

Product

Product description:

This EPD represents several similar products with <10% variation in A1-A3 GWP-total and is based on a representative product. Products included are weber ML 5 P Frost Masonry Mortar Mutus, Pallas, Pudas, Ropis and Suomus; and ML 5 PT Frost Tight Masonry Mortar Mutus, Pallas, Pudas, Ropis and Suomus.

weber ML 5 P colored Frost Masonry Mortar (weber ML 5 P Värillinen pakkasmuurauslaasti) is coloured frost mortar for masonry of clay and calcium silicate masonry units in facades under winter conditions up to -15°C. weber ML 5 PT colored Frost Tight Masonry Mortar (weber ML 5 PT Värillinen pakkastiivislaasti) is colored frost tight mortar developed for masonry of clay and calcium silicate masonry units in facades exposed to strong slanting rain under winter conditions. It is suitable for e.g. sites located on banks and shore lines, in open places or where higher than usual protection against weather stress is desired for the structure. The products can also be used for pointing brick structures when the depth of the mortar joint is at least 30 mm and the water absorption of the masonry unit is sufficient. In this case, the work instructions for the pointing mortar product data sheet apply. Compressive strength class M5. Hand applied. Delivered in 1000 kg big bags. GTIN 6415990125277, 6415990124768, 6415910011062, 6415990125307, 6415910016722, 6415990125420, 6415990125437, 6415990125406, 6415990125475, 6415910016739.

Product specification

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

Materials	Value	Unit
Binder	10-20	%
Filler	75-95	%
Additives	0-5	%
Packaging, PP	0,0014	kg

Technical data:

weber ML 5 P Coloured Frost masonry mortar and weber ML 5 PT Coloured Frost tight mortar meet the requirements of SFS-EN 998-2:2016 (Designed, general purpose masonry mortar for internal and external applications in structural masonry).

Water requirement: 3,0-3,2L / 25kg

More information in: www.fi.weber/muuraus-ja-rakennelaastit/varilliset-ja-erikoismuurauslaastit/weber-ml-5-p-varillinen-pakkasmuurauslaasti and www.fi.weber/muuraus-ja-rakennelaastit/varilliset-ja-erikoismuurauslaastit/weber-ml-5-pt-varillinen-pakkastiivislaasti

Market:

Nordic and Baltic countries

Reference service life, product

The reference service life of the product is similar to the service life of the building.

Reference service life, building

60 years

LCA: Calculation rules

Declared unit:

1 kg weber ML 5 P colored Frost Masonry Mortar, weber ML 5 PT colored Frost Tight Mortar Mutus, Pallas, Pudas, Ropis and Suomus

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. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different 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
Aggregate	ecoinvent 3.6	Database	2019
Filler	ecoinvent 3.6	Database	2019
Packaging	ecoinvent 3.6	Database	2019
Pigments	ecoinvent 3.6	Database	2019
Additives	ecoinvent 3.6	Database	2020
Cement	NEPD-3758-2695-EN	EPD	2022

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

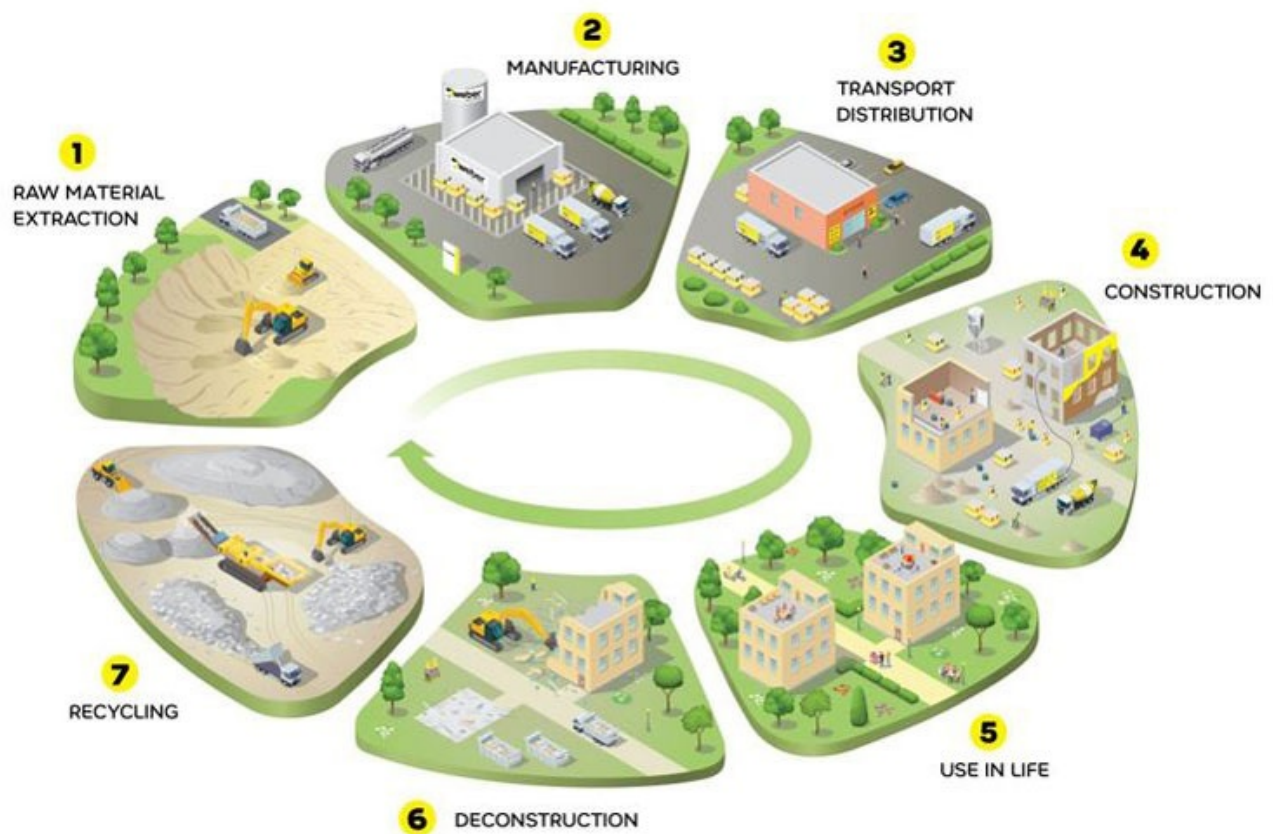
System boundary:

All processes from raw materials extraction to product transportation to the building site, assembly as well as end of life stage and phases beyond the system boundary (A1-A5, C1-C4, D) are included in the analysis.

The basic production process comprises of mixing raw materials together. Ready mixed product is then packed into bags for delivery. At assembly phase, water is added according to the instructions and it is mixed. Stage B is not considered. When building is de-constructed at the end-of-life, the structure with mortar integrated into it are crushed. 90% of crushed material is recycled and used to replace natural gravel in soil construction, remaining 10% being disposed to landfill.

System boundaries (cradle-to-gate with options) are illustrated in the picture below.

Higher than 10% variation of core environmental indicators of specific products compared to the representative result reported in this EPD in A1-A3: GWPbiogenic -22% to 1%, GWPluluc -2% to 2455%.



Additional technical information:

The LCA calculation has been made taking into account the fact that during the manufacturing process 100% renewable electricity is used. This 100% renewable electricity bought is evidenced by Guarantee of Origin certificates (GOs) from LOS, valid for the study year (2022) and after.

LCA: Scenarios and additional technical information

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

The results of stage A4 (transportation of product) in the table of this EPD refer to transportation in Finland (average distance 2022). This product may also be delivered to the countries in the table "Additional A4 information". In order to adapt the impact of transportation to these countries, A4 figures from this EPD shall be multiplied by the multiplication factors below.














At installation stage, it is assumed that mixing is done by electric mixer. Electricity mix used is that of Finland. Material loss is considered to be 5%.

At end of life stage, it is assumed that all demolition waste is collected and 90% of crushed building material is recycled and 10% is disposed into landfill. Transport distance to processing is estimated to be 30 km.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 5 (km)	53,3 %	177	0,023	l/tkm	4,07
Transport from production place to user (A4)	Unit	Value			
Tullinge, Sweden (truck / ferry 560 km)	Multiplication factor GWP/A4	3,68			
Lillestrom, Norway (truck / ferry 1050 km)	Multiplication factor GWP/A4	6,46			
Karlsunde, Denmark (truck / ferry 1215 km)	Multiplication factor GWP/A4	7,39			
Tallinn, Estonia (truck / ferry 193 km)	Multiplication factor GWP/A4	1,19			
Riga, Latvia (truck / ferry 494 km)	Multiplication factor GWP/A4	2,89			
Kaunas, Lithuania (truck / ferry 760 km)	Multiplication factor GWP/A4	4,40			
Assembly (A5)	Unit	Value			
	kg	0,00			
Electricity, Finland (kWh)	kWh/DU	0,00			
Product loss during installation (percentage)	Units/DU	0,05			
Water, tap water (L)	kg/DU	0,13			
De-construction demolition (C1)	Unit	Value			
Demolition of building per kg product (kg)	kg/DU	1,00			
Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 5 (km)	53,3 %	30	0,023	l/tkm	0,69
Waste processing (C3)	Unit	Value			
Waste treatment of product after demolition (kg)	kg/DU	0,90			
Disposal (C4)	Unit	Value			
Disposal of product in landfill (kg)	kg/DU	0,10			
Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of primary aggregates with crushed recycled inert products (kg)	kg/DU	0,90			

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	1,86E-01	1,61E-02	1,13E-02	4,00E-03	2,73E-03	6,48E-04	8,22E-04	-2,10E-03	
 GWP-fossil	kg CO ₂ -eq	1,79E-01	1,61E-02	1,09E-02	4,00E-03	2,73E-03	6,39E-04	8,20E-04	-2,06E-03	
 GWP-biogenic	kg CO ₂ -eq	7,51E-03	6,60E-06	3,80E-04	7,50E-07	1,12E-06	5,52E-06	9,58E-07	-4,11E-05	
 GWP-luluc	kg CO ₂ -eq	4,36E-05	4,70E-06	8,45E-06	3,15E-07	7,96E-07	8,84E-07	2,02E-07	-1,39E-06	
 ODP	kg CFC11 -eq	9,51E-09	3,72E-09	8,59E-10	8,64E-10	6,30E-10	1,26E-10	3,11E-10	-3,75E-10	
 AP	mol H+ -eq	7,20E-04	6,76E-05	4,59E-05	4,19E-05	1,15E-05	5,17E-06	7,30E-06	-1,85E-05	
 EP-FreshWater	kg P -eq	2,17E-06	1,23E-07	1,48E-07	1,46E-08	2,08E-08	4,04E-08	9,30E-09	-5,48E-08	
 EP-Marine	kg N -eq	3,77E-04	2,03E-05	2,19E-05	1,85E-05	3,45E-06	1,52E-06	2,71E-06	-6,43E-06	
 EP-Terrestrial	mol N -eq	2,45E-03	2,25E-04	1,55E-04	2,00E-04	3,81E-05	1,75E-05	2,99E-05	-7,56E-05	
 POCP	kg NMVOC -eq	5,12E-04	7,23E-05	3,53E-05	5,57E-05	1,23E-05	4,68E-06	8,56E-06	-2,00E-05	
 ADP-minerals&metals ¹	kg Sb -eq	1,62E-06	2,75E-07	1,05E-07	6,14E-09	4,66E-08	8,11E-09	7,39E-09	-1,83E-07	
 ADP-fossil ¹	MJ	1,07E+00	2,50E-01	9,17E-02	5,51E-02	4,24E-02	1,98E-02	2,26E-02	-3,49E-02	
 WDP ¹	m ³	1,04E+01	1,92E-01	1,64E+00	1,17E-02	3,25E-02	2,19E+00	1,39E-01	-1,63E+00	

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

Product hardens after 5 to 6 hours from adding water and can then be disposed of as construction waste.

Additional environmental impact indicators										
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D	
 PM	Disease incidence	4,90E-09	1,42E-09	6,17E-10	5,07E-09	2,40E-10	8,30E-11	1,56E-10	-3,95E-10	
 IRP ²	kgBq U235 -eq	3,67E-03	1,09E-03	7,00E-04	2,40E-04	1,85E-04	3,33E-04	1,03E-04	-3,20E-04	
 ETP-fw ¹	CTUe	2,15E+00	1,83E-01	1,34E-01	3,01E-02	3,10E-02	1,41E-02	1,23E-02	-3,59E-02	
 HTP-c ¹	CTUh	3,60E-11	0,00E+00	2,00E-12	1,00E-12	0,00E+00	1,00E-12	1,00E-12	-2,00E-12	
 HTP-nc ¹	CTUh	9,34E-10	1,77E-10	7,00E-11	2,80E-11	3,00E-11	1,30E-11	9,00E-12	-4,40E-11	
 SQP ¹	dimensionless	3,23E-01	2,87E-01	5,29E-02	6,69E-03	4,86E-02	1,12E-02	8,69E-02	7,91E-02	

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 = Potential Soil Quality Index (dimensionless)

"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
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	1,99E-01	3,15E-03	1,62E-02	3,00E-04	5,34E-04	1,02E-02	8,08E-04	-8,16E-03	
 PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 PERT	MJ	1,99E-01	3,15E-03	1,62E-02	3,00E-04	5,34E-04	1,02E-02	8,08E-04	-8,16E-03	
 PENRE	MJ	1,10E+00	2,50E-01	9,42E-02	5,51E-02	4,24E-02	1,99E-02	2,26E-02	-3,68E-02	
 PENRM	MJ	5,16E-02	0,00E+00	2,58E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 PENRT	MJ	1,15E+00	2,50E-01	9,68E-02	5,51E-02	4,24E-02	1,99E-02	2,26E-02	-3,68E-02	
 SM	kg	1,19E-03	0,00E+00	6,03E-05	0,00E+00	0,00E+00	1,71E-05	0,00E+00	-7,05E-05	
 RSF	MJ	6,10E-02	1,10E-04	3,14E-03	0,00E+00	1,87E-05	2,07E-04	1,68E-05	-1,67E-04	
 NRSF	MJ	2,90E-01	3,69E-04	1,47E-02	0,00E+00	6,26E-05	-1,28E-05	3,62E-05	-1,71E-04	
 FW	m ³	2,01E-03	2,85E-05	2,53E-04	2,83E-06	4,83E-06	3,40E-05	2,78E-05	-1,28E-03	

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	5,25E-04	1,37E-05	2,85E-05	1,62E-06	2,32E-06	1,98E-06	0,00E+00	-8,40E-06	
 NHWD	kg	2,26E-02	2,18E-02	1,22E-02	6,52E-05	3,69E-03	6,26E-05	1,00E-01	-2,55E-04	
 RWD	kg	4,25E-06	1,71E-06	5,38E-07	3,82E-07	2,90E-07	2,10E-07	0,00E+00	-2,76E-07	

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

*Reading example: 9,0 E-03 = 9,0*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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 MFR	kg	5,52E-05	0,00E+00	8,18E-02	0,00E+00	0,00E+00	9,00E-01	0,00E+00	-1,65E-06	
 MER	kg	2,61E-04	0,00E+00	1,32E-05	0,00E+00	0,00E+00	2,07E-06	0,00E+00	-6,17E-05	
 EEE	MJ	1,15E-03	0,00E+00	6,68E-05	0,00E+00	0,00E+00	3,55E-06	0,00E+00	-1,49E-05	
 EET	MJ	1,74E-02	0,00E+00	1,01E-03	0,00E+00	0,00E+00	5,38E-05	0,00E+00	-2,25E-04	

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*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	0,00E+00

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	Data source	Amount	Unit
Renewable electricity Saint-Gobain, based on 100% hydro power, with Guarantee of Origin from LOS 2021 (kWh)	ecoinvent 3.6	4,26	g CO ₂ -eq/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	10-20%
Sodium nitrate	7631-99-4	1-2%

Indoor environment

See product specific information in www.fi.weber/

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	1,04E-01	1,61E-02	7,13E-03	4,00E-03	2,73E-03	0,00E+00	0,00E+00	-2,20E-03

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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