Programme: The International EPD® System, www.environdec.com
Programme Operator: EPD International AB
S-P Code: S-P-10649
Date of Publication: 2024-01-11
Date of Validity: 2029-01-10
Geographical Scope: Türkiye

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO14025 and EN15804+A2:2019/AC:2021 for

Type 22 Standard Panel Radiator

Manufactured by ELBA Basınçlı Döküm Sanayii A.Ş

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

EPD® THE INTERNATIONAL EPD® SYSTEM

TÜRKİYE EPD® THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

elba

Programme Information

The International EPD® System: EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden, info@environdec.com

EPD Türkiye www.epdturkey.org info@epdturkey.org managed and run by SÜRATAM www.suratam.org Nef 09 B Blok No:7/15 34415 Kagıthane/Istanbul, Türkiye

ISO standard ISO 21930:2017 and CEN standard EN 15804 serves as the core Product Category Rules (PCR) Product Category Rules (PCR): 2019:14 Version 1.3.2, Construction Products and Construction Services, EN 15804:2012 + A2:2019 Sustainability of Construction Works

PCR review was conducted by: The Technical Committee of the International EPD® System.

Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.

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

EPD verification by individual verifier

Third party verifier: Prof. Ing. Vladimír Kočí, Ph.D., MBA LCA Studio Šárecká 5,16000 Prague 6 - Czech Republic

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:
Yes No x

Life Cycle Assessment (LCA)

LCA accountability: Metsims Sustainability Consulting

EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison.

ELBA Basınçlı Döküm Sanayi A.Ş. has the sole ownership, liability, and responsibility for the EPD.

How to read this EPD?

An Environmental Product Declaration (EPD) is an ISO Type III Environmental Declaration based on ISO 14025 standard. An EPD transparently reports the environmental performance of products or services from a lifecycle perspective. The preparation of an EPD includes different stages, from acquiring raw materials to the end of life of the final product/service. EPDs are based on international standards and consider the entire value chain. Additionally, EPD is a third-party verified document. This EPD includes several sections described below.

1. General and Program Information

The first part of an EPD has information about the name of the manufacturer and product/service and other general information such as the validity and expiration dates of the document, the name of the program operator, geographical scope, etc. The second page states the standards followed and gives information about the program operator, third-party verifier, etc. The followed Product Category Rule (PCR) is indicated on the second page.

2. Company and Product/Service Information

Information about the company and the investigated product is given in this section. It summarizes the characteristics of the product provided by the manufacturer. It also includes information about the product such as product composition and packaging.

3. LCA Information

LCA information is one of the most important parts of the EPD as it describes the functional/declared unit, time representativeness of the study, database(s) and LCA software, along with system boundaries. The table presented in this part has columns for each stage in the life cycle. The considered stages are marked 'X' whereas the ones that are not considered are labeled as 'NR'. Not all EPDs consider the full life cycle assessment for a product's entire life stages. The 'System Boundary' page is also the place where one can find detailed information about the stages and the assumptions made.

4. LCA Results

The results of the Life Cycle Assessment analysis are presented in table format. The first column in each table indicates the name of the impact category and their measurement units are presented in the second column. These tables show an amount at each life cycle stage to see the impact of different indicators on different stages. Each impact can be understood as what is released through the production of the declared unit of the material—in this case, 1 piece of Panel radiator type 22 size – h600 mm x L100mm, capable to produce 1 kW of heating as defined by the manufacturer. The benefits of reuse/ recycling of the declared productare reflected in this section. The benefits of reuse/recycling of the declared product are reflected in this section.

The first impact in the table is global warming potential (GWP), which shows how much CO_2 is released at each stage. Other impacts include eutrophication potential, acidification potential, ozone layer depletion, land use related impacts, etc. The second table provides results for resource use and the third table is about the waste produced during production. The fourth and final table shows the results for the GWP-GHG indicator, which is almost equivalent to the GWP-Total indicator mentioned previously. The only difference is that this indicator excludes the biogenic carbon content by following a certain methodology.

About ELBA Basınçlı Döküm Sanayi A.Ş

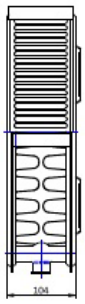
Established in İstanbul-Maltepe in 1969, ELBA started its operations with production of alloy aluminium pressure die casting and casting, which are demanded by the automotive industry. Having also included pressure die casting aluminium radiator and alloy aluminium rim in its production, the company started panel radiator production with E.C.A. branded semi-automatic welding lines in 1st section of Manisa Organized Industrial Zone in 1990 due to reasons such as increase of construction of collective housing, cheapness, ease of assembly, use and cleaning and aesthetics. Having its technology renewed by as of 2001, ELBA deactivated its old lines and commissioned its fully automatic and advanced technology 1st Welding Line with a capacity of 550.000 running meters; later it shifted to production of new design panel radiator which has higher thermal efficiency and more esthetical appearance. 2nd Welding Line with a capacity of 612.000 running meters was also commissioned in 2003 in line with increasing demands and production capacity was increased up to 1.224.000 running meters/year.

With the investment of the 3rd Welding Line with a capacity of 1.224.000 running meters commissioned in a new factory site in 3rd Section of Manisa Organized Industrial Zone in 2005, annual capacity was increased up to 2.448.000 running meters/year. Over the years, ELBA constantly self-renewing and invested 4. Production line in 2013 and the first one in Türkiye mega line is 5. Production line in 2017, that taking Turkey's biggest commissioned has succeeded to reach the capacity of the board. The installed capacity of ELBA Inc. , which has 5 fully automatic production lines, is 5,2 million meter. ELBA Inc. uses the installed capacity with full efficiency. E.C.A panel radiator products are produced in the factory, whose settlement was expanded with the purchase of new land.

ELBA is one of the leading companies in panel radiator production with its advanced technology factories settled on a closed area of 49.774 m^2 and a total area of 83.000 m^2 in two different factory. Within the next 10 years, ELBA aims to become a much more important producer in the world panel radiator sector with investments to be made at home and abroad.

High thermal capacity product, which is produced without compromising on quality, fast and solution oriented reactions given to customer demands, constant product renewal potential with the importance given to R&D, strong service network reaching every point in the whole world where its customers are located, compliance with all legal legislations and regulations, and transparent production and sharing management mentality make ELBA different from other companies in its sector.

About Type 22 Standard Panel Radiator



HEIGHT	ΔT 30°C		ΔT 50°C		ΔT 60°C		n	K_M
	Watt/m	Kcal/hm	Watt/m	Kcal/hm	Watt/m	Kcal/hm		
300	300	438	966	831	1214	1043	1.25122	7.23082
400	400	561	1242	1068	1563	1344	1.25976	8.99494
500	500	678	1507	1295	1899	1633	1.26830	10.54957
550	550	734	1635	1406	2062	1773	1.27257	11.25665
600	600	788	1760	1514	2222	1910	1.7684	11.92048
700	700	895	2005	1723	2532	2177	1.28178	13.31395
800	800	998	2240	1926	2832	2435	1.28671	14.59373
900	900	1097	2467	2121	3123	2685	1.29165	15.76764

Panel radiators are convection heat exchanger products and convectors are the most important structural element on the product. Convectors transfer the heat energy received from the panel surface to the air and heat the environment. E.C.A branded panel radiators are manufactured in accordance with EN 442 product standards using DC01 Quality Sheet. Our radiators have high heat efficiency power with superior design. All components and packaging materials used in our products consist of recyclable raw materials. Our radiators are coated with environmentally friendly Nanoceramic chemicals before the paint process to increase corrosion resistance. UN CPC code of the product is 44823.

Product Composition	% (by weight)
Steel	99
Paint	1

Packaging	% (by weight)
Plastics	79
Cardboard	21

System Boundaries & Description

A1 – Raw Material Supply

Raw material supply stage includes raw material extraction and pre-treatment processes before the production. The materials needed for the production of a Panel radiator Type 22 are: steel, primer paint, powder paint, plastics, cardboard and packaging film (PE). The cooling liquid used in the process has not been because of a quantity less than 1% in mass.

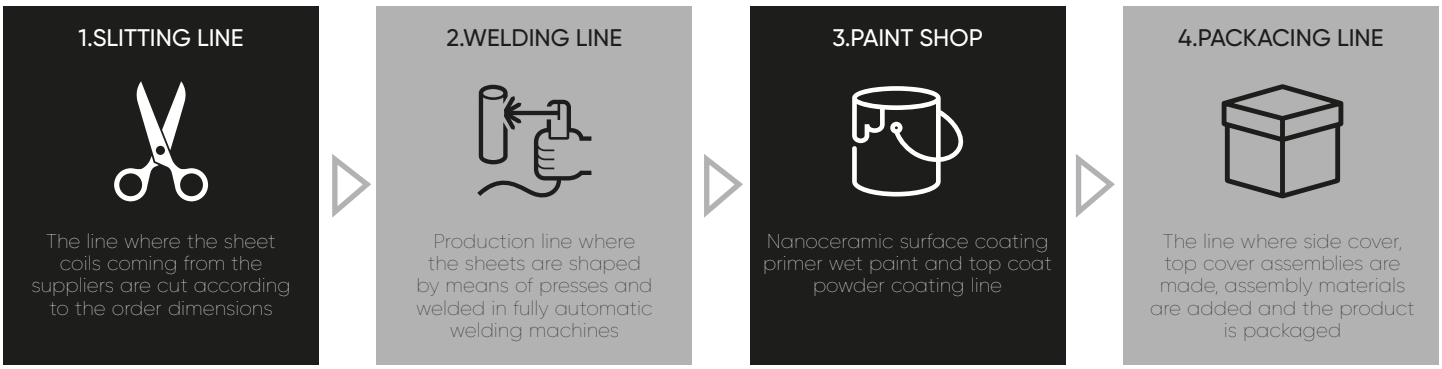
A2 – Transport

Transport is relevant for delivery of raw materials and packaging materials to the plant and transport of materials within the plant. The transport distances and routes are calculated based on the given information from the manufacturer for 2022.

A3 – Manufacturing

The supplied coil rolls are precision-cut according to the specified dimensions in the sheet metal slitting line, preparing them for the subsequent production phases. The panel sheets undergo meticulous formation using advanced presses, and their integration is facilitated through spot welds. The interconnected sheets are welded in both transverse and longitudinal sections, ensuring impeccable sealing. Fittings for water inlet and plumbing connections are welded into their designated positions. The product attains its final configuration through the welding of wall hanger brackets and support sheets. All products go through a comprehensive pressurization process utilizing 13-bar air, followed by a stringent 100% tightness test. All manufacturing operations are executed on state-of-the-art fully automatic welding machines.

Subsequent to the welding process, the colouring phase is executed through the application of a nano-ceramic surface coating, wet primer, and powder coating. After the dyeing process, the top and side covers of the products, upon reaching the packaging line, are methodically assembled. They are then enveloped with bubble wrap and shrink nylon, respectively, before being arranged on sturdy wooden pallets. The finished products are catalogued within warehouse stocks and dispatched to customers in adherence to the predetermined shipment plan.



A4 – Transport

Transport of final product to customers are considered and the routes and distances are calculated accordingly. Transport routes were provided by the manufacturer for 2022.

A5 – Construction & Installation

It is assumed that the assembly of the product is carried out without the use of machinery. Thus, the effect of the A5 stage is assumed to be zero.

C1 – Deconstruction/Demolition

It is assumed that manual removal of the product is sufficient. Thus, the effect of C1 stage is assumed to be zero.

C2 – Waste Transport

This step includes the transport of materials after their use phase. The average distance was assumed 50 km from demolition site to a waste processing area.

C3 – Waste Processing

It is assumed that the plastic content in the product will be incinerated and disposed of.

C4 – Disposal

Based on the figures of Word Steel Association (WSA), the recycling rate of steel isaround 95%. Based on this, 95% of the steel is assumed to be recycled.

D – Benefits

Approximately 83% of the steel profile product consists of primary steel. Therefore, pig iron benefit of 83% of the product weight is accepted.

LCA Information

Declared Unit: 1 piece of Panel radiator type 22 size – h600 mm x L100mm, capable to produce 1 kW of heating as defined by the manufacturer. (1 piece of panel radiator type 22 = 30,54 kg)
Time Representativeness: 2022
Database(s) and LCA Software: Ecoinvent 3.9.1 and SimaPro 9.5
System Boundaries: Cradle to gate with options, modules C1–C4, with optional module (A4).

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x
Geography	GLO	GLO	TR	GLO	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific data used	>90%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	0%				-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%				-	-	-	-	-	-	-	-	-	-	-	-	-

The system boundaries in tabular form for all modules are shown in the table above. The results of the LCA with the indicators as per EPD requirement are given in the following tables for product stage (A1 - A3), construction process (A4. A5), use stage (B1 - B7). and end of life (C1 - C4). Life Cycle Inventory Analysis indicators describing the use of resources are determined respectively to the following impact categories. calculated using CML-IA Baseline (Ver. 3.5) method: Global Warming Potential (GWP) for time span of 100 years, Ozone Layer Depletion Potential (ODP) with time span of infinity, Formation Potential of Tropospheric Ozone Photochemical Oxidants (POCP) with time span of 5 days, Acidification Potential (AP) with time span of eternity. Eutrophication Potential (EP) with time span of eternity, Photochemical Oxidation (POCP) and Abiotic Depletion Potential for Fossil (ADPF) and Non-fossil (ADPE) resources. All energy calculations were done using Cumulative Energy Demand (LHV) methodology. The freshwater use value for manufacturing life cycle was taken from the manufacturer as the net freshwater consumption occurs during the manufacturing stage only.

Allocations

Water consumption, energy consumption and raw material transportation were weighted according to 2022 production figures. In addition, hazardous and non-hazardous waste amounts were also allocated from the 2022 total waste generation.

Cut-Off Criteria

1% cut-off is applied. Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included.

REACH Regulation

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

LCA Modelling, Calculation and Data Quality

The results of the LCA with the indicators as per EPD requirement are given in the LCA result tables. EN15804 method is followed. All energy calculations were obtained using Cumulative Energy Demand, Low Heating Values (LHV) methodology, while freshwater use is calculated within selected inventory flows in SimaPro according to the PCR. Corresponding regional regional energy datasets were used for all energy related activities.

LCA Results

Impact Category	Unit	A1-3	A4	A5	C1	C2	C3	C4	D
GWP - Fossil	kg CO2 eq	42.4	1.56	39.7E-3	0	90.1E-3	58.6E-3	0	-18.2
GWP - Biogenic	kg CO2 eq	19.8E-3	495E-6	41.8E-3	0	29.1E-6	446E-9	0	-3.44E-3
GWP - Luluc	kg CO2 eq	170E-3	788E-6	5.28E-6	0	42.4E-6	159E-9	0	-4.59E-3
GWP - Total	kg CO2 eq	42.6	1.57	81.5E-3	0	90.2E-3	59E-3	0	-18.2
ODP	kg CFC-11 eq	744E-9	33.5E-9	116E-12	0	1.97E-9	14.8E-12	0	-438E-9
AP	mol H+ eq	208E-3	7.81E-3	48.6E-6	0	303E-6	7.56E-6	0	-68.1E-3
EP - Freshwater	kg P eq	20,9E-3	108E-6	1.02E-6	0	6.41E-6	73.6E-9	0	-7.40E-3
EP - Marine	kg N eq	45.3E-3	2.36E-3	434E-6	0	105E-6	3.84E-6	0	-16.4E-3
EP - Terrestrial	mol N eq	456E-3	25.3E-3	152E-6	0	1.11E-3	39.2E-6	0	-173-3
POCP	kg NMVOC	195E-3	9.67E-3	106E-6	0	472E-6	9.72E-6	0	-97E-3
**ADPE	kg Sb eq	220E-6	4.05E-6	14.2E-9	0	243E-9	1.17E-9	0	-9.3E-6
**ADPF	MJ	481E+0	22.6	112E-3	0	1.32	5.39E-3	0	-191
**WDP	m3 depriv.	10.4E+0	105E-3	4.42E-3	0	6.30E-3	84.9E-6	0	-940E-3
PM	disease inc.	3.15E-6	150E-9	778E-12	0	9.11E-9	34.0E-12	0	-1.27E-6
*IR	kBq U-235 eq	1.98	27.6E-3	255E-6	0	1.66E-3	6.17E-6	0	-234E-3
**HTP - C	CTUh	316E-9	683E-12	3.81E-12	0	39.0E-12	2.04E-12	0	-101E-9
**HTP - NC	CTUh	718E-9	15.7E-9	365E-12	0	947E-12	89.0E-12	0	-68.4E-9
**SQP	Pt	135	21,7	232E-3	0	1,34	1.47E-3	0	-35.8

Acronyms	*GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.*
Acronyms	*A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Installation, C1: Deconstruction / Demolition, C2: Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.*
*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 shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*

Biogenic carbon content in product (kg C)	0
Biogenic carbon content in packaging (kg C)	0,011

Resource use	Unit	A1-3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	48.9	323E-3	3.32E-3	0	19.3E-3	126E-6	0	-3.88
PERM	MJ	0	0	0	0	0	0	0	0
PERT	MJ	48.9	323E-3	3.32E-3	0	19.3E-3	126E-6	0	-3.88
PENRE	MJ	481	22.6	112E-3	0	1.32	5.39E-3	0	-191
PENRM	MJ	0	0	0	0	0	0	0	0
PENRT	MJ	481	22.6	112E-3	0	1.32	5.39E-3	0	-191
SM	kg	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m^3	406E-3	4.36E-3	115E-6	0	262E-6	13.9E-6	0	-63.4E-3

Acronyms

PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water.

Waste & Output Flows	Unit	A1-3	A4	A5	C1	C2	C3	C4	D
HWD	kg	0.130	0	0	0	0	0	0	0
NHWD	kg	2.65	0	0	0	0	0	0	0
RWD	kg	0	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	0	0	0	0	0	0	0

Acronyms

HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy thermal.

Climate Impact	Unit	A1-3	A4	A5	C1	C2	C3	C4	D
*GWP-GHG	kg CO2 eq	42.7	1.57	168E-3	0	90.3E-3	58.5E-3	0	-18.2

GWP-GHG = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology
** The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013*

Legend

A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Installation, C1: Deconstruction / Demolition, C2: Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.

References

ISO 9001:2015/ Quality Management Systems

ISO 50001:2018/ Energy Management Systems

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

ISO 14020:2000/ Environmental Labels and Declarations — General principles

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

ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

ISO 14040/44/ DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)

PCR for Construction Products and Construction Services/ Prepared by IVL Swedish Environmental Research Institute, Swedish environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, 2019:14 Version 1.3.2 DATE 2023-12-08

The International EPD® System/ The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

SimaPro/ SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

https://www.elba.com.tr/

Contact Information

Programme and Programme Operator

EPD International AB Box 210 60
SE-100 31 Stockholm, Sweden

www.environdec.com
info@environdec.com

EPD® THE INTERNATIONAL EPD® SYSTEM

EPD registered through fully aligned
regional programme: EPD Türkiye
www.epdturkey.org
info@epdturkey.org
SÜRATAM A.Ş. Nef 09 B Blok No:7/15,
34415 Kağıthane / İstanbul
www.suratam.org

TÜRKİYE EPD® THE INTERNATIONAL EPD® SYSTEM

Declaration Owner

Organize Sanayi Bölgesi, III. Kısım
Mustafa Çapra Caddesi No:8
MANİSA

T: (+90) 236 - 233 06 00
F: (+90) 236 - 233 06 02

www.elba.com.tr
info@elba.com.tr

LCA Practitioner & EPD Designer

The United Kingdom: 4 Clear Water Place Oxford OX2 7NL, UK 0 800 722 0185

www.metsims.com
info@metims.com

3rd Party Verifier

LCA Studio Šárecká 5,16000
Prague 6 - Czech Republic

www.lcastudio.cz

elba