



ENVIRONMENTAL PRODUCT DECLARATION

PRODUCT NAME:

Chiller: TR2-FC-G04-Z 1553
(alternative commercial name
TX2-FC-G04-Z 1553)

SITE:

Via dell'Industria, 13 Alpago (BL), Italy

In conformity to ISO 14025 and EN 15804:2012+A2:2019

Program Operator	EPDIItaly
Publisher	EPDIItaly

Declaration Number	MEHITS-TR2-CHILLER-01
Registration Number	EPDITALY0951

Release date	2025 / 05 / 28
Valid until	2030 / 05 / 28




www.epditaly.it

GENERAL INFORMATION

EPD OWNER	
Company name	Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A.
Registered office	Via Caduti di Cefalonia 1, 36061 Bassano del Grappa (VI) - Italy
Contacts for information on the EPD	Alessandro Fontana – alessandro.fontana@melcohit.com
PROGRAM OPERATOR	
EPDIItaly	Via Gaetano De Castilia n° 10 - 20124 Milano, Italy
INFORMAZIONI SULL'EPD	
Product name(s)	TR2-FC-G04-Z 1553 TX2-FC-G04-Z 1553
Site(s)	Via dell'Industria, 13 Alpago (BL), Italy
Short description and technical information of the product(s)	High efficiency air cooled chiller with free-cooling
Field of application of the product(s)	Data center cooling
Product(s) reference standards (if any)	“EC” Declaration of conformity for chillers or heat pumps. 2006/42/EC Machinery Directive. 2014/30/EU EMC Directive. 2014/68/EU Pressure Equipment Directive. 2011/65/EU RoHS Directive. Radio Equipment Directive 2014/53/EU (KIPLink).
CPC Code (number) https://unstats.un.org/unsd/classifications/Econ	43913 - Refrigerating and freezing equipment and heat pumps, except household type equipment

VERIFICATION INFORMATION	
PCR (title, version, date of publication or update)	EPDItaly 019-CORE PCR per HVAC home appliances, Rev. 2
EPDItaly Regulation (version, date of publication or update)	Regulation of the EPDItaly Programme – rev. 6, issue date: 30-10-2023
Project Report LCA	Analisi del ciclo di vita di un refrigeratore di liquido ad alta efficienza con sorgente aria con free-cooling: TR2-FC-G04-Z 1553; TX2-FC-G04-Z 1553. Rev 02, Maggio 2025
Independent Verification Statement	<p>The PCR review was performed by Ing. Daniele Pace - info@epditaly.it. Independent verification of the declaration and data, carried out according to ISO 14025: 2010.</p> <p><input type="checkbox"/> Internal <input checked="" type="checkbox"/> External</p> <p>Third party verification carried out by: ICMQ S.p.A., via Gaetano De Castilia n° 10 - 20124 Milan, Italy. Accredited by Accredia.</p>
Comparability Statement	Environmental statements published within the same product category, but from different programs, may not be comparable.
Liability Statement	The EPD Owner releases EPDItaly from any non-compliance with environmental legislation. The holder of the declaration will be responsible for the information and supporting evidence. EPDItaly disclaims any responsibility for the information, data and results provided by the EPD Owner for life cycle assessment.

ADDITIONAL INFORMATION	
Technical Support	<p>LCA study carried out by GREENWICH S.r.l.</p>  <p>Ing. Paride Romano – p.romano@greenwichsrl.it Dr. Lorenzo Calisse – l.calisse@greenwichsrl.it</p>

COMPANY

Company

Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A. is the Mitsubishi Electric Group company that specializes in Applied air conditioning solutions for comfort, process & IT Cooling.

Mission

Our goal is to “contribute to the creation of a dynamic and sustainable society through continuous technological innovation and constant creativity”. Our commitment is therefore to continue to change for the better, as our motto says, “Changes for the better”.

Vision

The company focuses on the “CIRCULAR ECONOMY” model based on the application of the concepts of reuse, recycling, recovery of materials and energy, reducing as much as possible the disposal of waste in landfill.



PRODUCT DESCRIPTION

Name:

TR2-FC-G04-Z 1553; TX2-FC-G04-Z 1553

Identification:

High efficiency air cooled chiller with free-cooling (1.300 kW)

Description:

This is an outdoor unit for the production of chilled water, equipped with oil-free centrifugal compressors, R1234ze refrigerant, 910 mm diameter EC helical fans, aluminum microchannel condensing battery, flooded tube bundle evaporator and electronic expansion valve. Base, structure and paneling are made of galvanized steel sheet painted with polyester powders. It is specified that the unit is supplied complete with refrigerant charge. The continuously variable speed compressors allow accurate and efficient thermoregulation in all conditions. In free-cooling mode the liquid is cooled by the external air, thus reducing the work of the compressors until it is completely eliminated. The NG configuration responds to all applications where the use of ethylene glycol is not permitted or desired.

The two names (TR2 / TX2) refer to the same product, which has two different commercial names. This has no influence with respect to the environmental impacts of the product, which are the same for the two denominations.

Geographical scope:

Europe

LCA INFORMATION

Declared Unit (DU):

A chiller, which exchanges with the refrigerated liquid 170.820.000 kWh of thermal energy during its life cycle.

Reference Service Lifetime:

20 years

Time representativeness:

Solar year 2023

Database and LCA software used:

Ecoinvent 3.9.1, SimaPro 9.5.0.1

System boundaries:

Cradle-to-grave (phases A, B, C, D)

Technical Specifications:

Nominal power of the machine: 1.300 kW

Cooling load at the expected external temperatures ($P_{cool,design}$): 975 kW

Seasonal Energy Performance Ratio (SEPR): 39,09

Activity time per year: 8760 hours

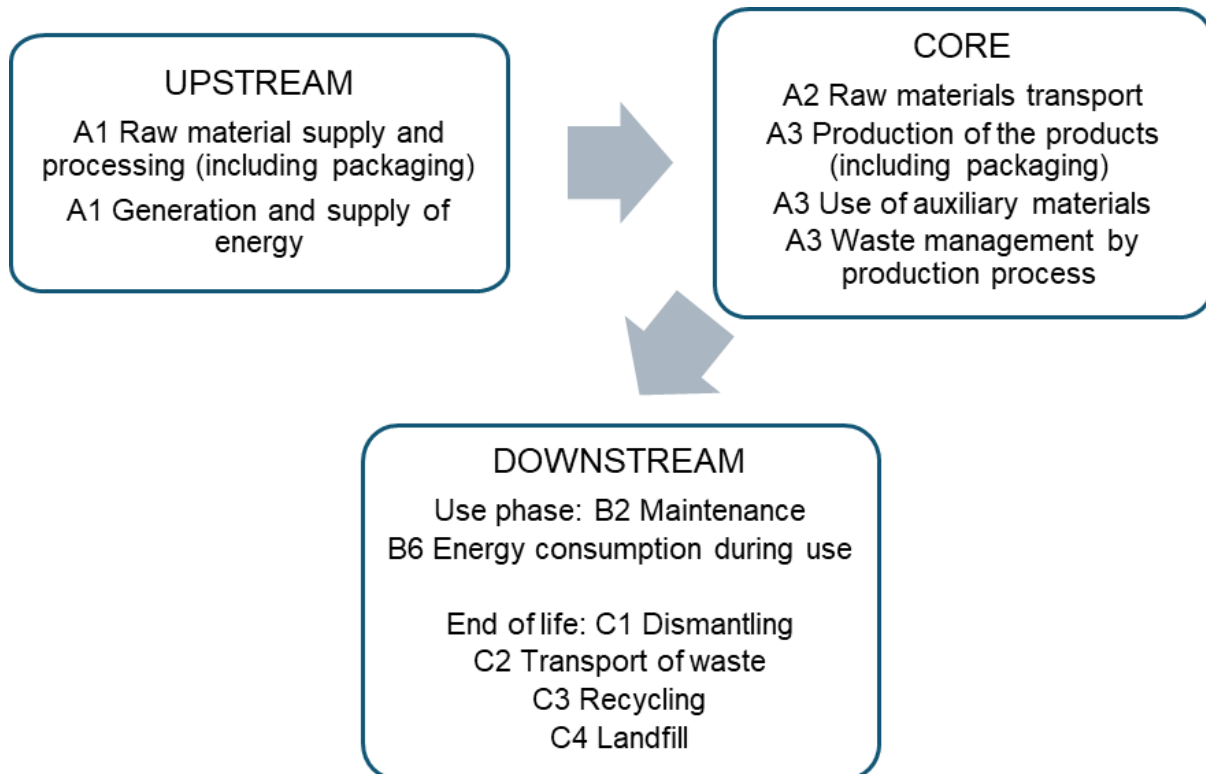
Yearly energy consumption in cooling mode ($E_{cooling}$): 218.477 kWh/year

Energy consumption during the use phase of 20 years (E_{use}): 4.369.534 kWh

Cooling mode: air to water

Number of generators and distribution unit considered: 10

System diagram:



Process description

The activity of the M12 plant in Alpago consists in the production of chillers in the power range between 300 and 1.500 kW and heat pumps up to 2.500 kW. The production of the assembly groups takes place on 3 lines. The assembly is divided into several work phases characterized by the use of different semi-finished products, which follow one another in the following order:

- base assembly;
- refrigeration system;
- component assembly;
- hydraulic system;
- structure assembly;
- electrical panel wiring;
- electrical system.

Before testing, the unit is checked with a blank test and an empty test. In the testing phase, carried out in dedicated cabins equipped with all the connections, the complete operation of the group is finally checked. There are 5 testing cabins in the plant. The production is concluded by a finishing phase with the completion of the units with the closing, cleaning and packaging panels. Since July 2018, a new area called “Testing Centre” has

been completed, dedicated to the research and development of new equipment in any type of environment. The new area has test cabins capable of recreating environments with temperature ranges from -20°C to $+60^{\circ}\text{C}$ and any type of humidity.

Allocation

Allocation for the use of electricity, methane, waste, internal transport and auxiliary materials was made based on the mass of a single refrigerator in relation to the total mass of goods produced in the calendar year 2023. A refrigerator has a mass of 12.540 kg, and the total production amounts to 6,51 million kg. Therefore, the impact of the above-mentioned processes was multiplied by $12.540/6.510.000 = 0,00193$.

Data quality

For generic data, the criteria of geographic and technological equivalence and equivalence with respect to system boundaries were considered throughout the analysis. Site-specific data refers to the year 2023.

Proxy data

The refrigerant gas (R1234ze) is not characterised in the method required by the regulation. The environmental impacts of the R134a gas were used as a proxy for direct emissions from refrigerant leaks, weighted in proportion to the difference in GWP between the two (GWP R1234ze = 1,37; GWP R134a = 1430). The GWP is the only characterised data relating to the refrigerant gas used in the product (R1234ze).

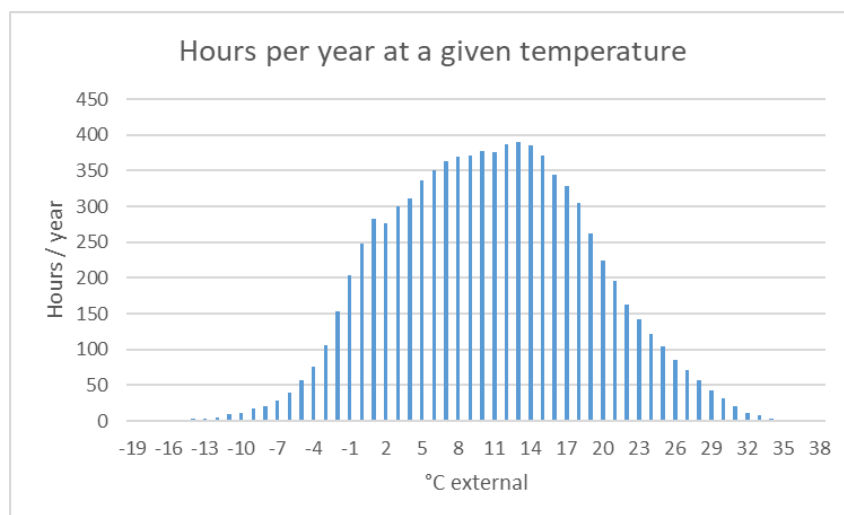
Electric energy modelling

Electric energy was modelled using the Italian residual mix for the production phases, and an average European mix, not residual, for the energy consumption during the use phases.

Use phase

Electricity consumption during the use phase was modelled based on a 2024 proposed scenario by Eurovent: SEPR for Very High Temperature Process Chillers (SEPR-VHT).

Use is considered constant at 75% of the nominal power, i.e. $0,75 * 1300 \text{ kW} = 975 \text{ kW}$. This value was proposed assuming that 4 chillers would work in parallel. This would ensure coverage in the event that one chiller was to malfunction, by increasing the power of the remaining 3 to 100%. Such value was then multiplied by the hours per year at each given temperature, represented in the figure below. This, divided by the energy efficiency ratio, results in the energy consumption for a given temperature bin. The sum of the energy consumption values at all the temperatures throughout a year gives the yearly energy consumption of the chiller, corresponding to 218.477 kWh. Over the RSL of 20 years, this value adds up to 4.369.534 kWh.



Module B2 – Maintenance was modelled to represent the maintenance suggested by the company for its customers, including production, shipment and installation of several spare parts, plus the disposal of the damaged ones.

Modules B1 (Use), B3 (Repair), B4 (Replacement), B5 (Refurbishment) and B7 (Operational water use) are declared as empty modules, since no additional consumption happens at these stages during the use phase of the analysed product.

End-of-life scenarios

For phase C1 - Deconstruction, electricity consumption was estimated using the same amount required for installation (primary data).

For phase C2 - Transport was modelled using the default scenario (as described in PEP-PCR-ed4-EN-2021 09 06), as no specific data was provided. A transport distance of 1,000 km to the disposal site was assumed, using transport means based on the Ecoinvent model for waste disposal in Europe.

In phase C3 - Waste treatment, all impacts related to waste recycling are presented. Recycling rates were taken from Table 7 of PEP-PCR-ed4-EN-2021 09 06 and applied accordingly. The same rates were used to model waste disposal in phase C4 - Disposal. Percentages are summarized in the table below.

MATERIAL	% Recycling (C3)	% Incineration (C3)	% Landfill (C4)
Steel	80	0	20
Cast Iron	80	0	20
Aluminium	70	0	30
Copper	60	0	40
Plastic	20	40	40
Electronics components	0	0	100
Refrigerant	0	0	100
Solid waste	0	0	100

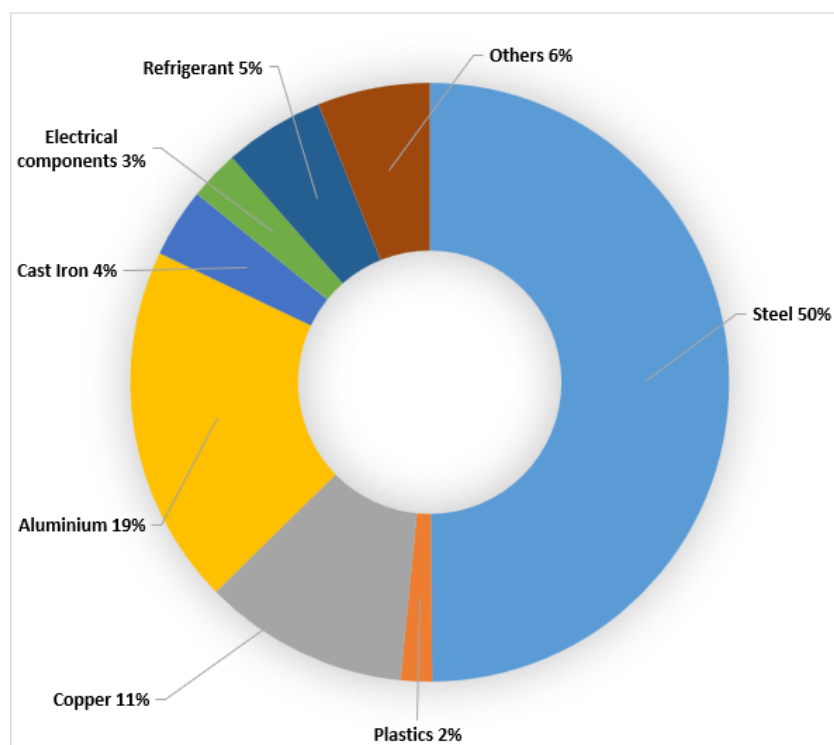
Life Cycle Inventory

Product composition

Product components	Weight per declared unit [ton]	Material, weight-%	Biogenic material, weight-%
Total	12,54	100,00	1,07
Structural parts	3,42	24,49	0
Compressors	0,39	3,09	0,36
Heat exchangers	1,84	17,49	0,21
Coils and fans	3,00	23,88	0
Piping	1,64	12,35	0
Electrical components	0,6	5,52	0
Electronics components	0,11	0,90	0
Pumps	0,71	5,62	0
Refrigerant	0,68	5,42	0
Packaging	0,05	0,37	0
Others	0,11	0,87	0,50

The product TR2-FC-G04-Z 1553 - TX2-FC-G04-Z 1553 is sold with recycled PE plastic packaging.

Subdivision by materials constituting the product



ENVIRONMENTAL PERFORMANCE INDICATORS

Mandatory environmental impact category indicators

Indicator	Unit	A1	A2	A3	A4	A5
GWP-total	kg CO ₂ eq.	7,85E+04	8,59E+02	1,85E+04	1,87E+03	2,81E+02
GWP-fossil	kg CO ₂ eq.	7,74E+04	8,57E+02	1,71E+04	1,86E+03	2,74E+02
GWP-biogenic	kg CO ₂ eq.	6,09E+02	7,00E-01	1,36E+03	1,56E+00	6,87E+00
GWP-luluc	kg CO ₂ eq.	4,60E+02	4,24E-01	3,97E+01	9,11E-01	4,79E-01
ODP	kg CFC 11 eq.	5,34E-01	1,87E-05	2,99E-04	4,09E-05	3,46E-06
AP	mol H ⁺ eq.	1,67E+03	4,48E+00	8,20E+01	8,70E+00	9,74E-01
EP-freshwater	kg P eq.	1,05E+02	6,11E-02	1,45E+01	1,34E-01	1,75E-01
EP-marine	kg N eq.	1,12E+02	1,69E+00	1,52E+01	3,45E+00	1,87E-01
EP-terrestrial	mol N eq.	1,47E+03	1,82E+01	1,33E+02	3,70E+01	1,58E+00
POCP	kg NMVOC eq.	4,59E+02	6,23E+00	4,33E+01	1,29E+01	5,08E-01
ADP-fossil*	MJ	9,15E+05	1,23E+04	3,73E+05	2,69E+04	4,39E+03
ADP-minerals&metals*	kg Sb eq.	1,90E+01	2,63E-03	3,50E-02	5,80E-03	3,78E-04
WDP*	m ³	3,62E+04	5,33E+01	3,26E+04	1,17E+02	4,55E+01

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

Indicator	Unit	B1	B2	B3	B4	B5	B6	B7
GWP-total	kg CO ₂ eq.	0,00E+00	9,45E+04	0,00E+00	0,00E+00	0,00E+00	1,61E+06	0,00E+00
GWP-fossil	kg CO ₂ eq.	0,00E+00	9,27E+04	0,00E+00	0,00E+00	0,00E+00	1,55E+06	0,00E+00
GWP-biogenic	kg CO ₂ eq.	0,00E+00	1,61E+03	0,00E+00	0,00E+00	0,00E+00	5,56E+04	0,00E+00
GWP-luluc	kg CO ₂ eq.	0,00E+00	2,20E+02	0,00E+00	0,00E+00	0,00E+00	3,86E+03	0,00E+00
ODP	kg CFC 11 eq.	0,00E+00	2,44E-03	0,00E+00	0,00E+00	0,00E+00	2,78E-02	0,00E+00
AP	mol H ⁺ eq.	0,00E+00	3,74E+03	0,00E+00	0,00E+00	0,00E+00	7,76E+03	0,00E+00
EP-freshwater	kg P eq.	0,00E+00	2,91E+02	0,00E+00	0,00E+00	0,00E+00	1,41E+03	0,00E+00
EP-marine	kg N eq.	0,00E+00	2,31E+02	0,00E+00	0,00E+00	0,00E+00	1,38E+03	0,00E+00
EP-terrestrial	mol N eq.	0,00E+00	2,93E+03	0,00E+00	0,00E+00	0,00E+00	1,22E+04	0,00E+00
POCP	kg NMVOC eq.	0,00E+00	8,85E+02	0,00E+00	0,00E+00	0,00E+00	3,92E+03	0,00E+00
ADP-fossil*	MJ	0,00E+00	1,16E+06	0,00E+00	0,00E+00	0,00E+00	3,54E+07	0,00E+00
ADP-minerals&metals*	kg Sb eq.	0,00E+00	5,26E+01	0,00E+00	0,00E+00	0,00E+00	3,04E+00	0,00E+00
WDP*	m ³	0,00E+00	6,40E+04	0,00E+00	0,00E+00	0,00E+00	3,66E+05	0,00E+00

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Indicator	Unit	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1,98E+02	1,40E+03	2,30E+02	2,26E+03	3,08E+04
GWP-fossil	kg CO ₂ eq.	1,91E+02	1,39E+03	2,27E+02	1,93E+03	3,04E+04
GWP-biogenic	kg CO ₂ eq.	6,87E+00	2,73E+00	2,54E+00	3,36E+02	1,35E+02
GWP-luluc	kg CO ₂ eq.	4,78E-01	8,79E-01	2,97E-02	5,25E-01	3,09E+02
ODP	kg CFC 11 eq.	3,43E-06	2,95E-05	9,06E-07	1,12E-04	5,92E-04
AP	mol H ⁺ eq.	9,59E-01	7,15E+00	1,35E-01	2,93E+00	8,04E+02
EP-freshwater	kg P eq.	1,74E-01	1,59E-01	9,62E-03	5,06E-01	4,29E+01
EP-marine	kg N eq.	1,70E-01	2,80E+00	5,28E-02	2,75E+00	4,76E+01
EP-terrestrial	mol N eq.	1,50E+00	3,00E+01	4,28E-01	7,66E+00	5,72E+02
POCP	kg NMVOC eq.	4,84E-01	1,01E+01	1,28E-01	2,77E+00	2,01E+02
ADP-fossil*	MJ	4,37E+03	2,02E+04	3,76E+02	9,31E+03	3,65E+05
ADP-minerals&metals*	kg Sb eq.	3,75E-04	4,29E-03	1,66E-04	2,35E-03	9,32E+00
WDP*	m ³	4,52E+01	1,01E+02	1,64E+01	2,51E+02	1,38E+04

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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.

Mandatory and voluntary additional impact category indicators

For additional environmental indicators, the GWP-GHG was considered for this study. This indicator takes into account all greenhouse gases, except absorption and emissions of biogenic carbon dioxide and biogenic carbon stored in the product. As such, the indicator is identical to the GWP-total, except that the carbon footprint (CF) for biogenic CO₂ is set to zero.

Indicator	Unit	A1	A2	A3	A4	A5
GWP-GHG	kg CO ₂ eq.	1,79E+04	7,66E+02	1,45E+03	1,70E+03	2,61E+01

Indicator	Unit	B1	B2	B3	B4	B5	B6	B7
GWP-GHG	kg CO ₂ eq.	0,00E+00	3,41E+04	0,00E+00	0,00E+00	0,00E+00	9,68E+04	0,00E+00

Indicator	Unit	C1	C2	C3	C4	D
GWP-GHG	kg CO ₂ eq.	1,20E+01	1,12E+03	1,31E+01	3,52E+03	1,12E+04

Resource use indicators

Indicator	Unit	A1	A2	A3	A4	A5
PERE	MJ	1,76E+05	1,05E+03	8,76E+04	2,29E+03	1,09E+03
PERM	MJ	8,98E+04	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,66E+05	1,05E+03	8,76E+04	2,29E+03	1,09E+03
PENRE	MJ	1,19E+05	2,76E+02	1,80E+05	6,10E+02	2,16E+03
PENRM	MJ	3,40E+02	0,00E+00	2,00E+03	0,00E+00	0,00E+00
PENRT	MJ	1,20E+05	2,76E+02	1,82E+05	6,10E+02	2,16E+03
SM	kg	3,90E+02	0,00E+00	4,37E+01	0,00E+00	0,00E+00
RSF	MJ	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
FW*	m ³	7,96E+05	1,21E+04	1,91E+05	2,63E+04	2,23E+03

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Indicator	Unit	B1	B2	B3	B4	B5	B6	B7
PERE	MJ	0,00E+00	2,80E+05	0,00E+00	0,00E+00	0,00E+00	8,16E+06	0,00E+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	0,00E+00	2,80E+05	0,00E+00	0,00E+00	0,00E+00	8,16E+06	0,00E+00
PENRE	MJ	0,00E+00	1,44E+05	0,00E+00	0,00E+00	0,00E+00	1,75E+07	0,00E+00
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	0,00E+00	1,44E+05	0,00E+00	0,00E+00	0,00E+00	1,75E+07	0,00E+00
SM	kg	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
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW*	m ³	0,00E+00	1,02E+06	0,00E+00	0,00E+00	0,00E+00	1,79E+07	0,00E+00

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Indicator	Unit	C1	C2	C3	C4	D
PERE	MJ	1,01E+03	1,95E+03	2,73E+02	2,46E+03	1,32E+05
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,01E+03	1,95E+03	2,73E+02	2,46E+03	1,32E+05
PENRE	MJ	2,16E+03	1,01E+03	9,11E+01	4,91E+02	4,74E+04
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,16E+03	1,01E+03	9,11E+01	4,91E+02	4,74E+04
SM	kg	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
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW*	m ³	2,21E+03	1,92E+04	2,85E+02	8,82E+03	3,18E+05

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

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 resources; 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 indicators

Indicator	Unit	A1	A2	A3	A4	A5
HWD	kg	1,43E+03	2,08E+00	1,05E+03	4,58E+00	4,06E+00
NHWD	kg	2,78E+00	4,10E-03	2,66E+00	9,04E-03	3,16E-02
RWD	kg	4,64E+01	7,74E-02	5,02E-01	1,69E-01	5,72E-03

Indicator	Unit	B1	B2	B3	B4	B5	B6	B7
HWD	kg	0,00E+00	1,93E+03	0,00E+00	0,00E+00	0,00E+00	2,80E+04	0,00E+00
NHWD	kg	0,00E+00	2,48E+00	0,00E+00	0,00E+00	0,00E+00	2,56E+02	0,00E+00
RWD	kg	0,00E+00	1,44E+01	0,00E+00	0,00E+00	0,00E+00	4,50E+01	0,00E+00

Indicator	Unit	C1	C2	C3	C4	D
HWD	kg	3,47E+00	4,37E+00	2,67E+00	7,98E+01	8,29E+02
NHWD	kg	3,16E-02	1,48E-02	1,41E-03	7,95E-03	7,56E-01
RWD	kg	5,56E-03	1,21E-01	1,05E-03	6,04E-02	1,63E+01

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

Output flow indicators

Indicator	Unit	A1	A2	A3	A4	A5
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	5,13E+02	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	5,13E+02	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Indicator	Unit	B1	B2	B3	B4	B5	B6	B7
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Indicator	Unit	C1	C2	C3	C4	D
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	7,96E+03	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	8,46E+01	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

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

Additional indicators

Indicator	Unit	A1	A2	A3	A4	A5
PM	disease inc.	6,92E-03	8,31E-05	3,10E-04	1,84E-04	3,54E-06
IRP*	kBq U235 eq.	7,17E+03	1,69E+01	1,04E+04	3,72E+01	1,23E+02
ETP-fw**	CTUe	1,65E+06	6,07E+03	7,67E+04	1,32E+04	5,82E+02
HTP-nc**	CTUh	1,99E-02	9,45E-06	3,59E-03	2,09E-05	1,82E-06
HTP-c**	CTUh	3,96E-04	4,60E-07	5,41E-06	1,00E-06	7,16E-08
SQP**	Pt	5,54E+05	9,11E+03	5,77E+04	2,02E+04	6,78E+02

Indicator	Unit	B1	B2	B3	B4	B5	B6	B7
PM	disease inc.	0,00E+00	1,11E-02	0,00E+00	0,00E+00	0,00E+00	2,62E-02	0,00E+00
IRP*	kBq U235 eq.	0,00E+00	9,73E+03	0,00E+00	0,00E+00	0,00E+00	9,96E+05	0,00E+00
ETP-fw**	CTUe	0,00E+00	4,72E+06	0,00E+00	0,00E+00	0,00E+00	4,42E+06	0,00E+00
HTP-nc**	CTUh	0,00E+00	5,04E-02	0,00E+00	0,00E+00	0,00E+00	1,34E-02	0,00E+00
HTP-c**	CTUh	0,00E+00	6,98E-04	0,00E+00	0,00E+00	0,00E+00	4,82E-04	0,00E+00
SQP**	Pt	0,00E+00	1,35E+06	0,00E+00	0,00E+00	0,00E+00	5,34E+06	0,00E+00

Indicator	Unit	C1	C2	C3	C4	D
PM	disease inc.	3,24E-06	1,34E-04	1,56E-06	3,96E-05	3,13E-03
IRP*	kBq U235 eq.	1,23E+02	5,93E+01	5,20E+00	3,05E+01	2,91E+03

ETP-fw**	CTUe	5,46E+02	9,72E+03	5,03E+02	3,57E+04	6,28E+05
HTP-nc**	CTUh	1,66E-06	1,52E-05	9,25E-07	8,97E-04	1,05E-02
HTP-c**	CTUh	5,95E-08	8,65E-07	3,89E-08	1,41E-05	2,12E-04
SQP**	Pt	6,61E+02	1,48E+04	1,93E+02	3,45E+03	2,57E+05

* *Disclaimer 1: 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.*

** *Disclaimer 2: The results of this environmental impact indicator should be used with caution, as the uncertainties of these results are high or experience with the indicator is limited.*

Acronyms. PM = Particulate Matter; IRP = Ionizing Radiation Potential - Human Health; ETP-fw = Ecotoxicity Potential, freshwater; HTP-nc = Human Toxicity Potential, non-cancer; HTP-c = Human Toxicity Potential, cancer; SQP = Soil Quality Potential.

Biogenic carbon

The product contains 134 kg of biogenic carbon, corresponding to 1,07% of the total weight. The packaging of the finished product does not contain any biogenic carbon.

REFERENCES

Regulation of the EPDIItaly Programme – rev. 6, issue date: 30-10-2023.

EPDIItaly 019-CORE PCR per HVAC home appliances, Rev. 2.

PEP-PCR–ed4-EN-2021 09 06.

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