

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 14040, ISO 14044 and EN 15804 + A1:2013

Owner of the declaration:	Dekningsmaterie ll AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
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Sørlandsmatta blasting mats

Dekningsmaterie ll AS

www.epd.norge.no

DEKNINGSMATERIELL



Generell information

Product:

Sørlandsmatta sprengingsmatte

Program operator:

The Norwegian EPD Foundation
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Declaration number:

NEPD-3295-1939-EN

ECO Platform reference number:
Product Category Rules:

CEN Standard EN 15804 serves as core PCR
Part B: NPCR 024:2016 Explosives and Initiation Systems

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 mat with dimensions 3,2m x 6m, produced and installed at site.

Declared unit with option:

A1-A3, A4, A5

Functional unit:
Verification:

The CEN Norm EN 15804 serves as the core PCR.
Independent verification of the declaration and data,
according to ISO14025:2010

internal external

Third party verifier:

Alexander Borg

Alexander Borg, Asplan Viak AS

Owner of the declaration:

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Manufacturer:

Dekningsmateriell AS
Hans Thornesvei 66
4846 Arendal

Place of production:

Arendal, Norge

Management system:
Organisation no:

980 622 959

Issue date:

03.01.2022

Valid to:

03.01.2027

Year of study:

2021

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

The EPD has been worked out by:

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aa|se

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Approved

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Product

Product description:

Sørlandsmatta is a blasting mat made of used truck tires bound together with galvanised steel wire and steel chain loops. The mats are used as protection against flying rocks and dust during blasting. Sørlandsmatta is made such that most of the forces are taken up by the steel wire. This protects the rubber from tearing apart, so that the mats can be used many times.

Market:

Nordic countries

Technical data:

Dimensions	3,2m x 6m
Weight	Ca 1390 kg
Area	19,2 m ²

Materials	kg	%
Tire treads from used tires	1284	92,3 %
Steel wire	72,2	5,2 %
Steel loops	31,6	2,3 %
Wire locks	3,5	0,3 %
Total mass	1391	100 %

Conversion factor to obtain results per ton mat

The mat can also be made with different dimensions. To convert the results to represent environmental impacts per ton mat, the following conversion factor can be used: **0,7189**.

*Environmental impact per ton mat = impact for declared unit * conversion factor*

Product variation and calculation of averages

Sørlandsmatta can be made with 16 mm or 18 mm steelwire. Different sizes of steel loops can also be used. The number of loops will vary, depending on the dimensions of the tire treads. The calculation is based on the average mass of steel wire and steel loops used in a mat. Calculated GWP-value for A1-A3 will maximum vary by about +/- 7,5 %, with different combinations of dimensions and number of steel loops used. For instance, if the largest dimensions are chosen for both wire and loops, at the same time as maximum number of steel loops are required, the GWP value will increase with about 7,5 %, and vice versa.

LCA: Calculation rules

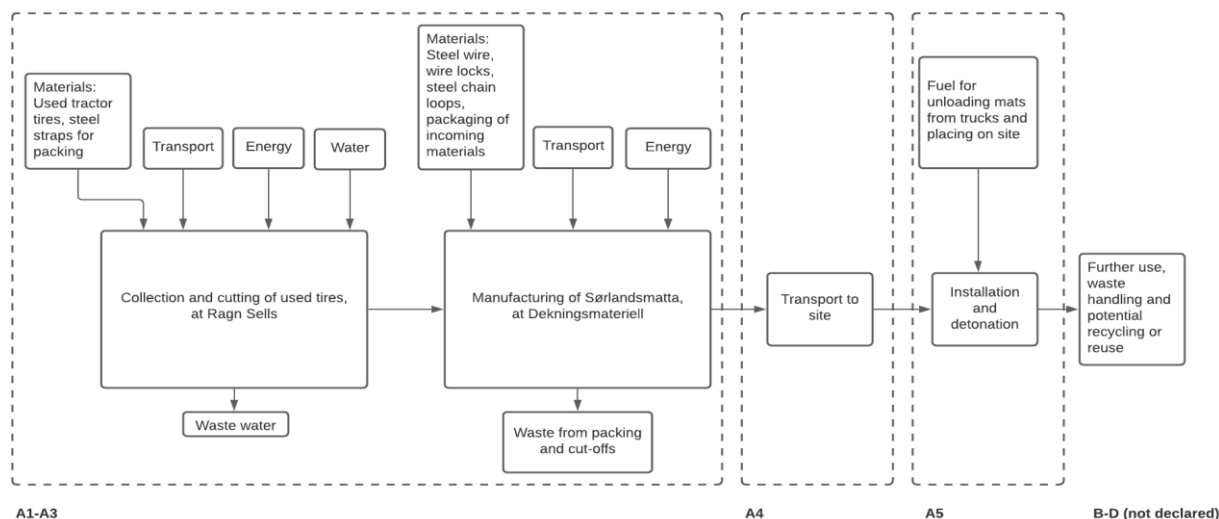
Declared unit:

1 blasting mat of the type "Sørlandsmatta", 3,2m x 6m.

System boundary:

A1-A3, A4, A5

The mats will not be destroyed during blasting, and can therefore be used many times. The service life will depend on how frequent the mats are used, in which environment they are used, and whether they are treated according to the recommendations. Estimated from 2 to 10 years. Thus module B is not declared. This is in accordance with NPCR 024.



Data quality:

Data for collecting used tires by Ragn Sells and production by Dekningsmaterieill is based on specific data for one year of production, from September 2020 to August 2021. Generic data is from Ecoinvent v3.7 and SimaPro v.9.2. All generic data is <10 years old. Characterisation factors according to EN15804:2012 + A1 2013.

Cut-off criteria:

All major raw materials and all the essential energy is included. The production process for raw materials and energy flows that are included with very small amounts (<1%) are not included. This cut-off rule does 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, as long as the difference in economic value is less than 25 %, then economic allocation is used. Effects of primary production of recycled materials allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to the user of the recycled material. For instance, the impacts related to production of the tractor tires in the previous life cycle are not included in this analysis, while the impacts from cutting the tires into tire treads, packing and transport is included.

LCA: Scenarios and additional technical information

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

The mats are transported to site by trucks. A transport scenario to Oslo is chosen for the A4 scenario. At site, the mats are either tipped off the trucks, or loaded off by wheel loaders. The mats are not destroyed during blasting. Thus no waste is made during the detonation/blasting phase.

The mats can be used several times over many years before waste treatment is necessary. After end of life, the tire treads can be used again in new blasting mats. It is estimated that about 60 % of the tire treads can be used again if the mat is delivered before it is ripped completely apart. This is however not included as a scenario (in module D), as this is not currently the most common practice.

Transport from manufacturing site to use site in Oslo (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption
Truck, 16-32 t	36,67 % (Ecoinvent process)	Euro 6	270	0,03 l/tkm

Installation on site (A5-1)

As a conservative approach, it is assumed that the mats are loaded off the transportation trucks by wheel loaders every time, even though they often are tipped directly off from the trucks. It is assumed that the wheel loaders use 2 minutes per mat, included detour/repositioning. A generic process from Ecoinvent for operation of a building machine is used. In addition to use and boring of diesel, the process contains materials in the machine, as well as use of motor oil. The equivalent amount of diesel burned in two minutes of operation in this Ecoinvent process is 0,684 kg, or 0,781 l.

	Value	Unit
Machine operation, diesel, >= 74,57 kW	2	min

Detonation (A5-2)

No additional energy use or auxillary materials are required during detonation and blasting. The mats are normally not leaving any waste after blasting, since the steel wire protects the rubber from tearing apart.

LCA: Results

The LCA results show environmental impacts, resource use and outflows calculated according to EN 15804: 2012 + A1: 2013. Results are given per piece of mat with standard dimensions (3,2m x 6m). For converting the results into impacts per ton mat, the results must be multiplied with the conversion factor 0,7189.

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

Product stage		Assembly stage				Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Installation	Use during detonation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5-1	A5-2	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	x	x	x	MND	MND	MND	MNR	MNR	MNR	MND	MNR	MND	MND	MND	MND

Environmental impact

Parameter	Unit	A1-A3	A4	A5-1	A5-2
GWP	kg CO ₂ -eq.	3,64E+02	6,09E+01	2,72E+00	0,00E+00
ODP	kg CFC11-eq.	2,46E-05	1,11E-05	4,82E-07	0,00E+00
POCP	kg C ₂ H ₄ -eq.	1,38E-01	6,98E-03	4,02E-04	0,00E+00
AP	kg SO ₂ -eq.	1,71E+00	1,44E-01	1,35E-02	0,00E+00
EP	kg PO ₄ ³⁻ -eq.	2,13E-01	1,42E-02	2,01E-03	0,00E+00
ADPM	kg Sb-eq.	1,39E-02	2,26E-04	1,12E-06	0,00E+00
ADPE	MJ	3,82E+03	9,12E+02	3,84E+01	0,00E+00

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

Resource use

Parameter	Unit	A1-A3	A4	A5-1	A5-2
RPEE	MJ	3,93E+02	1,27E+01	2,02E-01	0,00E+00
RPEM	MJ	6,89E+01	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	4,62E+02	1,27E+01	2,02E-01	0,00E+00
NRPE	MJ	4,03E+03	9,32E+02	3,87E+01	0,00E+00
NRPM	MJ	1,52E+01	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	4,04E+03	9,32E+02	3,87E+01	0,00E+00
SM	kg	1,30E+03	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	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
W	m ³	4,49E+00	9,50E-02	1,39E-03	0,00E+00

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE 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; W Use of net fresh water

End of life - Waste

Parameter	Unit	A1-A3	A4	A5-1	A5-2
HW	kg	7,83E-02	2,43E-03	1,08E-04	0,00E+00
NHW	kg	1,52E+02	4,55E+01	4,59E-02	0,00E+00
RW	kg	1,23E-02	6,38E-03	2,71E-04	0,00E+00

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life - Output flow

Parameter	Unit	A1-A3	A4	A5-1	A5-2
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	1,05E+01	0,00E+00	0,00E+00	0,00E+00
MER	kg	4,01E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

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

Additional Norwegian requirements

Electricity

For electricity use in the manufacturing phase, an average Norwegian market mix including imports is used. Emission factor from Ecoinvent v3.7.

Data source	Emission factor	Unit
Electricity, low voltage, NO	0,0229	kg CO2-ekv/kWh

Dangerous substances

Since the tire treads in the blasting mats are made of used truck tires, the manufacturer does not have documentation on the exact content in the tire treads. The tires are usually 1-2 years old when they are collected. Hence, the content of the tires is in line with current laws and regulations. In addition, random sampling from the collected tires have been analyzed. This declaration is therefore based on the random sampling of used tires collected by Ragn Sells. The samples are analyzed for PCB and heavy metals. Hence, the results are only showing any content of PCB or single metals (elements), not any compounds that the metals might be a part of.

The table below only shows detected substances listed on the REACH Candidate list or the Norwegian priority list. It is not possible to rule out that the metals might be a part of any compounds listed.

Tires are not classified as dangerous waste. However, used tires and thus used blasting mats is forbidden to deposit and must be delivered to an approved waste facility.

- The product contains no substances given by the REACH Candidate list or the Norwegian priority list
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- The product contain dangerous substances, more then 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskiften, Annex III), see table.

Name (substances detected in random samples)	CAS no.	Concentration (tire treads only)
Lead, Pb*	7439-92-1	24 mg/kg = 0,0024 weight-%
Cadmium, Cd*	7440-43-9	1,4 mg/kg = 0,00014 weight-%

*The substances are detected in random samples from the collected tires. The values can therefore vary for every tire tread. Note that the concentrations are given for the tire treads, not the entire blasting mat. The concentrations for the whole blasting mat will be substantially lower.





The table is only showing detected heavy metals that are listed on the Candidate list or the Priority list. A complete analysis report is available by request.

Indoor environment

Not relevant. The product does not affect any indoor environment.

Bibliography

NS-EN ISO 14025:2010	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
NS-EN ISO 14040:2006	<i>Environmental management - Life cycle assessment - Principles and framework</i>
NS-EN ISO 14044:2006	<i>Environmental management - Life cycle assessment - Requirements and guidelines</i>
EN 15804:2012+A1:2013	<i>Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products</i>
Ecoinvent v3.7	<i>Allocation, cut-off by classification, Swiss centre of Life Cycle Inventories</i>
NPCR Part A:	<i>EPD Norge, Product category rules, Part A: Construction products and services, 2017</i>
NPCR Part B:	<i>NPCR 024:2016 Explosives and Initiation Systems</i>
Skullestad, Julie Lyslo (2021)	<i>LCI/LCA-report for Blasting Mats Sørlandsmatta, Aase Teknikk AS</i>

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