

Product:

Product description:

This is a product specific EPD for Isola Mestertekk. Mestertekk is a one-layer roofing sheet for sloping and flat roofs, new built and rehabilitation.

Product specification

The product is made of natural bitumen free of tar, combined with thermoplastic elastomer, natural filler and granulate for UV protection and micrometer-thin foil. Raw materials are mixed separately at a specific range of temperature and successively reinforced with polyester fleece, coated with an aluminium foil. After calendaring and cooling, the roofing sheet is finished with light weight plastic films and slate granules

Materials	kg	%
Additives	0,22	4,62
Aluminium foil	0,03	0,62
Bitumen	2,55	52,42
Fire-, heat- and UV-stabilizers	0,07	1,42
Plastic - Polypropylene (PP)	0,01	0,15
Raw materials, Mineral	1,78	36,56
Tape	0,00	0,10
Textile - Polyester (PE)	0,20	4,11
Total	4,87	100,00

Packaging	kg	%
Packaging - Plastic	0,01	3,99
Packaging - Wood	0,13	96,01
Total incl. packaging	5,00	100,00

Technical data:

Weight: 4,6 kg/m²

Thickness: 3,8 mm

Market:

Norway and Europe

Reference service life, product

30 years

Reference service life, building

60 years

LCA: Calculation rules

Declared unit:

1 m² Isola Mestertekk

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

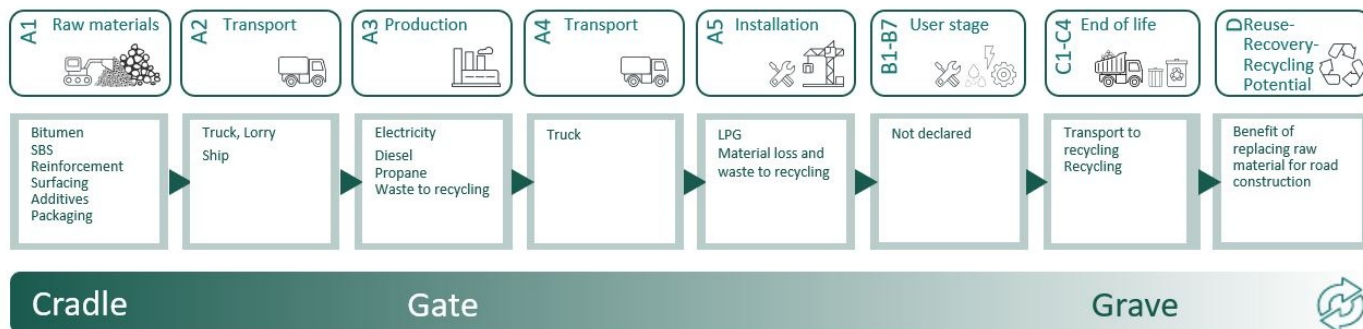
Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Additives	ecoinvent 3.6	Database	2019
Aluminium foil	ecoinvent 3.6	Database	2019
Bitumen	Eurobitume (2019)	Life Cycle Inventory	2019
Fire-, heat- and UV-stabilizers	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Wood	ecoinvent 3.6	Database	2019
Plastic - Polypropylene (PP)	ecoinvent 3.6	Database	2019
Raw materials, Mineral	ecoinvent 3.6	Database	2019
Tape	ecoinvent 3.6	Database	2019
Textile - Polyester (PE)	S-P-04186	EPD	2020

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	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	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



Additional technical information:

LCA: Scenarios and additional technical information














The following information describe the scenarios in the different modules of the EPD.

The product is produced in A3 and installed in A5, assuming a 2% material loss. LPG and electricity are used as energy sources during installation in A5. The packaging waste is treated appropriately. Module C1 is included but assumed to be zero, since the product contributes minimally to the total environmental load of a building demolition. Waste treatment of bituminous materials from installation (A5) and processing of building waste (C3) follow a 100% scenario, wherein all waste is assumed to be recycled for use as raw material in road asphalt production. The loads and benefits from substituting bitumen in road asphalt production are included in module D. Alternative scenarios for waste handling are used in an earlier version of this EPD. Documentation will be given on request.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, EURO 6 (kgkm)	36,7 %	300	0,043	l/tkm	12,90
Assembly (A5)					
	Unit	Value			
Propane, burned (kg)	kg/DU	0,17			
Waste bitumen sheet to recycling (kg)	kg/DU	0,02			
Waste treatment, packaging, pallet, EUR wooden pallet, single use (kg)	kg	0,13			
Waste treatment, packaging, plastic film (LDPE) (kg)	kg	0,01			
Transport to waste processing (C2)					
	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Ship, Ferry, Sea (kgkm)	50,0 %	163	0,034	l/tkm	5,54
Truck with trailer, EURO 6 (kgkm)	53,3 %	237	0,023	l/tkm	5,44
Waste processing (C3)					
	Unit	Value			
Waste, bitumen sheet to recycling (kg)	kg/DU	4,60			
Benefits and loads beyond the system boundaries (D)					
	Unit	Value			
Substitution of primary bitumen (kg)	kg	4,60			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 GWP-total	kg CO ₂ -eq	2,46E+00	2,26E-01	8,90E-01	0	1,77E-01	0,00E+00	0	-9,73E-01	
 GWP-fossil	kg CO ₂ -eq	2,40E+00	2,25E-01	6,97E-01	0	1,77E-01	0,00E+00	0	-9,73E-01	
 GWP-biogenic	kg CO ₂ -eq	-1,93E-01	9,33E-05	1,93E-01	0	6,19E-05	0,00E+00	0	-7,18E-06	
 GWP-luluc	kg CO ₂ -eq	2,52E-01	8,02E-05	6,26E-05	0	8,02E-05	0,00E+00	0	-4,07E-04	
 ODP	kg CFC11 -eq	1,80E-07	5,11E-08	1,39E-07	0	3,94E-08	0,00E+00	0	-8,05E-08	
 AP	mol H+ -eq	1,84E-02	6,48E-04	2,11E-03	0	3,00E-03	0,00E+00	0	-1,00E-02	
 EP-FreshWater	kg P -eq	2,15E-04	1,80E-06	3,10E-06	0	1,07E-06	0,00E+00	0	-2,17E-05	
 EP-Marine	kg N -eq	5,29E-03	1,28E-04	5,30E-04	0	7,40E-04	0,00E+00	0	-2,21E-03	
 EP-Terrestrial	mol N -eq	4,48E-02	1,43E-03	5,82E-03	0	8,23E-03	0,00E+00	0	-2,49E-02	
 POCP	kg NMVOC -eq	1,31E-02	5,49E-04	2,01E-03	0	2,23E-03	0,00E+00	0	-8,23E-03	
 ADP-minerals&metals ¹	kg Sb-eq	1,22E-05	6,23E-06	1,29E-06	0	2,24E-06	0,00E+00	0	-1,55E-06	
 ADP-fossil ¹	MJ	1,54E+02	3,41E+00	9,12E+00	0	2,59E+00	0,00E+00	0	-2,08E+02	
 WDP ¹	m ³	1,16E+02	3,30E+00	2,12E+00	0	1,38E+00	0,00E+00	0	-4,32E-01	







GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

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

Remarks to environmental impacts



Additional environmental impact indicators										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 PM	Disease incidence	3,06E-07	1,38E-08	2,36E-08	0	1,10E-08	0,00E+00	0	-2,88E-07	
 IRP ²	kgBq U235 -eq	5,59E-02	1,49E-02	3,75E-02	0	1,13E-02	0,00E+00	0	0,00E+00	
 ETP-fw ¹	CTUe	5,36E+01	2,53E+00	5,35E+00	0	1,73E+00	0,00E+00	0	-4,95E+01	
 HTP-c ¹	CTUh	1,32E-08	0,00E+00	2,25E-10	0	0,00E+00	0,00E+00	0	-6,62E-10	
 HTP-nc ¹	CTUh	4,55E-08	2,76E-09	7,05E-09	0	1,84E-09	0,00E+00	0	-9,97E-09	
 SQP ¹	dimensionless	4,55E+01	2,38E+00	1,24E+00	0	1,90E+00	0,00E+00	0	-3,45E+01	

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

"Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$ "

*INA Indicator Not Assessed




1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 PERE	MJ	5,27E+00	4,88E-02	5,78E-02	0	2,60E-02	0,00E+00	0	-3,80E-01	
 PERM	MJ	1,84E+00	0,00E+00	-1,77E+00	0	0,00E+00	0,00E+00	0	0,00E+00	
 PERT	MJ	7,12E+00	4,88E-02	-1,71E+00	0	2,60E-02	0,00E+00	0	-3,80E-01	
 PENRE	MJ	5,31E+01	3,41E+00	9,12E+00	0	2,59E+00	0,00E+00	0	-2,67E+01	
 PENRM	MJ	1,12E+02	0,00E+00	-2,25E-01	0	0,00E+00	0,00E+00	0	-1,81E+02	
 PENRT	MJ	1,57E+02	3,41E+00	8,89E+00	0	2,59E+00	0,00E+00	0	-2,08E+02	
 SM	kg	1,72E-01	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0	0,00E+00	
 RSF	MJ	1,10E-02	1,75E-03	1,38E-03	0	8,45E-04	0,00E+00	0	0,00E+00	
 NRSF	MJ	1,47E-02	6,24E-03	1,97E-02	0	2,27E-03	0,00E+00	0	0,00E+00	
 FW	m ³	4,63E-02	3,64E-04	6,28E-04	0	2,26E-04	0,00E+00	0	-1,08E-02	

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"






*INA Indicator Not Assessed

End of life - Waste										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 HWD	kg	1,04E-02	1,76E-04	6,49E-04	0	1,27E-04	0,00E+00	0	-6,44E-04	
 NHWD	kg	3,55E-01	1,66E-01	1,50E-01	0	1,36E-01	0,00E+00	0	-4,60E-02	
 RWD	kg	1,36E-03	2,32E-05	6,03E-05	0	1,79E-05	0,00E+00	0	-2,30E-03	

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

End of life - Output flow										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 CRU	kg	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0	0,00E+00	
 MFR	kg	2,75E-01	0,00E+00	2,27E-02	0	0,00E+00	4,60E+00	0	0,00E+00	
 MER	kg	2,25E-03	0,00E+00	1,26E-01	0	0,00E+00	0,00E+00	0	0,00E+00	
 EEE	MJ	9,33E-03	0,00E+00	8,80E-02	0	0,00E+00	0,00E+00	0	0,00E+00	
 EET	MJ	1,41E-01	0,00E+00	1,33E+00	0	0,00E+00	0,00E+00	0	0,00E+00	

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	5,48E-02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, Norway (kWh)	ecoinvent 3.6	24,33	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

Not relevant, the product is intended for outdoor use.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO ₂ -eq	2,61E+00	2,26E-01	6,94E-01	0	1,77E-01	0,00E+00	0	-9,73E-01

GWPIOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Bibliography

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	Program operator and publisher The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway	Phone: +47 977 22 020 e-mail: post@epd-norge.no web: www.epd-norge.no
	Owner of the declaration: Isola AS Prestemoen 9, 3946 Porsgrunn	Phone: +47 98 89 18 86 e-mail: t.risberg@isola.no web: www.isola.no
	Author of the Life Cycle Assessment LCA.no AS Dokka 6A, 1671	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	Developer of EPD generator LCA.no AS Dokka 6B,1671 Kråkerøy	Phone: +47 916 50 916 e-mail: post@lca.no web: www.lca.no
	ECO Platform ECO Portal	web: www.eco-platform.org web: ECO Portal