

# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006 and EN 15804:2012+A2:2019

## Steel Pipes and Profiles



# ÖZDEMİR BORU PROFİL SAN. VE TİC. AŞ



Programme:  
The International  
EPD® System

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THE INTERNATIONAL EPD® SYSTEM

 **EPD**®  
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ENVIRONMENTAL PRODUCT DECLARATIONS



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](http://www.environdec.com).

# Programme Information

ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)

Product Category Rules (PCR):

2019:14 Version 1.11, 2021-02-05, Construction Products and CPC 4128 Construction Services, EN 15804:2012 + A2:2019 Sustainability of Construction Works

PCR review was conducted by:

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

EPD process certification

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Procedure for follow-up of data during EPD validity involves third party verifier:

Yes      No

*The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.*

# How to Read This EPD?

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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 'ND' (Not Relevant). 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, 1000 kg of steel pipes and profiles. The benefits of reuse/recycling of the declared product is also reflected in this section.

The first impact in the table is global warming potential (GWP), which shows how much CO<sub>2</sub> 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 the 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 COMPANY

Özdemir Boru Inc., located in Ereğli of Zonguldak province, in Turkey, supplies its products domestically and to respectable foreign markets including Belgium, Holland, England, Spain, Greece, Italy, Germany in Europe, North America, Middle East and Africa through the Ereğli port facilities. Özdemir Boru has an annual production capacity of 345.000 tons, spread through its two locations spanning 36.000 m<sup>2</sup> covered and 110.000 m<sup>2</sup> open, 146.000 m<sup>2</sup> of total area. With its highly experienced and well-trained staff, it is one of the leading companies in Turkey in its field.

Özdemir Boru is certified with ISO 9001-2015, ISO 14001-2015, ISO 45001-2018 and manufactures its products in European Standards EN 10219-1, EN 10305-3/5, EN 10210-1. Our tubes and hollow sections are used in a lot of industries including white goods manufacturing, furniture making, automotive, and construction.



## About the Product

The products investigated in this EPD are the steel pipes and profiles manufactured by Özdemir Boru ve Profil San. Tic. A.Ş at the company's two plants that are both located in Zonguldak province of Türkiye. The one and only raw material used for the production is flat steel.

The amount of steel used for the production of 1 ton of final product changes during the production of different thicknesses due to the waste rate. Both pipes and profiles manufactures between the meat thickness range of 0.60 mm to 12.50 mm. When the smallest and largest diameters are considered for both products, the environmental performance for all the main indicators do not change more than 10 %. Additionally, the production methods and energy requirements are all the same for the two plants.

ÖZDEMİR PIPE was established at the beginning of 1980's and has an important experience in steel pipe and profile production for more than 35 years.

It can produce square and rectangular profiles with outer pipe diameters from 6 mm to 355.6 mm and dimensions from 10x10 to 300x300/200x400. It manufactures hot and cold rolled materials in a wide range of pipe / profile products with a meat thickness of 0.60 mm to a thickness of 12.50 mm. The products have a wide range of sizes and shapes, including round pipe, square and rectangular profile, specially shaped (oval, ellipse, D) profiles, open (U and Omega) profiles.



Product properties and composition:

Meat thickness (mm)	0,60- 12,50
Outer diameter (mm)	6- 355,6
Flat Steel (%)	100

## Steel Pipes

### Production Standard:

Meat thickness of 2.00 mm and above are produced according to EN 10219 and EN 10217-1 standards. Meat thickness 2.00 mm and thinner pipes are produced according to EN10305-3 standard.

### EN 10219- Steel Quality:

S235JRH, S275J0H, S275J2H, S355J0H, S355J2H, S355K2H, S275NH, S275MH, S355NH, S355MH, S420MH, S460NH, S460M.

## PROFILES

Product properties and composition:

Meat thickness(mm):	0,60- 12,50
Flat Steel (%)	100



## PACKAGING

The plastic (Nylon 6-6) and wood-based materials are used for the packaging of the investigated products. Their effects are included in the analysis.

### Production Standard:

Meat thickness 2.00 mm and above are produced according to EN 10219 and equivalent ASTM A500 & TS 5317 & BS 6363 standards. Meat thickness 2.00 mm and thinner profiles are produced according to EN10305-5 standard.

EN 10219- Steel Quality:

S235JRH, S275J0H, S275J2H, S355J0H, S355J2H, S355K2H, S275NH, S275MH, S355NH, S355MH, S420MH, S460NH, S460MH.

## MANUFACTURING

The production starts with slitting of the raw material, flat steel. After the slitting, they are fed to the pipe forming machine, which is a form of cold rolling in which steel sheet is formed into a pipe and then its final shape is given with the help of the rollers. Post-production processes might include deburring and cleaning the faces if the final shape is round.

### 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).

# System Boundaries and Description



## A1 - RAW MATERIAL SUPPLY

This stage includes raw material/s extraction and pre-treatments before its use in manufacturing. There is only one material used for the production; flat steel. The steel used for the manufacturing is primary steel mainly supplied from local producers and partially from Ukraine and Russia.



## A2 - TRANSPORT

Transport information of the raw materials are provided by the manufacturer. The distances and routes are calculated accordingly. According to the manufacturer, locally supplied steel is transported via trucks and other supplies come through seaway.



## A3 - MANUFACTURING

The production starts with slitting of the raw material, flat steel. After the slitting, they are fed to the pipe forming machine, which is a form of cold rolling in which steel sheet is formed into a pipe and then its final shape is given with the help of the rollers. Post-production processes might include deburring and cleaning the faces if the final shape is round.



## A4 - TRANSPORT

This stage includes energy, water and related consumptions during the manufacturing of the related products. The transport distances and routes of the final products are provided by the manufacturer. The distances and routes are calculated accordingly. According to the manufacturer, the main means of transports are done by trucks across Türkiye. In abroad, the company prefers sea transportation as the main means of transport.



### C1 - DECONSTRUCTION / DEMOLITION

It is assumed that 0.01 kWh/kg of energy is consumed during this stage with 100 % of the waste collection rate.



### C2 - WASTE TRANSPORT

This step includes the transport of materials after they reach their end-of-life. The average distance was assumed 50 km by truck from demolition site to a waste area.



### C3 - WASTE PROCESSING

It is assumed that no waste processing is needed after the product reaches its end-of-life.



### C4 - DISPOSAL

According to World Steel Association (WSA), the recycling rate of steel is around 95%. Based on this, 95% of the steel is assumed to be recycled with 90% efficiency.

\*System Boundary

### D - BENEFITS

The benefits of the recycled steel specified in the disposal stage is considered.



# LCA Information

<b>Declared Unit</b>	1 ton Steel Pipes and Profiles
<b>Time Representativeness</b>	2021
<b>Database(s) and LCA Software Used</b>	Ecoinvent 3.8 and SimaPro 9.3
<b>System Boundaries</b>	Cradle to gate with options, modules C1-C4, module D and with optional modules (A1–A3 + A4 + C + D)

The inventory for the LCA study is based on the 2021 production figures of Özdemir Boru Profil San. ve Tic. A.Ş. considering the company's two production plants located in Zonguldak, Türkiye.

This EPD investigates the environmental performance of related steel pipes and profiles based on 1 ton declared unit.

This EPD's system boundary is cradle to gate with options, modules C1-C4, module D and with optional modules (A1–A3 + A4 + C + D).

The end of-life stage (Modules C1-C4) and resource recovery stage (Module D) are modelled on the assumptions that are described in system boundaries and description section.

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.

Water consumption, energy consumption and raw material transportation were weighted according to 2021 production figures. In addition, hazardous and non hazardous waste amounts were also allocated from the 2021 total waste generation for the two plants included.

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage			Benefits and Loads	
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction. demolition	Transport	Waste Processing		Disposal
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules Declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	TR	GLO	-	-	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO
Specific Data Used					-	-	-	-	-	-	-	-	-	-	-	-	-
Variation-products	≤10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation-Sites	≤10%					-	-	-	-	-	-	-	-	-	-	-	-

X = Included in LCA, ND = Not Declared

## LCA Results

Impact Category	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
GWP- Fossil	kg CO <sub>2</sub> eq	2954	30.9	45.5	3030	817	6.26	8.14	0	0.809	-1832
GWP- Biogenic	kg CO <sub>2</sub> eq	19.5	0.021	0.994	20.5	0.346	0.064	0.022	0	0.003	-15.1
GWP- Luluc	kg CO <sub>2</sub> eq	3.07	0.019	0.364	3.46	0.523	0.045	0.003	0	0.001	-0.899
GWP- Total	kg CO <sub>2</sub> eq	2976	30.9	46.9	3054	817	6.37	8.17	0	0.813	-1848
ODP	kg CFC-11 eq	147E-6	6.32E-6	1.23E-6	155E-6	164E-6	147E-9	1.89E-6	0	327E-9	-80.1E-6
AP	mol H+ eq	12.7	0.86	0.303	13.8	25.1	0.041	0.023	0	0.008	-7.72
*EP- Freshwater	kg P eq	1.48	0.001	0.046	1.53	0.027	0.006	0.001	0	74.1E-6	-0.88
EP- Freshwater	kg (PO <sub>4</sub> ) eq	4.53	0.003	0.142	4.67	0.082	0.020	0.002	0	227E-6	-2.69
EP- Marine	kg N eq	2.70	0.213	0.055	2.97	6.27	0.007	0.005	0	0.003	-1.67
EP- Terrestrial	mol N eq	28.4	2.36	0.491	31.2	69.6	0.062	0.051	0	0.029	-17.8
POCP	kg NMVOC	8.40	0.576	0.124	9.10	16.9	0.016	0.013	0	0.007	-5.35
ADPE	kg Sb eq	0.04	50.2E-6	72.6E-6	0.036	0.001	8.6E-6	28.9E-6	0	1.85E-6	-0.028
ADPF	MJ	31253	407	497	32157	10579	67.3	123	0	22.6	-18493
WDP	m <sup>3</sup> depriv.	1233	0.698	575	1809	16.2	2.28	0.364	0	1.02	-413
PM	disease inc.	191E-6	1.09E-6	1.41E-6	194E-6	26.1E-6	171E-9	517E-9	0	149E-9	-128E-6
IR	kBq U-235 eq	105	1.89	0.735	108	48	0.054	0.636	0	0.100	-71.9
ETP- FW	CTUe	81107	259	534	81900	6503	65.9	96.8	0	14.3	-55920
HTTP- C	CTUh	16.7E-6	16.3E-9	10.4E-9	16.8E-6	447E-9	1.17E-9	3.12E-9	0	362E-12	-11.4E-6
HTTP- NC	CTUh	64.0E-6	188E-9	422E-9	64.6E-6	4.38E-6	53.6E-9	97.6E-9	0	9.3E-9	-43.4E-6
SQP	Pt	10172	101	142	10415	1912	7.45	89	0	49.4	-6927
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.										
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A1-A3: Sum of A1, A2, and A3, A4: Transport to Site. 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.										
*Disclaimer 3	EP-freshwater: This indicator is calculated both in kg PO <sub>4</sub> eq and kg P eq as required in the characterization model. (EUTREND model, Struijs et al, 2009b, as implemented in ReCiPe; <a href="http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml">http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml</a> )										

Resource Use											
Impact Category	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	3057	3.20	121	3182	73.2	14.5	1.76	0	0.193	-1883
PERM	MJ	0	0	0	0	0	0	0	0	0	0
PERT	MJ	3057	3.20	121	3182	73.2	14.5	1.76	0	0.193	-1883
PENRE	MJ	31254	407	497	32158	10580	67.3	123	0	22.6	-18493
PENRM	MJ	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	31254	407	497	32158	10580	67.3	123	0	22.6	-18493
SM	kg	0	0	0	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0
FW	m <sup>3</sup>	14	0.042	10.3	24.4	0.998	0.026	0.021	0	0.025	-6.329
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											
Impact Category	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
HWD	kg	0	0	0.001	0.001	0	0	0	0	0	0
NHWD	kg	0	0	0.018	0.018	0	0	0	0	0	0
RWD	kg	0	0	0	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	0	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.										
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A1-A3: Sum of A1, A2, and A3, A4: Transport to Site. C1: Deconstruction / Demolition, C2: Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary										
Climate impact											
Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
*GHG-GWP	kg CO <sub>2</sub> eq	2858	30.7	45.5	2934	812	6.25	8.08	0	0.796	-1756
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											

# References

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

/EN ISO 9001/ Quality Management Systems- Requirements

/EN ISO 14001/ Environmental Management Systems- Requirements

/EN ISO 50001/ Energy Management Systems- Requirements

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

/EN 15804:2012+A2:2019/ 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 CPC 54 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 1.11 DATE 2019-12-20

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# ÖZDEMİR BORU PROFİL SAN. VE TİC. AŞ

