Environmental Product Declaration

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

Porcelain Tableware Product - Moderna Series

from

Kütahya Porselen San. A.Ş.

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Licensee:	EPD Türkiye
Type of EPD:	EPD of multiple products from a company
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	An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

GENERAL INFORMATION

Programme:	The International EPD® System	EPD Türkiye
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): Tableware and Kitchenware, PCR 2022:01, Version 1.0
PCR review was conducted by: *The Technical Committee of the International EPD® System. Review chair: Gorka Benito*
Life Cycle Assessment (LCA)
LCA accountability: Ceren Naz Güleçyüz, Greenlife Consultancy Kıymet Eda Sakınmaz, Greenlife Consultancy
Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: Callum Hill, JCH Industrial Ecology Ltd Approved by: International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit 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 identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Kütahya Porselen San. A.Ş.

Address: Çalca Mahallesi, Atatürk Bulvarı Eskişehir Yolu 8. Km., 43001 Merkez/Kütahya/Türkiye

Contact: halitcimen@kutahyaporselen.com.tr

Description of the organization: Kütahya Porselen was established in 1970. In 1984, 75% of its shares were acquired by the current group, while the remaining 25% are publicly traded on Borsa İstanbul. Following the privatization process, the company completed its financial and investment requirements and established a research and development (R&D) department.

Kütahya Porselen operates in porcelain production.

Since the 1990s, Kütahya Porselen has expanded its operations and currently exports its products to 62 countries as of 2024, including member states of the European Union, the United States, Canada, and Japan.

In Türkiye, the company distributes its products through its own retail stores. Its product range includes porcelain dinnerware sets, porcelain decorative items, and table design accessories.

PRODUCT INFORMATION

Product name: Moderna Series

Product identification: Moderna tableware collection consists of four pieces: a colored deep plate, a flat plate, a dessert plate, and a bowl. The products feature modern design lines and natural color transitions, and are developed for both aesthetic and functional use. Each item is designed for everyday meal presentation and falls within the category of serving products suitable for standard household and professional kitchen environments.

UN CPC code: 37221

Product description: The Moderna series consists of tableware products designed for both daily use and special presentations, combining modern lines, gradient color surfaces, aesthetic appeal, and durability. The collection includes a deep plate, flat plate, dessert plate, and bowl.

The products are manufactured through standard production processes that include body preparation, shaping, drying, firing, glazing, and final firing stages. The natural textured surface, color transitions, and modern form are the result of an original design approach developed in the design studio.

In terms of technical performance, the products are suitable for hot and cold serving, feature durable surface properties, and are designed to resist scratching and color fading during daily use. Their application areas cover a wide range of serving functions including main dishes, soups and bowl presentations, desserts and fruits, breakfast items, salads, sauces, and snacks.

The technical/actual service life of the products is long under normal use and proper maintenance conditions and is equivalent to that of conventional high-quality tableware.

Name and location of production site(s): Çalca Mahallesi, Atatürk Bulvarı Eskişehir Yolu 8. Km., 43001 Merkez/Kütahya/Türkiye

CONTENT DECLARATION

Information on the environmental and hazardous/toxic properties of a substances contained in the product: Products meet the REACH requirement (reporting limit: 0.1% raw material), by default since no SVHC (substance of very high concern) exceeds 0.1%.

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Kaolin	0.564	0	0	0
Quartz	0.093	0	0	0
Alumina	0.001	0	0	0
Feldspar	0.304	0	0	0
Marble	0.016	0	0	0
Others	0.022	0	0	0
TOTAL	1	0	0	0

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Wood Pallets	0.013	1.3	0.0058
Polystyrene	0.002	2	0
Cardboard/Paper	0.260	26	0.1106
TOTAL	0.275	27.5	0.1164

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

LCA INFORMATION

Functional unit: 1 kg of Moderna Tableware for 1 use

Reference Service Life: 1000 uses

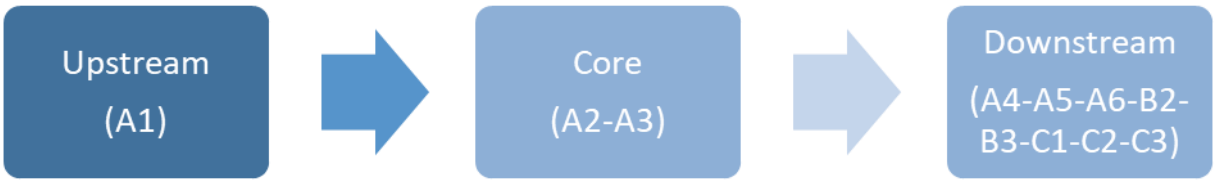
Time representativeness: Data is representative for 2024 production year. Primary production data for the year 2024 was used in the LCA.

Geographical scope: Global

Database(s) and LCA software used: Ecoinvent 3.10 database and Simapro v.9.6.0.1

Description of system boundaries: Cradle-to-grave system boundary

System Diagram:



Raw Material Supply (A1):

The raw material supply stage (A1) covers the processing, and upstream production of all raw materials used in the manufacturing of porcelain tableware. This includes mineral raw materials as well as auxiliary materials required for forming and finishing the product.

The primary raw materials considered in this module are kaolin, quartz, alumina, feldspar, marble, and other minor mineral additives. The environmental impacts associated with these materials include mining activities, beneficiation processes, crushing, grinding, and drying operations, as well as internal transport within the extraction and processing sites.

All raw materials are modelled using secondary data from recognized life cycle inventory databases, representative of average industry conditions. Background processes such as fuel and electricity consumption during processing, as well as emissions to air, water, and soil, are included. The system boundary for this module extends up to the factory gate of the raw material suppliers.

Transportation (A2):

Transportation embraces the transportation of raw materials from suppliers to the production site by road and sea transport.

Transportation is modelled based on a combination of road and sea transport, reflecting the actual logistics routes of the supply chain. Road transport is assumed to be carried out by heavy-duty diesel trucks, while sea transport is modelled using standard freight vessels for imported materials where applicable.

Manufacturing (A3):

At the manufacturing stage, the impact of fuel consumption and electricity usage throughout the production process, and water consumption are considered. Also, packaging and wastewater treatment were included in manufacturing.

Packaging materials are introduced into the system boundary at Module A3 together with the finished product.

During the manufacturing of Kütahya Porselen's tableware electricity is used as energy sources.

Details of electricity data used in LCA model
Country: Türkiye
Source Type: 100% Grid
Energy Sources: Coal: 62.7%
Oil: 0.7%
Natural gas: 36.6%
Electricity Data: Residual mix is calculated from "Electricity, medium voltage {TR}| market for electricity, medium voltage | Cut-off, S" by excluding renewable energy generation
Electricity Emission Factor (GWP-GHG result): 0.904 kg CO_2eq/kWh

A4. Transport to an Average Retailer/Distribution Platform

This stage is relevant for the delivery of final product to the intended markets and customers. Road and sea transportation are involved in this stage. Transportation data for Module A4 is based on the annual weighted average transportation distance. The average distance was calculated using the total transported tonnage and corresponding delivery distances.

A5. Waste Treatment Processes of Packaging Waste

After the final product is delivered to the customer, the environmental impacts associated with packaging disposal are evaluated at this stage. It is assumed that, at the end of life, 84% of the packaging waste is recycled, 6.8% is landfilled, and 8.9% is incinerated.

A6. Treatment of the Product Before the First Use

The final product undergoes a treatment process prior to its initial use. The washing process is modelled to reflect a typical household dishwasher operating under standard washing conditions. The scenario considers the use of electricity, water, and detergent in accordance with common European testing procedures and appliance efficiency standards (İTÜ POLEN, n.d.). The assumptions are based on average performance values for widely used energy-efficient dishwashers in Türkiye.

B2. Washing and Drying (after the use)

This module includes the washing and drying operations of the product following its use, covering the consumption of electricity, water and detergent. The cleaning process is modelled as a typical household dishwasher cycle operated under standard washing conditions.

B3. General Maintenance

No maintenance is required throughout the entire lifecycle of Moderna tableware.

C1. Disassembling/Sorting

No process is necessary for separating and sorting the product components.

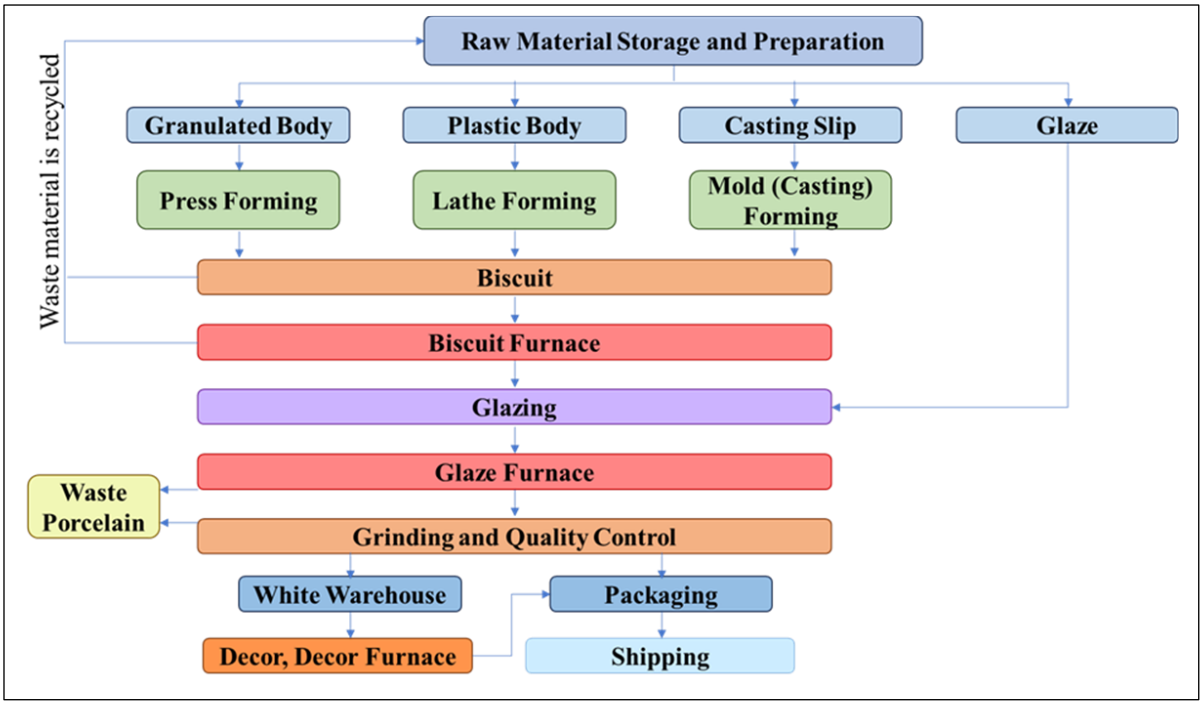
C2. Transport to Recovery/Disposal

This module covers the transport of discarded tableware to waste treatment or disposal facilities, assuming an average transportation distance of 50 km by truck.

C3. Final Disposal

The environmental impacts associated with the disposal of the product are accounted for in this module. It is assumed that all waste is sent to landfill.

Process flow diagram:



Cut-off Rule:

All the related data have been collected through detailed data sheets from the manufacturer. Data that is sent by the manufacturer has been analyzed and modelled. All data related to inputs and outputs for processes has been included. In situations where there were data gaps, generic data (Ecoinvent 3.10) has been used. The cut-off criteria have been set to allow the omission of individual input flows that account for less than 1% of the total, provided that the cumulative contribution does not exceed 5%.

The data that is omitted from the LCA modelling is as follows;

- Employees' commuting to the workplace
- Infrastructure and machinery (Machinery refers to capital goods)
- Impacts due to the maintenance of the machinery
- Waste produced during the production.
- Ancillary material use (There is not an ancillary material use)

It is assumed that these factors have insignificant impact.
Assumptions:

- It is assumed that in Module A5, 84.4% of all packaging materials are recycled, 6.8% are landfilled, and 8.9% are incinerated.
- It is assumed that in Module A6, 0.07975 kWh of electricity, 0.0872375 kg of water, and 0.0015 g of detergent are used.
- It is assumed that in Module B2, 79.75 kWh/kg of electricity, 872.375 kg of water, and 1.5 g of detergent are used.
- It is assumed that in Module B3, no maintenance is required.
- It is assumed that in Module C1, no operations are required for the separation and sorting of product components.
- It is assumed that in Module C2, the transport distance for waste is 50 km.
- It is assumed that in Module C3, 100% of the waste is landfilled.

Allocations:

In the production site of Kütahya Porselen Moderna is produced in their own production line. Therefore, energy consumption, water use, generated waste and packaging data have been obtained specific to the product from the EPD owner. Hence, no allocation has been made.

Characterization Factor:

EN 15804 method based on EF 3.1 normalization and weight values, published in July 2022

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing of product	Collected data	EPD owner	2024	Primary data	58.1%
Generation of electricity used in manufacturing of product	Database	Ecoinvent v3.10	2024	Primary data	26.4%
Transport of raw material to manufacturing site	Database	Ecoinvent v3.10	2024	Primary data	5.5%
Production of packaging	Database	Ecoinvent v3.10	2024	Secondary data	0%
Other processes	Database	Ecoinvent v3.10	2024	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					90%

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

X: Declared Module, MND: Module Not Declared

	Upstream	Core		Downstream								
	Raw material supply	Transport	Manufacturing	Transport to an average retailer/distribution platform	Waste treatment processes of packaging waste	Treatment of the product before the first use	Transport to use and back to washing and drying	Washing and drying	General maintenance	Disassembling/sorting	Transport to recovery/disposal	Final disposal
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**B1**	**B2**	**B3**	**C1**	**C2**	**C3**
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	TR	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	90%			-	-	-	-	-	-	-	-	-
Variation – products	0%			-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-

ENVIRONMENTAL PERFORMANCE

Impact category indicators

PARAMETER	UNIT	A1	A2	A3	A4	A5	A6	B2	B3	C1	C2	C3
GWP-Fossil	kg CO_2 eq.	1.86E-04	1.06E-04	1.64E-03	1.63E-04	1.87E-03	3.35E-04	7.24E-02	0.00E+00	0.00E+00	9.58E-06	5.16E-05
GWP-Biogenic	kg CO_2 eq.	1.07E-06	0.00E+00	-4.27E-01**	0.00E+00	4.27E-01**	6.19E-06	9.55E-04	0.00E+00	0.00E+00	2.80E-10	7.03E-04
GWP-luluc	kg CO_2 eq.	1.51E-07	4.62E-08	2.25E-06	7.34E-08	3.21E-07	5.09E-07	5.19E-06	0.00E+00	0.00E+00	3.89E-09	1.46E-08
GWP-Total	kg CO_2 eq.	1.87E-04	1.06E-04	1.02E-03	1.63E-04	6.41E-03	3.41E-04	7.34E-02	0.00E+00	0.00E+00	9.59E-06	7.55E-04
ODP	kg CFC 11 eq.	2.60E-12	1.68E-12	4.36E-11	2.53E-12	2.65E-12	4.15E-12	3.86E-10	0.00E+00	0.00E+00	1.42E-13	3.48E-13
AP	mol H^+ eq.	1.15E-06	7.45E-07	6.20E-06	1.79E-06	1.52E-06	1.87E-06	4.73E-04	0.00E+00	0.00E+00	2.20E-08	1.74E-07
EP-Freshwater	kg P eq.	6.23E-08	7.72E-09	7.20E-07	1.07E-08	3.72E-07	2.33E-07	7.38E-05	0.00E+00	0.00E+00	7.58E-10	7.73E-08
EP-Marine	kg N eq.	1.90E-07	1.86E-07	1.71E-06	4.47E-07	4.72E-06	3.53E-07	8.39E-05	0.00E+00	0.00E+00	5.10E-09	1.45E-06
EP-Terrestial	mol N eq.	2.03E-06	2.05E-06	1.42E-05	4.94E-06	6.26E-06	3.37E-06	7.66E-04	0.00E+00	0.00E+00	5.51E-08	5.42E-07
POCP	kg NMVOC eq.	6.45E-07	7.30E-07	5.11E-06	1.56E-06	2.22E-06	1.09E-06	2.27E-04	0.00E+00	0.00E+00	3.07E-08	3.42E-07
ADP-Metals and minerals	kg Sb eq.	1.38E-09	2.67E-10	1.87E-09	3.64E-10	3.54E-10	1.45E-09	1.80E-08	0.00E+00	0.00E+00	3.13E-11	3.59E-11
ADP-Fossil	MJ, net calorific value	2.21E-03	1.55E-03	2.27E-02	2.31E-03	2.03E-03	5.48E-03	8.11E-01	0.00E+00	0.00E+00	1.35E-04	3.28E-04
WDP*	m^3 world eq. deprived	1.15E-04	7.30E-06	4.73E-04	1.00E-05	-3.41E-04	3.75E-02	4.22E-02	0.00E+00	0.00E+00	6.13E-07	-1.66E-04

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

** Disclaimer: The GWP-biogenic value reported in Module A3 is due to the uptake of biogenic carbon contained in packaging materials. The same biogenic carbon is reported as leaving the system boundary in Module A5

Additional mandatory and voluntary impact category indicators

Indicator	Unit	A1	A2	A3	A4	A5	A6	B2	B3	C1	C2	C3
GWP-GHG[1]	kg CO2 eq.	1.86E-04	1.06E-04	1.64E-03	1.63E-04	1.87E-03	3.35E-04	7.24E-02	0.00E+00	0.00E+00	9.59E-06	5.16E-05

[1]This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO2 is set to zero.

Resource use indicators

PARAMETER	UNIT	A1	A2	A3	A4	A5	A6	B2	B3	C1	C2	C3
PERE	MJ, net calorific value	1.79E-01	1.84E-02	1.03E+01	2.57E-02	-6.17E-01	8.28E-01	1.55E-02	0.00E+00	0.00E+00	1.72E-03	9.89E-03
PERM	MJ, net calorific value	0.00E+00	0.00E+00	7.73E+00	0.00E+00	-7.05E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ, net calorific value	1.79E-01	1.84E-02	1.80E+01	2.57E-02	-7.67E+00	8.28E-01	1.55E-02	0.00E+00	0.00E+00	1.72E-03	9.89E-03
PENRE	MJ, net calorific value	2.21E+00	1.55E+00	2.27E+01	2.31E+00	2.03E+00	5.48E+00	8.11E-01	0.00E+00	0.00E+00	1.35E-01	3.28E-01
PENRM	MJ, net calorific value	0.00E+00	0.00E+00	7.00E-02	0.00E+00	-6.38E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ, net calorific value	2.21E+00	1.55E+00	2.28E+01	2.31E+00	1.97E+00	5.48E+00	8.11E-01	0.00E+00	0.00E+00	1.35E-01	3.28E-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											

Waste indicators (optional)

PARAMETER	UNIT	A1	A2	A3	A4	A5	A6	B2	B3	C1	C2	C3
Hazardous waste disposed	kg	1.59E-08	1.01E-08	8.93E-08	1.45E-08	1.63E-08	2.14E-08	1.42E-06	0.00E+00	0.00E+00	9.30E-10	2.04E-09
Non-hazardous waste disposed	kg	5.47E-05	1.13E-04	9.23E-05	1.44E-04	3.03E-03	3.94E-05	1.48E-03	0.00E+00	0.00E+00	6.45E-06	1.02E-03
Radioactive waste disposed	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	0.00E+00	0.00E+00	0.00E+00

Output flow indicators (optional)

PARAMETER	UNIT	A1	A2	A3	A4	A5	A6	B2	B3	C1	C2	C3
Components for reuse	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	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.78E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	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	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ per energy carrier	0.00E+00	0.00E+00	0.00E+00	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, thermal	MJ per energy carrier	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ABBREVIATIONS

Abbreviation	Definition
ADP	Abiotic Depletion Potential
AP	Acidification Potential
Kütahya Porselen	Kütahya Porselen Sanayi A.Ş.
EN	European Norm (Standard)
EF	Environmental Footprint
EP	Eutrophication Potential
Eq	Equivalent
GPI	General Programme Instructions
GHG	Greenhouse Gases
GWP	Global Warming Potential
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification
GRI	Global Reporting Initiative
LCA	Life Cycle Assessment
ND	Not Declared
ODP	Ozone Layer Depletion
PCR	Product Category Rules
POCP	Photochemical Oxidant Creation Potential
SVHC	Substances of Very High Concern
WDP	Water Deprivation Potential

REFERENCES

GPI / General Programme Instructions of the International EPD® System. Version 5.0.1

EN ISO 14001 / Environmental Management Systems – Requirements

ISO 14020:2000 / Environmental Labels and Declarations – General Principles

ISO 14025 / DIN EN ISO 14025:2009-11: Environmental Labels and Declarations – Type III Environmental Declarations – Principles and Procedures

ISO 14040/44 / DIN EN ISO 14040: 2006-10, Environmental Management – Life Cycle Assessment – Principles and Framework (ISO14040:2006) and Requirements and Guidelines (ISO 14044:2006)

İTÜ POLEN. (n.d.). Bulaşık makinesi enerji ve su tüketim verileri. https://polen.itu.edu.tr:8443/server/api/core/bitstreams/595493b1-a56d-49d5-8ddd-d19a02594275/content

PCR for Tableware and Kitchenware the International EPD System, 2019:14 Version 2.0.1.

The International EPD® System / The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

Eurostat. (n.d.). Packaging waste by waste management operations European Commission. https://ec.europa.eu/eurostat/databrowser/view/env_waspac__custom_18715567/default/table

SimaPro / SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

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