

Environmental Product Declaration

BREG EN EPD No.: 000061

Issue: 01

ECO EPD Ref. No.: 000183

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:

Glass Mineral Wool Insulation with ECOSE® Technology (0.034 – 0.035 W/mK)

Company Address

Stafford Road
St. Helens
Merseyside
WA10 3NS



Derek Hughes

21 May 2015

Signed for BRE Global Ltd

Operator

Date of this Issue

21 May 2015

20 May 2020

Date of First Issue

Expiry Date



This verified Environmental Product Declaration is issued subject to terms and conditions (for details visit www.greenbooklive.com/terms).

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 b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)</small> |

| LCA Consultant | Verifier |
|---|--|
| Chris Foster EuGeos Limited Park Lane Macclesfield SK11 8JR www.eugeos.co.uk | Victoria Blake BRE Global Bucknalls Lane Watford WD25 9XX www.bre.co.uk |

General Information

Summary

This environmental product declaration is for 1 cubic metre of Glass Mineral Wool Insulation with ECOSE® Technology (0.034 – 0.035 W/mK) produced by Knauf Insulation (Northern Europe) at the following manufacturing facilities:

Knauf Insulation (Northern Europe)
Stafford Road
St. Helens
Merseyside
WA10 3NS
UK

Knauf Insulation (Northern Europe)
Cwmbran

Torfaen
NP44 2YQ
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 | X | MND | MND | MND | MND | MND | MND | MND | MND | MND | X | MND | X | MND |

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

Product comes as slabs, rolls or boards with the names: Earthwool FrameTherm Roll 35; Earthwool FrameTherm Slab 35; Earthwool OmniFit Slab; Earthwool OmniFit Stud; Earthwool DriTherm Cavity Slab 34 Super; Earthwool DriTherm Cavity Slab 37 Standard (50 & 65mm); Earthwool Acoustic Roll (25mm); Kalzip Plus 35; Space Roll 035; EcoBlanket 035; EcoBlanket 034; EcoBatt 034; EcoBatt Mur Isol 34.

Technical Information

| Property | Value | Unit |
|--|---------------|-------------------|
| Thermal conductivity (EN12667) | 0.034 - 0.035 | W/mK |
| Gross dry density (EN 1602) | 17 - 25 | kgm ⁻³ |
| Water vapour diffusion resistance factor (EN 13162) | 1 | n/a |
| Water absorption Wp (EN 1609) | <1 | kgm ⁻² |
| Fire Classification (in accordance with BS EN 13501-1 :2002) | Euroclass A1 | n/a |

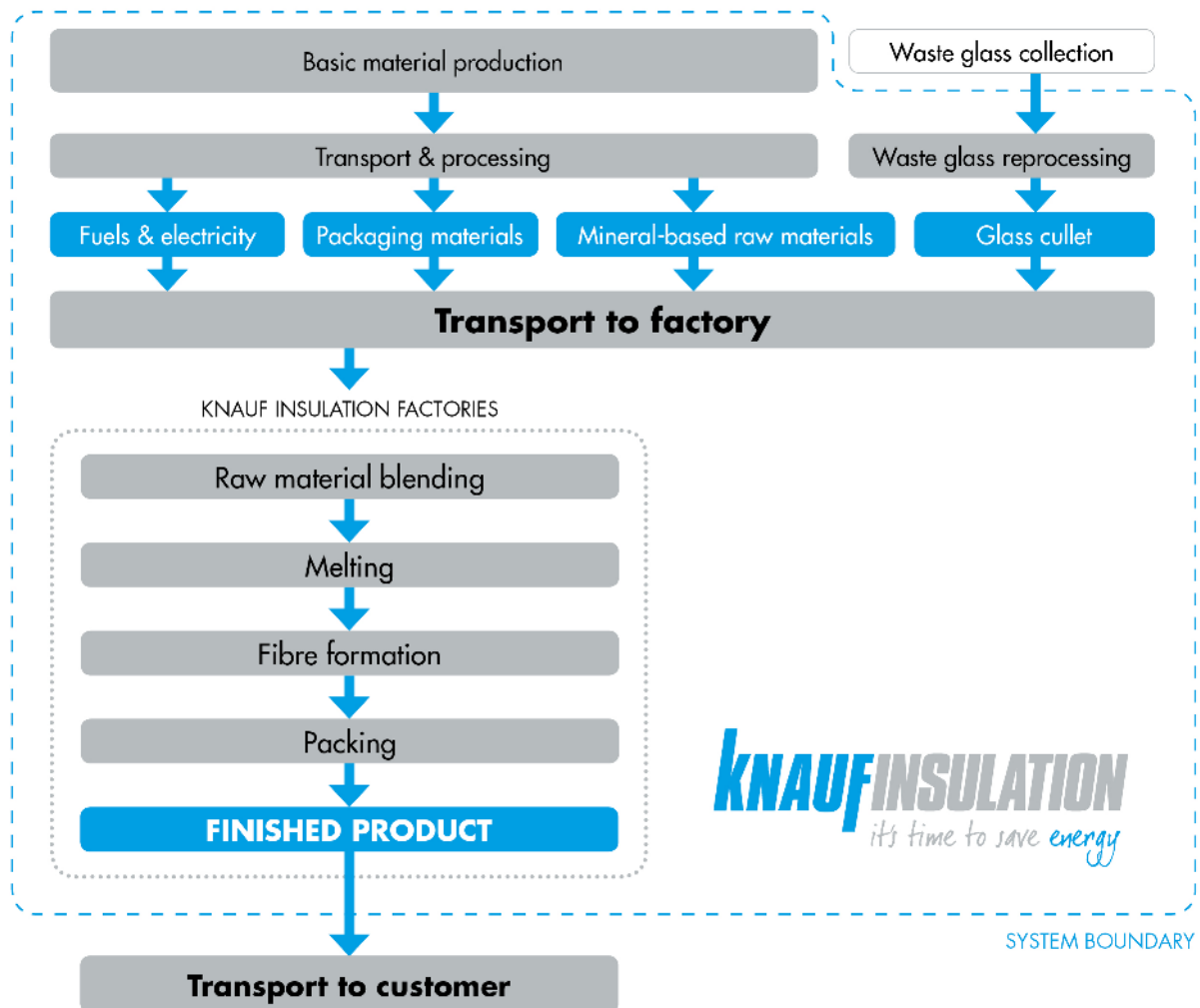
Product Contents

| Material/Chemical Input | % |
|-------------------------|---------|
| Recovered waste glass | 50 - 80 |
| Sand | 8 - 19 |
| Dolomite | 2 - 9 |
| Soda ash | 3 - 9 |
| Other minerals | 3 - 9 |
| Plant-based resin | 4 - 7 |

Manufacturing Process

The product is approximately 95% glass; the remaining 5% comprises a bio-based resin that serves as a binder and small quantities of additives that aid performance. In the manufacturing process, 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 glass fibres. Binder is then applied prior to forming and curing of the glass mineral wool 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

Glass mineral wool insulation is intended for thermal and acoustic insulation, as well as for fire prevention in buildings and industry. Methods of installation vary according to the type of application.

Use Information

Glass mineral wool insulation is 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.

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 glass mineral wool insulation with ECOSE® Technology with the product names provided in the Product Description. The density used for the calculation of the LCA is 21 kg/m³.

System boundary

The system boundary of the EPD is defined using the modular approach set out in EN 15804. This 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 information is used in the product-stage 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, vehicle operation, end-of-life).

Where possible all relevant background LCI datasets were taken from the ecoinvent database v3.1. Where the creation of specific background datasets was necessary, these were created using processes within the ecoinvent database v3.1 wherever possible.

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 are in accordance with EN 15804 and are based on the ISO 14044.

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, with 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 | 25.8 | 0.364 | INA | INA | INA | INA |
| ODP | kg CFC 11 eq. | AGG | AGG | AGG | 2.49E-06 | 6.67E-08 | INA | INA | INA | INA |
| AP | kg SO ₂ eq. | AGG | AGG | AGG | 0.13 | 0.0019 | INA | INA | INA | INA |
| EP | kg (PO ₄) ³⁻ eq. | AGG | AGG | AGG | 0.0224 | 0.00036 | INA | INA | INA | INA |
| POCP | kg C ₂ H ₄ eq. | AGG | AGG | AGG | 0.00486 | 6.94E-05 | INA | INA | INA | INA |
| ADPE | kg Sb eq. | AGG | AGG | AGG | 0.00099 | 1.19E-06 | INA | INA | INA | INA |
| ADPF | MJ eq. | AGG | AGG | AGG | 444 | 5.53 | 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 | 80.6 | 0.0688 | INA | INA | INA | INA |
| PERM | MJ | AGG | AGG | AGG | INA | 0.00 | INA | INA | INA | INA |
| PERT | MJ | AGG | AGG | AGG | 80.6 | 0.0688 | INA | INA | INA | INA |
| PENRE | MJ | AGG | AGG | AGG | 455 | 5.92 | INA | INA | INA | INA |
| PENRM | MJ | AGG | AGG | AGG | INA | 0.00 | INA | INA | INA | INA |
| PENRT | MJ | AGG | AGG | AGG | 455 | 5.92 | INA | INA | INA | INA |
| SM | kg | AGG | AGG | AGG | 15.4 | 0.00176 | 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 | 0.351 | 0.00106 | 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 | 0.111 | 0.0024 | INA | INA | INA | INA |
| NHWD | kg | AGG | AGG | AGG | 2.42 | 0.272 | INA | INA | INA | INA |
| TRWD | kg | AGG | AGG | AGG | 0.00161 | 3.82E-05 | INA | INA | INA | INA |
| RWDHL | kg | AGG | AGG | AGG | 0.00015 | 3.50E-07 | 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 | INA | INA | 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 | 0.179 | INA | 0.115 | INA |
| ODP | kg CFC 11 eq. | INA | INA | INA | INA | INA | 3.27E-08 | INA | 3.78E-08 | INA |
| AP | kg SO ₂ eq. | INA | INA | INA | INA | INA | 0.000931 | INA | 0.00088 | INA |
| EP | kg (PO ₄) ³⁻ eq. | INA | INA | INA | INA | INA | 0.000176 | INA | 0.000145 | INA |
| POCP | kg C ₂ H ₄ eq. | INA | INA | INA | INA | INA | 3.40E-05 | INA | 4.20E-05 | INA |
| ADPE | kg Sb eq. | INA | INA | INA | INA | INA | 5.84E-07 | INA | 1.52E-07 | INA |
| ADPF | MJ eq. | INA | INA | INA | INA | INA | 2.71 | INA | 3.21 | 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 | 0.0337 | INA | 0.076 | INA |
| PERM | MJ | INA | INA | INA | INA | INA | 0.00 | INA | 0.00 | INA |
| PERT | MJ | INA | INA | INA | INA | INA | 0.0337 | INA | 0.076 | INA |
| PENRE | MJ | INA | INA | INA | INA | INA | 2.90 | INA | 3.45 | INA |
| PENRM | MJ | INA | INA | INA | INA | INA | 0.00 | INA | 0.00 | INA |
| PENRT | MJ | INA | INA | INA | INA | INA | 2.90 | INA | 3.45 | INA |
| SM | kg | INA | INA | INA | INA | INA | 0.000863 | INA | 0.00084 | INA |
| RSF | MJ | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| NRSF | MJ | INA | INA | INA | INA | INA | INA | INA | INA | INA |
| FW | m ³ | INA | INA | INA | INA | INA | 0.00052 | INA | 0.00358 | 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 | 0.00118 | INA | 0.00142 | INA |
| NHWD | kg | INA | INA | INA | INA | INA | 0.133 | INA | 21.00 | INA |
| TRWD | kg | INA | INA | INA | INA | INA | 1.87E-05 | INA | 2.16E-05 | INA |
| RWDHL | kg | INA | INA | INA | INA | INA | 1.72E-07 | INA | 1.70E-07 | 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 | INA | INA | INA | 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 | 0.3 | 100 | 36 | 21 |

| End-of-life modules – C1, C3, and C4 | | | |
|--------------------------------------|-------------------------------|------|-------|
| Parameter | Description | Unit | Value |
| Waste for final disposal | Quantity of waste to landfill | kg | 21 |

| Module C2 – Transport to waste processing | | | | |
|---|-------------------------|---------------|--------------------------|---|
| Vehicle Type | Fuel Consumption (L/km) | Distance (km) | Capacity Utilisation (%) | Density Of Product (kg/m ³) |
| Lorry | 0.3 | 50 | 36 | 21 |

Interpretation

At all stages of the life cycle and for most impact categories, fossil fuel production and combustion make a dominant contribution to the environmental impact indicator results. One exception is the ADPE category: here the extraction of minerals contributes significantly to the overall indicator value.

Figure 1 shows environmental impact potential per module for each of the impact categories covered by the LCA. The product stage makes the most significant contribution to total indicator values.

LCIA results for the declared unit are related to product density. To illustrate how this affects environmental indicator values, Figure 2 shows LCIA results for the minimum and maximum density products in the product group.

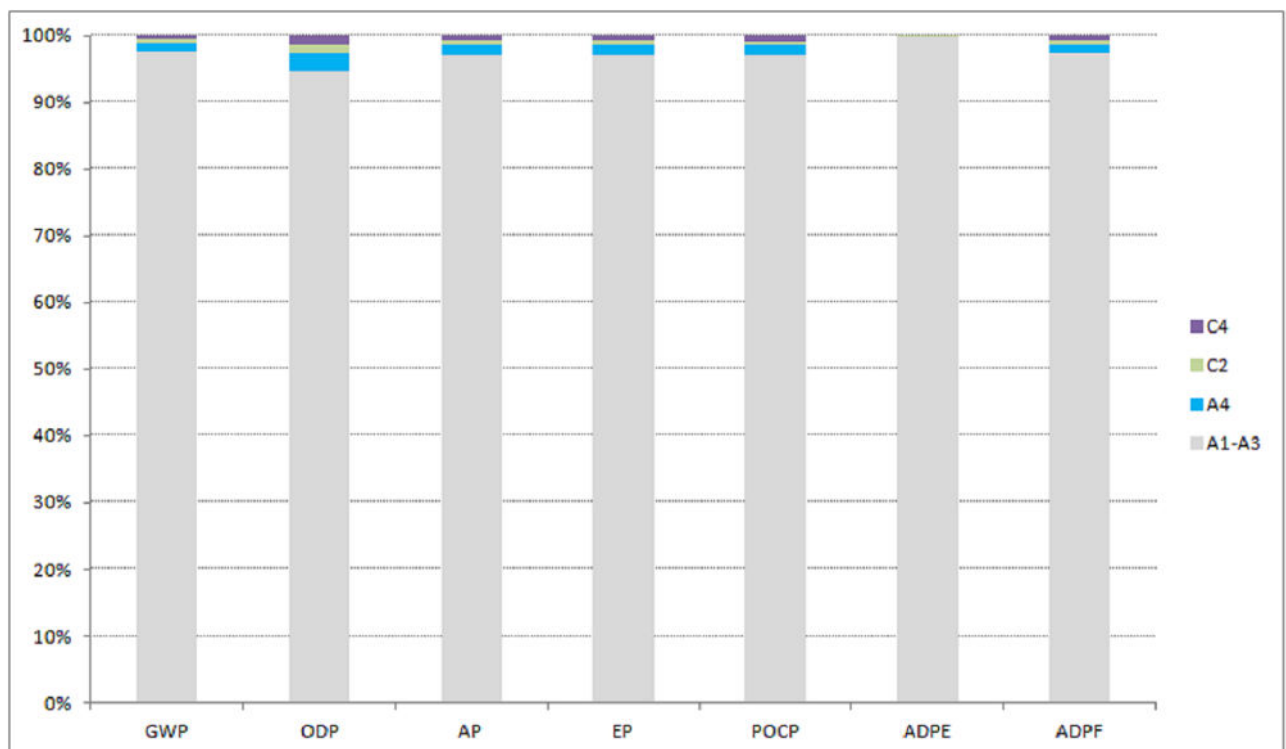


Figure 1

| Module | Product density (kgm ⁻³) | GWP | ODP | AP | EP | POCP | ADPE | ADPF |
|---------|--------------------------------------|-----------------------|--------------|-----------------------|-------------------------------------|----------------|----------|----------|
| | | kg CO ₂ eq | kg CFC-11 eq | kg SO ₂ eq | kg PO ₄ ³⁻ eq | kg ethylene eq | kg Sb eq | MJ |
| A1 - A3 | 17 | 2.09E+01 | 2.01E-06 | 1.05E-01 | 1.81E-02 | 3.93E-03 | 8.01E-04 | 3.60E+02 |
| | 25 | 3.07E+01 | 2.96E-06 | 1.55E-01 | 2.67E-02 | 5.79E-03 | 1.18E-03 | 5.29E+02 |
| A4 | 17 | 6.01E-03 | 1.10E-09 | 3.13E-05 | 5.93E-06 | 1.15E-06 | 1.97E-08 | 9.14E-02 |
| | 25 | 8.84E-03 | 1.62E-09 | 4.60E-05 | 8.71E-06 | 1.69E-06 | 2.89E-08 | 1.34E-01 |
| C2 | 17 | 2.95E-03 | 5.40E-10 | 1.53E-05 | 2.90E-06 | 5.62E-07 | 9.64E-09 | 4.48E-02 |
| | 25 | 4.33E-03 | 7.94E-10 | 2.26E-05 | 4.27E-06 | 8.26E-07 | 1.42E-08 | 6.59E-02 |
| C4 | 17 | 9.32E-02 | 3.06E-08 | 7.12E-04 | 1.17E-04 | 3.40E-05 | 1.23E-07 | 2.60E+00 |
| | 25 | 1.37E-01 | 4.50E-08 | 1.05E-03 | 1.72E-04 | 5.00E-05 | 1.81E-07 | 3.83E+00 |

Figure 2

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.