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The Norwegian EPD Foundation

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Saint-Gobain Byggevarer as
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-1514-512-EN
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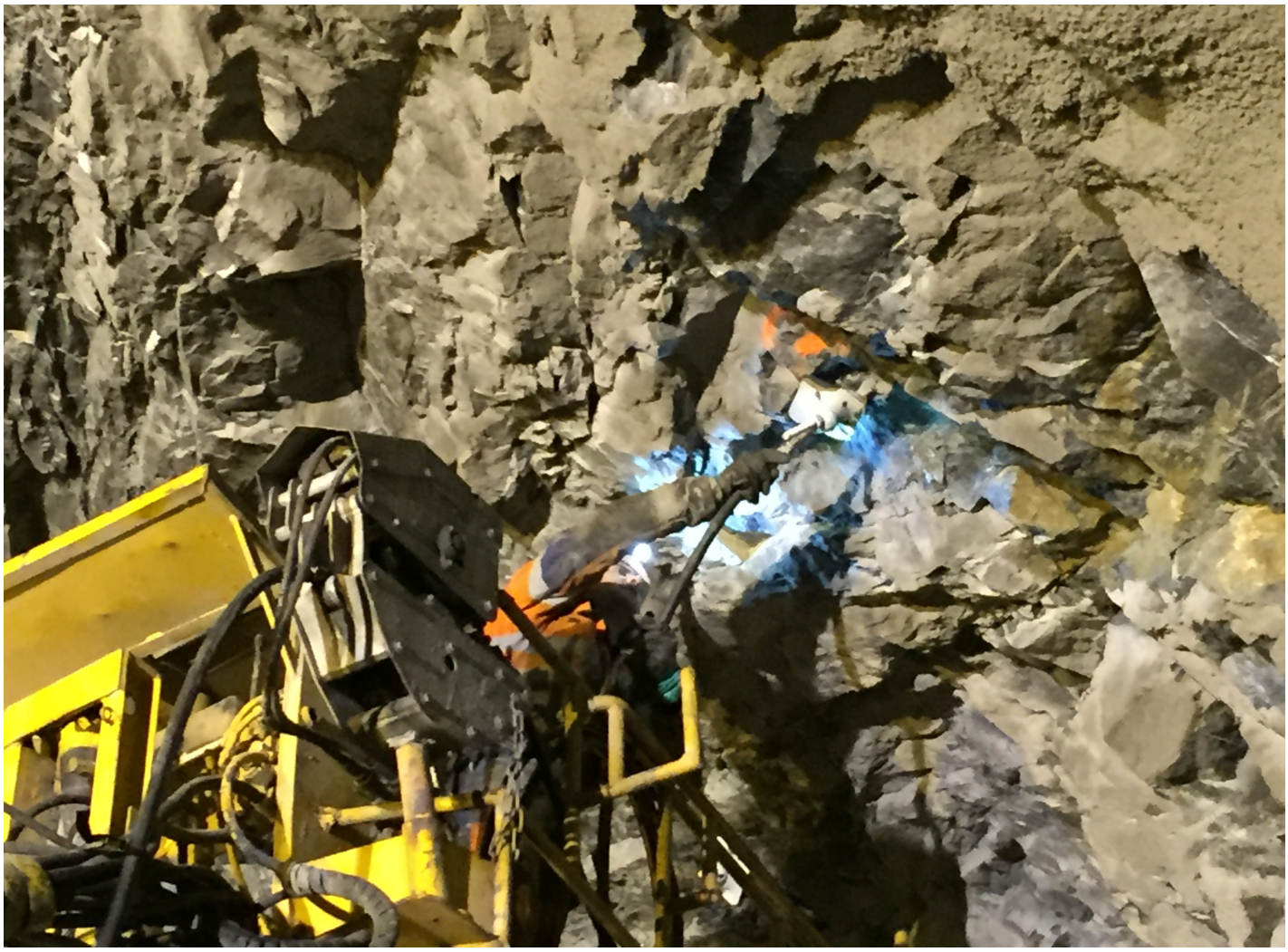
Issue date:	21.02.2018
Valid to:	21.02.2023

weber Bolt, dry anchoring mortar

Saint-Gobain Byggevarer as

www.epd-norge.no



General information

Product:

weber Bolt, dry anchoring mortar

Owner of the declaration:

Saint-Gobain Byggevarer as
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Program operator:

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Manufacturer:

Saint-Gobain Byggevarer as

Declaration number: NEPD-1514-512-EN

Place of production:

Saint-Gobain Weber Trondheim, Norway

ECO Platform reference number:

Management system:

ISO 9001, ISO 14001

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR
Requirements on the EPD for Mineral factory-made mortar.

Organisation no:

940 198 178

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.

Issue date: 21.02.2018

Valid to: 21.02.2023

Declared unit:

1 kg weber Bolt, dry anchoring mortar

Year of study:

2018

Declared unit with option:

A1,A2,A3,A4

Comparability:

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

Functional unit:

Author of the Life Cycle Assessment:

The declaration is developed using EPDGen-Version 1.1
Approval:
Company specific data are:

Collected/registered by:	Line Holaker
Internal verification by:	Cecilie Evju

Verification:

Independent verification of data, other environmental information and the declaration according to ISO14025:2010, § 8.1.3 and § 8.1.4

External

Third party verifier:

Sign

Senior Research Scientist, Anne Rønning

(Independent verifier approved by EPD Norway)

Approved:

Sign

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

weber Bolt is an expanding chloride free anchoring premix mortar based on cement, sand, and additives. The mortar expands and eliminates shrinkage in the plastic phase. Weber Bolt is designed for anchoring coated/non-coated bolts. Weber Bolt can be used both indoors and outdoors.

Product specification

The composition of the product is described in the following table:

Materials	
Binder	30-60%
Aggregate	30-60%
Packaging	2,3%
Additives	<0,5%

Technical data:

weber Bolt is tested according to EN 1504-6.
Compressive strength:
1 day: ~30 MPa, 7 days: ~45 MPa, 28 days: ~55 MPa.
Reaction to fire: Euroclass A1.
Pull-out strength: <0,6 mm at 75 kN load.
The production of weber Bolt is certified according to EN 1504-6.
For further information, see www.weber-norge.no

Market:

Norway

Reference service life, product

Reference service life, building

LCA: Calculation rules

Declared unit:

1 kg weber Bolt, dry anchoring mortar

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. 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. 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:

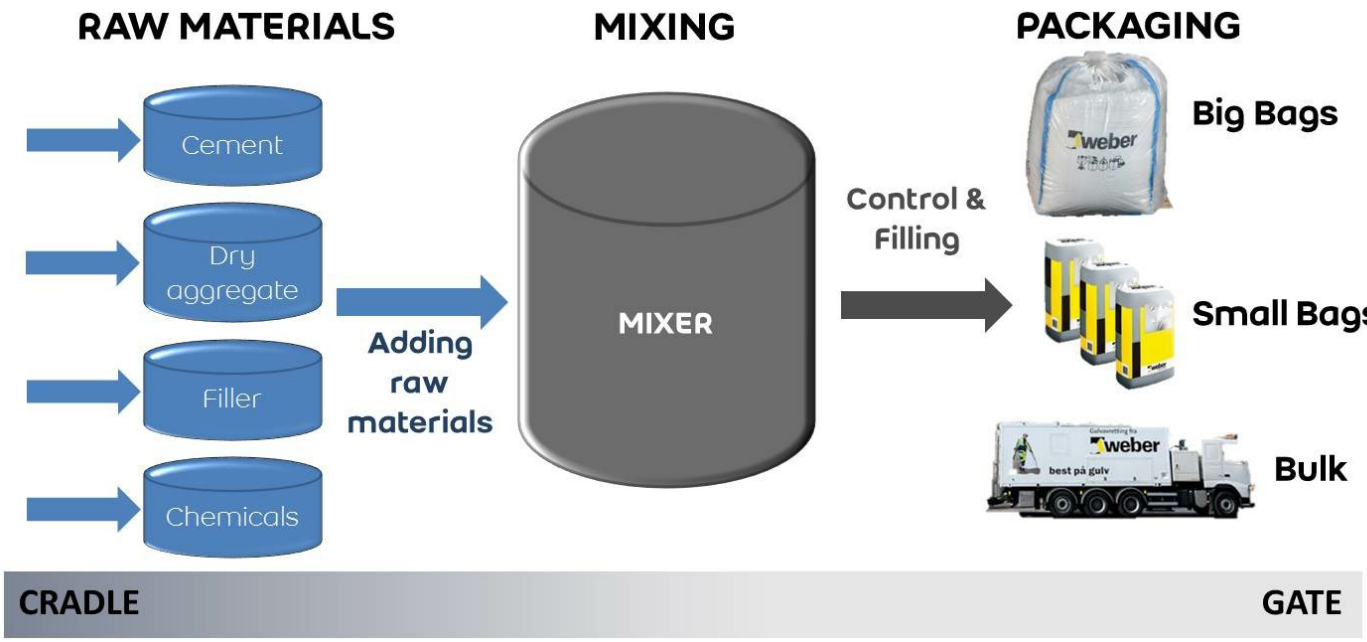
Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other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

Materials	Source	Data quality	Year
Packaging	0	0	0
Packaging	APME	European Average	0
Chemicals	Chemicals below cut-off	No data	0
SCM	0	Waste	0
Aggregate	Østfoldforskning	Database	2012
Cement	NEPD 210, 13	EPD	2012

System boundary:

All processes from raw material extraction to product from the factory gate are included in the analysis (A1-A3). In addition, transportation to a central warehouse placed in accordance with guidelines issued by the EPD Norway (A4) is included.

The flow chart below illustrates the system boundaries for the A1 to A3 part of the analysis.



Additional technical information:

1,6 kg dry mortar gives approximately 1 liter of final product. The remaining powder is classified as hazardous waste. Cured material is inactive and not classified as hazardous waste and may be disposed as construction waste to disposal or recycling. The packaging properly emptied is not classified as hazardous waste.

LCA: Scenarios and additional technical information

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

Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	53,0 %	Truck, EURO 5	50	0,020216	l/tkm	1,01
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Assembly (A5)

.	Unit	Value
Auxiliary	kg	
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
Output materials from waste treatment	kg	
Dust in the air	kg	
VOC emissions	kg	

Use (B1)

.	Unit	Value

Maintenance (B2)/Repair (B3)

.	Unit	Value
Maintenance cycle*	.	
Auxiliary	kg	
Other resources	kg	
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
VOC emissions	kg	

Replacement (B4)/Refurbishment (B5)

.	Unit	Value
Replacement cycle*		
Electricity consumption	kWh	
Replacement of worn parts		

* Described above if relevant

Operational energy (B6) and water consumption (B7)

.	Unit	Value
Water consumption	m^3	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

End of Life (C1, C3, C4)

.	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	
Energy recovery	kg	
To landfill	kg	

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck					l/tkm	
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Benefits and loads beyond the system boundaries (D)

LCA: Results

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

Product stage			Construction installation stage	User stage								End of life stage				.	Beyond the system bondaries
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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	.	MND

Environmental impact

Parameter	Unit	A1	A2	A3	A4
GWP	kg CO_2 -eq	4,19E-01	1,08E-02	3,09E-02	4,23E-03
ODP	kg CFC11 -eq	8,86E-09	2,03E-09	7,23E-09	8,00E-10
POCP	kg C_2H_4-eq	5,86E-05	1,96E-06	9,59E-06	7,50E-07
AP	kg SO_2 -eq	3,63E-04	6,01E-05	1,03E-04	1,49E-05
EP	kg PO_4^{3-} -eq	1,43E-03	1,31E-05	1,62E-05	3,10E-06
ADPM	kg Sb -eq	1,90E-07	1,33E-08	1,79E-08	9,35E-09
ADPE	MJ	2,38E+00	1,58E-01	5,72E-01	6,46E-02

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

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

Resource use

Parameter	Unit	A1	A2	A3	A4
RPEE	MJ	1,83E+00	1,67E-03	8,65E-02	9,93E-04
RPEM	MJ	1,07E+00	4,50E-04	1,31E-03	3,04E-04
TPE	MJ	2,90E+00	2,12E-03	8,78E-02	1,30E-03
NRPE	MJ	2,46E+00	1,61E-01	5,78E-01	6,59E-02
NRPM	MJ	1,66E-02	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	2,48E+00	1,61E-01	5,78E-01	6,59E-02
SM	MJ	6,54E-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	2,75E-01	0,00E+00	0,00E+00	0,00E+00
W	m^3	5,41E-01	8,65E-05	7,10E-04	5,88E-05

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

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

End of life - Waste

Parameter	Unit	A1	A2	A3	A4
HW	kg	1,57E-06	6,21E-08	2,79E-05	5,00E-08
NHW	kg	6,27E-02	8,50E-03	3,48E-03	6,53E-03
RW	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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

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

End of life - Output flow

Parameter	Unit	A1	A2	A3	A4
CR	kg	0,00E+00	0,00E+00	1,54E-02	0,00E+00
MR	kg	2,32E-04	0,00E+00	5,37E-04	0,00E+00
MER	kg	5,73E-05	0,00E+00	2,13E-06	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*10-3 = 0,009

Additional Norwegian 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	Data source	Amount	Unit
El-mix, Norway (kWh)	Ecoinvent 3	25,30	g CO2-ekv/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list. The product is classified as hazardous waste, see table.

Name	CASNo	Amount
Portland Cement	65997-15-1	30-60%

Indoor environment

The product has no impact on the indoor environment.

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007 Sustainability in building construction - Environmental declaration of building products.
ecoinvent v3, Alloc Rec, Swiss Centre of Life Cycle Inventories.
Iversen et al., (2017) EPD generator v2.0 - Background information for system verification, OR 10.17, Østfoldforskning, Fredrikstad.

Product Category Rules for Environmental Product Declarations: Institut Bauen und Umwelt e.V. (IBU): Requirements on the EPD for Mineral factory-made mortar.

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