

Hunton Asphalt Vindtett (Bitroc)

NEPD nr: 213E

Approved according to ISO 14025, § 8.1.4

Approved: 31.05.2011

Valid until: 31.05.2016

Svein Fossdal

Verification

Independent verification of data and other environmental information has been carried out by Jarle Svanes, in accordance with ISO 21930, § 9.1

The declaration has been prepared by:

Kjersti Folvik, SINTEF Byggforsk

PCR

NPCR010 Building boards [3]

About EPD

EPD from other program operators than The Norwegian EPD Foundation may not be comparable.

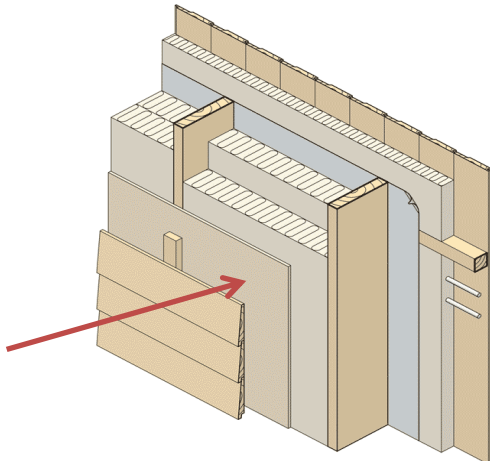


Figure 1 - Wind barrier [10]

Manufacturer information

Organization Hunton Fiber AS
Address Postboks 633, 2810 Gjøvik
Contact person Lars Harald Nilsen, nillar@hunton.no, tlf. 995 93807
Organisation no. 964014256
ISO 14001/EMAS: _____

Product information

Scope of assessment cradle to grave
Functional unit (FU) 1 m² building board, installed and maintained, with an expected average service life of 60 years.
All figures in this document refer to 1 functional unit (FU)
Expected service life 60 years
Year of study 2010, with data collection representing 2008
Production area Gjøvik, Norway
Expected market area Nordic
Product description

Hunton Asphalt Vindtett (Bitroc) are 12 mm thick soft fiberboards impregnated with bitumen. The boards are intended for use as sheathing in timber frame construction, and have a special high density bitumen layer on one side in order to make the boards airtight. The boards have square edges on all four sides, or rebated edges at the long sides. Standard width is 1200 mm (net). Standard lengths are 2440 mm and 2740 mm. Special dimensions are delivered on request. Hunton Asphalt Vindtett can be used as combined sheathing and breather membrane in thermal insulated timber frame construction.

Environmental indicators

Global warming	2 kg CO ₂ -ekv.
Energy consumption	49 MJ
Amount of renewable materials	80 %
Indoor classification (according to EN 15251:2007)	not relevant

Product specification

Tabell 1

Composition of final product		Input i LCA*		Weight final product	
Wood chips	kg	2,28	73,7 %	Specific data	2,17 73,7 %
Oxidized Bitumen	kg	0,38	12,3 %	Generic data	0,36 12,3 %
Waste paper	kg	0,20	6,3 %	Generic data	0,19 6,3 %
Resin	kg	0,02	0,7 %	Generic data	0,02 0,7 %
Other	kg	0,21	6,9 %	Generic data	0,20 6,9 %
Total	kg	3,09	100 %		2,94 100 %

* Including 5% loss at construction site

Resource consumption

Material resources

Table 2

Material resources	Raw materia	Production	Building site	Use stage	Demolition	Transport	Total
New, renewable resources							
Timber (incl. bark) [m³]	kg	2,28	0,04	0,00	0,00	4,5E-08	2,31
Water (fresh) [kg]	kg	4,729	3,528	0,057	-	0,057	8,388
Air [kg]	kg	0,573	6,043	0,101	-	0,101	6,831
Other [kg]	kg	0,003	0,041	0,001	-	0,001	0,046
New, non-renewable resources							
Inert rock [kg]	kg	0,198	3,020	0,051	-	0,051	3,322
Crude oil [kg]	kg	1,061	0,090	7,48E-04	-	7,48E-04	1,251
Hard coal [kg]	kg	0,021	0,259	0,004	-	0,004	0,289
Natural gas [kg]	kg	0,100	0,126	0,002	-	0,002	0,235
Peat [kg]	kg	7,98E-04	0,113	0,002	-	0,002	0,117
Lignite [kg]	kg	0,023	0,033	5,52E-04	-	5,52E-04	0,058
Limestone [kg]	kg	0,007	0,041	7,01E-04	-	7,01E-04	0,050
Soil [kg]	kg	3,76E-04	0,019	3,18E-04	-	3,18E-04	0,020
Sodium chloride (rock salt) [kg]	kg	0,012	9,04E-05	1,45E-06	-	1,45E-06	0,012
Aluminum [kg]	kg	0,006	2,13E-05	3,60E-07	-	3,60E-07	0,006
Heavy spar [kg]	kg	0,003	7,35E-04	1,13E-05	-	1,13E-05	0,004
Iron [kg]	kg	0,003	6,75E-04	1,09E-05	-	1,09E-05	0,004
Other (ore without minerals and	kg	6,81E-04	0,002	3,72E-05	-	3,72E-05	0,003
Clay [kg]	kg	0,002	6,98E-04	1,16E-05	-	1,16E-05	0,003
Quartz sand [kg]	kg	3,56E-04	1,72E-04	2,76E-06	-	2,76E-06	5,64E-04
Gypsum [kg]	kg	4,19E-05	4,13E-04	6,99E-06	-	6,99E-06	4,73E-04
Nickel [kg]	kg	9,20E-05	1,59E-06	2,19E-08	-	2,19E-08	9,36E-05
Barium sulphate [kg]	kg	6,16E-05	2,76E-07	1,93E-14	-	1,93E-14	6,19E-05
Copper [kg]	kg	4,40E-05	1,11E-05	1,87E-07	-	1,87E-07	5,56E-05
Chromium [kg]	kg	3,01E-05	1,26E-05	2,11E-07	-	2,11E-07	4,31E-05
Unspecified [kg]	kg	0,086	0,122	0,002	-	0,002	0,212
Feedstock energy, renewable resources [MJ]							39,4
Feedstock energy, non-renewable resources [MJ]							14,7

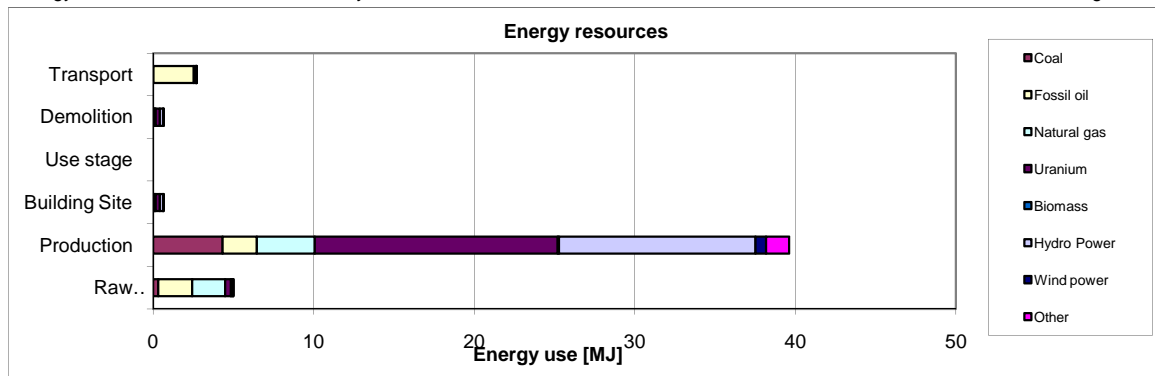
Land use and water resources

Land use has not been quantified. Water consumption is included in Table 2.

Energy resources

Energy carrier distribution for each life cycle fase

Figure 2



Energy consumption specified for the different energy carrier and life cycle stages

Table 3

	Unit	Raw materia	Production	Building Site	Use stage	Demolition	Transport	Total
Fossil energy								
Coal	MJ	0,311	4,316	0,073	0,00E+00	0,073	0,009	4,782
Fossil oil	MJ	2,126	2,140	0,019	0,00E+00	0,019	2,510	6,814
Natural gas	MJ	2,051	3,613	0,059	0,00E+00	0,059	0,143	5,925
Uranium	MJ	0,349	15,125	0,256	0,00E+00	0,256	0,013	15,999
Renewable energy								
Biomass	MJ	0,024	0,077	5,14E-06	0,00E+00	5,14E-06	6,64E-07	0,101
Hydro Power	MJ	0,098	12,231	0,207	0,00E+00	0,207	0,003	12,747
Wind power	MJ	0,009	0,663	0,011	0,00E+00	0,011	2,88E-04	0,695
Other	MJ	0,003	1,443	0,024	0,00E+00	0,024	2,55E-04	1,496
Total	MJ							48,56

* Electricity used for production in Norway is based on Nordic electricity grid mix (NORDEL)

Emissions and environmental impacts

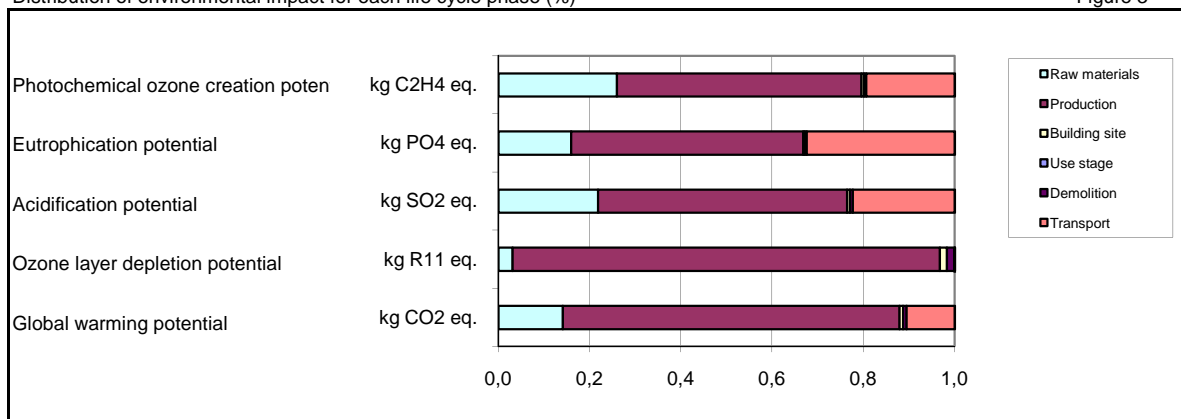
Environmental impacts

Table 4

Indicator	Unit	Raw materials	Production	Building site	Use stage	Demolition	Transport	Total
Global warming potential	kg CO ₂ eq.	0,291	1,521	0,016	0,00E+00	0,016	0,217	2,062
Ozone layer depletion potential	kg R11 eq.	1,36E-08	4,07E-07	6,91E-09	0,00E+00	6,91E-09	3,60E-10	4,35E-07
Acidification potential	kg SO ₂ eq.	0,002	0,004	4,75E-05	0,00E+00	4,75E-05	0,002	0,008
Eutrophication potential	kg PO ₄ eq.	1,53E-04	4,87E-04	3,73E-06	0,00E+00	3,73E-06	3,10E-04	9,57E-04
Photochemical ozone creation pote	kg C ₂ H ₄ eq.	1,59E-04	3,28E-04	3,16E-06	0,00E+00	3,16E-06	1,18E-04	6,11E-04

Distribution of environmental impact for each life cycle phase (%)

Figure 3



Emissions and waste

Table 5

	Unit	Raw materials	Production	Building site	Use stage	Demolition	Transport	Total
Emissions to air								
NH ₃ [g]	g	0,004	0,011	1,01E-04	-	1,01E-04	0,001	0,016
CO ₂ [g]	g	248,452	1610,733	17,987	-	17,987	211,762	2106,921
CO [g]	g	0,334	1,618	0,015	-	0,015	0,342	2,324
HCl [g]	g	0,003	0,032	5,35E-04	-	5,35E-04	2,37E-04	0,037
Hg [g]	g	5,07E-06	7,87E-06	1,32E-07	-	1,32E-07	1,75E-07	1,34E-05
CH ₄ [g]	g	1,476	2,000	0,032	-	0,032	0,180	3,721
N ₂ O [g]	g	0,008	0,034	3,61E-04	-	3,61E-04	0,003	0,046
NO _x [g]	g	1,146	3,659	0,028	-	0,028	2,378	7,238
NM VOC [g]	g	0,413	0,300	0,002	-	0,002	0,132	0,849
Particles [g]	g	0,045	0,455	0,004	-	0,004	0,040	0,547
Pb [g]	g	4,24E-05	1,89E-04	3,19E-06	-	3,19E-06	2,83E-06	2,41E-04
SO ₂ [g]	g	0,918	1,743	0,028	-	0,028	0,099	2,816
Emissions to water								
BOD [g]	g	0,118	0,001	1,11E-05	-	1,11E-05	2,34E-04	0,120
COD [g]	g	0,342	64,543	0,004	-	0,004	0,007	64,900
N [g]	g	0,034	0,079	4,91E-04	-	4,91E-04	2,13E-04	0,114
P [g]	g	0,002	0,007	4,21E-06	-	4,21E-06	6,78E-05	0,010
Waste								
Waste to landfill [kg]	kg	0,0864	1,8499	0,1782	-	0,0312	0,0112	2,1524
Hazardous waste [kg]	kg	0,0862	1,8459	0,0313	-	0,0313	0,0112	2,0014

Waste treatment of final product

Hunton Asphalt Vintett (Bitroc) is sorted as mixed waste on demolition site. The product shall be delivered to an authorized waste treatment plant for recovery. No organic waste may be landfilled after July 2009 (Norway), and the products is assumed to be entirely energy recovered.

Use of chemicals

Use of chemicals in the production process and in the final product is assessed according to guidelines for environmental information in SINTEF Technical Approval [6] and the methodology document for EcoProduct [7].

All priority substances according to list of priority substances [8] and REACH candidate list [9] are declared regardless of concentration.

In addition, substances giving EcoProduct score Red (bad or unacceptable) or White (average) are also

Chemicals in production process *):

Name	CAS	Amount [g]	Weight %	Process	Grouping according to EcoProduct
Acrylamide	79-06-01	0,00046	0,000015	Production of boards	1 CMR - effects

Chemicals in final product *)

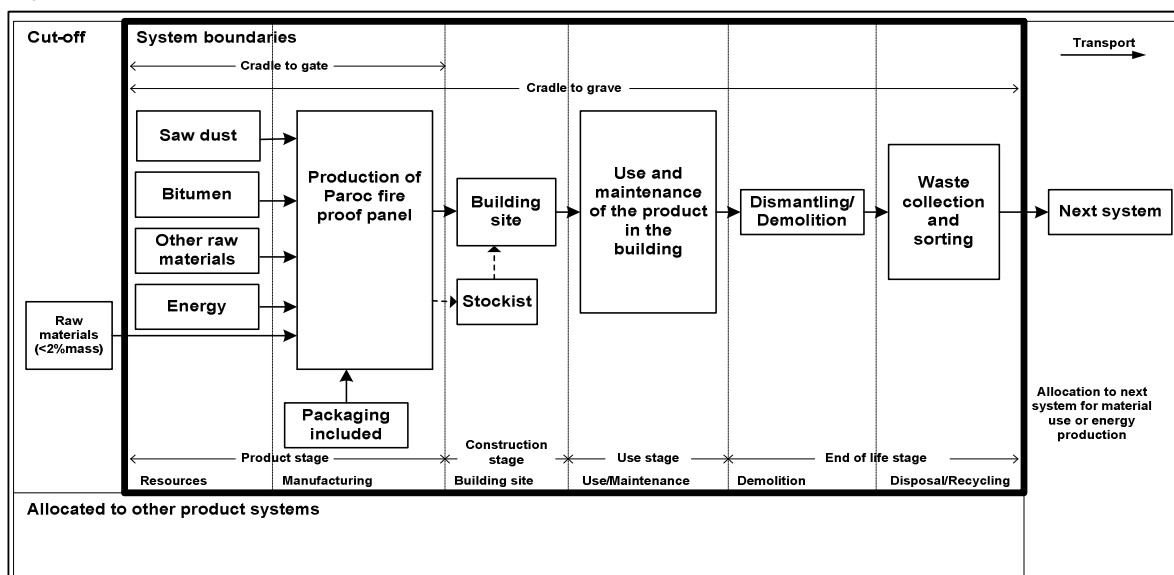
Name	CAS	Amount [g]	Weight %	Process	Grouping according to EcoProduct
PAH (max. 100 mg/kg bitumen)		0,0379	0,00123	Bitumen	1 CMR - effects
Sodium hydroxide	1310-73-2	2,284	0,07400	Resin	6 Harmful to health
Phenol	108-95-2	0,0685	0,00222	Resin	2 Toxic
Formaldehyde	50-00-0	0,0228	0,00074	Resin	1 CMR effects

*) Declared values are maximum amounts according to health and safety data sheets.

Methodology

System boundaries

Figur 4



References

- [1] NS-ISO 14025:2006, Miljømerker og deklarasjoner - Miljødeklarasjoner type III - Prinsipper og prosedyrer
- [2] ISO 21930:2007, Sustainability in building construction - Environmental declaration of building products
- [3] PCR NPCR10 - Product category rules for preparing an environmental product declaration of Building boards
- [4] Sintef Byggforsk (2011): "3 Environmental Product Declarations (EPD) of Hunton bitumen boards", LCA-report
- [5] EN 15251:2007, Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics
- [6] Sintef Byggforsk 2010 - Orientering til søkere om dokumentasjon av miljørelaterte egenskaper i SINTEF Teknisk Godkjenning
- [7] Strand-Hanssen 2008 - EcoProduct: Metodebeskrivelse 2.0, SINTEF Byggforsk oppdragsrapport
- [8] Prioritetsliste. Klima- og forurensningsdirektoratet oppdatert 24.02.2010, <http://www.miljostatus.no/Tema/Kjemikalier/Kjemikalier/Prioritetslisten/>
- [9] Candidate List of Substances of Very High Concern for authorisation, http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp
- [10] BKS, Building Research Design Guides - <http://bks.byggforsk.no/>, SINTEF Building and Infrastructure.,