

Product Environmental Profile

Family technical name: CAT 6 U/UTP LSZH

Family brand name: CAT6 U/UTP LSZH

Reference product name : LAN Cat6 UTP 4x2x0,55 LSZH



0,403

kg CO₂ eq.

Climate change - total



0,00002

kg Sb eq.

Resource use - minerals & metals (ADPe)



0,004

m³

Net use of fresh water



11

MJ

Total Primary Energy

The above environmental impacts are "cradle to gate" or "Manufacturing phase" values (A1-A3)

PEP ecopassport N°:	NXNS-00299-V01.01-EN	Product Category Rules:	PEP-PCR-ed4-EN-2021 09 06
Verifier accreditation N°:	VH18	Product Specific Rules:	PSR-0001-ed4-EN-2022 11 16
Date of publication:	09-2023	Program information & documents:	www.pep-ecopassport.org
		Validity period:	5 years

Independent verification of the declaration and data, in accordance with ISO 14025 : 2006

Internal External

The PCR critical review was conducted by a panel of experts chaired by Julie Orgelet (Ddomain).

PEP are compliant with XP C08-100-1 :2016 or EN 50693

The elements of the present PEP cannot be compared with elements from another program.

Compliant with ISO 14025: 2006 "Environmental labels and declarations - Type III environmental declarations".



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I. PRODUCTS AND COMMITMENT

Nexans Corporate Social Responsibility commitment

Corporate Social Responsibility which is the confluence between environmental, economic and social aspects, is an integral part of the Nexans's strategy. 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. It includes responsible governance, healthy and safe working environment for employees, reduced global carbon footprint through the Nexans Carbon Neutrality strategy.



Reference Product description

LAN Cat6 UTP 4x2x0,55 LSZH

Nexans U/UTP Category 6 cables are the standard 250MHz offering from Nexans. Manufactured in accordance with TIA/EIA 568-C.2, EN 50173-1, ISO/IEC 11801 and IEC 61156-5 requirements, U/UTP cable is the best choice to support all Class E applications like Ethernet, Fast Ethernet, Gigabit Ethernet, The Cat 6 U/UTP cables are suitable for basic voice and data installations up to 250 MHz. Nexans Category 6 cables are compliant with the requirements of the TIA/EIA 568-C, EN 50173-1, ISO/IEC 11801 and IEC 61156-5. Used with Cat 6 connectivity, these cables are compliant with Class E link requirements as described in EN 50173 and ISO 11801 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 CAT 6 U/UTP LSZH and the reference product of the PEP is LAN Cat6 UTP 4x2x0,55 LSZH.

Functional unit:

To transmit a communication signal on 1 m according to Ethernet 1G protocol, 6 category, during 10 years and a 100% use rate in accordance with the standards in force, detailed in the data sheet available on our website www.nexans.com.

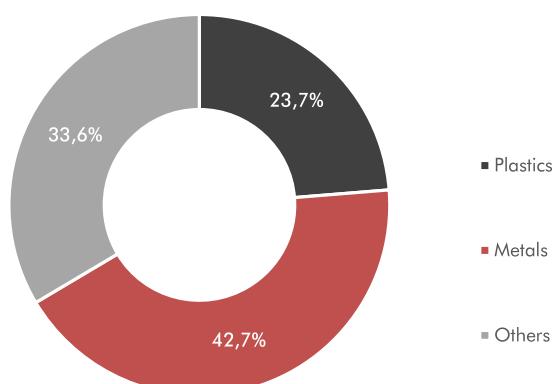
Lifetime and use rate correspond to the Building - LAN: Industrial application as defined in the table given in Appendix 1 of the specific rules for wires, cables and accessories.

This PEP has been drawn up considering the following parameters:

- 1 m for manufacturing, distribution and end-of-life stages
- 1 m and 1A for the use stage

The potential impact of the use stage shall be calculated by the PEP user considering the real amperage through the product during the use phase by multiplying the impact by the square of the intensity. This PEP is valid in the intensity range taking into account the maximum allowable intensity.

Constituent materials



The total mass of the reference product and packaging is 40.3g/m. Constituent materials are distributed as given in the graph.

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



II. LIFE CYCLE ASSESSMENT

Manufacturing



- All the products in the range CAT 6 U/UTP LSZH are manufactured in Turkey.
- The electricity mix model for the manufacturing stage is from Turkey.
- All Nexans sites in Turkey 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 Box. 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 5% of product losses and packaging disposal is considered in this stage

Use



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

- | | |
|---------------------------------------|-------------------------|
| • Reference Lifetime (RLT) = 10 years | • Use rate = 100 % |
| • Category: 6 | • Protocol: Ethernet 1G |

Considering the aforementioned hypotheses, the energy consumption over the RLT at use stage is 98.988 kWh/m.

- The electricity mix considered at use stage is Europe.
- 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.

The cables are recycled through a grinding process for the separation of polymers and metal parts. The separated materials are then assumed to be recycled, incinerated or landfilled.

If the customer wants to recycle their cables at the end-of-life, Nexans has the know-how of cables recycling at their end-of-life through the structure named Nexans Recycling Services (recycling.services@nexans.com), to offer a complete solution for the recycling of polymers and metals.



III. ENVIRONMENTAL IMPACTS

The reference product LAN Cat6 UTP 4x2x0,55 LSZH belongs to the Product Category Rules (PEP-PCR-ed4-EN-2021 09 06) and Product Specific Rules (PSR-0001-ed4-EN-2022 11 16) 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 5.9.4, with the Nexans-2023-10 database.

Representativeness: the study is representative of cable production in Turkey with a intracontinental scenario for distribution. The electricity model for use is Europe and the model for end-of-life is Europe.

Impact results for 1 m of LAN Cat6 UTP 4x2x0,55 LSZH

Mandatory indicators:

Environmental indicator/flows	Unit	Manufacturing (A1-A3)	Distribution (A4)	Installation* (A5)	Use (B6)	End-of-life (C1-C4)	TOTAL
Climate change - total (GWP)	kg CO ₂ eq.	4,03E-01	7,11E-03	9,22E-03	4,06E+01	3,17E+00	4,42E+01
Climate change - fossil (GWPf)	kg CO ₂ eq.	3,98E-01	7,11E-03	9,01E-03	4,05E+01	3,16E+00	4,41E+01
Climate change - biogenic (GWPb)	kg CO ₂ eq.	4,97E-03	0,00E+00	2,05E-04	5,41E-02	7,58E-03	6,69E-02
Climate change - land use & land use change (GWPlu)	kg CO ₂ eq.	1,81E-08	0,00E+00	0,00E+00	0,00E+00	1,98E-07	2,16E-07
Ozone layer depletion (ODP)	kg CFC-11 eq.	1,91E-08	1,09E-11	8,76E-10	1,73E-07	1,58E-08	2,09E-07
Acidification potential of soil and water (AP)	mol H+ eq.	5,08E-03	4,50E-05	1,61E-04	2,32E-01	1,83E-02	2,55E-01
Eutrophication - freshwater (Epf)	kg PO43- eq.	1,25E-05	2,67E-09	5,03E-08	1,11E-04	1,29E-04	2,53E-04
Eutrophication - marine (Epm)	kg N eq.	3,34E-04	2,11E-05	6,50E-06	2,63E-02	2,09E-03	2,88E-02
Eutrophication - terrestrial (Ept)	mol N eq.	4,45E-03	2,31E-04	5,52E-05	3,95E-01	3,13E-02	4,31E-01
Photochemical ozone formation - human health (POCP)	kg NMVOC eq.	1,27E-03	5,84E-05	2,78E-05	8,44E-02	6,71E-03	9,25E-02
Resource use - minerals & metals (ADPe)	kg Sb eq.	2,33E-05	2,80E-10	1,15E-06	2,94E-06	3,62E-06	3,10E-05
Resource use - fossils (ADPf)	MJ	9,54E+00	9,91E-02	1,06E-01	1,03E+03	7,99E+01	1,12E+03
Water use (WU)	m ³ eq.	1,85E-01	2,70E-05	7,99E-03	1,44E+00	2,04E-01	1,83E+00
Use of renewable primary energy excluding renewable primary energy used as raw material (PERE)	MJ	1,56E+00	1,32E-04	8,88E-03	1,98E+02	1,54E+01	2,15E+02
Use of renewable primary energy used as raw material (PERM)	MJ	3,98E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,98E-02
Total use of renewable primary energy resources (PERT)	MJ	1,60E+00	1,32E-04	8,88E-03	1,98E+02	1,54E+01	2,15E+02
Non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	9,23E+00	9,91E-02	9,02E-02	1,03E+03	7,99E+01	1,12E+03
Use of non renewable primary energy resources used as raw materials (PENRM)	MJ	3,09E-01	0,00E+00	1,54E-02	0,00E+00	0,00E+00	3,24E-01
Total use of non-renewable primary energy resources (PENRT)	MJ	9,54E+00	9,91E-02	1,06E-01	1,03E+03	7,99E+01	1,12E+03
Use of secondary material (SM)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	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 (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Net use of fresh water (FW)	m ³	4,28E-03	6,28E-07	1,86E-04	3,34E-02	4,75E-03	4,26E-02
Hazardous waste disposed (HWD)	kg	2,12E+00	0,00E+00	1,06E-01	7,58E-01	7,01E-02	3,06E+00
Non hazardous waste disposed (NHWD)	kg	1,14E-01	2,49E-04	3,19E-03	5,84E+00	4,59E-01	6,41E+00
Radioactive waste disposed	kg	1,67E-05	1,78E-07	3,26E-07	1,22E-03	9,47E-05	1,33E-03
Components for reuse (CRU)	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (MFR)	kg	1,84E-03	0,00E+00	7,27E-06	0,00E+00	1,85E-02	2,03E-02
Materials for energy recovery (MER)	kg	5,50E-04	0,00E+00	2,81E-06	0,00E+00	4,55E-03	5,10E-03
Exported Energy (EE)	MJ	0,00E+00	0,00E+00	1,96E-03	0,00E+00	0,00E+00	1,96E-03
Biogenic carbon content - product (BC-pro)	kg of C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content - packaging (BC-pack)	kg of C	6,20E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,20E-01

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

Optional indicators:

Environmental indicator/flow	Unit	Manufacturing (A1-A3)	Distribution (A4)	Installation* (A5)	Use (B6)	End-of-life (C1-C4)	TOTAL
Total Primary Energy (TPE)	MJ	1,11E+01	9,93E-02	1,15E-01	1,23E+03	9,53E+01	1,34E+03
EF-particulate matter (EF-PM)	Disease occurrence	3,35E-08	3,66E-10	9,75E-10	1,80E-06	1,41E-07	1,97E-06
Ionising radiation, human health (IR)	kg U235 eq.	5,92E+00	1,73E-05	2,75E-01	6,03E+01	4,65E+00	7,12E+01
Ecotoxicity, freshwater (Eco-fw)	CTUe	6,14E+00	4,79E-03	9,84E-02	4,37E+02	4,61E+01	4,89E+02
Human toxicity, cancer (HT-c)	CTUh-c	3,23E-07	1,25E-13	1,61E-08	4,73E-09	5,05E-10	3,44E-07
Human toxicity, non-cancer (HT-nc)	CTUh-nc	4,17E-08	1,35E-11	1,98E-09	1,88E-07	2,26E-08	2,54E-07
Land use (LU)	No dimension	4,21E-02	0,00E+00	2,98E-04	8,07E-01	3,95E-01	1,24E+00

Environmental indicators are calculated according to JRC method - EF3.0.



V. EXTRAPOLATION RULES FOR THE PRODUCT FAMILY CAT6 U/UTP LSZH

General information

The extrapolation rules have been calculated based on the environment impact assessment results of 3 products in the range CAT 6 U/UTP LSZH. The reference product is LAN Cat6 UTP 4x2x0,55 LSZH. The weight of reference product is 38,08 g/m.

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.

Extrapolation rules for each life cycle stage

Life cycle stage	Applicable extrapolation principle	Formula to calculate each environmental indicator	Example: If the product weight is 48.08 g/m, each indicator value shall be calculated with:	Mean deviation of extrapolation rule																																																							
	Manufacturing	Linear variation versus weight	Indicator = $a \times \text{Cable weight} + b$	Indicator = $(48.08 \times a) + b$ 1.21%																																																							
	Distribution	Linear variation versus weight	Indicator = $a \times \text{Cable weight} + b$	Indicator = $48.08 \times a + b$. 0.00%																																																							
	Installation	Linear variation versus weight	Indicator = $a \times \text{Cable weight} + b$	Indicator = $48.08 \times a + b$. 1.06%																																																							
	Use	Variation versus resistivity ratio	Indicator = Indicator for Reference Product x (number of pairs / number of pairs of the reference product) x Y x Z. Y depends on the cable under study. Z is related to the cable category of the product under study. Y & Z may take the following values: <table border="1"> <tr><td>Y =</td><td>0,25</td><td>for a mono cable</td><td></td><td></td><td></td></tr> <tr><td>Y =</td><td>0,5</td><td>for a dual cable</td><td></td><td></td><td></td></tr> <tr><td>Y =</td><td>X/4</td><td>for a multi (X) cable</td><td></td><td></td><td></td></tr> <tr><td>Z =</td><td>0,0757</td><td>for category 5e</td><td></td><td></td><td></td></tr> <tr><td>Z =</td><td>0,0942</td><td>for category 6</td><td></td><td></td><td></td></tr> <tr><td>Z =</td><td>0,1137</td><td>for category 6a</td><td></td><td></td><td></td></tr> <tr><td>Z =</td><td>0,1136</td><td>for category 7</td><td></td><td></td><td></td></tr> <tr><td>Z =</td><td>0,1113</td><td>for category 7a</td><td></td><td></td><td></td></tr> <tr><td>Z =</td><td>0,1126</td><td>for category 7+</td><td></td><td></td><td></td></tr> </table>	Y =	0,25	for a mono cable				Y =	0,5	for a dual cable				Y =	X/4	for a multi (X) cable				Z =	0,0757	for category 5e				Z =	0,0942	for category 6				Z =	0,1137	for category 6a				Z =	0,1136	for category 7				Z =	0,1113	for category 7a				Z =	0,1126	for category 7+				If the reference product is a 1 cable, category and the product to be evaluated is a Dual cable, category 7, then the coefficients to be used shall be Y=0,5 & Z=0,1136 and each environmental indicator value shall be calculated with: Indicator = Indicator of reference product x 0,5 x 0,1136 x (Number of pairs of product to be evaluated / Number of pairs of the reference product).	0,00%
Y =	0,25	for a mono cable																																																									
Y =	0,5	for a dual cable																																																									
Y =	X/4	for a multi (X) cable																																																									
Z =	0,0757	for category 5e																																																									
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Z =	0,1137	for category 6a																																																									
Z =	0,1136	for category 7																																																									
Z =	0,1113	for category 7a																																																									
Z =	0,1126	for category 7+																																																									
	End of life	Linear variation versus weight	Indicator = $a \times \text{Cable weight} + b$	Indicator = $(48.08 \times a) + b$ 0.87%																																																							

Table to be considered for extrapolation calculations of different life cycle stages:

	Manufacturing		Distribution		Installation		End of life	
	a	b	a	b	a	b	a	b
GWP	9,63E-03	3,63E-02	-	-	1,76E-04	3,92E-04	9,43E-05	5,64E-03
GWPf	9,57E-03	3,37E-02	-	-	1,76E-04	3,92E-04	9,19E-05	5,53E-03
GWPb	6,06E-05	2,57E-03	-	-	0,00E+00	0,00E+00	2,46E-06	1,08E-04
GWPlu	4,43E-10	1,13E-09	-	-	0,00E+00	0,00E+00	0,00E+00	4,85E-09
ODP	6,34E-10	-4,79E-09	-	-	2,70E-13	6,01E-13	3,00E-11	-2,54E-10
AP	6,69E-05	2,44E-03	-	-	1,12E-06	2,48E-06	1,10E-06	1,15E-04
Epf	9,73E-08	8,51E-06	-	-	6,61E-11	1,47E-10	1,25E-09	3,21E-09
Epm	6,95E-06	6,73E-05	-	-	5,23E-07	1,16E-06	6,85E-08	3,88E-06
Ept	9,62E-05	7,63E-04	-	-	5,74E-06	1,27E-05	7,60E-07	2,61E-05
POCP	2,56E-05	2,89E-04	-	-	1,45E-06	3,22E-06	3,99E-07	1,25E-05
ADPe	1,09E-07	1,85E-05	-	-	6,94E-12	1,54E-11	5,33E-09	9,11E-07
ADPF	2,43E-01	3,12E-01	-	-	2,46E-03	5,46E-03	2,43E-03	1,36E-02
WU	2,06E-03	1,02E-01	-	-	6,70E-07	1,49E-06	8,19E-05	4,69E-03
PÈRE	3,91E-02	7,18E-02	-	-	3,28E-06	7,28E-06	1,16E-04	4,47E-03
PERM	0,00E+00	3,98E-02	-	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	3,91E-02	1,12E-01	-	-	3,28E-06	7,28E-06	1,16E-04	4,47E-03
PENRE	2,25E-01	6,55E-01	-	-	2,46E-03	5,46E-03	1,56E-03	3,08E-02
PENRM	1,75E-02	-3,44E-01	-	-	0,00E+00	0,00E+00	8,75E-04	-1,72E-02
PENRT	2,43E-01	3,12E-01	-	-	2,46E-03	5,46E-03	2,43E-03	1,36E-02
SM	0,00E+00	0,00E+00	-	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	0,00E+00	0,00E+00	-	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	0,00E+00	0,00E+00	-	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	4,74E-05	2,38E-03	-	-	1,56E-08	3,46E-08	1,91E-06	1,09E-04
HWD	9,78E-03	1,68E+00	-	-	0,00E+00	0,00E+00	4,79E-04	8,13E-05
NHWD	1,88E-03	4,35E-02	-	-	6,19E-06	1,37E-05	3,86E-05	1,76E-03
RWD	3,65E-07	2,84E-06	-	-	4,41E-09	9,79E-09	6,63E-09	7,63E-08
CRU	0,00E+00	0,00E+00	-	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	1,40E-05	1,25E-03	-	-	0,00E+00	0,00E+00	3,37E-08	5,77E-06
MER	1,24E-05	7,80E-05	-	-	0,00E+00	0,00E+00	5,44E-09	2,57E-06
EE	0,00E+00	0,00E+00	-	-	0,00E+00	0,00E+00	0,00E+00	1,35E-04
BC-pro	0,00E+00	0,00E+00	-	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00
BC-pack	0,00E+00	6,20E-01	-	-	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	2,82E-01	4,21E-01	-	-	2,46E-03	5,47E-03	2,55E-03	1,80E-02
EF-PM	4,87E-10	1,44E-08	-	-	9,08E-12	2,02E-11	7,03E-12	6,83E-10
IR	8,71E-02	2,51E+00	-	-	4,30E-07	9,52E-07	3,80E-03	1,25E-01
Eco-fw	1,09E-01	1,94E+00	-	-	1,19E-04	2,64E-04	1,11E-03	5,51E-02
HT-c	1,50E-09	2,56E-07	-	-	3,10E-15	6,87E-15	7,50E-11	1,28E-08
HT-nc	2,35E-10	3,16E-08	-	-	3,35E-13	7,44E-13	9,82E-12	1,55E-09
LU	6,08E-04	1,82E-02	-	-	0,00E+00	0,00E+00	1,32E-05	-1,99E-04
							3,75E-03	2,43E-01



VI. PRODUCTS COVERED BY THE PEP

The products covered by the given PEP are represented in the below table with a:

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The below table gives the category of each cable, along with its conductor size and fire resistance category included in this PEP for the cable family CAT6 U/UTP LSZH.

Category	Fire resistance	B2ca			Cca			Dca			Eca			Fca		
		1x4P	2x4P	6x4P	1x4P	2x4P	6x4P	1x4P	2x4P	6x4P	1x4P	2x4P	6x4P	1x4P	2x4P	6x4P
	Nº pairs	Conductor size (AWG)														
Cat.5E	24															
Cat.6	23	●			●			●			●					
	24							●			●					
Cat.6A	22															
	23															
	26															
Cat.7	23															
Cat.7A	22															
	23															

AWG or American Wire Gauge is the US standard measure for the diameter of electrical conductors.

The correlation between conductor size in AWG & mm² is given in the norm UL 444

The technical datasheet of the products can be obtained from the link below:

<https://www.nexans.com.tr/tr/products/TELECOM-INFRASTRUCTURES/Copper-pair-cables/LAN-cables/ALSECURE%C2%AE->