EPD®

THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

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

Duroplast Toilet Seat

from

MKW Kunststofftechnik GmbH

MKW®

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0016752
Publication date:	2025-03-01
Valid until:	2030-02-28

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

PROGRAMME INFORMATION

Programme:	The International EPD® System EPD International AB
Address:	Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

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): PCR 2019:14 Construction Products, version 1.3.4

PCR review was conducted by the Technical Committee of the International EPD® System. A full list of members is available on www.environdec.com. The review panel may be contacted via info@environdec.com.

Life Cycle Assessment (LCA)

LCA accountability: DDI Dr. Matthias Katschnig, m.katschnig@oekobilanz.at, www.oekobilanz.at

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

EPD verification by individual verifier
Third-party verifier: Dr. Andreas Ciroth, GreenDelta GmbH
Approved by: The International EPD® System

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 15804, 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 characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:
MKW Kunststofftechnik GmbH

Contact:
MKW Kunststofftechnik GmbH
Jutogasse 3, 4675 Weibern, AUSTRIA, E-Mail: office@mkw.at

Description of the organisation:
MKW was founded in 1960 and is 100 % family-owned. MKW fabricates products in the core competencies of metal, plastic, powder coating, and sanitary – all under the slogan: Made in Austria.

Under the umbrella of MKW Holding GmbH, the MKW Group is made up of two divisions, MKW Kunststofftechnik GmbH and MKW Oberflächen+Draht GmbH. The MKW Group employs over 500 people at its Austrian sites in Weibern and Haag as well as its site in Slovakia.

MKW Kunststofftechnik GmbH in Weibern produces injection-molded and pressed technical components in thermoplastic and resin plastic. The injection molding technology areas product development, construction, and toolmaking are covered in-house. In addition to its own designs, the company also produces products for well-known ceramic manufacturers.

MKW Oberflächen+Draht GmbH in Haag am Hausruck is specialised in powder coating of steel, wood, and aluminium products, but also provides wire and sheet metal processing solutions. Up to 2.000 tons of aluminium, steel, and stainless steel are processed annually in the sheet metal processing department. Coated and metal products are made for global corporations in the refrigeration, kitchen, and household appliance industries.

Name and location of production site(s):
MKW Kunststofftechnik GmbH, Jutogasse 3, 4675 Weibern, AUSTRIA

Product information

Product name:
Duroplast Toilet Seat

Product identification:
Toilet seat made from a urea-formaldehyde thermoset polymer with 30 % cellulose

Product description:
Toilet seat set consisting of a cover, a seat ring, four buffers, two dropping units, and a fixing hinge for attachment

UN CPC code:
3693 – baths, wash basins, lavatory pans and covers, flushing cisterns, and similar sanitary ware of plastics

LCA INFORMATION

THE INTENDED APPLICATION OF THIS LCA IS AN EPD OF A STANDARD MKW DUROPLAST TOILET SEAT PRODUCED IN 2024 AS MAIN MKW PRODUCT IN THE DUROPLAST TOILET SEAT PORTFOLIO FOR THE TARGET GROUP B2B.

Type of EPD:
Average EPD; the average was weighted by the produced volume of duroplast toilet seats in 2023.

Functional unit:
1 piece average MKW duroplast toilet seat (2.19 kg)

Reference service life:
10 years

Time representativeness:
Production data was collected for 2024.

Database and LCA software used:
openLCA v2.1.1, ecoinvent v3.10 incl. en15804gd addon from GreenDelta GmbH

System boundaries:
Cradle to gate with options, modules C1–C4 and module D and with optional modules (A1–A3, A5 + C + D)

Waste scenarios:
In module A3 (toilet seat production), 1 % of plastic production waste is considered and thermally recycled (incineration). In module A5 (installation of the toilet seat), the packaging waste consisting of cardboard and PE foil packaging is considered and the cardboard and the plastic foil are thermally recycled (incineration). In module C3 (waste processing), the plastic

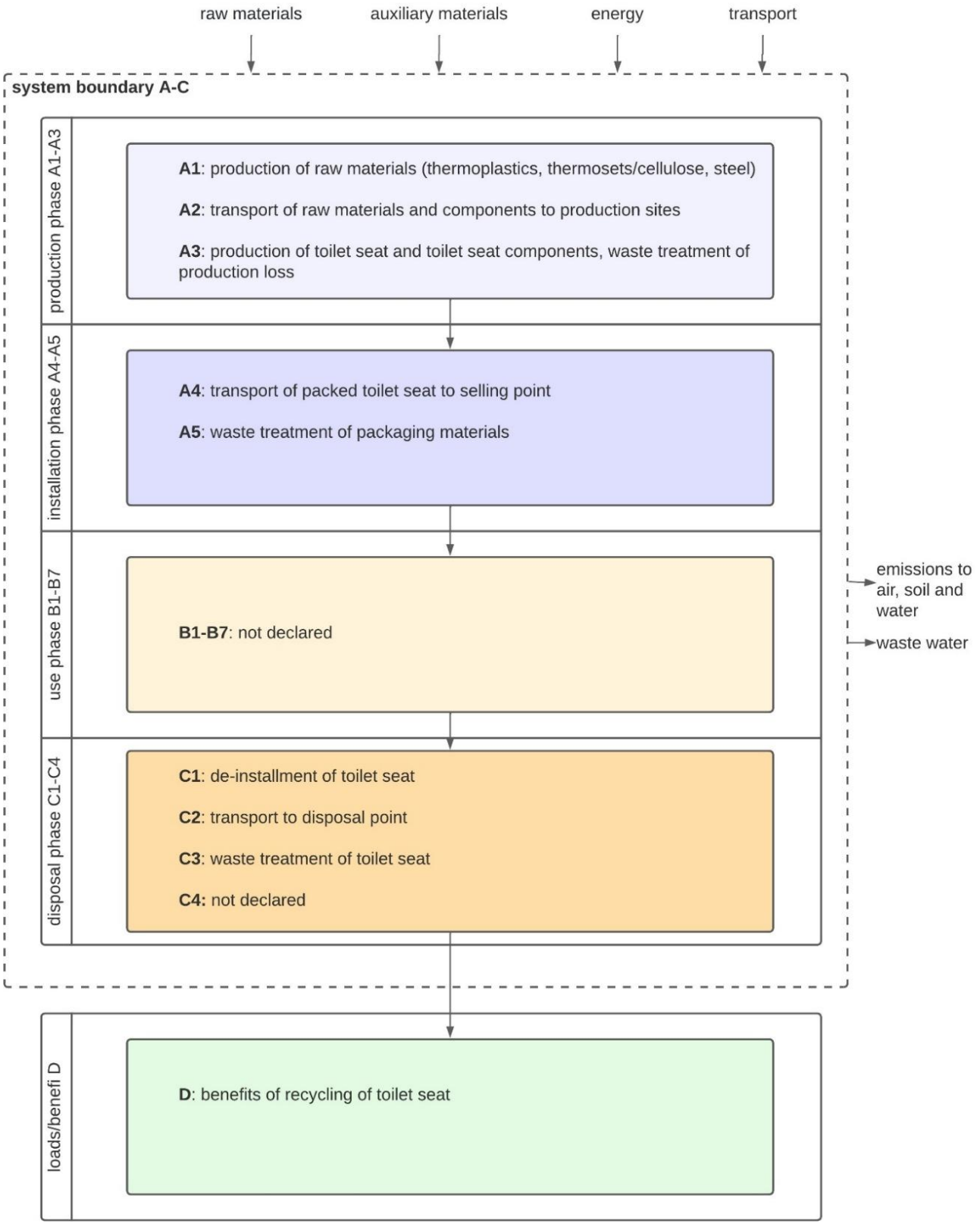
components and the cellulose filling of the toilet seat are thermally recycled (incineration) and the metal parts are materially recycled (steel scrap). Recycling benefits of the toilet seat beyond EoW status (cut-off by classification at point of waste collection) are assigned to module D. The average distance from the disposal site to the recycling site was assumed to be 300 kilometers by road, except for production waste in A3: approximately 40 km by road.

Cut-off criteria:
It is assumed that the cut-off criterion on mass inputs and primary energy at the unit process level (5 %) and the information module level (5 %) are met.

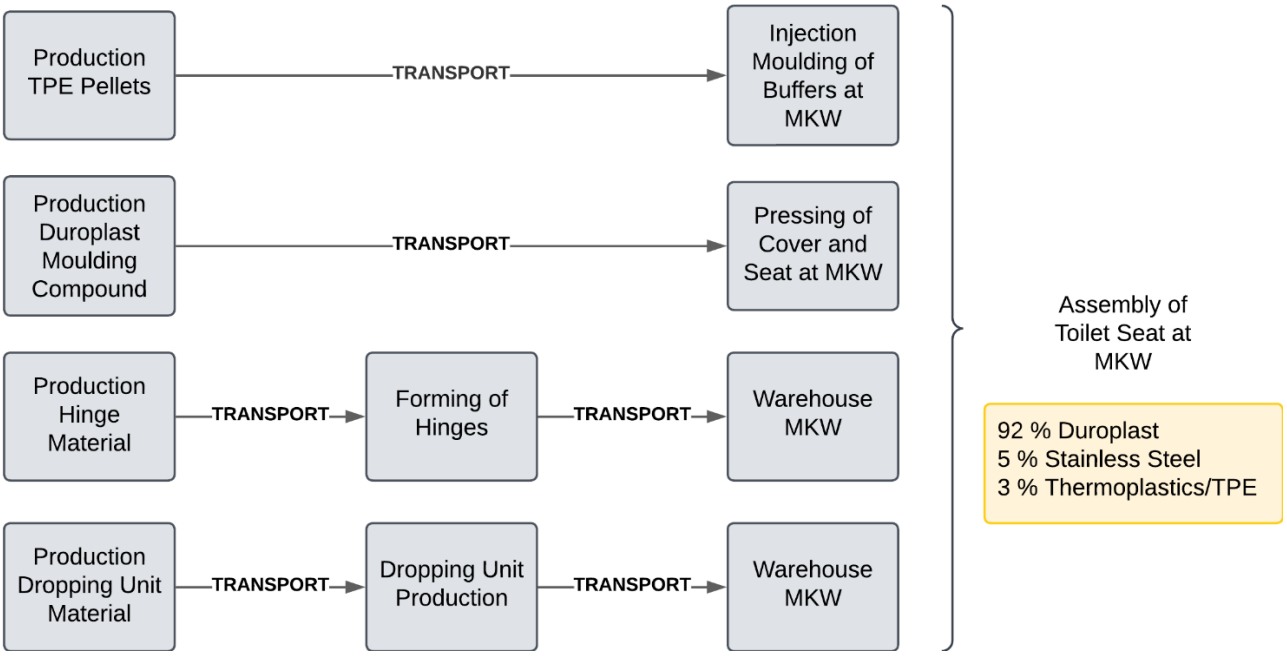
Allocations:
There are no relevant co-products in modules A1–A3 and A5. Loads due to energy, auxiliary, and operating materials are allocated to the functional unit. In modules A3 and A5, loads and benefits for the disposal of production waste (A3) and packaging materials (A5) are also allocated to the functional unit.

Assumptions:
Shares of secondary metals for steel components were defined by the LCA background data (ecoinvent v3.10). Recycling loads and benefits regarding the steel waste is technically based on the arc furnace route. The benefits of plastic incineration (including cellulose filling) were assumed to be 3,93 MJ/kg of electrical energy and 7,67 MJ/kg of thermal energy, while the benefits of cardboard incineration were defined by 1,99 MJ/kg of electrical energy and 3,99 MJ/kg of thermal energy. In C1, dismantling of the toilet seat was done during building demolition as a worst-case approach. The heaviest steel hinge in the MKW portfolio was modelled as a worst-case approach. Silicone oil was below cut-off (0,15 % of mass of product).

SYSTEM DIAGRAM:



PRODUCTION FLOWCHART:



MODULES DECLARED, GEOGRAPHICAL SCOPE, SHARE OF SPECIFIC DATA (IN GWP-GHG RESULTS) AND DATA VARIATION (IN GWP-GHG RESULTS):

	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	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	ND	X
Geography	GER, ITA, CHN, SWE, ESP, TUR	AUT, GER ITA, CHN, TUR, NLD	AUT, ITA, CHN	EU	EU	-	-	-	-	-	-	-	EU	EU	EU		EU
Specific data used	> 90 %			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-18% to +18% for GWP GHG in reference to functional unit			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Possible variations in the LCA results would occur mainly due to the different weights of the main duroplast components (cover and seat-ring) of different duroplast toilet seats. The other components like the buffers remain the same in different duroplast toilet seat products.

Duroplast component weight and LCIA results are positively correlated in general, the lower the weight, the lower the LCA loads and benefits. The total weight of the duroplast components spans from 1.5 kg to 2.5 kg.

The following electricity inputs were modelled in A3:

- China: residual mix (CN-NCGC, 2023, medium voltage, 1174 g CO_2 eq/kWh)
- EU: residual mix (RER, 2023, medium voltage, 325 g CO_2 eq/kWh)
- A3: VERBUND EnergyBusiness GmbH Versorgermix (GO, 2023, 129 g CO_2 eq/kWh[1])

[1] VERBUND Energy4Business GmbH Geschäftsbericht 2023, S. 46

Content information

PRODUCT COMPONENTS	WEIGHT, KG	POST-CONSUMER MATERIAL, WEIGHT-%	BIOGENIC MATERIAL, WEIGHT, KG IN FU
Urea-formaldehyde thermoset polymer with 30 % cellulose	2.00		0.59
Injection molding plastics (PBT, TPE)	0.07		
Stainless steel	0.12	46	
TOTAL	**2.19**	**4**	**0.59**
PACKAGING MATERIALS	**WEIGHT, KG**	**WEIGHT-% (VERSUS THE PRODUCT)**	**WEIGHT BIOGENIC CARBON, KG C/KG**
Cardboard	0.2	9	0.2
Polyethylene foil	0.05	2	
TOTAL	**0.25**	**11**	**0.2**

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg CO_2

DANGEROUS SUBSTANCES FROM THE CANDIDATE LIST OF SVHC FOR AUTHORISATION	EC NO.	CAS NO.	WEIGHT-% PER FUNCTIONAL OR DECLARED UNIT
Injection molding materials			none
Stainless steel			none
UF thermoset incl. cellulose			none

Results of the environmental performance indicators

MANDATORY IMPACT CATEGORY INDICATORS ACCORDING TO EN 15804

RESULTS PER FUNCTIONAL UNIT								
Indicator	**Unit**	**A1– A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
GWP-fossil	kg CO_2 eq.	5,01E+00	2,29E-01	1,35E-01	5,94E-01	6,24E-02	3,52E+00	-2,04E+00
GWP-biogenic	kg CO_2 eq.	-9,80E-03	1,59E-04	3,16E-01	1,94E-04	4,33E-05	8,64E-01	-9,42E-03
GWP-luluc	kg CO_2 eq.	5,42E-03	7,59E-05	-8,06E-06	6,31E-05	2,07E-05	7,36E-05	-6,87E-04
GWP-total	kg CO_2 eq.	5,01E+00	2,29E-01	4,51E-01	5,95E-01	6,25E-02	4,39E+00	-2,05E+00
ODP	kg CFC 11 eq.	1,05E-06	4,54E-09	-2,16E-09	1,12E-08	1,24E-09	4,49E-09	-4,80E-08
AP	mol H^+ eq.	2,18E-02	4,76E-04	2,83E-04	5,12E-03	1,30E-04	1,17E-03	-7,08E-03
EP-freshwater	kg P eq.	1,17E-03	1,55E-05	-1,10E-05	2,57E-05	4,23E-06	2,48E-05	-3,48E-04
EP-marine	kg N eq.	4,53E-03	1,14E-04	2,26E-04	2,36E-03	3,12E-05	5,59E-04	-1,20E-03
EP-terrestrial	mol N eq.	5,11E-02	1,23E-03	2,42E-03	2,58E-02	3,37E-04	4,98E-03	-1,26E-02
POCP	kg NMVOC eq.	2,09E-02	7,91E-04	8,40E-04	7,87E-03	2,16E-04	1,58E-03	-5,30E-03
ADP-minerals& metals*	kg Sb eq.	9,20E-05	7,62E-07	5,04E-08	2,75E-07	2,08E-07	7,78E-07	-1,54E-05
ADP-fossil*	MJ	9,67E+01	3,21E+00	-4,36E-01	7,66E+00	8,78E-01	2,94E+00	-2,75E+01
WDP*	m^3	4,46E+00	1,57E-02	1,52E-02	2,76E-02	4,29E-03	2,51E-01	-2,10E-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							

** 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.*

ADDITIONAL MANDATORY AND VOLUNTARY IMPACT CATEGORY INDICATORS

RESULTS PER FUNCTIONAL UNIT								
Indicator	**Unit**	**A1– A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
GWP-GHG[2]	kg CO_2 eq.	5,04E+00	2,29E-01	1,37E-01	5,95E-01	6,24E-02	3,52E+00	-2,04E+00

RESOURCE USE INDICATORS

RESULTS PER FUNCTIONAL UNIT								
Indicator	**Unit**	**A1– A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
PERE	MJ	1,00E+01	5,52E-02	-4,28E-02	7,82E-02	1,51E-02	7,06E-02	-2,17E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,00E+01	5,52E-02	-4,28E-02	7,82E-02	1,51E-02	7,06E-02	-2,17E+00
PENRE	MJ	9,10E+01	2,92E+00	-4,54E-01	6,93E+00	7,96E-01	2,69E+00	-2,59E+01
PENRM	MJ	5,70E+00	2,99E-01	1,74E-02	7,30E-01	8,16E-02	2,50E-01	-1,61E+00
PENRT	MJ	9,67E+01	3,21E+00	-4,36E-01	7,66E+00	8,78E-01	2,94E+00	-2,75E+01
SM	kg	1,72E+00	3,67E-03	-1,21E-03	8,60E-03	1,00E-03	4,94E-03	-1,04E-01
RSF	MJ	1,14E-01	1,03E-03	-8,27E-04	1,41E-03	2,80E-04	1,14E-03	-1,95E-02
NRSF	MJ	0,00E+00	0,00E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,07E-01	4,32E-04	1,69E-04	5,82E-04	1,18E-04	4,20E-03	-6,84E-03
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							

[2] 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 CO_2 is set to zero.

WASTE INDICATORS

RESULTS PER FUNCTIONAL UNIT								
Indicator	**Unit**	**A1– A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
Hazardous waste disposed	kg	7,85E-01	3,19E-03	3,82E-03	1,04E-02	8,71E-04	5,57E-02	-5,76E-01
Non-hazardous waste disposed	kg	2,53E+00	3,53E-02	2,65E-01	8,43E-02	9,65E-03	2,14E+00	-4,06E-01
Radioactive waste disposed	kg	7,90E-05	1,04E-06	-6,34E-07	1,55E-06	2,83E-07	1,17E-06	-2,05E-05

OUTPUT FLOW INDICATORS

RESULTS PER FUNCTIONAL UNIT								
Indicator	**Unit**	**A1– A3**	**A4**	**A5**	**C1**	**C2**	**C3**	**D**
Components for re-use	kg	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	2,44E-01	3,33E-03	-1,27E-03	7,21E-03	9,10E-04	3,56E-03	-3,74E-02
Materials for energy recovery	kg	5,11E-05	4,61E-07	-3,72E-07	6,33E-07	1,26E-07	5,14E-07	-8,78E-06
Exported energy, electricity	MJ	4,25E-02	5,46E-04	-4,25E-04	8,03E-04	1,49E-04	6,16E-04	-9,68E-03
Exported energy, thermal	MJ	1,67E-01	7,73E-04	-2,52E-03	2,78E-04	2,11E-04	3,00E-03	-3,98E-02

The estimated impact results are only relative statements which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins, and/or risks.

Additional environmental information

Instructions for proper cleaning to improve the durability of the product

Clean the surfaces of the toilet seat with a damp sponge or a cloth and only use neutral soap or mild and natural standard household cleaning products. Use clean water and a soft cloth to wipe the surfaces after cleaning. Do not use any abrasive, chlorinated or acidic cleaning products. These can cause seat discolouration or rust forming on the hinges. Clean the metal hinges with standard glass or alcohol-based cleaner on a cloth. Wipe them with clean water afterwards and then with a dry cloth. If stains remain on the hinges, remove them with a vinegar-based cleaner and a cleaning brush. Afterwards, wipe them with clean water and then with a dry cloth.

References

General Programme Instructions of the International EPD® System. Version 4.0.

PCR 2019:14 Construction Products, version 1.3.4

EN 15804:2012+A2:2019 + AC:2021: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

General Programme Instructions of the International EPD® System. Version 3.01.

ISO 14025:2006-07: Environmental labels and declarations - Type III environmental declarations - Principles and procedures

MKW®

www.mkw.at

EPD®

THE INTERNATIONAL EPD® SYSTEM