epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

NKT instal CYKY-J 5x16 RE



The Norwegian EPD Foundation

Owner of the declaration:
NKT A/S

Product:
NKT instal CYKY-J 5x16 RE

Declared unit:
1 m

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 027:2020 Part B for Electrical cables and wires

Program operator:
The Norwegian EPD Foundation

Declaration number:

Registration number:

Issue date:

Valid to:

EPD software:
LCAno EPD generator ID: 356337

General information

Product

NKT instal CYKY-J 5x16 RE

Owner of the declaration:

NKT A/S
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Program operator:

The Norwegian EPD Foundation
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Manufacturer:

NKT s.r.o.
Prumyslova 1130
CZ-272 01 Kladno, Czech Republic

Declaration number:

Place of production:

NKT production site Kladno (Czech Republic)
Prumyslová 1130
CZ-272 01 Kladno, Czech Republic

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 027:2020 Part B for Electrical cables and wires

Management system:

ISO 9001, ISO 14001, ISO 45001

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:

957 338 690

Declared unit:

1 m NKT instal CYKY-J 5x16 RE

Issue date:

Declared unit with option:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Valid to:

Year of study:

2021

Functional unit:

1 m of NKT instal CYKY-J 5x16 RE installed electrical cables, including waste treatment at end-of-life.

Comparability:

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

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. Approval number: NEPDT32

Developer of EPD: Marek Kincl

Reviewer of company-specific input data and EPD: Matheo Roehr

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. Approval number: NEPDT32.

Approved:

Third party verifier:

Vito D'Incognito, Take Care International

(no signature required)

Product

Product description:

Cables are designed for installation under plaster, in flat´s cores and for installation in conduits and cable ducts. It is possible to use them for fixed installation, indoors and outdoors, in the ground and in concrete.

Product specification

Copper conductor - round, solid class 1
PVC insulation
Bedding
PVC sheath

Materials	kg	%
Fillers	0,15	13,87
Metal - Copper	0,69	63,87
Plastic - Polyvinyl chloride (PVC)	0,24	22,26
Total	1,08	100,00

Technical data:

Norm (standard): PN-NKT-061-00
Rated voltage Uo/U: 0,45/0,75 kV
Test voltage: 4 (AC) kV
Maximal short-circuit temperature: 160 °C
Maximal operating conductor temperature: 70 °C
Temperature range: from -40 up to 70 °C
Minimal temperature for laying and manipulation: -5 °C
Minimal storage temperature: -40 °C
Self-extinguishing of one cable: IEC 60332-1-2
CPR-Classification: Eca
UV stability: yes
Certificate: EZÚ
RoHS: yes
REACH: yes
Declaration of Conformity UE (CE): yes
LVD Conformity: yes

Market:

CZ & SK

Reference service life, product

30 years. As defined in appendix 1 of the PEP Ecopassport PSR.

Reference service life, building or construction works

30 years.

LCA: Calculation rules

Declared unit:

1 m NKT instal CYKY-J 5x16 RE

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.

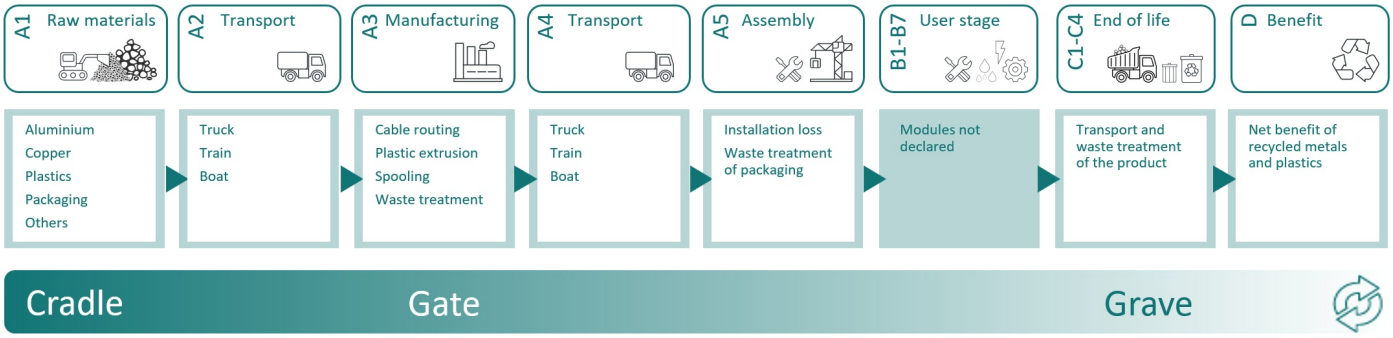
Materials	Source	Data quality	Year
Fillers	ecoinvent 3.6	Database	2019
Metal - Copper	ecoinvent 3.6	Database	2019
Plastic - Polyvinyl chloride (PVC)	ecoinvent 3.6	Database	2019

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 flowchart below illustrates the system boundaries of the analysis:



Additional technical information:

The reference product NKT instal CYKY-J 5x16 RE represents the entire product family based on the highest material consumption. Please contact us for a specific EPD of another cable in the product family:

NKT instal CYKY 2x1,5 mm²
NKT instal CYKY 2x2,5 mm²
NKT instal CYKY 2x4 mm²
NKT instal CYKY 2x6 mm²
NKT instal CYKY 2x10 mm²
NKT instal CYKY 2x16 mm²
NKT instal CYKY 3x1,5 mm²
NKT instal CYKY 3x2,5 mm²
NKT instal CYKY 3x4 mm²
NKT instal CYKY 3x6 mm²
NKT instal CYKY 3x10 mm²
NKT instal CYKY 3x16 mm²
NKT instal CYKY 4x1,5 mm²
NKT instal CYKY 4x2,5 mm²
NKT instal CYKY 4x4 mm²
NKT instal CYKY 4x6 mm²
NKT instal CYKY 4x10 mm²
NKT instal CYKY 4x16 mm²
NKT instal CYKY 5x1,5 mm²
NKT instal CYKY 5x2,5 mm²
NKT instal CYKY 5x4 mm²
NKT instal CYKY 5x6 mm²
NKT instal CYKY 5x10 mm²
NKT instal CYKY 5x16 mm²
NKT instal CYKY 7x1,5 mm²
NKT instal CYKY 7x2,5 mm²

LCA: Scenarios and additional technical information

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

Module A4 = An average distance between the factory and the market is considered.

Modules A5 = 2 % product losses during installation are estimated by the company. No energy use for installation has been quantified since this operation is assumed to be done with other products and should be assessed at a construction works level. Cable drums are reused and assumed under the cut-off criterion of 1%.

Module C1 = For both buildings and construction works, cables will be taken out as part of a larger demolition. The energy use for cable removal compared to other heavier materials is assumed to be low. This module can therefore be included with zero impact.

Module C2 = An average distance between the market and the waste treatment facility is considered.

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 and without 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 and plastics 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 6 (km) - Europe	36,7 %	350	0,043	l/tkm	15,05

Assembly (A5)	Unit	Value			
Product loss during installation (percentage of cable)	Units/DU	0,02			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km) - Europe	36,7 %	300	0,043	l/tkm	12,90

Waste processing (C3)	Unit	Value			
Copper to recycling (kg)	kg	0,42			
Waste treatment of non-hazardous waste, incineration with fly ash extraction (kg)	kg	0,15			
Waste treatment of polyvinylchloride (PVC), incineration with energy recovery and fly ash extraction (kg)	kg	0,12			

Disposal (C4)	Unit	Value			
Landfilling of ashes from incineration of Non-hazardous waste, process per kg ashes and residues (kg)	kg	0,04			
Landfilling of ashes from incineration of Polyvinylchloride (PVC), process per kg ashes and residues (kg)	kg	0,02			
Landfilling of copper (kg)	kg	0,28			
Landfilling of plastic mixture (kg)	kg	0,12			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of electricity (MJ)	MJ	0,12			
Substitution of primary copper with net scrap (kg)	kg	0,27			
Substitution of thermal energy, district heating (MJ)	MJ	1,87			

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	A2	A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	6,44E+00	5,98E-02	5,94E-02	6,20E-02	1,42E-01	0	5,32E-02	4,84E-01	2,24E-02	-6,61E-01
	GWP-fossil	kg CO_2 -eq	6,31E+00	5,97E-02	5,72E-02	6,20E-02	1,35E-01	0	5,31E-02	2,46E-01	2,24E-02	-6,57E-01
	GWP-biogenic	kg CO_2 -eq	1,25E-01	2,47E-05	2,05E-03	2,57E-05	7,29E-03	0	2,20E-05	2,38E-01	3,43E-06	-3,03E-03
	GWP-luluc	kg CO_2 -eq	5,19E-03	2,13E-05	2,26E-04	2,21E-05	1,10E-04	0	1,89E-05	1,97E-05	2,40E-06	-1,05E-03
	ODP	kg CFC11 -eq	6,33E-07	1,35E-08	1,09E-08	1,40E-08	1,36E-08	0	1,20E-08	8,35E-09	1,82E-09	-7,89E-04
	AP	mol H+ -eq	5,92E-01	1,72E-04	7,35E-04	1,78E-04	1,19E-02	0	1,53E-04	1,79E-04	5,36E-05	-1,09E-01
	EP-FreshWater	kg P -eq	5,83E-03	4,77E-07	2,09E-06	4,95E-07	1,17E-04	0	4,24E-07	7,55E-07	1,51E-07	-7,32E-04
	EP-Marine	kg N -eq	1,96E-02	3,40E-05	2,28E-04	3,52E-05	3,99E-04	0	3,02E-05	5,15E-05	3,26E-05	-4,48E-03
	EP-Terrestial	mol N -eq	2,80E-01	3,80E-04	3,50E-03	3,94E-04	5,70E-03	0	3,38E-04	5,45E-04	2,07E-04	-6,94E-02
	POCP	kg NMVOC -eq	8,84E-02	1,45E-04	6,62E-04	1,51E-04	1,79E-03	0	1,29E-04	1,47E-04	6,09E-05	-1,89E-02
	ADP-minerals&metals[1]	kg Sb-eq	1,65E-03	1,65E-06	3,17E-07	1,71E-06	3,30E-05	0	1,47E-06	5,30E-07	5,55E-08	-6,08E-04
	ADP-fossil[1]	MJ	7,85E+01	9,03E-01	7,48E-01	9,37E-01	1,63E+00	0	8,03E-01	3,44E-01	1,50E-01	-5,93E+00
	WDP[1]	m^3	3,47E+01	8,73E-01	1,46E+02	9,06E-01	3,83E+00	0	7,77E-01	6,33E+00	3,09E+00	3,34E+01

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	A2	A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	1,05E-06	3,66E-09	1,07E-08	3,79E-09	2,14E-08	0	3,25E-09	1,21E-09	8,53E-10	-2,22E-07
	IRP[2]	kgBq U235 -eq	1,61E-01	3,95E-03	1,63E-03	4,10E-03	3,46E-03	0	3,51E-03	1,61E-03	9,09E-04	-8,16E-03
	ETP-fw[1]	CTUe	4,44E+03	6,69E-01	6,01E+00	6,95E-01	9,26E+01	0	5,95E-01	1,56E+01	1,72E+02	-9,99E+02
	HTP-c[1]	CTUh	1,08E-07	0,00E+00	7,60E-11	0,00E+00	2,17E-09	0	0,00E+00	4,30E-11	1,20E-11	-1,41E-08
	HTP-nc[1]	CTUh	9,64E-06	7,30E-10	2,06E-09	7,59E-10	1,93E-07	0	6,50E-10	4,01E-09	3,23E-10	-1,21E-06
	SQP[1]	dimensionless	5,83E+01	6,32E-01	2,41E+01	6,55E-01	1,68E+00	0	5,62E-01	1,21E-01	3,59E-01	-1,37E+01

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	A2	A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	9,66E+00	1,29E-02	5,35E+00	1,34E-02	3,02E-01	0	1,15E-02	4,20E-02	1,67E-02	-3,27E+00
	PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	9,66E+00	1,29E-02	5,35E+00	1,34E-02	3,02E-01	0	1,15E-02	4,20E-02	1,67E-02	-3,27E+00
	PENRE	MJ	7,31E+01	9,03E-01	7,48E-01	9,37E-01	1,52E+00	0	8,03E-01	3,48E-01	1,50E-01	-5,92E+00
	PENRM	MJ	5,45E+00	0,00E+00	0,00E+00	0,00E+00	5,19E-03	0	0,00E+00	-5,19E+00	0,00E+00	0,00E+00
	PENRT	MJ	7,85E+01	9,03E-01	7,48E-01	9,37E-01	1,53E+00	0	8,03E-01	-4,84E+00	1,50E-01	-5,92E+00
	SM	kg	1,59E-01	0,00E+00	0,00E+00	0,00E+00	3,18E-03	0	0,00E+00	0,00E+00	0,00E+00	1,89E-01
	RSF	MJ	6,22E-02	4,62E-04	2,77E-04	4,80E-04	1,29E-03	0	4,11E-04	7,65E-04	3,56E-04	1,78E-02
	NRSF	MJ	1,06E-01	1,65E-03	1,34E-03	1,72E-03	2,22E-03	0	1,47E-03	0,00E+00	4,55E-04	-1,79E-02
	FW	m^3	1,04E-01	9,66E-05	4,70E-04	1,00E-04	2,25E-03	0	8,59E-05	7,79E-03	1,83E-04	-1,70E-02

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	A2	A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	5,53E-02	4,66E-05	2,67E-03	4,83E-05	2,03E-03	0	4,14E-05	0,00E+00	4,37E-02	-7,33E-03
	NHWD	kg	1,81E+00	4,39E-02	1,19E-02	4,56E-02	4,67E-02	0	3,91E-02	0,00E+00	4,24E-01	-3,15E-01
	RWD	kg	1,62E-04	6,15E-06	2,51E-06	6,38E-06	3,56E-06	0	5,47E-06	0,00E+00	9,48E-07	-7,30E-06

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	A2	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	3,22E-05	0,00E+00	8,31E-03	0	0,00E+00	4,15E-01	1,08E-05	-7,40E-03
	MER	kg	0,00E+00	0,00E+00	8,89E-03	0,00E+00	5,60E-03	0	0,00E+00	2,71E-01	2,65E-07	-9,74E-04
	EEE	MJ	0,00E+00	0,00E+00	5,26E-03	0,00E+00	5,04E-03	0	0,00E+00	2,46E-01	1,72E-05	-2,39E-03
	EET	MJ	0,00E+00	0,00E+00	7,96E-02	0,00E+00	7,62E-02	0	0,00E+00	3,73E+00	2,60E-04	-3,61E-02

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	Source	Amount	Unit
Electricity, renewable with guarantee of origin, low voltage, Czech Republic (kWh) - NKT	ecoinvent 3.6	57,10	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	A2	A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	6,43E+00	5,98E-02	5,88E-02	6,20E-02	1,41E-01	0	5,32E-02	4,32E-01	2,38E-02	-3,18E-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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