



ENVIRONMENTAL PRODUCT DECLARATION

DISTRIBUTION TRANSFORMER 400/24/20 B2 O-PE

**Loeches,
Madrid, Spain**

In accordance with ISO 14025 and EN 50693

Regulation of the EPDItaly Programme, Revision 7.1

Program Operator	EPDItaly
Publisher	EPDItaly

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General information

EPD owner

Name of the company	Ormazabal Cotradis Transformadores SLU, Velatia Group
Registered office	Pol. Ind. El Caballo, Parcela 56. 28890 Loeches. Madrid, Spain.
Contacts for information on the EPD	Óscar Castejon Pinilla (ocp@cotradis.com)

Programme operator

Programme:	EPD Italy
Address:	Via Gaetano De Castilla, 10 – 21124 Milano, Italy
Website:	www.epditaly.it
E-mail:	info@epditaly.it

EPD & Product information

EPD type	Product specific
Product name	Distribution transformer 400/24/20 B2 O-PE
Product codes included	400/24/20 B2 O-PE
Production site	Loeches, Madrid, Spain
Intended use	The function of this distribution transformer is to adjust and regulate voltage and current intensity components of electric power. This model is under Tier 2 Standard.
Product standards	IEC 62109-1, IEC 62109-2, IEC 61000-6-2/4, IEEE 1547, EN 55011, IEC 62920, EN 50530, IEC 62116, IEC 61683, IEEE 519, IEC 60529, IEC 61727, NTS 631 v1.1 SENP & v2.1 SEPE, UL 1741-SA, CSA C22.2, NEC 2020, CEA 2007, Rule 14, Rule 21, PRC 024 AND UL 62109-1.
CPC Code	46121, "Electrical Transformers"
LCA Consultant	Ingurumenaren Kideak Ingenieria (IK Ingenieria) Website: www.ik-ingenieria.com/ Contact: ik@ik-ingenieria.com

Verification information

Product category rules (PCR)	- Core PCR EPDItaly007:20 Electronic and Electrical Products and Systems revision 3.2, 01/10/2025. - Sub-PCR EPDItaly018: Electronic and Electrical Products and Systems: Power Transformers revision 3.6, 01/07/2024.
EPDItaly regulations	Regulations of the EPDItaly Programme rev. 7.1, 05/09/2025
LCA project report	This EPD study is based on the LCA study described in the LCA report – Distribution Transformer 400/24/20 B2 O-PE
Independent verification	Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☒ External ☐ Internal Third-party verification carried out by: ICMQ S.p.A., via Gaetano de Castillia n ° 10 - 20124 Milan, Italy. Accredited by Accredia.
Comparability statement	Environmental statements published within the same product category, but from different programs, may not be comparable.
Liability statement	The EPD Owner releases EPDItaly from any non-compliance with environmental legislation. The holder of the declaration will be responsible for the information and supporting evidence. EPDItaly disclaims any responsibility for the information, data and results provided by the EPD Owner for life cycle assessment.

The EPD owner has the sole ownership, liability and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 50693, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 50693 and ISO 14025.

Company information

Owner of the EPD:

Ormazabal Cotradis Transformadores SLU.

Description of the organisation:

Ormazabal Cotradis Transformadores SLU is an industrial company in the electricity business (Ormazabal) of Velatia.

Velatia, before Ormazabal Group, is a business group that provides solutions, products and services for such diverse fields as: electric grids, communication networks, transportation, security and intelligent infrastructure management.

On the market since 1967, Ormazabal has a profound knowledge of the sector enabling it to meet the present and future needs of power and renewable grids and contribute to its development with innovative solutions and its own technology.

Ormazabal Cotradis, as part of Velatia, is a company highly committed to Social Responsibility. In this regard, since 2002, Velatia is a member of the Spanish Network of the United Nations Global Compact, making commitments to align strategies and operations with the ten universally accepted principles concerning some thematic areas: human rights, labour standards, environment and anti-corruption.

Velatia is committed to society as an essential basis for the sustainable development of the group. This philosophy is reflected in the commitments to our customers, our people, to excellence, good governance and transparency, and to the environment.

As a sign of that commitment, Ormazabal Cotradis has implemented an Integrated Management System according to the standards UNE-EN ISO 9001, UNE EN ISO 14001 and UNE-EN ISO 45001, in addition to the voluntary commitments that have been taken on over the years.



The objective is that all the companies of Velatia offer their customers a quality service in a responsible and efficient manner, boosting the professional development of our personnel, supporting the development of the communities in which we operate, developing responsible technologies and products, and promoting initiatives that favour environmental protection.

Name and location of production site:

Ormazabal Cotradis Transformadores SLU

- Pol. Ind. El Caballo, Parcela 56. 28890 Loeches. Madrid, Spain.

Contact:

Óscar Castejón Pinilla. Email: ocp@ormazabal.com

More information on www.ormazabal.com.

Product information

Product name:

Distribution transformer 400/24/20 B2 O-PE

Product description:

This Environmental Product Declaration covers the life cycle analysis carried out on a Distribution transformer 400/24/20 B2 O-PE manufactured by Ormazabal Cotradis in their manufacturing plant in Spain.

The characteristics of the Distribution transformer 400/24/20 B2 O-PE are shown below:

Operating power		400 kVA
Nominal voltage on the primary side		20,000 V
Nominal voltage on the secondary side		420 V
Nominal current on the primary side		11.55 A
Nominal current on the secondary side		549.86 A
Service lifetime		35 years
Dimensions	Length	1,200 mm
	Width	800 mm
	Height (with wheels)	1,403 mm

UN CPC code: 46121 "Electrical Transformers"

Life Cycle Assessment information

Functional unit: The functional unit of the study is a **single piece of transformer operating for 35 years**.

The reference flows for the product is 1,526.91 kg.

Reference service life: A lifetime of 35 years has been considered for these products, as stated by the sub-PCR.

Geographical scope: The geographical scope of this EPD is **Europe**.

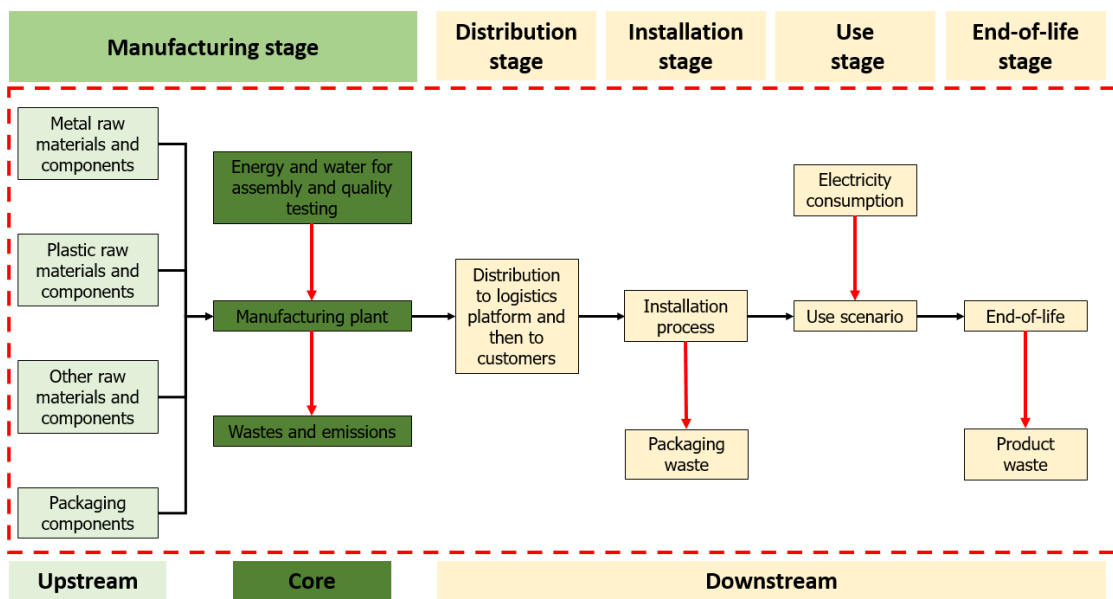
Time representativeness: The data collection from factory (primary data) and electricity mix are from 01/01/2024 to 31/12/2024. In this study, no dataset older than 10 years was used.

Database(s) and LCA software: All data used for the Life Cycle Inventory and to model the process is specific and have been obtained from Ormazabal Cotradis' internal system and measurements carried out during 2024 year.

Ecoinvent database 3.11 version has been used due to the characteristics of the study and the analysed product as this database contains the most extensive and updated information and its scope coincides with the geographical, technological and temporal area of the project. The Life Cycle Assessment was modelled with Simapro software version 10.2.0.0.

System boundaries: The life cycle analysis is from cradle to grave, including upstream, core and downstream modules.

Modules	Upstream	Core	Downstream				Benefits and loads beyond the system
Stages	Manufacturing		Distribution	Installation	Use & Maintenance	End-of-life	
Processes	Extraction of raw materials and processing of semi-finished products. Transport of raw materials to production unit.	Product assembly and testing; Transport and treatment of manufacturing waste.	Transport of the product to the installation place; Transport and treatment of packaging components; Electricity consumption of the products during its service lifetime; Transport and treatment of the product at its end-of-life.				Reuse-recovery-recycling potential
Declared modules	X	X	X	X	X	X	Not included
Geography	EU	ES	GLO	GLO	GLO	GLO	-

System diagram:

Data quality: The environmental impact of the transformers has been calculated. This study is based on the international standards established for the development of environmental product declarations: ISO 14025 for the preparation of the environmental product declaration, ISO 14040 and ISO 14044 for the development of the life cycle analysis, and standard EN 50693 and the product category rules of EPDItaly programme (Core-PCR EPDItaly007 and Sub-PCR EPDItaly018) for the definition of the study rules.

Data has been collected for 2024 year and is representative of that year. Data for raw material supply, transport from suppliers to fabrication plant and production is based on specific data for Ormazabal Cotradis' plant in Spain. Generic background datasets and representative scenarios were used for downstream processes.

Assumptions:

The modularity principle, as well as the polluter-payer principle have been followed for the development of the study. The following assumptions have been followed:

- The impacts related to the production, transportation and installation of capital goods (buildings, infrastructure, machinery and internal transport packing); the general operations (staff travel, marketing and communication actions); and the infrastructure for general management (office, laboratory and headquarters operations) have been excluded from the system boundaries.
- An allocation of the energy and water consumption required by Ormazabal Cotradis to manufacture and test the transformers, the generated wastes, the paint quantity and the additives has been made based on the total consumption of these aspects and the total power of the units manufactured in 2024.
- The processes associated with the production of fuels and emissions are intrinsically included in the indicators of the Ecoinvent 3.11 database.
- The environmental impact of external transport has been calculated using trucks from the Ecoinvent 3.11 database. Those trucks have been chosen to reflect the most realistic scenario possible.

Cut-off rules:

The ISO 14025 standard and the Core-PCR EPDItaly007 Electronic and electrical products systems indicate that the life cycle inventory data must include a minimum of 95% of the total inputs (material and energy). In this study, several minor elements have been cut-off, representing approximately 0.8% of the total weight of the transformer.

Allocation:

It has not been necessary to make any load allocation between products and co-products. The energy and water consumption for manufacturing and quality testing the analysed products, the generated wastes during the manufacturing process, the paint of the transformers and the auxiliary additives for the manufacturing have been allocated to the functional unit.

Life Cycle Assessment scenarios and additional information

Manufacturing stage

This stage includes the production, industrial transformation, manufacturing processes and transportation of raw materials and components making up the corresponding distribution transformer. All the necessary materials and components making up the transformers are received from suppliers in Cotradis' warehouses, from which they are sent to the different sections of the plant in order to be transformed and wound together. At the same time that the internal parts of the transformers are made, the enclosure is welded and painted. An inspection is carried out on the enclosure to check for leaks.

Once the different parts are developed, the final assembly starts. This process includes the curing and the addition of the dielectric oil. All the transformers manufactured are subjected to various quality tests, which, once passed, the final product is packaged, accessories are fitted and the distribution transformer is finished.

The impact of the manufacturing electricity mix with GHG-GWP category is 6.09E-02 kg CO₂ eq. per kWh.

Distribution stage

These distribution transformers, once packaged, are distributed from the manufacturing plant to the last logistics platform and then to the end customers.

Installation stage

This module includes impacts arising from the installation of the transformers in the operational site. The installation process of distribution transformer 400/24/20 B2 O-PE doesn't require any additional material, but it requires the use of an elevation machine.

In addition to this process, the end-of-life of packaging is included in this stage, as well as their transportation to the waste manager. The EoL scenario of the packaging materials has been obtained from data about the recovery rate of diverse materials provided by the European Commission.

Use & Maintenance stage

The impacts related to the energy used by the transformer to operate during its entire reference service life are considered. Use stage considers the electricity load losses of the transformers, the power dissipated without losses and the power loss due to auxiliary activities, such as cooling.

The calculation of the electricity consumption of the transformers during the product's service life has been carried out with the formula from the sub-PCR EPDItaly – Power Transformers:

$$E_d [kWh] = [P_{load} * k_{load}^2 + P_{noload}] * t_{year} * RSL + P_{aux} * f_{aux} * t_{year} * RSL$$

In this transformer, no auxiliary process is considered and only the power losses due to the main activities are considered.

Distribution transformer 400/24/20 B2 O-PE are under Tier 2 Standard, which was implemented for the manufacturing of transformers at European level in July 2021. This standard provides the parameters to calculate the electricity consumption:

Parameter	Value
P_{load}	2,479.4 W
k_{load}	70%
P_{noload}	621 W
P_{aux}	0 W
f_{aux}	0%
t_{year}	8,760 hours
RSL	35 years

Ordinary maintenance is not contemplated due to the high reliability of these devices. For this reason, maintenance interventions are exclusively related to extraordinary maintenance. In the case of these transformers, no extraordinary maintenance operations have been considered as these products don't require substitution of components during the 35 years of lifetime considered by the sub-PCR.

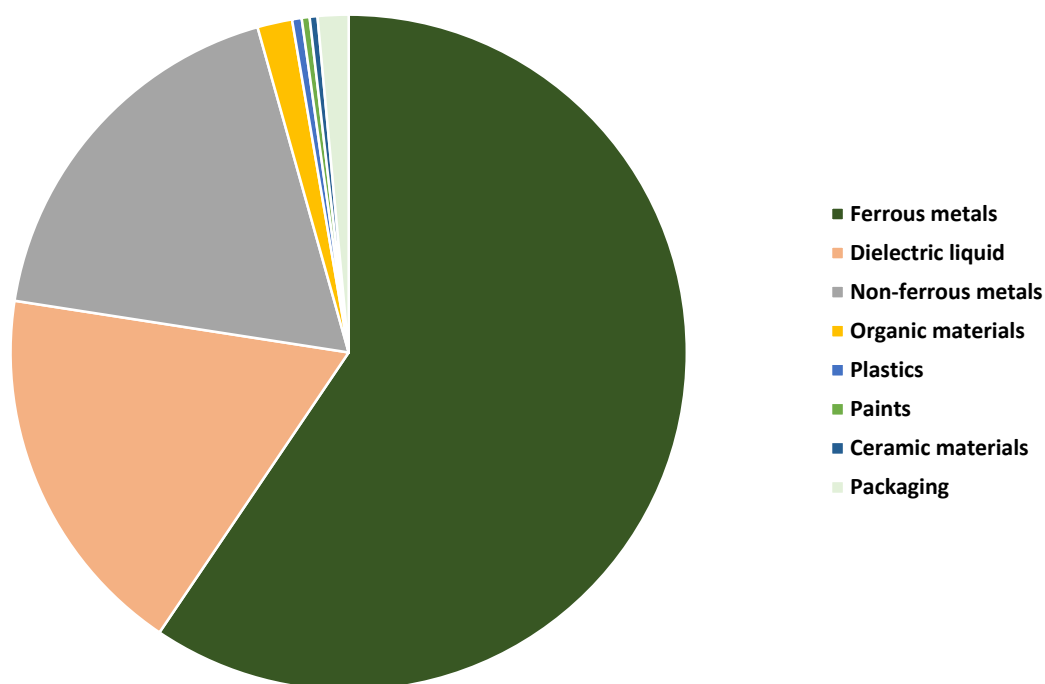
End-of-life stage

Ormazabal Cotradis developed a disassembly manual, which is included with all the shipped units to the clients. This manual includes all the step related to the disassembly process, as well as a study carried out in several units in which the components of the transformer are divided into recycled components and disposed components. From this study, it has been considered that the recovery rate of these transformers is 77.79%, while a transportation of 100 km by lorry to the waste manager is also included.

Content declaration

The analysed transformer is an electronic component of several complex parts, such as magnetic sheet, conductors, insulation, bushings, dielectric liquid and accessories among others.

Type of material	Weight (kg)	Percentage (%)
Ferrous metals	899.91	58.94%
Dielectric liquid	296.56	19.42%
Non-ferrous metals	268.82	17.61%
Organic materials	18.87	1.24%
Plastics	7.31	0.48%
Paints	6.02	0.39%
Ceramic materials	5.96	0.39%
Packaging	23.45	1.54%
Total weight of the product	1,503.46	98.46%
Total packaging of the product	23.45	1.54%
Total weight of one product with packaging material	1,526.91	100.00%



The product is transported to the customer in pallets and packed with protective plastic foams.

Environmental impacts

The environmental impacts of the distribution transformer 400/24/20 B2 O-PE are shown below:

Potential environmental impacts – Environmental impact descriptive parameters:

Category	Unit	TOTAL	Manufacturing stage	Distribution stage	Installation stage	Use & Maintenance stage	End-of-life stage
GWP – Total	Kg CO ₂ eq.	1.38E+05	5.84E+03	5.59E+02	5.19E+01	1.31E+05	5.80E+02
GWP – Fossil	Kg CO ₂ eq.	1.38E+05	5.87E+03	5.59E+02	1.78E+01	1.31E+05	5.22E+02
GWP – Biogenic	Kg CO ₂ eq.	3.98E+02	-6.71E+01	1.18E-01	3.41E+01	3.73E+02	5.82E+01
GWP – Luluc	Kg CO ₂ eq.	5.37E+01	3.62E+01	1.85E-01	2.08E-03	1.73E+01	1.17E-01
ODP	Kg CFC-11 eq.	3.30E-03	1.11E-04	1.22E-05	2.68E-07	3.17E-03	3.31E-06
AP	mol H ⁺ eq.	4.49E+02	2.48E+01	1.79E+00	6.18E-02	4.21E+02	1.13E+00
EP – Freshwater	Kg P eq.	3.69E+00	2.70E-01	4.09E-03	6.91E-05	3.41E+00	2.69E-03
EP – Marine aquatic	Kg N eq.	8.02E+01	6.45E+00	5.97E-01	2.57E-02	7.28E+01	3.41E-01
EP - Terrestrial	mol N eq.	8.91E+02	5.05E+01	6.57E+00	2.79E-01	8.29E+02	3.96E+00
POCP	Kg NMVOC eq.	3.68E+02	2.18E+01	2.72E+00	1.00E-01	3.43E+02	1.16E+00
ADP – Minerals & metals	Kg Sb eq.	2.05E-01	8.48E-02	1.88E-03	8.21E-06	1.15E-01	3.60E-03
ADP - Fossil	MJ	2.32E+06	8.94E+04	7.92E+03	2.32E+02	2.22E+06	2.30E+03
WDP	m ³ eq.	6.65E+04	1.19E+03	3.07E+01	4.10E-01	6.53E+04	2.44E+01
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption						

Potential environmental impacts – Parameters describing resource use:

Category	Unit	TOTAL	Manufacturing stage	Distribution stage	Installation stage	Use & Maintenance stage	End-of-life stage
PERE	MJ	7.66E+05	1.69E+04	1.25E+02	3.11E+02	7.48E+05	5.77E+02
PERM	MJ	0.00E+00	7.36E+02	0.00E+00	-3.09E+02	0.00E+00	-4.27E+02
PERT	MJ	7.66E+05	1.76E+04	1.25E+02	1.80E+00	7.48E+05	1.50E+02
PENRE	MJ	2.32E+06	6.48E+04	7.92E+03	2.49E+02	2.22E+06	2.79E+04
PENRM	MJ.	0.00E+00	2.57E+04	0.00E+00	-1.74E+01	0.00E+00	-2.56E+04
PENRT	MJ	2.32E+06	9.05E+04	7.92E+03	2.32E+02	2.22E+06	2.30E+03
SM	kg	3.26E+02	3.26E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	1.94E+03	1.10E+02	9.89E-01	-5.72E-02	1.82E+03	6.98E-01
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; 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 used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water						

Potential environmental impacts – Waste production parameters:

Category	Unit	TOTAL	Manufacturing stage	Distribution stage	Installation stage	Use & Maintenance stage	End-of-life stage
Hazardous landfill waste	Kg	8.26E+01	6.07E+00	5.40E-02	1.61E-03	1.06E+01	6.59E+01
Non-hazardous waste disposed	Kg	6.45E+03	7.97E+02	3.80E+02	1.71E+01	4.93E+03	3.24E+02
Radioactive waste disposed	Kg	7.48E+00	2.52E+00	2.33E-03	3.44E-05	4.96E+00	2.93E-03
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	Kg	1.32E+03	1.39E+02	0.00E+00	6.93E+00	0.00E+00	1.17E+03
Materials for recycling	Kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

References

Regulation of the EPDItaly Programme, Revision 7.1 (05/09/2025).

EPDItaly007: Electronic and Electrical Products and Systems, Revision 3.2 (10/12/2025). Core-PCR.

EPDItaly018: Electronic and Electrical Products and Systems – Power Transformers, revision 3.6 (01/07/2024). Sub-PCR.

ISO 14020:2000 Environmental labels and declarations-General principles.

ISO 14025:2010 Environmental labels and declarations-Type III Environmental Declarations-Principles and procedures.

ISO 14040:2006 Environmental Management-Life Cycle Assessment-Principles and framework.

ISO 14044:2006 Environmental Management-Life Cycle Assessment-Requirements and guidelines.

UNE-EN 50963. Product category rules for life cycle assessments of electronic and electrical products and systems.

Life Cycle Assessment Report - Distribution Transformer 400/24/20 B2 O-PE (Version 4, May 2026).