

Annex

Results of Alu cover foil for PROMALIGHT® 1000X

to the

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804+A2/

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General Information

The PROMALIGHT® range of products is available as naked boards, or with a PE foil or Aluminum covering. The main EPD is based on the naked boards, and the impact of the PE and alu foil will be added as an Annex.

This annex includes the LCA results of the average alu cover foil per declared unit (1 m²) of PROMALIGHT® 1000X microporous insulation board. These results of the cover foil can be considered independent of the thickness and the density.

The PE foil covering has a standard 20 µ thickness aluminum foil, and the weight is 54 g/m² of PROMALIGHT® 1000X microporous insulation board.

The results presented in this annex can simply be added to the results of the naked PROMALIGHT® 1000X microporous insulation board, to calculate the LCA profile of the boards with the aluminum covering.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

The system boundary of the LCA of aluminum foil covers, as in the main product, cradle to gate with options (A1-A3, A5, C1-C4 & D).

Module A1& A2: Procurement of Alu foil in pallet and carton packaging, via 50 km road transport and 600 km inland waterways.

Module A3: Waste disposal of pallets and carton packaging

Module C1: No impact in C1

Module C2: 50 km to landfill

Module C3: 100% landfill

Module C4: Sorting and landfill

1. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE								END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	MND	X	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X	

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: Alu cover foil per declared unit (1 m2) of PROMALIGHT® 1000X microporous insulation board

Core Indicator	Unit	A1	A2	A3	A5	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ -Eq.]	5.60E-01	6.24E-03	2.68E-03	0.00E+00	0.00E+00	7.99E-04	0.00E+00	8.19E-04	-1.71E-03
GWP-fossil	[kg CO ₂ -Eq.]	5.49E-01	6.24E-03	3.86E-05	0.00E+00	0.00E+00	7.98E-04	0.00E+00	8.16E-04	-3.73E-04
GWP-biogenic	[kg CO ₂ -Eq.]	2.17E-03	2.01E-06	2.64E-03	0.00E+00	0.00E+00	2.57E-07	0.00E+00	2.62E-06	-1.34E-03
GWP-luluc	[kg CO ₂ -Eq.]	9.38E-03	3.24E-06	1.93E-08	0.00E+00	0.00E+00	3.94E-07	0.00E+00	2.38E-07	-7.34E-07
ODP	[kg CFC11-Eq.]	1.23E-08	1.35E-10	1.06E-12	0.00E+00	0.00E+00	1.74E-11	0.00E+00	2.16E-11	-1.22E-11
AP	[mol H ⁺ -Eq.]	3.95E-03	2.11E-05	3.61E-07	0.00E+00	0.00E+00	1.75E-06	0.00E+00	5.32E-06	-1.30E-06
EP-freshwater	[kg P-Eq.]	2.33E-05	5.02E-08	4.64E-10	0.00E+00	0.00E+00	6.48E-09	0.00E+00	8.76E-09	-2.00E-08
EP-marine	[kg N-Eq.]	4.91E-04	7.31E-06	1.55E-07	0.00E+00	0.00E+00	4.30E-07	0.00E+00	2.16E-06	-2.84E-07
EP-terrestrial	[mol N-Eq.]	5.45E-03	7.82E-05	1.76E-06	0.00E+00	0.00E+00	4.47E-06	0.00E+00	2.39E-05	-3.21E-06
POCP	[kg NMVOC-Eq.]	2.08E-03	3.14E-05	5.19E-07	0.00E+00	0.00E+00	2.71E-06	0.00E+00	8.44E-06	-1.21E-06
ADPE	[kg Sb-Eq.]	7.41E-07	1.97E-08	1.32E-10	0.00E+00	0.00E+00	2.61E-09	0.00E+00	3.61E-09	-1.76E-09
ADPF	[MJ]	7.02E+00	8.82E-02	5.41E-04	0.00E+00	0.00E+00	1.13E-02	0.00E+00	1.71E-02	-6.54E-03
WDP	[m ³ world-Eq deprived]	1.35E-01	3.62E-04	4.36E-06	0.00E+00	0.00E+00	4.67E-05	0.00E+00	8.68E-05	-6.74E-05

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; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: Alu cover foil per declared unit (1 m2) of PROMALIGHT® 1000X microporous insulation board

Indicator	Unit	A1	A2	A3	A5	C1	C2	C3	C4	D
PERE	[MJ]	2.35E+00	1.36E-03	1.21E-02	0.00E+00	0.00E+00	1.75E-04	0.00E+00	3.07E-03	0.00E+00
PERM	[MJ]	3.06E-02	0.00E+00	-2.45E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-02
PERT	[MJ]	2.38E+00	1.36E-03	-1.24E-02	0.00E+00	0.00E+00	1.75E-04	0.00E+00	3.07E-03	1.24E-02
PENRE	[MJ]	7.02E+00	8.82E-02	5.41E-04	0.00E+00	0.00E+00	1.13E-02	0.00E+00	1.71E-02	0.00E+00
PENRM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	7.02E+00	8.82E-02	5.41E-04	0.00E+00	0.00E+00	1.13E-02	0.00E+00	1.71E-02	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m ³]	-1.92E-02	-3.38E-05	-1.04E-06	0.00E+00	0.00E+00	-4.34E-06	0.00E+00	1.75E-07	1.03E-04

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 – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: Alu cover foil per declared unit (1 m2) of PROMALIGHT® 1000X microporous insulation board

Indicator	Unit	A1	A2	A3	A5	C1	C2	C3	C4	D
HWD	[kg]	2.77E-04	5.61E-07	3.14E-09	0.00E+00	0.00E+00	7.21E-08	0.00E+00	7.34E-08	-2.06E-08
NHWD	[kg]	1.49E-01	4.23E-03	2.78E-05	0.00E+00	0.00E+00	5.63E-04	0.00E+00	5.68E-02	-3.73E-05
RWD	[kg]	1.84E-05	2.93E-08	6.40E-10	0.00E+00	0.00E+00	3.73E-09	0.00E+00	3.31E-08	-2.35E-08
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	8.85E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	1.21E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	2.42E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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; EEE = Exported electrical energy; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
Alu cover foil per declared unit (1 m²) of PROMALIGHT® 1000X microporous insulation board**

Indicator	Unit	A1	A2	A3	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	4.11E-08	4.87E-10	4.98E-12	0.00E+00	0.00E+00	5.92E-11	0.00E+00	1.17E-10	-1.91E-11
IRP	[kBq U235-Eq.]	2.46E-02	4.50E-05	8.27E-07	0.00E+00	0.00E+00	5.75E-06	0.00E+00	6.11E-05	-2.95E-05
ETP-fw	[CTUe]	1.79E+00	4.34E-02	3.19E-04	0.00E+00	0.00E+00	5.60E-03	0.00E+00	4.43E-01	-1.01E-03
HTP-c	[CTUh]	1.33E-09	2.84E-12	2.70E-13	0.00E+00	0.00E+00	3.64E-13	0.00E+00	1.49E-12	-3.10E-13
HTP-nc	[CTUh]	1.42E-08	6.14E-11	7.98E-13	0.00E+00	0.00E+00	8.05E-12	0.00E+00	1.39E-11	-3.38E-12
SQP	[-]	6.51E-01	5.26E-02	2.95E-04	0.00E+00	0.00E+00	6.85E-03	0.00E+00	3.39E-02	-3.41E-02

Caption PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”.

This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”.

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.