

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

Function	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) : - no-load loss A0-10% - load loss Ak for a reference life time of 20 years.
Reference Product	HK4AIAGBA Green Transformers High Efficiency TIER2 1000 kVA - A0-10%Ak series

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 amended by delegated directive (EU) 2015/863, and its amendment 2017/2102/EU.

Total weight of Reference Product	2822.51 kg (all packaging included)
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Product alone weight : 2820.16 kg					
Plastics as % of weight		Metals as % of weight		Other as % of weight	
Thermoset	9.5 %	Steel	66.2 %		
PET	2.5 %	Aluminium	21.8 %		
		Copper and copper alloys	<0.1 %		

Packaging (alone) : 2.35 kg					
Polyethylene (LDPE)	<0.1 %				
Total plastics : 338.70 kg	12.0 %	Total metals : 2483.81 kg	88.0 %	Total others : 0.00 kg	0.0 %

At the date of edition of this document, the content of recycled material(s) is :

- Product alone (excluding packaging): 19 % by mass



■ MANUFACTURE

This Reference Product comes from sites that have received ISO14001 certification. The final assembly site is located in Italy.



■ 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.

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 3500 kVA	1100 to 1810	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 of products marketed and used in Europe, in compliance with the local current standards. The data collected for this PEP are representative of the year 2026.

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

System Limit	Manufacture A1-A3	Materials and components of the product, all transport for the manufacturing, the packaging and the waste generated by the manufacturing.
	Distribution A4	Transport between the last Group distribution centre and an average delivery point in the sales area.
	Installation A5	The end of life of the packaging.
	Use B1-B7	- Product category: PSR-0005-ed3.1-2023 12 08 - § 3.15 «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_Low voltage_2022_Europe_EU-27
	End of life C1-C4	Choice of end-of-life by default model for PCR-ed4-EN-2021 09 06
D Module		Module D is calculated according to PCR-ed4-EN-2021 09 06 based on the materials recycled and the modelled end-of-life scenario. It expresses the net benefits and burdens beyond the boundaries of the system, and are not to be included in the life cycle totals.
Software and data-base used		EIME V6 and its CODDE-2025-04 database The set of indicators used is Indicators for PEF EF 3.1 (compliance: PEP ed.4, EN15804+A2) v2.0

Unless otherwise indicated the modelling energetic mix are those integrated in the data modules used from the aforementioned database.

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ENVIRONMENTAL IMPACTS

	Total Life Cycle		Manufacturing	Distribution	Installation	Use ⁽¹⁾			End of Life	Module D
			A1-A3	A4	A5	Total B1-B7	B2	B6	C1-C4	
Climate change - total	1.77E+05	kg CO ₂ eq.	1.81E+04	4.04E+02	0*	1.56E+05	0.00E+00	1.56E+05	2.59E+03	-8.06E+03
Climate change - fossil fuels	1.73E+05	kg CO ₂ eq.	1.77E+04	4.04E+02	0*	1.53E+05	0.00E+00	1.53E+05	2.58E+03	-7.90E+03
Climate change - biogenics	3.79E+03	kg CO ₂ eq.	3.27E+02	0*	0*	3.45E+03	0.00E+00	3.45E+03	1.18E+01	-1.56E+02
Climate change - land use and land use transformation	2.32E-03	kg CO ₂ eq.	6.22E-04	5.85E-04	0*	0.00E+00	0.00E+00	0.00E+00	1.11E-03	0.00E+00
Ozone depletion	2.41E-03	kg CFC-11 eq.	1.58E-03	4.62E-06	0*	6.69E-04	0.00E+00	6.69E-04	1.57E-04	-7.94E-04
Acidification (AP)	9.38E+02	mole of H ⁺ eq.	1.05E+02	6.39E-01	0*	8.17E+02	0.00E+00	8.17E+02	1.44E+01	-4.93E+01
Freshwater eutrophication	4.47E-01	kg P eq.	6.75E-02	1.48E-03	0*	3.74E-01	0.00E+00	3.74E-01	4.38E-03	-2.38E-02
Marine aquatic eutrophication	1.09E+02	kg of N eq.	1.13E+01	1.23E-01	0*	9.56E+01	0.00E+00	9.56E+01	1.86E+00	-5.18E+00
Terrestrial eutrophication	1.68E+03	mole of N eq.	1.26E+02	1.34E+00	0*	1.53E+03	0.00E+00	1.53E+03	2.28E+01	-5.67E+01
Photochemical ozone formation	3.52E+02	kg NMVOC eq.	4.22E+01	4.30E-01	0*	3.03E+02	0.00E+00	3.03E+02	6.44E+00	-2.00E+01
Depletion of abiotic resources - elements	5.63E-02	kg Sb eq.	5.12E-03	1.29E-04	0*	5.06E-02	0.00E+00	5.06E-02	4.47E-04	-2.40E-03
Depletion of abiotic resources - fossil fuels	4.36E+06	MJ	5.71E+05	7.06E+03	0*	3.74E+06	0.00E+00	3.74E+06	4.25E+04	-3.89E+05
Water requirement	1.81E+04	m ³ deprivation worldwide eq.	5.81E+03	1.44E+01	0*	1.18E+04	0.00E+00	1.18E+04	4.75E+02	-2.55E+03
Emission of fine particles	7.26E-03	incidence of diseases	7.64E-04	5.62E-06	0*	6.40E-03	0.00E+00	6.40E-03	9.17E-05	-3.64E-04

*Represents less than 0.01% of the total life cycle of the reference flow

(1) For the Use phase and according to the current PCR, the information modules B1, B3, B4, B5 and B7, all having indicator values equal to «0» (zero), are not listed in this table

In accordance with current PCR rules, the environmental indicator values in the «Module D» column must not be summed with the values in the «Total Life Cycle» column

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Total Life Cycle			Manufacturing	Distribution	Installation	Use ⁽¹⁾			End of Life	Module D
			A1-A3	A4	A5	Total B1-B7	B2	B6	C1-C4	
Ionizing radiation, human health	2.10E+05	kBq of U235 eq.	4.86E+03	0*	0*	2.04E+05	0.00E+00	2.04E+05	6.63E+02	-2.42E+03
Ecotoxicity (fresh water)	3.95E+05	CTUe	1.15E+05	1.11E+04	0*	2.34E+05	0.00E+00	2.34E+05	3.47E+04	-2.86E+04
Human toxicity, carcinogenic effects	3.50E-05	CTUh	1.52E-05	7.44E-08	0*	1.93E-05	0.00E+00	1.93E-05	4.34E-07	-2.76E-06
Human toxicity, non-carcinogenic effects	5.92E-04	CTUh	1.06E-04	1.57E-06	0*	4.57E-04	0.00E+00	4.57E-04	2.63E-05	-5.67E-05
Impacts related to land use/soil quality	4.22E+03	-	3.07E+01	1.66E+00	0*	4.14E+03	0.00E+00	4.14E+03	4.70E+01	0.00E+00
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	8.90E+05	MJ	1.01E+04	0*	0*	8.77E+05	0.00E+00	8.77E+05	2.55E+03	-3.94E+03
Use of renewable primary energy resources used as raw materials	2.42E+03	MJ	2.42E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	8.92E+05	MJ	1.25E+04	0*	0*	8.77E+05	0.00E+00	8.77E+05	2.55E+03	-3.94E+03
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	4.36E+06	MJ	5.65E+05	7.06E+03	0*	3.74E+06	0.00E+00	3.74E+06	4.25E+04	-3.89E+05
Use of non-renewable primary energy resources used as raw materials	5.85E+03	MJ	5.85E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	4.36E+06	MJ	5.71E+05	7.06E+03	0*	3.74E+06	0.00E+00	3.74E+06	4.25E+04	-3.89E+05

*Represents less than 0.01% of the total life cycle of the reference flow

(1) For the Use phase and according to the current PCR, the information modules B1, B3, B4, B5 and B7, all having indicator values equal to «0» (zero), are not listed in this table

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Total Life Cycle			Manufacturing	Distribution	Installation	Use ⁽¹⁾			End of Life	Module D
			A1-A3	A4	A5	Total B1-B7	B2	B6	C1-C4	
Use of secondary materials	6.91E+02	kg	6.91E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	0.00E+00	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	0.00E+00	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	4.28E+02	m³	1.36E+02	3.35E-01	0*	2.77E+02	0.00E+00	2.77E+02	1.42E+01	-5.94E+01
Hazardous waste disposed of	9.39E+03	kg	1.71E+03	1.62E+00	0*	4.31E+03	0.00E+00	4.31E+03	3.37E+03	-6.03E+02
Non-hazardous waste disposed of	4.61E+04	kg	2.05E+04	3.59E+01	0*	2.35E+04	0.00E+00	2.35E+04	1.98E+03	-1.03E+04
Radioactive waste disposed of	2.19E+01	kg	1.62E+01	2.85E-02	0*	5.55E+00	0.00E+00	5.55E+00	1.38E-01	-8.28E+00
Components for re-use	0.00E+00	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	2.54E+03	kg	6.15E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.92E+03	0.00E+00
Materials for energy recovery	0.00E+00	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	0.00E+00	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of primary energy during the life cycle	5.26E+06	MJ	5.83E+05	7.08E+03	0*	4.62E+06	0.00E+00	4.62E+06	4.51E+04	-3.93E+05
Biogenic carbon content of the product	0.00E+00	kg of C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	5.35E+01	kg of C	5.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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In accordance with current PCR rules, the environmental indicator values in the «Module D» column must not be summed with the values in the «Total Life Cycle» column

The values of the indicators defined in the PCR-ed4-EN-2021 09 06 are available in the digital database of pep-ecopassport.org website.

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To obtain the values of the environmental impacts of the products for the insulation class 24 kV covered by the document and different from the Reference Product apply the following extrapolation coefficients to the environmental impacts of the Reference Product.

Insulation class 24 kV SR [kVA]	Total Life Cycle	Manufacturing and Distribution	Installation	Use	End of life
100	0.2	0.3	1.0	0.2	0.3
160	0.3	0.3	1.0	0.3	0.3
250	0.4	0.4	1.0	0.4	0.4
315	0.4	0.5	1.0	0.4	0.5
400	0.5	0.5	1.0	0.5	0.5
500	0.6	0.6	1.0	0.6	0.6
630	0.7	0.6	1.0	0.7	0.6
800	0.9	0.8	1.0	0.9	0.8
1000	1.0	1.0	1.0	1.0	1.0
1250	1.2	1.1	1.0	1.2	1.1
1600	1.4	1.4	1.0	1.4	1.4
2000	1.7	1.7	1.0	1.7	1.7
2500	2.0	2.0	1.0	2.0	2.0
3150	2.5	2.5	1.0	2.4	2.5
3500	3.1	3.3	1.0	3.1	3.3

Registration number: LGRP-01351-V02.01-EN		Drafting rules: « PEP-PCR-ed4-EN-2021 09 06 » Supplemented by «PSR-0005-ed3.1-EN-2023 12 08»	
Verifier accreditation N°: VH23		Information and reference documents : www.pep-ecopassport.org	
Date of issue: 04-2026		Validity period : 5 years	
Independent verification of the declaration and data, in compliance with ISO 14025 : 2006			
Internal ☒ External ☐			
The PCR review was conducted by a panel of experts chaired by Julie ORGELET (DDemain)			
PEP are compliant with XP C08-100-1 :2016 or EN 50693 :2019			
The elements of the present PEP cannot be compared with elements from another program			
Document in compliance with ISO 14025 : 2006: «Environmental labels and declarations. Type III environmental declarations»			

Environmental data in alignment with EN 15804: 2012 + A2 : 2019