

Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019

Sibirit 1200



The Norwegian
EPD Foundation

Owner of the declaration:
Nitro Sibir Finland Oy

Product name:
Sibirit 1200

Declared unit:
1 kg of manufacture, installed and used
(detonated) bulk explosives product

Product category /PCR:
CEN Standard EN 15804 serves as core PCR
NPCR 024 version 2.0 Explosives and Initiation
Systems (11/2021)

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-6937-6131-EN

Registration number:
NEPD-6937-6131-EN

Issue date: 19.06.2024

Valid to: 19.06.2029



General information

Product:

Sibirit 1200

Program operator:

The Norwegian EPD Foundation
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Declaration number:

NEPD-6937-6131-EN

This declaration is based on Product

Category Rules:

NPCR 024 Explosives and Initiation Systems, ver. 2.0

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, life cycle assessment data and evidences.

Declared unit:

1 kg of manufactured, installed and used (detonated) bulk explosives product

Declared unit with option:

A1-A3, A4, A5

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal

external

Mie Vold, LCA.no AS

Independent verifier approved by EPD Norway

Owner of the declaration:

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Manufacturer:

Nitro Sibir Finland Oy
Putkinotkontie 468, 71480 Kurkimäki
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e-mail: www.nitros.fi

Place of production:

Kauhavantie 768, 62100 Lapua

Management system:

Organisation no:

2009600-3

Issue date:

19.06.2024

Valid to:

19.06.2029

Year of study:

LCA conducted in 2024. Production data is representative of September 2022 to September 2023

Comparability:

EPD of construction products may not be able to compare if they do not comply with EN 15804 and are seen in a building context.

The EPD has been worked out by:

Dan André Johansen, Asplan Viak AS

Approved

Manager of EPD Norway



Product

Product description:

Sibirit 1200 production chain: AN solution is purchased from Yara (Nilsiantie 501, 71800 Siilinjärvi), transported to the Lapua factory (Kauhavantie 768, 62100 Lapua). The oil is bought in Sweden (Raffinaderivägen, 149 41 Nynäshamn) and transported to Lapua. Emulsifying agent, Lubrizol 2820 for purchase Nitric acid for purchase (Kaaronojantie 12-14, 60800 Ilmajoki). The ingredients are mixed and the finished ANE (ammonium nitrate emulsion) is transported to Kuopio (Putkinotkontie 468, 71480 Kurkimäki) or to the Alavieska (Taluskuläntie 343, 85200 Alavieska) warehouse. The Sibirit 1200 is then transported to the customer at the use site where the finished bulk emulsion is manufactured and charged into bore holes by the use of Mobile Explosives Manufacturing Units (MEMUs). The finished bulk emulsion explosives are then detonated by the customer or a third party working for the customer.

Product specification:

Sibirt 1200 is an ammonium nitrate emulsion produced at Kauhaventie in Finland.

Materials	%
Ammonium Nitrate (AN) Solution, 86%	70-95%
Distillates (petroleum)	5-15%
Emulsifier	0-5%
Sodium nitrite	0-5%
Nitric acid	0-5%

Technical data:

Product name: Sibirt 1200

EC-type examination certificate: EXP 1395-017/2018

Market:

Nordic countries (NO/SE/DK/FI)

Reference service life, product:

Not relevant. Explosives products cannot be used more than once.

Reference service life, building:

Not relevant. Explosives products cannot be used more than once.

LCA: Calculation rules

Declared unit:

1 kg of manufactured, installed and used (detonated) bulk explosives product

Cut-off criteria:

All major raw materials and all the essential energy is included. This cut-off rule does not apply for hazardous materials and substances.

Allocation:

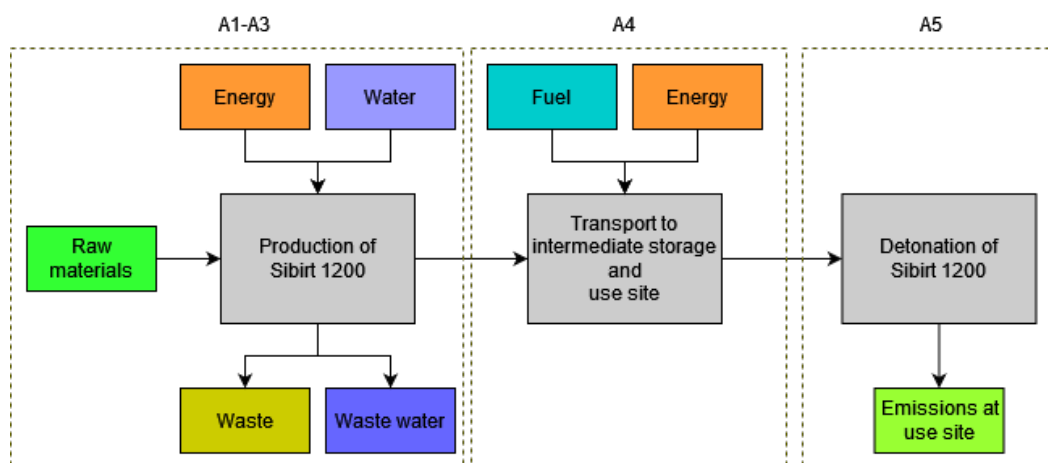
The allocation is made in accordance with the provisions of EN 15804.

Data quality:

Data has been collected in 2023 and 2024 and the production data is representative for the period September 2022 to September 2023. Data for production and transport of explosives (A1-A3) is based on specific consumption data for the factory. Detonation of explosives (A5-2) has been modeled by theoretical calculations, carried out by the producer in accordance with requirements in NPCR 024. Generic data is from ecoinvent v3.9, Allocation, Cut-Off by classification (2024). SimaPro v 9.5.0.1. Characterization factors from EN15804:2012+A2:2019.

System boundary:

The system boundary is from cradle to gate (A1-A3) including mandatory modules A4 and A5. Other modules are not relevant as the product is detonated in the use phase (A5). The figure below shows the system boundary for Sibirt 1200.



LCA: Scenarios and additional technical information

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

Transport from production place to assembly/user (A4)

Transport from production place to assembly/user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption	Unit	Value
Truck (MEMU/SSE Truck, EURO5, 17t)	80	271	0,34	l/km	92,14
Truck (Lorry, EURO6, 27t)	95	271	0,41	l/km	111,11

Assembly (A5)

	Unit	Value
Water consumption	m ³	0
Electricity consumption	kWh	0
Other energy carriers	MJ	0
Material loss	Kg	0
Output materials from waste treatment	Kg	0

Detonation of explosives (A5-2)	Unit	Value
C	Kg	0,0000
CH ₄	Kg	0,0024
CO ₂	Kg	0,1750
CO	Kg	0,0034
H ₂ O	Kg	0,5420
N ₂	kg	0,2650

Theoretical calculations per kg explosive product detonated, from a balanced chemical reaction.

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document. Impact assessment results are presented with core and additional impact indicators presented in EN15804+A2. Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

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

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
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	MND	MND	MND	MND	MND

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	A5
GWP - total	kg CO2 eq	1,50E+00	6,50E-02	2,67E-01
GWP - fossil	kg CO2 eq	1,50E+00	6,44E-02	2,67E-01
GWP - biogenic	kg CO2 eq	-2,52E-02	5,17E-04	2,91E-02
GWP - luluc	kg CO2 eq	2,60E-02	5,39E-05	0,00E+00
ODP	kg CFC11 eq	3,55E-08	1,48E-09	0,00E+00
AP	molc H+ eq	8,85E-03	1,79E-04	3,97E-08
EP- freshwater	kg P eq	2,19E-02	6,05E-07	0,00E+00
EP -marine	kg N eq	1,55E-03	5,05E-05	2,09E-08
EP - terrestrial	molc N eq	3,05E-02	5,35E-04	2,28E-07
POCP	kg NMVOC eq	3,89E-03	2,78E-04	1,53E-04
ADP-M&M ²	kg Sb-Eq	1,99E-05	2,05E-07	0,00E+00
ADP-fossil ²	MJ	2,09E+01	1,04E+00	0,00E+00
WDP ²	m ³	-6,97E-01	5,21E-03	0,00E+00

GWP-total: Global Warming Potential; **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; See "additional Norwegian requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

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

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	A5
PM	Disease incidence	5,20E-08	4,56E-09	8,58E-14
IRP ¹	kBq U235 eq.	2,20E-02	2,42E-03	0,00E+00
ETP-fw ²	CTUe	1,27E+01	5,04E-01	7,67E-05
HTP-c ²	CTUh	8,52E-10	2,81E-11	0,00E+00
HTP-nc ²	CTUh	3,04E-08	8,77E-10	3,63E-09
SQP ²	Dimensionless	5,15E+00	9,30E-01	0,00E+00

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

¹ 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.

² 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

Resource use

Parameter	Unit	A1-A3	A4	A5
RPEE	MJ	1,39E+00	3,43E-02	0,00E+00
RPEM	MJ	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	1,39E+00	3,43E-02	0,00E+00
NRPE	MJ	1,89E+01	1,04E+00	0,00E+00
NRPM	MJ	2,04E+00	0,00E+00	0,00E+00
TRPE	MJ	2,10E+01	1,04E+00	0,00E+00
SM	kg	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00
W	m ³	-8,63E-03	2,04E-04	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** Nonrenewable primary energy resources used as energy carrier; **NRPM** Nonrenewable 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
HW	kg	6,41E-04	2,85E-05	0,00E+00
NHW	kg	1,95E-01	7,79E-02	0,00E+00
RW	kg	1,54E-05	1,17E-06	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
CR	kg	0,00E+00	0,00E+00	0,00E+00
MR	kg	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	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.

Information describing the biogenic carbon content at the factory gate

No biogenic carbon is used in the foreground system for the product.

Additional requirements

Location based electricity mix from the use of electricity in manufacturing

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 (foreground/core) per functional unit.

National electricity grid	Data source	Foreground / core [kWh]	GWP _{total} [kg CO ₂ - eq/kWh]	SUM [kg CO ₂ - eq]
<i>Electricity, medium voltage {FI} market for electricity, medium voltage Cut-off, U</i>	ecoinvent 3.9.1	1,9E-02	2,65E-01	5,05E-03

Guarantees of origin from the use of electricity in the manufacturing phase

No guarantee of origin has been utilized in this EPD.

Additional environmental impact indicators required for construction products

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.

Parameter	Unit	A1-A3	A4	A5
GWP-IOBC	kg	1,52E+00	6,45E-02	2,67E-01

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation.

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

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

Name	CAS no.	Amount
Ammonium Nitrate	6484-52-2	70-95 %
Distillates (petroleum)		5-15 %
Emulsifier		0-5 %
Sodium nitrite	7632-00-0	0-5 %
Nitric acid	7697-37-2	0-5 %

Indoor environment






Not relevant. No tests have been carried out on the product concerning indoor climate.

Carbon footprint

Carbon footprint has not been worked out for the product.

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+A2:2019	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
SimaPro	LCA software, developed by PRé Sustainability
NPCR PART A Ver 2	Construction Products and Services
NPCR 024 2021 ver. 2.0	Explosives and Initiation Systems
Johansen, Dan André, 2024	LCA Report for Nitro Sibir Finland Oy

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