epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

MSA170-XKR

MAXETA

PFISTERER

The Norwegian EPD Foundation

Owner of the declaration:
Maxeta AS

Product:
MSA170-XKR

Declared unit:
1 pcs

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019, EN 50693:2019, EPDItaly007 serves as core PCR
PCR EPD Italy 10 - Insulators

Program operator:
The Norwegian EPD Foundation

Declaration number:

NEPD-7993-7657-EN

Registration number:

NEPD-7993-7657-EN

Issue date: 08.11.2024

Valid to: 08.11.2029

EPD software:
LCAno EPD generator ID: 495065

General information

Product

MSA170-XKR

Owner of the declaration:

Maxeta AS
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Phone:
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Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Phone: +47 977 22 020
web: www.epd-norge.no

Manufacturer:

Pfisterer
Rosenstrasse 44
73650 Winterbach, Germany

Declaration number:

NEPD-7993-7657-EN

Place of production:

Pfisterer production site (Czech Republic)
Královský Vrch 1977
43201 Kadan , Czech Republic

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019, EN 50693:2019,
EPDItaly007 serves as core PCR
PCR EPD Italy 10 - Insulators

Management system:

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.

Organisation no:

864 425 402

Declared unit:

1 pcs MSA170-XKR

Issue date:

08.11.2024

Declared unit with option:

A1-A3,A4,A5,C1,C2,C3,C4,D

Valid to:

08.11.2029

Year of study:

2023

Functional unit:

1 pc of a MSA170-XKR is a joint for secure installation and durable cable connections. The product is exprected 40 years of service life including waste treatment at end-of-life.

Comparability:

EPD for electronic and electrical products and systems may not be comparable if they do not comply with similar PCR standards

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. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Nathaniel Kittilsen Aale

Reviewer of company-specific input data and EPD: Andreas Johnsen

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.

Third party verifier:

Elisabet Amat, GREENIZE projects

(no signature required)

Approved:

Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

The one-piece MSA170-XKR it consist mainly of a pre-assembled silicone joint body, and different variants are available.
Max.system voltage is 170 kV for MSA170-XKR.

Expected service life after installation: 40 years

Product specification

MSA170-XKR weight approx 33 kg
During the transportation, the product will weigh approximately 63 kg.

Materials	kg	%
Metal - Copper	2,40	3,79
Plastic - Polyethylene (HDPE)	11,60	18,32
Plastic - Polypropylene (PP)	1,46	2,31
Plastic - Polyvinyl chloride (PVC)	1,72	2,72
Rubber, synthetic	0,01	0,01
Metal - Aluminium	2,45	3,87
Metal - Stainless steel	0,16	0,25
Silicone	13,54	21,38
Total	33,33	52,63

Packaging	kg	%
Packaging - Wood	30,00	47,37
Total incl. packaging	63,33	47,37

Technical data:

Datasheet for MSA170-XKR: https://catalogue.pfisterer.com/en/msa170-xkr/
Datasheet for MSA170-DOR: https://catalogue.pfisterer.com/en/msa170-dor/

General information: https://www.pfisterer.com/products/products/cable-joints/

Market:

Norway

Reference service life, product

40 years

Reference service life, building or construction works

N/A

LCA: Calculation rules

Declared unit:

1 pcs MSA170-XKR

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.

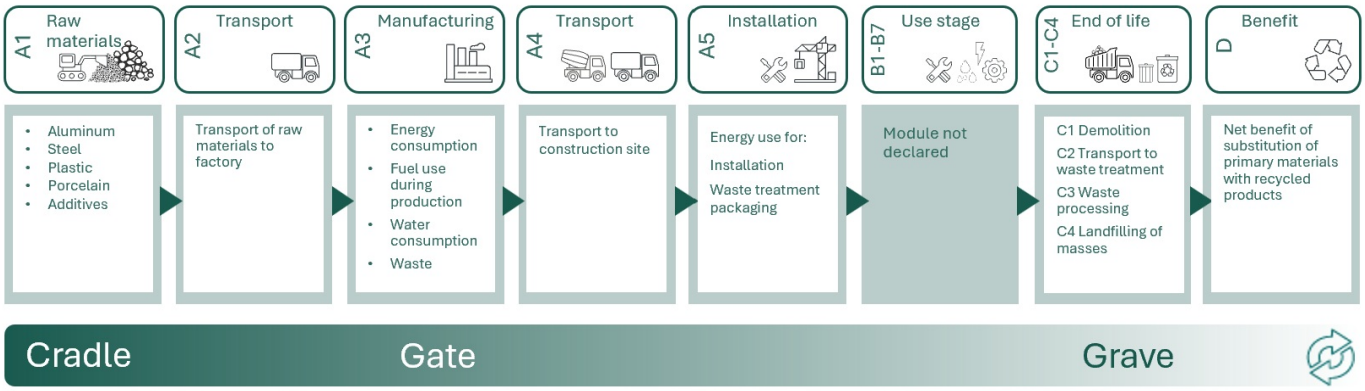
Materials	Source	Data quality	Year
Metal - Aluminium	ecoinvent 3.6	Database	2019
Metal - Copper	ecoinvent 3.6	Database	2019
Metal - Stainless steel	Modified ecoinvent 3.6	Database	2019
Packaging - Wood	ecoinvent 3.6	Database	2019
Plastic - Polyethylene (HDPE)	ecoinvent 3.6	Database	2019
Plastic - Polypropylene (PP)	ecoinvent 3.6	Database	2019
Plastic - Polyvinyl chloride (PVC)	ecoinvent 3.6	Database	2019
Rubber, synthetic	ecoinvent 3.6	Database	2019
Silicone	ecoinvent 3.6	Database	2019

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:

The system includes the production of raw materials (A1), the transport of these raw materials to manufacturing facility (A2), manufacturing with raw material preparation, cold pressing (A3), transport to market (A4), installation (A5), and end-of-life stages (C1-C4, D).



Additional technical information:

LCA: Scenarios and additional technical information

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

Module A4 = Includes the transport from the factory to the end customer in Norway.

Module A5 = Includes installation of the product done via manual installation and disposal of packaging (Note: the assembly will require the use of gas torch). Falls under the 1% cutoff criteria and therefore excluded from the inputs.

Module C1 = Includes disassembly of the product done via manual disassembly . Falls under the 1% cutoff criteria and therefore excluded from the inputs.

Module C2 = Transport to average recycling station in Norway.

Modules C3 and C4 = Waste treatment of the product follows the default values provided in EN 50693, Product Category Rules for life cycle assessments of electronic and electrical products and systems, table G.4. This table specified how different types of raw materials used in A1 will likely be treated during the end-of-life of the product. Waste treatments in C3 include material recycling and incineration with energy recovery and fly ash extraction. Disposal in C4 consist of landfilling of different waste fractions and of ashes.

Module D = The recyclability of metals, plastics, and electronic components allows the producers a credit for the net scrap that is produced at the end of a product's life. The benefits from recycling of net scrap are described in formula from EN 15804:2012+A2:2019. Substitution of heat and electricity generated by the incineration with energy recovery of plastic insulation and other parts is also calculated in module D.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 5 (km)	36,7 %	1580	0,044	l/tkm	69,52

Assembly (A5)	Unit	Value			
Waste, packaging, wood beam, softwood, raw, dried, u=20%, average treatment (kg) - A5, inkl. 85 km transp.	kg	30,00			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 5 (km)	36,7 %	85	0,044	l/tkm	3,74

Waste processing (C3)	Unit	Value			
Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)	kg	6,77			
Waste treatment of plastic mixture, incineration with energy recovery and fly ash extraction (kg)	kg	6,77			
Copper to recycling (kg)	kg	1,44			
Aluminium to recycling (kg)	kg	1,71			
Steel to recycling (kg)	kg	0,13			
Waste treatment of polyethylene (PE), incineration with energy recovery and fly ash extraction (kg)	kg	5,80			
Landfilling of ashes from incineration of Polyvinylchloride (PVC), process per kg ashes and residues (kg)	kg	0,86			
Waste treatment of polyvinylchloride (PVC), incineration with energy recovery and fly ash extraction (kg)	kg	0,86			
Waste treatment of polypropylene (PP), incineration with energy recovery and fly ash extraction (kg)	kg	0,58			
Polypropylene (PP) to recycling (kg)	kg	0,29			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Plastic mixture, process per kg ashes and residues (kg)	kg	0,24			
Landfilling of copper (kg)	kg	0,96			
Landfilling of aluminium (kg)	kg	0,73			
Landfilling of steel (kg)	kg	0,03			
Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)	kg	0,20			
Landfilling of plastic mixture (kg)	kg	6,38			
Landfilling of ashes from incineration of Polyvinylchloride (PVC), process per kg ashes and residues (kg)	kg	0,14			
Landfilling of ashes from incineration of Polypropylene (PP), process per kg ashes and residues (kg)	kg	0,02			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity (MJ)	MJ	23,48			
Substitution of thermal energy, district heating (MJ)	MJ	355,29			
Substitution of primary copper with net scrap (kg)	kg	1,03			
Substitution of primary aluminium with net scrap (kg)	kg	1,71			
Substitution of primary other ferrous metals with net scrap (kg)	kg	0,13			
Substitution of Polypropylene, PP granulate (kg)	kg	0,29			

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	3,59E+02	1,67E+01	4,66E+01	0	8,98E-01	3,70E+01	7,99E-01	-2,09E+01
	GWP-fossil	kg CO_2 -eq	4,01E+02	1,67E+01	8,07E-01	0	8,97E-01	3,70E+01	7,99E-01	-2,05E+01
	GWP-biogenic	kg CO_2 -eq	-4,28E+01	6,80E-03	4,58E+01	0	3,66E-04	1,31E-03	8,75E-05	-8,84E-02
	GWP-luluc	kg CO_2 -eq	8,77E-01	5,83E-03	2,07E-04	0	3,14E-04	2,50E-04	2,98E-05	-3,63E-01
	ODP	kg CFC11 -eq	4,21E-05	3,80E-06	1,29E-07	0	2,05E-07	1,21E-07	3,03E-08	-1,50E-01
	AP	mol H+ -eq	2,42E+00	6,82E-02	6,49E-03	0	3,67E-03	7,51E-03	8,21E-04	-5,37E-01
	EP-FreshWater	kg P -eq	5,03E-02	1,31E-04	9,68E-06	0	7,05E-06	1,28E-05	1,74E-06	-3,58E-03
	EP-Marine	kg N -eq	3,46E-01	2,02E-02	2,79E-03	0	1,09E-03	3,25E-03	1,04E-03	-3,61E-02
	EP-Terrestial	mol N -eq	4,00E+00	2,24E-01	2,98E-02	0	1,20E-02	3,43E-02	3,20E-03	-4,72E-01
	POCP	kg NMVOC -eq	1,17E+00	6,85E-02	7,67E-03	0	3,68E-03	8,41E-03	1,06E-03	-1,39E-01
	ADP-minerals&metals[1]	kg Sb-eq	9,14E-03	4,52E-04	1,31E-05	0	2,43E-05	6,78E-06	8,43E-07	-2,33E-03
	ADP-fossil[1]	MJ	6,22E+03	2,52E+02	9,49E+00	0	1,35E+01	7,12E+00	2,35E+00	-2,67E+02
	WDP[1]	m^3	3,66E+04	2,40E+02	1,46E+01	0	1,29E+01	8,83E+01	3,18E+01	-8,96E+03

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

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	8,57E-06	1,20E-06	7,94E-08	0	6,46E-08	3,72E-08	1,47E-08	-2,95E-06
	IRP[2]	kgBq U235 -eq	2,68E+01	1,10E+00	3,44E-02	0	5,91E-02	2,61E-02	1,25E-02	-1,07E+00
	ETP-fw[1]	CTUe	1,12E+04	1,85E+02	1,08E+01	0	9,97E+00	1,50E+02	1,07E+03	-4,21E+03
	HTP-c[1]	CTUh	3,38E-07	0,00E+00	1,20E-09	0	0,00E+00	1,79E-09	1,29E-10	-9,61E-08
	HTP-nc[1]	CTUh	1,38E-05	2,00E-07	5,77E-08	0	1,08E-08	9,15E-08	3,52E-09	-5,20E-06
	SQP[1]	dimensionless	3,02E+03	1,73E+02	5,32E+00	0	9,33E+00	5,92E+00	7,51E+00	-2,48E+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	1,04E+03	3,55E+00	1,95E-01	0	1,91E-01	5,72E-01	1,73E-01	-2,61E+02
	PERM	MJ	4,20E+02	0,00E+00	-4,20E+02	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	1,46E+03	3,55E+00	-4,20E+02	0	1,91E-01	5,72E-01	1,73E-01	-2,61E+02
	PENRE	MJ	5,52E+03	2,52E+02	9,49E+00	0	1,35E+01	7,12E+00	2,35E+00	-2,58E+02
	PENRM	MJ	7,43E+02	0,00E+00	0,00E+00	0	0,00E+00	-7,31E+02	0,00E+00	-9,57E+00
	PENRT	MJ	6,27E+03	2,52E+02	9,49E+00	0	1,35E+01	-7,24E+02	2,35E+00	-2,68E+02
	SM	kg	4,06E-01	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	7,22E-01
	RSF	MJ	2,06E+01	1,27E-01	5,69E-03	0	6,83E-03	1,19E-02	3,67E-03	-3,11E-03
	NRSF	MJ	1,71E+01	4,53E-01	6,48E-02	0	2,44E-02	4,28E-02	2,90E-02	-1,04E+01
	FW	m^3	9,43E+00	2,65E-02	6,91E-03	0	1,42E-03	7,77E-02	2,87E-03	-6,68E-01

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	3,58E+00	1,28E-02	0,00E+00	0	6,90E-04	2,57E-01	2,71E-01	3,37E-02
	NHWD	kg	4,56E+01	1,20E+01	3,00E+01	0	6,47E-01	9,55E-01	8,38E+00	-6,38E+00
	RWD	kg	2,43E-02	1,71E-03	0,00E+00	0	9,23E-05	3,81E-06	1,48E-05	-9,78E-04

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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	7,19E+00	0,00E+00	7,10E-04	0	0,00E+00	3,57E+00	5,73E-04	-2,84E-02
	MER	kg	1,36E+01	0,00E+00	3,00E+01	0	0,00E+00	1,40E+01	1,40E-05	-4,43E-03
	EEE	MJ	9,09E+00	0,00E+00	2,09E+01	0	0,00E+00	2,35E+01	9,09E-04	-1,03E-02
	EET	MJ	1,38E+02	0,00E+00	3,16E+02	0	0,00E+00	3,55E+02	1,37E-02	-1,57E-01

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	1,25E+01

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	Source	Amount	Unit
Electricity, Czech Republic (kWh)	ecoinvent 3.6	942,91	g CO2-eq/kWh

Dangerous substances

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

Indoor environment

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	4,10E+02	1,67E+01	8,07E-01	0	8,98E-01	3,75E+01	8,26E-01	-1,89E+01

GWP-IOBC: 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.

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