

**IMESA S.p.A.**



## **ENVIRONMENTAL PRODUCT DECLARATION**

**In compliance with ISO 14025 and EN 50693**




Product Name: **IMESA GSCM004 Switchboard**

Site Plant: via G. di Vittorio 14, Zona Industriale ZIPA, Jesi (AN), Italy

Program operator	EPDItaly
Publisher	EPDItaly
Declaration number	IMESA02
Registration number	EPDITALY0370
Issue date	28/09/2022
Updated on	05/04/2023
Valid to	28/09/2027

## GENERAL INFORMATION

<b>EPD owner</b>	IMESA S.p.A., via G. Di Vittorio 14, Zona industrial ZIPA 60035 Jesi (AN) - <a href="http://www.imesaspa.com">www.imesaspa.com</a>
<b>Production site</b>	via G. Di Vittorio 14, Zona industrial ZIPA 60035 Jesi (AN), Italy.
<b>Reference product</b>	IMESA GSCM004 switchboard with self-protected transformer AT, air insulated, with nominal voltage 24kV and a service life of 20 years
<b>Program operator</b>	EPDItaly <a href="https://www.epditaly.it/">https://www.epditaly.it/</a> ; <a href="mailto:info@epditaly.it">info@epditaly.it</a>
<b>Third-party verification</b>	Independent verification of the declaration and data, in compliance with ISO 14025:2010. <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External Verification conducted by: IMQ SpA, Via Marco Fabio Quintiliano, 43, 20138 – Milano ( <a href="http://www.imq.it">www.imq.it</a> ). (Certification Body accredited by Accredia)
<b>CPC Code</b>	CPC 46214 “Boards, consoles, cabinets and other bases, equipped with electrical switching etc. apparatus, for electric control or the distribution of electricity, for a voltage exceeding 1000 V”
<b>Reference PCR</b>	Core-PCR EPDItaly007 “Electronic and electrical products and systems”, rev. 2, 21/10/2020. Sub-PCR EPDItaly015 “Electronic and electrical products and systems – switchboards”, rev. 1.5, 23/02/2022 [PCR Committee: ENEL S.p.A.; Life Cycle Engineering; Moderatore: Massimo De Pieri, Life Cycle Engineering]
<b>Other reference documents</b>	Regulation of the EPDItaly Programme – rev. 5.2 EN 50693:2019 “Product category rules for life cycle assessments of electronic and electrical products and systems”.
<b>Company contact</b>	Giampiero Schiavoni, <a href="mailto:giampiero.schiavoni@imesaspa.com">giampiero.schiavoni@imesaspa.com</a>
<b>Study developed by</b>	 Valentina Castellani, Sustainability consultant
<b>Declaration of responsibility</b>	The owner of the declaration will be responsible for the information and supporting evidence. EPDItaly disclaims any liability regarding the manufacturer's information data.
<b>Comparability</b>	EPDs relating to the same category of products but belonging to different programmes may not be comparable.

## COMPANY INFORMATION

IMESA SPA is a company operating since 1972 in the field of electromechanical constructions. IMESA has its headquarters in Jesi (AN), where it was created as an offshoot of the Schiavoni Group, one of the most important business realities in Marche region who sees Sergio Schiavoni the founder, already in the 60's, now supported by the second and third generation. In the field of electromechanical equipment, IMESA stands as one of Europe's leading manufacturer of Low Voltage and Medium Voltage electrical systems , MV breakers in SF6 supervision and control systems, and developed thanks to a long experience in this specific field and

is it rooted in Marche region sharing the characteristics of this region: the taste for the work, entrepreneurial skills and innovation diffusion of knowledge.

## SCOPE AND TYPE OF EPD

The company undertook the study having as main goal to obtain EPDItaly certification, and to have transparent and reliable information about the environmental impact generated by the product under study, to be communicated to its clients. Other potential uses of the study include the identification of hotspots in the product life cycle, in support to the definition of improvement measures, and the monitoring of results over time.

The scope of the EPD is “from cradle to grave”. It includes the following modules, according to EN 50639:2019:

Manufacturing		Distribution	Installation	Use & Maintenance	End-of-Life
Upstream module	Core module	Downstream module			
Extraction of raw materials, and production of semi-finished and ancillary products	Manufacturing of the product constituents	Transport of product to the site of installation	Installation of product and disposal of packaging materials	Energy dissipated during the service life	De-installation of product and EoL of product materials
Production of packaging materials	Product assembly				
Transportation of raw materials and components to the manufacturing company	Product packaging				

**Geographical scope:** the geographical scope of the study is Italy, where the product is manufactured and installed.

**Temporal scope:** the reference period for the study is 2020-2021. Inventory data refer to 2020, which is the last year for which a complete record of input, outputs, emissions, and other activity data was available at the time of the study.

**Database and LCA software used:** the LCI of the system has been modelled in SimaPro software, version 9.1, using ecoinvent 3.6 LCI library.

**Cut-off and exclusions:** activities contributing for less than 1% to the final impact has been cut-off. Impacts related to the production, transportation, and installation of capital goods (buildings, infrastructure, machinery, internal transport packaging) and general operations (staff travel, marketing and communication actions) that cannot be directly allocated to products are excluded from the LCA study, in compliance with PCR EPDItaly 007. The same applies to the consumption associated to the use of a crane during the installation, which is not included in the study.

**Allocation:** electricity and natural gas use related to the activities performed in IMESA production site for the production of DY698A switchboards have been estimated by allocation of the total consumption of the production site in one year (2020) to the production of the products under study. Allocation has been performed based on the number of working hours dedicated to the production of one unit of the products under study compared to the total hours worked during one year (2020).

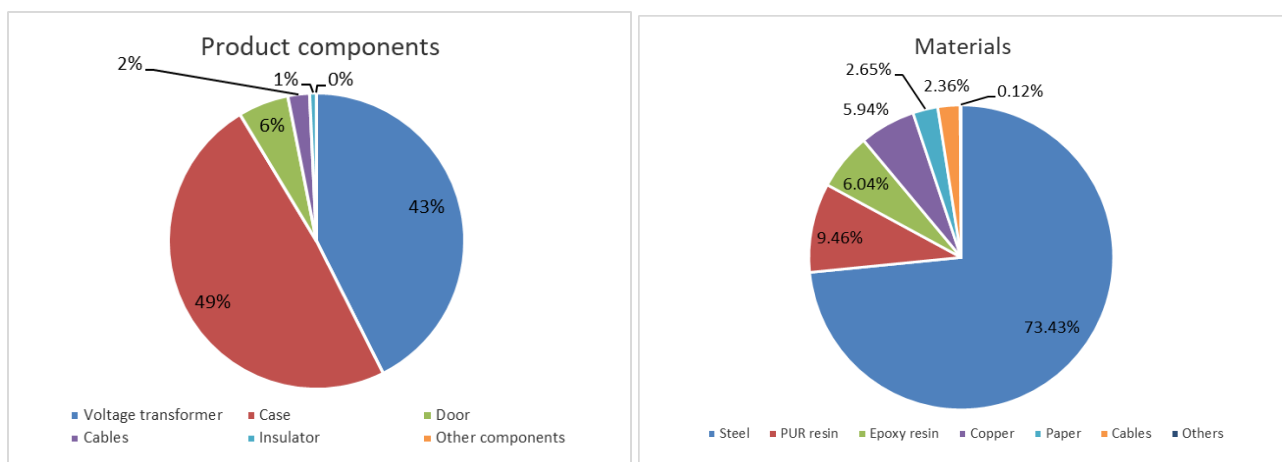
## PRODUCT SYSTEM ANALYZED

The product analyzed is GSCM004 module with self-protected transformer AT, produced by IMESA S.p.A. The function of the analyzed product is to allow for voltage measurement of the electric line and to communicate this information to a remote-control room. The switchboard is defined as an assembly of electric and electronic devices delivering control, distribution, and safety functions, during a reference service life of 20 years.

**Declared unit:** 1 unit of GSCM004 switchboard, air insulated, with nominal voltage 24kV and a service life of 20 years.

Main components of the GSCM004 switchboard analyzed are: metal case, door, insulator, voltage transformer, and cables. Figure 1a-1b illustrates the relative importance of components and materials over the total weight of the product excluding packaging (185 kg). The product is packed in a nylon bag (0.8 kg) and then placed on a wood pallet wrapped with a PE film (0.4 kg) for transportation to the site of installation.

Figure 1a-1b: Share of product components (1a) and materials (1b) over the total mass of the product



The product is compliant to the requirements of the European directive "2011/65/EU ROHS 2 - Restriction of dangerous substances in electrical and electronic equipment".

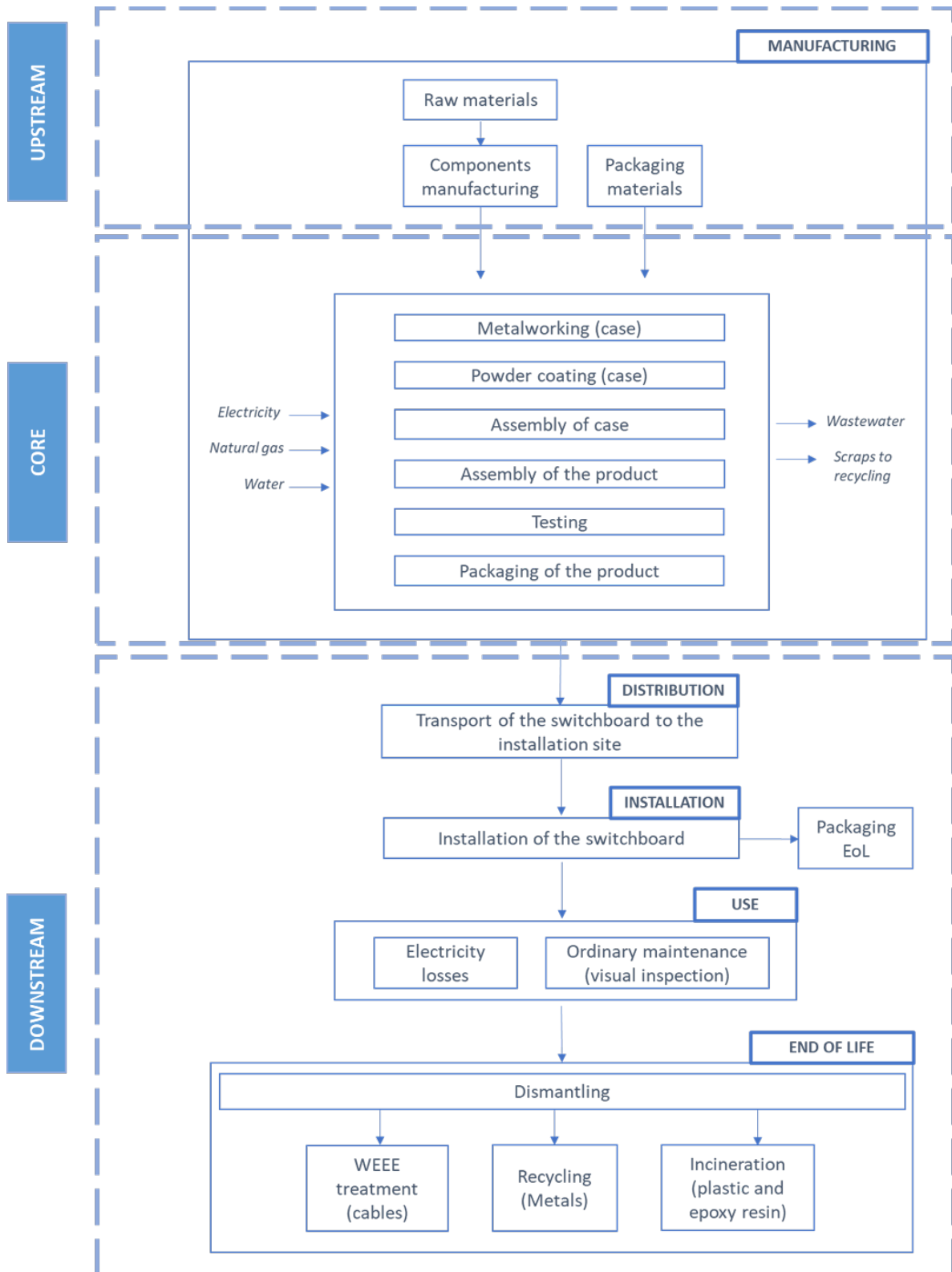
Raw materials and some of the components are produced by IMESA suppliers and delivered to Jesi production site. Part of the metalworking related to the manufacture of the frame is done by IMESA, using metal sheets provided by external suppliers. The activities performed by IMESA in Jesi production site are: metalworking of laminated steel used for switchboard case; powder coating of laminated steel used for switchboard case; assembly of case; assembly of unit (insertion of electric components and other parts into the case); testing, and packaging of the product (Figure 2).

Distribution scenario: information about the installation sites for the GSCM004 switchboard is not available. Therefore, the distribution scenario is built following the general rules provided by sub-PCR EPDItaly 015: transport by lorry EURO4 over 300 km.

Use scenario: The defined service life of the product, according to sub-PCR EPDItaly 015, is 20 years. During the service life, the product does not need any material input. Electricity losses happening during the service life, due to Joule effect, are calculated considering 30% of the rated current (50A). Losses happening during the service life are calculated considering that the product is on active service for 30% of the reference service life (20 years). The resulting value, i.e. 245 kWh, is then associated to a dataset representing the Italian residual medium voltage grid mix.

End of Life scenario: It is assumed that the dismantling is done manually, starting from the case of the switchboard, consisting of laminated steel that can be recycled. Electric components are assumed to be collected and treated as WEEE. The remaining parts are generally separated by milling; the resulting metal scraps, after separation, are sent to recycling, whereas small plastic fragments resulting from milling are incinerated.

Figure 2: Life cycle of GSCM004 switchboard



## ENVIRONMENTAL PERFORMANCE

The following tables report the results of environmental indicators, resource use indicators, and waste production indicators, expressed with reference to the declared unit of the study (D.U.), i.e. one unit of GSCM004 switchboard, air insulated, with nominal voltage 24kV and a service life of 20 years.

### Results of indicators describing environmental impacts per D.U.

Indicator	Unit	Total/DU	Manufacturing		Distribution		Installation		Use		EoL	
GWP100a_Total	kg CO <sub>2</sub> eq	<b>9,25E+02</b>	6,67E+02	72%	1,26E+01	1%	3,43E+00	0%	1,48E+02	16%	9,45E+01	10%
GWP100a_fossil	kg CO <sub>2</sub> eq	<b>9,49E+02</b>	6,99E+02	74%	1,25E+01	1%	3,42E+00	0%	1,47E+02	16%	8,62E+01	9%
GWP100a_biogenic	kg CO <sub>2</sub> eq	<b>2,00E+01</b>	-3,31E+01	-166%	3,56E-02	0%	4,46E+01	223%	1,51E-01	0%	8,28E+00	41%
Global warming (GWP100a)_land transf	kg CO <sub>2</sub> eq	<b>7,95E-01</b>	7,77E-01	98%	5,24E-03	1%	3,23E-04	0%	8,16E-03	1%	4,49E-03	1%
Ozone layer depletion	kg CFC-11eq	<b>8,85E-05</b>	6,54E-05	74%	2,78E-06	3%	1,29E-07	0%	1,84E-05	21%	1,79E-06	2%
Acidification	mol H <sup>+</sup> eq	<b>6,40E+00</b>	5,64E+00	88%	6,01E-02	1%	3,33E-03	0%	6,40E-01	10%	5,47E-02	1%
Eutrophication potential freshwater	kg P eq	<b>1,12E+00</b>	1,05E+00	94%	9,88E-04	0%	6,39E-05	0%	6,16E-02	6%	1,01E-03	0%
Photochemical ozone formation	kg NMVOC	<b>4,22E+00</b>	3,78E+00	90%	6,36E-02	2%	3,51E-03	0%	3,11E-01	7%	5,91E-02	1%
Resource use, minerals and metals	kg Sb eq	<b>3,82E-01</b>	3,82E-01	100%	5,97E-05	0%	3,87E-06	0%	7,03E-05	0%	5,36E-05	0%
Resource use, fossils	MJ	<b>1,32E+04</b>	1,06E+04	80%	1,88E+02	1%	9,04E+00	0%	2,27E+03	17%	1,27E+02	1%
Water deprivation potential	m <sup>3</sup> eq	<b>5,96E+02</b>	5,36E+02	90%	5,91E-01	0%	1,66E-01	0%	5,51E+01	9%	4,15E+00	1%

### Results of parameters describing resource use, referred to the D.U.

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use & Maintenance	EoL
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw material (PENRE)	MJ	<b>1,31E+04</b>	1,05E+04	1,88E+02	9,04E+00	2,27E+03	1,27E+02
Use of renewable primary energy excluding renewable primary energy resources used as raw material (PERE)	MJ	<b>1,70E+03</b>	1,65E+03	3,04E+00	1,93E-01	4,50E+01	2,86E+00
Use of non-renewable primary energy resources used as raw material (PENRM)	MJ	<b>4,20E+01</b>	4,20E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources used as raw material (PERM)	MJ	<b>1,95E+02</b>	1,95E+02	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) (PENRT)	MJ	<b>1,32E+04</b>	1,06E+04	1,88E+02	9,04E+00	2,27E+03	1,27E+02
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PERT)	MJ	<b>1,90E+03</b>	1,85E+03	3,04E+00	1,93E-01	4,50E+01	2,86E+00
Net use of fresh water (FW)	m <sup>3</sup>	<b>1,45E+01</b>	1,30E+01	2,44E-02	5,49E-03	1,33E+00	1,34E-01
Use of secondary materials (MS)	kg	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels (NRSF)	MJ	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

### Results of waste production descriptive parameters, referred to the D.U.

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use & Maintenance	EoL
Hazardous waste disposed (HWD)	kg	<b>1,35E-01</b>	1,32E-01	5,03E-04	2,51E-05	2,05E-03	3,56E-04
Non-hazardous waste disposed (NHWD)	kg	<b>2,68E+02</b>	2,50E+02	7,44E+00	3,36E-01	3,94E+00	6,29E+00
Radioactive waste disposed (RWD)	kg	<b>4,02E-02</b>	3,19E-02	1,28E-03	5,81E-05	6,19E-03	7,81E-04
Materials for energy recovery (MER)	kg	<b>3,98E+01</b>	0,00E+00	0,00E+00	1,20E+00	0,00E+00	3,86E+01
Material for recycling (MFR)	kg	<b>1,83E+02</b>	2,63E+01	0,00E+00	1,00E+01	0,00E+00	1,47E+02
Components for reuse (CRU)	kg	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (ETE)	MJ	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electricity energy (EEE)	MJ	<b>0,00E+00</b>	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

## REFERENCES

1. Life Cycle Assessment of GSMC004 module with self-protected transformer AT produced by IMESA S.p.A. Study report v.02, released 16/09/2022.
2. ISO 14025:2006. Environmental labels and declarations –Type III environmental declarations –Principles and procedures.
3. EN 50693:2019 Product category rules for life cycle assessments of electronic and electrical products and systems
4. EPDItaly Regulation, Rev. 5.2 published 16/02/2022
5. Core-PCR EPDItaly007 “Electronic and electrical products and systems”, rev. 2, 21/10/2020.
6. Sub-PCR EPDItaly015 “Electronic and electrical products and systems – switchboards”, rev. 1.5, 23/02/2022