

Environmental Product Declaration

Average EPD

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

Distribution Transformer

MATCO part of Al Ojaimi Industrial
Group



Programme

EPD Square | www.epdsquare.com

Programme operator

EPD Square, s.r.o.

EPD Registration number

SQ 00-064

Publication date

15.04.2026

Valid until

14.04.2031

General information

Product

Distribution Transformer
Loose TR 300 kVA13.8/0.4-0.23kV AL Pole Mounted
Loose TR 100 kVA33/0.4-0.23kV AL Pole Mounted
Loose TR 300 kVA33/0.4-0.23kV AL Pole Mounted
USS 1000 kVA33/0.4-0.23kV AL USS (Representative)

Program operator

EPD Square, s.r.o.
Lermontovova 3, 811 05
Bratislava, Slovak Republic
Email: info@epdsquare.com

Registration number

SQ 00-064

Publication date

15.04.2026

Valid until date

14.04.2031

Owner of the declaration

Advanced Technical Solutions Company for Industry
(MATCO) – Member of Al Ojaimi Empower House
2nd Industrial City, Riyadh,
Kingdom of Saudi Arabia
Contact person: Alfonso Delgado
Email: ga.tr@alojaimi.com

Manufacturer

Advanced Technical Solutions Company for Industry
(MATCO) – Member of Al Ojaimi Empower House
2nd Industrial City, Riyadh,
Kingdom of Saudi Arabia

Place of production

2nd Industrial City, Riyadh,
Kingdom of Saudi Arabia

Product Category Rules (PCR)

The CEN standard EN 15804+A2 serves as the core PCR.
In addition, EPD Square PCR v1.0.1, 2025

Declared unit

1 unit of distribution transformer of 1000 kVA power rating

Mass per DU

2375 kg

UN CPC code

46121 Electrical transformers

Geographical scope

World

Year of study

01.01.2024 – 31.12.2024

Comparability

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in the context of the building.

EPD author

Sarah Curpen, Silvia Vilčeková, EPD Clarity s.r.o.

Verification type

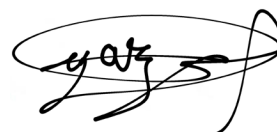
Independent verification of the declaration and data, according to ISO14025:2006

Internal: ☐

External: ☒

Verified by

Yazan BADOUR



The owner of the declaration shall be liable for the underlying information and evidence.

EPD Square shall not be liable with respect to manufacturer, life cycle assessment data and evidence.

System boundaries

Cradle to gate with additional modules. That is modules A1-A3, C1-C4, D are declared.

Modules declared and geographical scope

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	✓	✓	✓	MND	MND	MND	MND	MND	MND	MND	✓	MND	✓	✓	✓	✓	✓
Geographic scope	KSA	KSA	KSA	-	-	-	-	-	-	-	KSA	-	Glo bal	Glo bal	Glo bal	Glo bal	world

MND = Modules not declared.

Description of organization

MATCO, part of Al Ojaimi Industrial Group, specializes in high-quality transformers and substations up to 10 MVA. With over 25 years of experience, MATCO delivers reliable, sustainable, and internationally compliant electrical solutions.

MATCO has built a strong reputation in the electrical products industry, specifically in transformers and substations. With over 25 years of experience, we specialize in producing high-quality package/unit substations and oil-immersed transformers capable of handling up to 10MVA. Our expertise extends to both conventional and solar solutions in Electrical Distribution Systems.

At MATCO, our unwavering dedication to excellence is evident in our commitment to international quality standards. We take great pride in offering a wide range of substations that cater to diverse needs, including customizable solutions. By embracing our solar-powered substations and solar transformers, you not only contribute to sustainability efforts but also minimize your environmental impact while optimizing operational efficiency.

To ensure the utmost dependability and superior performance of our products, we subject them to stringent quality assurance processes. Our unwavering commitment to delivering reliable solutions is at the forefront of everything we do.

More info: <https://www.oig-sa.com/>

Product information

Product name

Distribution Transformer:

Loose TR 300 kVA13.8/0.4-0.23kV AL Pole Mounted

Loose TR 100 kVA33/0.4-0.23kV AL Pole Mounted

Loose TR 300 kVA33/0.4-0.23kV AL Pole Mounted

USS 1000 kVA33/0.4-0.23kV AL USS (Representative)

Product description

A transformer is an electrical device used to transfer electrical energy between two or more circuits through electromagnetic induction. It changes (or “transforms”) the voltage and current levels while keeping the power (ideally) the same, except for small losses.

Rated Power (kVA or MVA), Primary Voltage & Secondary Voltage, Frequency (50/60Hz), Phase Single-phase or three-phase, Vector Group Dyn11, Yyn0). Impedance (%) Percentage of voltage drop due to internal resistance/leakage reactance. Cooling Method (ONAN, ONAF, AF), Efficiency at full load and half load (usually above 98%). Losses (No-load loss (iron/core loss), Load loss (copper loss).

Standard: IEC-60076

Product application

Transmission & Distribution, Industrial & Commercial Uses

Geographical scope

Kingdom of Saudi Arabia, Global

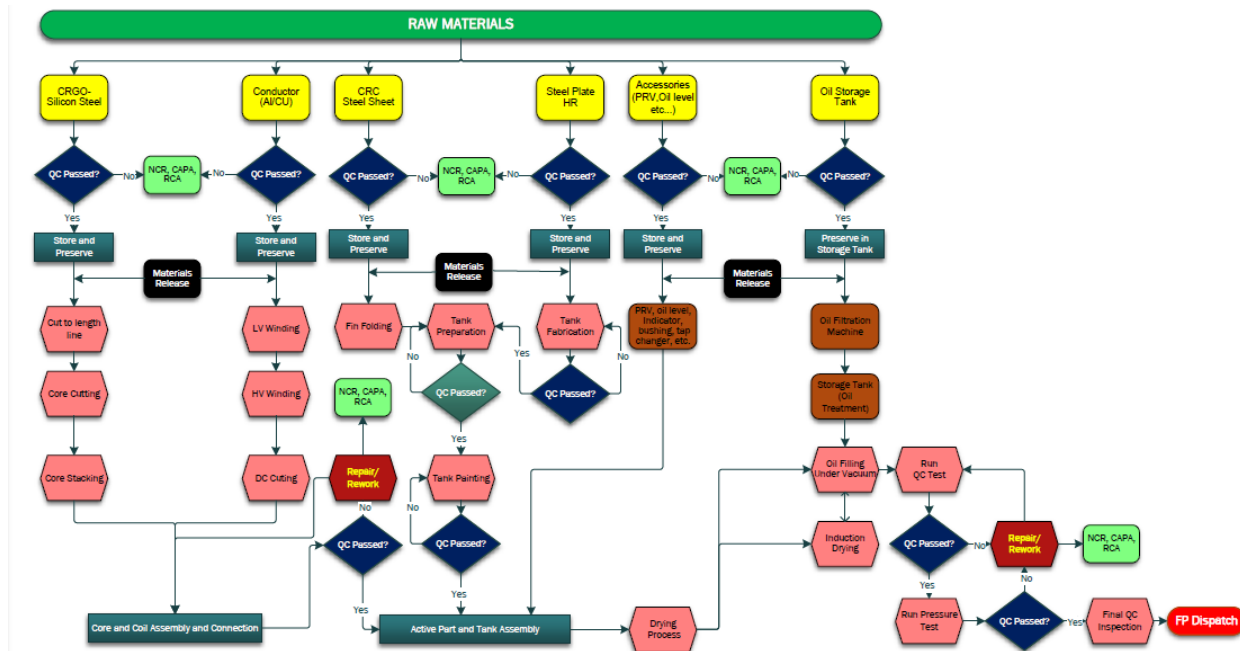
Product contents information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Core Steel	641	0	0
Steel Casing	802	0	0
Copper	80.2	0	0
Aluminium	160	0	0
Mineral Oil	641	0	0
Paper insulation	24.1	0	0
Wood insulation	24.1	0	0
Silicon rubber	0.401	0	0
TOTAL	2375	0	0
Packaging materials	Weight, kg	Weight-% (versus the product)	
Wood Pallet	16.8	0.7	
Acrylic Tape	8	0.3	
Stretch Film	1.67	0.07	
TOTAL	26.5	1.11	

Manufacturing process

Once materials are received, they are sent to respective units where manufacturing activities are accomplished.

- Manufacturing and painting of MS tanks, Core Channels, radiators and colling tubes are done.
- The core slitting, core cutting, winding, core coil assembly, tanking and testing are done
- Conductors are drawn, enamelled and covered with paper
- In timber unit wooden packing for transformers, sizing, wooden pellets etc. are done



Life cycle assessment

Cut-off criteria

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass. The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

Allocation, estimations, and assumptions

Allocation is based on annual production rate and made with high accuracy and precision. The values for 1 m² of the products which are used within this study are calculated by considering the total product weight per annual production. In the production plant, several kinds of products are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total energy consumption, packaging materials and the generated waste per the declared product are allocated. Subsequently, the produced products output fixed to 1 m² and the corresponding amount of product is used in the calculations.

Database(s) and LCA software

This EPD has been created using One Click LCA Pre-Verified EPD Generator. Ecoinvent v3.11 and One Click LCA databases were used as sources of environmental data.

LCA scenarios and additional technical information

Module A1

This module includes the extraction and processing of all raw materials and packaging which occur upstream to the manufacturing site.

Module A2

Vehicle capacity utilization volume factor is assumed to be 1 which means full load. It may vary but as the role of transportation emission in total results is small and so the variety in load assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by transportation companies to serve the needs of other clients. The considered transportation impacts include exhaust emissions resulting from transportation of all raw materials from suppliers to production plant as well as the environmental impacts of production of the used fuel. The transportation distances and methods were provided by manufacturer.

Transportation scenario (A2)

Vehicle type used for transport	Transport, freight, lorry 16-32 metric ton, EURO6 Transport, freight, lorry >32 metric ton, EURO6 Transport, freight, sea, container ship Transport, freight, sea, tanker for petroleum, heavy fuel oil
Capacity utilization	100
Capacity utilization factor	1

Module A3

The environmental impacts considered for the production stage cover the manufacturing of the production materials and fuels used by machines. The environmental impacts of this stage have been calculated using the most recent data in regard to what applied in the factory.

Manufacturing energy scenario (A3)

Electricity data source and quality	Electricity, consumption mix w/o renewables, Saudi Arabia, 2023	One Click LCA
Electricity kg CO _{2e} / kWh	0.65	
Energy data source and quality	Heat and power co-generation, natural gas, combined cycle power plant, 400MW electrical (Reference product: electricity, high voltage), Saudi Arabia	Ecoinvent 3.11
Energy kg CO _{2e} / kWh	0.48	
Energy data source and quality	Diesel, burned in building machine (Reference product: diesel, burned in building machine), World	Ecoinvent 3.11
Diesel kg CO _{2e} / kWh	0.1	

Module B6

The product has a reference service life of 35 years. There is operational energy use during its entire use phase with no requirements for repair, replacement or refurbishment throughout this period. Therefore, it has no impact at this stage, except for operational electricity use.

The data for electricity use during the use phase is calculated by assuming the continuous operation of transformer at the rated loss throughout the lifetime. This phase has the highest impacts attributable to the losses accrued for the entire life span of 35 years. Use phase considers the losses specified below according to IEC 60076-1 technical standard.

1. Load Losses: These kinds of losses are caused by the winding impedance and vary according to the loading on the transformer. They are being calculated at rated frequency and temperature. These losses are also called copper losses.
2. No load Losses: this represents the active power absorbed by the transformer when the machine is energized and the secondary circuit is open. These losses are also called iron losses.

The total energy consumed is expressed in multiples of kWh via the following formula:

$$(\text{Rated load losses} + \text{Rated no load losses}) \times (24 \times 365) \times 35$$

Except B6 there is no other use phase module that requires consumption of energy of materials, so not considered.

Module C1

Energy consumption during the deinstallation phase is 5 kWh.

Module C2

Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed as lorry (Transport freight lorry 16-32 metric ton) which is the most common.

Module C3

Based on case studies, the following recycling rates are reported for each component of the transformer:

Copper windings (99%), Aluminium windings (97%), Core Steel (95%), Casing Steel (98%), Transformer oil (85%), Bushings (60%) tested and re-used, Wood and paper insulation (0%)

Module C4

Wood and paper insulation are often incinerated due to contamination. The remaining components which are not recycled are assumed to be landfilled.

End of life (C1, C3, C4)

	Value	Unit
Collected separately	2754	kg
Collected as mixed construction waste	0	kg
Reuse	0.282	kg
Recycling	2490	kg
Incinerated without energy recovery	203	kg
To landfill	60.3	kg

Data quality

Specific data for the product composition are provided by the manufacturers. The data represents the production of the declared product and was collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality assessment was carried out in accordance with EN 15941.

Geographical rating	Technology Rating	Time-related rating
1.8 Very Good	2.1 Good	1.0 Very Good

Additional environmental information

Declared unit is 1 unit of distribution transformers. If it is necessary to quantify the results to a product weight of 1 kg, the conversion factor is 0,000421.

LCA results

Results are presented per 1 ton (DU) of the product. Estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks. Results are based on the representative product USS 1000 kVA; other products deviate by -25% to -58% in GWP-GHG A1-A3.

Core environmental impact indicators – EN 15804+A2

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1.1E+04	MND	MND	1.3E+06	1.8E+00	1.3E+01	3.8E+02	4.6E+02	-2.0E+03
GWP-fossil	kg CO ₂ eq.	1.1E+04	MND	MND	1.3E+06	1.8E+00	1.3E+01	3.8E+02	3.7E+02	-2.0E+03
GWP-biogenic	kg CO ₂ eq.	-8.5E+01	MND	MND	-2.8E-14	3.5E-04	2.1E-03	3.8E-03	8.5E+01	1.8E+01
GWP-LULUC	kg CO ₂ eq.	1.3E+01	MND	MND	6.1E+01	1.9E-04	6.1E-03	4.2E-01	2.7E-03	-2.6E+01
ODP	kg CFC-11 eq.	1.8E-04	MND	MND	2.4E-02	2.7E-08	2.1E-07	4.7E-06	1.1E-07	-2.0E-05
AP	mol H ⁺ eq.	9.2E+01	MND	MND	5.8E+03	1.6E-02	3.4E-02	3.6E+00	5.0E-02	-3.9E+01
EP-freshwater	kg P eq.	8.5E+00	MND	MND	1.5E+01	5.8E-05	1.1E-03	1.9E-01	2.5E-02	-3.2E+00
EP-marine	kg N eq.	1.2E+01	MND	MND	9.1E+02	7.5E-03	8.7E-03	6.9E-01	2.7E-02	-2.5E+00
EP-terrestrial	mol N eq.	1.3E+02	MND	MND	9.9E+03	8.3E-02	9.4E-02	7.6E+00	2.3E-01	-3.5E+01
POCP	kg NMVOC eq.	6.0E+01	MND	MND	3.9E+03	2.5E-02	5.1E-02	2.5E+00	5.6E-02	-1.1E+01
ADP-M&M	kg Sb eq.	7.1E-01	MND	MND	5.5E-01	6.5E-07	3.8E-05	1.9E-02	3.1E-05	-4.4E-01
ADP-fossil	MJ	1.5E+05	MND	MND	1.9E+07	2.4E+01	2.0E+02	5.1E+03	6.5E+01	-2.5E+04
WDP	m ³	6.5E+03	MND	MND	9.1E+04	6.1E-02	9.7E-01	8.5E+01	7.0E+00	-2.1E+03

GWP-total: Global Warming Potential; **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; See "additional requirements" for indicator given as PO₄ eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional (optional) environmental impact indicators – EN 15804+A2

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PM	Disease incidence	1.0E-03	MND	MND	4.4E-02	4.6E-07	1.3E-06	4.3E-05	1.7E-06	-1.8E-04
IRP	kBq U235 eq.	5.2E+02	MND	MND	2.1E+03	1.0E-02	1.7E-01	1.6E+01	1.0E-01	-2.8E+02
ETP-fw	CTUe	1.2E+05	MND	MND	5.7E+06	1.4E+01	2.8E+01	2.6E+04	4.3E+04	-2.2E+04
HTP-c	CTUh	1.3E-05	MND	MND	2.0E-04	1.9E-10	2.2E-09	3.3E-07	3.6E-08	-4.0E-06
HTP-nc	CTUh	5.3E-04	MND	MND	2.2E-03	2.9E-09	1.3E-07	1.6E-05	6.1E-07	-2.3E-04
SQP	Dimensionless	5.4E+04	MND	MND	6.2E+05	1.6E+00	2.0E+02	1.7E+03	4.8E+01	-1.2E+04

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Use of natural resources

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
RPEE	MJ	1.7E+04	MND	MND	4.2E+04	1.5E-01	2.7E+00	-2.1E+04	-1.0E+03	-7.4E+03
RPEM	MJ	0.0E+00	MND	MND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.7E+00
TPE	MJ	1.7E+04	MND	MND	4.2E+04	1.5E-01	2.7E+00	-2.1E+04	-1.0E+03	-7.4E+03
NRPE	MJ	1.3E+05	MND	MND	1.9E+07	2.4E+01	2.0E+02	5.0E+03	-4.8E+03	-2.5E+04
NRPM	MJ	0.0E+00	MND	MND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.4E+00
TRPE	MJ	1.3E+05	MND	MND	1.9E+07	2.4E+01	2.0E+02	5.0E+03	-4.8E+03	-2.5E+04
SM	kg	6.7E+02	MND	MND	1.6E+03	9.8E-03	8.4E-02	5.7E+01	1.3E-01	1.0E+03
RSF	MJ	7.6E+00	MND	MND	5.3E+00	2.6E-05	1.1E-03	4.2E-02	7.1E-04	-5.2E-02
NRSF	MJ	0.0E+00	MND	MND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
W	m ³	8.6E+01	MND	MND	2.1E+03	1.5E-03	3.0E-02	3.7E+00	3.9E-02	-9.9E+01

RPEE: Renewable primary energy resources used as energy carrier; **RPEM:** Renewable primary energy resources used as raw materials; **TPE:** Total use of renewable primary energy resources; **NRPE:** Non-renewable primary energy resources used as energy carrier; **NRPM:** Non-renewable primary energy resources used as materials; **TRPE:** Total use of non-renewable primary energy resources; **SM:** Use of secondary materials; **RSF:** Use of renewable secondary fuels; **NRSF:** Use of non-renewable secondary fuels; **W:** Use of net fresh water

End of life – Waste

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
HW	kg	4.9E+03	MND	MND	7.9E+03	2.7E-02	3.3E-01	4.6E+01	2.9E+00	-2.6E+02
NHW	kg	3.5E+04	MND	MND	1.2E+05	3.9E-01	6.1E+00	9.4E+02	1.8E+02	1.0E+04
RW	kg	1.3E-01	MND	MND	4.9E-01	2.5E-06	4.2E-05	3.8E-03	2.6E-05	-7.5E-02

HW: Hazardous waste disposed; **NHW:** Non-hazardous waste disposed; **RW:** Radioactive waste disposed

End of life – Output flows

Parameter	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
CR	kg	0.0E+00	MND	MND	0.0E+00	0.0E+00	0.0E+00	2.4E-01	0.0E+00	0.0E+00
MR	kg	4.5E+01	MND	MND	0.0E+00	0.0E+00	0.0E+00	2.1E+03	0.0E+00	0.0E+00
MER	kg	0.0E+00	MND	MND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
EEE	MJ	0.0E+00	MND	MND	0.0E+00	0.0E+00	0.0E+00	1.7E+01	0.0E+00	0.0E+00
ETE	MJ	0.0E+00	MND	MND	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

CR: Components for reuse; **MR:** Materials for recycling; **MER:** Materials for energy recovery; **EEE:** Exported electric energy; **ETE:** Exported thermal energy

Information describing biogenic carbon content at factory gate

Biogenic carbon content	Value	Unit
Biogenic carbon content in product	42.3	kg C
Biogenic carbon content in the accompanying packaging	8.38	kg C

Specific data (GWP-GHG) and data variation for A1-A3

Specific data and data variation	Value-%
Specific data	82.5%
Variation - product	58%
Variation - site	Not relevant

Hazardous substances

- ☒ The product does not contain any REACH SVHC substances in amounts greater than 0.1 %.

Contact information

Programme operator

EPD Square, s.r.o.
Lermontovova 3, 811 05
Bratislava, Slovak Republic
Email: info@epdsquare.com

EPD owner

Advanced Technical Solutions Company for Industry (MATCO) – Member of Al Ojaimi Empower House
2nd Industrial City, Riyadh,
Kingdom of Saudi Arabia
Contact person: Alfonso Delgado
Email: qa.tr@alojaimi.com
Website: <https://www.oig-sa.com/>

Author of Life Cycle Assessment (LCA)

Sarah Curpen, Silvia Vilčeková, EPD Clarity, s.r.o.
Email: curpen@epdclarity.com; vilcekova@epdclarity.com
Website: <https://epdclarity.com/>

EPD verifier

Badour Yazan
Email: yazan.badour.phd@gmail.com

Bibliography

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

EN 15804:2012+A2:2019/AC:2021

Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

EN 15941:2024

Sustainability of construction works - Data quality for environmental assessment of products and construction work - Selection and use of data

EPD Square PCR v.1.0.1, 2025

EPD Square, General Programme Instructions v.1, 2024

Ecoinvent database v3.10.1/v3.11 (2024) and One Click LCA database

<https://taishantransformer.com/typical-lifecycle-of-power-transformer/>

Annex

Environmental impacts – EN 15804+A1, CML/ISO 21930

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP	kg CO ₂ eq.	1.1E+04	MND	MND	1.3E+06	1.8E+00	1.3E+01	3.7E+02	3.8E+02	-2.0E+03
ODP	kg CFC-11 eq.	1.5E-04	MND	MND	1.9E-02	2.1E-08	1.7E-07	3.9E-06	9.4E-08	-1.7E-05
AP	kg SO ₂ eq.	7.8E+01	MND	MND	4.9E+03	1.1E-02	2.7E-02	3.0E+00	3.5E-02	-3.4E+01
EP	kg PO ₄ eq.	1.1E+01	MND	MND	4.0E+02	2.7E-03	6.4E-03	1.4E+01	1.5E-02	-5.1E-01
POCP	kg C ₂ H ₄ eq.	4.7E+00	MND	MND	2.9E+02	8.6E-04	2.5E-03	2.0E-01	2.7E-03	-2.4E+00
ADP-M&M	kg Sb eq.	7.1E-01	MND	MND	5.4E-01	6.3E-07	3.7E-05	1.9E-02	2.0E-05	-4.4E-01
ADP-fossil	MJ	1.5E+05	MND	MND	1.9E+07	2.3E+01	1.9E+02	4.8E+03	6.3E+01	-2.0E+04

Environmental impacts – GWP-GHG

Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP - GHG	kg CO ₂ eq.	1.1E+04	MND	MND	1.3E+06	1.8E+00	1.3E+01	3.7E+02	3.8E+02	-2.0E+03

GWP- GHG: Global Warming Potential, greenhouse gases