

Product Environmental Profile

Green Transformers High Efficiency TIER2



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 the Group 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 and provide informations in compliance with ISO 14025**

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>To transform by electromagnetic induction a system of alternating voltage and current into another system of alternating voltage and current for the purpose of transmitting electrical power ensuring the following levels of performance according to EN 60076-11, EN-50708 standards and EU Regulation n. 548/2014 and subsequent updates (EU Regulation 2019/1783) :</p> <ul style="list-style-type: none"> - no-load loss A_0 -10% - load loss A_k <p>for a reference life time of 20 years.</p>
<p>Reference Product</p>	
<p>HK4AIAGBA</p>	
<p>Green Transformers High Efficiency TIER2 1000 kVA - A_0-10%A_k series</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.



PRODUCTS CONCERNED

The environmental data is representative of the following products: the whole offer of Green Transformers High Efficiency TIER2, as presented in catalogs (list of codes available upon request through our Technical Customer Service).

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■ 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/EU and its delegated directive 2015/863/EU.

Total weight of Reference Product	2900 kg (all packaging included)				
Plastics as % of weight		Metals as % of weight		Other as % of weight	
Other plastics	9,8 %	Steel	65,4 %		
PET	2,5 %	Aluminum	22,3 %		
		Copper alloys	< 0,1 %		
Packaging					
Polyethylene	< 0,1 %				
Total plastics	12,3 %	Total metals	87,7 %	Total other	0,0 %

Estimated recycled material content: 26 % by mass.

The % of the materials masses can vary on the basis of the total mass of the transformer: to have further information about the % of the materials of products different from the Reference Product, please contact our Customer Technical Service.



■ MANUFACTURE

This Reference Product comes from a site that has received ISO14001 certification.



■ DISTRIBUTION

Products are distributed from logistics centres located with a view to optimize transport efficiency. The Reference Product is therefore transported over an average distance of 3500 km by road from our warehouse to the local point of distribution into the European market. Packaging is compliant with European directive 2004/12/EU concerning packaging and packaging waste.



■ INSTALLATION

For the installation of the product, only standard tools are needed.



■ USE

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

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END OF LIFE

The product end-of-life factors are taken into account during the design phase. Dismantling and sorting of components or materials is made as easy as possible with a view to recycling or failing that, another form of reuse.

• Recyclability rate:

Calculated using the method described in technical report IEC/TR 62635, the recyclability rate of the product is estimated at 90 %. This value is based on data collected from a technological channel operating on an industrial basis. It does not pre-validate the effective use of this channel for the end of life of this product.

Separated into:

- plastic materials (excluding packaging) : 2 %
- metal materials (excluding packaging) : 88 %

The following table shows the material of the components used in our products, useful to manage recycling operations, getting high-performance end-of-life recycling solutions.

Due to the manufacturing complexity of the product, the table below provides the main materials of which it is composed, and the relative quantity by weight. The precise data for each single transformer are indicated on the plate of the specific transformer itself.

WEIGHTS OF THE MAIN TRANSFORMER MATERIALS		
Range	Conductor material Aluminum [kg]	Core material CRGO (cold-rolled grain-oriented steel) [kg]
Up to 630 kVA	100 to 500	200 to 1500
From 800 to 1600 kVA	500 to 1100	1300 to 2700
From 2000 to 3150 kVA	1100 to 1700	2700 to 7000



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 from products marketed and used in Europe, in compliance with the local current standards.

For each phase, the following modelling elements were taken in account:

Manufacture	Materials and components of the product, all transport for the manufacturing, the packaging and the waste generated by the manufacturing.
Distribution	Transport between the last Group distribution centre and an average delivery point in the sales area.
Installation	The end of life of the packaging.
Use	<ul style="list-style-type: none"> • Product category: PSR-0005-ed2-2016 03 29 - § 3.13. Other equipments - passive products • Use scenario: continuous operation (100% of the time) for 20 years at 30% of rated load. This modelling duration does not constitute a minimum durability requirement. • Energy model: Electricity Mix, Europe 27 - 2008.
End of life	The default end of life scenario maximizing the impacts.
Software and database used	EIME V5 and its database «CODDE-2018-11»

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SELECTION OF ENVIRONMENTAL IMPACTS

	Total for Life cycle		Raw material and manufacture		Distribution		Installation		Use		End of life	
	Value	Unit	Value	%	Value	%	Value	%	Value	%	Value	%
Global warming	2.07E+05	kgCO ₂ eq.	1.73E+04	8%	4.82E+02	< 1%	2.82E-01	< 1%	1.89E+05	91%	1.96E+02	< 1%
Ozone depletion	1.44E-02	kgCFC-11 eq.	2.04E-03	14%	9.76E-07	< 1%	7.20E-09	< 1%	1.23E-02	86%	2.03E-06	< 1%
Acidification of soils and water	8.71E+02	kgSO ₂ eq.	7.87E+01	9%	2.16E+00	< 1%	1.07E-03	< 1%	7.90E+02	91%	8.14E-01	< 1%
Water eutrophication	5.54E+01	kg[PO ₄] ³⁻ eq.	6.00E+00	11%	4.97E-01	< 1%	1.22E-03	< 1%	4.77E+01	86%	1.28E+00	2%
Photochemical ozone formation	4.91E+01	kgC ₂ H ₄ eq.	5.48E+00	11%	1.54E-01	< 1%	8.38E-05	< 1%	4.34E+01	88%	6.15E-02	< 1%
Depletion of abiotic resources - elements	2.14E-02	kgSb eq.	4.94E-03	23%	1.93E-05	< 1%	1.82E-08	< 1%	1.64E-02	77%	9.15E-06	< 1%
Total use of primary energy	4.45E+06	MJ	6.63E+05	15%	6.81E+03	< 1%	3.07E+00	< 1%	3.78E+06	85%	2.39E+03	< 1%
Net use of fresh water	6.87E+05	m ³	5.41E+02	< 1%	4.31E-02	< 1%	2.48E-04	< 1%	6.86E+05	100%	7.56E-02	< 1%
Depletion of abiotic resources - fossil fuels	2.33E+06	MJ	1.70E+05	7%	6.77E+03	< 1%	2.74E+00	< 1%	2.15E+06	92%	2.30E+03	< 1%
Water pollution	9.78E+06	m ³	1.86E+06	19%	7.92E+04	< 1%	3.18E+01	< 1%	7.81E+06	80%	2.68E+04	< 1%
Air pollution	1.01E+07	m ³	1.91E+06	19%	1.97E+04	< 1%	3.34E+01	< 1%	8.15E+06	81%	1.36E+04	< 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.

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For products covered by the PEP other than the Reference Product, to obtain the environmental impacts of each phase of the Life cycle for the insulation class 24 kV, multiply the environmental impacts of the Reference Product by the following coefficients:

Insulation class 24 kV S _R [kVA]	Manufacturing	Distribution	Installation	Use	End of life
100	0.30	0.30	1.00	0.19	0.30
160	0.32	0.32	1.00	0.27	0.32
250	0.42	0.42	1.00	0.35	0.42
315	0.48	0.48	1.00	0.41	0.48
400	0.52	0.52	1.00	0.49	0.52
500	0.57	0.57	1.00	0.60	0.57
630	0.65	0.65	1.00	0.74	0.65
800	0.79	0.79	1.00	0.86	0.79
1000	1.00	1.00	1.00	1.00	1.00
1250	1.14	1.14	1.00	1.18	1.14
1600	1.36	1.36	1.00	1.43	1.36
2000	1.67	1.67	1.00	1.71	1.67
2500	2.03	2.03	1.00	2.04	2.03
3150	2.50	2.50	1.00	2.45	2.50

The environmental impacts of the transformers of the other insulation classes of the range are available upon request to our Customer Technical Service.

Registration N°: LGRP-01351-V01.01-EN	Drafting rules: PEP-PCR-ed3-EN-2015 04 02 Supplemented by PSR-0005-ed2-2016 03 29
Verifier accreditation N°: VH02	Information and reference documents : www.pep-ecopassport.org
Date of issue: 04-2021	Validity period: 5 years
Independent verification of the declaration and data, in compliance with ISO 14025:2010 Internal <input checked="" type="checkbox"/> External <input type="checkbox"/>	
The PCR 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	
Document in compliance with ISO 14025 : 2010: «Environmental labels and declarations. Type III environmental declarations»	
Environmental data in alignment with EN 15804 : 2012 + A1 : 2013	

