



ENVIRONMENTAL FACT SHEET

Tektalan A2-SD

Description: Wood Wool composite board with RMW core

Product dimensions

Thickness:

- Wood wool: 2 layer(s) of 5 mm
- Core: 90 mm

Board dimensions: 2000 x 600 mm

Boards per pallet: 11 pc

Product characteristics

R value: 2,36 m²K/W

CE marking following EN 13168

PEFC and Blue Angel certified

Declared unit: 1 m²

Transport distance: 410 km (truck) and 0 km (train)

End-of-Life scenario: landfill

EFS reference N°: EFS_WW_4302_C_005

Date of issue: 12.09.2013

Scope of validity: This Environmental Fact Sheet is only valid for a specific product. The calculation model is derived from the model used for the generation of the IBU verified wood wool EPD published by Knauf Insulation in 2012 (EPD reference No. EPD-KNI-2012711-D).

Declaration holder:

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LIFECYCLE IMPACT CATEGORIES

Summary table of results		Raw material & transport	Manufacturing	Transport to site	End-of-Life & transport	Total	Benefits and loads
GWP	kg CO ₂ eq	20,1	2,48	0,365	8,55	31,5	-0,215
ODP	kg CFC11 eq	1,23E-009	2,22E-010	6,39E-012	1,8E-010	1,64E-009	-1,94E-010
AP	kg SO ₂ eq	0,0666	0,00153	0,00169	0,00229	0,0721	-0,00101
EP	kg PO ₄ ³⁻ eq	0,00477	0,000488	0,000389	0,000685	0,00633	-5,36E-005
POCP	kg Ethene eq	0,00595	0,000332	-0,000557	0,00118	0,0069	-5,95E-005
ADP-e	kg Sb eq	8,41E-006	1,08E-007	1,36E-008	1E-007	8,63E-006	-2,97E-008
Primary Energy non-renew.	MJ	254	12,9	5,07	5,36	277	-3,8
Primary Energy renew.	MJ	32	13,6	0,199	0,329	46,1	-0,634
Water	m ³	0,0494	0,00276	0,00022	-0,00903	0,0434	-0,0017
Hazardous waste	kg	0,00515	0,00756	0	0,00261	0,0153	0
Non-hazardous waste	kg	1,87	0,225	0,000657	16,1	18,2	-0,00166
Radioactive waste (*)	kg	0,00625	0,000691	7,04E-006	8,62E-005	0,00704	-0,000559

(*) Mainly impact coming from power generation

UNDERSTANDING THE METHODOLOGICAL APPROACH



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Objectives

Knauf Insulation is committed to making information about the environmental impact relating to products it places on the market available upon request. The format for presenting this information can either be a standard verified EPD or a simpler Environmental Fact Sheet based on a verified EPD.

The results are based on the LCA of Wood Wool insulation products produced by Knauf Insulation as an average from three different sites, Oosterhout (The Netherlands), Simbach (Germany) and Zalaegerszeg (Hungary).

The areas of application of the wood wool boards include underground parking, basement ceiling and pitched roof, etc.

System boundaries

The assessment is based on a "Cradle to Gate" LCA with the following additional stages: transportation to job site and end of life stages. Benefits and loads beyond the system boundaries are not included in the total. The 'Cradle to Gate' assessment takes into consideration the following stages of the life cycle: from raw material extraction, (including the necessary upstream processes, auxiliaries, transports and energy supply), the manufacturing and transportation to construction site, as well as the transportation to and the end of life itself. The end of life and the benefits and loads beyond the system boundaries are based on landfill scenarios.

Scope

Standards: the environmental data reported in this Environmental Fact Sheet are based on calculation rules according to EN 15804 (see annex). The Life Cycle Assessment (LCA) follows ISO 14040:2006 and ISO 14044:2006.

Data and tools

The model used for the calculation of the LCA results is derived from a verified EPD model. In order to calculate results according to EN 15804, the original model was updated with background LCA datasets from 2012 and slightly adapted (e.g. modules according to EN 15804 and generic end-of-life modules). GaBi 6 software and data were used for modeling and calculation of results.

www.gabi-software.com

Verification

The results and the consistency with the abovementioned standards have been checked through an extensive internal review applying PE INTERNATIONAL's quality standards. The original underlying LCA model for Wood Wool was verified by IBU in 2012 and communicated in three Environmental Product Declarations (EPDs). The current LCA calculation has been conducted by PE INTERNATIONAL AG according to the requirements of the PCR "Holzwerkstoffe" /PCR 2011/

ENVIRONMENTAL INDICATORS

Global Warming Potential (GPW): impact of greenhouse gases such as carbon dioxide (CO₂) or methane.

Ozone Depletion Potential (ODP): relative impact that the product can cause to the stratospheric ozone layer.

Acidification Potential (AP): the acidification of soils and waters predominantly occurs through the transformation of air pollutants into acids

Eutrophication Potential (EP): impact of nitrification by nitrogen and phosphorus to aquatic and terrestrial ecosystems, for example through algal blooms, disturbing the balance between species.

Photochemical Ozone Creation Potential (POCP): also known as summer smog, the impact from oxidizing of volatile compounds in the presence of nitrogen oxides (NO_x) which frees ozone in the lower atmosphere

Abiotic Depletion Potential element (ADP- e): impact from depletion of resources excluding fossil fuel resources (such as oil or natural gas) expressed in equivalent antimony so to take into account scarcity of resources.

Non-renewable Primary Energy: non-renewable energy resources required to manufacture the product. Sources of non-renewable energy are fossil fuels and uranium.

Renewable Primary Energy: renewable energy resources required to manufacture the product. Sources of renewable energy are biomass, wind, solar or hydraulic sources for example.

Net fresh water: input of net fresh water consumed in the life cycle stages ("blue water consumption" equals evaporated water).

Annex to Environmental Fact Sheet N° EFS_WW_4302_C_005

Complete results according to EN 15804 presentation

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² Tektalan A2-SD



		Manufacturing	Transport to site	Transport to EoL	End of Life	Benefits and loads
Parameter	Unit	A1-3	A4	C2	C4	D
GWP	[kg CO ₂ -Äq.]	22,5	0,365	0,0441	8,51	-0,215
ODP	[kg CFC11-Äq.]	1,45E-009	6,39E-012	7,71E-013	1,8E-010	-1,94E-010
AP	[kg SO ₂ -Äq.]	0,0681	0,00169	0,000203	0,00208	-0,00101
EP	[kg PO ₄ -- Äq.]	0,00525	0,000389	4,69E-005	0,000638	-5,36E-005
POCP	[kg Ethen Äq.]	0,00628	-0,000557	-6,71E-005	0,00125	-5,95E-005
ADPE	[kg Sb Äq.]	8,51E-006	1,36E-008	1,64E-009	9,85E-008	-2,97E-008
ADPF	[MJ]	250	5,05	0,609	4,54	-2,44

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE: 1 m² Tektalan A2-SD

		Manufacturing	Transport to site	Transport to EoL	End of Life	Benefits and loads
Parameter	Unit	A1-3	A4	C2	C4	D
PERE	[MJ]	20,59	-	-	-	-
PERM	[MJ]	24,92	-	-	-	-
PERT	[MJ]	45,5	0,199	0,0239	0,305	-0,634
PENRE	[MJ]	249,41	-	-	-	-
PENRM	[MJ]	17,59	-	-	-	-
PENRT	[MJ]	267	5,07	0,611	4,75	-3,8
SM	[kg]	0	-	-	-	-
RSF	[MJ]	0	0	0	0	0
NRSF	[MJ]	0	0	0	0	0
FW	[m ³]	0,0522	0,00022	2,66E-005	-0,00906	-0,0017

Caption: 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 = Use of net fresh water

RESULTS OF THE LCA - OUTPUT FLOWS AND WASTE CATEGORIES: 1 m² Tektalan A2-SD

		Manufacturing	Transport to site	Transport to EoL	End of Life	Benefits and loads
Parameter	Unit	A1-3	A4	C2	C4	D
HWD	[kg]	0,0127	0	0	0,00261	0
NHWD	[kg]	2,09	0,000657	7,93E-005	16,1	-0,00166
RWD	[kg]	0,00694	7,04E-006	8,49E-007	8,53E-005	-0,000559
CRU	[kg]	-	-	-	-	-
MFR	[kg]	-	-	-	-	-
MER	[kg]	-	-	-	-	-
EE [power]	[MJ]	-	-	-	1,69	-
EE [thermal energy]	[MJ]	-	-	-	0	-

Caption: 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 per energy carrier