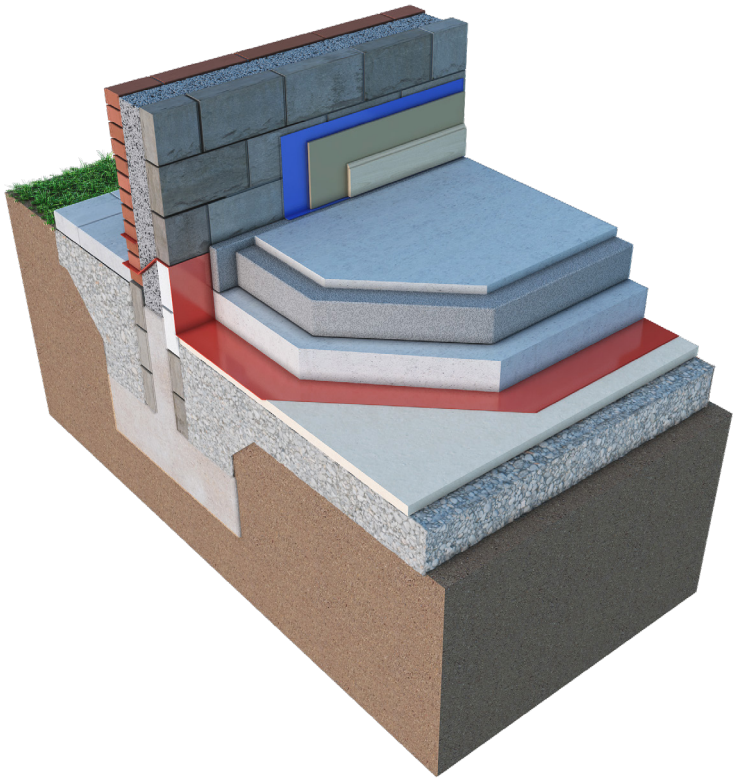
KORE

KORE Floor

Floor Insulation Design Guide

KORE Floor Insulation



Key Features

· Meets and exceeds building regulations
· Suitable for passive house construction
· Easy to work with and install
· Exceptional compressive strength making the product suitable for use in both domestic and commercial applications
· Thermal mass benefits from concrete construction
· Suitable for use with underfloor heating systems
· KORE Floor can meet and exceeds nZEB standards at a range of thicknesses across each grade of material.

Application & Description

Application

KORE Floor Insulation is a super versatile insulation product. Typical applications for the product include floor insulation for use below a concrete floor slab, below a concrete based screed on a concrete slab with a hardcore base, above a suspended beam and dense block floor and between the joists of a suspended timber floor. KORE Floor is used in conjunction with the KORE Passive Foundation System

It is the opinion of NSAI Agrement and KORE Insulation that if this product is used in accordance the KORE Floor Insulation System Certificate (Certificate No.04/0097) that it will meet the requirements of the Building Regulations 1997 to 2019, as indicated in Section 1.2 of the KORE Floor Insulation System Irish Agrement Certificate.

Description

KORE Floor Insulation is a high performance floor insulation consisting of rigid polystyrene (EPS) boards cut from moulded blocks of EPS that are manufactured in accordance with IS EN 13163:2012+A1:2016 Thermal insulation products for buildings - Factory made expanded polystyrene (EPS) products - Specification. The closed cell nature of the boards ensures a consistent thermal and compressive performance throughout the lifetime of the building. KORE Floor Insulation can be manufactured to accommodate very high compressive strengths, making the product suitable for both domestic and commercial application. The product is suitable for use on existing buildings and for new buildings. KORE Floor products are available in two grades of material, silver and white, and a range of thicknesses. Our KORE Perimeter strips are the perfect compliment with the floor insulation to ensure best practice when limiting thermal bridging.

Application & Description

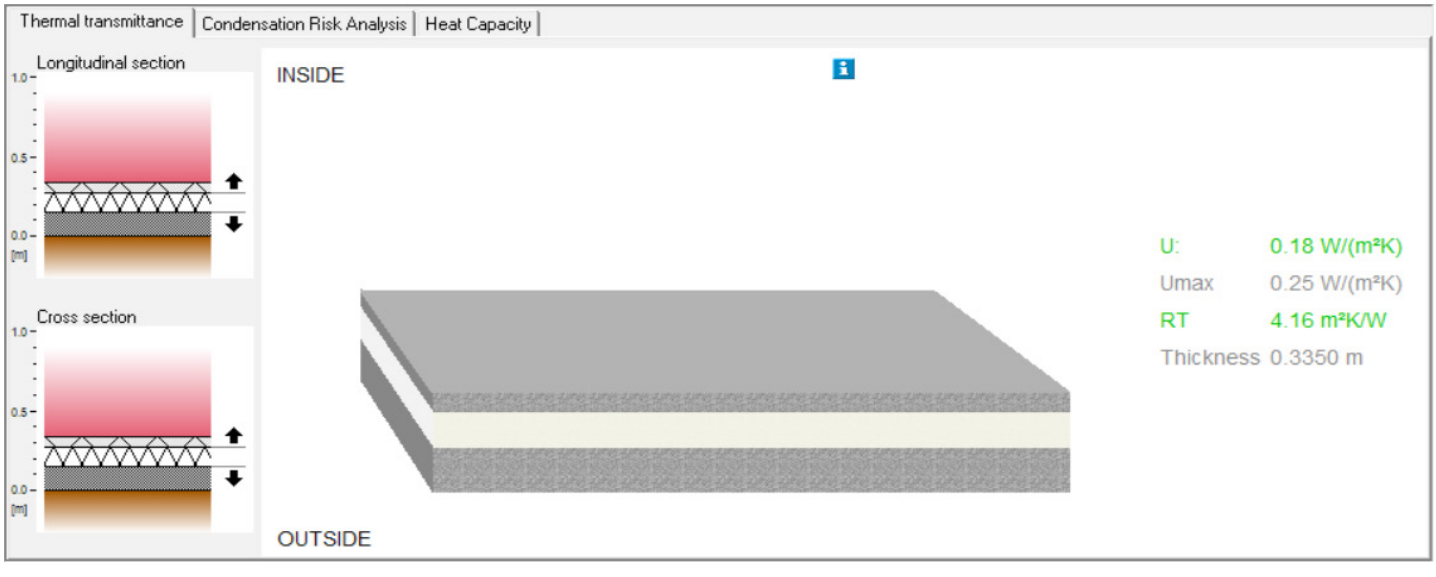
Product Name

Product Name	Application	New Build	Retrofitting*
KORE Floor EPS70 Silver	Ground Floor & Suspended Floors	Yes	Yes
KORE Floor EPS70 White	Ground Floor & Suspended Floors	Yes	Yes
KORE Floor EPS100 Silver	Ground Floor & Suspended Floors	Yes	Yes
KORE Floor EPS100 White	Ground Floor & Suspended Floors	Yes	Yes
KORE Floor EPS200 White	Ground Floor & Suspended Floors	Yes	Yes
KORE Perimeter Strips EPS70 White	Floor Perimeter	Yes	No
KORE Perimeter Strips EPS70 White	Floor Perimeter	Yes	No

* To retrofit KORE Floor Insulation would involve a complete renovation on the ground floor. For suspended floors the internal surface must be lifted to install the product

Typical Construction and U-Value Calculations

All U-value calculations are in accordance with BS EN ISO 6946:2007. Ground floor U-value calculations are different from wall and roof calculations in that reference to the construction detail alone is not sufficient to calculate the U-value. The floor area and the perimeter of the external wall and the thickness of the wall must be known to calculate floor U-values correctly. In the case of a basement perimeter, (1) area, (2) thickness of the wall and (3) the depth of the basement must be known and included in the calculation. When determining the floor dimensions internal measurements must be taken. Heated spaces that are considered unused (stairwells) that are within the heated space should be included. Unheated spaces outside of the insulated fabric should be excluded when calculating the area. Examples include garages or porches. However, the length of the wall between the heated and unheated parts of the building should be included when calculating the perimeter. When considering the U-value for an extension to the existing building, the floor dimensions of the extension only should be considered in the calculations. The thermal conductivity of the ground was taken as 2.0W/mK (sand and gravel) in all calculations below. It was assumed that perimeter insulation was installed in all applications (35mm KORE EPS70 Silver Floor Perimeter Insulation with min R-value of 1.0 m2k/W). X denotes the result is not in line with building regulation maximum U-values.



Definitions

fRSI-Values Definition

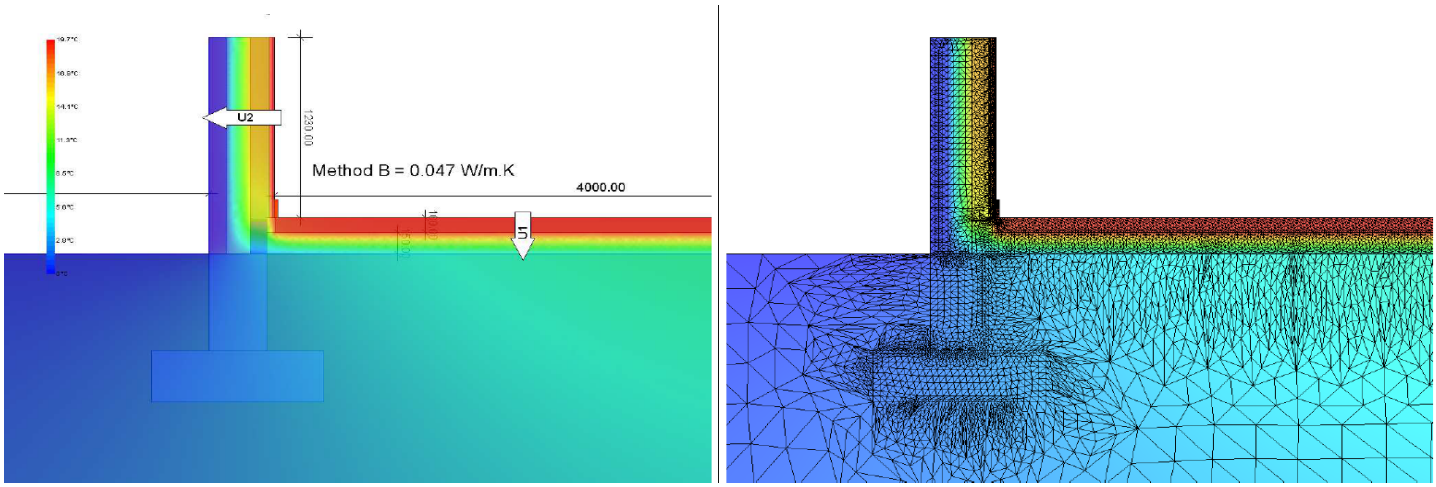
The fRSI-value is a ratio of the difference in internal temperature and minimum surface temperature to the difference in internal and external temperatures. Internal and external temperatures are applied to the relevant surfaces of the model, and the software calculates the heat flow through the materials 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.

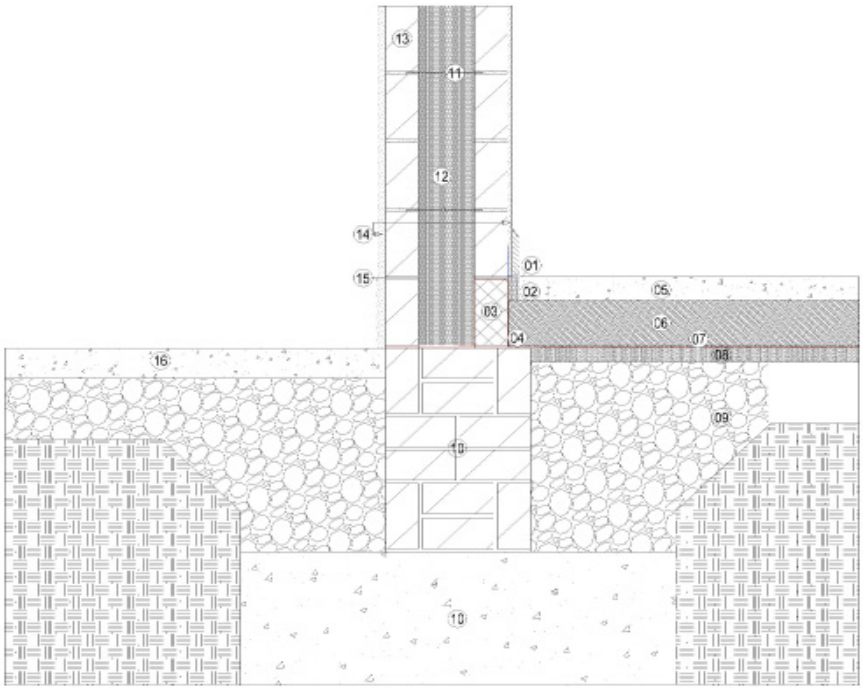
Thermal Modelling

All thermal modelling has been carried out by Evolusion Innovation on behalf of KORE Insulation. Evolusion Innovation are NSAI certified to thermally model junction details and calculate their linear thermal transmittance. Evolusions thermal modellers are also included on the NSAI registrar of approved thermal modellers. All modelling is carried out in accordance with EN ISO 6946 as well as EN ISO 10211-1 and BR 497.



Typical Construction & U-Value Calculations

CWI_04: Solid Concrete Ground Floors - Insulation Below the Floor Slab



1. Junctions to be taped with airtightness tape to ensure air tightness levels are achieved
2. 35mm KORE EPS70 Silver Floor Perimeter Insulation with min R-value of 1.0 m2k/W
3. Autoclaved aerated concrete (AAC) block to be used to ensure thermal break is maintained, (maximum thermal conductivity of 0.20 W/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 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 Engineer's specifications and details
11. Wall ties to manufacturers specifications and details
12. 170mm KOREFILL Diamond Bonded Bead insulation to be installed 225mm minimum below top of floor level
13. 370mm cavity wall: -100mm concrete block outer leaf, 170mm cavity and 100mm concrete block inner leaf
14. 24mm external and 15mm internal sand cement render (internal includes airtight parge coat)
15. DPC level minimum of 150mm from ground level
16. Footpath

Typical Construction & U-Value Calculations

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

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.17	0.19	0.20	0.21	0.22	0.22
120	0.15	0.17	0.18	0.19	0.19	0.19
130	0.14	0.16	0.17	0.17	0.18	0.18
140	0.14	0.15	0.16	0.17	0.17	0.17
150	0.13	0.14	0.15	0.16	0.16	0.16
180	0.12	0.13	0.13	0.14	0.14	0.14
190	0.11	0.12	0.13	0.13	0.13	0.13
200	0.11	0.12	0.12	0.13	0.13	0.13
210	0.10	0.11	0.12	0.12	0.12	0.12
220	0.10	0.11	0.11	0.12	0.12	0.12
230	0.10	0.11	0.11	0.11	0.11	0.11
240	0.09	0.10	0.11	0.11	0.11	0.11
250	0.09	0.10	0.10	0.10	0.11	0.11
300	0.08	0.09	0.09	0.09	0.09	0.09

U-Value Legend	
Blue	nZEB Ready

U-Value Calculations: KORE Floor EPS70 White (0.037 W/mK)

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.19	0.21	0.23	0.24	0.24	0.25
120	0.17	0.19	0.20	0.21	0.22	0.22
130	0.16	0.18	0.19	0.20	0.20	0.21
140	0.15	0.17	0.18	0.19	0.19	0.20
150	0.15	0.16	0.17	0.18	0.18	0.19
180	0.13	0.14	0.15	0.16	0.16	0.16
190	0.13	0.14	0.15	0.15	0.15	0.16
200	0.12	0.13	0.14	0.14	0.15	0.15
210	0.12	0.13	0.14	0.14	0.14	0.14
220	0.11	0.12	0.13	0.13	0.14	0.14
230	0.11	0.12	0.13	0.13	0.13	0.13
240	0.11	0.12	0.12	0.12	0.13	0.13
250	0.10	0.11	0.12	0.12	0.12	0.12
300	0.09	0.10	0.10	0.10	0.11	0.11

U-Value Legend	
Blue	nZEB Ready

Typical Construction & U-Value Calculations

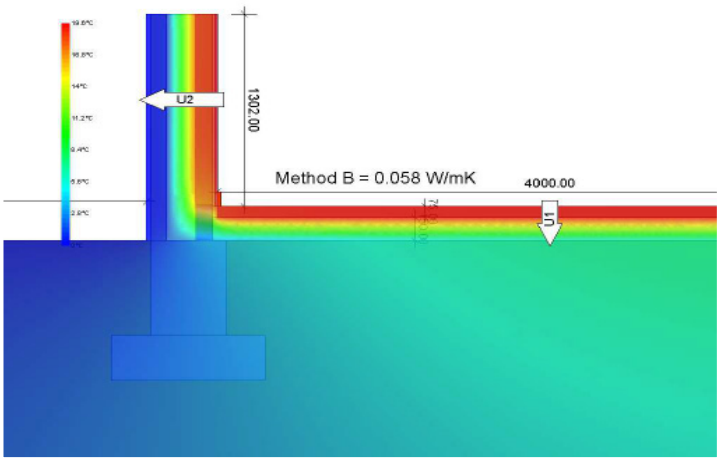
U-Value Calculations: KORE Floor EPS100 White (0.036W/mK)

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.18	0.21	0.22	0.23	0.24	0.24
120	0.17	0.18	0.20	0.21	0.21	0.22
130	0.16	0.18	0.19	0.19	0.20	0.20
140	0.15	0.17	0.18	0.18	0.19	0.19
150	0.14	0.16	0.17	0.18	0.18	0.18
180	0.13	0.14	0.15	0.15	0.16	0.16
190	0.12	0.14	0.14	0.15	0.15	0.15
200	0.12	0.13	0.14	0.14	0.14	0.15
210	0.12	0.13	0.13	0.14	0.14	0.14
220	0.11	0.12	0.13	0.13	0.13	0.13
230	0.11	0.12	0.12	0.13	0.13	0.13
240	0.11	0.11	0.12	0.12	0.12	0.13
250	0.10	0.11	0.12	0.12	0.12	0.12
300	0.09	0.10	0.10	0.10	0.10	0.10

U-Value Legend	
Blue	nZEB Ready

Thermal Models

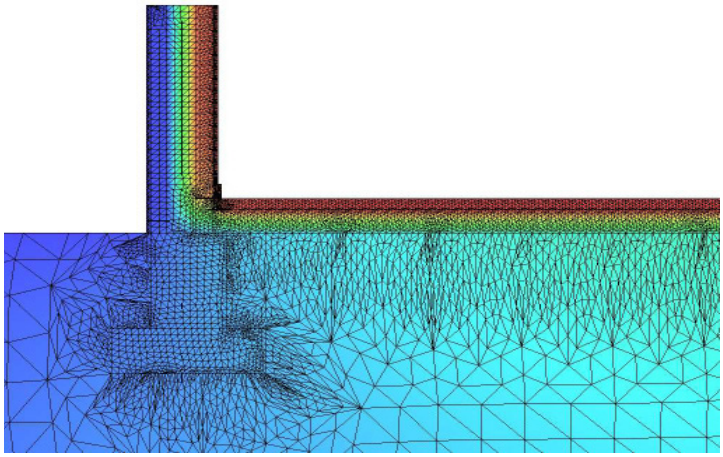
CWI_04: PSI Calculation



Thermal bridges calculation

Ψ = +0.058 W/(mK)

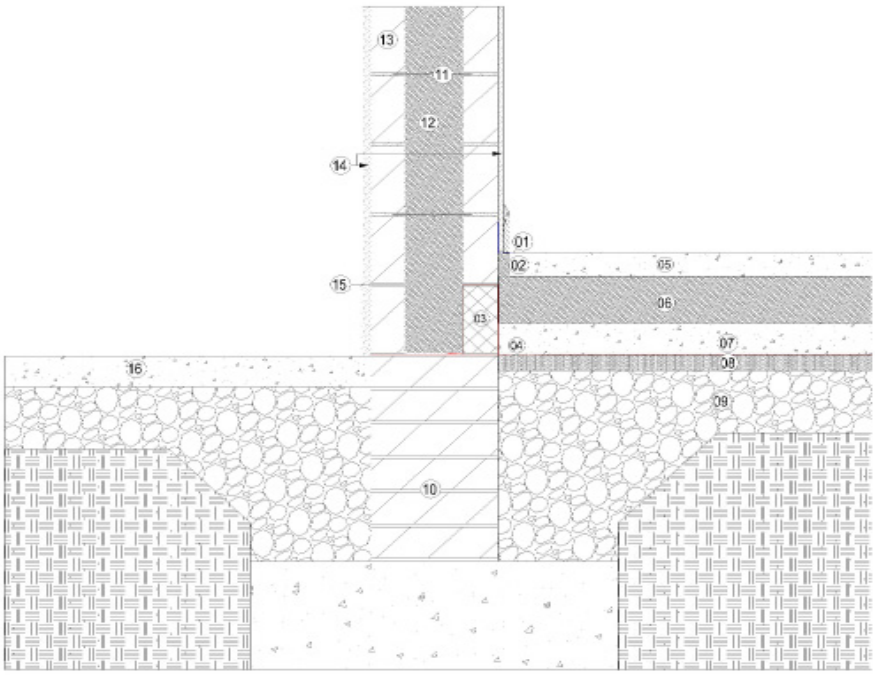
CWI_04: fRSI Calculation



$f_{RSI} = 0.92 > 0.75$

Typical Construction & U-Value Calculations

CWI_10: Solid Concrete Ground Floors - Insulation Below the Floor Screed



1. Junctions to be taped with air tightness tape to ensure air tightness levels are achieved
2. 35mm KORE EPS70 Silver Floor Perimeter Insulation with min R-value of 1.0 m2k/W
3. Autoclaved aerated concrete (AAC) block to be used to ensure thermal break is maintained. (maximum thermal conductivity of 0.20 W/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 conductivity
4. Radon membrane to be lapped over AAC block and sealed to radon barrier below with radon resisting sealing tape to avoid rising moisture
5. Concrete floor screed 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. Wall ties to manufacturers specifications and details
12. 170mm KOREFILL Diamond Bonded Bead Insulation to be installed 225mm below top of floor level
13. 370mm cavity wall: -100mm concrete block outer leaf, 170mm cavity and 100mm concrete block inner leaf
14. 24mm external and 15mm internal sand cement render (internal includes airtight parge coat)
15. DPC level minimum of 150mm from ground level
16. Footpath

Typical Construction & U-Value Calculations

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

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.17	0.19	0.20	0.21	0.21	0.22
120	0.15	0.17	0.18	0.18	0.19	0.19
130	0.14	0.16	0.17	0.17	0.18	0.18
140	0.13	0.15	0.16	0.16	0.17	0.17
150	0.13	0.14	0.15	0.16	0.16	0.16
180	0.11	0.13	0.13	0.13	0.14	0.14
190	0.11	0.12	0.13	0.13	0.13	0.13
200	0.11	0.12	0.12	0.12	0.13	0.13
210	0.10	0.11	0.11	0.12	0.12	0.12
220	0.10	0.11	0.11	0.11	0.12	0.12
230	0.10	0.10	0.11	0.11	0.11	0.11
240	0.09	0.10	0.10	0.11	0.11	0.11
250	0.09	0.10	0.10	0.10	0.10	0.11
300	0.08	0.08	0.09	0.09	0.09	0.09

U-Value Calculations: KORE Floor EPS70 White (0.037W/mK)

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.18	0.21	0.22	0.23	0.24	0.24
120	0.17	0.18	0.20	0.21	0.21	0.20
130	0.16	0.18	0.19	0.20	0.20	0.20
140	0.15	0.17	0.18	0.19	0.19	0.19
150	0.14	0.16	0.17	0.18	0.18	0.18
180	0.13	0.14	0.15	0.15	0.16	0.16
190	0.12	0.14	0.14	0.15	0.15	0.15
200	0.12	0.13	0.14	0.14	0.15	0.15
210	0.12	0.13	0.13	0.14	0.14	0.14
220	0.11	0.12	0.13	0.13	0.13	0.14
230	0.11	0.12	0.12	0.13	0.13	0.13
240	0.11	0.12	0.12	0.12	0.13	0.13
250	0.10	0.11	0.12	0.12	0.12	0.12
300	0.09	0.10	0.10	0.10	0.10	0.11

U-Value Legend	
Blue	nZEB Ready

Typical Construction & U-Value Calculations

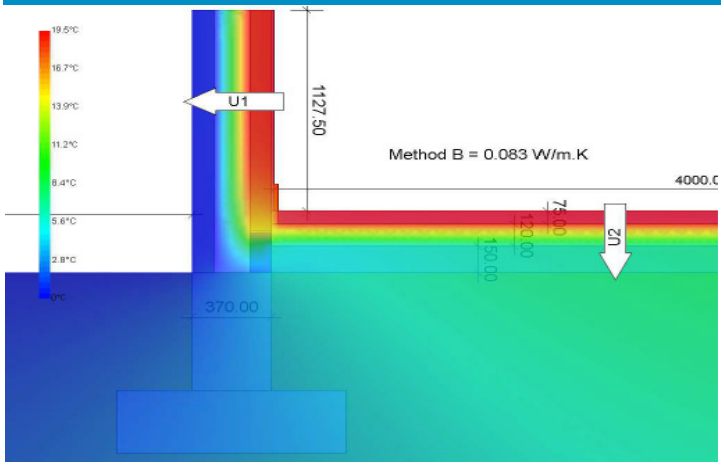
U-Value Calculations: KORE Floor EPS100 White (0.036W/mK)

Thickness (mm)	Perimeter/Area (m²)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m²k					
100	0.18	0.20	0.22	0.23	0.23	0.24
120	0.16	0.18	0.19	0.20	0.21	0.21
130	0.16	0.17	0.18	0.19	0.20	0.20
140	0.15	0.16	0.18	0.18	0.19	0.19
150	0.14	0.16	0.17	0.17	0.18	0.18
180	0.13	0.14	0.15	0.15	0.15	0.16
190	0.12	0.13	0.14	0.15	0.15	0.15
200	0.12	0.13	0.14	0.14	0.14	0.14
210	0.11	0.13	0.13	0.13	0.14	0.14
220	0.11	0.12	0.13	0.13	0.13	0.13
230	0.11	0.12	0.12	0.13	0.13	0.13
240	0.10	0.11	0.12	0.12	0.12	0.12
250	0.10	0.11	0.11	0.12	0.12	0.12
300	0.09	0.10	0.10	0.10	0.10	0.10

U-Value Legend	
Blue	nZEB Ready

Thermal Models

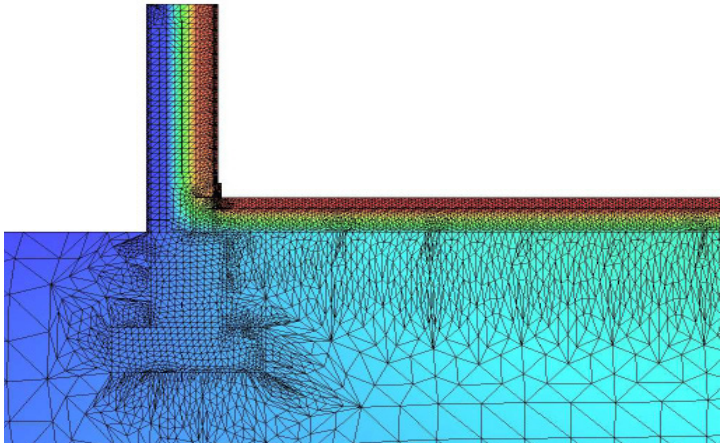
CWI_10: PSI Calculation



Thermal bridges calculation

Ψ = +0.083 W/(mK)

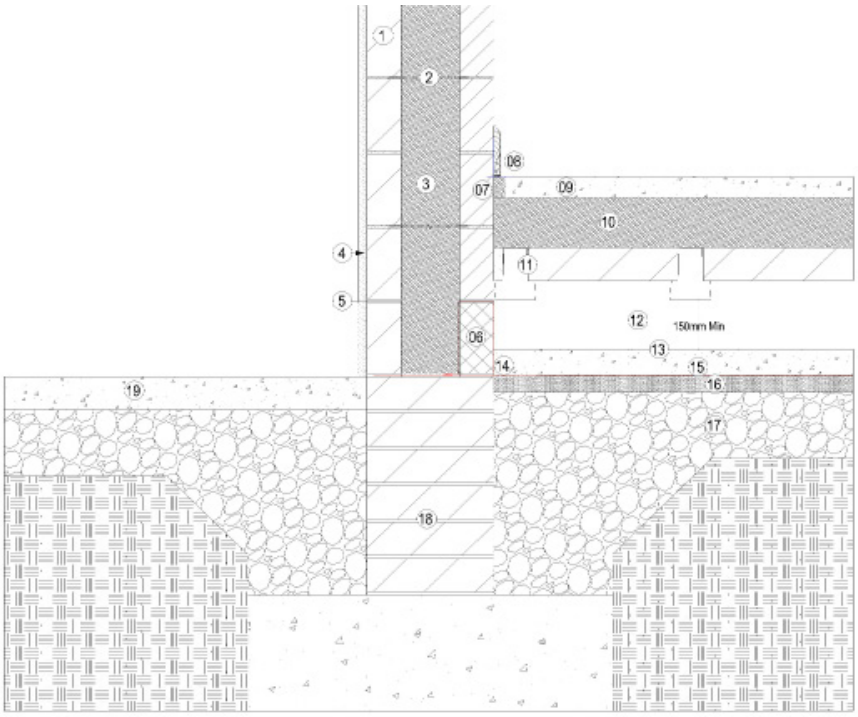
CWI_10: fRSI Calculation



$f_{RSI} = 0.89 > 0.75$

Typical Construction & U-Value Calculations

CWI_18: Beam and Block Ground Floor - Insulation Below the Floor Screed



1. 370mm cavity wall: - 100mm concrete block outer leaf, 170mm cavity and 100mm concrete block inner leaf
2. Wall ties to manufacturers specifications and details
3. 170mm KOREFILL Diamond Bonded Bead insulation to be installed 225mm minimum below top of floor level
4. 24mm external sand cement render and 15mm internal render
5. DPC level minimum of 150mm from ground level
6. Autoclaved aerated concrete (AAC) block to be used to ensure thermal break is maintained. (maximum thermal conductivity of 0.20 W/mK)
7. 35mm KORE EPS70 Silver Floor Perimeter Insulation with min R-value of 1.0 m2k/W
8. Junctions to be taped with air tightness tape to ensure air tightness levels are achieved
9. Floor screed thickness and reinforcement in accordance with manufacturers recommendations
10. 150mm KORE Floor Insulation
11. Proprietary T beam and block floor in accordance with manufacturers recommendations
12. Underfloor void to be ventilated with ventilation pipe across cavity, minimum distance from concrete to underside of T beam is 150mm
13. Concrete floor to engineers specifications and details
14. Radon membrane to be lapped over AAC block and sealed to radon barrier below with radon resisting sealing tape to avoid rising moisture
15. Radon barrier on 50mm sand blinding and installed to TGD-C
16. 50mm sand blinding
17. Compacted hardcore
18. Foundations and rising walls to Structural Engineers specifications and details
19. Footpath

Typical Construction & U-Value Calculations

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

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.17	0.18	0.19	0.19	0.20	0.20
110	0.16	0.17	0.18	0.19	0.19	0.19
120	0.15	0.16	0.17	0.17	0.17	0.18
130	0.14	0.15	0.16	0.16	0.17	0.17
140	0.14	0.15	0.15	0.16	0.16	0.16
150	0.14	0.14	0.15	0.15	0.15	0.15
170	0.12	0.13	0.13	0.13	0.14	0.14
180	0.12	0.13	0.13	0.13	0.14	0.14
190	0.11	0.12	0.12	0.13	0.13	0.13
200	0.11	0.11	0.12	0.12	0.12	0.12
210	0.11	0.11	0.12	0.12	0.12	0.12
220	0.10	0.10	0.11	0.11	0.11	0.11
230	0.10	0.10	0.11	0.11	0.11	0.11
240	0.09	0.10	0.10	0.10	0.10	0.10
250	0.09	0.10	0.10	0.10	0.10	0.10
300	0.08	0.08	0.08	0.08	0.08	0.09

U-Value Calculations: KORE Floor EPS70 White (0.037W/mK)

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.19	0.20	0.21	0.22	0.23	0.23
120	0.17	0.18	0.19	0.19	0.20	0.20
130	0.16	0.17	0.18	0.19	0.19	0.19
140	0.16	0.17	0.17	0.18	0.18	0.18
150	0.15	0.16	0.17	0.17	0.17	0.18
170	0.14	0.15	0.15	0.16	0.16	0.16
180	0.13	0.14	0.15	0.15	0.15	0.15
190	0.13	0.13	0.14	0.14	0.14	0.14
200	0.12	0.13	0.13	0.13	0.14	0.14
210	0.12	0.13	0.13	0.13	0.14	0.14
220	0.11	0.12	0.12	0.13	0.13	0.13
230	0.11	0.12	0.12	0.13	0.13	0.13
240	0.11	0.11	0.12	0.12	0.12	0.12
250	0.11	0.11	0.12	0.12	0.12	0.12
300	0.09	0.10	0.10	0.10	0.10	0.10

U-Value Legend	
Blue	nZEB Ready

Typical Construction & U-Value Calculations

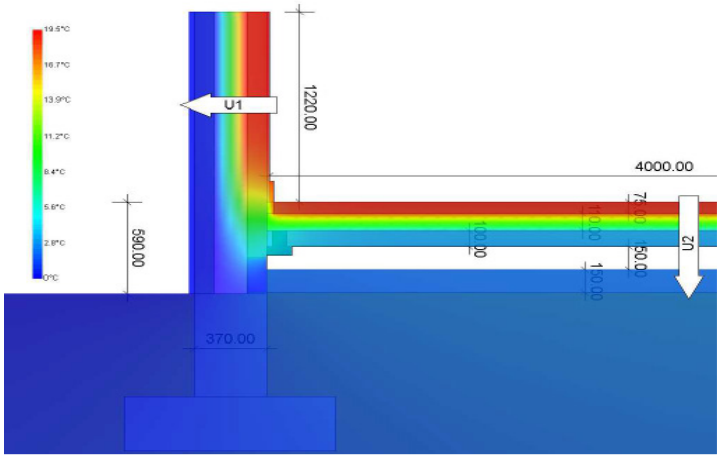
U-Value Calculations: KORE Floor EPS100 White (0.036W/mK)

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.18	0.20	0.21	0.21	0.22	0.22
120	0.17	0.18	0.19	0.19	0.20	0.20
125	0.16	0.17	0.18	0.19	0.19	0.19
130	0.16	0.17	0.17	0.18	0.18	0.18
140	0.15	0.16	0.17	0.17	0.17	0.18
150	0.14	0.15	0.16	0.16	0.17	0.17
170	0.13	0.14	0.15	0.15	0.15	0.15
180	0.13	0.14	0.15	0.15	0.15	0.15
190	0.13	0.13	0.14	0.14	0.14	0.14
200	0.12	0.13	0.13	0.13	0.14	0.14
210	0.12	0.13	0.13	0.13	0.14	0.14
220	0.11	0.12	0.12	0.13	0.13	0.13
230	0.11	0.11	0.12	0.12	0.12	0.12
240	0.11	0.11	0.12	0.12	0.12	0.12
250	0.11	0.11	0.12	0.12	0.12	0.12
300	0.09	0.10	0.10	0.10	0.10	0.10

U-Value Legend	
Blue	nZEB Ready

Thermal Models

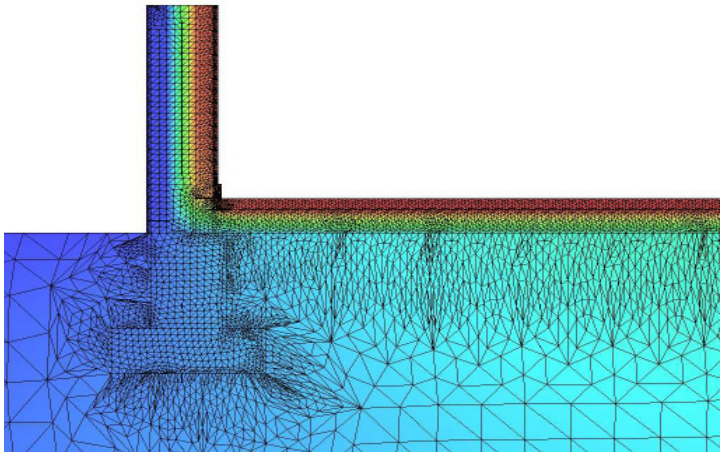
CWI_18: PSI Calculation



Thermal bridges calculation

Ψ = +0.134 W/(mK)

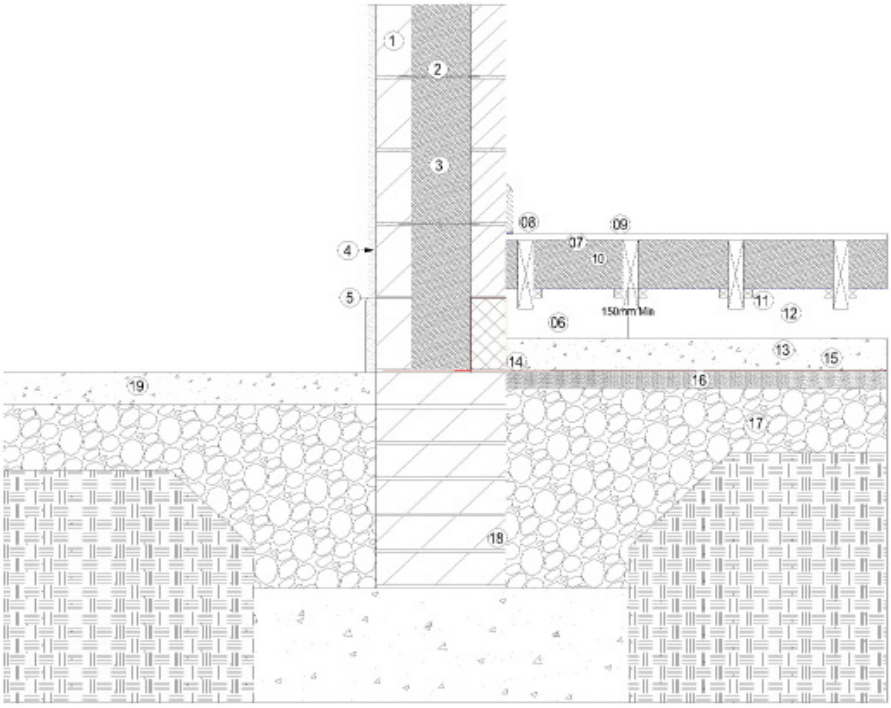
CWI_18: fRSI Calculation



f_{RSI} = 0.83 > 0.75

Typical Construction & U-Value Calculations

CWI_17: Suspended Timber Ground Floors Insulation Between Joists



1. 370mm cavity wall: - 100mm concrete block outer leaf, 170mm cavity and 100mm concrete block inner leaf
2. Wall ties to manufacturers specifications and details
3. 170mm KOREFILL Diamond Bonded Bead Insulation to be installed 225mm minimum below top of floor level
4. 24mm external sand cement render and 15mm internal sand and cement render.
5. DPC level minimum of 150mm from ground level
6. Autoclaved aerated concrete (AAC) block to be used to ensure thermal break is maintained. (maximum thermal conductivity of 0.20 W/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
7. 35mm KORE EPS70 Silver Floor Perimeter Insulation with min R-value of 1.0 m2k/w
8. Junctions to be taped with air tightness tape to ensure air tightness levels are achieved
9. Timber flooring
10. KORE Floor Insulation to be cut to fit between the timber joists and supported by timber batten carriers
11. Timber joists to Structural Engineers specifications and details
12. Underfloor void to be ventilated with ventilation pipe across cavity, minimum distance from concrete to underside of floor joist is 150mm
13. Concrete floor to engineers specifications and details
14. Radon membrane to be lapped over AAC block and sealed to radon barrier below with radon resisting sealing tape to avoid rising moisture
15. Radon barrier on 50mm sand blinding and installed to TGD-C
16. 50mm sand blinding
17. Compacted hardcore
18. Foundations and rising walls to Structural Engineers specifications and details
19. Footpath
20. Vapour control layer / air tightness membrane

Typical Construction & U-Value Calculations

U-Value Calculations: KORE Floor EPS70 Silver (0.031W/mK) & KORE Floor EPS 100 Silver

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.20	0.21	0.23	0.23	0.24	0.24
120	0.18	0.19	0.20	0.21	0.21	0.21
130	0.17	0.19	0.19	0.20	0.20	0.21
140	0.16	0.17	0.18	0.19	0.19	0.19
150	0.16	0.17	0.17	0.18	0.18	0.18
160	0.15	0.16	0.17	0.17	0.17	0.18
170	0.14	0.15	0.16	0.16	0.17	0.17
180	0.14	0.15	0.15	0.16	0.16	0.16
190	0.14	0.15	0.15	0.16	0.16	0.16
200	0.13	0.14	0.15	0.15	0.15	0.15
210	0.13	0.13	0.14	0.14	0.14	0.14
220	0.13	0.13	0.14	0.14	0.14	0.14
230	0.12	0.13	0.13	0.13	0.14	0.14
240	0.12	0.13	0.13	0.13	0.14	0.14
250	0.11	0.12	0.12	0.13	0.13	0.13
300	0.10	0.10	0.11	0.11	0.11	0.11

U-Value Calculations: KORE Floor EPS70 White (0.037W/mK)

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.20	0.23	0.24	0.25	0.25	0.26
120	0.19	0.21	0.22	0.23	0.23	0.24
130	0.18	0.20	0.21	0.21	0.22	0.22
140	0.18	0.19	0.20	0.21	0.21	0.21
150	0.17	0.19	0.19	0.20	0.20	0.21
160	0.16	0.17	0.18	0.19	0.19	0.19
170	0.16	0.17	0.17	0.18	0.18	0.18
180	0.15	0.16	0.17	0.17	0.17	0.18
190	0.15	0.16	0.17	0.17	0.17	0.18
200	0.14	0.15	0.16	0.16	0.17	0.17
210	0.14	0.15	0.15	0.16	0.16	0.16
220	0.13	0.14	0.15	0.15	0.15	0.15
230	0.13	0.14	0.15	0.15	0.15	0.15
240	0.13	0.13	0.14	0.14	0.14	0.14
250	0.13	0.13	0.14	0.14	0.14	0.14
300	0.11	0.11	0.12	0.12	0.12	0.12

U-Value Legend	
Blue	nZEB Ready

Typical Construction & U-Value Calculations

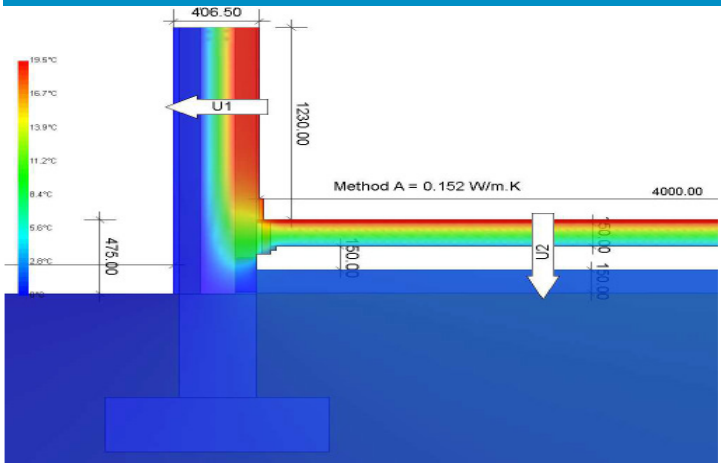
U-Value Calculations: KORE Floor EPS100 White (0.036W/mK)

Thickness (mm)	Perimeter/Area (m^2)					
	0.2	0.3	0.4	0.5	0.6	0.7
	U-Value W/m^2k					
100	0.20	0.23	0.24	0.25	0.25	0.26
120	0.19	0.20	0.21	0.22	0.23	0.23
130	0.18	0.20	0.21	0.21	0.22	0.22
140	0.17	0.19	0.19	0.20	0.20	0.21
150	0.17	0.18	0.19	0.19	0.20	0.20
160	0.16	0.17	0.18	0.19	0.19	0.19
170	0.16	0.17	0.17	0.18	0.18	0.18
180	0.15	0.16	0.17	0.17	0.17	0.18
190	0.14	0.15	0.16	0.16	0.17	0.17
200	0.14	0.15	0.15	0.16	0.16	0.16
210	0.14	0.15	0.15	0.16	0.16	0.16
220	0.13	0.14	0.15	0.15	0.15	0.15
230	0.13	0.13	0.14	0.14	0.14	0.14
240	0.13	0.13	0.14	0.14	0.14	0.14
250	0.12	0.13	0.13	0.13	0.14	0.14
300	0.11	0.11	0.12	0.12	0.12	0.12

U-Value Legend	
Blue	nZEB Ready

Thermal Models

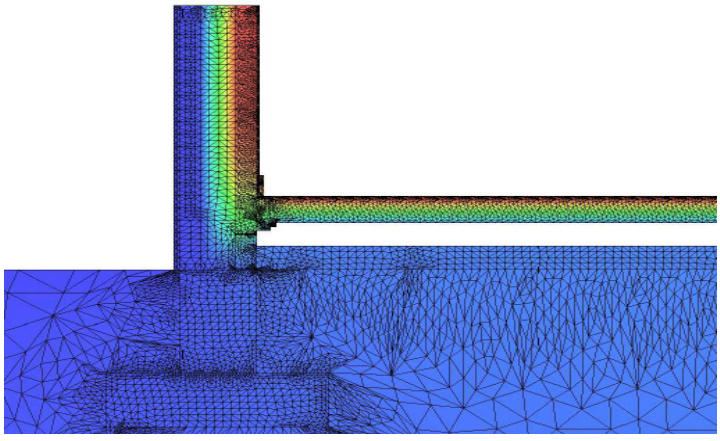
CWI_17: PSI Calculation



Thermal bridges calculation

Ψ = +0.152 W/(mK)

CWI_17: fRSI Calculation



$f_{RSI} = 0.81 > 0.75$

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 thermal bridging analysis of KORE Floor Insulation at this typical junction. Please contact our technical team today to request a copy of these results.

To minimise cold bridging at the edge of the floor, around the perimeter, the distance between the top of the floor insulation surface or the perimeter insulation upstand, and the bottom on the wall insulation must be 225mm minimum in the case of a concrete floor and 200mm minimum in the case of a suspended floor.

Specification Guidelines

Building Standards

KORE Floor Insulation 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 - Building 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 floors:

- BS 8215: 1991 Code of practice for the design and installation of damp proof courses in masonry construction
- BS 8102: 1990 Code of practice for protection of buildings against water from the ground
- BRE GBG28 Domestic floors: construction, insulation and damp-proofing
- BRE GG74 Radon protection for new dwellings
- BS 6399-1: 1996 Loading for buildings - Code of practice for dead and imposed loads
- BS 8203: 2001 - Code of practice for the installation of resilient floor coverings

For retrofit installations consult:

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

Compressive Loading

The compressive strength of the KORE Floor Insulation range offers compressive strength from 82kPa to 206kPa ensuring loading for domestic and commercial requirements can be satisfied. The design loadings for self contained single family dwelling units as defined in BS 6399-1:1996 Loading for buildings - Code of practice for dead and imposed loads, are uniformly distributed load 1.5kPa and concentrated load 1.4kPa.

KORE Floor Insulation System covered with chipboard, OSB or similar material or a screed can support these design loadings without undue deflection. Un-reinforced screeds can be used with KORE Floor in the majority of applications. Where KORE Floor Insulation System is used under a concrete slab, resistance to concentrated and distributed loads is a function of the slab specification. Where floor loads are excessive, the density of the KORE Floor product can be increased. Please contact our team directly for further information.

Resistance to Moisture

KORE Floor Insulation will not allow moisture to cross the floor construction once it is installed as per the installation instructions in this design guide.

Detailed Specification Guide

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

Fire Stops

With respect to heating appliances, flue pipes or openings to a heating appliance, KORE Floor should be separated by a solid, non-combustible material not less than 200mm.

On Site

Depending on the type of floor under construction, attention must be given to damp-proofing, vapour control layers, drying times for concrete bases and screeds and the position of the insulation being fitted.

Installation Guidelines: Insulation Below the Floor Slab

- Where KORE Floor Insulation System is used below the floor slab, lay the hardcore in layers (150-225mm). Each layer should be well compacted with the surface blinded with quarry dust or sand to provide a suitable surface for laying a DPM (damp proof membrane).
- A DPM e.g. 1200 gauge polythene or a radon barrier, subject to site conditions, should be laid over the blinding with joints taped to prevent the passage of ground moisture. The DPM should be carried up the wall until it meets and seals with the damp proof course.
- KORE Floor Insulation System should be laid with closely butted joints, laid staggered with a break-bonded pattern and fitted tightly at the edges and around any service penetrations.
- Vertical up stands of insulation 35mm thick should be placed at the floor perimeter to minimise thermal bridging. The KORE Passive Foundation System offers the ideal solution for constructing a thermal bridge free foundation.
- Care should be taken to avoid damage to the insulation or DPM and radon barriers as the slab is being poured and operatives should make use of barrow runs and walkways whilst installation progresses.
- Airtightness details between the floor and the wall structure must be considered and best practice adopted.

Installation Guidelines: Insulation Below the Screed

- Where KORE Floor Insulation is used below the floor screed, the floor slab with which the insulation is to be laid must be level.
- A DPM e.g. 1200 gauge polythene or a radon barrier, subject to site conditions, should be laid over the blinding with joists taped to prevent the passage of ground moisture. The DPM should be carried up the wall until it meets and seals with the damp proof course.
- KORE Floor Insulation System should be laid with closely butted joints, laid staggered with a break-bonded pattern and fitted tightly at the edges and around any service penetrations.
- Vertical up stands of insulation 50mm thick should be placed at floor perimeter to minimise thermal bridging. The KORE Passive Slab Foundation System offers the ideal solution for constructing a thermal bridge free foundation.
- Care should be taken to avoid damage to the insulation or DPM and radon barriers as the slab is being poured and operatives should make use of barrow runs and walkways whilst installation progresses.
- The concrete floor over which the insulation is to be laid should be left as long as possible to maximise drying out in accordance with the relevant recommendations of BS 8203:2001 Code of practice for the installation of resilient floor coverings.
- The minimum thickness of sand and cement screed is 65mm for domestic construction and 75mm for most other buildings. However, architectural specifications should be consulted. Different floor screeds have different installation requirements.
- Airtightness details between the floor and the wall structure must be considered and best practice adopted.

Installation Guidelines: Block and Beam Floor

- The floor surface should be smooth and flat - any irregularities should be removed. Lay a DPM to ensure that it is correctly positioned and turned up to meet the seal with the DPC.
- KORE Floor Insulation System should be laid with joints tightly butted and staggered joints. During construction the boards must be protected from damage by moisture sources, water spillage, plaster droppings etc. Use scaffold boards to prevent wheelbarrow and other traffic damage to the boards. KORE Floor Insulation System should be over laid with 500 gauge polythene sheet to prevent the wet screed from penetrating the joints between the insulation boards.
- As is the case with solid ground floors, attention should be given to detailing to avoid thermal bridging.
- All surfaces should be level to accept the KORE Floor Insulation System. Uneven surfaces should be leveled prior to the laying of the floor.
- Airtightness details between the floor and the wall structure must be considered and best practice adopted.

Installation Guidelines: Suspended Timber Floor

- KORE Floor Insulation System should be cut to fit between the timber joists and supported by carriers. These may be nails part driven into the side of the joists at selected level, timber battens or proprietary saddle clips.
- Where services need to be accommodated below the

On Site

floor, KORE Floor Insulation System can be lowered to provide an insulated duct.
- Install flooring grade chipboard, ply or softwood timber flooring directly onto the joists fixing in the normal manner.
- Ensure that the void below the insulated suspended floor is well ventilated and that the sleeper walls do not restrict the airflow.
- Airtightness details between the floor and the wall structure must be considered and best practice adopted.

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 Floor Insulation boards must be protected from prolonged exposure to sunlight, and should be stored under cover in their 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. The boards must not be exposed to a naked flame or other ignition source.

Product Technical Details

Properties

Type

KORE Floor Insulation is supplied as EPS70, EPS100 and EPS200 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 Floor EPS70 Silver - 15kg/m^3
KORE Floor EPS70 White - 15kg/m^3
KORE Floor EPS100 White - 20kg/m^3
KORE Floor EPS100 Silver - 20kg/m^3
KORE Floor EPS200 White - 30kg/m^3

Thermal Conductivity

The thermal conductivity of KORE Floor 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 Floor EPS70 White 0.037W/mK
- KORE Floor EPS70 Silver 0.031W/mK
- KORE Floor EPS100 White 0.036W/mK
- KORE Floor EPS100 Silver 0.031W/mK
- KORE Floor EPS200 White 0.033W/mK

Durability

KORE Floor Insulation and KORE Perimeter is rot-proof, water repellent and durable.

Behaviour in Fire

When installed and used as per this technical document the increase in fire load in the building consequent to its use is negligible.

Dimensions

Standard Size: 1.200m x .600m
1.800m x 1.200m
2.400m x 1.200m

Standard Thickness: KORE Floor (all grades): 50mm, 75mm, 100mm, 125mm, 150mm, 175mm, 200mm, 250mm, 300mm
KORE Perimeter: 25mm, 50mm, 100mm

Project specific dimensions can be accommodated.

Dimensional Stability

KORE Floor EPS70: In accordance with IS EN 13163:2012 and EN 1603, dimensional stability under constant laboratory conditions, DS(N)2.

Product Technical Details

Thermal Resistance

Thermal resistance, known as the R-value, varies with the thickness of the insulation. To calculate the thermal resistance (m^2.K/W) divide the thickness of the insulation by its thermal conductivity and round down the result to the nearest 0.05.

	KORE Floor EPS70 White	KORE Floor EPS70 Silver	KORE Floor EPS100 White	KORE Floor EPS100 Silver	KORE Floor EPS200 White
Thickness Insulation (mm)	Thermal Resistance (m2.K/W)				
50mm	1.351	1.613	1.389	1.613	1.515
75mm	2.027	2.419	2.083	2.419	2.273
100mm	2.703	3.226	2.778	3.226	3.030
125mm	3.378	4.032	3.472	4.032	3.788
150mm	4.054	4.839	4.167	4.839	4.545
175mm	4.730	5.645	4.861	5.645	5.303
200mm	5.405	6.452	5.556	6.452	6.061
250mm	6.757	8.065	6.944	8.065	7.576
300mm	8.108	9.677	8.333	9.677	9.091

Tolerances

In accordance with IS EN 13163:2012 the following tolerances apply to all KORE Floor Insulation products:

Characteristic	Level/Class/Limit Value	Value (mm)	Standard
Thickness	T2	±2mm	EN823
Length	L3	±3mm	EN822
Width	W3	±3mm	EN822
Squareness	S5	±5mm	EN824
Flatness	P5 ≤0.72m² P15 >0.72m²	±5mm ±15mm	EN825

Product Technical Details

KORE Floor EPS70: In accordance with IS EN 13163:2012 and EN 1603, dimensional stability under constant laboratory conditions, DS(N)2.

KORE Floor EPS100: In accordance with IS EN 13163:2012 and EN 1603, dimensional stability under constant laboratory conditions, DS(N)2.

KORE Floor EPS200: In accordance with IS EN 13163:2012 and EN 1603, dimensional stability under constant laboratory conditions, DS(N)2.

Compressive Strength

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

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

KORE Floor EPS200: In accordance with IS EN 13163:2012 and EN826, compressive strength at 10% deformation, CS(10)200.

Bending Strength

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

KORE Floor EPS100: In accordance with IS EN 13163:2012 and EN 12089, bending strength, BS150.

KORE Floor EPS200: In accordance with IS EN 13163:2012 and EN12089, bending strength, BS250.

Tensile Strength

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

KORE Floor EPS 100: In accordance with IS EN 13163:2012 and EN1607, tensile strength perpendicular to the surface, TR170.

KORE Floor EPS200: In accordance with IS EN 13163:2012 and EN1607, tensile strength perpendicular to the surface, TR220.

Certification

NSAI Irish Agrement Certificate Number 04/0097.

Standards

KORE Floor 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

Long Term Water Absorption by Total Immersion

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

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

KORE Floor EPS200: In accordance with IS EN 13163:2012 and EN12087, long term water absorption by Total immersion, declared value WL(T)i 5%.

Technical Services

Other Products

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

- KORE Passive Slab Insulated Foundation System
- KORE External Wall Insulation
- KORE Fill Bonded Bead Cavity Wall Insulation
- KORE Lock for Cold and Warm Pitched Roofs
- KORE Loft Insulated Attic Flooring System
- 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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Twitter: www.twitter.com/KORESystem

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
- BIM Files

Disclaimer

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A Product of AIRPACKS

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