



ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	MAXAMCORP International, S.L.U.
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2308-1057-EN
Registration number:	NEPD-2308-1057-EN
ECO Platform reference number:	-
Issue date:	13.08.2020
Valid to:	13.08.2025

Non electric detonators.

RIONEL F serie MS (n° 10, n° 19, n° 30) / RIONEL F serie LP (n° 16, n° 60) / RIONEL F SCX (n° 25)

MAXAMCORP International, S.L.U.

www.epd-norge.no



General information

Product:

Non electric detonators:

- RIONEL F serie MS (n° 10, n° 20, n° 25)
- RIONEL-F serie LP (n° 16, n° 60)
- RIONEL F SCX (25 ms)

Program operator:

The Norwegian EPD Foundation
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Declaration number:

NEPD-2308-1057-EN

ECO Platform reference number:

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This declaration is based on Product Category Rules:

CEN Standard EN 15804 serves as core PCR
NPCR 024 version 1.0 Explosives and Initiation Systems
(03/2016)

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 unit of manufactured, installed and used (detonated) non electric detonator

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:



Elisabet Amat Guasch
(Independent verifier approved by EPD Norway)

Owner of the declaration:

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MAXAMCORP International S.L.U.
Barrio Zuazo s/n
Galdakao (Bizkaia) Spain
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Place of production:

Galdakao (Spain)

Management system:

ISO 14001
ISO 14006
ISO 50001

Organisation no:

ES-B- 84967587

Issue date:

13.08.2020

Valid to:

13.08.2025

Year of study:

LCA conducted in 2019. Production data is from 2018.

Comparability:

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

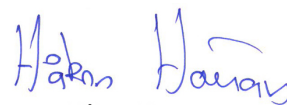
The EPD has been worked out by:

IK Ingenieria



IK /
INGENIERIA

Approved



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

The RIONEL F MS series has been designed for use as a down-the-hole detonator in standard blasting scenarios. RIONEL F MS are manufactured in a series of varying delay timings and are highly accurate delays that reduce risk of timing overlap.

The RIONEL F LP series has been designed for use in underground mining and tunneling, both in nonflammable environments. The delays of the RIONEL F LP series are longer than those of the RIONEL F MS series and are used in confined underground blasting where longer delays are required.

The RIONEL F SCX series has been designed for blast sequencing, introducing intervals of delay time in between blast holes, by means of easy surface connections.

Each series includes different products and each one can be commercialized in different lengths. After production the detonators are transported to customer in Sweden.

Product specification:

In this EPD, the declared products contained the following substances:

Materials	Average[%]	Materials	Average[%]
Lead Azide	< 1.5	Lead Tetroxide	< 0.1
Pentrite (PETN)	< 5	Potassium permanganate	< 0.1
Aluminum	6 - 12	Silicon	< 0.1
Polyethylene	9 - 40	Antimony	< 0.1
Surlyn	6 - 30	HMX (Octogen)	< 0.1
Rubber	< 5	Lead Peroxide (lead dioxide)	< 0.1

Technical data:

The technical characteristics of RIONEL F, Class 1. UN number 0360, 0361 or 0500 (nominal values) are the following:

	Delay	Time (ms)	Length (m)	Net Weight (10 ⁻³ kg)
MS 10	10	250	7,8-30	53,71-178,71
MS 19	19	475	7,8-30	54,56-179,56
MS 30	30	1000	7,8-30	55,67-180,67
LP 16	16	1600	7,8-30	54,27-179,27
LP 60	60	6000	7,8-30	54,75-179,75
SCX 25	25	25	4,8-15	45,81-101,81

EC-type examination certificates:

CE0163 (LOM, Spain), 98-EXP-2003 for RIONEL type MS.
CE0163 (LOM, Spain), 98-EXP-2004 for RIONEL type LP.
CE0163 (LOM, Spain), 99-EXP-4033 for RIONEL type SCX.

Market:

Nordic countries (Finland, Sweden, Norway)

Reference service life, product:

Not relevant. Explosives cannot be used more than once.

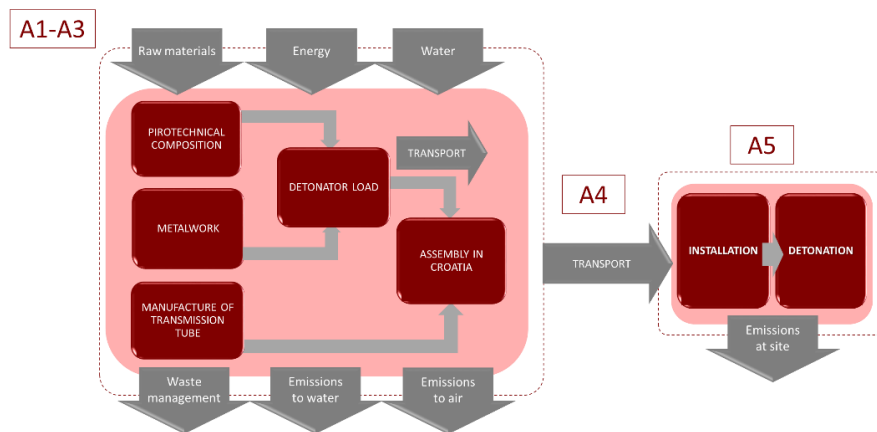
LCA: Calculation rules

Declared unit:

1 unit of manufactured, installed and used (detonated) non electric detonator.

System boundary:

The flow diagram corresponding to modules A1-A3, A4 and A5 is shown in the figure below:



Data quality:

Data has been collected in 2018 and is representative of that year. Data for raw material supply, transport to fabrication plant and production of detonator (A1-A3) is based on specific consumption data for the factory at Galdakao. Detonation of the detonator has been calculated from a balanced chemical reaction, at final state and 1 bar using proprietary software called DETCOM. Generic data is from Ecoinvent v3.5 (November 2018), Allocation, Cut off and SimaPro v 9.0.0.41. Characterization factors from EN15804: 2012 + A1: 2013 (CML August 2016).

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Diesel and lubricant for transport machinery and output waste production have been allocated among all products fabricated at MAXAM through economic allocation.

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.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD. This declaration is based on a "cradle to gate with options" assessment, including the fabrication of the caps in Galdakao (Spain), the assembly of the detonator in Mahovo (Croatia), transportation to the installation site, installation and detonation. The caps are packed and taken to Maxam-Detines d.o.o. in Mahovo, for assembly as a final stage, after which they are packed for transportation to the customer. Distance from factory to assembly site in 2.500 km.

UPSTREAM MODULE:

A1) Supply of raw materials:

- ✓ Extraction and processing of raw materials and recycling processes of materials from the recycling of waste streams from a previous product system (does not include the processes of treatment of waste unrelated to recycling as such).
- ✓ Extraction and processing of fuels.

CORE MODULES:

A2) Transportation to factory:

- ✓ External and internal transport of raw materials to the manufacturing plant.

A3) Manufacturing:

- ✓ Manufacturing of the product under analysis: energy consumption and materials.
- ✓ Emissions from the plant.
- ✓ Packaging materials.
- ✓ Consumables used for the maintenance of the machinery.
- ✓ Treatment of waste generated during the manufacturing process.

CONSTRUCTION PROCESSES

A4) Transportation:

- ✓ Transportation of the product from the plant to the installation site.

A5) Construction installation processes

- ✓ Materials and energy consumed in the installation of the product.
- ✓ Emissions in the use of the product.

The distance from the factory in Galdakao to Maxam-Detines in Croatia is 2.500 km. The weighted average distance to the installation and detonation site is 2.100 km the distance from Croatia to the client in Sweden. Scenarios for manufacture and charging of explosives, as well as detonation at site have also been added. The installation of the product is done manually so there is no consumption of material or energy. Detonation of explosives has been calculated from a balanced chemical reaction, at final state and 1 bar (software DETCOM).

Transport from factory to assembly site (A1-A3)

Type	Capacity utilization (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value
Truck	100%	16-32 t [EURO 5]	2.500,00	l/tkm	0.045

Transport from production place to user (A4)

Type	Capacity utilization (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value
Truck	100%	16-32 t [EURO 5]	2.100,00	l/tkm	0.045

Installation (A5-1)

	Unit	Value
Auxiliary	kg	N/A
Water consumption	m ³	N/A
Electricity consumption	kWh	N/A
Other energy carriers	MJ	N/A
Material loss	kg	N/A
Output materials from waste treatment	kg	N/A
Dust in the air	kg	N/A

Detonation (A5-2)

	Unit	RIONEL MS/LP	RIONEL SCX
Carbon dioxide	kg	4,86E-04	-
Lead	kg	2,48E-04	1,707E-04
Nitrogen	kg	2,40E-04	6,930E-05
Water	kg	1,31E-04	-
Carbon monoxide	kg	4,57E-05	-
Ammonia	kg	6,90E-06	-
Methane	kg	4,60E-06	-
Hydrogen	kg	3,90E-06	-
Nitrogen Oxide	kg	1,60E-06	-

Additional information

Unused Rionel detonators are classified as explosives and must only be handled by personnel with approvals/licences to handle such products. Remaining plastic tubes from used (detonated) Rionel detonators should be collected and treated as general residual waste.

LCA: Results

This EPD contemplates a "Cradle to Gate with options" scope, following the guidelines of the document NPCR 024 version 1.0 Explosives and Initiation Systems (03/2016). The LCA results show environmental impacts, resource use and outflows calculated according to EN 15804: 2012 + A1: 2013. Results are given for declared unit for all product types:

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	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	MNR	MNR	MNR	MNR	MNR	MNR	MNR	MND	MND	MND	MND	MND

Environmental impact:

Parameter	Unit	RIONEL MS 10 (7,8m)			RIONEL MS 10 (30m)			RIONEL MS 19 (7,8m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
GWP	kg CO ₂ -eqv	2,59E-01	1,86E-02	2,45E-03	5,44E-01	6,18E-02	2,45E-03	2,56E-01	1,89E-02	2,43E-03
ODP	kg CFC11-eqv	2,34E-08	3,43E-09	0,00E+00	4,36E-08	1,14E-08	0,00E+00	2,25E-08	3,49E-09	0,00E+00
POCP	kg C ₂ H ₄ -eqv	1,36E-03	5,97E-05	2,19E-05	2,26E-03	1,99E-04	2,19E-05	1,35E-03	6,08E-05	2,16E-05
AP	kg SO ₂ -eqv	4,73E-04	1,39E-05	1,05E-04	6,89E-04	4,64E-05	1,05E-04	4,77E-04	1,42E-05	1,05E-04
EP	kg PO ³⁻⁴ -eqv	7,20E-05	3,04E-06	8,85E-06	1,40E-04	1,01E-05	8,85E-06	7,29E-05	3,09E-06	8,60E-06
ADPM	kg Sb-eqv	6,45E-06	5,57E-08	0,00E+00	6,85E-06	1,85E-07	0,00E+00	7,29E-06	5,67E-08	0,00E+00
ADPE	MJ	4,62E+00	2,81E-01	0,00E+00	1,21E+01	9,35E-01	0,00E+00	4,54E+00	2,86E-01	0,00E+00

Environmental impact:

Parameter	Unit	RIONEL MS 19 (30m)			RIONEL MS 30 (7,8m)			RIONEL MS 30 (30m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
GWP	kg CO ₂ -eqv	5,40E-01	6,21E-02	2,43E-03	2,62E-01	1,92E-02	2,41E-03	5,47E-01	6,25E-02	2,41E-03
ODP	kg CFC11-eqv	4,27E-08	1,15E-08	0,00E+00	2,31E-08	3,55E-09	0,00E+00	4,34E-08	1,15E-08	0,00E+00
POCP	kg C ₂ H ₄ -eqv	2,25E-03	2,00E-04	2,16E-05	1,39E-03	6,19E-05	2,13E-05	2,30E-03	2,01E-04	2,13E-05
AP	kg SO ₂ -eqv	6,94E-04	4,66E-05	1,05E-04	4,93E-04	1,44E-05	1,05E-04	7,09E-04	4,69E-05	1,05E-04
EP	kg PO ³⁻⁴ -eqv	1,41E-04	1,02E-05	8,60E-06	7,56E-05	3,15E-06	8,34E-06	1,44E-04	1,02E-05	8,34E-06
ADPM	kg Sb-eqv	7,70E-06	1,86E-07	0,00E+00	8,36E-06	5,77E-08	0,00E+00	8,76E-06	1,87E-07	0,00E+00
ADPE	MJ	1,20E+01	9,40E-01	0,00E+00	4,61E+00	2,91E-01	0,00E+00	1,21E+01	9,46E-01	0,00E+00

Environmental impact

Parameter	Unit	RIONEL LP 16 (7,8m)			RIONEL LP 16 (30m)			RIONEL LP 60 (7,8m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
GWP	kg CO ₂ -eqv	2,55E-01	1,88E-02	2,42E-03	5,53E-01	6,20E-02	2,42E-03	2,80E-01	1,89E-02	2,39E-03
ODP	kg CFC11-eqv	2,25E-08	3,46E-09	0,00E+00	4,45E-08	1,14E-08	0,00E+00	2,60E-08	3,49E-09	0,00E+00
POCP	kg C ₂ H ₄ -eqv	1,35E-03	6,04E-05	2,16E-05	2,33E-03	1,99E-04	2,16E-05	1,50E-03	6,09E-05	2,13E-05
AP	kg SO ₂ -eqv	4,79E-04	1,41E-05	1,05E-04	7,13E-04	4,65E-05	1,05E-04	8,82E-04	1,42E-05	1,05E-04
EP	kg PO ³⁻⁴ -eqv	7,23E-05	3,07E-06	8,59E-06	1,43E-04	1,01E-05	8,59E-06	7,82E-05	3,09E-06	8,33E-06
ADPM	kg Sb-eqv	8,95E-06	5,63E-08	0,00E+00	9,36E-06	1,86E-07	0,00E+00	3,20E-06	5,68E-08	0,00E+00
ADPE	MJ	4,54E+00	2,84E-01	0,00E+00	1,22E+01	9,38E-01	0,00E+00	4,91E+00	2,87E-01	0,00E+00

Environmental impact:

Parameter	Unit	RIONEL LP 60 (30m)			RIONEL F SCX 25 (4,8m)			RIONEL F SCX 25 (15m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
GWP	kg CO ₂ -eqv	5,78E-01	6,21E-02	2,39E-03	2,12E-01	1,58E-02	1,43E-03	3,43E-01	3,52E-02	1,43E-03
ODP	kg CFC11-eqv	4,71E-08	1,15E-08	0,00E+00	1,75E-08	2,92E-09	0,00E+00	2,69E-08	6,49E-09	0,00E+00
POCP	kg C ₂ H ₄ -eqv	2,46E-03	2,00E-04	2,13E-05	1,17E-03	5,09E-05	5,56E-06	1,59E-03	1,13E-04	5,56E-06
AP	kg SO ₂ -eqv	1,12E-03	4,67E-05	1,05E-04	7,70E-04	1,19E-05	3,02E-05	8,73E-04	2,64E-05	3,02E-05
EP	kg PO ³⁻⁴ -eqv	1,49E-04	1,02E-05	8,33E-06	6,25E-05	2,59E-06	4,87E-06	9,38E-05	5,75E-06	4,87E-06
ADPM	kg Sb-eqv	3,68E-06	1,86E-07	0,00E+00	2,35E-06	4,75E-08	0,00E+00	2,54E-06	1,06E-07	0,00E+00
ADPE	MJ	1,26E+01	9,41E-01	0,00E+00	4,07E+00	2,40E-01	0,00E+00	7,48E+00	5,33E-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	RIONEL MS 10 (7,8m)			RIONEL MS 10 (30m)			RIONEL MS 19 (7,8m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
RPEE	MJ	3,39E-01	3,01E-03	0,00E+00	3,31E-01	1,00E-02	0,00E+00	3,64E-01	3,06E-03	0,00E+00
RPEM	MJ	1,58E-01	0,00E+00	0,00E+00	4,88E-01	0,00E+00	0,00E+00	1,56E-01	0,00E+00	0,00E+00
TPE	MJ	4,96E-01	3,01E-03	0,00E+00	8,19E-01	1,00E-02	0,00E+00	5,20E-01	3,06E-03	0,00E+00
NRPE	MJ	4,32E+00	2,86E-01	0,00E+00	9,71E+00	9,50E-01	0,00E+00	4,18E+00	2,91E-01	0,00E+00
NRPM	MJ	1,15E+00	0,00E+00	0,00E+00	3,88E+00	0,00E+00	0,00E+00	1,15E+00	0,00E+00	0,00E+00
TRPE	MJ	5,47E+00	2,86E-01	0,00E+00	1,36E+01	9,50E-01	0,00E+00	5,33E+00	2,91E-01	0,00E+00
SM	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	0,00E+00
RSF	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	0,00E+00
NRSF	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	0,00E+00
W	m ³	1,41E-03	4,84E-05	0,00E+00	2,53E-03	1,61E-04	0,00E+00	1,49E-03	4,93E-05	0,00E+00

Resource use

Parameter	Unit	RIONEL MS 19 (30m)			RIONEL MS 30 (7,8m)			RIONEL MS 30 (30m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
RPEE	MJ	3,56E-01	1,01E-02	0,00E+00	3,86E-01	3,12E-03	0,00E+00	3,77E-01	1,01E-02	0,00E+00
RPEM	MJ	4,87E-01	0,00E+00	0,00E+00	1,54E-01	0,00E+00	0,00E+00	4,85E-01	0,00E+00	0,00E+00
TPE	MJ	8,43E-01	1,01E-02	0,00E+00	5,39E-01	3,12E-03	0,00E+00	8,62E-01	1,01E-02	0,00E+00
NRPE	MJ	9,56E+00	9,56E-01	0,00E+00	4,26E+00	2,96E-01	0,00E+00	9,66E+00	9,61E-01	0,00E+00
NRPM	MJ	3,88E+00	0,00E+00	0,00E+00	1,15E+00	0,00E+00	0,00E+00	3,88E+00	0,00E+00	0,00E+00
TRPE	MJ	1,34E+01	9,56E-01	0,00E+00	5,41E+00	2,96E-01	0,00E+00	1,35E+01	9,61E-01	0,00E+00
SM	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	0,00E+00
RSF	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	0,00E+00
NRSF	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	0,00E+00
W	m ³	2,61E-03	1,62E-04	0,00E+00	1,56E-03	5,02E-05	0,00E+00	2,68E-03	1,63E-04	0,00E+00

Resource use

Parameter	Unit	RIONEL LP 16 (7,8m)			RIONEL LP 16 (30m)			RIONEL LP 60 (7,8m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
RPEE	MJ	3,51E-01	3,04E-03	0,00E+00	3,47E-01	1,00E-02	0,00E+00	3,77E-01	3,07E-03	0,00E+00
RPEM	MJ	1,56E-01	0,00E+00	0,00E+00	4,87E-01	0,00E+00	0,00E+00	1,54E-01	0,00E+00	0,00E+00
TPE	MJ	5,07E-01	3,04E-03	0,00E+00	8,34E-01	1,00E-02	0,00E+00	5,31E-01	3,07E-03	0,00E+00
NRPE	MJ	5,12E+00	2,89E-01	0,00E+00	9,82E+00	9,54E-01	0,00E+00	4,68E+00	2,91E-01	0,00E+00
NRPM	MJ	2,07E-01	0,00E+00	0,00E+00	3,86E+00	0,00E+00	0,00E+00	1,18E+00	0,00E+00	0,00E+00
TRPE	MJ	5,32E+00	2,89E-01	0,00E+00	1,37E+01	9,54E-01	0,00E+00	5,87E+00	2,91E-01	0,00E+00
SM	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	0,00E+00
RSF	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	0,00E+00
NRSF	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	0,00E+00
W	m ³	1,54E-03	4,89E-05	0,00E+00	2,66E-03	1,62E-04	0,00E+00	2,06E-03	4,94E-05	0,00E+00

Resource use

Parameter	Unit	RIONEL LP 60 (30m)			RIONEL F SCX 25 (4,8m)			RIONEL F SCX 25 (15m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
RPEE	MJ	3,80E-01	1,01E-02	0,00E+00	2,83E-01	2,56E-03	0,00E+00	2,65E-01	5,70E-03	0,00E+00
RPEM	MJ	4,85E-01	0,00E+00	0,00E+00	1,45E-01	0,00E+00	0,00E+00	3,26E-01	0,00E+00	0,00E+00
TPE	MJ	8,65E-01	1,01E-02	0,00E+00	4,29E-01	2,56E-03	0,00E+00	5,91E-01	5,70E-03	0,00E+00
NRPE	MJ	1,02E+01	9,56E-01	0,00E+00	4,05E+00	2,44E-01	0,00E+00	7,70E+00	5,41E-01	0,00E+00
NRPM	MJ	4,04E+00	0,00E+00	0,00E+00	7,09E-01	0,00E+00	0,00E+00	7,73E-01	0,00E+00	0,00E+00
TRPE	MJ	1,42E+01	9,56E-01	0,00E+00	4,76E+00	2,44E-01	0,00E+00	8,47E+00	5,41E-01	0,00E+00
SM	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	0,00E+00
RSF	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	0,00E+00
NRSF	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	0,00E+00
W	m ³	3,23E-03	1,62E-04	0,00E+00	1,23E-03	4,13E-05	0,00E+00	1,78E-03	9,18E-05	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	RIONEL MS 10 (7,8m)			RIONEL MS 10 (30m)			RIONEL MS 19 (7,8m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
HW	kg	4,24E-04	1,80E-07	0,00E+00	4,26E-04	6,00E-07	0,00E+00	4,27E-04	1,83E-07	0,00E+00
NHW	kg	3,11E-02	1,35E-02	0,00E+00	5,43E-02	4,48E-02	0,00E+00	3,21E-02	1,37E-02	0,00E+00
RW	kg	1,38E-05	1,93E-06	0,00E+00	1,98E-05	6,43E-06	0,00E+00	1,29E-05	1,97E-06	0,00E+00

End of life – Waste:

Parameter	Unit	RIONEL MS 19 (30m)			RIONEL MS 30 (7,8m)			RIONEL MS 30 (30m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
HW	kg	4,28E-04	6,03E-07	0,00E+00	4,29E-04	1,87E-07	0,00E+00	4,30E-04	6,06E-07	0,00E+00
NHW	kg	5,52E-02	4,50E-02	0,00E+00	3,34E-02	1,39E-02	0,00E+00	5,66E-02	4,52E-02	0,00E+00
RW	kg	1,89E-05	6,46E-06	0,00E+00	1,34E-05	2,00E-06	0,00E+00	1,94E-05	6,50E-06	0,00E+00

End of life – Waste:

Parameter	Unit	RIONEL LP 16 (7,8m)			RIONEL LP 16 (30m)			RIONEL LP 60 (7,8m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
HW	kg	4,27E-04	1,82E-07	0,00E+00	4,28E-04	6,02E-07	0,00E+00	4,30E-04	1,84E-07	0,00E+00
NHW	kg	3,22E-02	1,36E-02	0,00E+00	5,60E-02	4,49E-02	0,00E+00	3,67E-02	1,37E-02	0,00E+00
RW	kg	1,29E-05	1,95E-06	0,00E+00	2,05E-05	6,45E-06	0,00E+00	1,57E-05	1,97E-06	0,00E+00

End of life – Waste:

Parameter	Unit	RIONEL LP 60 (30m)			RIONEL F SCX 25 (4,8m)			RIONEL F SCX 25 (15m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
HW	kg	4,33E-04	6,03E-07	0,00E+00	4,21E-04	1,54E-07	0,00E+00	4,22E-04	3,42E-07	0,00E+00
NHW	kg	6,14E-02	4,50E-02	0,00E+00	3,01E-02	1,15E-02	0,00E+00	4,09E-02	2,55E-02	0,00E+00
RW	kg	2,23E-05	6,47E-06	0,00E+00	1,11E-05	1,65E-06	0,00E+00	1,39E-05	3,66E-06	0,00E+00

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

End of life - Output flow (INA = Information not available)

Parameter	Unit	RIONEL MS 10 (7,8m)			RIONEL MS 10 (30m)			RIONEL MS 19 (7,8m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
CR	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	0,00E+00
MR	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
MER	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
EEE	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	0,00E+00
ETE	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	0,00E+00

End of life - Output flow (INA = Information not available)

Parameter	Unit	RIONEL MS 19 (30m)			RIONEL MS 30 (7,8m)			RIONEL MS 30 (30m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
CR	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	0,00E+00
MR	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
MER	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
EEE	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	0,00E+00
ETE	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	0,00E+00

End of life - Output flow (INA = Information not available)

Parameter	Unit	RIONEL LP 16 (7,8m)			RIONEL LP 16 (30m)			RIONEL LP 60 (7,8m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
CR	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	0,00E+00
MR	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
MER	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
EEE	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	0,00E+00
ETE	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	0,00E+00

End of life - Output flow (INA = Information not available)

Parameter	Unit	RIONEL LP 60 (30m)			RIONEL F SCX 25 (4,8m)			RIONEL F SCX 25 (15m)		
		A1-3	A4	A5	A1- A3	A4	A5	A1-3	A4	A5
CR	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	0,00E+00
MR	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
MER	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA
EEE	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	0,00E+00
ETE	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	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 emission from the use of electricity in the manufacturing phase

Spanish Residual National production mix and Croatia's 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).

Data source	Amount	Unit
Residual National production mix based on Ecoinvent v3.5 (Spain)	0.555	CO ₂ -eqv/kWh
National production mix based on Ecoinvent v3.5 (Croatia)	0.413	CO ₂ -eqv/kWh

Dangerous substances

- 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 contains dangerous substances, more than 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 (Avfallsforsiften, Annex III), see table.

Name	CAS no.	Average
		Amount
Lead Azide	13424-46-9	1.5%
Pentrite (PETN)	78-11-5	< 5%
Lead Peroxide	1309-60-0	< 0.1%
Lead Tetroxide	1314-41-6	< 0.1%
Potassium permanganate	7722-64-7	< 0.1%
HMX (Octogen)	2691-41-0	< 0.1%

Indoor environment





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

Carbon footprint

Carbon footprint has not been worked out for the product.

Bibliography

ISO 14025:2010	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
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 declaration - Core rules for the product category of construction products</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
NPCR 024 2016 ver. 1.0	Explosives and Initiation Systems
SimaPro	LCA software, developed by PRé Sustainability https://simapro.com/
Ecoinvent v3.5 (November 2018)	Swiss Centre of Life Cycle Inventories https://www.ecoinvent.org/

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