

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 +A2



Owner of the declaration:
Lyngson, Sia

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-3296-1940-EN

Registration Number:
NEPD-3296-1940-EN

Issue date: 03.01.2022
Valid to: 03.01.2027

Product name:

Panel radiator type 22 size – h500
mm x L700 mm

Manufacturer:
Lyngson, Sia

General information

Product:

Panel radiator type 22 size - h500 mm x L700 mm

Program Operator:

The Norwegian EPD Foundation
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Declaration Number:

NEPD-3296-1940-EN

This declaration is based on Product

Category Rules:

CEN Standard EN 15804:2012+A2:2019 and
NPCR Part A Construction products and
services ver 2.

Statements:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit:

1 piece of Panel radiator type 22 size – h500 mm x L700mm, capable to produce 1 kW of heating as defined by the manufacturer.

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal external

Sign



Elisabet Amat

Independent verifier approved by EPD Norway

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Manufacturer:

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e-mail: info@lyngson.lv

Place of production:

Akaci, Olaines novadas, Olaines pagasts, Latvia

Management system:

ISO 9001, ISO 50001 and ISO 14001

Organisation no:

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Issue date:

03.01.2022

Valid to:

03.01.2027

Year of study:

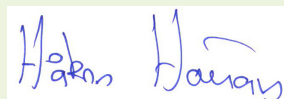
2021

Comparability:

EPDs from other programmes than EPD Norge may not be comparable.

The EPD has been worked out by:

Bureau Veritas Latvia



Approved (Manager of EPD Norway)

Product

Product description:

Panel heaters with compact module and side connection. These devices have a wide range of applications in closed environments, both in new construction and renovations. It has a lifespan of 50 years. The Panel radiator products are produced only in one plant.

Product specification:

The product composition is steel and paint.

Products materials	KG	%
Steel	19,5	98
Paint	0,414	2
TOTAL	19,914	100
Packaging materials	KG	%
Cardboard	0,35	56,45
PE	0,27	43,55
TOTAL	0,62	100

Technical data:

- Length – 700 mm, Width – 500 mm, Thickness – 102 mm;
- Weight 19,914 kg;
- Density 7,85 kg/dm³;
- Lifetime 50 years;
- Tensile strength 270 – 410 MPa;
- Water resistance for 100 h of humidity.

Market:

Nordic market

Reference service life, product:

50 years

LCA: Calculation rules

Declared unit:

1 piece of Panel radiator type 22 size – h500 mm x L700mm, capable to produce 1 kW of heating as defined by the manufacturer. For the static or mixed hot water radiator, the measurement of

this power is defined at ΔT 50 according to the EN 442 standard and with a reference lifetime of 50 years.

Data quality:

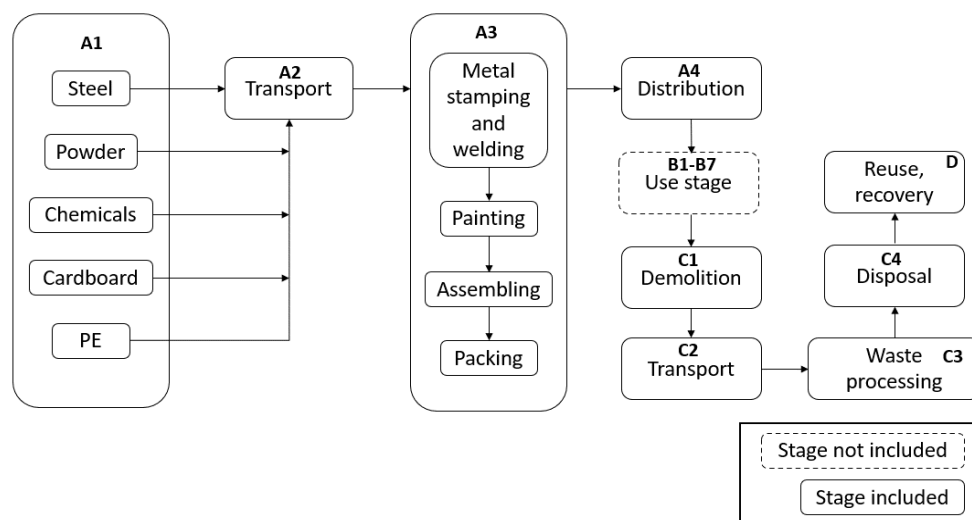
The production data are from 2020, the database data are from 2013 – 2021 i.e. no data is older than 10 years. Database used is mainly Ecoinvent 3.7.1. The LCA software used is SimaPro 9.2.

Allocation:

Heat, electricity and other energy use, and waste in production are calculated as a average weight per produced tonne of all products using yearly production data and rate for 2020. For manufacturing processes and raw materials the specific country mix of heat and electricity were considered. For secondary data on materials' flow information has been gathered from the Ecoinvent 3.7.1 database. In addition, the allocation is made following the provisions of PSR-0011-ed1.0-EN-2018 02 09. Incoming energy and water together with waste production in-house are allocated equally among all products through mass allocation. The recycling process and transportation of the material are allocated to this analysis.

System boundary:

LCA is made in “Cradle-to-gate with options, modules C1-C4 and module D”. All major materials, production energy use and waste are included for product stages A1, A2, A3, A4, C1, C2, C3, C4, and D. All life cycle impacts are included, see flowchart below. The following information describes the scenarios in the different modules of the EPD. It must be noted that, all major raw materials and all the essential energy are included.



Cut-off criteria:

Marginal production process for raw materials and energy flows with a cut-off of 1% not included in the Ecoinvent database are not considered. This cut-off rule does not apply for hazardous materials and substances and it is consistent with EN 15804+A2.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Product stage (A1, A2, A3)

- Raw material supply (A1)

The materials needed for the production of a Panel radiator type 22 size - h500 mm x L700 mm are: steel, lubricating oil, chemicals for washing (tetrachloroethylene), hydraulic gas, powder paint (polyester resin), cardboard and packaging film (PE). The cooling liquid used in the process has not been because of a quantity less than 1% in mass.

- Transport of raw materials (A2)

Steel is transported for a distance of 473 km, steel connection 2943 km, lubricating oil 30 km, hydraulic gas 30 km, powder paint 25 km, cardboard 300 km, PE 3 km, and chemicals (Gardobond H 7406, Gardobond A 4952, Gardobond H 7200L) 550 km.

- Manufacturing (A3)

This product stage includes welding, stamping, painting, assembling and packing of the final product. It includes energy consumption (electricity, natural gas), the consumption of raw materials such as water and some operations such as welding, as well as the waste and emissions produced within manufacturing stage.

Transport from production place to assembly/user (A4)

Transportation from Lyngson SIA production sites in Latvia to customers in Sweden, Norway, Finland and Estonia have been considered and described in the table below. Trips start with an initial transport of 30km from the production factory to the harbour of Riga from which they follow a sea route of 440 km to Sweden and then split according to different scenarios where products destined for Norway depart by road from Oslo with different distances 660 km, 1060 km and 1310 km. While for Finland the sea route is 400 km, instead for Estonia there is just road transport.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Sweden destination 1					
Truck	75%	Lorry, >32t, EURO6	200	0,0226 l/tkm	4,52
Boat	64%	Ferry	440	0,0299 l/tkm	13,156
Sweden destination 2					
Truck	75%	Lorry, >32t, EURO6	600	0,0226 l/tkm	13,56
Boat	64%	Ferry	440	0,0299 l/tkm	13,156
Sweden destination 3					
Truck	10%	Lorry, >32t, EURO6	850	0,0226 l/tkm	19,21
Boat	64%	Ferry	440	0,0299 l/tkm	13,156
Norway destination 1					
Truck	75%	Lorry, >32t, EURO6	660	0,0226 l/tkm	14,916
Boat	64%	Ferry	440	0,0299 l/tkm	13,156

Norway destination 2					
Truck	75%	Lorry, >32t, EURO6	1060	0,0226 l/tkm	23,956
Boat	64%	Ferry	440	0,0299 l/tkm	13,156
Norway destination 3					
Truck	15%	Lorry, >32t, EURO6	1310	0,0226 l/tkm	29,606
Boat	64%	Ferry	440	0,0299 l/tkm	13,156
Finland					
Truck	25%	Lorry, >32t, EURO6	100	0,0226 l/tkm	2,26
Boat	64%	Ferry	400	0,0299 l/tkm	11,96
Estonia					
Truck	25%	Lorry, >32t, EURO6	400	0,0226 l/tkm	9,04

End of Life (C1, C3, C4)

- Demolition (C1)

It is assumed that for the decommissioning of a radiator there are no particular operations and therefore in this step it is possible to exclude relevant impacts.

- Waste processing (C3)

It is assumed that there are no special procedures for preparing the radiator as a “waste”.

- Disposal (C4)

It is assumed the following scenario: for the cardboard (0,35 kg) the 74,2% is recycled, while the remaining quantity for 95% goes to an energy recovery through incineration and 5% is disposed of through landfill. PE (0,27 kg) is recycled for 37,5%, the remaining quantity follows the same end as for cardboard. The quantities divided by the different fractions are shown in the following table and for the recycling is included also the amount of steel from the radiator.

Type	Unit	Value
Hazardous waste disposed	Kg	0
Collected as mixed construction waste	Kg	0
Reuse	Kg	0
Recycling	Kg	19,861
Energy recovery	Kg	0,247
To landfill	Kg	0,013

Transport to waste processing (C2)

As suggested by PSR-0011-ed1.0-EN-2018 02 09 is assumed an average transport for a distance of 100 km by truck.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance KM	Fuel/Energy consumption	value (l/t)
Truck	36,5	Lorry, 16-32t, EURO5	100	0,0449 l/tkm	4,49

Benefits and loads beyond the system boundaries (D)

It is assumed that all the quantity of steel that form a Panel radiator size 22 - h500 mm x L700 mm is recovered and recycled. In addition, is recycled also the 74,2% of cardboard and the 37,5% of PE from the packaging materials.

Material	Unit	Value
Steel	kg	19,5
PE	kg	0,101
Cardboard	kg	0,2597

LCA: Results

System boundaries (X=included, MND= module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage								End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X	

Core environmental impact indicators

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	3,29 E+01	1,8 E+00	6,91 E+00	3,15 E+00	0	3,47 E-01	0	9,86 E-04	-3,69 E+01
GWP-fossil	kg CO2 eq.	3,30 E+01	1,8 E+00	5,91 E+00	3,14 E+00	0	3,46 E-01	0	9,83 E-04	-3,71 E+01
GWP-biogenic	kg CO2 eq.	-1,52 E-01	4,36 E-03	9,98 E-01	4,95 E-03	0	8,29 E-04	0	2,89 E-06	1,95 E-01
GWP-LULUC	kg CO2 eq.	1,34 E-02	6,16 E-04	8,57 E-03	1,24 E-03	0	1,17 E-04	0	9,68 E-08	-1,37 E-02
ODP	kg CFC11 eq.	2,05 E-06	4,08 E-07	1,35 E-06	7,30 E-07	0	7,86 E-08	0	1,35 E-10	-1,74 E-06
AP	mol H ⁺ eq.	1,25 E-01	5,00 E-03	3,92 E-02	3,89 E-02	0	1,39 E-03	0	6,57 E-05	-1,40 E-01
EP-freshwater	kg P eq.	1,38 E-02	1,23 E-04	1,17 E-02	1,77 E-04	0	2,33 E-05	0	9,34 E-08	-1,62 E-02
EP-marine	kg N eq.	3,07 E-02	1,04 E-03	6,57 E-03	9,56 E-03	0	4,25 E-04	0	3,13 E-05	-3,51 E-02
EP-terrestrial	mol N eq.	3,11 E-01	1,13 E-02	6,79 E-02	1,06 E-01	0	4,63 E-03	0	3,65 E-04	-3,55 E-01
POCP	kg NMVOC eq.	1,49 E-01	4,33 E-03	1,12 E-02	1,91 E-02	0	1,42 E-03	0	9,58 E-05	-1,72 E-01
ADP-M&M	kg Sb eq.	6,60 E-05	6,60 E-06	2,69 E-05	6,48 E-06	0	1,25 E-06	0	2,27 E-09	-4,96 E-05
ADP-fossil	MJ	3,52 E+02	2,72 E+01	1,39 E+02	4,78 E+01	0	5,24 E+00	0	1,54 E-02	-3,63 E+02
WDP	m ³	6,92 E+00	7,88 E-02	1,29 E-00	1,34 E-01	0	1,49 E-02	0	-3,58 E-03	-6,15 E+00

GWP-total: Global Warming Potential; **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; See “additional Norwegian requirements” for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional environmental impact indicators

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
PM	Disease inc.	2,20 E-06	1,14 E-07	4,66 E-07	2,18 E-07	0	2,40 E-08	0	5,18 E-10	-2,56 E-06
IRP	kBq U-235 eq	1,01 E+00	1,43 E-01	8,64 E-01	2,38 E-01	0	2,74 E-02	0	2,48 E-05	-9,98 E-01
ETP-fw	CTUe	7,78 E+02	2,09 E+01	5,17 E+01	3,45 E+01	0	4,00 E+00	0	4,06 E-03	-8,65 E+02
HTP-c	CTUh	1,70 E-07	7,43 E-10	2,57 E-08	1,43 E-09	0	1,43 E-10	0	6,70 E-11	-2,08 E-07
HTP-nc	CTUh	6,47 E-07	2,04 E-08	2,95 E-08	3,24 E-08	0	4,07 E-09	0	6,75 E-12	-7,19 E-07
SQP	Pt	1,47 E+02	1,90 E+01	3,93 E+01	4,22 E+01	0	3,61 E+00	0	3,59 E-03	-1,64 E+02

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Classification of disclaimers to the declaration of core and additional environmental impact indicators

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
ILCD type / level 3	Potential Human exposure efficiency relative to U235 (IRP)	1
	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
Potential Soil quality index (SQP)	2	
<p>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.</p>		
<p>Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator</p>		

Resource use

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
RPEE	MJ	7,63 E+00	2,71 E-01	3,02 E+01	3,75 E-01	0	5,14 E-02	0	1,21 E-04	-7,74 E+00
RPEM	MJ	7,64 E+00	1,01 E-01	9,33 E+00	1,31 E-01	0	1,92 E-02	0	3,82 E-05	-6,66 E+00
TPE	MJ	1,53 E+01	3,72 E-01	3,95 E+01	5,05 E-01	0	7,06 E-02	0	1,59 E-04	-1,44 E+01
NRPE	MJ	3,52 E+02	2,72 E+01	1,40 E+02	4,78 E+01	0	5,24 E+00	0	1,54 E-02	-3,63 E+02
NRPM	MJ	7,14 E-03	5,70 E-04	7,69 E-04	1,32 E-03	0	1,08 E-04	0	2,82 E-08	-7,03 E-03
TRPE	MJ	3,52 E+02	2,72 E+01	1,40 E+02	4,78 E+01	0	5,24 E+00	0	1,54 E-02	-3,63 E+02
SM	kg	3,8 E+00	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
W	m ³	1,75 E-01	2,78 E-03	6,18 E-02	4,32 E-03	0	5,26 E-04	0	1,02 E-04	-1,56 E-01

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

End of life – Waste

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
HW	kg	2,47 E-03	7,11 E-05	1,06 E-05	9,59 E-05	0	1,36 E-05	0	2,12 E-08	-3,02 E-03
NHW	kg	5,71 E+00	1,33 E+00	4,45 E-01	3,10 E+00	0	2,51 E-01	0	1,28 E-02	-6,80 E+00
RW	kg	5,74 E-04	1,86 E-04	4,20 E-04	3,30 E-04	0	3,59 E-05	0	1,54 E-08	-6,17 E-04

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

End of life – output flow

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
CR	kg	0	0	0	0	0	0	0	0	0
MR	kg	0	0	1,23 E+00	0	0	0	0	3,61 E-01	1,95 E+01
MER	kg	0	0	0	0	0	0	0	2,47 E-01	0
EEE	MJ	0	0	0	0	0	0	0	3,43 E-01	0
ETE	MJ	0	0	0	0	0	0	0	6,37 E-01	0

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: $9,0 \text{ E-}03 = 9,0 \cdot 10^{-3} = 0,009$

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	0,024

Additional Norwegian requirements

Greenhouse gas emission from the use of electricity in the manufacturing phase National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process(A3).

National electricity grid	Unit	Value
Latvian electricity grid (from Ecoinvent 3.7.1.)	kg CO2 -eq/kWh	0,416

Additional environmental impact indicators required in NPCR Part A for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator for GWP has been sub-divided into the following:

GWP-IOBC Climate impacts calculated according to the principle of instantaneous oxidation
GWP-BC Climate impacts from the net uptake and emission of biogenic carbon from each module.

In addition, EP-freshwater shall also be declared as PO4 eq.

Indicator	Unit	A1	A2	A3	A4	C1	C2	C3	C4	D
EP-freshwater*	kg PO4 eq.	5,00 E-03	1,63 E-04	3,28 E-02	2,78 E-04	0	3,12 E-05	0	2,24 E-08	-5,23 E-03
GWP-IOBC	kg CO2 eq.	3,31E+01	1,80E+00	5,91E+00	3,15E+00	0	3,46E-01	0	9,83E-04	-3,71E+01
GWP-BC	kg CO2 eq.	-1,52 E-01	4,36 E-03	9,98 E-01	4,95 E-03	0	8,29 E-04	0	2,89 E-06	1,95 E-01
GWP	kg CO2 eq.	3,29 E+01	1,8 E+00	6,91 E+00	3,15 E+00	0	3,47 E-01	0	9,86 E-04	-3,69 E+01

EP-freshwater* Eutrophication potential, fraction of nutrients reaching freshwater end compartment. Declared as PO4 eq. **GWP-IOBC** Global warming potential calculated according to the principle of instantaneous oxidation. **GWP-BC** Global warming potential from net uptake and emissions of biogenic carbon from the materials in each module. **GWP** Global warming potential

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- The product contains substances given by the REACH Candidate list or the Norwegian priority list that are less than 0,1 % by weight.
- The product contains dangerous substances, more than 0,1% by weight, given by the REACH Candidate List or the Norwegian Priority list, see table.
- The product contains no substances given by the REACH Candidate list or the Norwegian priority list. The product is classified as hazardous waste (Avfallsforskriften, Annex III), see table.

Indoor environment




The product meets the requirements for low emissions.

Carbon footprint

Carbon footprint has not been worked out for the product.

Bibliography

ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
PEP-PCR-ed3-EN-2015 04 02.	Product Category Rules for Electrical, Electronic and HVAC-R Products
PSR-0011-ed1.0-EN-2018 02 09.	Specific rules for hot water radiators or towel radiators
EN 442-1:2014	Radiators and convectors – Part 1. Technical specifications and requirements
EN 442-2:2014	Radiators and convectors Test methods and rating
EN 13501 – 1	Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests
ISO 14040:2006	Environmental management – Life cycle assessment – Principles and framework
ISO 14044:2006	Environmental management – Life cycle assessment – Requirements and guidelines
UNI EN ISO 9001:2015	Quality management systems — Requirements
UNI EN ISO 14001:2015	Environmental management systems — Requirements with guidance for use
ISO 50001:2018	Energy management systems — Requirements with guidance for use
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EPD for the best environmental decision



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