

KORE

KORE Key

Partial Fill Cavity Wall & Internal Dry Lining System

KORE Key Insulation System



Key Features

- Meets and exceeds building regulations
- Sheets tongue and grooved
- Prevents thermal looping
- Easy to work with and install
- Control of surface and interstitial condensation in walls
- Suitable for use with composite external insulation systems
- Thermal mass benefits from concrete construction

Application & Description

Application

KORE Key Insulation System is designed for application in masonry cavity walls. When used with KORE Thermal Board the requirements of building regulations with a 150mm cavity will be satisfied.

Description

The KORE Key System combines partial fill cavity wall insulation and internal insulation to quickly achieve high comfort levels for occupants. The KORE Key Partial Fill Cavity Wall Insulation System is unique as it is secured to the inner block leaf of the cavity wall by wall ties and a mortar lock key. The system is designed to prevent thermal looping (which is a major contributor to heat loss and severe condensation) while the wall is heating and cooling. Each board is tongue and grooved to form a continuous layer of insulation.

Product Name

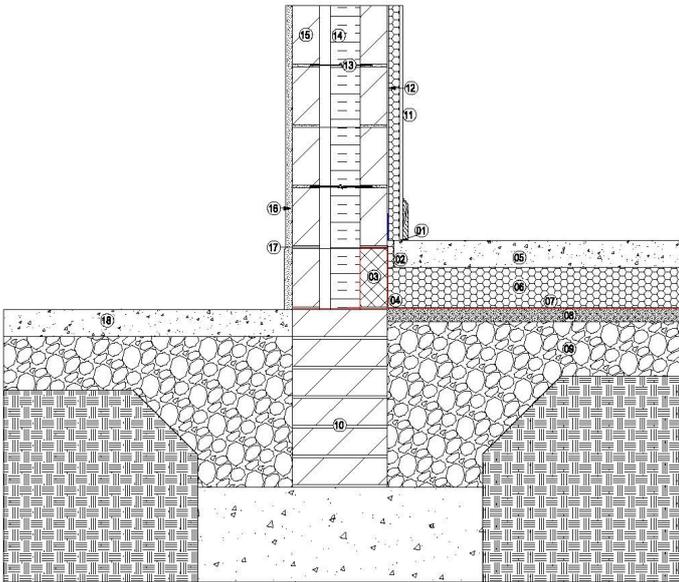
Product Name	Application	New Build	Retrofitting
KORE Key EPS70 Silver	Cavity Wall Insulation	Yes	No
KORE Thermal Board EPS70 Silver	Internal Walls	Yes	Yes
KORE Thermal Board EPS70 White	Internal Walls	Yes	Yes

Typical Construction & U-Value Calculations

Calculation Assumptions

All U-value calculations are in accordance with BS EN ISO 6946:2007. Unless stated otherwise inner blocks have a thermal conductivity of 1.13W/mK. Internal finish unless otherwise stated taken as 12.5mm standard plasterboard with 3mm plaster skim on dabs. Conventional surface resistance; direction of heat flow taken as horizontal. Where applicable air layer is taken as unventilated. Unventilated air layer emissivity surfaces were given due consideration. Calculations that include KORE Thermal Board; the vapour control layer is provided by the plasterboard (Gyproc Duplex Board 12.5mm). KORE Thermal Board applied using plaster dabs are treated as an inhomogeneous layer. Corrections for air layers and mechanical fasteners penetrating the insulation layer were considered. Best practice in terms of workmanship was assumed and therefore the correction factor for air gaps were ignored in calculations for new buildings. A correction factor was applied to calculations for existing buildings. Mechanical fasteners were taken as double triangle stainless steel, number 2.5 per m/sq. These calculations should act as a guide only. Please contact our technical team for a detailed U-value calculation and condensation risk analysis.

Detail 1: Cavity Wall Construction - Block Inner and Outer Leaf, Thermal Plasterboard and Skim Internal Finish

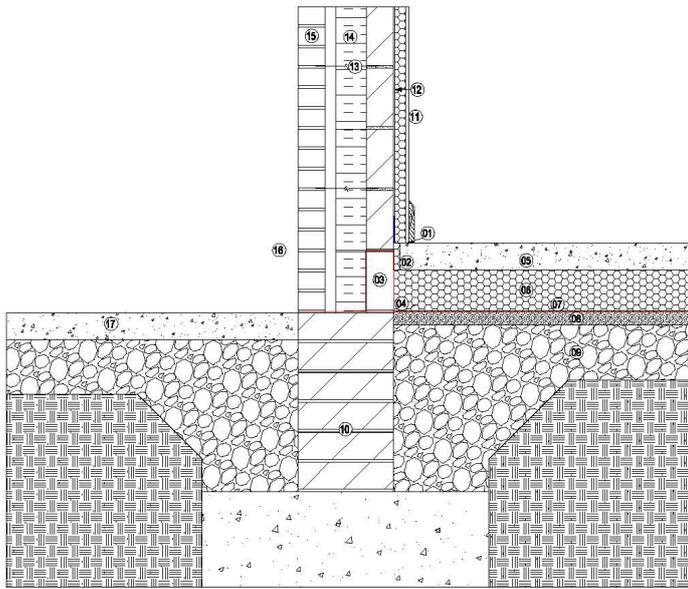


1. Junctions to be taped with air tightness tape to ensure air tightness levels are achieved
2. 50mm KORE Floor Perimeter Insulation with min U-value of 0.75 m²k/W
3. Autoclaved aerated concrete (AAC) block to be used to ensure thermal break is maintained (maximum thermal conductivity of 0.20W/mK). AAC block to be suitable for use in foundations in all conditions. Block to be installed so to avoid any effect of moisture on thermal conductivity
4. Radon membrane to be lapped over AAC block and sealed to radon barrier below with radon resisting sealing tape to avoid moisture
5. Concrete floor to engineers specifications and details
6. 150mm KORE Floor Insulation
7. Radon barrier on 50mm sand blinding and installed to TGD-C
8. 50mm sand blinding
9. Compacted hardcore
10. Foundations and rising walls to Structural Engineers specifications and details
11. KORE Thermal Plasterboard with internal vapour control
12. Continuous bonding adhesive seal along perimeter of KORE Thermal Plasterboard, to prevent air infiltration at back of plasterboard slab.
13. Wall ties to manufacturers specifications and details
14. 110mm KORE Key EPS70 Silver Cavity Wall Insulation to be installed 225mm minimum below top of floor level
15. 350mm cavity wall: - 100mm concrete block outer leaf, 150mm cavity and 100mm concrete block inner leaf
16. 24mm external sand cement render
17. DPC level minimum of 150mm from ground level
18. Footpath

Typical Construction & U-Value Calculations

	Plasterboard, Insulation, Block, Insulation, Cavity, Block, Render		
KORE Key EPS70 Silver (mm)	KORE Thermal Board EPS70 Silver	KORE Thermal Board EPS70 Silver	KORE Thermal Board EPS70 Silver
	25mm	38mm	50mm
	U-value W/m ² K		
110	0.20	0.18	0.17
150	0.16	0.15	0.14

Detail 2: Cavity Wall Construction - Block Inner and Brick Outer Leaf, Thermal Plasterboard and Skim Internal Finish



1. Junctions to be taped with air tightness tape to ensure air tightness levels are achieved
2. 50mm KORE Floor Perimeter Insulation with min U-value of 0.75 m²k/W
3. Autoclaved aerated concrete (AAC) block to be used to ensure thermal break is maintained (maximum thermal conductivity of 0.20W/mK). AAC block to be suitable for use in foundations in all conditions. Block to be installed so to avoid any effect of moisture on thermal conductivity
4. Radon membrane to be lapped over AAC block and

5. sealed to radon barrier below with radon resisting sealing tape to avoid rising moisture
5. Concrete floor to engineers specifications and details
6. 150mm KORE Floor Insulation
7. Radon barrier on 50mm sand blinding and installed to TGD-C
8. 50mm sand blinding
9. Compacted hardcore
10. Foundations and rising walls to Structural Engineers specifications and details
11. KORE Thermal Plasterboard with internal vapour control
12. Continuous seals of bonding adhesive along perimeter of KORE Thermal Plasterboard to prevent air infiltration at back of plasterboard slab
13. Wall ties to manufacturers specifications and details
14. 110mm KORE Key EPS70 Silver Insulation to be installed 225mm minimum below top of floor level
15. 352.5mm cavity wall: - 102.5mm brick outer leaf, 150mm cavity and 100mm fair faced block inner leaf
16. DPC level minimum of 250mm from ground level
17. Footpath

	Plasterboard, Insulation, Block, Insulation, Cavity, Block, Render		
KORE Key EPS70 Silver (mm)	KORE Thermal Board EPS70 Silver	KORE Thermal Board EPS70 Silver	KORE Thermal Board EPS70 Silver
	25mm	38mm	50mm
	U-value W/m ² K		
110	0.20	0.18	0.17
150	0.16	0.15	0.14

Typical Construction & U-Value Calculations

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 complete thermal bridging analysis of KORE Key Insulation at all typical junctions. Please contact our technical team today to request a copy of these results.

Specification Guidelines

For specific technical details relating to the KORE Thermal Board product please refer to the KORE Thermal Board Design Guide. This design guide deals specifically with the KORE Key Cavity Wall Insulation part of the KORE Key system.

Building Standards

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

- Part L - Conservation of Fuel and Energy - Dwellings (2011)
- Part L - Conservation of Fuel and Energy - Buildings other than Dwellings (2008)

Environmental

Expanded polystyrene is BRE Green Guide A+ Rated.

Design Standards

The following standards should be consulted regarding the construction of cavity walls:

- BS EN 5250:2002 Code of practice for control of condensation in buildings
- BS EN 1996-1-1:2005 Eurocode 6 design of masonry structures. Common rules for reinforced and unreinforced masonry structures.
- BS EN 845-1:2003 Specification for ancillary components for masonry. Ties, tension straps, hangers and brackets.
- BS 5628-3: 2001 Code of practice for use of masonry. Materials and components, design and workmanship.
- BS 5628-1:2005 Code of practice for use of masonry. Structural use of unreinforced masonry.
- BS 5628-2:2005 Code of practice for use of masonry. Structural use of reinforced and prestressed masonry.

Residual Cavity Width

Building regulations in Ireland state that a minimum of 40mm residual cavity is recommended in all wall heights for partial fill cavity wall insulation.

Wall Ties

Wall ties used in construction of cavity walls must conform to BS EN 845-1 2003. They should have a retaining clip to ensure the insulation board is secured to the inner masonry leaf. The wall ties should have a double drip. In severe and very severe exposure zones it is advised that stainless steel wall ties should be used.

Water Vapour Control/Condensation

Consideration must be given to the risk of condensation when designing thermal elements. In accordance with BS 2550:2002 Code of practice for the control of condensation in buildings, a condensation risk analysis should be carried out. Contact the KORE technical department for further details.

Fire Stops

Current building regulations and standards should be considered in full when detailing fire stops for the building.

Detailed Specification Guide

Full specification guide is available on www.kore-system.com.

Installation Guidelines

- It is recommended that the inner leaf of block work is constructed ahead of the outer leaf. The first run of boards may commence below the DPC level to provide floor edge insulation for typical construction.
- After every second course of block work the KORE Key boards are placed tightly against the inner leaf in the cavity and held in place by the wall ties. Wall ties should include a retaining clip/disc and be double drip type, installed with the drip downwards.
- Always ensure that the tongue is facing upwards and that the mortar key is filled when laying the mortar bed. Vertical joints should be staggered. Excess mortar should be removed and mortar droppings cleaned from all exposed edges of the insulation boards.
- KORE Key boards should be overlapped at corner and secured using wooden skewers. KORE Key should be installed with a minimum residual cavity of 40mm in accordance with TGD Part L.
- Refer to the KORE Thermal Board design guide for specific installation instructions for the KORE Thermal Board product.

Cutting

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.

Packaging and Storage

KORE Key insulation boards must be protected from prolonged exposure to sunlight, and should be stored under cover in the 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.

Product Technical Details

Properties

Type

KORE Key Insulation is supplied as EPS70 defined in IS EN 13163:2012. Reaction to Fire Class E, containing a flame retardant additive.

Density

KORE Key EPS70 Silver: 15kg/m³

Thermal Conductivity

The thermal conductivity of KORE Key Insulation is 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 Key EPS70 Silver 0.031W/mK

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 Key EPS70 Silver
Insulation Thickness (mm)	Thermal Resistance (m ² .K/W)
110	3.55
150	4.84

Durability

The KORE Key insulation is rot-proof, water repellent and durable.

Behaviour in Fire

When properly installed, the insulation is protected by the cladding or other facing material and will have no adverse effect on either the surface spread of flame rating of the fire resistance of the wall. Any necessary fire performance is provided by the facing material.

Product Technical Details

Dimensions

Standard Size: 1.200 x .450m
Standard Thickness: 110mm, 150mm

Tolerances

In accordance with IS EN 13163:2012 the following tolerances apply to KORE Key:

Characteristic	Level/Class/ Limit Value	Value (mm)	Standard
Thickness	T1	±1mm	EN823
Length	L2	±2mm	EN822
Width	W2	±2mm	EN822
Squareness	S2	±2mm	EN824
Flatness	P5	±5mm	EN825

Dimensional Stability

KORE Key EPS70: In accordance with IS EN 13163:2012 and EN1603, dimensional stability, DS(N)2, declared value ±0.2%.

Compressive Strength

KORE Key EPS70: In accordance with IS EN 13163:2012 and EN826, compressive strength at 10% deformation, CS(10)70, declared value 82kPa.

Bending Strength

KORE Key EPS70: In accordance with IS EN 13163:2012 and EN12089, bending strength, BS115, declared value ≥115.

Tensile Strength

KORE Key EPS70: In accordance with IS EN 13163:2012 and EN1607, tensile strength perpendicular to the surface, TR150, declared value ≥150kPa.

Certification

NSAI Irish Agreement Certificate Number 06/0096.

Standards

KORE Key Insulation is manufactured to BS EN 13163:2012 and BS EN 13499:2003 under Quality System approved to EN ISO 9001:2008 Quality Management.

Technical Services

Contact our team today for:

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

Other Products

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

- KORE's Passive Slab Insulated Foundation System
- KORE Floor Insulation
- KORE Loft Insulation for Pitched Roofs
- KORE's Range of Draught Proofing Solutions
- KORE Wall and Roof Ventilation
- KORE Hot and Cold Water Lagging and Jackets
- KORE's Pipe Insulation

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Disclaimer

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KOREKEY



A Product of **AIRPACKS**

The Green, Kilnaleck, Co. Cavan, Ireland