

Product Environmental Profile

Ortronics® MTP®-to-LC Cassettes



COMPANY OVERVIEW

• Sustainability built in to support our associates, customers, and the environment

At Legrand North and Central America, we're committed to leading by example within our own operations, to developing high quality solutions for our customers' High Performance Buildings, and to transforming how people live and work – more safely, more comfortably, more efficiently.

• Better Performance

A core principle of designing for sustainability drives us to innovate products and systems that enable buildings to reach exceptional levels of performance, bringing about industry-leading ideas, inventions and initiatives.

• Better Operations

A commitment to a leadership role in operational excellence through environmental management, optimizing the way we manage energy, water and waste.

• Better Lives

A dedication to enhancing employee and community welfare through programs that help people enjoy healthier, more productive and more rewarding lives.

For more information on Legrand's PEPs and other sustainability initiatives, visit legrand.us/sustainability.



LEGRAND'S ENVIRONMENTAL COMMITMENTS

• Incorporate environmental management into our industrial sites

Of all Legrand sites worldwide, over 85% are ISO 14001 certified (sites belonging to Legrand for more than five years).

• Offer our customers environmentally friendly solutions

Develop innovative solutions to help our customers design more energy efficient, better managed and more environmentally friendly installations.

• Involve the environment in product design

Reduce the environmental impact of products over their whole life cycle.

Provide our customers with all relevant information (composition, consumption, end of life, etc.).



REFERENCE PRODUCT

<p>Function</p>	<p>Provides pre-terminated structured cabling deployment for 24 optical fibers for 10 years with a 100% use rate in a data communications system for data centers applications. This system complies with the OM3/OM4 specification, per TIA-568-C.3-2009 standard.</p>
<p>Reference Product</p>	<div data-bbox="475 1541 965 1870" data-label="Image"> </div> <p>Part Number: OR-M4LCQ24-50EA3A1 High Density Cassette, MTP® to LC Quad Adapters, 24 fibers</p>

The company reserves the right to change specifications and designs without notice. All illustrations, descriptions, dimensions and weights in the document are for guidance and cannot be held binding on the company.

Note: MTP is a registered trademark of US Conec Ltd.

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PRODUCTS CONCERNED

The environmental data is representative of the following products:

Standard Density MTP-LC Cassette

OR-M2LCD12-CCCXY
 OR-M2LCQ24-CCCXY
 CCC = fiber type and bandwidth
 X = pair positioning
 YY = performance tier level

High Density MTP-LC Cassette

OR-M4LCQ24-GGGXYZ
 GGG = fiber type and bandwidth
 X = MPO type
 Y = performance tier level
 ZZ = pair positioning

Ultra High Density MTP-LC Cassette

OR-M6LCQ12-GGGYZ
 GGG = fiber type and bandwidth
 Y = performance tier level
 Z = pair positioning

High Density MTP-LC Cassette for Mixed Media

OR-HDCA6LC12CD
 C = rear adapter keying
 D = fiber type and bandwidth



CONSTITUENT MATERIALS

This Reference Product contains no substances prohibited by the regulations applicable at the time of its introduction to the market. It respects the restrictions on use of hazardous substances as defined in the RoHS directive 2011/65/CE.

Total weight of Reference Product (with unit packaging)	314 g
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Plastics as % of weight		Metals as % of weight		Others as % of weight	
Product					
PC	13.3%	Steel	22.6%	Optical Fiber Cable	19.1%
PEI	2.2%	Aluminum alloy	22.1%	Ceramic	<0.1%
PBT+ 30% glass filled	0.8%	Copper alloy	0.4%	Paper	<0.1%
TPE-O	0.4%				
PP	0.2%				
PPS	0.1%				
Packaging					
PET	17.2%			Paper	1.6%
Total plastics	34.2%	Total metals	45.1%	Total others	20.7%

Estimated recycled material content: 10% of weight.

The products covered within the PEP use different metal or plastic-based housings compared to the Aluminum and Steel housing that is accounted for in the Reference Product. The M2- and HDCA- cassette housing is made of ABS or PC, respectively, and the M6- cassette housing is made solely of Aluminum. This does not have a significant impact on the recycled material content so 10% is used to represent all products. The cassettes also differ in weight so there may be some variation in the proportion of materials compared to what is shown.



MANUFACTURING

The Reference Product comes from a site that observes the applicable legislation for industrial sites.



DISTRIBUTION

Products are distributed from logistics centers located to optimize transport efficiency using EPA SmartWay® certified carriers to reduce greenhouse gases emissions. Information on the distance of distribution is not available so the PCR hypothesis for "Intracontinental transport", 2175 miles (3500 km) by heavy truck, was used. This represents transportation of the Reference Product from our warehouse to the local point of distribution in the North American market.

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INSTALLATION

No electricity is required for installing the Reference Product.



USE

Servicing and maintenance:

Under normal conditions of use, this type of product requires no servicing or maintenance.

Consumable:

No consumables are necessary to use this type of product.



END OF LIFE

• **Hazardous waste* contained in the product:** no hazardous waste
 (*) Hazardous waste as defined by European Commission decision 2000/532/EC.

• **Recycling rate:**

Calculated using the method described in the IEC/TR 62635 technical report, the recyclability rate of the Reference Product without packaging is estimated as 72%. This value is based on data collected from a technological channel using industrial procedures. It does not pre-validate the effective use of this channel for end-of-life electrical and electronic products.

Separated into:	(% mass of Reference Product without packaging)
- plastic materials (excluding packaging):	17%
- metal materials (excluding packaging):	55%
- other materials (excluding packaging):	<1%

Recycling rate of packaging (all types of materials): 9% (% mass of packaging)

The difference in materials for products other than the Reference Product does not significantly affect the recyclability rate of these products since the recyclability of the materials are similar to that of Aluminum and Steel. Thus, 72% shall represent the recyclability rate of these products.



ENVIRONMENTAL IMPACTS

The evaluation of environmental impacts examines the stages of the Reference Product life cycle: manufacturing, distribution, installation, use, and end of life. It is representative of products marketed and used in North America.

The following modelling elements were taken into account:

Manufacturing	Unit packaging taken into account. As required by the PEP ecopassport program, all transport for the manufacturing of the Reference Product, including materials and components, has been taken into account. The waste generated during manufacturing phase has been taken into account.
Distribution	Transport between the last distribution center and an average delivery to the sales area. The default scenario modelled maximizes the environmental impact using the PCR hypothesis for "Intracontinental transport": 2175 miles (3500 km) by heavy truck.
Installation	The end-of-life of the packaging (59 g) is taken into account at this phase. Transport of packaging to end of life treatment.
Use	<ul style="list-style-type: none"> • Under normal conditions of use, this type of product requires no servicing or maintenance. • No consumables are necessary to use this type of product. • Use scenario: continuous operation (100% of the time) for 10 years when connected to fiber optic cables. This modelling duration does not constitute a minimum durability requirement. The energy loss accounted for is the optical energy losses caused by insertion loss (0.0037 W). Loss of optical transmission through the fiber cable is considered negligible since the length of fiber is typically less than 1 m. • Energy model: Electricity(US) - 2009
End of life	The default end of life scenario modelled maximizes the environmental impact using the PCR hypothesis for "Local transport": 621 miles (1000 km) by heavy truck and landfilling. Separation between connectors and fiber cable also taken into account.
Software used	EIME V5 and its database "CODDE-2015-04" and the indicators defined in the PCR ed 3 in alignment with the EN15804 standard

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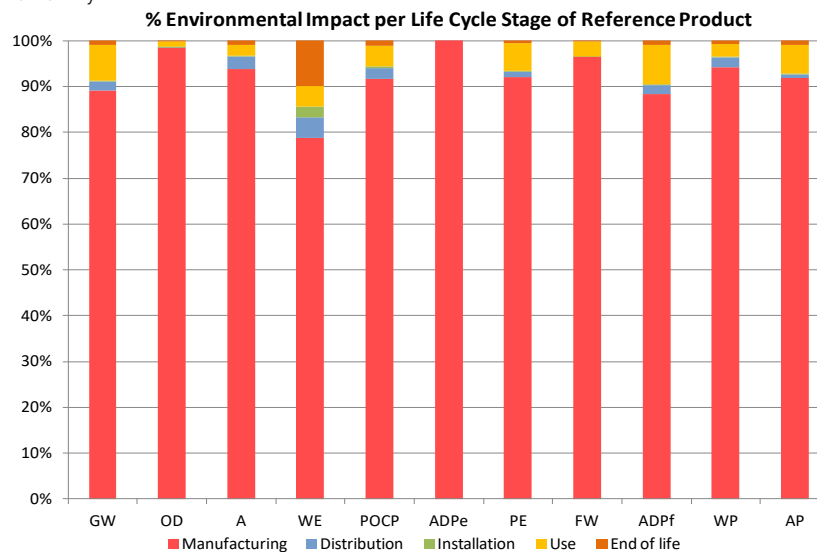
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ENVIRONMENTAL IMPACTS (continued)

	Total for Life cycle		Raw material and manufacturing		Distribution		Installation		Use		End of life	
	Value	Unit	Value	%	Value	%	Value	%	Value	%	Value	%
Global warming (GW)	2.87E+00	kg CO ₂ eq.	2.56E+00	89%	5.47E-02	2%	6.81E-03	< 1%	2.24E-01	8%	2.50E-02	< 1%
Ozone depletion (OD)	3.46E-07	kg CFC-11 eq.	3.41E-07	99%	1.11E-10	< 1%	1.68E-10	< 1%	4.07E-09	1%	7.49E-10	< 1%
Acidification of soil and water (A)	9.39E-03	kg SO ₂ eq.	8.81E-03	94%	2.46E-04	3%	2.63E-05	< 1%	2.15E-04	2%	9.28E-05	< 1%
Water eutrophication (WE)	1.27E-03	kg PO ₄ ³⁻ eq.	9.98E-04	79%	5.65E-05	4%	2.98E-05	2%	5.72E-05	5%	1.24E-04	10%
Photochemical ozone creation (POCP)	7.43E-04	kg C ₂ H ₄ eq.	6.81E-04	92%	1.75E-05	2%	2.04E-06	< 1%	3.44E-05	5%	7.75E-06	1%
Depletion of abiotic resources - elements (ADPe)	3.22E-05	kg Sb eq.	3.22E-05	100%	2.19E-09	< 1%	4.32E-10	< 1%	2.21E-09	< 1%	1.31E-09	< 1%
Total use of primary energy (PE)	6.34E+01	MJ	5.83E+01	92%	7.73E-01	1%	1.05E-01	< 1%	3.84E+00	6%	3.82E-01	< 1%
Net use of fresh water (FW)	1.20E-02	m ³	1.16E-02	96%	4.90E-06	< 1%	5.81E-06	< 1%	3.97E-04	3%	2.08E-05	< 1%
Depletion of abiotic resources - fossil fuels (ADP _f)	4.09E+01	MJ	3.62E+01	88%	7.69E-01	2%	9.71E-02	< 1%	3.55E+00	9%	3.47E-01	< 1%
Water pollution (WP)	4.09E+02	m ³	3.85E+02	94%	9.00E+00	2%	7.82E-01	< 1%	1.11E+01	3%	2.95E+00	< 1%
Air pollution (AP)	3.03E+02	m ³	2.78E+02	92%	2.24E+00	< 1%	8.10E-01	< 1%	1.91E+01	6%	2.61E+00	< 1%

The values of the 27 impacts defined in the PCR-ed3-EN-2015 04 02 are available in the digital database of pep-ecopassport.org website. The environmental impacts of the Reference Product are representative of the products covered by the PEP, which therefore constitute a homogeneous environmental family.



The environmental impact of the Reference Product occurs predominantly during the manufacturing phase.

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ENVIRONMENTAL IMPACTS (continued)

For products other than the Reference Product, the environmental impacts can be estimated by weighting the environmental impacts of the Reference Product by the values shown in the table below. Impacts for Distribution are proportional to mass. Impacts for Installation are the same as the Reference Product. Impacts for Use can be calculated by multiplying the number of fibers in the product (with the default number of fibers being 24) by each impact. For example, to calculate the impacts for a cassette with 12 fibers, multiply each impact by 0.5.

Part Number	Manufacturing	End of Life
OR-M2LCD12-CCCXY	ADPf / AP: 0.8 A: 0.2 all else: 0.5	0.7
OR-M2LCQ24-CCCXY	ADPe / ADPf / AP: 1.0 A: 0.3 all else: 0.8	1.3
OR-M4LCQ24-GGGXYZZ	1.0	1.0
OR-M6LCQ12-GGGYZ	ADPe: 0.5 A / WE / OD: 1.3 GW: 0.9 all else: 0.8	0.6
OR-HDCA6LC12CD	A: 0.2 WP: 0.8 all else: 0.5	0.7

Registration number: LGRP-00011-V01.02-EN	Drafting rules: "PCR-ed3-EN-2015 04"
Verifier's accreditation number: VH25	Information and reference documents: www.pep-ecopassport.org
Date of issue: 12-2015	Validity period: 5 years
Independent verification of the declaration and data, in compliance with ISO 14025:2010 Internal <input type="checkbox"/> External <input checked="" type="checkbox"/>	
The PCR Review was conducted by a panel of experts chaired by Philippe Osset (SOLINNEN).	
The elements of the present PEP cannot be compared with elements from another program.	
Document in compliance with ISO 14025:2010: "Environmental labels and declarations - Type III environmental declarations"	
In compliance with ISO 14040:2006: "Environmental management - LCA - Principles and framework"	
In compliance with ISO 14044:2006: "Environmental management - LCA - Requirements and guidelines" In alignment with EN 15804:2012+A1:2013: "Sustainability of construction works - EPD's - Core rules for the product category of construction products"	