

Environmental Product Declaration

BREG EN EPD No.: 000053

Issue: 01

ECO EPD Ref. No.: 000111

This is to certify that this verified Environmental Product Declaration provided by:

Knauf Insulation (Northern Europe)

Is in accordance with the requirements of:

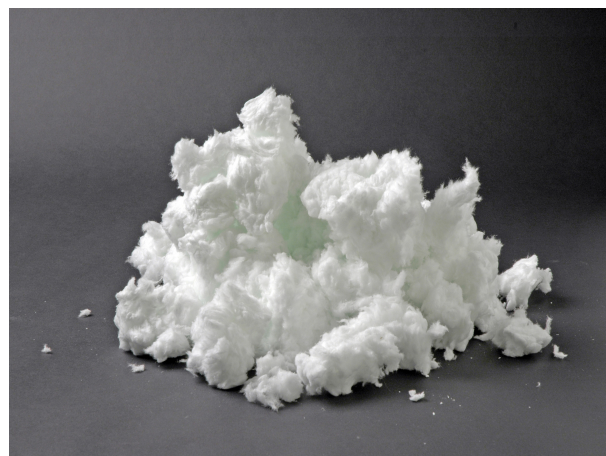
EN 15804:2012+A1:2013

This declaration is for:

Supafil® Frame (0.033 W/mK) blown glass mineral wool insulation

Company Address

Stafford Road
St Helens
Merseyside
WA10 3NS



Richard Hardy
Operator

24 December 2014
Date of this Issue

24 December 2014
Date of First Issue

23 December 2019
Expiry Date



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To check the validity of this EPD please visit www.greenbooklive.com/check or contact us.
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EPD verification and LCA details

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR ^a
Independent verification of the declaration and data according to EN ISO 14025:2010
<input type="checkbox"/> Internal <input checked="" type="checkbox"/> External
Third party verifier ^b : Victoria Blake
<small>a: Product category rules</small> <small>b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)</small>

LCA Consultant	Verifier
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General Information

Summary

This environmental product declaration is for 1 cubic metre of Supafil® Frame (0.033 W/mK) blown glass mineral wool insulation produced by Knauf Insulation (Northern Europe) at the following manufacturing facilities:

Knauf Insulation
Cwmbran

Knauf Insulation
Stafford Road

Torfaen
NP44 2YQ
UK

St Helens
WA10 3NS
UK

This is a Cradle to gate with options EPD. The life cycle stages included are as shown below (X = included, MND = module not declared):

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction - Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water use	Deconstruction	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
X										X	X						

Programme Operator

BRE Global, Watford, Herts, WD25 9XX, United Kingdom

This declaration is based on the BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013

Comparability

Environmental declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the product category rules used and the source of the data, e.g. the database. See EN 15804:2012+A1:2013 for further guidance.

Construction Product:

Product Description

Supafil® is an unbonded, non-combustible blown glass mineral wool insulation which requires no mixing on site and is installed by approved installing technicians. It consists of granulated glass mineral wool fibres, treated with an inert water repellent during manufacture.

The declared unit is 1 m³ of Supafil® blown glass mineral wool insulation. This EPD covers Supafil® Frame (0.033 W/mK).

Technical Information

Property	Value	Unit
Thermal conductivity (EN 12667)	0.033	W/mK
Gross dry density (EN 1602)	29 - 31	kg/m ³
Water vapour diffusion resistance factor (EN 13162)	1	n/a
Longitudinal air-diffusion resistance (EN 29053)	n/a	kNs/m ⁴
Water absorption Wp (EN 1609)	<1	kg/m ²
Water absorption Wlp (EN 12087)	n/a	kg/m ²
Fire Classification (in accordance with BS EN 13501-1:2002)	Euroclass A1	n/a

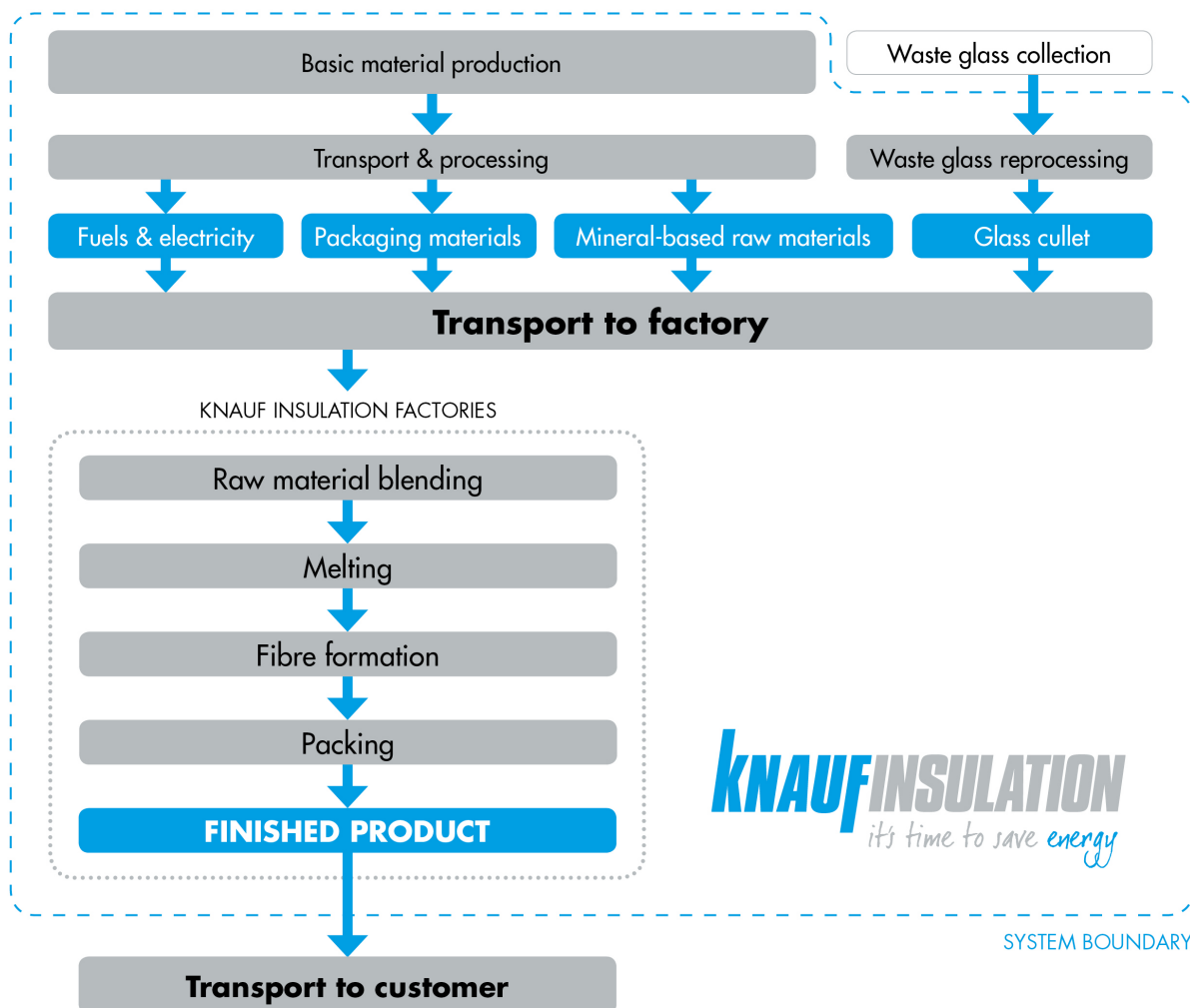
Product Contents

Material/Chemical Input	%
Recovered waste glass	50 - 80
Sand	10 - 20
Dolomite	2 - 10
Soda ash	3 - 10
Other minerals	5 - 10

Manufacturing Process

The product is approximately 99% glass. Recovered waste glass is melted together with other raw materials needed to achieve the target composition. As molten glass leaves the furnace, it is cooled and formed into the glass fibres that comprise the product. All glass mineral wool products are compressed when packed to optimise their transport to customers.

The process flow diagram is shown below:



Construction Installation

Installation of Supafil® is undertaken using specialist blowing machines by specialist contractors who provide all necessary hoses, equipment and materials for the installation of the product. After installation of the product, the installing technician will perform a series of density checks to ensure that the correct target density has been achieved.

Use Information

Supafil® blown glass mineral wool is especially designed for installation into both new and existing buildings. It is used in cavity walls, party walls, open attics and lofts, timber frame walls and in pitched roofs. It can also be used as a Blow-in-Blanket® System (BIBS) for closed cavity applications in which ventilation is not required.

End of Life

The product is classified as non-hazardous. The International Agency for Research on Cancer (IARC) classifies mineral wool fibres in group 3: "not classified as to their carcinogenicity to humans". These fibres are exempt from carcinogenic classification under European Regulation 1272/2008, having bio-persistence below the values defined in its note "Q". This exemption is certified by the European Certification Board (www.euceb.org). The product may be disposed of as a non-hazardous material.

Life Cycle Assessment Calculation Rules

Declared / Functional unit

1 m³ of Supafil® blown glass mineral wool insulation. The density used for the calculation of the LCA is 31 kg/m³. This EPD covers Supafil® Frame (0.033 W/mK).

System boundary

The system boundary of the EPD is according to the modular approach as defined in EN 15804. The cradle-to-gate with options EPD includes the product stage (A1-A3); transport to the construction site (A4); transport to waste processing (C2); and disposal at end-of-life (C4).

Data sources, quality and allocation

Specific foreground data derived from Knauf Insulation production processes is used in the production LCA for modules A1-A3. Generic data is used for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production, and end-of-life).

Modelling of the life cycle of Supafil® blown glass mineral wool insulation was performed using SimaPro 8 LCA software from PRé. Where possible all relevant background LCI datasets were taken from the ecoinvent database v2.2. Where the creation of BRE background datasets was required, these were created using ecoinvent datasets.

In accordance with the requirements of EN 15804, the most current available data was used to calculate the EPD. Manufacturer-specific data from Knauf Insulation covers a production period of 1 year (01/01/2012 to 31/12/2012).

All allocation procedures in the background datasets is according to EN 15804 and are based on the ISO 14044 guidance. Materials, energy flows and associated emissions are allocated to the product by physical property.

Cut-off criteria

All data related to raw material, packaging material and consumable items and the associated transport to the manufacturing site; process energy and water use; direct production waste and emissions to air and water are included.

LCA Results

(INA = Indicator not assessed, AGG = Aggregated, NA = Not Applicable)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3
		Raw materials supply	Transport to factory	Manufacturing	Aggregated	Transport to site	Construction - installation	Use	Maintenance	Repair
Environmental impacts per declared/functional unit										
GWP	kg CO ₂ eq.	AGG	AGG	AGG	33.1	0.257	INA	INA	INA	INA
ODP	kg CFC 11 eq.	AGG	AGG	AGG	1.38E-05	2.12E-07	INA	INA	INA	INA
AP	kg SO ₂ eq.	AGG	AGG	AGG	0.096	0.000686	INA	INA	INA	INA
EP	kg (PO ₄) ³⁻ eq.	AGG	AGG	AGG	0.0122	0.000133	INA	INA	INA	INA
POCP	kg C ₂ H ₄ eq.	AGG	AGG	AGG	0.00783	7.86E-05	INA	INA	INA	INA
ADPE	kg Sb eq.	AGG	AGG	AGG	8.89E-07	1.37E-10	INA	INA	INA	INA
ADPF	MJ eq.	AGG	AGG	AGG	566	3.30	INA	INA	INA	INA
GWP = Global Warming Potential (Climate Change); ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels										
Resource use										
PERE	MJ	AGG	AGG	AGG	24.3	0.0052	INA	INA	INA	INA
PERM	MJ	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
PERT	MJ	AGG	AGG	AGG	24.3	0.0052	INA	INA	INA	INA
PENRE	MJ	AGG	AGG	AGG	634	3.30	INA	INA	INA	INA
PENRM	MJ	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
PENRT	MJ	AGG	AGG	AGG	634	3.30	INA	INA	INA	INA
SM	kg	AGG	AGG	AGG	23.6	INA	INA	INA	INA	INA
RSF	MJ	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
NRSF	MJ	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
FW	m ³	AGG	AGG	AGG	0.317	0.000311	INA	INA	INA	INA
PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water										
Waste to disposal										
HWD	kg	AGG	AGG	AGG	0.359	4.55E-05	INA	INA	INA	INA
NHWD	kg	AGG	AGG	AGG	1.80	4.54E-07	INA	INA	INA	INA
TRWD	kg	AGG	AGG	AGG	0.00431	6.53E-05	INA	INA	INA	INA
RWDHL	kg	AGG	AGG	AGG	0.000425	8.54E-06	INA	INA	INA	INA
HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; TRWD = Total Radioactive waste disposed; RWDHL = Radioactive waste disposed (high-level nuclear waste)										
Other output flows										
CRU	kg	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
MFR	kg	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
MER	kg	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
EE	MJ	AGG	AGG	AGG	1.79	0.000607	INA	INA	INA	INA
CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Export energy										

LCA Results (continued)

(INA = Indicator not assessed, AGG = Aggregated, NA = Not Applicable)

Indicator	Unit	B4	B5	B6	B7	C1	C2	C3	C4	D
		Replacement	Refurbishment	Operational energy use	Operational water use	Demolition	Transport	Waste processing	Disposal	Reuse/ Recovery/ Recycling potential
Environmental impacts per declared/functional unit										
GWP	kg CO ₂ eq.	INA	INA	INA	INA	INA	0.128	INA	0.076	INA
ODP	kg CFC 11 eq.	INA	INA	INA	INA	INA	1.06E-07	INA	1.86E-07	INA
AP	kg SO ₂ eq.	INA	INA	INA	INA	INA	0.000343	INA	0.000578	INA
EP	kg (PO ₄) ³⁻ eq.	INA	INA	INA	INA	INA	6.67E-05	INA	0.000124	INA
POCP	kg C ₂ H ₄ eq.	INA	INA	INA	INA	INA	3.93E-05	INA	7.37E-05	INA
ADPE	kg Sb eq.	INA	INA	INA	INA	INA	6.87E-11	INA	5.33E-11	INA
ADPF	MJ eq.	INA	INA	INA	INA	INA	1.65	INA	1.01	INA
GWP = Global Warming Potential (Climate Change); ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels										
Resource use										
PERE	MJ	INA	INA	INA	INA	INA	0.0026	INA	0.00231	INA
PERM	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
PERT	MJ	INA	INA	INA	INA	INA	0.0026	INA	0.00231	INA
PENRE	MJ	INA	INA	INA	INA	INA	1.65	INA	1.02	INA
PENRM	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
PENRT	MJ	INA	INA	INA	INA	INA	1.65	INA	1.02	INA
SM	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
RSF	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
NRSF	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
FW	m³	INA	INA	INA	INA	INA	0.000156	INA	9.77E-05	INA
PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water										
Waste to disposal										
HWD	kg	INA	INA	INA	INA	INA	2.27E-05	INA	2.78E-05	INA
NHWD	kg	INA	INA	INA	INA	INA	2.27E-07	INA	31.00	INA
TRWD	kg	INA	INA	INA	INA	INA	3.26E-05	INA	2.28E-05	INA
RWDHL	kg	INA	INA	INA	INA	INA	4.27E-06	INA	2.97E-06	INA
HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; TRWD = Total Radioactive waste disposed; RWDHL = Radioactive waste disposed (high-level nuclear waste)										
Other output flows										
CRU	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
MFR	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
MER	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
EE	MJ	INA	INA	INA	INA	INA	0.000304	INA	0.0124	INA
CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Export energy										

Scenarios and Additional Technical Information

Module A4 – Transport to the building site				
Vehicle Type	Fuel Consumption (L/km)	Distance (km)	Capacity Utilisation (%)	Density Of Product (kg/m ³)
Lorry	0.302	100	29	31

End-of-life modules – C1, C3, and C4			
Parameter	Description	Unit	Value
Waste for final disposal	Quantity of waste to landfill	kg	31

Module C2 – Transport to waste processing				
Vehicle Type	Fuel Consumption (L/km)	Distance (km)	Capacity Utilisation (%)	Density Of Product (kg/m ³)
Lorry	0.302	50	29	31

Interpretation

The findings from the LCA analysis show that the fuels consumed in the manufacturing process of the Supafil® blown glass mineral wool insulation, raw material and packaging inputs and fuels consumed in the transport of product to site, from demolition and in the end-of-life processes are responsible for the majority of the impacts to the environment.

These impacts can be attributed to emissions associated with the combustion and extraction of fossil fuels used in the manufacturing process and production or processing of material inputs; direct emissions from combustion of diesel in transport and landfill machinery; the upstream processing of the diesel fuel and depletion of fossil fuel resources.

The product stage for Supafil® blown glass mineral wool insulation is responsible for the largest impact across all impact categories when compared to the other stages included in the LCA. This can be seen in the graph below showing environmental impacts by parameter per declared module.

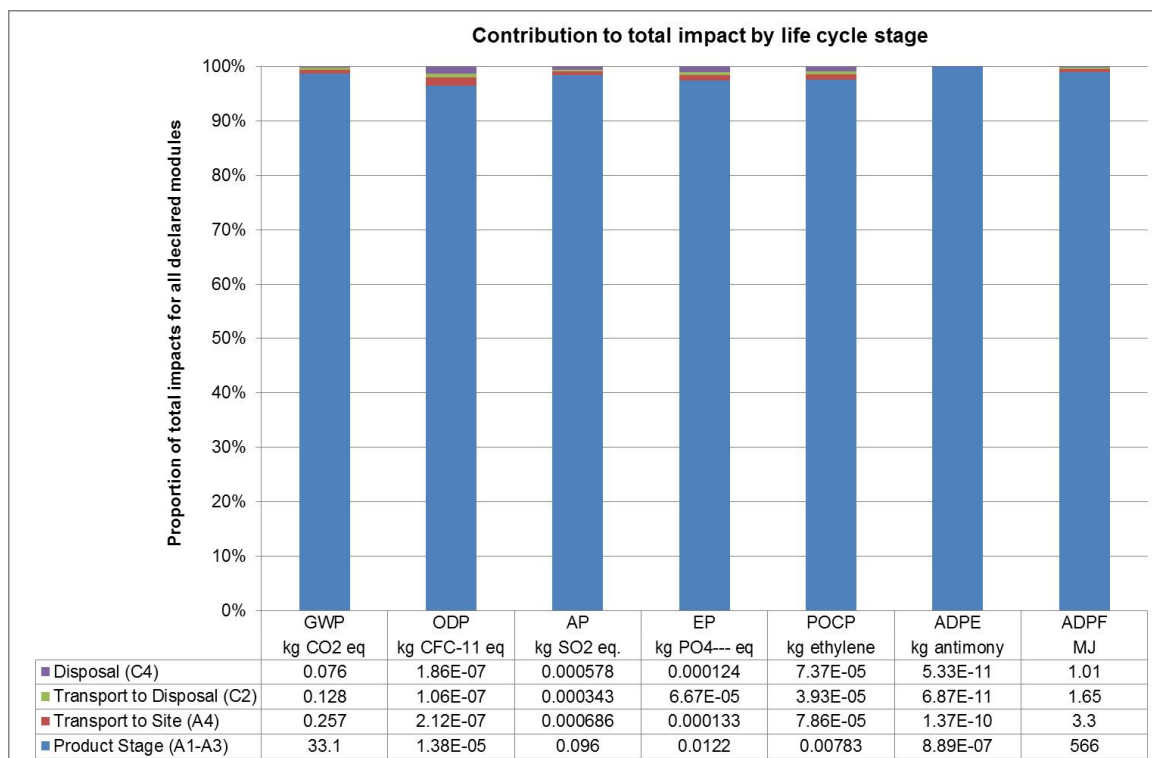


Figure 1

Sources of additional information

BRE Global. BRE Environmental Profiles 2013: Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013. PN 514. Watford, BRE, 2014.

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

BS EN 12667:2001. Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance.

BS EN 1602:2013. Thermal insulating products for building applications. Determination of the apparent density.

BS EN 13162:2012. Thermal insulation products for buildings. Factory made mineral wool (MW) products.

BS EN 29053:1993. Acoustics. Materials for acoustical applications. Determination of airflow resistance.

BS EN 1609:2013. Thermal insulating products for building applications. Determination of short term water absorption by partial immersion.

BS EN 12087:2013. Thermal insulating products for building applications. Determination of long term water absorption by immersion.

BS EN 13501-1:2002. Fire classification of construction products and building elements. Classification using test data from reaction to fire tests.

PRé Consultants bv. SimaPro 8 LCA Software 2013. <http://www.pre-sustainability.com>



ecoinvent Centre. Swiss Centre for life Cycle Inventories. <http://www.ecoinvent.org>