Product Environmental Profile

Product line : F/UTP X*4PR

Reference product : FUTP 6 LSZH Dca 4P D1000

EDS 844

PEP ecopassport N°:	NXNS-00045-V01.01-EN	Product Category Rules:	**PEP-PCR-ed3-EN-2015 04 02**
		Product Specific Rules:	**PSR-0001-ed3-EN-2015 10 16**
Verifier accreditation n°:	VH28	Program information & documents:	**www.pep-ecopassport.org**
Date of publication:	09/2018	Validity period:	**5 years**

Independent verification of the declaration and data, in accordance with ISO 14025 : 2010

Internal ☒ External ☐

The PCR critical review was conducted by a panel of experts chaired by Philippe Osset (Solinnen).

PEP are compliant with XP C08-100-1 :2016
The elements of the present PEP cannot be compared with elements from another program.

Compliant with ISO 14025: 2010 "Environmental labels and declarations - Type III environmental declarations".

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Nexans Environmental commitments

Nexans integrates Sustainable Development in its strategy to meet stakeholders needs. Nexans has been supporting the United Nations Global Compact since December 2008 and has implemented internal action plans to integrate Sustainable Development at all levels: responsible governance, healthy and safe working environment for employees, setting up carbon footprint of Nexans sites, and designing high performance products.

Reference Product description

FUTP 6 LSZH Dca 4P D1000

F/UTP Category 6 cables are the standard offering from Nexans. Manufactured in accordance with ISO IEC 61156-5 requirements, the F/UTP cable is the best choice to support all Class E applications like Ethernet, Fast Ethernet, Gigabit Ethernet, … Cat 6 F/UTP cables are suitable for basic voice and data installations up to 250 MHz. Nexans Cat.6 cables, combined with a similar class of performance connectivity, are suitable for voice and data installations according to ISO/IEC 11801, EN 50173 and TIA/EIA 568 standards.

Products covered:

The aforementioned products belong to the category Wires, Cables and Accessories of the Product Category Rules (PCR) from the PEP ecopassport® program.

The PEP concern all the products in the range F/UTP X*4PR and the reference product of the PEP is the product FUTP 6 LSZH Dca 4P D1000.

Functional unit:

To transmit a communication signal on 1 m according to Ethernet 1G protocol, 6 category, during 10 years and a 25% use rate in accordance with the standards in force, detailed in the data sheet available on our website www.nexans.com.
Lifetime and use rate correspond to the Building - LAN: Tertiary application as defined in the table given in Appendix 1 of the specific rules for wires, cables and accessories.

Materials and substances

The total mass of the reference product and packaging is 48,9 g/m. Constituent materials are distributed as follows:

- 35,9% Plastics
- 41,5% Metals
- 22,6% Others

Nexans has implemented necessary procedures to ensure product compliance with the relevant standards when products are put on the market.

Manufacturing

- All the products in the range F/UTP X*4PR are manufactured in France.
- The electricity mix model for the manufacturing stage is France, >1 kV.
- All Nexans sites in France have implemented a certified Environmental Management System according to ISO14001 standard.

Packaging designed to reduce environmental impacts:

Packaging was designed according to the applicable standard (Directive 94/62/EC).

- The packaging considered to transport the reference product is a B60-63AP. It is considered to be used 1 time.

Distribution

The transportation scenario for the impact assessment of the distribution stage is intracontinental, considering:

- 3500 km covered by truck.

Installation

Installation processes for the reference product are considered out of the scope of the study, according to the Product Specific Rules document for "Wires, Cables and Accessories" from PEP ecopassport® program. Only packaging disposal is considered at this stage.

Use

- The use scenario considers the operation of the reference product in Building / LAN: Tertiary, with:

- Reference Lifetime (RLT) = 10 years
- Use rate = 25 %
- Category: 6
- Protocol: Ethernet 1G

- **Considering the aforementioned hypotheses, the energy consumption over the RLT at use stage is 0,0247 kWh/m.**

- The electricity mix considered at use stage is Europe, <1 kV.
- No maintenance is necessary to ensure the operation of the cable during the considered reference lifetime.

The reference lifetime mentioned in this PEP corresponds to an average data used for impact calculation, taking into account the average time a cable might be installed in a system before being disposed. **It CANNOT BE considered as an equivalent to the guaranteed product technical lifetime**.

End-of-life

- The transportation scenario chosen for the impact analysis associated with end-of-life stage is 1000 km covered by truck.
- The assumed electricity mix model for end-of-life stage is Europe, >1 kV.

The cables are recycled through a grinding process for the separation of polymers and metal parts. It was considered that 100% of metals are recycled and 100% of other materials are landfilled.

Nexans has the know-how of cables recycling at their end-of-life through the company named Recycables, created in partnership with Sita, a subsidiary of Suez Environment, to offer a complete solution for the recycling of polymers and metals.

The reference product FUTP 6 LSZH Dca 4P D1000 belongs to the category Wires, Cables and Accessories of the Product Category Rules (PEP-PCR-ed3-EN-2015 04 02) from the PEP ecopassport® program. According to the PCR, the life cycle impact assessment of the reference product takes into account manufacturing, distribution, installation, use and end-of-life stages.

All the necessary hypotheses to evaluate the environmental impacts of the reference product lifecycle are presented in the previous sections (electricity mix models, use scenario, etc). The software used to perform the evaluation is EIME 5.7.0.3, with the Nexans-2018-07 database.

Representativeness: the study is representative of cable production in France with a intracontinental scenario for distribution. The electricity model for use is Europe, <1 kV and the model for end-of-life is Europe, >1 kV.

Impact results for 1 m of FUTP 6 LSZH Dca 4P D1000

	Indicators/ Flows	Unit	Manufacturing	Distribution	Installation*	Use	End-of-life	TOTAL
Environmental impact indicators	Global Warming	kg CO_2 eq.	1,28E-01	8,52E-03	6,11E-07	1,21E-02	8,27E-03	1,57E-01
	Ozone Depletion	kg CFC-11 eq.	3,62E-08	1,73E-11	4,05E-15	7,90E-10	1,18E-09	3,82E-08
	Acidification of soils and water	kg SO_2 eq.	5,75E-04	3,83E-05	2,98E-09	5,06E-05	4,83E-05	7,12E-04
	Water Eutrophication	kg PO_4^{3-} eq.	7,16E-05	8,80E-06	3,12E-09	3,05E-06	1,50E-05	9,84E-05
	Photochemical Ozone formation	kg C_2H_4 eq.	3,89E-05	2,72E-06	2,11E-10	2,78E-06	2,72E-06	4,71E-05
	Depletion of abiotic resources (elements)	kg Sb eq.	2,38E-05	3,41E-10	2,64E-14	1,05E-09	4,22E-10	2,38E-05
Inventory flows	Total use of primary energy	MJ	3,02E+00	1,20E-01	8,40E-06	2,42E-01	1,38E-01	3,53E+00
	Net fresh water use	m^3	2,20E-01	7,62E-07	1,85E-10	4,40E-02	1,45E-05	2,64E-01

* Installation stage includes only packaging disposal. Impacts related to installation processes might be completed by the PEP user.

	Indicators/ Flows	Unit	Manufacturing	Distribution	Installation	Use	End-of-life	TOTAL
Environmental impact indicators	Depletion of abiotic resources (fossil fuels)	MJ	2,50E+00	1,20E-01	8,49E-06	1,38E-01	9,92E-02	2,85E+00
	Water pollution	m^3	9,04E+00	1,40E+00	9,47E-05	5,00E-01	7,07E-01	1,16E+01
	Air pollution	m^3	1,03E+02	3,49E-01	7,50E-05	5,22E-01	5,71E-01	1,05E+02
Inventory flows - Use of primary resources	Use of renewable primary energy (excluding resources used as raw materials)	MJ	1,69E-01	1,61E-04	9,25E-08	3,08E-02	7,34E-03	2,07E-01
	Use of renewable primary energy resources used as raw materials	MJ	1,11E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,11E-04
	Total use of renewable primary energy resources	MJ	1,69E-01	1,61E-04	9,25E-08	3,08E-02	7,34E-03	2,07E-01
	Use of non-renewable primary energy (excluding resources used as raw materials)	MJ	2,00E+00	1,20E-01	8,31E-06	2,11E-01	1,31E-01	2,46E+00
	Use of non-renewable primary energy resources used as raw materials	MJ	8,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,56E-01
	Total use of non-renewable primary energy resources	MJ	2,86E+00	1,20E-01	8,31E-06	2,11E-01	1,31E-01	3,32E+00
Inventory flows - Second. materials	Use of renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Use of non-renewable secondary fuels	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Use of secondary materials	kg	3,14E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,14E-03
Inventory flows - Waste	Hazardous waste disposed	kg	2,19E+00	0,00E+00	2,14E-09	6,32E-06	1,18E-05	2,19E+00
	Non-hazardous waste disposed	kg	9,43E-02	3,03E-04	9,69E-06	4,52E-02	5,00E-02	1,90E-01
	Radioactive waste disposed	kg	3,27E-04	2,16E-07	5,05E-11	3,02E-05	1,49E-05	3,72E-04
Inventory flows - Output flows	Components for reuse	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	Materials for recycling	kg	2,79E-03	0,00E+00	4,98E-07	0,00E+00	2,03E-02	2,31E-02

General information

The extrapolation rules have been calculated based on the environment impact assessment results of 6 products in the range F/UTP X*4PR. The reference product is FUTP 6 LSZH Dca 4P D1000.

The extrapolation rules below apply to 1m of product. In the following sections, the product weight is expressed in g for 1m of cable, where applicable.

Manufacturing

The extrapolation principle applicable to manufacturing stage impacts is a Linear variation versus weight.

Each environmental indicator value shall be calculated using the following formula:

Indicator = a x Cable weight + b

Table to be used for manufacturing stage

	a	b
GWP	2,17E-03	2,50E-02
ODP	7,46E-10	9,31E-10
A	9,47E-06	1,09E-04
EP	1,32E-06	6,95E-06
POCP	6,38E-07	8,47E-06
ADPe	3,88E-07	3,60E-06
TPE	5,26E-02	6,18E-01
FW	3,77E-03	5,85E-02
ADPf	4,29E-02	5,45E-01
WP	2,49E-01	-3,29E+00
AP	1,78E+00	1,30E+01
PERE	2,74E-03	3,69E-02
PERM	1,35E-06	6,02E-05
PERT	2,74E-03	3,69E-02
PENRE	3,54E-02	3,37E-01
PENRM	1,45E-02	2,44E-01
PENRT	4,98E-02	5,81E-01
RSF	0,00E+00	0,00E+00
NRSF	0,00E+00	0,00E+00
SM	5,13E-05	4,74E-04
HWD	3,57E-02	3,30E-01
NHWD	1,68E-03	1,21E-02
RWD	5,54E-06	8,25E-05
CRU	0,00E+00	0,00E+00
EE	0,00E+00	0,00E+00
MER	0,00E+00	0,00E+00
MFR	3,98E-05	7,36E-04

Example: If the product weight is 58,889 g/m, each indicator value shall be calculated with: 58,889 x a + b.

The reckoned mean and maximum deviations concerning manufacturing impact extrapolation rules are respectively 6,59% and 31,14%.

Distribution

The extrapolation principle applicable to distribution stage impacts is a Linear variation versus weight.

Each environmental indicator value shall be calculated using the following formula:

Indicator = a x Cable weight + b

Table to be used for distribution stage

	a	b
GWP	1,67E-04	8,21E-04
ODP	3,37E-13	1,66E-12
A	7,48E-07	3,69E-06
EP	1,72E-07	8,48E-07
POCP	5,32E-08	2,62E-07
ADPe	6,66E-12	3,29E-11
TPE	2,35E-03	1,16E-02
FW	1,49E-08	7,35E-08
ADPf	2,34E-03	1,15E-02
WP	2,74E-02	1,35E-01
AP	6,83E-03	3,37E-02
PERE	3,14E-06	1,55E-05
PERM	0,00E+00	0,00E+00
PERT	3,14E-06	1,55E-05
PENRE	2,35E-03	1,16E-02
PENRM	0,00E+00	0,00E+00
PENRT	2,35E-03	1,16E-02
RSF	0,00E+00	0,00E+00
NRSF	0,00E+00	0,00E+00
SM	0,00E+00	0,00E+00
HWD	0,00E+00	0,00E+00
NHWD	5,92E-06	2,92E-05
RWD	4,21E-09	2,08E-08
CRU	0,00E+00	0,00E+00
EE	0,00E+00	0,00E+00
MER	0,00E+00	0,00E+00
MFR	0,00E+00	0,00E+00

Example:

If the product weight is 58,889 g/m, each indicator value shall be calculated with: 58,889 x a + b.

The reckoned mean and maximum deviations concerning distribution impact extrapolation rules are respectively 3,72% and 10,08%.

Installation

The extrapolation principle applicable to installation stage impacts is a Maximum impact value.
The maximum impact values indicated in the table below are applicable to the whole range for installation stage impacts.

Table to be used for installation phase

	Impact value
GWP	9,96E-04
ODP	2,54E-11
A	3,79E-06
EP	4,32E-06
POCP	2,96E-07
ADPe	6,41E-11
TPE	1,09E-02
FW	8,77E-07
ADPf	1,42E-02
WP	1,12E-01
AP	1,18E-01
PERE	2,73E-04
PERM	0,00E+00
PERT	2,73E-04
PENRE	1,06E-02
PENRM	0,00E+00
PENRT	1,06E-02
RSF	0,00E+00
NRSF	0,00E+00
SM	0,00E+00
HWD	4,41E-06
NHWD	9,28E-03
RWD	3,18E-07
CRU	0,00E+00
EE	0,00E+00
MER	0,00E+00
MFR	0,00E+00

N.B.: Installation stage represents only the disposal of the packaging of the products. Installation processes are excluded from the system boundaries.

Use

The reference product is FUTP 6 LSZH Dca 4P D1000, a Communication - Twisted pairs cable with 4 pairs per mono cable and a power consumption of 1,13 mW/m.

Each environmental indicator value shall be calculated using the following formula:

Indicator = Indicator Reference Product x number of pairs / number of pairs of the reference product x Y x Z

- Y depends on the cable under study. Y may take the following values :

  Y = 1 if the product under study is a mono cable

  Y = 2 if the product under study is a dual cable

  Y = X/1 if the product under study is a multi (X) cable

- Z is related to the cable category of the product under study. Coefficients to apply are the following :

	Coefficients
5e	0,8035
6	1,0000
6a	1,2071
7	1,2062
7a	1,2000
7+	1,1956

Example:

If the reference product is a Mono cable, category 6 and the product to be evaluated is a Dual cable, category 7, then the coefficients to be used shall be Y= 2 and Z=1,2062 and each environmental indicator value shall be calculated with: Indicator = Indicator reference product x 2 x 1,2062 x Number of pairs / Number of pairs of the reference product".

- Z is related to the reference product power consumption (mW/m) over m, with:

Z = Power consumption over m of the product studied / Power consumption over m of the reference product

Example:

If the reference product is a Mono cable and the product to be evaluated is a dual cable then the coefficient to be used shall be Y= 2 and each environmental indicator value shall be calculated with: Indicator = Indicator reference product x 2 x Z x Number of pairs / Number of pairs of the reference product".

End-of-life

The extrapolation principle applicable to end-of-life stage impacts is a Linear variation versus weight.

Each environmental indicator value shall be calculated using the following formula:

Indicator = a x Cable weight + b

Example:

If the product weight is 58,889 g/m, each indicator value shall be calculated with: 58,889 x a + b.

The reckoned mean and maximum deviations concerning end-of-life impact extrapolation rules are respectively 0,90% and 11,91%.

Terms and abbreviations

The various abbreviations used in the PEP document are explained in the table below:

Abbreviations	Environmental indicator/flow complete name
GWP	Global Warming
ODP	Ozone Depletion
A	Acidification of soil and water
EP	Eutrophication
POCP	Photochemical Ozone Creation
ADPe	Depletion of abiotic resources - elements
TPE	Total use of Primary Energy
FW	Net use of Freshwater
ADPf	Depletion of abiotic resources - fossil fuels
WP	Water Pollution
AP	Air Pollution
PERE	Use of renewable primary energy, excluding renewable primary energy resources used as raw materials
PERM	Use of renewable primary energy resources as raw materials
PERT	Total use of renewable primary energy resources (PERE+PERM)
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 as raw materials
PENRT	Total use of non-renewable primary energy resources (PENRE+PENRM)
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
SM	Use of secondary materials
HWD	Hazardous waste disposed
NHWD	Non-hazardous waste disposed
RWD	Radioactive waste disposed
CRU	Components for reuse
EE	Exported energy
MER	Materials for energy recovery
MFR	Materials for recycling