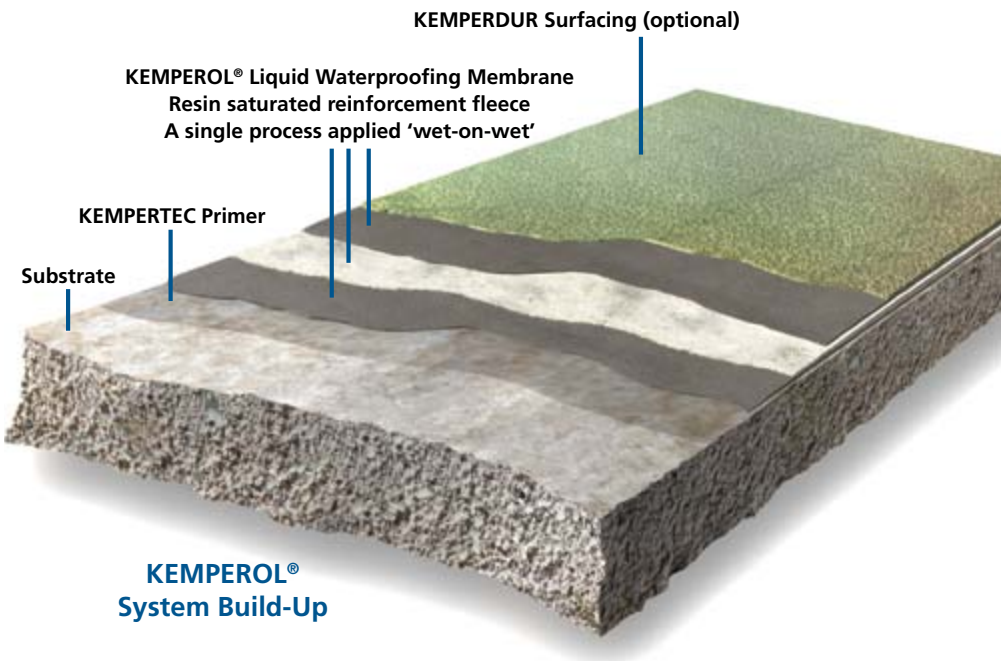
# KEMPEROL® waterproofing

The integrity and reliability of the waterproofing membrane on any warm roof is critical for its long-term performance. KEMPEROL® is a complete resin-based liquid waterproofing system. Applied wet-on-wet, KEMPEROL® offers many advantages over partially bonded, layered liquid, sheet membrane, or hot-applied materials.

KEMPEROL® waterproofing resins impregnate a polyester reinforcement fleece which is immensely strong, durable and tear-resistant. It also provides a clear visual quality assurance indication that the correct membrane thickness has been achieved.

KEMPEROL® membranes are permanently elastic, eliminating the need for the ‘carrier membrane’ required with other systems; saving on materials, time and above all cost.

STRATEX can be specified using either KEMPEROL® V210 or our sustainable, solvent-free and odourless, KEMPEROL® 2K-PUR. Both have BBA certification with an expected working life in excess of 25 years.



*KEMPERTHERM aluminium joint tape (for aluminium facing) and KEMPERTHERM joint fleece (for reinforced facing) provides surface continuity for the application of the waterproofing.*

# KEMPERSHIELD vapour barrier

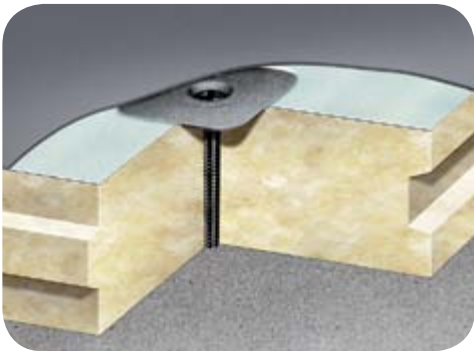
The STRATEX warm roof system incorporates KEMPERSHIELD a reinforced aluminium, self-adhesive vapour barrier. Class ‘O’ rated, it has excellent tear resistance and is suitable for use on concrete, profiled metal or timber decks. With its high vapour resistance, it can also be used on buildings with extreme levels of humidity and, once laid, can provide temporary waterproofing to the building structure.

# KEMPERFIX adhesive and fixings

For most applications the insulation is secured using cold applied KEMPERFIX, a moisture-curing single component polyurethane which adheres to the vapour barrier.

Where a mechanical fixing is needed, KEMPERFIX rebated fastenings anchor the insulation whilst retaining a flush finish for the waterproofing membrane.

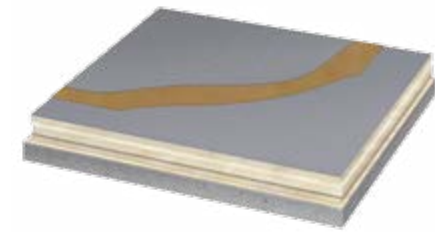
Our technical team can offer advice on the suitability of the different adhesive and mechanical fixings based on the specification of your project.



# STRATEX surfacing options

Not only is STRATEX sufficiently robust and durable to withstand occasional foot traffic for access or maintenance, it is can also be specified for more long-term or heavier use. It also provides a compatible substrate for a wide range of landscaped or surfacing options, including green roofs.

## KEMPERDUR TC



For a hard wearing and highly durable surface finish, KEMPEROL® TC is a solvent-free surfacing application comprising a resin base with aggregate wear course and resin sealer. It is slip resistant in both wet and dry conditions and comes in a range of standard or bespoke colours making it a good choice for balconies, terraces or walkways.

## Paving and flooring tiles



All STRATEX systems can be landscaped using paving slabs seated on load bearing spacers. An application that is suited to a wide range of modular landscaping materials. Reinforced systems using KEMPERTHERM TR and FR insulation boards can also be surfaced with flooring tiles fully bonded to the waterproof membrane.

## Decking



The decking timber bearers can sit directly over the STRATEX system if separated by a neoprene/rubber or geotextile runner.

# STRATEX System Weights

Average STRATEX System weights using KEMPERTHERM F or FR thermal insulation boards:

Thickness mm	KEMPERTHERM F						KEMPERTHERM FR					
	90	120	130	140	150	160	93	123	133	143	153	163
KEMPERSHIELD Type 1 Primer	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
KEMPERSHIELD Vapour Barrier	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
KEMPERFIX Adhesive	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
KEMPERTHERM Insulation	2.70	3.60	3.90	4.20	4.50	4.80	7.64	8.54	8.84	9.14	9.44	9.74
KEMPERTEC Primer	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
KEMPEROL® Fleece 200gsm	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
KEMPEROL® Waterproofing	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
Total Weight Kg	8.05	8.95	9.25	9.55	9.85	10.15	12.99	13.89	14.19	14.49	14.79	15.09

This is a guide only. Primer and waterproofing system weights are based on average coverage rate per kilogram. The weight of tapered insulation schemes will vary depending on the roof dimensions and the fall required. The calculated weight can be provided by our Technical Department based on plans submitted for quotation.



# STRATEX in green roof systems

Green roofs have significant advantages for the environment; climate control, storm water attenuation, noise and pollution reduction and heat insulation. They protect against thermal gain and offer an additional habitat for flora and fauna. Whatever your requirement KEMPER SYSTEM can provide a solution to meet local climatic conditions, aspect, biodiversity and specifier preference.

STRATEX is ideal as a complete warm roof solution below an extensive green roof. The compressive strength of the hard top and standard KEMPERTHERM insulation is robust enough to handle the additional loading imposed by green roof build-ups. In addition KEMPEROL® liquid waterproofing is certified by FLL for its root resistant properties, durability and proven performance in green roof developments.

KEMPER SYSTEM are members of the Green Roof Organisation (GRO) - the independent UK body representing the industry trade associations, manufacturers and key players within the green roofing sector. GRO sets out to promote the green roof concept, provide suitable guidelines to both manufacturers and installers and to recognise and promote correctly trained green roofing companies.

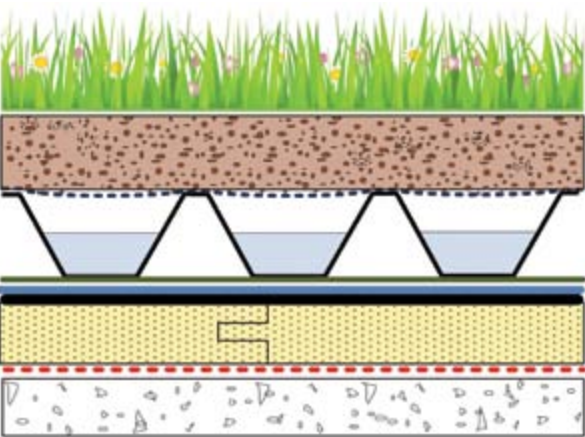


## KEMPERGRO - A complete approach to sustainable green roof systems

Our KEMPERGRO green roof system is fully compatible with the STRATEX warm roof system. KEMPERGRO brings together a unique combination of recycled, renewable and sustainable components to provide a complete waterproof roofing and green roof system with a single source specification.

- KEMPERGRO is ideal for use in extensive roof gardens providing light-weight drainage and storage for rainwater in both new build and refurbishment projects.
- The upper filter fleece supports the growing medium and prevents substrate fines from blocking the reservoir yet allows percolation of rainwater.
- The factory bonding of the fleece to the reservoir core prevents sagging of the fleece under the weight of the substrate. This maintains reservoir capacity and prevents blockages.
- The reservoir core holds a predetermined amount of rainwater whilst allowing excess water to pass through percolation holes to the base layer.
- The base felt layer provides physical protection to the waterproofing but also attenuates run-off to regulate flow to outlets and drains during flash floods and storms.
- Suitable for use with solvent-free KEMPEROL® 2K-PUR liquid waterproofing which is inherently root resistant.

## KEMPERGRO - Sustainable and renewable



- All sedum and plant varieties are sourced and grown in the UK.
- The growing media is manufactured using 100% recycled materials.
- The base felt is composed of 100% recycled materials.
- The reservoir core is composed of 90% recycled materials.
- The waterproofing membrane is composed of solvent-free KEMPEROL® 2K-PUR (80% of the applied polyols or resins are obtained from the seeds of the tropical castor plant - a renewable resource), combined with a polyester reinforcing fleece containing up to 25% recycled material.
- The hard-top on the insulation board is 100% recycled.
- Substrate conservation - As the KEMPEROL® liquid waterproofing and warm roof build up can be installed directly on top of your existing roof covering, there is no need to remove it avoiding unnecessary and costly disposal to landfill.





## Technical support

When you choose the STRATEX warm roof system from KEMPER SYSTEM, you will have access to a comprehensive design and technical support service from start to finish. And because no two jobs are ever the same, we will work with you to identify the most suitable, cost effective and reliable materials and systems for your project; ensuring your design objectives are achieved.

Our experienced sales and technical team offer full support, recommending solutions and can liaise directly with your installation contractor to assist the smooth running of your project.

### Design support

We can produce U-value calculations, condensation risk analyses, supply section detail drawings and bespoke tapered insulation schemes. A comprehensive set of system technical and material safety data sheets are also available.

### On-site support for the client, specifier, architect and contractor

We have a team of technical field specialists who, as well as providing on-site training and contractor support, work closely with client specifiers on active projects.

- Deliveries co-ordinated with your construction schedule.
- Guidance offered on the correct setting out of components.
- Installation training provided.
- Continued on-site support.







All the information provided in this brochure was correct at the time of printing and reflects our current knowledge and experience of the systems described. As this information is subject to change without notice, always consult our Technical Department for the latest information and advice relating to the specification and use of our products.



**KEMPER SYSTEM LTD**  
Kemper House, 30 Kingsland Grange,  
Woolston, Warrington, Cheshire  
United Kingdom WA1 4RW

Tel: 01925 445532 Fax: 01925 575096  
Email: [enquiries@kempersystem.co.uk](mailto:enquiries@kempersystem.co.uk)  
Web: [www.kempersystem.co.uk](http://www.kempersystem.co.uk)

