ENVIRONMENTAL PRODUCT DECLARATION

According ISO 14025 and EN 15804

KNAUF INSULATION CAVITEC 032 PREMIUM (FAÇADE)

COMPANY INFORMATION / DECLARATION OWNER

Manufacturer: KNAUF
Production Location: VISE
Address: address
4600 Visé
E-mail: info@knauf.nl
Website: www.knauf.nl

EPD INFORMATION

Calculation number: EPD-NIBE-20180418-2145
Date of issue: 21-08-2018
End of validity: 21-08-2023
Version NIBE's EPD Application: 1.0
Version database: V2.69 (20180720)
PCR: SBK bepalingsmethode v2.0 incl. Wijzingingsblad overgang naar EcoInvent v3.3 of 1th June 2017

VERIFICATION OF THE DECLARATION

CEN standard EN 15804:2012 serves as the core PCR
Independent verification of the declaration. according to EN ISO 14025:2010. ☐ Internal ☑ External

De LCA voldoet aan de gestelde in de Bepalingsmethode Milieuprestatie Gebouwen en GWW- werken, inclusief de wijzigingsbladen d.d. 1-6-2017 en 1-8-2017 en het SBK-toetsingsprotocol (o.b.v. Definitief Versie 2.0, november 2014, inclusief wijziging 1 juni 2017). Daardoor wordt ook voldaan aan het gestelde in ISO 14440/44 en ISO 21930.

Third party verifier: Jeeninga+reviewer, Review Jeeninga

DECLARED UNIT

Isolatielagen buitenmuur

Een vierkante meter isolatiemateriaal toegepast in een spouwmuur of als ondergrond voor een pleisterlaag. Schaling gebeurd o.b.v. isolatiewaarde (m²K/W), de isolatiewaarde heeft alleen betrekking op het isolatiemateriaal.

SCOPE OF DECLARATION

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	MND	MND	MND	MND	X	X	X	X	X

(X = included, MND = module not declared)

PRODUCT DESCRIPTION

Zeer stevige, waterafstotende glaswolplaat met ECOSE® Technology. Eenzijdig bekleed met een micro geperforeerde aluminiumfolie voor thermische isolatie van spouwmuren en gesloten vliesgevels. De aluminiumfolie werkt het best in de thermische isolatie bij niet-geventileerde luchtspouw van minimaal 20 mm breed.

Knauf Insulation manufactures glass mineral wool insulation products with ECOSE® Technology. The density for glass mineral wool for Cavitec 032 Premium ranged from 30 to 36 kg/m³, for this LCA we used the highest density as a worst case approach. The labda value of the product is 0.032 W/mK, for an Rd of 4,5 the thicknes need to be 146mm. Glass mineral wool consists of >= 92.5% inert material.

The inert part is made of recycled glass (external cullet, up to 80% of the composition) and mainly sand and dolomite. The remainings are made of bio-based binder components. At Knauf Insulation, the binder used for the GMW products is the ECOSE binder whose origin is plant starch.

The product is used for their thermal, acoustical and fire characteristics. A representative product out of a particular group of produts was selected for the calculation. For the placing on the market of construction products in the European Union and EFTA (with the exception of Switzerland) /Regulation (EU) No 305/2011/ applies. The products need a Declaration of performance (DoP) taking into

DESCRIPTION OF THE MANUFACTURING PROCESS

The product is an insulation material of mostly inorganic origin intended for thermal and acoustic insulation, as well as for fire prevention in construction and industry. Raw materials used in the production of GMW are sand, limestone, soda ash and a high level of recycled glass (up to 80%). A bio-based binder, ECOSE, is spread on the fibers which polymerisation contributes to fix the product dimensions. The cured binder bonds the fibres together thus providing the necessary mat stability and mechanical strength. The facing is applied and the insulating material is dried after which it is packed and ready for transport

consideration the harmonized product standard /EN 13162/ and the CE-mark /Regulation (EC) No 765/2008/.

RESULTS (SOLID PART)

Impact category	Unit	A1	A2	A3	A4	A5	B1	B2	B3	C2	C1+C3+C4	D	Total
ADPE	Kg Sb	1.30E-6	2.37E-9	1.81E-8	1.18E-9	3.98E-8	0.00E+0	0.00E+0	0.00E+0	3.13E-10	3.76E-11	0.00E+0	1.37E-6
ADPF	Kg Sb	2.04E-4	6.80E-6	2.93E-6	3.08E-6	6.54E-6	0.00E+0	0.00E+0	0.00E+0	8.16E-7	5.59E-7	0.00E+0	2.24E-4
GWP	Kg CO2 Equiv.	2.67E-2	9.26E-4	3.84E-4	4.17E-4	8.59E-4	0.00E+0	0.00E+0	0.00E+0	1.10E-4	3.60E-5	0.00E+0	2.95E-2
ODP	Kg CFC-11 Equiv.	1.74E-9	1.71E-10	2.69E-11	7.80E-11	6.15E-11	0.00E+0	0.00E+0	0.00E+0	2.06E-11	1.45E-11	0.00E+0	2.11E-9
POCP	Kg Ethene Equiv.	1.71E-5	6.09E-7	2.47E-7	2.52E-7	5.51E-7	0.00E+0	0.00E+0	0.00E+0	6.67E-8	4.02E-8	0.00E+0	1.89E-5
AP	Kg SO2 Equiv.	1.60E-4	5.70E-6	2.30E-6	1.84E-6	5.11E-6	0.00E+0	0.00E+0	0.00E+0	4.87E-7	2.68E-7	0.00E+0	1.75E-4
EP	Kg PO43- Equiv.	1.57E-5	9.02E-7	2.31E-7	3.63E-7	5.19E-7	0.00E+0	0.00E+0	0.00E+0	9.59E-8	5.60E-8	0.00E+0	1.78E-5
HTP	kg 1.4 DB	2.88E-2	4.07E-4	4.05E-4	1.81E-4	8.96E-4	0.00E+0	0.00E+0	0.00E+0	4.79E-5	1.68E-5	0.00E+0	3.08E-2
FAETP	kg 1.4 DB	2.92E-4	1.14E-5	4.22E-6	5.32E-6	9.44E-6	0.00E+0	0.00E+0	0.00E+0	1.41E-6	4.18E-7	0.00E+0	3.24E-4
MAETP	kg 1.4 DB	2.77E+0	4.44E-2	3.90E-2	2.02E-2	8.64E-2	0.00E+0	0.00E+0	0.00E+0	5.34E-3	1.47E-3	0.00E+0	2.97E+0
TETP	kg 1.4 DB	1.36E-4	3.18E-6	1.93E-6	1.45E-6	4.30E-6	0.00E+0	0.00E+0	0.00E+0	3.83E-7	1.47E-7	0.00E+0	1.48E-4
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**C2**	**C1+C3+C4**	**D**	**Total**
PERE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	3.70E-2	2.11E-4	5.15E-4	8.90E-5	1.14E-3	0.00E+0	0.00E+0	0.00E+0	2.35E-5	1.44E-5	0.00E+0	3.90E-2
PENRE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	4.21E-1	1.52E-2	6.07E-3	6.89E-3	1.36E-2	0.00E+0	0.00E+0	0.00E+0	1.82E-3	1.29E-3	0.00E+0	4.65E-1
SM	Kg	3.57E-3	0.00E+0	4.93E-5	0.00E+0	1.09E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.73E-3
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	M3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
HWD	Kg	1.30E-5	1.06E-7	1.82E-7	4.82E-8	4.01E-7	0.00E+0	0.00E+0	0.00E+0	1.28E-8	8.78E-9	0.00E+0	1.38E-5
NHWD	Kg	3.13E-3	7.83E-4	1.71E-4	3.93E-4	3.89E-4	0.00E+0	0.00E+0	0.00E+0	1.04E-4	8.39E-3	0.00E+0	1.34E-2
RWD	Kg	1.03E-6	9.73E-8	1.59E-8	4.43E-8	3.63E-8	0.00E+0	0.00E+0	0.00E+0	1.17E-8	8.39E-9	0.00E+0	1.25E-6
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
SP	**s€**	**s€ 0,01**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,01**

Impact categories: ADPE=Depletion of abiotic resources-elements | **ADPF**=Depletion of abiotic resources-fossil fuels | **GWP**=Global warming | **ODP**=Ozone layer depletion | **POCP**=Photochemical oxidants creation | **AP**=Acidification of soil and water | **EP**=Eutrophication | **HTP**=Human toxicity | **FAETP**=Ecotoxicity. fresh water | **MAETP**=Ecotoxicity. marine water (MAETP) | **TETP**=Ecotoxicity. terrestric

Parameters: PERE=renewable primary energy ex. raw materials | **PERM**=renewable primary energy used as raw materials | **PERT**=renewable primary energy total | **PENRE**=non-renewable primary energy ex. raw materials | **PENRM**=non-renewable primary energy used as raw materials | **PENRT**=non-renewable primary energy total | **SM**=use of secondary material | **RSF**=use of renewable secondary fuels | **NRSF**=use of non-renewable secondary fuels | **FW**=use of net fresh water | **HWD**=hazardous waste disposed | **NHWD**=non hazardous waste disposed | **RWD**=radioactive waste disposed | **CRU**=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EE**=Exported energy

RESULTS (SCALABLE PART)

Impact category	Unit	A1	A2	A3	A4	A5	B1	B2	B3	C2	C1+C3+C4	D	Total
ADPE	Kg Sb	7.06E-6	3.16E-7	4.48E-6	8.99E-7	3.74E-7	0.00E+0	0.00E+0	0.00E+0	2.31E-7	2.79E-8	0.00E+0	1.34E-5
ADPF	Kg Sb	1.08E-2	1.05E-3	3.96E-2	2.35E-3	2.70E-4	0.00E+0	0.00E+0	0.00E+0	6.04E-4	4.14E-4	0.00E+0	5.51E-2
GWP	Kg CO2 Equiv.	1.52E+0	1.45E-1	4.93E+0	3.17E-1	3.60E-1	0.00E+0	0.00E+0	0.00E+0	8.16E-2	2.66E-2	0.00E+0	7.38E+0
ODP	Kg CFC-11 Equiv.	1.69E-7	2.61E-8	5.73E-7	5.93E-8	1.24E-8	0.00E+0	0.00E+0	0.00E+0	1.53E-8	1.07E-8	0.00E+0	8.65E-7
POCP	Kg Ethene Equiv.	8.40E-4	1.06E-4	3.02E-3	1.92E-4	9.51E-5	0.00E+0	0.00E+0	0.00E+0	4.94E-5	2.97E-5	0.00E+0	4.33E-3
AP	Kg SO2 Equiv.	1.22E-2	1.24E-3	1.35E-2	1.40E-3	6.76E-4	0.00E+0	0.00E+0	0.00E+0	3.61E-4	1.98E-4	0.00E+0	2.95E-2
EP	Kg PO43- Equiv.	3.86E-3	1.62E-4	2.50E-3	2.76E-4	1.83E-4	0.00E+0	0.00E+0	0.00E+0	7.10E-5	4.15E-5	0.00E+0	7.10E-3
HTP	kg 1.4 DB	6.79E-1	6.49E-2	9.69E-1	1.38E-1	5.43E-2	0.00E+0	0.00E+0	0.00E+0	3.54E-2	1.25E-2	0.00E+0	1.95E+0
FAETP	kg 1.4 DB	7.20E-2	1.70E-3	2.01E-2	4.05E-3	4.40E-3	0.00E+0	0.00E+0	0.00E+0	1.04E-3	3.09E-4	0.00E+0	1.04E-1
MAETP	kg 1.4 DB	6.12E+1	6.83E+0	6.46E+1	1.54E+1	6.56E+0	0.00E+0	0.00E+0	0.00E+0	3.96E+0	1.09E+0	0.00E+0	1.60E+2
TETP	kg 1.4 DB	1.85E-2	4.91E-4	5.87E-2	1.10E-3	2.25E-3	0.00E+0	0.00E+0	0.00E+0	2.83E-4	1.09E-4	0.00E+0	8.15E-2
Parameter	**Unit**	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**C2**	**C1+C3+C4**	**D**	**Total**
PERE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	8.76E+0	3.58E-2	1.75E+1	6.77E-2	3.50E-1	0.00E+0	0.00E+0	0.00E+0	1.74E-2	1.06E-2	0.00E+0	2.68E+1
PENRE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRM	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	2.45E+1	2.35E+0	1.22E+2	5.25E+0	1.80E+0	0.00E+0	0.00E+0	0.00E+0	1.35E+0	9.51E-1	0.00E+0	1.58E+2
SM	Kg	4.28E+0	0.00E+0	5.92E-2	0.00E+0	1.30E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.47E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	M3	9.14E-4	0.00E+0	1.15E-3	0.00E+0	6.19E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.13E-3
HWD	Kg	1.23E-4	1.63E-5	6.21E-4	3.67E-5	1.58E-5	0.00E+0	0.00E+0	0.00E+0	9.44E-6	6.50E-6	0.00E+0	8.29E-4
NHWD	Kg	1.31E-1	1.03E-1	2.24E-1	2.99E-1	2.30E-1	0.00E+0	0.00E+0	0.00E+0	7.69E-2	6.21E+0	0.00E+0	7.27E+0
RWD	Kg	9.61E-5	1.50E-5	5.24E-4	3.37E-5	1.64E-5	0.00E+0	0.00E+0	0.00E+0	8.68E-6	6.21E-6	0.00E+0	7.00E-4
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	1.58E-4	0.00E+0	7.22E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.38E-3
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EE	MJ	0.00E+0	0.00E+0	2.76E-2	0.00E+0	1.66E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.69E+0
SP	**s€**	**s€ 0,23**	**s€ 0,02**	**s€ 0,43**	**s€ 0,04**	**s€ 0,03**	**s€ 0,00**	**s€ 0,00**	**s€ 0,00**	**s€ 0,01**	**s€ 0,00**	**s€ 0,00**	**s€ 0,77**

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ADDITIONAL INFORMATION

Allocation

Environmental profile	Explanation of used allocation method
Aluminium	Allocation based on economic values. Aluminium consists of 20% primary and 80% secondary material (26,7% post-cosumer).
elastomeres (i.a. epdm) (i.a. roofing, foils) - D	Allocation based on economic values. The output side is assumed to be 5% recycling. The EcoInvent process 'Polyethene, low density, granulate {RER} | production | Alloc Rec, U' is assumed to be the avoided environmental impact. Emissions, fresh water use, Shreddering, sorting, separation metal, cyclone, agglomerator, extrusion, purification and granulating are included. A lost of 10% is included

Scaling

Parameter	Value
Scaling type	Linear
Description dimension	Rd waarde
Dimension	4.500
Scalable dimension	4.500
Unit dimension	W/m2