Environmental Product Declaration

EPD Number: ECO EPD 00000076 Issue: 01

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

ROCKPANEL Group

Is in accordance with the requirements of:

EN 15804:2012+A1:2013

This declaration is for:

ROCKPANEL® Durable ProtectPlus Cladding Panel

Company Address

PO Box 1160
KD Roermond
The Netherlands
NL 6040

Signed for BRE Global Ltd	Operator	16 October 2014 Date of this Issue
16 October 2014 Date of First Issue		27 May 2019 Expiry Date

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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 ☐ Internal ☑ External
Third party verifier[b]: **Kim Allbury**
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

LCA Consultant	Verifier
Nigel Jones BRE Bucknalls Lane Watford Herts. WD25 9XX www.bre.co.uk	Kim Allbury BRE Global Bucknalls Lane Watford Herts. WD25 9XX

General Information

Summary

This environmental product declaration is for 1 square metre of ROCKPANEL® Durable Cladding Panel produced by ROCKPANEL Group at the following manufacturing facility:

Konstruktieweg 2
JD Roermond
NL 6045
The Netherlands

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 demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
x	x	x	x	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

ROCKPANEL® board material is used, mostly in ventilated constructions, for façade cladding, roof detailing, soffits and fascias. The product is manufactured from basalt. ROCKPANEL® is a very robust and flexible board material which fits perfectly with modern trends such as organic shapes and sustainability, with strong emphasis on cost efficiency and short installation times.
The product content in the table below represents a typical ROCKPANEL® Durable Cladding Panel.

Technical Information

Name	Value	Unit
Maximum board size	3050 x 1250	mm
Density (nominal)	1050±150	kg/m^3
Mass (nominal)	8.96	kg/m^2
Characteristic bending strength (BS EN 310 / BS EN 1058)	length and width f_{05} ≥ 27	N/mm^2
Modulus of elasticity (BS EN 310)	4015	N/mm^2
Dimensional stability (BS EN 438-2)	11×10^{-3}	mm/(m°K)
Vapour transmission Sd at 23°C and 65% RH	1.8	m
Water uptake via the sawn edge after 28 days at 20°C and 85% RV	< 1.3	%
Thermal conductivity	0.35	W/(m.K)

Product Contents

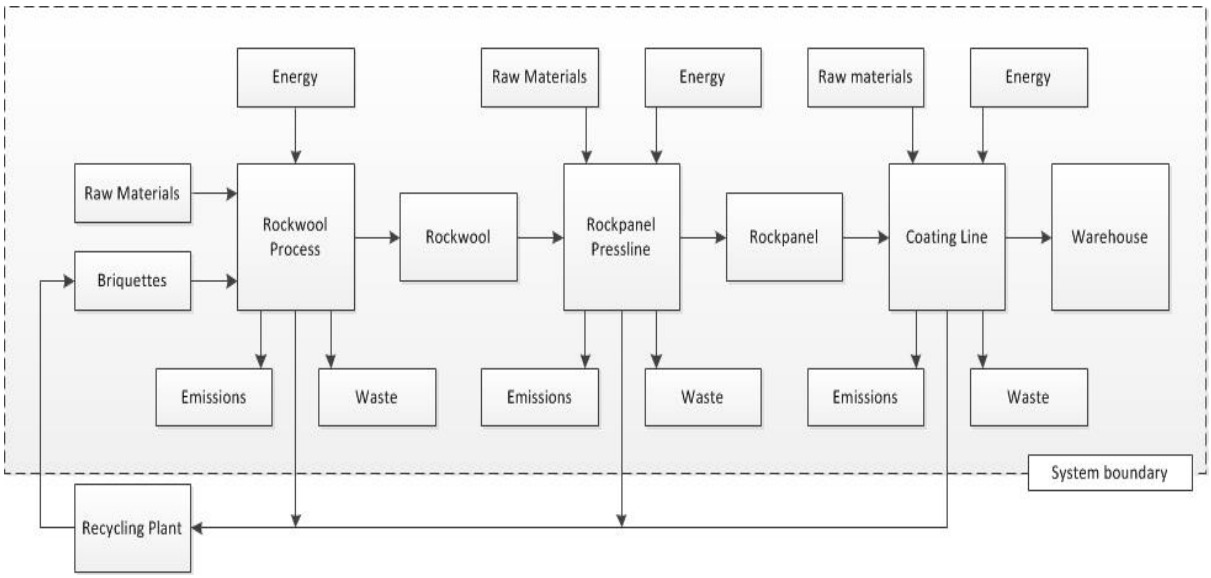
Material/Chemical Input	%
Stone Wool	88 – 90
Binder	10 – 12
Cured coating	0 – 2.5

Manufacturing Process

ROCKPANEL® board material is produced from basalt rock. The basalt is melted and spun into fibres. From these fibres the high density board is pressed. The board is finished with a waterborne coating system which has a high durability.

Products such as Woods, Metallics and Chameleon are finished with an extra ProtectPlus coating which creates a self-cleaning surface with an even higher weathering resistance.

The process flow diagram is shown below:



Construction Installation

The cladding on vertical timber battens with mechanically fixed boards can be carried out with or without ventilated cavities at the back. The cladding on vertical timber battens provided with mechanically fixed ROCKPANEL® strips with the bonding system must be carried out with a ventilated cavity at the back. The cladding on vertical aluminium support shall be carried out with a ventilated cavity at the back.

Use Information

ROCKPANEL® boards are intended for external cladding and for fascias and soffits. ROCKPANEL® ProtectPlus clear coat used on the ROCKPANEL® Durable ProtectPlus requires re-coating after 15 years.

Reference Service Life

Assumed intended working life of the ROCKPANEL® boards is 60 years, provided that they are subject to appropriate use and maintenance. It is expected that the actual working life under normal use conditions will be considerably longer without major degradation affecting the essential requirements. Indications given as to the working life of the boards cannot be interpreted as a guarantee given by ROCKWOOL B.V. / ROCKPANEL Group.

End of Life

ROCKPANEL® boards can be recycled at end of life or disposed of in landfill. The boards contain no hazardous materials. No biocides or flame retardants are used in the manufacture of ROCKPANEL® boards.

Life Cycle Assessment Calculation Rules

Declared / Functional unit

The declared unit is 1 m² of ROCKPANEL® Durable ProtectPlus cladding panel.

System boundary

In accordance with the modular approach as defined in EN 15804, this cradle to gate with options EPD includes the product stage (A1-A3), transport to site (A4), maintenance (B2) and disposal at end-of-life (C4).

Data sources, quality and allocation

Specific foreground data derived from the ROCKPANEL B.V. production process at Roermond 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).

Modelling of the life cycle of ROCKPANEL® Durable ProtectPlus is performed using SimaPro 8 LCA software from PRé. Background LCI datasets are taken from 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 is used. The manufacturer-specific data from ROCKPANEL B.V. covers a production period of 1 year (01/01/2008 to 31/12/2008).

Allocation procedures in the background datasets is according to EN 15804 and are based on the ISO 14044 guidance. ROCKPANEL B.V. manufactures other finished products at the Roermond site in addition to those covered by this EPD. Calculations were performed to enable allocation of total site energy use, water use, waste and emissions to the ROCKPANEL® Durable ProtectPlus product.

Cut-off criteria

All raw materials, packaging materials and consumable input items, and associated transport to the plant, 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	16.8	1.03	INA	INA	0.000924	INA
ODP	kg CFC 11 eq.	AGG	AGG	AGG	1.35E-05	1.15E-06	INA	INA	9.96E-10	INA
AP	kg SO_2 eq.	AGG	AGG	AGG	0.0761	0.00578	INA	INA	3.70E-06	INA
EP	kg $(PO_4)^{3-}$eq.	AGG	AGG	AGG	0.00956	0.00132	INA	INA	5.39E-07	INA
POCP	kg C_2H_4 eq.	AGG	AGG	AGG	0.0125	0.000463	INA	INA	5.17E-07	INA
ADPE	kg Sb eq.	AGG	AGG	AGG	4.71E-07	4.98E-10	INA	INA	1.37E-10	INA
ADPF	MJ eq.	AGG	AGG	AGG	452	13.5	INA	INA	0.0185	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	26.6	0.0327	INA	INA	0.000511	INA
PERM	MJ	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
PERT	MJ	AGG	AGG	AGG	26.6	0.0327	INA	INA	0.000511	INA
PENRE	MJ	AGG	AGG	AGG	471	13.3	INA	INA	0.0198	INA
PENRM	MJ	AGG	AGG	AGG	INA	INA	INA	INA	INA	INA
PENRT	MJ	AGG	AGG	AGG	471	13.3	INA	INA	0.0198	INA
SM	kg	AGG	AGG	AGG	INA	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	0.276	0.00137	INA	INA	2.87E-05	INA
PERE = Use of renewable primary energy excluding renewable primary energy 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	0.668	0.000271	INA	INA	1.73E-05	INA
NHWD	kg	AGG	AGG	AGG	0.0201	2.05E-06	INA	INA	2.37E-08	INA
TRWD	kg	AGG	AGG	AGG	0.0011	0.000261	INA	INA	7.70E-09	INA
RWDHL	kg	AGG	AGG	AGG	0.000104	3.40E-05	INA	INA	7.10E-10	INA
HWD = Hazardous waste disposal; 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	0.645	0.00243	INA	INA	0.000177	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 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse/ Recovery/ Recycling potential
Environmental impacts per declared/functional unit										
GWP	kg CO_2 eq.	INA	INA	INA	INA	INA	INA	INA	6.67	INA
ODP	kg CFC 11 eq.	INA	INA	INA	INA	INA	INA	INA	1.78E-07	INA
AP	kg SO_2 eq.	INA	INA	INA	INA	INA	INA	INA	0.000922	INA
EP	kg $(PO_4)^{3-}$eq.	INA	INA	INA	INA	INA	INA	INA	0.00481	INA
POCP	kg C_2H_4 eq.	INA	INA	INA	INA	INA	INA	INA	0.00113	INA
ADPE	kg Sb eq.	INA	INA	INA	INA	INA	INA	INA	1.67E-09	INA
ADPF	MJ eq.	INA	INA	INA	INA	INA	INA	INA	0.892	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	INA	INA	0.129	INA
PERM	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
PERT	MJ	INA	INA	INA	INA	INA	INA	INA	0.129	INA
PENRE	MJ	INA	INA	INA	INA	INA	INA	INA	1.50	INA
PENRM	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA
PENRT	MJ	INA	INA	INA	INA	INA	INA	INA	1.50	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	m^3	INA	INA	INA	INA	INA	INA	INA	0.00165	INA
PERE = Use of renewable primary energy excluding renewable primary energy 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	INA	INA	8.09	INA
NHWD	kg	INA	INA	INA	INA	INA	INA	INA	2.03E-05	INA
TRWD	kg	INA	INA	INA	INA	INA	INA	INA	2.72E-05	INA
RWDHL	kg	INA	INA	INA	INA	INA	INA	INA	2.62E-06	INA
HWD = Hazardous waste disposal; 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	2.85	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	-	1069.5	-	-
Rail	-	50.5	-	-

Module B2 – Maintenance			
Parameter	**Description**	**Unit**	**Value**
Maintenance cycle	Re-application of ROCKPANEL® Durable ProtectPlus coating	years	25

End-of-life modules – C1, C3, and C4			
Parameter	**Description**	**Unit**	**Value**
Waste for final disposal	ROCKPANEL® Durable ProtectPlus cladding panel from demolition to landfill	kg	900
Waste for final disposal	ROCKPANEL® Durable ProtectPlus cladding panel from demolition to incineration	kg	100

Interpretation

The raw material inputs to the ROCKPANEL® Durable ProtectPlus cladding product and fuels consumed in the manufacturing process, transport of product to site and in the end-of-life processes are responsible for the majority of the impacts to the environment over the life cycle of the product.

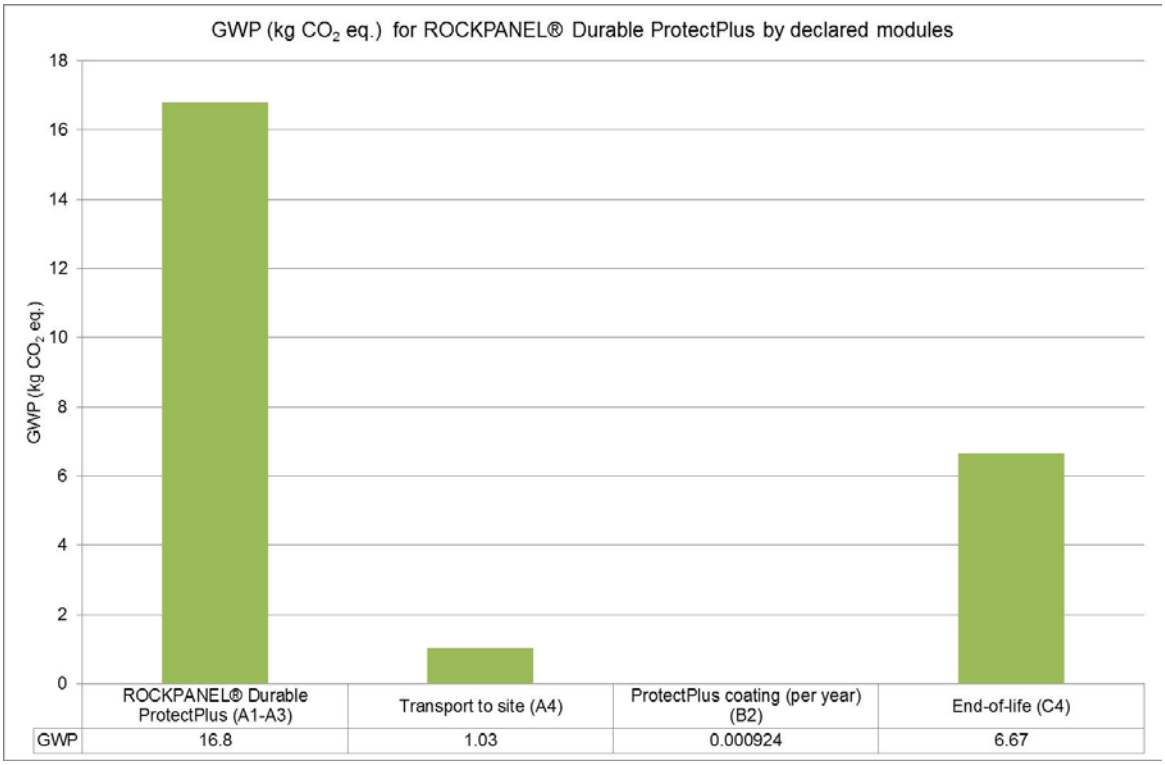
In the production stage (A1-A3), impacts can be attributed to emissions associated with the combustion of and extraction of fossil fuels used in the manufacturing process and production or processing of the material inputs.

In the transport of product to site scenario (A4), impacts result from direct emissions from combustion of diesel in transport processes, the upstream processing of the diesel fuel used in trucks etc. (i.e. process electricity) and depletion of fossil fuel resources.

Impacts from the maintenance scenario (B2) are attributed to the ProtectPlus coating inputs and the associated extraction of resources and manufacturing processes for the ProtectPlus inputs.

In the end-of-life disposal scenario (C4), impacts result from the associated emissions from fuel consumption in transport and machinery processes carried out at the landfill site, from the upstream processing of the diesel fuel used in landfill machinery together with grid electricity used directly at the landfill. The impacts associated with incineration result from emissions associated with combustion and depletion of fossil fuel resources.

The environmental impacts from the product stage are greater than the impacts from all other stages. This can be seen in the graph below showing GWP (kg CO_2 eq.) impacts for the ROCKPANEL® Durable ProtectPlus cladding product by declared modules.



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.

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BS EN 310:1993, Wood-based panels. Determination of modulus of elasticity in bending and of bending strength

BS EN 1058:2009, Wood-based panels. Determination of characteristic 5-percentile values and characteristic mean values

BS EN 438-2:2005, High-pressure decorative laminates (HPL). Sheets based on thermosetting resins (usually called laminates) Determination of properties

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