ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

MULTI/JOINT 3000 Plus FAMILY

GEORG FISCHER WAGA N.V.

EPD HUB, EPDHUB-0191
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GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Georg Fischer Waga N.V.
Address	Lange Veenteweg 19, 8161PA, Epe, the Netherlands
Contact details	waga.ps@georgfischer.com
Website	www.waga.nl

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Michel Hulsebos, Georg Fischer Waga N.V.
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	E.A as authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	MULTI/JOINT 3000 Plus Family
Additional labels	Couplings and Flange Adapters
Product reference	-
Place of production	Epe, the Netherlands
Period of data	Calendar year 2021
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 VP-025-C	+14%/-17%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	3.79
GWP-total, A1-A3 (kgCO2e)	0.617
Secondary material, inputs (%)	1.64
Secondary material, outputs (%)	98.5
Total energy use, A1-A3 (kWh)	19.2
Total water use, A1-A3 (m3e)	1.23

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

GF Piping Systems is one of the three divisions within Georg Fischer Corporation and a leading provider of plastic and metal piping systems with global market presence. The product portfolio includes pipes, fittings, valves and the corresponding automation and jointing technology for industry, building technology as well as water and gas utilities. Georg Fischer Piping Systems proactively incorporates its environmental responsibility into its everyday business activities. Because we understand environmental awareness as one of the corporation‘s core values, internal structures and processes are geared towards sustainability. Within this context, we increasingly utilize Life Cycle Assessments (LCA) to gain insight into the different life cycle phases of our systems.

GF Waga is renowned as being the best jointing technology for gas and water applications since 1957, the extensive product range is used globally for transport lines, distribution lines, house connections and service lines. The components are used underground and aboveground, for new systems, extensions, service and repair work. Waga joined Georg Fischer in 1965, closing the gap between old and new pipe materials – cost-efficiently and safely at all times.

PRODUCT DESCRIPTION

MULTI/JOINT 3000 Plus restraint wide tolerance fittings DN50 – DN800.

Product application

MULTI/JOINT 3000 Plus is suitable for all pipe materials, both metal and non-metal, like PE, PVC, GRP, PB, asbestos cement, copper, steel, galvanized steel, stainless steel AISI 304 and AISI 316, grey cast iron, ductile cast iron and concrete.

MULTI/JOINT 3000 Plus restraint wide tolerance fittings sized DN50 up to and including DN825 with NBR rubber gasket connect various pipe materials for conveying gases gaseous fuels (gas or natural gas) and fluids like potable water, waste water and cooling water. Suitable for fluid temperatures between -5 ˚C and 50 ˚C, suitable to be installed under and above ground and inside and outside buildings.

MULTI/JOINT 3000 Plus restraint wide tolerance fittings sized DN50 up to and including DN825 with EPDM rubber gasket connect various pipe materials for conveying fluids like potable water, waste water and cooling water. Suitable for fluid temperatures between -5 ˚C and 50 ˚C, suitable to be installed under and above ground and inside and outside buildings.

Technical specifications

Body & clamping rings:
Ductile cast iron in conformity with EN-GJS-450-10-HB200.

Coating:
Resicoat® RT9000R4 epoxy powder coating certified according the requirements of GSK (in accordance with DIN 3476 (P), DIN 30677-2 and EN 14901.

Bolts, nuts and washers:
Stainless steel A2-70 (AISI 304) or A4-80 (AISI 316). Bolts have a non-chemical dry anti-friction Lubo coating to prevent cold- welding due to fretting. Nuts are galvanized and passivated to prevent galling.

Rubber gasket:
EPDM according to EN 681-1, for the type WA for cold potable water supply up to 50 °C.

NBR according to EN 682 for gas or natural gas, cold (non) potable water supply, drainage and sewage.

Gripping elements:
Stainless steel.

Flanges:
Flanges are constructed in such a way that they can be attached to flanges from which the dimensions and tolerances comply to EN 1092-2. Flange faces have concentric grooves, for optimal seal positioning and sealing.

Pressures rating (water):
Non restraint max working pressure: 25 bar / 16 bar.
Restraint max working pressure: 16 bar / 10 bar (Depending on DN-size and/or pipe material).

Pressures MOP (gas):
Non restraint max operating pressure: 8 bar MOP.

Restraint max operating pressure: 8 bar / 5 bar MOP (Depending on DN-size and/or pipe material).

Angular deflection:
8º per side, based on middle of range (16º for a coupling).

Product standards
Quality assurance:
ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018.

Certification (potable water):
EN 14525 certificate of KIWA (BRL-775), ÖVGW (QS-W 503) and SVGW.
NSF 61 certificate of NSF.
Products with NBR gasket bear the Watermark of KIWA for use in potable water.

Certification (gas):
AR 208 (KIWA/GASTEC) and H2 ready AR 214 (KIWA/GASTEC).

Physical properties of the product
Further information:
https://www.gfps.com/content/dam/gfps/com/brochures-and-flyers/en/gfps-waga-brochure-multijoint-3000-plus-en.pdf

Additional technical information

Further information: www.waga.nl.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	89	Malaysia, the Netherlands, Turkey
Minerals	1.2	Portugal
Fossil materials	9.8	Germany, Portugal, the Netherlands
Bio-based materials	0	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	0.033

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 kg
Mass per declared unit	1 kg

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The MULTI/JOINT 3000 family wide tolerance couplings and flange adapters consist of multiple components like cast iron body and gland(s), stainless steel fasteners and parts that shape the Uni/Fiks sealing ring. The components are mainly produced in Europe. The ductile iron components are produced with a machining allowance that is assumed at 10% weight average. This is a generalized average over multiple foundries and taken from CAD data. The high machining demanding products are undervalued but compensated by low machining demanding products. The 10% weight average is a conservative estimate, and in general less than 1% of the end score. This waste goes 100% back into production. The ductile iron components are coated with an epoxy resin, partially close to the foundry and partially at the fabrication site in Epe, the Netherlands. The dataset available on Ecoinvent for the process of powder coating is intended for sheet steel and takes too little energy consumption in consideration. Hence for the Epoxy Coating process, the total gas and electricity consumptions of all stages of the process, including the production of compressed air needed for the process, are taken from the fabrication site in Epe and assumed to be normative for the subcontracting process as well. The Uni/Fiks sealing rings are made of plastic carriers, stainless steel grippers and a rubber seal and are assembled in the Netherlands at a sheltered workshop. The glass filled plastics are put in separately from the non-glass filled plastics for end of life differences. These plastic products are made by injection moulding. The produced material waste is recycled. The stainless steel grippers are produced by stamping where the punched out material is collected for recycling. The rubber seal can be either NBR or EPDM. EPDM has been selected in the LCA. NBR has very similar values and in effect on the total score neglectable. The stainless steel fasteners are produced by forging and rolling. Material losses during the production are to be considered neglectable. After receipt of all components from the suppliers and subcontractors at the fabrication site in Epe, the components undergo quality inspection, then are temporary stored and finally they are assembled to order and packed for shipment. The packaging used during transport from the supplier to the fabrication site (A2) is mostly part of a multi-use-system, like Euro-pallets. Packaging losses are <1% as the same pallets and packaging materials are used to ship the ready products. The number of incoming pallets is higher than the number of outgoing pallets, but damaged pallets are taken out of the process and sold to a recycling company. The balance is such that <1% of the pallets used has to be purchased.

The smaller sized MULTI/JOINT Couplings and Flange adapters are packed in an individual cardboard box and stacked to fill a Euro-pallet, but in average the products are packed together in a large cardboard box on a Euro-pallet. Large products are individually packed on a Euro-pallet, supported by a plywood plate and covered by a cardboard box. Not included in A3 are the infrastructure at the production site and administration activities of the employees.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The products are shipped worldwide to stockholding distributors and distribution centres and distributed locally. The average transport distance is 500 km by truck. Depending on the packaging unit, the products are re-packed to match the local order. All packaging material is re-used and/or fully recycled by the user of the product. The products are then installed in an existing or newly made piping system. In A5 the reaming packaging is discarded (treated as waste). The installation is done manually and no further work is assumed for this product, like excavating, since that work belongs to the installation of the pipe system in which the MULTI/JOINT is an auxiliary product.

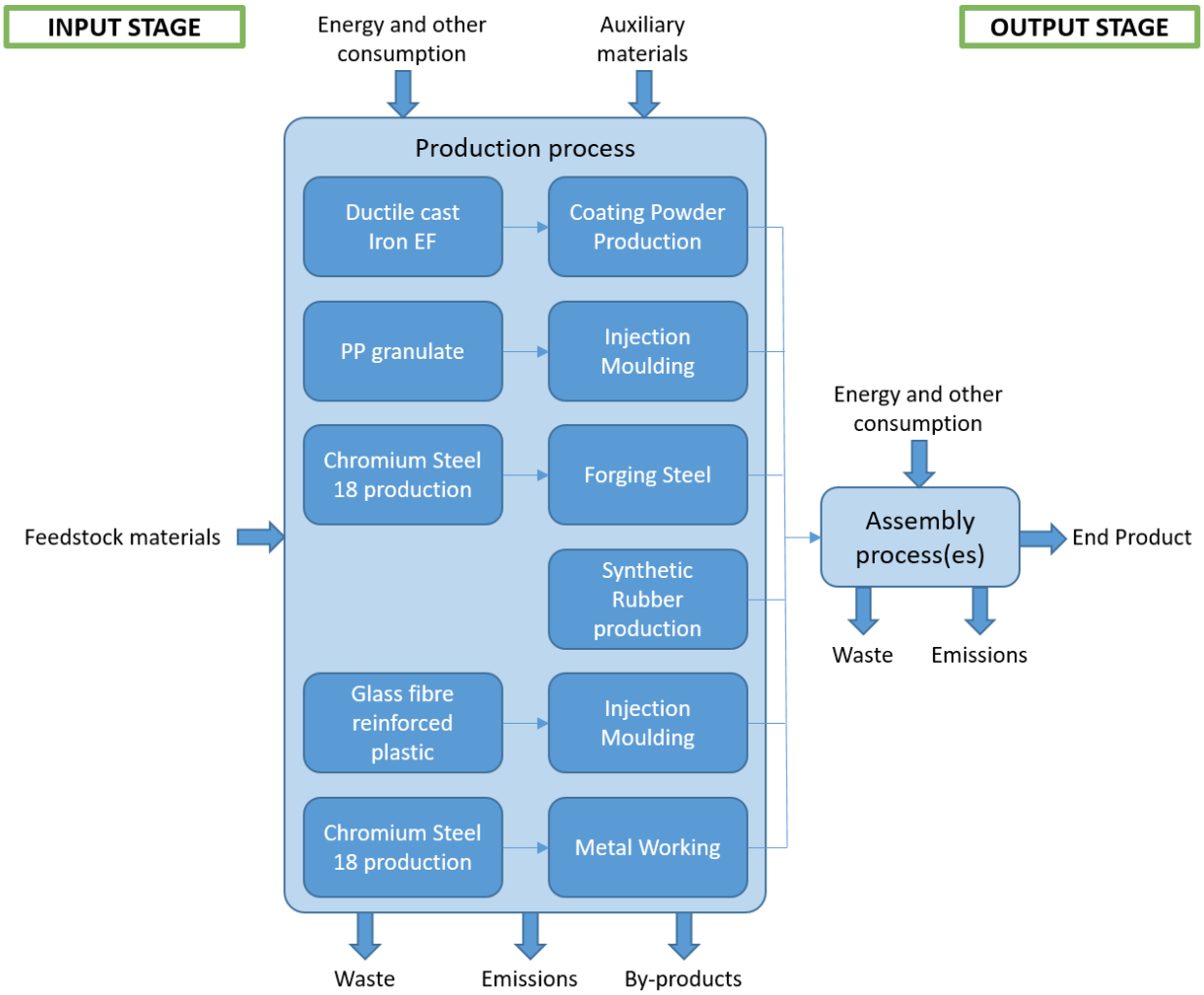
PRODUCT USE AND MAINTENANCE (B1-B7)

The MULTI/JOINT couplings and flange adapters are designed and tested for a life expectancy of 50 years. In general the products are used for an average period of more than 50 years. The product can be used for temporary service or even as a pressurizing tool to test piping sections and is accordingly refurbished. The use of the product does not consume resources neither release effluents nor emissions, and it does not generate wastes. Maintenance, repair, replacement and refurbishment are not needed during the service life of the products. The product does not use energy neither water during the use stage. For these reasons, modules B1-B7 are not declared in the EPD. Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

At the end of the economical or technical lifetime of the piping system, the products are taken out together with the pipes. This means that deconstruction is a side activity of new installations, hence zero resources and energy are consumed during de-construction stage C1. The products are assumed to be fully separated into their unique materials. Waste processing and disposal have been modelled to reflect average European scenarios. As conservative assumption the transport distance to waste processing or disposal is 100 km by truck. All materials, except for the glass filled plastic carriers, rubber seal and epoxy coating, are assumed to be recycled. Glass filled plastics and epoxy do not (yet) find a way to be re-used and are typically used for incineration without energy recovery. Rubber is mostly recycled for entirely new product such as playground surfaces. Only a very small percentage is used for energy recovery or goes to landfill. The cast iron and stainless steel parts, which add to >85% by weight of the product, are fully recycled.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard 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.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	Multiple products
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	+14%/-17%

The product studied in this EPD represent the average for the MULTI/JOINT product range in the dimensions DN50 – DN800. The variation of weight is in the range 3.1 kg – 364.6 kg.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2,54E0	4,36E-1	-2,36E0	6,17E-1	4,85E-2	3,22E-3	MND	0E0	9,1E-3	1,15E-1	3,59E-2	-1,63E0
GWP – fossil	kg CO_2e	2,53E0	4,35E-1	8,22E-1	3,79E0	4,9E-2	2,59E-3	MND	0E0	9,09E-3	1,16E-1	3,59E-2	-1,89E0
GWP – biogenic	kg CO_2e	8,15E-3	2,25E-4	-3,18E0	-3,18E0	3,56E-5	6,24E-4	MND	0E0	6,6E-6	-1,28E-3	2,52E-6	2,63E-1
GWP – LULUC	kg CO_2e	1,46E-3	1,57E-4	3,9E-3	5,52E-3	1,47E-5	2,44E-6	MND	0E0	2,74E-6	2,58E-5	2,15E-7	-5,67E-4
Ozone depletion pot.	kg CFC_{-11}e	1,62E-7	9,86E-8	1,03E-7	3,64E-7	1,15E-8	3,35E-10	MND	0E0	2,14E-9	3,36E-9	8,53E-11	-5,91E-8
Acidification potential	mol H^+e	1,16E-2	2,01E-3	4,84E-3	1,85E-2	2,06E-4	1,31E-5	MND	0E0	3,82E-5	2,95E-4	8,28E-6	-9,17E-3
EP-freshwater[2)]	kg Pe	1,15E-4	3,63E-6	8,28E-5	2,02E-4	3,98E-7	9,22E-8	MND	0E0	7,39E-8	1,53E-6	9,34E-9	-1,07E-4
EP-marine	kg Ne	2,35E-3	5,79E-4	1,21E-3	4,14E-3	6,2E-5	3,66E-6	MND	0E0	1,15E-5	7,15E-5	3,87E-6	-1,76E-3
EP-terrestrial	mol Ne	2,39E-2	6,4E-3	1,57E-2	4,61E-2	6,84E-4	3,94E-5	MND	0E0	1,27E-4	8,14E-4	3,98E-5	-2E-2
POCP (“smog”)	kg NMVOCe	1,01E-2	1,93E-3	4,56E-3	1,66E-2	2,2E-4	1,29E-5	MND	0E0	4,08E-5	2,51E-4	9,63E-6	-9,59E-3
ADP-minerals & metals	kg Sbe	3,23E-5	1,15E-5	1,07E-5	5,45E-5	8,36E-7	5,12E-8	MND	0E0	1,55E-7	1,25E-6	1,27E-8	-3,11E-5
ADP-fossil resources	MJ	3,51E1	6,54E0	1,4E1	5,56E1	7,62E-1	3,77E-2	MND	0E0	1,41E-1	3,2E-1	6,54E-3	-2,1E1
Water use	m^3e depr.	1,13E0	2,12E-2	5,5E-1	1,7E0	2,83E-3	4,89E-4	MND	0E0	5,26E-4	6E-3	1,74E-3	-9,68E-1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 2) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1,92E-7	3,01E-8	2,66E-7	4,88E-7	4,43E-9	2,69E-10	MND	0E0	8,22E-10	5,24E-9	3,89E-11	-1,34E-7
Ionizing radiation[3)]	kBq U235e	9,22E-2	2,86E-2	5,29E-2	1,74E-1	3,33E-3	1,82E-4	MND	0E0	6,18E-4	1,54E-3	1,34E-5	-3,94E-3
Ecotoxicity (freshwater)	CTUe	5,91E1	5,05E0	2,72E1	9,14E1	5,82E-1	9,69E-2	MND	0E0	1,08E-1	2,05E0	7,45E-2	-9,47E1
Human toxicity, cancer	CTUh	2,86E-8	1,49E-10	4,12E-9	3,29E-8	1,49E-11	3,71E-12	MND	0E0	2,76E-12	1,35E-10	3,1E-12	-8,62E-9
Human tox. non-cancer	CTUh	3,18E-7	5,67E-9	2,51E-8	3,49E-7	6,9E-10	4,65E-11	MND	0E0	1,28E-10	2,1E-9	1,23E-10	2,02E-7
SQP[4)]	-	5,5E0	5,47E0	1,72E0	1,27E1	1,15E0	1,77E-2	MND	0E0	2,13E-1	1,13E-1	1,85E-3	-4,13E0

3) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator. 4) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Renew. PER as energy[5)]	MJ	1,83E0	9,07E-2	3,12E1	3,31E1	9,59E-3	2,67E-3	MND	0E0	1,78E-3	4,8E-2	2,49E-4	-2,69E0
Renew. PER as material	MJ	0E0	0E0	1,73E1	1,73E1	0E0	0E0	MND	0E0	0E0	0E0	0E0	-1,64E0
Total use of renew. PER	MJ	1,83E0	9,07E-2	4,85E1	5,04E1	9,59E-3	2,67E-3	MND	0E0	1,78E-3	4,8E-2	2,49E-4	-4,34E0
Non-re. PER as energy	MJ	1,58E1	6,54E0	1,38E1	3,61E1	7,62E-1	3,77E-2	MND	0E0	1,41E-1	3,2E-1	6,54E-3	-1,64E1
Non-re. PER as material	MJ	1,92E0	0E0	1,61E-1	2,09E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	-4,53E0
Total use of non-re. PER	MJ	1,77E1	6,54E0	1,4E1	3,82E1	7,62E-1	3,77E-2	MND	0E0	1,41E-1	3,2E-1	6,54E-3	-2,1E1
Secondary materials	kg	1,63E-2	0E0	1,6E-4	1,64E-2	0E0	0E0	MND	0E0	0E0	0E0	0E0	7,58E-1
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m^3	1,13E0	1,12E-3	9,79E-2	1,23E0	1,59E-4	9,43E-6	MND	0E0	2,94E-5	1,79E-4	5,98E-5	-1,22E-2

5) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Hazardous waste	kg	3,9E-1	6,72E-3	3,98E-2	4,36E-1	7,4E-4	1,47E-4	MND	0E0	1,37E-4	0E0	5E-4	-6,43E-1
Non-hazardous waste	kg	1,69E0	4,57E-1	1,6E0	3,75E0	8,19E-2	5,67E-3	MND	0E0	1,52E-2	0E0	1,46E-2	-5,56E0
Radioactive waste	kg	3,66E-5	4,48E-5	4,98E-5	1,31E-4	5,23E-6	2,01E-7	MND	0E0	9,7E-7	0E0	1,68E-8	-7,8E-6

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	1,19E-1	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	8,49E-2	8,49E-2	0E0	3,62E-2	MND	0E0	0E0	9,85E-1	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	1,05E0	4,32E-1	8,07E-1	2,29E0	4,85E-2	2,79E-3	MND	0E0	9,01E-3	1,1E-1	3,59E-2	-1,8E0
Ozone depletion Pot.	kg $CFC_{-11}e$	6,34E-8	7,84E-8	8,72E-8	2,29E-7	9,15E-9	2,85E-10	MND	0E0	1,7E-9	2,86E-9	9,21E-11	-5,23E-8
Acidification	kg SO_2e	5,04E-3	1,09E-3	3,47E-3	9,61E-3	9,96E-5	1,02E-5	MND	0E0	1,85E-5	1,95E-4	5,97E-6	-7,59E-3
Eutrophication	kg PO_4^3e	1,56E-3	2,02E-4	1,64E-3	3,41E-3	2,01E-5	1,16E-5	MND	0E0	3,74E-6	1,3E-3	3,84E-6	-4,73E-3
POCP (“smog”)	kg C_2H_4e	2,94E-4	6,2E-5	3,69E-4	7,25E-4	6,31E-6	7,59E-7	MND	0E0	1,17E-6	2,71E-5	1,26E-7	-1,22E-3
ADP-elements	kg Sbe	3,23E-5	1,15E-5	1,07E-5	5,45E-5	8,36E-7	5,12E-8	MND	0E0	1,55E-7	1,25E-6	1,27E-8	-3,11E-5
ADP-fossil	MJ	3,51E1	6,54E0	1,4E1	5,56E1	7,62E-1	3,77E-2	MND	0E0	1,41E-1	3,2E-1	6,54E-3	-2,1E1

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Elma Avdyli as an authorized verifier acting for EPD Hub Limited
18.11.2022

EPD Hub
VERIFIED ISO 14025