Environmental Product Declaration ISO 14025

epd-norge.no
The Norwegian EPD Foundation

Norgips Plasterboard 13, Type A (STD)

NEPD no: 113E

Approved according to ISO 14025:2006, 8.1.4

Approved: 06.05.09 Verification leader

Valid until: 06.05.14 Sunn Fossdal

Verification of data: Externally **X** Internally

Verification of data and other environmental information has been carried out by Senior reseracher Guri Krigsvoll, HiO according to ISO 14025, 8.1.3.

Guri Krigsvoll

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About the EPD:

EPDs from other program operatios than Næringslisvets Stiftelse for Miljødeklarasjoner will not necessary be comparable.

PCR:

Product category rules NPCR 10:2007 Building boards

Environmental indicators	*Cradle to gate*	*Cradle to gate with opti.*	*Cradle to grave*
Global warming	2,3 kg CO2 eqv/UE	3,1 kg CO2 eqv/DU	3,1 kg CO2-eqv/FU
Total energy consumption	35,5 MJ/DU	48,8 MJ/DU	49,0 MJ/FU
Indoor impact	M1	M1	M1
Use of chemicals	See page 2	See page 2	See page 2
Resirculated materials	99 %	99 %	99 %

Scope and marked

Functionel unit (FU):	m² installed plasterboard with expected service life of 60 years
Declared unit (DU):	m² manufactured plasterboard
Cradle to gate with option:	m² manufactured and installed plasterboard
Expected service life:	60 years
Scope:	See page 4
Year of study:	2008
Year of data:	2008
Marked area:	Norway/Sweden

Product description

Gypsum plasterboards are composed of a plaster core encased in, and firmly bonded to paper liners to form flat rectangular boards. Type A plasterboards are classified for use in constructions designed for fire resistance and will also perform excellent in constructions designed for sound insulation.

Product specification

		Part %	Quantity (kg/FU)
Gypsum		95,0 %	7,84
Cardboard		4,5 %	0,37
Processing aid		0,6 %	0,05
SUM		100 %	8,26

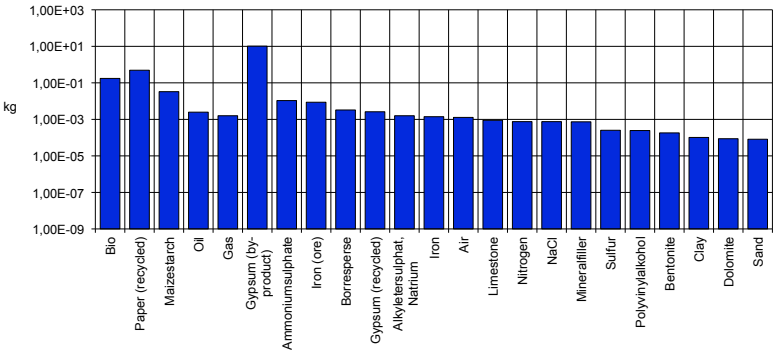
Use of resources

Material resources

All figures refer to functional unit (FU)

R = Recycled materials * = Feedstock	Type	Unit	Raw materials	Manufacturing + packaging	Building site	Use	Demolition/ Disposal	Transport	Total
Renewable materials									
Bio	*	kg		1,75E-01					1,75E-01
Paper (recycled)	R	kg	4,89E-01						4,89E-01
Maizestarch		kg	3,28E-02						3,28E-02
Non-renewable materials									
Oil	*	kg		2,47E-03					2,47E-03
Gas	*	kg		1,58E-03					1,58E-03
Gypsum (by-product)	R	kg	1,02E+01						1,02E+01
Ammoniumsulphate		kg	1,07E-02						1,07E-02
Iron (ore)		kg	8,67E-03						8,67E-03
Borresperse		kg	3,25E-03						3,25E-03
Gypsum (recycled)	R	kg	2,59E-03						2,59E-03
Alkyletersulphat, Natrium		kg	1,58E-03						1,58E-03
Iron		kg	1,39E-03						1,39E-03
Air		kg	1,28E-03						1,28E-03
Limestone		kg	8,93E-04						8,93E-04
Nitrogen		kg	7,51E-04						7,51E-04
NaCl		kg	7,51E-04						7,51E-04
Mineralfiller		kg	7,31E-04						7,31E-04
Sulfur		kg	2,52E-04						2,52E-04
Polyvinylalkohol		kg	2,44E-04						2,44E-04
Bentonite		kg	1,81E-04						1,81E-04
Clay		kg	1,03E-04						1,03E-04
Dolomite		kg	8,67E-05						8,67E-05
Sand		kg	8,18E-05						8,18E-05
Feedstock Renewable		MJ							3,82E+00
Feedstock Non-renewable		MJ							2,39E-01

Material resources total



Renewable materials 4 %, Non-renewable materials 96 %, Recycled materials 99 %

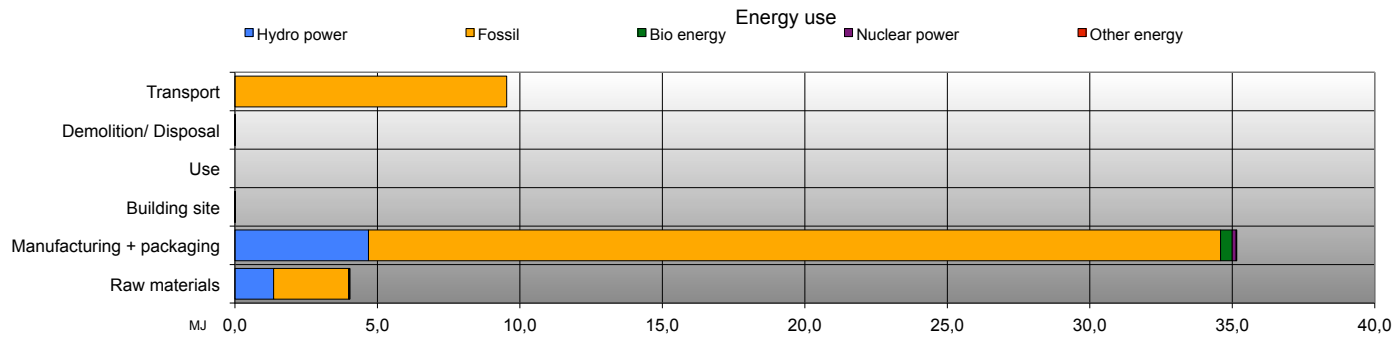
The product does not contain tropical wood.

Consumption of chemicals on the Norwegian observation list

CAS-number	Risk phrases	Quantity	Unit
CAS-55965-84-9	Xi; R36/38-43	4,88E-02	g
CAS-10043-35-3	Xn, Rep3, R62, R63	4,88E-02	g
CAS-7758-98-7	Xi R22-36/38-50/53	3,61E-13	g
			g
			g
			g
Total		9,75E-02	g

Energy resources

	Unit	Raw materials	Manufacturing + packaging	Building site	Use	Demolition/ Disposal	Transport	Total
Renewable energy								
Hydro power	MJ	1,36E+00	4,69E+00	1,48E-03		1,48E-03		6,05E+00
Bio energy	MJ		4,10E-01					4,10E-01
Non-renewable energy								
Oil	MJ	2,60E+00	5,16E-01	3,86E-06		3,86E-06	9,54E+00	1,26E+01
Gas	MJ	1,72E-02	2,94E+01	1,27E-05		1,27E-05		2,94E+01
Coal	MJ	1,77E-02	2,50E-01	1,64E-05		1,64E-05		2,68E-01
Nuclear power	MJ	3,58E-02	1,64E-01	3,61E-05		3,61E-05		2,00E-01
Other energy	MJ	7,69E-03	1,89E-02	8,28E-06		8,28E-06		2,66E-02
							Total	4,90E+01



Water

Potable water 8,5E-04 m³

Land

Land used 0,00 m²

Emissions and environmental impacts

Environmental impacts

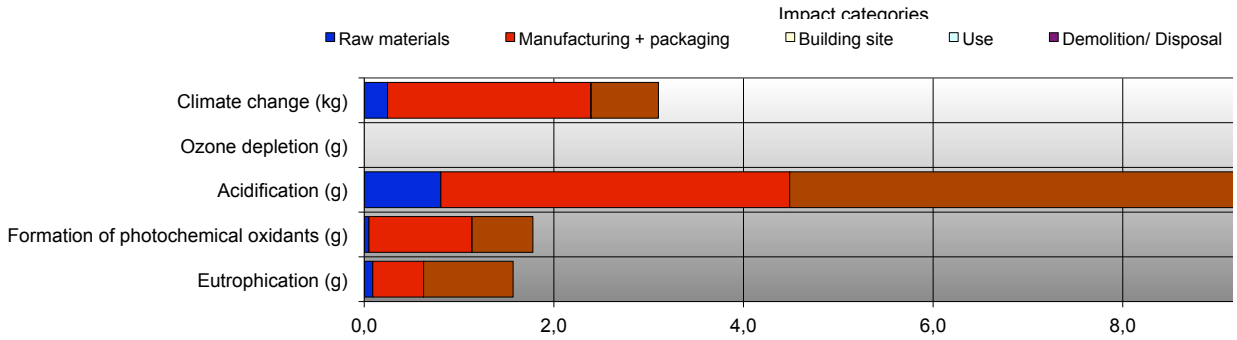
	Unit	Raw materials	Manufacturing + packaging	Building site	Use	Demolition/ Disposal
Climate change	kg CO_2 - equiv.	2,45E-01	2,15E+00	3,50E-06		3,50E-06
Ozone depletion	kg ODP - equiv.	3,98E-14	2,80E-12	2,41E-17		2,41E-17
Acidification	kg SO_2 - equiv.	8,08E-04	3,68E-03	4,88E-09		4,88E-09
Formation of photochemical oxidants	kg POCP- equiv.	4,92E-05	1,09E-03	5,52E-10		5,52E-10
Eutrophication	kg PO_4 - equiv.	8,95E-05	5,36E-04	5,23E-10		5,23E-10

Emissions to air

	Unit	Raw materials	Manufacturing + packaging	Building site	Use	Demolition/ Disposal
CO_2	g	2,27E+02	2,13E+03	2,97E-03		2,97E-03
CO	g	1,56E-03	2,05E+00	1,18E-06		1,18E-06
SO_2	g	3,52E-01	8,10E-01	2,28E-06		2,28E-06
NO_x	g	6,48E-01	4,10E+00	3,59E-06		3,59E-06
NMVOC	g	2,78E-02	2,11E+00	4,41E-07		4,41E-07
Particles	g	6,98E-02	2,78E-01	6,00E-07		6,00E-07
CH_4	g	3,35E-01	2,24E-01	2,10E-05		2,10E-05
N_2O	g	3,97E-02	1,37E-02	2,82E-07		2,82E-07
NH_3	g	8,08E-05	3,15E-04	5,48E-08		5,48E-08
Pb	g	1,55E-04	2,99E-07	9,71E-11		9,71E-11
Hg	g	1,05E-06	2,99E-07	9,71E-11		9,71E-11
HF	g	5,77E-04	1,26E-06	1,42E-11		1,42E-11
HCl	g	7,85E-04	2,33E-04	8,94E-11		8,94E-11
Benzene	g	2,85E-05	7,44E-08	2,41E-11		2,41E-11
HCFC-22	g	1,17E-09	8,24E-08	7,10E-13		7,10E-13
Sb	g	7,74E-09				
As	g	4,64E-09				
Ca	g	1,55E-09				

Emissions to water

Substance/fibre	g		3,82E-04			
COD	g		2,71E-02	1,75E-10		1,75E-10
BOD	g		6,44E-03	9,71E-11		9,71E-11
Phosphorus P	g		8,09E-06	9,71E-11		9,71E-11
Nitrogen N	g		3,84E-04	1,42E-10		1,42E-10



Indoor environment

TVOC	<10	µg/m²h Measured after 3 days
Formaldehyde	<10	µg/m²h Measured after 3 days
Ammonia	22,0	µg/m²h Measured after 3 days
Carcinogenic compounds	<2	µg/m²h Measured after 3 days
Classified as category	M1	Classification according to EN 15251:2007

Noise	No information	dB(A)

Emissions are measured for Norgips Plasterboard 13 Type A (STD), report from SP 23.01.2009.

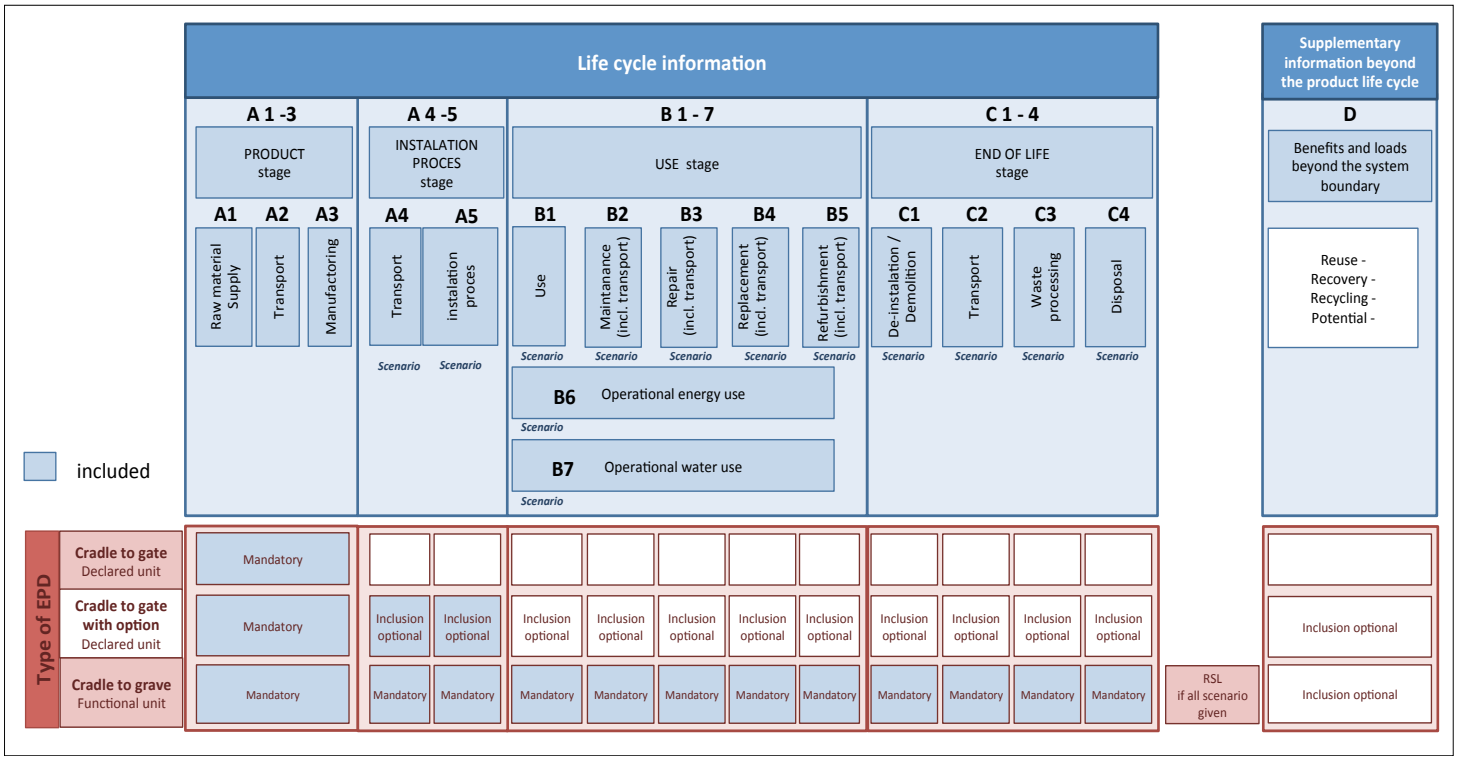
Waste treatment

All figures refer to functional unit (FU)

	Unit	Raw materials	Manufacturing + packaging	Building site	Use	Demolition/ Disposal	Total
Reuse/ recycling	kg	9,23E-04	1,59E-02	1,24E+00		2,06E+00	3,32E+00
Energy production	kg	7,84E-04	1,81E-04				9,65E-04
Waste to land fill	kg	6,80E-03	1,80E-02			6,19E+00	6,22E+00
Hazardous waste	kg	9,67E-05	1,28E-04				2,24E-04
Radioactive waste	g	1,89E-05	1,63E-03			4,27E-07	1,65E-03

By end of life 25 % of plasterboards will be recycled, the rest will be waste to landfill.

System boundaries



Uncertainty	±	10 %
Scope of data (average)		99 %
Materials with product specific data		100 %
Cut-off		0,25 %

References: Sintef Byggforsk Report 21800

Cut-off only includes data for production of rawmaterials for some chemicals/helping aids. All materials are assessed regarding content of hazardous and toxic materials and all transport are included.

All plasterboards with length over 3000 mm have 5 g glassfibre per m²