



# 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
<b>General Technical Properties</b>			
Nominal Dry Density	EN ISO 845	kg/m <sup>3</sup>	35-40
Thermal Conductivity	EN 12667 at +10°C	W/m.K	0.021
	Initial	W/m.K	0.025
Closed Cell Content	EN ISO 4570 Meth. 1	%	≥ 90
	Aged (7.5 weeks @ 70°C)	%	+110 -50
Operating Temperature Limits	Upper Limit	°C	± 150
	Lower Limit	°C	± 90
Compressive Strength	EN 826 at +23°C	kPa	± 150
	Parallel	kPa	± 110
Tensile Strength	EN 826 at +23°C	kPa	± 150
	Perpendicular	kPa	± 110
Linear Dimensional Stability	ASTM D 1623 - Spec. A at +23°C	%	± 1
	Parallel	%	± 1
Linear Expansion Coefficient	EN 1604	°K <sup>-1</sup>	40-70 x 10 <sup>-6</sup>
	+93°C for 24 hours -30°C for 24 hours	°K <sup>-1</sup>	
Technical Properties of the reinforced vapour barrier foil	ASTM D 696		
	EN ISO 536	g/m <sup>2</sup>	96
EDANA	EN ISO 536	µm	471
	EN ISO 1924-2 (MDICI)	N/15mm	> 40 / > 15
EN ISO 1924-2 (MDICI)	EN ISO 1924-2 (MDICI)	%	< 7
	EN ISO 1924-2 (MDICI)	g/m <sup>2</sup> ·24hr	< 0.1

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Nominal Dry Density	EN ISO 845	kg/m <sup>3</sup>	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 <sup>-1</sup>	40-70 x 10 <sup>-6</sup>

### Technical Properties of the reinforced vapour barrier foil

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

### Fire Classifications

Property	Test Method	Typical Result
Reaction to fire	EN 13501-1	B <sub>1</sub> - s1, d0
Fire propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i <sub>1</sub> ) 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.

## Technical Data Sheet

# Kooltherm™ 37

CFC/HCFC Free Rigid Phenolic Insulation

Material Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m <sup>3</sup>	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 <sup>-1</sup>	40-70 x 10 <sup>-6</sup>

Fire Properties	Test Method	Typical Result
Fire Propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i <sub>1</sub> ) 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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## Technical Data Sheet

# Kooltherm™ 60

CFC/HCFC Free Rigid Phenolic Insulation

Material Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m <sup>3</sup>	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 <sup>-1</sup>	40-70 x 10 <sup>-6</sup>

Fire Properties	Test Method	Typical Result
Fire Propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i <sub>1</sub> ) 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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## Technical Data Sheet

# Kooltherm™ 80

CFC/HCFC Free Rigid Phenolic Insulation

Material Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m <sup>3</sup>	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 <sup>-1</sup>	40-70 x 10 <sup>-6</sup>

Fire Properties	Test Method	Typical Result
Fire Propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i <sub>1</sub> ) 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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## Technical Data Sheet

# Kooltherm™ 120

CFC/HCFC Free Rigid Phenolic Insulation

Material Property	Test Method	Unit	Typical Value
Nominal Dry Density	EN ISO 845	kg/m <sup>3</sup>	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 <sup>-1</sup>	40-70 x 10 <sup>-6</sup>

Fire Properties	Test Method	Typical Result
Fire Propagation	BS 476-6	Index of performance (I) not exceeding 12 and sub-index (i <sub>1</sub> ) 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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Published May 2015