



TOP GLASS Industries S.p.A.



ENVIRONMENTAL PRODUCT DECLARATION

In compliance with ISO 14025 and EN 15804+A2

Product Name:

TRIGLASS® Cable duct for ARCOSYSTEM® system

Manufacturing Plant:

Via Dei Soldani 3, 23875 Osnago (LC) Italy

Program Operator

EPDItaly

Publisher

EPDItaly

Declaration Number

TOP_001

Registration Number

EPDITALY0545

UNCPC Code

37990

Issue Date

16/02/2024

Valid until

16/02/2029



GENERAL INFORMATION

EPD REFERENCES	
EPD OWNER	TOP GLASS Industries S.p.A. Via Monte Suello 18, 25128, Brescia (BS)
REFERENCE PRODUCTION SITE	Via Dei Soldani 3 23875 Osnago (LC) Italy
PROGRAM OPERATOR	EPDItaly Via Gaetano De Castillia 10, 20124 Milano (MI), Italy www.epditaly.it
INDEPENDENT VERIFICATION	This declaration was developed following the general instructions of the EPDItaly programme. Independent verification of the declaration and data, according to EN ISO 14025:2010. <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External Third party verifier: ICMQ SpA, Via Gaetano De Castillia 10, 20124 Milano (MI) www.icmq.it Accredited by Accredia.
SCOPE OF APPLICATION	The following is an EPD is referred to 1 m of the following: - TRIGLASS® cable duct 150x100x2,7 mm and its TRIGLASS® cover 100x3 mm for ARCOSYSTEM® system - TRIGLASS® cable duct 250x150x2,7 mm and TRIGLASS® cover 250x3 mm for ARCOSYSTEM® system
UNCP CODE	37990; Non-metallic mineral products (including mineral wool, expanded mineral materials, worked mica, articles of mica, non-electrical articles of graphite or other carbon and articles of peat)
REFERENCE DOCUMENTS	Regolamento EPDItaly rev. 5.2 published on 16/02/2022, available at www.epditaly.it .
PCR	CEN standard EN 15804 serves as the core PCR. PCR ICMQ-001/15 rev. 3 Prodotti da costruzione e servizi per costruzione, EPDItaly. Data di emissione: 02/12/2019
COMPARABILITY	Environmental Declarations published within the same product category, but from different programmes, may not be comparable. In particular, EPDs of similar products may not be comparable if they do not comply with the reference technical standard.
RESPONSIBILITY	TOP GLASS Industries S.p.A. releases EPDItaly from any non-compliance with environmental legislation self-declared by the manufacturer. The holder of the declaration shall be responsible for the supporting information and evidence; EPDItaly declines all responsibility for the manufacturer's information, data and results of the life cycle assessment.
ORGANIZATION CONTACT	Maurizio Ondei, TOP GASS Industries S.p.A., Via Dei Soldani 3, 23875 Osnago (LC) Italy maurizio.ondei@topglass.it
TECHNICAL CONTACT	Alessandro Betti, Federica Gilardelli, Michele Caimi, Greenwich S.r.l. Head office: Via Presolana 2/4, 24030 Medolago (BG) Italy Registered office: Via Vittorio Emanuele II 179, 24033 Calusco d'Adda (BG) Italy tecnicog4@greenwichsrl.it

COMPANY INFORMATION

In 1963 TOP GLASS was established, successfully tackling the challenge of creating machines suitable for the industrial production of protruded products in European territory. Expanding its market, the company broadened its range of products in fiberglass-reinforced resin. In 1981, a centrifugation line was started, used for the production of poles for public lighting.

In 1989, the company acquired its first production plant in Pioltello (MI) with an area of 9,000 square meters, and following the same growth trend, a second plant was initiated in Osnago (LC) in 2001, covering an area of 12,000 square meters.



In 2011, through collaboration with Castioni Kabelführungssysteme, ARCOSYSTEM was born a groundbreaking above-ground channel system for laying cables in the railway sector. To date, the company manufactures a wide range of fiberglass products, both protruded and centrifuged, in the fields of lighting, public transport, fixtures, and partitions. With over two thousand customers in 25 countries worldwide and more than six thousand kilometers of profiles produced exclusively for the TRIGLASS® range.

60 YEARS OF EXPERIENCE

750 DIFFERENT SECTIONS

100% EUROPEAN RAW MATERIALS

6000 km PROFILES PRODUCED IN ONE YEAR.

OUR MISSION

To make TRIGLASS® pultruded profiles an innovative solution for architects, engineers and designers by enhancing their extraordinary features as a natural evolution of traditional materials such as wood, aluminium, steel and PVC.

OUR VISION

Top Glass understands its customers' needs and offers them, thanks to its extensive network of contacts, the best composite solution either by means of TRIGLASS® profiles or by involving other technologies.



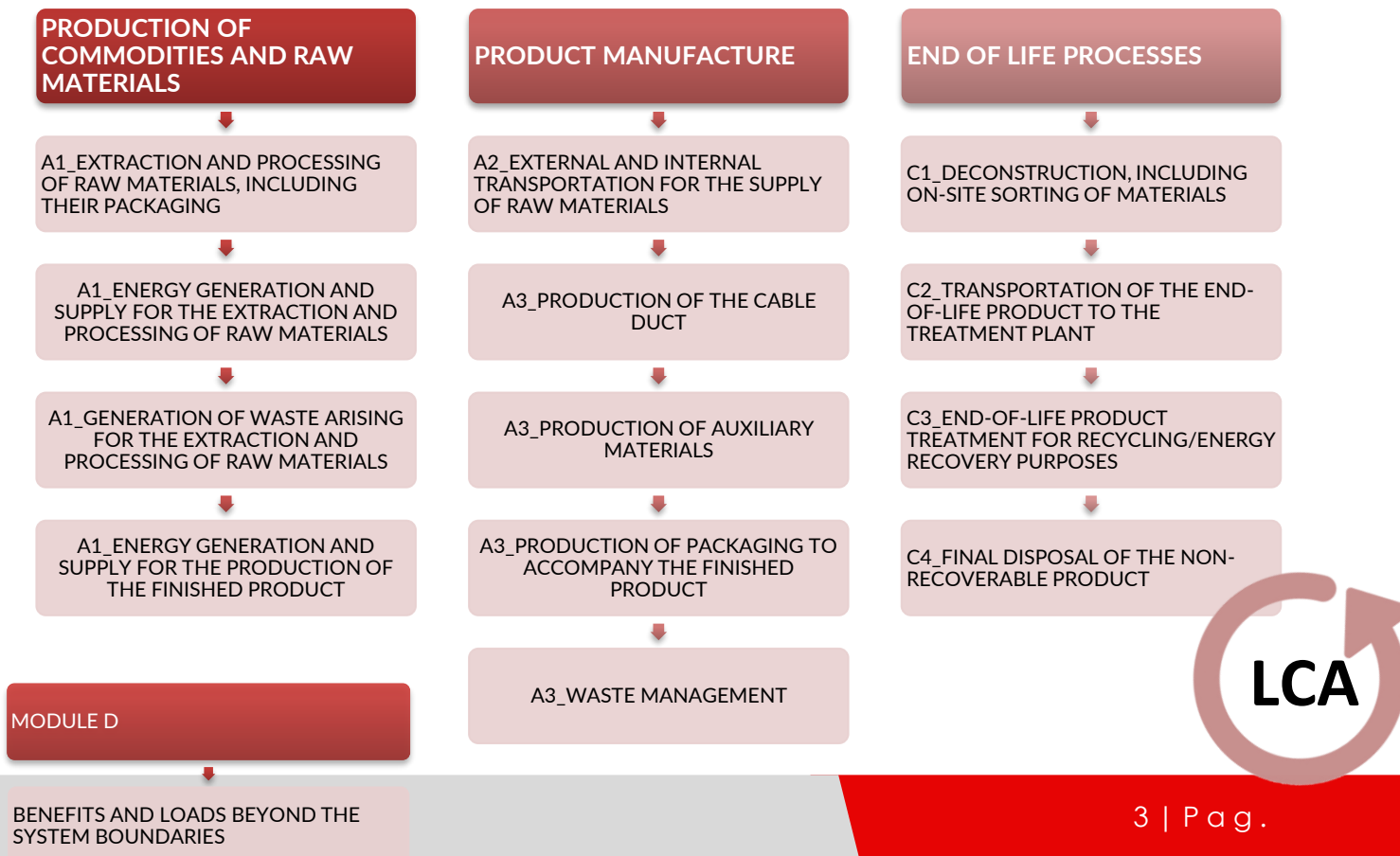
SCOPE AND TYPE OF EPD

This declaration is a product-specific declaration. The EPD is “cradle to gate with module C1-C4 and module D”; thus, the following phases were considered:

- Manufacturing Stage (extraction of raw materials, including waste recycling processes and the production of semi-finished and ancillary products, as well as their packaging; transportation of raw materials to the manufacturing site; manufacturing of the product constituents, including all the stages; product assembly; packaging; waste recycling processes);
- End-of-life Stage (de-installation; collection & transport; End-of-life treatments)
- Load and benefits beyond the system boundaries.

	Manufacturing 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 - Re cycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	IT EU	EU	IT										EU	EU	EU	EU	EU

X Module declared – ND Module Not Declared



LCA INFORMATION

Type of EPD	Product specific EPD. Cradle to gate with module C1-C4 and module D
Geographical validity	Performance was calculated with reference to TOP GLASS Industries S.p.A. in Via Dei Soldani 3 23875 Osnago (LC) Italy. The reference market is European.
Temporal validity	The reference period is the calendar year 2022.
Database used:	Ecoinvent 3.9.1
Software:	SimaPro 9.5.0.1
Declared Unit:	One linear meter of cable duct (1 m), which correspond to: - TRIGLASS® 150x100x2.7 mm cable duct and relative TRIGLASS® 100x3 mm cover for the ARCOSYSTEM® system: 5,3 kg - TRIGLASS® 250x150x2,7 mm cable duct and relative TRIGLASS® 250x3 mm cover for the ARCOSYSTEM® system: 7,8 kg
Cut-off rules:	A catalyst was considered in CUT-OFF, which counts in terms of mass: - 0.207% and 0.172% for the product TRIGLASS® 150x100x2.7 mm cable duct and relative TRIGLASS® 100x3 mm cover for the ARCOSYSTEM® system - 0,239% and 0,178% for the product TRIGLASS® 250x150x2,7 mm cable duct and relative TRIGLASS® 250x3 mm cover for the ARCOSYSTEM® system - Employee travel;
Exclusions:	- Packaging of the auxiliary material. - Replacement of machinery components and molds necessary for the production process
Allocation:	Mass-based allocation considering net production of pultruded profiles in 2022.
Proxy data:	None.
Data quality	- all data related to the product manufacture are site specific; - for the production of commodities and raw materials data, the data regarding weight, quantity, raw materials and waste are derived from company databases and they are site-specific. The type of material and processes were taken from the Ecoinvent 3.9.1 database. The company supply energy through the national energy system, and therefore the Residual Italian energy mix is adopted. In the use of generic data, the following criteria were applied:
Generic data	<ul style="list-style-type: none"> • geographic equivalence when possible; • technological equivalence; • equivalence with respect to system boundaries. For generic data, information between 2018 and 2022 was considered.

Assumptions / Scenarios - End-of-Life Stage

Modules	Scenarios
C1	The disassembly of the cable duct is not considered relevant. No impacts were considered.
C2	A distance of 100 km was considered for the transport of the waste to treatment plants.
C3	It was not possible to define recycling or energy recovery scenarios starting from glass resin products. Therefore, no impacts have been attributed to these phase.
C4	The dismantle product was considered to be sent 100% on landfill.
D	This module includes benefits related to material recycling. Given the considerations carried out for module C3, its impacts were considered null.

PRODUCT AND PRODUCTION PROCESS DESCRIPTION

TRIGLASS® Cable duct for ARCOSYSTEM® system

Overhead GRP cable ducts, such as ARCOSYSTEM® Size 1 and Size 2, provide effective protection for a variety of sensitive cables in settings such as railway lines, airports and in the energy supply sector. Designed to tackle tough terrain, these raceways offer reliable defense against outdoor elements while ensuring easy cable routing. With a useful internal section of 100 x 150 mm for ARCOSYSTEM® Size 1 and 250 x 150 mm for ARCOSYSTEM® Size 2, these solutions adapt to topographical challenges along the tracks without compromising the integrity of the information transmission system or energy supply. The TRIGLASS® material does not contain substances listed in the Candidate List of Substances of Very High Concern for authorization under (UE) 1907/2006 (REACH) and (UE) 1272/2008 regulations.



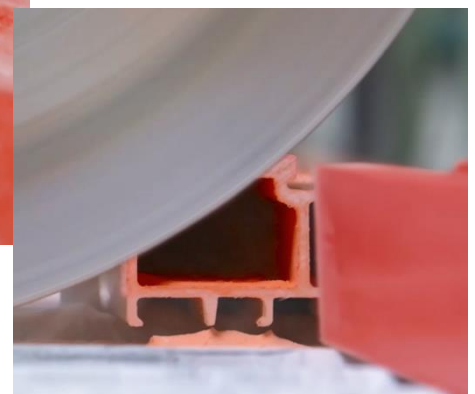
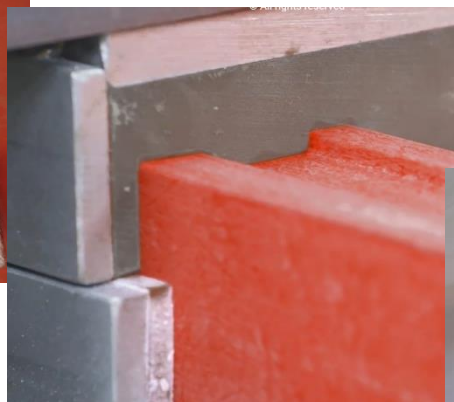
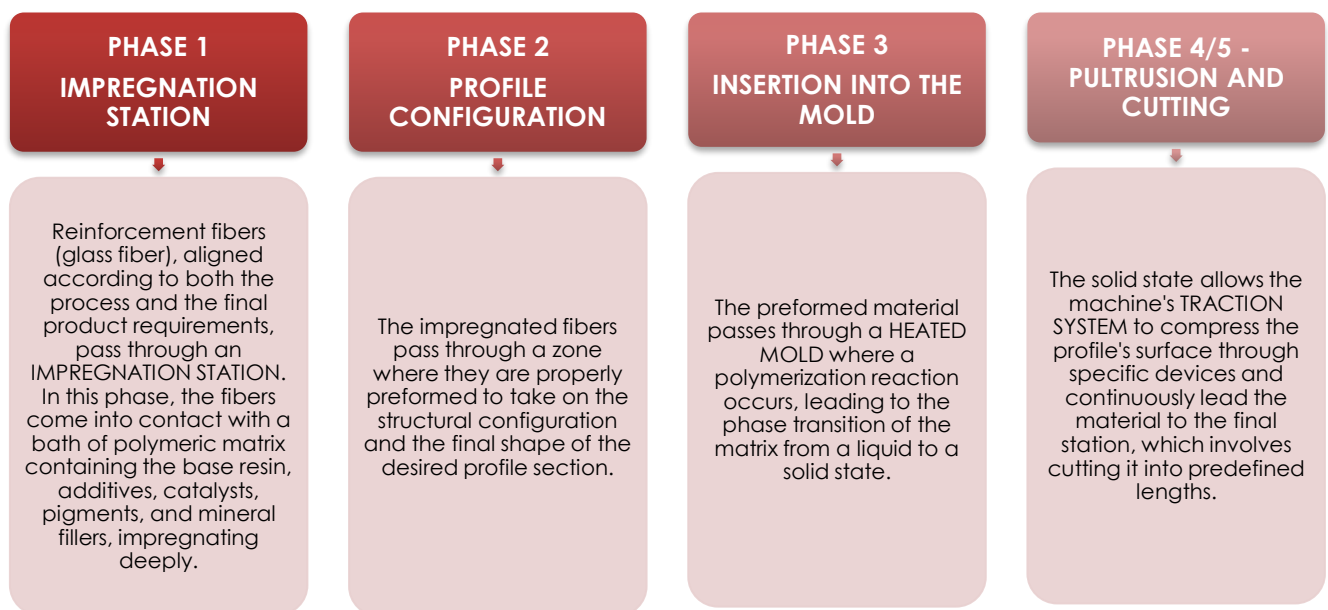
Product components [1 m]	UM	TRIGLASS® 150x100x2.7 mm cable duct and relative TRIGLASS® 100x3 mm cover for the ARCOSYSTEM® system	TRIGLASS® 250x150x2,7 mm cable duct and relative TRIGLASS® 250x3 mm cover for the ARCOSYSTEM® system
Resin based matrix	Kg/m	1,772	2,922
Glass fiber	Kg/m	3,522	4,873
Total	Kg/m	5,294	7,795
Packaging	Kg/m	0,487	0,967
Biogenic carbon content in product (*)	Kg C/m	0,00	0,00
Biogenic carbon content final product packaging (*)	Kg C/m	0,256	0,509

(*) The content in the product and packaging of the finished product of biogenic carbon was quantified according to EN 16449:2014.



Production Process

Inside the Osnago production site, the entire production of the fiberglass cable duct takes place. The raw materials are received and stored within the production facility. The fiberglass fibers used are in the form of both mats and rovings, purchased as semi-finished products in coil form. The resin matrix, on the other hand, is naturally composed of a series of compounds that must be purchased and stored separately before being mixed during processing. Specifically, the resin used consists of a polystyrene base and a series of additives, solvents, and catalysts. Part of the matrix components is controlled by a computerized system that the operator adjusts as needed, while a second part of the components is added after being weighed or measured manually.



RESULTS – ENVIRONMENTAL INDICATORS

TRIGLASS® 150x100x2.7 mm cable duct and relative TRIGLASS® 100x3 mm cover for the ARCOSYSTEM® system [1 m]

Main environmental impact parameters - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
GWP-total	Kg CO ₂ eq	1,64E+01	6,96E-01	1,87E+00	1,90E+01	0,00E+00	9,98E-02	0,00E+00	6,25E-02	1,62E-01	-5,54E-02
GWP-fossil	Kg CO ₂ eq	1,65E+01	6,95E-01	2,38E+00	1,95E+01	0,00E+00	9,97E-02	0,00E+00	6,20E-02	1,62E-01	-7,54E-02
GWP-biogenic	Kg CO ₂ eq	-3,40E-02	6,07E-04	-5,09E-01	-5,42E-01	0,00E+00	9,01E-05	0,00E+00	3,95E-04	4,85E-04	2,05E-02
GWP-luluc	Kg CO ₂ eq	1,92E-02	3,43E-04	7,00E-04	2,02E-02	0,00E+00	4,84E-05	0,00E+00	4,51E-05	9,35E-05	-4,46E-04
ODP	Kg CFC11 eq.	3,08E-06	1,50E-08	7,71E-08	3,17E-06	0,00E+00	2,17E-09	0,00E+00	1,47E-09	3,63E-09	-1,24E-09
AP	Mol H+ eq.	9,70E-02	2,78E-03	4,98E-03	1,05E-01	0,00E+00	3,25E-04	0,00E+00	4,41E-04	7,66E-04	-2,64E-04
EP-freshwater	Kg P eq.	4,88E-03	4,79E-05	1,23E-04	5,06E-03	0,00E+00	6,97E-06	0,00E+00	1,63E-05	2,32E-05	-2,32E-05
EP-marine	Kg N eq.	1,91E-02	9,02E-04	7,62E-04	2,08E-02	0,00E+00	1,12E-04	0,00E+00	1,65E-04	2,77E-04	-8,72E-05
EP-terrestrial	Mol N eq.	1,96E-01	9,61E-03	7,74E-03	2,13E-01	0,00E+00	1,18E-03	0,00E+00	1,77E-03	2,95E-03	-5,49E-04
POCP	Kg NMVOC eq.	7,28E-02	3,72E-03	9,49E-03	8,60E-02	0,00E+00	4,86E-04	0,00E+00	5,97E-04	1,08E-03	-3,07E-04
ADPminerals& metals (2)	Kg Sb eq.	1,06E-03	2,19E-06	3,03E-06	1,07E-03	0,00E+00	3,20E-07	0,00E+00	1,26E-07	4,46E-07	-3,14E-07
ADP-fossil (2)	MJ	3,03E+02	9,81E+00	6,78E+00	3,20E+02	0,00E+00	1,41E+00	0,00E+00	1,34E+00	2,76E+00	-2,20E+00
WDP(2)	m ³ world eq deprived	6,22E+00	3,96E-02	3,82E-01	6,64E+00	0,00E+00	5,76E-03	0,00E+00	5,69E-02	6,27E-02	-4,09E-02

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

Acronymous

Additional indicators parameters - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
PM	disease inc.	7,45E-07	5,43E-08	5,29E-08	8,52E-07	0,00E+00	7,93E-09	0,00E+00	9,51E-09	1,74E-08	-3,03E-09
IRP (1)	kBq U235 eq.	1,73E+00	1,29E-02	3,33E-02	1,78E+00	0,00E+00	1,89E-03	0,00E+00	1,77E-03	3,66E-03	-6,81E-03
ETP-fw (2)	CTUe	1,87E+02	4,84E+00	2,02E+01	2,12E+02	0,00E+00	6,97E-01	0,00E+00	5,89E-01	1,29E+00	-2,37E-01
HTP-c (2)	CTUh	1,59E-08	3,15E-10	9,79E-10	1,72E-08	0,00E+00	4,53E-11	0,00E+00	3,46E-11	7,99E-11	-9,31E-11
HTP-nc (2)	CTUh	5,49E-07	6,81E-09	1,02E-08	5,66E-07	0,00E+00	9,95E-10	0,00E+00	3,88E-10	1,38E-09	-3,93E-10
SQP	Pt	5,23E+01	5,72E+00	2,52E+01	8,31E+01	0,00E+00	8,41E-01	0,00E+00	3,07E+00	3,91E+00	-1,67E+00

PM = Particulate Matter, emissions; IRP = Ionising Radiation Potential, human health; ETP-fw = Eco-toxicity (freshwater); HTP-nc = Human Toxicity Potential, non-cancer; HTP-c = Human Toxicity Potential, cancer; SQP = Land use (Soil Quality Potential)

Resource use indicator parameter - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
PERE	MJ	1,97E+01	1,50E-01	1,30E+00	2,12E+01	0,00E+00	2,19E-02	0,00E+00	2,31E-02	4,50E-02	-3,36E-01
PERM	MJ	0,00E+00	0,00E+00	3,45E+00	3,45E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,97E+01	1,50E-01	4,75E+00	2,46E+01	0,00E+00	2,19E-02	0,00E+00	2,31E-02	4,50E-02	-3,36E-01
PENRE	MJ	2,64E+02	9,81E+00	6,51E+00	2,81E+02	0,00E+00	1,41E+00	0,00E+00	1,34E+00	2,76E+00	-2,20E+00
PENRM	MJ	3,89E+01	0,00E+00	2,70E-01	3,92E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	3,03E+02	9,81E+00	6,78E+00	3,20E+02	0,00E+00	1,41E+00	0,00E+00	1,34E+00	2,76E+00	-2,20E+00
SM	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
RSF	MJ	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
NRSF	MJ	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
FW	m3	1,71E-01	1,38E-03	0,00E+00	1,72E-01	0,00E+00	2,01E-04	0,00E+00	1,39E-03	1,59E-03	-9,69E-04

Acronymous

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

Waste production - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
Hazardous waste disposed	kg	1,46E-03	6,21E-05	2,02E-05	1,54E-03	0,00E+00	9,00E-06	0,00E+00	6,68E-06	1,57E-05	-3,34E-06
Non-hazardous waste disposed	kg	1,55E+00	4,68E-01	7,03E-02	2,09E+00	0,00E+00	6,90E-02	0,00E+00	5,31E+00	5,38E+00	-9,85E-03
Radioactive waste disposed	kg	4,42E-04	3,14E-06	8,59E-06	4,54E-04	0,00E+00	4,59E-07	0,00E+00	4,27E-07	8,86E-07	-1,74E-06

Acronymous

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

Output flows - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
Components for re-use	kg	0,00E+00	0,00E+00	3,12E-02	3,12E-02	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	3,43E-02	3,43E-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	7,07E-01	7,07E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	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	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

Acronymous

CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal

TRIGLASS® 250x150x2,7 mm cable duct and relative TRIGLASS® 250x3 mm cover for the ARCOSYSTEM® system [1 m]

Main environmental impact parameters - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
GWP-total	Kg CO2eq	2,41E+01	9,97E-01	2,64E+00	2,77E+01	0,00E+00	1,47E-01	0,00E+00	9,20E-02	2,39E-01	-8,16E-02
GWP-fossil	Kg CO2eq	2,41E+01	9,95E-01	3,56E+00	2,87E+01	0,00E+00	1,47E-01	0,00E+00	9,13E-02	2,38E-01	-1,11E-01
GWP-biogenic	Kg CO2eq	-5,02E-02	8,71E-04	-9,19E-01	-9,68E-01	0,00E+00	1,33E-04	0,00E+00	5,81E-04	7,14E-04	3,01E-02
GWP-luluc	Kg CO2eq	2,71E-02	4,91E-04	1,27E-03	2,89E-02	0,00E+00	7,13E-05	0,00E+00	6,65E-05	1,38E-04	-6,57E-04
ODP	Kg CFC11 eq.	4,88E-06	2,15E-08	1,15E-07	5,02E-06	0,00E+00	3,19E-09	0,00E+00	2,16E-09	5,35E-09	-1,82E-09
AP	Mol H+ eq.	1,40E-01	3,94E-03	7,61E-03	1,52E-01	0,00E+00	4,79E-04	0,00E+00	6,50E-04	1,13E-03	-3,89E-04
EP-freshwater	Kg P eq.	7,08E-03	6,87E-05	2,01E-04	7,35E-03	0,00E+00	1,03E-05	0,00E+00	2,39E-05	3,42E-05	-3,41E-05
EP-marine	Kg N eq.	2,76E-02	1,28E-03	1,20E-03	3,00E-02	0,00E+00	1,65E-04	0,00E+00	2,43E-04	4,08E-04	-1,28E-04
EP-terrestrial	Mol N eq.	2,83E-01	1,36E-02	1,22E-02	3,09E-01	0,00E+00	1,74E-03	0,00E+00	2,60E-03	4,34E-03	-8,08E-04
POCP	Kg NMVOC eq.	1,06E-01	5,30E-03	1,43E-02	1,26E-01	0,00E+00	7,15E-04	0,00E+00	8,80E-04	1,59E-03	-4,52E-04
ADPminerals&metals (2)	Kg Sb eq.	1,48E-03	3,14E-06	4,69E-06	1,49E-03	0,00E+00	4,71E-07	0,00E+00	1,85E-07	6,57E-07	-4,63E-07
ADP-fossil (2)	MJ	4,49E+02	1,41E+01	1,10E+01	4,74E+02	0,00E+00	2,08E+00	0,00E+00	1,98E+00	4,06E+00	-3,25E+00
WDP(2)	m3 world eq deprived	9,22E+00	5,67E-02	5,87E-01	9,86E+00	0,00E+00	8,48E-03	0,00E+00	8,38E-02	9,22E-02	-6,02E-02

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

Acronymous

Additional indicators parameters - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
PM	disease inc.	1,09E-06	7,79E-08	8,24E-08	1,25E-06	0,00E+00	1,17E-08	0,00E+00	1,40E-08	2,57E-08	-4,46E-09
IRP (1)	kBq U235 eq.	2,50E+00	1,85E-02	5,39E-02	2,57E+00	0,00E+00	2,78E-03	0,00E+00	2,61E-03	5,39E-03	-1,00E-02
ETP-fw (2)	CTUe	2,84E+02	6,94E+00	3,01E+01	3,21E+02	0,00E+00	1,03E+00	0,00E+00	8,67E-01	1,89E+00	-3,49E-01
HTP-c (2)	CTUh	2,36E-08	4,51E-10	1,73E-09	2,57E-08	0,00E+00	6,66E-11	0,00E+00	5,10E-11	1,18E-10	-1,37E-10
HTP-nc (2)	CTUh	7,79E-07	9,76E-09	1,57E-08	8,05E-07	0,00E+00	1,47E-09	0,00E+00	5,72E-10	2,04E-09	-5,78E-10
SQP	Pt	7,61E+01	8,20E+00	5,22E+01	1,36E+02	0,00E+00	1,24E+00	0,00E+00	4,52E+00	5,76E+00	-2,46E+00

PM = Particulate Matter, emissions; IRP = Ionising Radiation Potential, human health; ETP-fw = Eco-toxicity (freshwater); HTP-nc = Human Toxicity Potential, non-cancer; HTP-c = Human Toxicity Potential, cancer; SQP = Land use (Soil Quality Potential)

Resource use indicator parameter - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
PERE	MJ	2,84E+01	2,15E-01	2,38E+00	3,10E+01	0,00E+00	3,23E-02	0,00E+00	3,40E-02	6,62E-02	-4,95E-01
PERM	MJ	0,00E+00	0,00E+00	7,40E+00	7,40E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,84E+01	2,15E-01	9,79E+00	3,84E+01	0,00E+00	3,23E-02	0,00E+00	3,40E-02	6,62E-02	-4,95E-01
PENRE	MJ	3,80E+02	1,41E+01	1,04E+01	4,05E+02	0,00E+00	2,08E+00	0,00E+00	1,98E+00	4,06E+00	-3,25E+00
PENRM	MJ	6,86E+01	0,00E+00	6,01E-01	6,92E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	4,49E+02	1,41E+01	1,10E+01	4,74E+02	0,00E+00	2,08E+00	0,00E+00	1,98E+00	4,06E+00	-3,25E+00
SM	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
RSF	MJ	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
NRSF	MJ	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
FW	m3	2,53E-01	1,98E-03	0,00E+00	2,55E-01	0,00E+00	2,96E-04	0,00E+00	2,04E-03	2,34E-03	-1,43E-03

Acronymous 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

Waste production - Results per declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
Hazardous waste disposed	kg	2,24E-03	8,90E-05	3,33E-05	2,36E-03	0,00E+00	1,32E-05	0,00E+00	9,84E-06	2,31E-05	-4,91E-06
Non-hazardous waste disposed	kg	2,30E+00	6,72E-01	1,19E-01	3,09E+00	0,00E+00	1,02E-01	0,00E+00	7,81E+00	7,92E+00	-1,45E-02
Radioactive waste disposed	kg	6,38E-04	4,50E-06	1,39E-05	6,56E-04	0,00E+00	6,76E-07	0,00E+00	6,29E-07	1,30E-06	-2,56E-06

Acronymous HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

Output flows - Results per functional or declared unit

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	C1-C4	D
Components for re-use	kg	0,00E+00	0,00E+00	4,59E-02	4,59E-02	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	5,04E-02	5,04E-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	1,04E+00	1,04E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	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	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

Acronymous CRU = Components for re-use; MR = Material for recycling; MER = Materials for energy recovery; EEE = Exported energy, electricity; EET = Exported energy, thermal

Disclaimer (1) This impact category deals primarily with the possible impact on human health of low-dose ionizing radiation from the nuclear fuel cycle. It does not consider effects from possible nuclear accidents, occupational exposure, or from disposal of radioactive waste in underground dumps. Potential ionizing radiation from soil, radon, and some building materials are also not assessed by this indicator. (2) The results of this indicator should be used with care given their high uncertainty or limited experience with the indicator.

References

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- [4] UNI EN 15804:2012 + A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
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