

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Norsk Stein AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2883-1575-EN
Registration number:	NEPD-2883-1575-EN
ECO Platform reference number:	-
Issue date:	09.06.2021
Valid to:	09.06.2026

Crushed Rock from Jelsa Quarry - Norsk Stein

Norsk Stein AS



www.epd-norge.no



General information

Product:

Crushed Rock from Jelsa Quarry - Norsk Stein

Program operator:

The Norwegian EPD Foundation
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Declaration number:

NEPD-2883-1575-EN

ECO Platform reference number:

This declaration is based on Product Category Rules:

EN 15804:2012+A1:2013 and NPCR Part A serves as core PCR
NPCR Part A: Construction products and services. Ver. 1.0. April 2017

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 tonne Crushed Rock from Jelsa Quarry - Norsk Stein

Declared unit with option:

A1,A2,A3,A4

Functional unit:

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Individual third party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii) the process is reviewed annually. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Martin Erlandsson, IVL, Swedish Environmental Research Institute
(no signature required)

Owner of the declaration:

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Manufacturer:

Norsk Stein AS
Jelsavegen 512 4234 Jelsa
Norway

Place of production:

Norsk Stein, Jelsa
Norway

Management system:

Organisation no:

958 990 022

Issue date: 09.06.2021

Valid to: 09.06.2026

Year of study:

2020

Comparability:

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

Development and verification of EPD:

The declaration has been developed and verified using EPD tool lca.tools ver EPD2020.11, developed by LCA.no AS. The EPD tool is integrated into the company's environmental management system, and has been approved by EPD-Norway

Developer of EPD:

Stian Johansen

Reviewer of company-specific input data and EPD:

Henrik Skogland

Approved:

Sign



Håkon Hauan, CEO EPD-Norge

Product

Product description:

Our quarry at Jelsa provides us with a very versatile and high-quality granodiorite aggregate. The aggregates are used in the concrete and asphalt industry, railway construction, hydraulic engineering, in roadbeds, the offshore industry, and numerous other applications.

Product specification

Crushed rock (granodiorite) in bulk - aggregates for various uses.

In compliance with Regulation 305/2011/EU of the European Parliament and the Council of 9th of March 2011 (the Construction Products Regulation – CPR), we hold a certificate for construction of the following products, according to the approved standards:

- Aggregates for Concrete: EN 12620:2002+A1:2008
- Aggregates for Asphalt: EN 13043:2002
- Aggregates for Roads: EN 13242:2002+A1:2007
- Armourstone: EN 13383-1:2002+AC:2004
- Railway ballast: EN 13450:2002

Materials	kg	%
Stein	1000,31	100,00
Total:	1000,31	

LCA: Calculation rules

Declared unit:

1 tonne Crushed Rock from Jelsa Quarry - Norsk Stein

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.

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 (2015 – 2017), ecoinvent v3.3 Allocation, recycled content (2016) and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Production data is collected in 2021 from the site of production for the year 2020.

The data is from various internal logging systems within the company.

Materials	Source	Data quality	Year
PRIMARY/J	Owner of EPD	Database	2020
QUARRY/J	Owner of EPD	Database	2020
SECONDARY/J	Owner of EPD	Database	2020
TERTIARY/J	Owner of EPD	Database	2020
WASHING PLANT/J	Owner of EPD	Database	2020

Technical data:

If applicable, products come along with a CE mark and DoP. Upon request we can also provide specific TDS.

Density: $2,75 \pm 0,05 \text{ Mg/m}^3$

More specific technical data/ material properties are stated in above mentioned DoP/ TDS

Market:

From our production site at Jelsa, we mainly supply aggregates for the coastal regions along the North Sea and Baltic Sea throughout Europe. We also supply domestic markets.

Reference service life, product

Norsk Stein products are tested according to all demanded properties according to CE.

Results can be made available upon request.

The high quality of our products provide a long-term service life in end-use for our customers.

Reference service life, building

Not applicable.

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.

System boundaries and Additional technical information:



In order to find the specific result for the product in question, simply summarize the various processes needed to produce the final product. For example, if you want to see our environmental impact of producing 2/5 mm, simply summarize respective values stated in the below section **LCA: Results**

– in this case; from columns QUARRY/J + PRIMARY/J + SECONDARY/J + TERTIARY/J.

The overall Global Warming Potential (GWP) of each product is also stated in the below column.

PRODUCT	GWP kg CO2 eq	NEEDED PROCESSES to PRODUCE VARIOUS PRODUCTS	REMARKS
Raw Blast Rock	1,49	QUARRY	
63/200 mm	1,51	QUARRY + PRIMARY	
22/125 mm	1,62	QUARRY + PRIMARY + SECONDARY	
16/90 mm	1,62	QUARRY + PRIMARY + SECONDARY	
0/16 mm	1,62	QUARRY + PRIMARY + SECONDARY	
0/5 mm	1,62	QUARRY + PRIMARY + SECONDARY	
5/16 mm	1,62	QUARRY + PRIMARY + SECONDARY	
0/2 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
2/5 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
2/5 mm WASHED	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	Washed as a part of the tertiary process.
5/8 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
8/11 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
11/16 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
16/22 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
22/32 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
16/32 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
30/60 mm	1,87	QUARRY + PRIMARY + SECONDARY + TERTIARY	
0/2 mm WASHED	1,94	QUARRY + PRIMARY + SECONDARY + TERTIARY + WASHING PLANT	Separate washing plant

Our loading system at Jelsa is capable of blending our single fractions and finished products into numerous different blends and variations, such as 0/32mm SUBBASE, 8/16mm, 2/8mm and so on.

In these cases, the specific blend will determine the total environmental impact the final loaded product has. A product might consist of fractions with different production processes. For example, a final blend could be made from fractions that all have been through the processes of QUARRY (100%) and PRIMARY (100%), but only partly SECONDARY (60%) and TERTIARY (40%). In these cases, NORSK STEIN will be able to produce a more product specific EPD for that particular blend.

LCA: Scenarios and additional technical information

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

The method of transportation and distance chosen in this EPD is merely an example. The actual destination and end-customers chosen method for transportation will have to be considered for each case. Norsk Stein as a part of Mibau-Stema Group mainly sells and transports to international markets. Our own fleet of vessels are highly efficient and in general make a far lower environmental impact, than described in this example. In addition to international markets, we also supply domestic and local markets with the use of various third-party owned vessels and vehicles.

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					l/tkm	
Railway					l/tkm	
Boat	50,0 %	Ship, Regional bulk ship, 10866 DWT (7200t load)	400	0,003740	l/tkm	1,50
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		
Other resources		
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, C2)

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

LCA: Results

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

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 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														

Environmental impact

Parameter	Unit	QUARRY/J	PRIMARY/J	SECONDARY/J	TERTIARY/J	WASHING PLANT/J
GWP	kg CO ₂ -eq	1,49E+00	2,41E-02	1,01E-01	2,57E-01	7,00E-02
ODP	kg CFC11 -eq	2,10E-07	2,31E-09	1,53E-08	4,05E-08	6,62E-09
POCP	kg C ₂ H ₄ -eq	2,66E-04	5,40E-06	2,10E-05	5,32E-05	1,57E-05
AP	kg SO ₂ -eq	9,12E-03	1,14E-04	6,67E-04	1,75E-03	3,27E-04
EP	kg PO ₄ ³⁻ -eq	2,00E-03	2,73E-05	1,47E-04	3,85E-04	7,87E-05
ADPM	kg Sb -eq	7,58E-07	3,90E-07	5,65E-07	1,19E-06	1,15E-06
ADPE	MJ	2,20E+01	2,46E-01	1,31E+00	3,42E+00	7,10E-01

Parameter	Unit	A4
GWP	kg CO ₂ -eq	9,24E+00
ODP	kg CFC11 -eq	4,00E-07
POCP	kg C ₂ H ₄ -eq	5,26E-04
AP	kg SO ₂ -eq	2,95E-02
EP	kg PO ₄ ³⁻ -eq	4,69E-03
ADPM	kg Sb -eq	8,00E-07
ADPE	MJ	2,40E+01

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

*INA Indicator Not Assessed

Resource use

Parameter	Unit	QUARRY/J	PRIMARY/J	SECONDARY/J	TERTIARY/J	WASHING PLANT/J
RPEE	MJ	3,26E-01	3,14E+00	4,37E+00	9,08E+00	9,21E+00
RPEM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	3,26E-01	3,14E+00	4,37E+00	9,08E+00	9,21E+00
NRPE	MJ	2,16E+01	4,20E-01	1,56E+00	3,95E+00	1,22E+00
NRPM	MJ	6,03E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	2,23E+01	4,20E-01	1,56E+00	3,95E+00	1,22E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	5,44E-04	7,57E-04	1,57E-03	1,60E-03
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m ³	2,24E-03	1,74E-04	3,45E-04	7,90E-04	5,09E-04

Parameter	Unit	A4
RPEE	MJ	7,52E-01
RPEM	MJ	0,00E+00
TPE	MJ	7,52E-01
NRPE	MJ	2,57E+01
NRPM	MJ	0,00E+00
TRPE	MJ	2,57E+01
SM	kg	0,00E+00
RSF	MJ	0,00E+00
NRSF	MJ	0,00E+00
W	m ³	3,66E-03

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 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

End of life - Waste

Parameter	Unit	QUARRY/J	PRIMARY/J	SECONDARY/J	TERTIARY/J	WASHING PLANT/J
HW	kg	1,50E-02	5,36E-07	1,18E-06	2,77E-06	1,57E-06
NHW	kg	1,15E-01	3,15E-02	4,85E-02	1,04E-01	9,25E-02
RW	kg	INA*	INA*	INA*	INA*	INA*

Parameter	Unit	A4
HW	kg	1,76E-05
NHW	kg	2,18E-01
RW	kg	INA*

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

Parameter	Unit	QUARRY/J	PRIMARY/J	SECONDARY/J	TERTIARY/J	WASHING PLANT/J
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	7,21E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	3,64E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	INA*	INA*	INA*	INA*	INA*
ETE	MJ	INA*	INA*	INA*	INA*	INA*

Parameter	Unit	A4
CR	kg	0,00E+00
MR	kg	0,00E+00
MER	kg	0,00E+00
EEE	MJ	INA*
ETE	MJ	INA*

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 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

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).

Dangerous substances

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

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 Environmental product declaration - Core rules for the product category of construction products.

ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products. ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.

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Iversen et al., (2019) EPD-generator for Norsk Bergindustri, Bakgrunnsrapport for bransjeapplikasjon og datagrunnlag, LCA.no report number 07.19.

NPCR Part A: Construction products and services. Ver. 1.0. April 2017, EPD-Norge.

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