



Kooltherm™

Technical Data

HVAC & Building Services Pipe Insulation



Technical Data Sheet

Kooltherm™ FM Pipe Insulation

CFC/HCFC Free Rigid Phenolic Insulation with a factory applied aluminium foil vapour barrier

Property	Test Method	Unit	Typical Value
General Technical Properties			
Nominal Dry Density	EN ISO 845	kg/m ³	35-40
Thermal Conductivity	EN 12667 at +10°C	W/m.K	0.021
	Initial	W/m.K	0.025
Closed Cell Content	EN 12667 at +10°C	%	≥ 90
	Aged (7.5 weeks @ 70°C)	%	+110 -50
Operating Temperature Limits	EN ISO 45/90 Meth. 1	°C	± 150
	Upper Limit	°C	± 90
Compressive Strength	EN 826 at +23°C	kPa	≥ 150
	Parallel	kPa	≥ 110
Tensile Strength	EN 826 at +23°C	kPa	≥ 1
	Perpendicular	kPa	≥ 1
Linear Dimensional Stability	ASTM D 1623 - Spec. A at +23°C	%	40-70 x 10 ⁻⁴
	Parallel	%	
Linear Expansion Coefficient	EN 1604	K ⁻¹	
	+93°C for 24 hours -30°C for 24 hours	K ⁻¹	
Technical Properties of the reinforced vapour barrier foil			
Property	EN ISO 536	g/m ²	96
	EDANA	µm	471
Property	EN ISO 1924-2 (MDCD)	N/15mm	> 40 / ± 15
	EN ISO 1924-2 (MDCD)	%	< 7
Property	EN ISO 1924-2 (MDCD)	g/m ² ·24h	< 0.1

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General Technical Properties

Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m ³	35-40
Thermal Conductivity	EN 12667 at +10°C	W/m·K	0.021
	Initial	W/m·K	0.025
	Aged (25 weeks @ 70°C)		
Closed Cell Content	EN ISO 4590 Meth. 1	%	≥ 90
Operating Temperature Limits	Upper Limit	°C	+110
	Lower Limit	°C	-50
Compressive Strength	EN 826 at +23°C		
	Parallel	kPa	≥ 150
	Perpendicular	kPa	≥ 90
Tensile Strength	ASTM D 1623 – Spec. A at +23°C		
	Parallel	kPa	≥ 150
	Perpendicular	kPa	≥ 110
Linear Dimensional Stability	EN 1604		
	+93°C for 24 hours	%	≤ 1
	-30°C for 24 hours	%	≤ 1
Linear Expansion Coefficient	ASTM D 696	K ⁻¹	40-70 x 10 ⁻⁶

Technical Properties of the reinforced vapour barrier foil

Property	Test Method	Unit	Typical Value
Weight	EN ISO 536	gr/m ²	70-105
Thickness	EDANA	µm	210-310
Elongation	DIN EN ISO 1924-2	%	< 7
Water vapour transmission	ASTM F 1249	gr/m ² ·24hr	< 0.1

Fire Classifications

Property	Test Method	Typical Result
Reaction to fire	EN 13501-1	B ₁ - s1, d0
Fire propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i ₁) not exceeding 6*
Flame spread	BS 476-7	Class 1*
Surface burning characteristics	ASTM E84	Flame spread index ≤ 25 Smoke developed index ≤ 50

*These test results combined enable a Class 0 classification to the Building Regulations in England & Wales, Northern Ireland and the Republic of Ireland, and a Low Risk classification to the Building Standards in Scotland.

** Based on test results according to EN 13501-1. Conversion in accordance with publication of MPA-NRW Materialprüfungsamt Nordrhein-Westfalen.

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CFC/HCFC Free Rigid Phenolic Insulation

Material Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m ³	37
Thermal Conductivity	EN 12667 at +10°C		
	Initial	W/m·K	0.021
	Aged (25 weeks @ 70°C)	W/m·K	0.025
Colour			Grey
Closed Cell Content	EN ISO 4590 Meth. 1	%	≥ 90
Operating Temperature Limits	Upper Limit	°C	+110
	Lower Limit	°C	-50
Compressive Strength	EN 826 at +23°C		
	Parallel	kPa	≥ 150
	Perpendicular	kPa	≥ 90
Tensile Strength	ASTM D 1623 – Spec. A at +23°C		
	Parallel	kPa	≥ 150
	Perpendicular	kPa	≥ 110
Linear Dimensional Stability	EN 1604		
	+93°C for 24 hours	%	≤ 1
	-30°C for 24 hours	%	≤ 1
Linear Expansion Coefficient	ASTM D 696	K ⁻¹	40-70 x 10 ⁻⁶

Fire Properties	Test Method	Typical Result
Fire Propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i ₁) not exceeding 6*
Surface Spread of Flame	BS 476-7	Class 1*
Horizontal Burning	EN ISO 3582	≤ 10 mm
Oxygen Index	EN ISO 4589-2	≥ 50 %
Temperature Index	EN ISO 4589-3	> 390°C
Surface Burning Characteristics	ASTM E 84	Flame Spread Index: ≤ 25 Smoke Developed Index: ≤ 50
Epiradiateur	NF P92-501	M1
Vertical Burning	DIN 4102-1	B2

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CFC/HCFC Free Rigid Phenolic Insulation

Material Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m ³	60
Thermal Conductivity	EN 12667 at +10°C		
	Initial	W/m·K	0.024
	Aged (25 weeks @ 70°C)	W/m·K	0.028
Colour			Grey
Closed Cell Content	EN ISO 4590 Meth. 1	%	≥ 90
Operating Temperature Limits	Upper Limit	°C	+110
	Lower Limit	°C	-50
Compressive Strength	EN 826 at +23°C		
	Parallel	kPa	≥ 320
	Perpendicular	kPa	≥ 170
Tensile Strength	ASTM D 1623 – Spec. A at +23°C		
	Parallel	kPa	> 300
	Perpendicular	kPa	> 210
Linear Dimensional Stability	EN 1604		
	+93°C for 24 hours	%	≤ 1
	-30°C for 24 hours	%	≤ 1
Friability	ASTM C 421 (10 min.)	%	≥ 30
Linear Expansion Coefficient	ASTM D 696	K ⁻¹	40-70 x 10 ⁻⁶

Fire Properties	Test Method	Typical Result
Fire Propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i ₁) not exceeding 6*
Surface Spread of Flame	BS 476-7	Class 1*
Horizontal Burning	EN ISO 3582	≤ 10 mm
Oxygen Index	EN ISO 4589-2	≥ 50 %
Temperature Index	EN ISO 4589-3	> 390°C
Epiradiateur	NF P92-501	M1
Vertical Burning	DIN 4102-1	B2

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CFC/HCFC Free Rigid Phenolic Insulation

Material Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m ³	80
Thermal Conductivity	EN 12667 at +10°C		
	Initial	W/m·K	0.030
	Aged (25 weeks @ 70°C)	W/m·K	0.034
Colour			Grey
Operating Temperature Limits	Upper Limit	°C	+110
	Lower Limit	°C	-50
Compressive Strength	EN 826 at +23°C		
	Parallel	kPa	> 470
	Perpendicular	kPa	> 340
Tensile Strength	ASTM D 1623 – Spec. A at +23°C		
	Parallel	kPa	> 520
	Perpendicular	kPa	> 350
Linear Dimensional Stability	EN 1604		
	+93°C for 24 hours	%	≤ 1
	-30°C for 24 hours	%	≤ 1
Friability	ASTM C 421 (10 min.)	%	≤ 30
Linear Expansion Coefficient	ASTM D 696	K ⁻¹	40-70 x 10 ⁻⁶

Fire Properties	Test Method	Typical Result
Fire Propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i ₁) not exceeding 6*
Surface Spread of Flame	BS 476-7	Class 1*
Horizontal Burning	EN ISO 3582	≤ 10 mm
Oxygen Index	EN ISO 4589-2	≥ 50 %
Temperature Index	EN ISO 4589-3	> 390°C
Epiradiateur	NF P92-501	M1
Vertical Burning	DIN 4102-1	B2

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CFC/HCFC Free Rigid Phenolic Insulation

Material Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m ³	120
Thermal Conductivity	EN 12667 at +10°C		
	Initial	W/m·K	0.043
	Aged (25 weeks @ 70°C)	W/m·K	0.045
Colour			Grey
Operating Temperature Limits	Upper Limit	°C	+110
	Lower Limit	°C	-50
Compressive Strength	EN 826 at +23°C		
	Parallel	kPa	> 1000
	Perpendicular	kPa	> 800
Tensile Strength	ASTM D 1623 – Spec. A at +23°C		
	Parallel	kPa	> 800
	Perpendicular	kPa	> 600
Linear Dimensional Stability	EN 1604		
	+93°C for 24 hours	%	≤ 1
	-30°C for 24 hours	%	≤ 1
Friability	ASTM C 421 (10 min.)	%	≤ 15
Linear Expansion Coefficient	ASTM D 696	K ⁻¹	40-70 x 10 ⁻⁶

Fire Properties	Test Method	Typical Result
Fire Propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i ₁) not exceeding 6*
Surface Spread of Flame	BS 476-7	Class 1*
Horizontal Burning	EN ISO 3582	≤ 10 mm
Oxygen Index	EN ISO 4589-2	≥ 50 %
Temperature Index	EN ISO 4589-3	> 390°C
Epiradiateur	NF P92-501	M1
Vertical Burning	DIN 4102-1	B2

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UK, Ireland & Gibraltar

Kingspan Industrial Insulation Ltd

Pembridge, Leominster, Herefordshire, HR6 9LA, United Kingdom
General Enquiries Tel: +44 (0) 1544 388 601
Technical Advice Tel: 0808 168 7363 or +44 (0) 1457 890534

Australasia, Oceania and SE Asia as far west and north as, and including, Myanmar, China, Mongolia, Japan

Kingspan Insulation Pty Ltd

266 Beringarra Ave, Malaga, WA 6090, Australia
Tel: 1300 247 235 (for calls within Australia only)
Tel: +61 8 6240 6200 (for calls outside of Australia)

The rest of Europe (excluding Turkey, Malta & Cyprus) and Russia

Kingspan Insulation N.V.

Visbeekstraat 24
B - 2300 Turnhout, Belgium
Tel: +32 14 44 25 25

Everywhere else excluding Canada, USA, Mexico, Bermuda, the Cayman Islands, Puerto Rico & St Pierre and Miquelon

PAL Middle East PIR LLC

P.O. Box 113826, Dubai Investment Park 2, Dubai, U.A.E.
Tel: +971 4 889 1000



www.kingspaninsulation.com



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