



Underfloor Heating Applications

Floor Insulation

Celotex
Insulation Specialists

Introduction

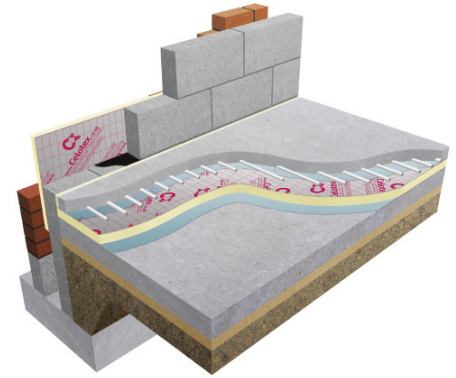
Celotex is the brand leading manufacturer of PIR insulation boards, with its range encompassing the thinnest and thickest boards available to the construction industry today. All of the Company's products are manufactured at its plant in Suffolk, from where the dedicated Celotex Technical Centre offers advice and calculations for compliance with current regulations and legislation.

Celotex: We know insulation inside and out.

Use **Celotex FF4000** high performance thermal insulation in underfloor heating applications to minimise insulation thickness and give the following benefits:

- Minimal downward heat loss into the structure
- Easy to cut boards to fit in most spaces
- Pipe retaining clips may be inserted directly into the Celotex insulation
- Provides reliable long term energy savings for building structures
- Excellent dimensional stability

Celotex FF4000 is purpose designed for use in internal underfloor heating applications. Wet underfloor heating systems may be used with Celotex FF4000. The Celotex insulation is positioned above the concrete slab or floor deck. Compatibility with any given system should be checked with the system manufacturer. Underfloor heating systems must be installed carefully in line with the manufacturers recommendations.



Celotex FF4000 in an underfloor heating application

Celotex FF4000 Technical Data

Product Code	Thickness (mm)	R-value (m ² K/W)	Weight (kg/m ²)
FF4050	50	2.25	1.98
FF4070	70	3.15	2.68
FF4075	75	3.40	2.86
FF4085	85	3.85	3.21
FF4090	90	4.05	3.38
FF4100	100	4.50	3.73
FF4125	125	5.65	4.61

Sustainable Insulation

Celotex PIR insulation has been independently assessed by BRE Global and has been accredited with an A+ rating when compared to the BRE Green Guide.

The results also show that Celotex offers a lower environmental impact than other typical PIR manufacturers.

For further information about Celotex' sustainable insulation solutions, visit the sustainability pages of the website at celotex.co.uk



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Example U-value Calculation: Celotex FF4000 for use with Underfloor Heating

	Celotex Product	Thickness (mm)	Perimeter / Area Ratio									
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Concrete Slab Based on 65mm screed and 20mm insulation as perimeter upstand	FF4000	50	0.12	0.18	0.22	0.24	0.25	-	-	-	-	-
	FF4000	70	0.11	0.15	0.18	0.19	0.20	0.21	0.22	0.23	0.23	0.23
	FF4000	75	0.11	0.15	0.17	0.18	0.20	0.20	0.21	0.21	0.22	0.22
	FF4000	85	0.10	0.14	0.16	0.17	0.18	0.19	0.19	0.20	0.20	0.20
	FF4000	90	0.10	0.13	0.15	0.16	0.17	0.18	0.18	0.19	0.19	0.19
	FF4000	100	0.10	0.13	0.14	0.15	0.16	0.17	0.17	0.17	0.17	0.18
	FF4000	125	0.09	0.11	0.12	0.13	0.14	0.14	0.14	0.14	0.15	0.15
Beam & Block Based on 65mm screed and 20mm insulation as perimeter upstand	FF4000	50	0.16	0.22	0.24	-	-	-	-	-	-	-
	FF4000	70	0.14	0.18	0.20	0.21	0.22	0.22	0.23	0.23	0.23	0.24
	FF4000	75	0.14	0.17	0.19	0.20	0.21	0.21	0.22	0.22	0.22	0.22
	FF4000	85	0.13	0.16	0.18	0.18	0.19	0.19	0.20	0.20	0.20	0.20
	FF4000	90	0.13	0.16	0.17	0.18	0.18	0.19	0.19	0.19	0.19	0.19
	FF4000	100	0.12	0.14	0.16	0.16	0.17	0.17	0.17	0.18	0.18	0.18
	FF4000	125	0.11	0.12	0.13	0.14	0.14	0.14	0.15	0.15	0.15	0.15
Suspended Timber Floor Based on timbers @ 400 ctrs	FF4000	50	0.18	0.25	-	-	-	-	-	-	-	-
	FF4000	70	0.17	0.22	0.25	-	-	-	-	-	-	-
	FF4000	75	0.16	0.21	0.24	0.25	-	-	-	-	-	-
	FF4000	85	0.15	0.20	0.22	0.24	0.25	0.25	-	-	-	-
	FF4000	90	0.15	0.19	0.21	0.23	0.24	0.24	0.25	0.25	-	-
	FF4000	100	0.14	0.18	0.20	0.21	0.22	0.23	0.23	0.24	0.24	0.24
	FF4000	125	0.13	0.16	0.18	0.18	0.19	0.19	0.20	0.20	0.20	0.20

U-value
For U-values see variable layer list, or for more options, refer to our online U-value calculator at celotex.co.uk

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Installation Guidelines

Celotex insulation boards should not be installed when the temperature is at or below 4°C and falling.

Pre-installation guidelines for concrete slab floor applications only

- Install a damp proof membrane below the Celotex. This can either be over the top or below the slab. The damp proof membrane must provide continuity with the damp proof course in the surrounding walls.
- Level the surface of the slab; it should be smooth and free of projections.
- If required, use a thin layer of sand blinding on a rough, tamped slab to ensure that the insulation boards are continuously supported.
- **Use scaffold boards or other protection to prevent wheelbarrows and other traffic damaging the insulation.**

Installation guidelines for concrete slab and beam & block floor applications

- Use Celotex TB4000 boards as upstands to fit around the floor perimeters to eliminate thermal bridging at screed edges. The upstand depth should be equal to the sum of the slab insulation and the screed thickness. The upstand thickness should not exceed the combined thicknesses of the wall lining.
- Lay the insulation boards directly onto the prepared slab / beam and block with all joints tightly butted.
- Install a polythene membrane over the insulation.
- Lay a proprietary underfloor heating system, generally comprising pipework in coils. Pipe retaining clips may be inserted directly into the Celotex insulation.
- Apply the screed over the Celotex insulation boards to a thickness recommended by the manufacturer of the underfloor heating system (normally 75mm).
- Compact the screed solidly when laid.
- Allow the screed to dry thoroughly before an impermeable surface, such as a vinyl finish, is applied. (Consult a specialist flooring contractor).

These recommendations are suitable for normal domestic floor loadings. If higher loadings are required, it may be necessary to increase the screed thickness and provide reinforcement within the screed. Consult a structural engineer or a specialist flooring contractor.

Installation guidelines for suspended timber floor applications

- Install joists in the conventional manner, with solid or diagonal strut bracing as necessary. (NB: diagonal bracing may lead to thermal bridging).
- Fix battens to the sides of the joists to support the insulation and to form a cavity for the underfloor heating, between the insulation and floor boards.
- Use the **Celotex Insulation Saw** to cut the Celotex FF4000 insulation to achieve a tight fit, then push the boards firmly down between the joists.
- Insulate the gaps between the joists and wall to prevent thermal bridging.
- Lay a proprietary underfloor heating system within the cavity, generally comprising pipework in coils, to the manufacturer's guidelines.
- Install either chipboard or soft woodfloor boarding directly onto the joists.

Certifications and Accreditations

Celotex products GA4000, XR4000 and FF4000 are covered by BBA Agreement Certificate No 95/3197. To download a copy of this certificate, visit the 'literature' pages of the website at celotex.co.uk

Further Information

If you wish to contact Celotex, please visit celotex.co.uk and click on the 'contact us' page.

For information regarding **storage, installation and handling** of Celotex products, or for **Health and Safety** advice, please refer to the 'literature' pages of the website at celotex.co.uk

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