V2/1018/PR/TD01



KORE Lock

Roof Insulation Design Guide

KORE Roof Insulation



Key Features

- Meets and exceeds building regulations
- Excellent thermal properties
- Very simple and safe to install
- Variable width adjustment
- Facilitates necessary ventilation requirements
- Easy to work with and install

Application & Description

Application

KORE Lock is an insulation system for use in warm and cold pitched roofs. For warm pitched roof applications the KORE Lock Sheet is installed between the rafters, along with KORE Warmsark board over the rafters. For cold pitched roof applications the KORE Lock Sheet is installed between the rafters, along with KORE EPS in a thermal board on the underside of the rafters.

Description

KORE Lock is a high performance expanded polystyrene insulation system that is very simple and safe to install. The system provides a completed tight fitting insulation envelope. The unique cut of the KORE Lock variable width panels allows the product to be compressed slightly for easy insertion between the rafters. Once in place, the KORE Lock panels return to their normal size and remain securely in place. Thermal bridges are limited through the use of KORE Warmsark for warm pitched roof applications and KORE EPS in thermal boards for cold pitched roof applications.

fRSI-Values Definition

The fRSI-value is a ratio of the difference in internal temperature and minimum surface temperature to the difference in internal and external temperatures. Internal and external temperatures are applied to the relevant surfaces of the model, and the software calculates the heat flow through the materials and bridging elements, to determine the heat energy loss from inside to outside, and the surface temperatures on the inner surfaces of the building. It is then determined if the fRSI-value is above or below the limits set out in IP 106 and Technical Guidance Document Part L 2019. fRSI-value must be above 0.75 at the coldest point (must be above 15 degrees Celsius) on any internal face of the junction modelled for residential areas.

Psi Values Definition

The Psi-value represents the extra heat flow through the linear thermal bridge over and above that through the adjoining plane elements. If a Psi-value does not meet the default value outlined in TGDL tables it is still possible to calculate a Thermal Bridging Factor (y value) that is better than default, by means of manual (y value) calculation. The Thermal Bridging Factor (y value) is a parameter that is inputted in the BER calculation and takes into account the Psi-values of all heat loss junctions, the lengths over which the Psi-values apply and the total thermal envelope area of the building.

Application & Description

Product Name

Product Name	Application	New Build	Retrofitting*
KORE Lock EPS70 Silver	Cold Pitched Roof & Warm Pitched Roof	Yes	Yes
KORE Lock EPS70 White	Cold Pitched Roof & Warm Pitched Roof	Yes	Yes
KORE Warmsark EPS100 Silver	Warm Pitched Roof	Yes	Yes
KORE Warmsark EPS100 White	Warm Pitched Roof	Yes	Yes
KORE Thermal Board EPS70 Silver	Cold Pitched Roof	Yes	Yes
KORE Thermal Board EPS70 White	Cold Pitched Roof	Yes	Yes

Typical Construction and U-Value Calculations

All U-value calculations are in accordance with BS EN ISO 6946:2007. The calculations take account of fixings for both the warm roof and cold roof applications. The roof finish for all calculations were taken as clay roof tiles. The timber centres were taken as 400mm. Please contact our technical team for calculations at different centres. It is assumed that the insulation is fitted accordingly and the correction factor for air gaps has been ignored. All calculations take account all of the necessary ventilation.



guarantee and as the conditions of use are beyond our control. Recommendations for use should be verified for subability and compliance with actual requirements specifications and any applicabel laws and regulations. KORE technical literature The information in this document is to the best of our knowledge, true and accurate However and recommendations or suggestions contained within are without the second se Disclaimer: and our Agrement certificates are all available for download from our website www.kore-system.com. Airpacks. Ltd t/a KORE reserves the right to amend product specifications without prior notice. Please check that the copy of this literature is by contacting the KORE depa with insulation having a min. R-value across the insulation thickness of 1.2 m²K/W proprietary eaves vent is completely filled Tilting fillet/felt support to prevent ponding of Ensure gap between wall plate and felt at eaves level 370mm cavity wall - 100mm concrete bonded bead insulation (Thermal Conductivity 0.33W/mK) block outer, 170mm Cavity and 100mm concrete block inner leaf Gutter Ventilated Soffit 170mm KOREFill Diamond Wall ties to manufacturers specifications and details CWI 64_KORE Fill & KORE Lock Unventilated Roof No Sarking Tiled/ Slated Roof 50mm KORE Thermal Board Airtight Breather Membrane Kilnaleck, Co. Cavan, Ireland Phone: +353 49 4374000 Fax: +353 49 4336823 over Rafters INSULATION AND ENERGY SAVING SOLUTIONS counter batten to provide unobstructed 47mm x 35mm slate/ tiling battens on www.kore-system.com air passage over Insulation bed.Wall plate to be secured down to wall by Expanded Galvanised Steel Reinforcing Mesh wall ceiling junction Airtight tape applied to (internal includes airtight parge coat) 15mm internal sand cement render manufacturers specifications Insulated cavity closer to conductivity of 0.20 W/mk). AAC block to be installed so ensure thermal break is maintained. (maximum thermal and details to avoid any effect of moisture on thermal conductivity Autoclaved aerated concrete (AAC) block to be used to long, 450mm of which should be over the blockwork restraint straps nailed to wall. Strap at least 750mm 100mm x 75mm wallplate on continious mortar each rafter, keeping panels flush with the under side of the rafter and closely 175mm KORE Lock panels, between butted at the ends Drawing Nº .: Drawn: AON Checked: SM Project : KORE Standard Details Title:KORE Fill & KORE Lock Unventilated Roof No Sarking Scale: 1 : 10 @ A4 CWI 64 layer below rafter 12.5mm Plaster slab with Vapor control Date: 02/05/2019 Drawn by Airpacks Ltd. t/a KORE Rev: ⊳

CWI_64: Warm Pitched Roof - Insulation Between and Over Rafters (no sarking board)



CWI_64: Warm Pitched Roof - Insulation Between and Over Rafters (no sarking board)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
Silver	100 Silver (mm)		Green	nZEB Ready
100mm	50mm	0.22		, <u> </u>
120mm	50mm	0.19		
150mm	50mm	0.17		
170mm	50mm	0.16		
180mm	50mm	0.15		
200mm	50mm	0.14		
210mm	50mm	0.14		
220mm	50mm	0.13		
240mm	50mm	0.12		

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/ mK) & KORE Warmsark EPS100 Silver (0.031W/mK)

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Warmsark EPS100 Silver (0.031W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valı	ue Legend
Silver	100 Silver (mm)		Green	nZEB Ready
100mm	100mm	0.16		
120mm	100mm	0.15		
130mm	100mm	0.14		
150mm	100mm	0.13		
180mm	100mm	0.12		
200mm	100mm	0.11		
230mm	100mm	0.10		

CWI_64: Warm Pitched Roof - Insulation Between and Over Rafters (no sarking board)

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Warmsark EPS100 White (0.036W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ue Legend
White	100 White (mm)		Green	nZEB Ready
100mm	50mm	0.25		
120mm	50mm	0.22		
130mm	50mm	0.21		
150mm	50mm	0.20		
180mm	50mm	0.18		
190mm	50mm	0.17		
200mm	50mm	0.16		
210mm	50mm	0.15		
230mm	50mm	0.14		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Warmsark EPS100 White (0.036W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
White	100 White (mm)		Green	nZEB Ready
100mm	100mm	0.18		, , , , , , , , , , , , , , , , , , ,
120mm	100mm	0.17		
130mm	100mm	0.16		
150mm	100mm	0.15		
170mm	100mm	0.14		
190mm	100mm	0.13		
220mm	100mm	0.12		
250mm	100mm	0.11		

CWI_65: Warm Pitched Roof - Insulation Between and Over Rafters (With Sarking Board)







U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Warmsark EPS100 Silver (0.031W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
Silver	100 Silver (mm)		Green	nZEB Ready
100mm	50mm	0.21		,
120mm	50mm	0.19		
130mm	50mm	0.18		
150mm	50mm	0.17		
160mm	50mm	0.16		
170mm	50mm	0.15		
190mm	50mm	0.14		
210mm	50mm	0.13		
240mm	50mm	0.12		

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Warmsark EPS100 Silver (0.031W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
Silver	100 Silver (mm)		Green	nZEB Ready
100mm	100mm	0.16	0.001	
120mm	100mm	0.15		
130mm	100mm	0.14		
150mm	100mm	0.13		
180mm	100mm	0.12		
200mm	100mm	0.11		
230mm	100mm	0.10		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Warmsark EPS100 White (0.036W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
White	100 White (mm)		Green	nZEB Ready
100mm	50mm	0.24		
120mm	50mm	0.22		
130mm	50mm	0.21		
150mm	50mm	0.19		
180mm	50mm	0.17		
190mm	50mm	0.16		
210mm	50mm	0.15		
230mm	50mm	0.14		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Warmsark EPS100 White (0.036W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Val	ue Legend
White	100 White (mm)		Green	nZEB Ready
100mm	100mm	0.18		
120mm	100mm	0.17		
130mm	100mm	0.16		
150mm	100mm	0.15		
180mm	100mm	0.14		
190mm	100mm	0.13		
220mm	100mm	0.12		
250mm	100mm	0.11		

CWI_59: Cold Pitched Roof - Insulation Between and Under Rafters (No Sarking Board)





U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70 Silver	KORE Warmsark EPS 100 Silver (mm)	U-Value (W/m²K)		
100mm	50mm	0.23		
120mm	50mm	0.20		
130mm	50mm	0.19		
150mm	50mm	0.18		
170mm	50mm	0.16		
190mm	50mm	0.15		
200mm	50mm	0.14	_\/alı	le legend
230mm	50mm	0.13	Green	n7FB Ready
250mm	50mm	0.12	Green	

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ue Legend
Silver	100 Silver (mm)		Green	nZEB Ready
100mm	100mm	0.16		
120mm	100mm	0.15		
130mm	100mm	0.15		
150mm	100mm	0.14		
180mm	100mm	0.12		
210mm	100mm	0.11		
240mm	100mm	0.10		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valı	ue Legend
White	100 White (mm)		Green	nZEB Ready
100mm	50mm	0.26		
120mm	50mm	0.23		
130mm	50mm	0.22		
150mm	50mm	0.20		
180mm	50mm	0.18		
190mm	50mm	0.17		
210mm	50mm	0.16		
230mm	50mm	0.15		
250mm	50mm	0.14		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
White	100 White (mm)		Green	nZEB Ready
100mm	100mm	0.19		, ,
120mm	100mm	0.18		
130mm	100mm	0.17		
150mm	100mm	0.16		
180mm	100mm	0.14		
200mm	100mm	0.13		
230mm	100mm	0.12		



CWI_63: Cold Pitched Roof - Insulation Between and Under Rafters - Unventilated (No Sarking Board



U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70 Silver	KORE Warmsark EPS 100 Silver (mm)	U-Value (W/m²K)		
100mm	50mm	0.22		
120mm	50mm	0.20		
130mm	50mm	0.19		
150mm	50mm	0.17	U-Valu	ie Legend
170mm	50mm	0.16	Green	nZEB Ready
180mm	50mm	0.15]	
200mm	50mm	0.14		
220mm	50mm	0.13]	
240mm	50mm	0.12		

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70 Silver	KORE Warmsark EPS 100 Silver (mm)	U-Value (W/m²K)	
100mm	100mm	0.16	
120mm	100mm	0.15	
130mm	100mm	0.14	
150mm	100mm	0.13	
180mm	100mm	0.12	
200mm	100mm	0.11	
240mm	100mm	0.10	Green Inzeb Ready

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
White	100 White (mm)		Green	nZEB Ready
100mm	50mm	0.25		
120mm	50mm	0.22		
130mm	50mm	0.21		
150mm	50mm	0.20		
180mm	50mm	0.17		
200mm	50mm	0.16		
220mm	50mm	0.15		
240mm	50mm	0.14		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
White	100 White (mm)		Green	nZEB Ready
100mm	100mm	0.18		, , , , , , , , , , , , , , , , , , ,
120mm	100mm	0.17		
130mm	100mm	0.16		
150mm	100mm	0.15		
180mm	100mm	0.14		
190mm	100mm	0.13		
220mm	100mm	0.12		
250mm	100mm	0.11		

Typical Construction & U-Value Calculations Sarking Board) The information in this document is to the best of our knowledge, true and accurate However and recommendations or suggestions contained within are without guarantee and as the conditions of use are beyond our control. Recommendations for use should be verified for suitability and compliance with actual requirements. Disclaimer: and our Agrement certificates are www.kore-system cifications and any applicabel cations ntacting the KORE ma without .com . Airpacks Ltd t/a KORE ability and compliance with actual requirements laws and regulations. KORE technical literature all available for download from our website with insulation having a min. R-value across Ensure gap between wall plate and proprietary eaves vent is completely filled reserves the right to amend product k that the copy of this literature is the insulation thickness of 1.2 m²K/W Tilting fillet/felt support to prevent ponding of felt at eaves level 370mm cavity wall - 100mm concrete bonded bead insulation (Thermal Conductivity 0.33W/mK) block outer, 170mm Cavity and 100mm concrete block inner leaf Gutter Ventilated Soffit 170mm KOREFill Diamond Wall ties to manufacturers specifications and details CWI 61_KORE Fill & KORE Lock Partial Fill Between Rafter Detail Tiled/ Slated Roof Airtight Breather Membrane Kilnaleck, Co. Cavan, Ireland Phone: +353 49 4374000 Fax: +353 49 4336823 INSULATION AND ENERGY SAVING SOLUTIONS www.kore-system.com Slate/Tiling Battens 47mm x 35mm ensure thermal break is maintained. (maximum thermal bed.Wall plate to be secured down to wall by restraint straps nailed to wall. Strap at least 750mm Insulated cavity closer to Airtight tape applied to (internal includes airtight parge coat) 15mm internal sand cement render and details manufacturers specifications to avoid any effect of moisture on thermal conductivity conductivity of 0.20 W/mk). AAC block to be installed so long, 450mm of which should be over the blockwork wall ceiling junction Autoclaved aerated concrete (AAC) block to be used to 100mm x 75mm wallplate on continious mortar each rafter, keeping panels flush with butted at the ends the under side of the rafter and closely 175mm KORE Lock panels, between

KORE linear drylining panel with vapour control layer behind

25mm Timber Batten fixed to Rafter to Allow Ventilation Above

CWI_61: Cold Pitched Roof - Insulation Between (Partial Fill) and Under Rafters - Ventilated (No





U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valı	ue Legend
Silver	100 Silver (mm)		Green	nZEB Ready
100mm	50mm	0.23		
120mm	50mm	0.20		
130mm	50mm	0.19		
150mm	50mm	0.18		
170mm	50mm	0.16		
190mm	50mm	0.15		
200mm	50mm	0.14		
230mm	50mm	0.13		
250mm	50mm	0.12		

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ue Legend
Silver	100 Silver (mm)		Green	nZEB Ready
100mm	100mm	0.16		
120mm	100mm	0.15		
130mm	100mm	0.15		
150mm	100mm	0.14		
180mm	100mm	0.12		
210mm	100mm	0.11		
240mm	100mm	0.10		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
White	100 White (mm)		Green	nZEB Ready
100mm	50mm	0.26		, <u>,</u>
120mm	50mm	0.23		
130mm	50mm	0.22		
150mm	50mm	0.20		
180mm	50mm	0.18		
190mm	50mm	0.17		
210mm	50mm	0.16		
230mm	50mm	0.15		
250mm	50mm	0.14		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Warmsark EPS	U-Value (W/m²K)	U-Valu	ie Legend
White	100 White (mm)		Green	nZEB Ready
100mm	100mm	0.19		, <u>,</u>
120mm	100mm	0.18		
130mm	100mm	0.17		
150mm	100mm	0.16		
180mm	100mm	0.14		
200mm	100mm	0.13		
230mm	100mm	0.12		



CWI_60: Cold Pitched Roof - Insulation Between Rafters and Under Rafters (With Sarking Board)



U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Value (W/m²K)	U-Valu	ie Legend
Silver	EPS70 Silver (mm)		Green	nZEB Ready	
100mm	50mm	0.21			
125mm	50mm	0.19			
150mm	50mm	0.17			
175mm	50mm	0.15			
200mm	50mm	0.14			

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Value (W/m²K)	U-Valu	ie Legend
Silver	EPS70 Silver (mm)		Green	nZEB Ready	
100mm	100mm	0.16			
125mm	100mm	0.15			
150mm	100mm	0.13			
175mm	100mm	0.12			
200mm	100mm	0.11			

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
White	EPS70 White (mm)		Green	nZEB Ready
100mm	50mm	0.25		,
125mm	50mm	0.22		
150mm	50mm	0.20		
175mm	50mm	0.18		
200mm	50mm	0.16		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
White	EPS70 White (mm)		Green	nZEB Ready
100mm	100mm	0.19		
125mm	100mm	0.17		
150mm	100mm	0.16		
175mm	100mm	0.14		
200mm	100mm	0.13		

CWI_66: Cold Pitched Roof - Insulation Between and Under Rafters - Unventilated (With Sarking Board)





- 1. Gutter
- Tilting fillet/felt support to prevent ponding of felt at eaves level
- 3. Ventilated soffit
- 4. Tiled/slated roof
- 5. Airtight breather membrane
- Ensure a gap between wall plate and proprietary eaves vent is completely filled with insulation having a min. R-value across the insulation thickness of 1.2 m2K/W
- 7. 47mm x 35mm slate/tiling battens
- 8. 18mm sarking board
- 150mm KORE Lock panels, between each rafter, keeping panels flush with the underside of the rafter and tightly butted at the ends
- 10. 12.5mm plaster slab with vapour control layer below rafter
- 11. Airtight tape applied to wall ceiling junction
- 100mm 75mm wall plate on continuous mortar bed, wall plate to be secured down to wall by restraint straps nailed to wall. Strap at least 750mm long, 450mm of which should be over blockwork
- 13. Insulated cavity closer to manufacturers specifications and details
- 14. 15mm internal sand cement render (internal includes airtight parge coat)
- 15. Wall ties to manufacturers specifications and details
- 16. 170mm KOREFILL Diamond Bonded Bead Insulation



U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ue Legend
Silver	EPS70 Silver (mm)		Green	nZEB Ready
100mm	50mm	0.21		,
125mm	50mm	0.19		
150mm	50mm	0.17		
175mm	50mm	0.15		
200mm	50mm	0.14		

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
Silver	EPS70 Silver (mm)		Green	nZEB Ready
100mm	100mm	0.16		, ,
125mm	100mm	0.15		
150mm	100mm	0.13		
175mm	100mm	0.12		
200mm	100mm	0.11		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
White	EPS70 White (mm)		Green	nZEB Ready
100mm	50mm	0.25		, , , , , , , , , , , , , , , , , , ,
125mm	50mm	0.22		
150mm	50mm	0.20		
175mm	50mm	0.18		
200mm	50mm	0.16		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
White	EPS70 White (mm)		Green	nZEB Ready
100mm	100mm	0.19		
125mm	100mm	0.17		
150mm	100mm	0.16		
175mm	100mm	0.14		
200mm	100mm	0.13		



CWI_62: Cold Pitched Roof - Insulation Between (Partial Fill) and Under Rafters - Ventilated (With Sarking Board)





U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
Silver	EPS70 Silver (mm)		Green	nZEB Ready
100mm	50mm	0.21		
125mm	50mm	0.18		
150mm	50mm	0.17		
175mm	50mm	0.15		
200mm	50mm	0.14		

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
Silver	EPS70 Silver (mm)		Green	nZEB Ready
100mm	100mm	0.16		ļ
125mm	100mm	0.14		
150mm	100mm	0.13		
175mm	100mm	0.12		
200mm	100mm	0.11		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
White	EPS70 White (mm)		Green	nZEB Ready
100mm	50mm	0.24		, <u>,</u>
125mm	50mm	0.21		
150mm	50mm	0.19		
175mm	50mm	0.17		
200mm	50mm	0.16		

U-Value Calculations: KORE Lock EPS70 White (0.037W/mK) & KORE Thermal Board EPS70 White (0.037W/mK)

KORE Lock EPS70	KORE Thermal Board	U-Value (W/m²K)	U-Valu	ie Legend
White	EPS70 White (mm)		Green	nZEB Ready
100mm	100mm	0.18		, <u>,</u>
125mm	100mm	0.16		
150mm	100mm	0.15		
175mm	100mm	0.14		
200mm	100mm	0.13		

GEN_06: Dwarf Wall Detail







- 1. Tiled/slated roof
- 2. 47mm x 35mm slate/tiling battens
- 200mm KORE Lock variable width panels, between each rafter, keeping panels flush with the upper side of the rafter and tightly butted at the ends
- 4. 12.5mm plaster slab with vapour control layer below rafter
- 5. 100mm KORE Lock panels in dwarf wall, tightly butted at the ends with second layer of KORE Lock panels fixed to back
- 6. Timber flooring

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK) - Ventilated Attic

KORE Lock EPS70	KORE Lock EPS70 Silver	KORE Thermal		U-Valu	ie Legend
Silver Between Studs (mm)	Back Studs (mm)	Board EPS70 Silver (mm)	U-Value (W/m²K)	Green	nZEB Ready
100mm	40mm	50mm	0.19		
100mm	50mm	50mm	0.18	e -	
100mm	60mm	50mm	0.17		
100mm	70mm	50mm	0.16		
100mm	90mm	50mm	0.15		
100mm	100mm	50mm	0.14		

U-Value Calculations: KORE Lock EPS70 Silver (0.031W/mK) & KORE Thermal Board EPS70 Silver (0.031W/mK) - Unventilated Attic

KORE Lock EPS70	KORE Lock EPS70 Silver	KORE Thermal		U-Valu	e Legend
Silver Between Studs (mm)	Back Studs (mm)	Board EPS70 Silver (mm)	U-Value (W/m²K)	Green	nZEB Ready
100mm	40mm	50mm	0.19		
100mm	50mm	50mm	0.18	-	
100mm	60mm	50mm	0.17	-	
100mm	70mm	50mm	0.16		
100mm	80mm	50mm	0.15		
100mm	100mm	50mm	0.14		

Thermal Bridging

TGD Part L of the Irish Building Regulations states that care must be taken to ensure the continuity of insulation and to limit local thermal bridging and that any thermal bridge should not pose a risk of surface or interstitial condensation. KORE have undertaken a thermal bridging analysis of KORE Lock Insulation at this typical junction. Please contact our team today to request a copy of these results. To minimise cold bridging at pitched roofs continuity of insulation between the wall and the attic junction is critical.

Specification Guidelines

Building Standards

KORE Lock can satisfy the requirements of the Irish Building Regulations as outlined in:

- Part L Conservation of Fuel and Energy Dwellings (2019)
- Part L Conservation of Fuel and Energy Buildings other than Dwellings (2019)

Environmental

Expanded Polystyrene is BRE Green Guide A+ Rated.

Design Standards

The following standards should be consulted regarding the construction of insulation at rafter level:

• BS 5250:2002 Code of practice for control of condensation in buildings

- BRE GBG37 Insulating roofs at rafter level: sarking insulation
- BS 9250:2007 Code of practice for design of the airtightness of ceilings in pitched roofs
- BRE BR262 Thermal insulation: avoiding risks 2nd edition
- IS ICP 2:2002 Code of practice for slating and tiling

For retrofit installations consult:

• NSAI S.R. 54:2014 Code of practice for the energy efficient retrofit of dwellings

Ventilation Construction

With rafter insulation applications the designer will either choose a ventilated or an unventilated construction type. Unventilated design options are only suitable in retrofit situations where the structure is being re-roofed, as this level of retrofit will allow for a breathable sarking membrane to be installed. The majority of retrofit situations will not be suitable for unventilated design.

The position of the insulation will determine the make up of the roof structure. In warm unventilated pitched roofs the insulation is placed between the rafters and over the rafters. This approach is favourable where very high thermal performance is required as the depth of insulation will not impact on head heights internally. Warm pitched roofs do not require cross ventilation because the insulation placed over the rafters reduces the thermal bridging effect and the structure of the roof is maintained at an environment close to that of an internal occupied space and thus reducing the risk from condensation. Where the rafters are not fully filled with insulation a service cavity between the insulation and the plasterboard can be maintained.

In cold unventilated pitched roofs the insulation is placed between the rafters and under the rafter. As per building

Sarking Membranes

It is recommended that pitched roofs with slates or tiles should incorporate an underlay to direct any penetrating or condensed water to the roof drainage system. The underlay will reduce the potential for wind uplift of unsecured slate and tile and also prevent wind driven rain, air particles and snow from entering the roof space The underlay can be either fully supported on the KORE Board (fitted in horizontally runs), the sarking board (fitted in horizontal runs) or draped over the counter battens (fitted in vertical runs). The joints of the underlay must be sealed in accordance with the manufacturers instructions. Holes and tears in the underlay should be made good before applying the external roof covering.

Vapour Control Layer

A vapour control layer directly behind the internal finish can reduce the transfer of moisture into the insulated roof structure. It is important to note that vapour control layers are not a substitute for ventilation. A vapour control layer with the KORE Lock system can be provided by a vapour check plasterboard or by the application of two coats of Gyproc Drywall Sealer. Alternatively, a layer of polythene sheeting will provide a vapour control layer. The requirement for a vapour control layer should be assessed in accordance with BS 5250:2002 Code of practice for control of condensation in buildings.

Fire Stops

Building regulations should be considered for the requirements and provision of fire stops.

Wind Loading

Across Ireland and the United Kingdom a variety of wind-loading and uplift conditions are experienced. Calculations to determine the correct size batten and the pattern of nailing must be determined for the particular site in accordance with the relevant code of practice.

Detailed Specification Guide

A full specification guide is available on www.kore-system. com

On-Site

Installation Guidelines: Warm Pitched Roof -Insulation Between and Above the Rafters

- Before fitting the KORE Warmsark sheet a preservative treated stop rail must be fitted to the rafters at the eaves.
- KORE Warmsark sheets are fitted across the line of the rafters. All sheets joints running from the eaves to the ridge must occur over the rafters.
- Ensure that the insulation is continued at the ridge of the roof.
- The KORE Lock sheet can be fitted from the outside (before the KORE Warmsark board is fitted) or from the inside (after the KORE Warmsark board is fitted).
- When fitting from the outside commence by fitting the KORE Lock sheets between the rafters. When in position the sheet will expand to fill the rafter space completely. The sheet will not require fittings to stay in place.
- The KORE Lock sheets must be flush with the outside of the rafter to ensure there is no air movement between the KORE Lock and the KORE Warmsark sheet.
- Where KORE Lock sheets need to be cut to fit between the rafters, sarking clips should be used to secure the insulation in place. Sarking clips must be to the correct size to ensure the KORE Lock sheet is flush with the outside of the timbers.
- Sheets should be closely butted together. Where rafters are cut in such a design that it makes fitting a ridge insulation difficult, causing small gaps in the insulation, it is necessary to fill the space with a flexible insulating material.
- When fitting KORE Lock from the inside the same fitting instructions apply, except, if necessary, sheets are secured in place with timber stop battens.

Installation Guidelines: Cold Pitched Roof - Insulation Between and Under the Rafters

- When fitting KORE Lock sheets it is important to ensure
 a 50mm air space is maintained between the insulation sheet and the roof finish. This gap can be reduced
 where a breathable membrane is installed. Please follow
 the instructions of the membrane manufacturer on the
 appropriate air space to leave.
- Commence by fitting the KORE Lock sheets between each rafter, following the completion of the roof cladding. The KORE Lock sheet will compress slightly to allow the sheet to be fitted between the rafters. When in position the sheet will expand to fill the rafter space

completely. The sheet will not require fittings to stay in place.

- Keep sheets flush with the underside face of the rafter and closely butt at ends. This is to ensure that the necessary clear air space between the insulation and the membrane/sarking felt is maintained.
- Fix the first row of KORE Lock sheets to roof line at junction with vertical stud walls, beginning with the first slot. Repeat the procedure until the entire area is insulated.
- Where rafter width vary and sheets need to be cut to fit, the sheets may need to be secured into position with timber stop battens.
- Continue installation of the KORE Lock panels to vertical studding and ceiling collars until completed.
- Sheets should be closely butted together. Where rafters are cut in such a design that is makes fitting a ridge insulation difficult, causing small gaps in the insulation, it is necessary to fill this space with a flexible insulating material.
- Apply KORE EPS in a Thermal Board to the underside of the rafters with suitable fixings, ensuring all joints are tightly sealed. Face with minimum 500 gauge polyethylene vapour barrier.

Installation Guidelines: Dwarf Wall

- KORE Lock sheets should be friction fitted between the timber studding flush with the inside surface of the studs. This will prevent the risk of air movement between the sheets and the thermal plasterboard.
- To achieve greater thermal performance KORE EPS sheets can be fitted to the back of the studs using suitable fixings. The EPS sheets should be fixed directly to the timber studs.
- Apply KORE EPS in a Thermal Board to the inside surface of the studs with suitable fixings, ensuring all joints are tightly sealed. Face with minimum 500 gauge polyethylene vapour barrier.

Cutting & Packaging

On-site trimming of boards where necessary to maintain continuity of insulation is easily executed using a fine tooth saw or builder's knife. Care must be taken to maintain the thickness, flatness and squareness of the board to achieve close butting of joints and continuity of insulation.

KORE Lock Insulation boards must be protected from prolonged exposure to sunlight, and should be stored under cover in its original wrapping, not in contact with ground moisture and raised above ground level. Care must be taken to avoid contact with solvents and with materials containing volatile organic components such as tar and newly treated timber.

Properties

Туре

KORE Lock Insulation is supplied as EPS70 and EPS100 as defined in IS EN 13163:2012. Other densities and grades are available on request. Reaction to Fire Class E, containing a flame retardant additive.

Density

KORE Lock EPS70 Silver & White:	15kg/m³
KORE Warmsark EPS100 Silver & White:	20kg/m³

Thermal Conductivity

The thermal conductivity of KORE Lock Insulation products are in accordance with IS EN 13163:2012 and EN 12667 Thermal Performance of building materials and products determination of thermal resistance by means of guarded hot plate and heat flow meter method.

- KORE Lock EPS70 White
- KORE Lock EPS70 Silver
- KORE Warmsark EPS100 White
- KORE Warmsark EPS100 Silver
- KORE EPS70 White
- KORE EPS70 Silver
 - KORE EPS100 Silver
- KORE EPS100 White
- 0.037W/mK 0.031W/mK 0.036W/mK 0.031W/mK 0.031W/mK 0.031W/mK 0.033W/mK

Durability

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The KORE Lock, KORE Warmsark and KORE EPS in a Thermal Board are rot-proof, water repellent and durable.

Behaviour in Fire

The KORE Lock Systems (warm and cold roof application) will not affect the external fire rating of roofs on which it is incorporated. The internal plasterboard finish will achieve a class 0 performance classification.

Thermal Resistance

Thermal resistance, known as the R-value, varies with the thickness of the insulation. To calculate the thermal resistance (m2.K/W) divide the thickness of the insulation by its thermal conductivity and round down the result to the nearest 0.05.

	KORE Lock EPS70 White	KORE Lock EPS70 Silver
Thickness Insulation (mm)	Thermal Resistance (m2.K/W)	
100mm	2.703	3.226
125mm	3.378	4.032
150mm	4.054	4.839
175mm	4.730	5.645
200mm	5.405	6.452
250mm	6.757	8.065
275mm	7.432	8.871
300mm	8.108	9.677

	KORE Warmsark EPS100 White	KORE Warmsark EPS100 Silver	
Thickness Insulation (mm)	Thermal Resistance (m².K/W)		
40mm	1.111	1.290	
50mm	1.389	1.613	
60mm	1.667	1.935	
70mm	1.944	2.258	
80mm	2.222	2.581	
90mm	2.500	2.903	
100mm	2.778 3.226		

	KORE EPS70 White in a Ther- mal Board	KORE EPS70 Sil- ver in a Thermal Board	
Thickness Insulation (mm)	Thermal Resistance (m².K/W)		
25mm	0.676	0.806	
38mm	1.027	1.226	
50mm	1.351	1.613	
88mm	2.378	2.839	

Product Technical Details

Dimensions

Standard Size

KORE Lock1.200m x .377m (400mm centres)KORE Warmsark1.800m x 1.200mKORE EPS in a Thermal Board2.438m x 1.195m2.743m x 1.195m

Standard Thickness: KORE Lock (all grades): 100mm, 125mm, 150mm, 175mm, 200mm, 250mm, 275mm, 300mm

KORE Warmsark (all grades): 40mm - 100mm increments of 10mm

KORE EPS in a Thermal Board (overall): 38mm, 50mm, 62mm, 100mm

Project specific dimensions can be accommodated.

Tolerances

Characteristic	Level/Class/ Limit Value	Value (mm)	Standard
Thickness	T2	±2mm	EN823
Length	L3	±3mm	EN822
Width	W3	±3mm	EN822
Squareness	S 5	±5mm	EN824
Flatness	P5 ≤0.72m² P15 >0.72m²	±15mm	EN825

Dimensional Stability

KORE Lock EPS70: In accordance with IS EN 13163:2012 and EN1603, dimensional stability, DS(N)2.

KORE Warmsark EPS100: In accordance with IS EN 13163:2012 and EN1603, dimensional stability, DS(N)2.

Compressive Strength

KORE Lock EPS70: In accordance with IS EN 13163:2012 and EN826, compressive strength at 10% deformation, CS(10)70.

KORE Warmsark EPS100: In accordance with IS EN 13163:2012 and EN826, compressive strength at 10% deformation, CS(10)100.

Bending Strength

KORE Lock EPS70: In accordance with IS EN 13163:2012 and EN12089, bending strength, BS115.

KORE Warmsark EPS100: In accordance with IS EN 13163:2012 and EN12089, bending strength, BS150.

Tensile Strength

KORE Lock EPS70: In accordance with IS EN 13163:2012 and EN1607, tensile strength perpendicular to the surface, TR120.

KORE Warmsark EPS100: In accordance with IS EN 13163:2012 and EN1607, tensile strength perpendicular to the surface, TR170.

Long Term Water Absorption by Partial Immersion

KORE Lock EPS70: In accordance with IS EN 13163:2012 and EN12087, long term water absorption by partial immersion, declared value WL(P)i 0.2kg/m².

KORE Warmsark EPS100: In accordance with IS EN 13163:2012 and EN12087, long term water absorption by partial immersion, declared value WL(P)i 0.2kg/m².

Long Term Water Absorption by Total Immersion

KORE Lock EPS70: In accordance with IS EN 13163:2012 and EN12087. long term water absorption by total immersion, declared value WL(T)i 5%.

KORE Warmsark EPS100: In accordance with IS EN 13163:2012 and EN12087, long term water absorption by total immersion, declared value WL(T)i 4.5%.

Certification

NSAI Irish Agrement Certificate Number 05/0235.

Standards

KORE Lock is manufactured to:

- 1) ISO 14001:2015 Environmental Management systems
- 2) ISO 9001:2015 Quality Management Systems

3) ISO 45001:2018 – Occupational Health & Safety Management System

Other Products

KORE Lock Roof Insulation can be installed in conjunction with a wide range of KORE products and services. When installing KORE Lock Insulation, consider the following products for a whole-home solution:

- KORE Insulated Foundation System
- KORE External Wall Insulation
- KORE Floor Insulation
- KORE Fill Bonded Bead Cavity Wall Insulation
- KORE's Range of Draught Proofing Solutions
- KORE Wall and Roof Ventilation
- KORE Hot and Cold Water Lagging and Jackets
- KORE Pipe Insulation

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Contact our sales team today for:

- U-value calculations
- Condensation risk analysis
- Determination of exposure zone
- Accredited drawings and details
- Thermal bridging analysis results
- Temperature factor analysis
- BIM Files



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