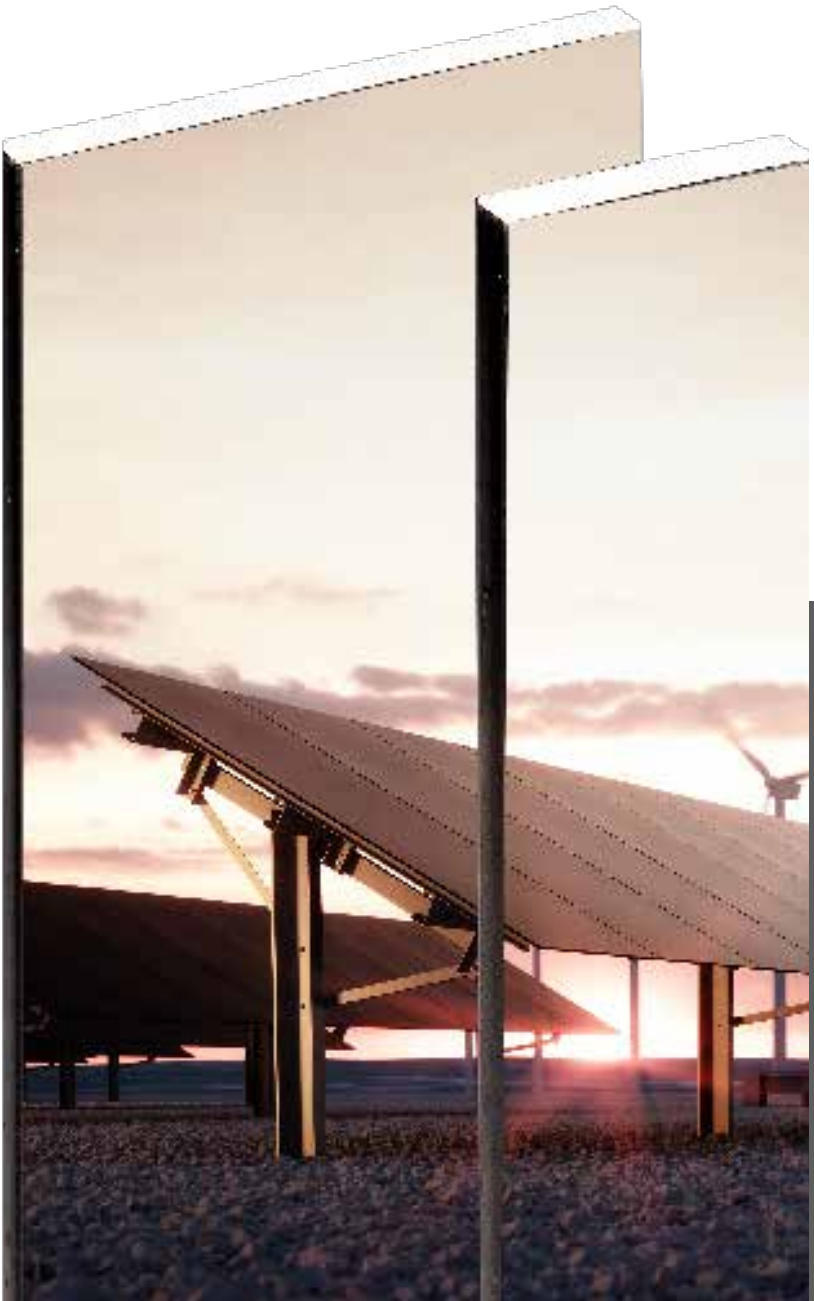
ÖZKAN
DEMİR ÇELİK SANAYİ A.Ş.

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and PCR 2014:10 for

Carbon Steel



TURKEY EPD®
ENVIRONMENTAL PRODUCT DECLARATIONS

EPD®
THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD EN 15804 VERIFIED

Programme:	The International EPD® System www.environdec.com EPD Turkey A fully aligned regional programme www.epdturkey.org
Programme operator:	EPD International AB Stockholm, SWEDEN EPD Turkey: SÜRATAM – Turkish Centre for Sustainable Production Research&Design Istanbul, TURKEY
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Geographical scope:	Turkey

ÖZKAN
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WE SHAPE

PROGRAMME INFORMATION

Programme	EPD Turkey, a fully aligned regional programme SÜRATAM – Turkish Centre for Sustainable Production Research & Design Nef 09 B Blok No:7/15 34415 Kağıthane-Istanbul/TURKEY www.epdturkey.org info@epdturkey.org	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm/SWEDEN www.environdec.com info@environdec.com

Product category rules (PCR): PCR 2014:10 Fabricated steel products, except construction products, machinery and equipment,version 2.1, UN CPC 412, 422, 429.

PCR review was conducted by: The Technical Committee of the International EPD® System.
Review chair: Massimo Marino. Contact via info@environdec.com

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

EPD process certification EPD verification ☑

Third party verifier: Prof. Ing. Vladimír Kočí, Ph.D., MBA

Approved by: The International EPD® System

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.

ÖZKAN
DEMİR ÇELİK SANAYİ A.Ş.

WE SHAPE ENVIRONMENT

We know what we need to do to protect the environment. Recycling is one of them.

COMPANY PROFILE

Özkan Steel was founded in 1953 and has its headquarter and production sites in İzmir-Aliağa over an area of 460,000 m². Özkan Steel, having a melting capacity of 1,000,000 tons and rolling capacity of 700,000 tons per year, has been active in producing special steel profiles for the Shipbuilding, Offshore, Onshore, Automotive, Mining and Tunneling, Railways, Agriculture, Earth Moving, Material Handling, Machinery, Energy and Commercial Construction sectors.

Özkan Steel is exporting to more than 120 countries every year and has established itself worldwide as a well-known and trusted brand name in these sectors for its high quality, on-time delivery, flexibility, customer specific solutions and high customer satisfaction. By regarding the production of value added products as a corporate principle, Özkan Steel has been using its over 60 years of experience in hot rolling of special profiles to increase its product portfolio continuously.

Özkan Steel's product portfolio is consist of over 3,600 different sizes of profiles produced in three rolling mills with a rolling capability of 3.5 kg/m to 600 kg/m steel profiles. This accumulated experience grants Özkan Steel the ability to be one of the leading steel companies in the production of special steel grades and special steel profiles throughout the world.


Quality
Focused
Production

QUALITY FOCUSED PRODUCTION

The aim of Özkan Steel is to provide superior know-how and customer satisfaction by developing solutions with its products that give our customers a competitive advantage.

Our products fulfill the highest requirements as a result of our more than half century know-how in metallurgy, hot rolling, machining, heat treatment, and material testing. Also, our official Research and Development Center constantly researches new methods and steel grades to increase quality and surpass customer requirements. In all phases of the production process, process parameters and product characteristics are tracked and recorded, according to the conditions specified under national/international standards and/or customer specific needs, with the guidance of dimensional properties, shape related properties, product weight, product precision, surface delivery conditions specified in the quality plans of IATF 16949 and ISO 9001 quality management systems.

Our Product Range

Product description / definition:
The product declared is “carbon steel”.
OZKAN uses direct melting of scrap for the production of carbon steel. Alloying elements are added in the form of ferroalloys or metals.

The production process route is Electric arc furnace -> Ladle furnace -> Vacuum de gassing -> Continuous casting -> Hot rolling.

Application:
Hot rolled carbon steels are being produced in various shapes such as Flat&Wide Flat Bars, Square Bars, Round Bars.

Carbon steel is used for various application.
For example:
- Medium carbon steels (axles, gears, shafts ect.)
- High carbon steels (cutting tools, blades, punches, dies, springs ect.)

Product standards:
DIN 17200, EN 10083-2, ISO 683-1, ASTM A29, BS 970-3, DIN 17212, EN 10269.

Reference service life:
A reference service life for carbon steel bars is not declared. The use and maintenance requirements are not based on the steel products but on the specific design and application. These are special products with many different application purposes. The lifetime therefore will be limited by the service life of the work.

PRODUCT INFORMATION

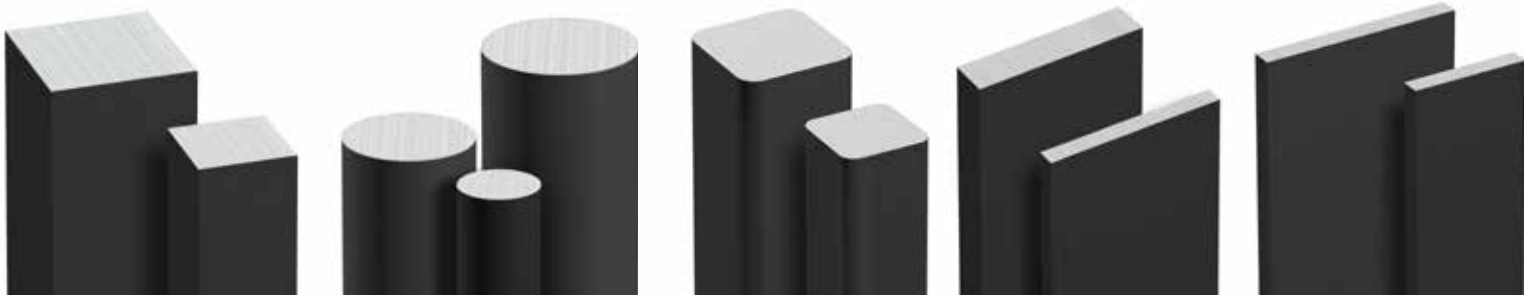
Product name: Carbon steel

UN CPC code: 41241

Geographical scope: Turkey

Technical Properties

GRADE	MATERIAL NUMBER	STANDARD		C	Si	Mn	P	S	Al	Cr	Mo	Ni	Cu	Cr+Mo+Ni
1020	-	ASTM A29	max	0.23	-	0.60	0.040	0.050	-	-	-	-	-	-
			min	0.18	-	0.30	-	-	-	-	-	-	-	-
1030	**-**	**ASTM A29**	**max**	**0.34**	**-**	**0.90**	**0.040**	**0.050**	**-**	**-**	**-**	**-**	**-**	**-**
			min	**0.28**	**-**	**0.60**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
1035	**-**	**ASTM A29**	**max**	**0.38**	**-**	**0.90**	**0.040**	**0.050**	**-**	**-**	**-**	**-**	**-**	**-**
			min	**0.32**	**-**	**0.60**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
1040	-	ASTM A29	max	0.44	-	0.90	0.040	0.050	-	-	-	-	-	-
			min	0.37	-	0.60	-	-	-	-	-	-	-	-
1043	-	ASTM A29	max	0.47	-	1.00	0.040	0.050	-	-	-	-	-	-
			min	0.40	-	0.70	-	-	-	-	-	-	-	-
1045	-	ASTM A29	max	0.50	-	0.90	0.040	0.050	-	-	-	-	-	-
			min	0.43	-	0.60	-	-	-	-	-	-	-	-
1050	-	ASTM A29	max	0.55	-	0.90	0.040	0.050	-	-	-	-	-	-
			min	0.48	-	0.60	-	-	-	-	-	-	-	-
070M20	1.1151	BS 970-3	max	0.24	0.40	0.90	0.050	0.050	-	-	-	-	-	-
			min	0.16	0.10	0.50	-	-	-	-	-	-	-	-
080A15	1.0401	BS 970-3	max	0.18	0.40	0.90	0.050	0.050	-	-	-	-	-	-
			min	0.13	0.10	0.70	-	-	-	-	-	-	-	-
Ck 45	1.1191	DIN 17200	max	0.50	0.40	0.80	0.035	0.030	-	-	-	-	-	-
			min	0.42	-	0.50	-	-	-	-	-	-	-	-
Cf 53	1.1213	DIN 17212	max	0.57	0.35	0.70	0.025	0.035	-	-	-	-	-	-
			min	0.50	0.15	0.40	-	-	-	-	-	-	-	-
C45	1.0503	ISO 683-1	max	0.50	0.40	0.80	0.045	0.045	-	0.40	0.10	0.40	0.30	0.63
			min	0.42	0.10	0.50	-	-	-	-	-	-	-	-
C45E	1.1191	ISO 683-1	max	0.50	0.40	0.80	0.025	0.035	-	0.40	0.10	0.40	0.30	0.63
			min	0.42	0.10	0.50	-	-	-	-	-	-	-	-
C45R	1.1201	ISO 683-1	max	0.50	0.40	0.80	0.025	0.040	-	0.40	0.10	0.40	0.30	0.63
			min	0.42	0.10	0.50	-	0.020	-	-	-	-	-	-
20Mn5	1.1133	EN 10269	max	0.23	0.40	1.50	0.030	0.035	-	0.40	0.10	0.40	-	0.63
			min	0.17	-	1.00	-	-	0.020	-	-	-	-	-



SYSTEM BOUNDARY

Upstream		Core	Downstream												Other Environmental Information
Raw Material	Raw Material Transport	Manufacturing	Transport to Plant	Construction / Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction / Demolition	Transport to Disposal Site	Waste Processing	Disposal	Future reuse, recycling or energy recovery potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

This EPD's system boundary has been defined as cradle to grave, comprising modules A1-A3, C1-C4 and module D. Besides, A4: Transport stage was added as optional in the downstream stage.

A1: Raw Material Supply

Production starts with raw materials. Raw material stage includes raw material extraction/preparation and pre-treatment processes before production.

A2: Transportation

Transport is relevant for delivery of raw materials and other materials to the plant and the transport of materials within the plant.

A3:Manufacturing

Manufacturing starts with the melting in steel plant and is followed by rolling of the steel. Electricity and natural gas are consumed during manufacturing stage. The end products are then packaged to be sold.

A4: Transport to Site

Transport of final product to site is taken as the weight average values for transportation for the year of 2020.

SYSTEM BOUNDARY

C1: Deconstruction / Demolition

For demolition stage it is assumed that 0.239 MJ/kg of energy is consumed (Gervasio and Dimova, 2018).

C2: Transport to Disposal Site

This stage includes the transportation of the discarded profiles to final disposal. Average distance from demolition site to waste processing site for final disposal is assumed to be 100 km.

C3: Waste Processing

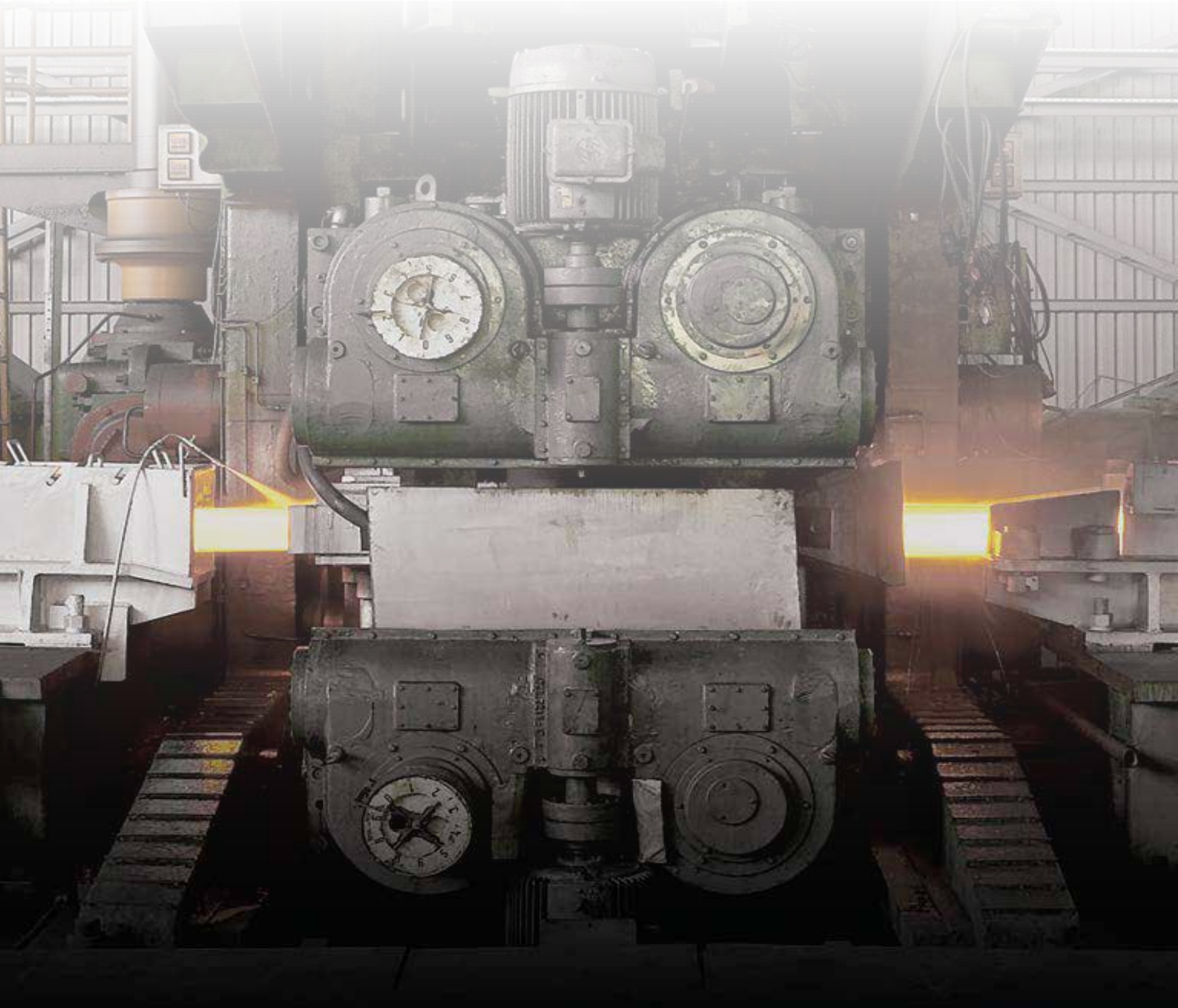
As it is assumed that the waste is going to landfill, there is no need for any waste process.

C4: Disposal

Disposal is the final stage of product life and it is assumed that 85% of the steel is send to be recycled while the rest ends up in landfill.

D: Benefits and Loads Beyond the system Boundary

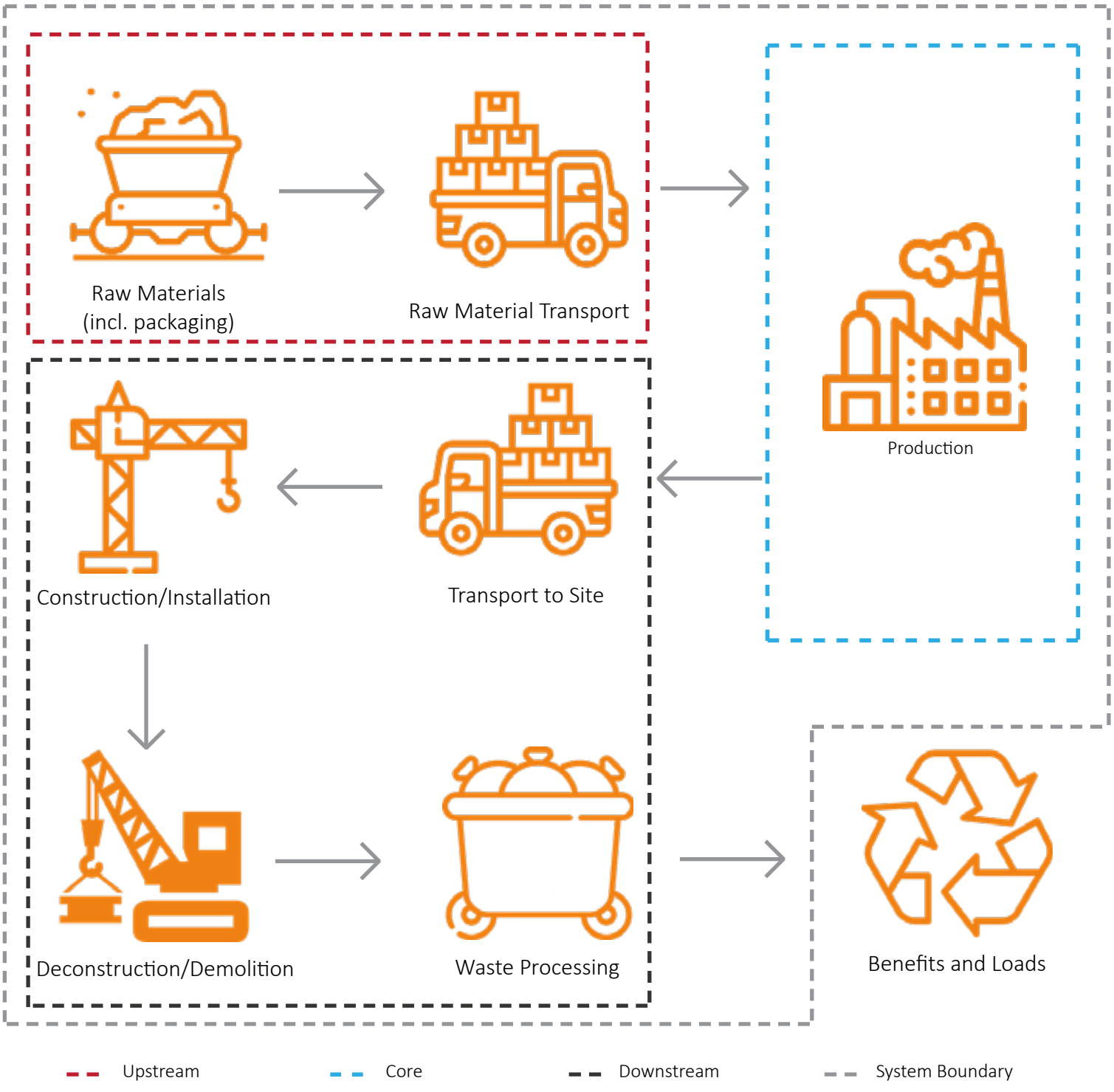
In this stage, benefits from the recycled steel specified in the disposal stage were calculated.



LCA INFORMATION

Declared Unit	1 tonne of carbon steel
Time Representativeness	Average data for the year of 2020
Database(s) and LCA Software Used	TLCID ver. 1.0 (Turkish Lifecycle Inventory Database), Ecoinvent 3.5 SimaPro 9.0

System Boundary of the LCA Study



MORE INFORMATION

The results of the LCA with the indicators as per EPD requirement are given in the LCA result tables. All energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while fresh water use is calculated with selected inventory flows in SimaPro according to the PCR.

There are no co-products in the production. Hence, there is no need for co-product allocation.

Energy consumption and transport datasets were allocated based on the average production figures for the year of 2020, and weighted average of environmental impacts for the construction steel were presented.

Accordingly, hazardous and non-hazardous waste amounts were also allocated based on the average waste arisings for the period of 2020.

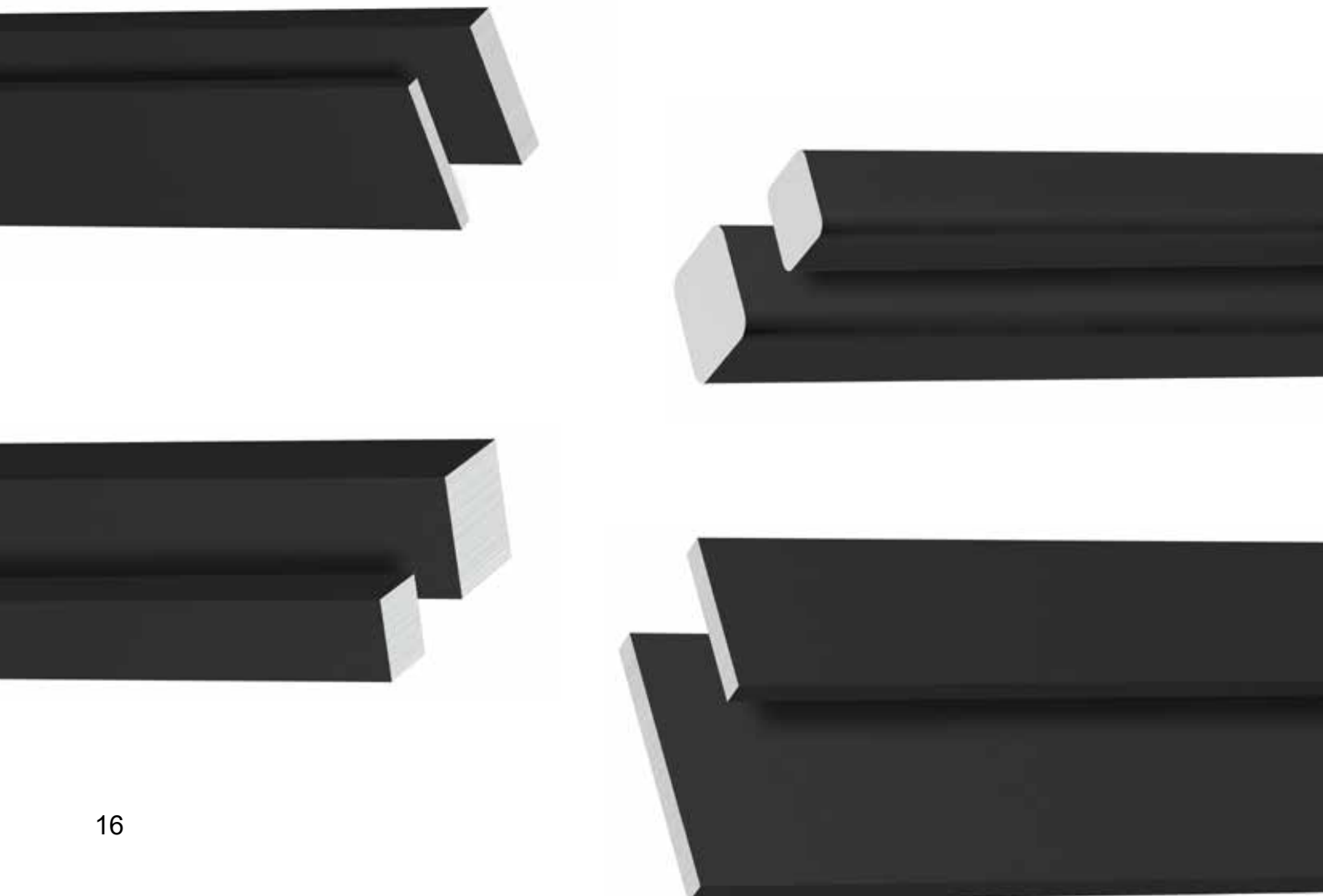
All the waste resulting from the main production and related processes is managed as per Waste Management Plan of Özkan Steel in accordance with Turkish laws and regulations.

No substances included in the Candidate List of Substances of Very High Concern for authorisation under the REACH Regulations are present in the onstruction steelmanufactured by Özkan Steel, either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

LCA RESULTS

LCA RESULTS

Environmental Impacts for 1 tonne of Carbon Steel									
Impact Category	Unit	Upstream	Core	Downstream					Other
		A1-A2	A3	A4	C1	C2	C3	C4	D
GWP - Fossil	kg CO_2 eq	287E+0	631E+0	63.5E+0	36.8E+0	21.4E+0	0	6.85E+0	-63.6E+0
GWP - Biogenic	kg CO_2 eq	758E-3	2.66E+0	16.9E-3	207E-3	5.56E-3	0	73.5E+0	-114E-3
GWP - Luluc	kg CO_2 eq	474E-3	6.72E+0	19.0E-3	525E-3	7.53E-3	0	2.02E-3	-47.5E-3
GWP - Total	kg CO_2 eq	289E+0	640E+0	63.6E+0	37.6E+0	21.4E+0	0	80.4E+0	-63.8E+0
AP	kg SO_2 eq	1.68E+0	2.67E+0	259E-3	197E-3	75.2E-3	0	41.3E-3	-492E-3
EP	kg PO_4^{-3} eq	630E-3	1.59E+0	50.3E-3	122E-3	16.3E-3	0	326E-3	-155E-3
POCP	kg NMVOC	1.46E+0	1.48E+0	276E-3	102E-3	82.1E-3	0	45.0E-3	-488E-3
ADPE	kg Sb eq	1.36E-3	613E-6	186E-6	47.1E-6	84.6E-6	0	2.68E-6	-564E-6
ADPF	MJ	5.34E+3	7.54E+3	960E+0	387E+0	317E+0	0	43.8E+0	-862E+0
WDP	m^3 eq	128E+0	447E+0	4.96E+0	24.0E+0	2.26E+0	0	1.65E+0	-8.41E+0
Acronyms	GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, AP: Acidification potential, EP: Eutrophication potential, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity potential								
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A1-A2: Sum of A1-A2, A4: Distribution of the end product, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary, .								



Resource Use for 1 tonne of Carbon Steel									
Impact Category	Unit	Upstream	Core	Downstream					Other
		A1-A2	A3	A4	C1	C2	C3	C4	D
PERE	MJ	404E+0	1.37E+3	10.6E+0	107E+0	3.56E+0	0	1.80E+0	-56.9E+0
PERM	MJ	0	0	0	0	0	0	0	0
PERT	MJ	404E+0	1.37E+3	10.6E+0	107E+0	3.56E+0	0	1.80E+0	-56.9E+0
PENRE	MJ	5.96E+3	7.59E+3	976E+0	390E+0	322E+0	0	46.8E+0	-895E+0
PENRM	MJ	0	0	0	0	0	0	0	0
PENRT	MJ	5.96E+3	7.59E+3	976E+0	390E+0	322E+0	0	46.8E+0	-895E+0
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
FW	m^3	1.40E+0	4.38E+0	164E-3	141E-3	53.8E-3	0	38.7E-3	-225E-3

Waste & Output Flows for 1 tonne of Carbon Steel									
Impact Category	Unit	Upstream	Core	Downstream					Other
		A1-A2	A3	A4	C1	C2	C3	C4	D
HWD	kg	0	0.10	0	0	0	0	0	0
NHWD	kg	0	215.85	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	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, 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-A2: Sum of A1-A2, A4: Distribution of the end product, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary,								

REFERENCES

/GPI/ General Programme Instructions of the International EPD® System. Version 3.0.

/ISO 14020:2000/ Environmental labels and declarations — General principles

/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)

/Gervasio, H. and Dimova, S./ Model for Life Cycle Assessment (LCA) of buildings, EUR 29123 EN, Publications Office of the European Union, 2018, ISBN 978-92-79-79973-0

/PCR 2014:10 Fabricated steel products, except construction products, machinery and equipment, version 2.1, UN CPC 412, 422, 429

/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

/TLCID/ Turkish Life Cycle Inventory Database, Turkish Center for Sustainable Production Research and Design (SURATAM), www.suratam.org

VERIFICATION & REGISTRATION

Programme	EPD registered through fully aligned regional programme: EPD Turkey www.epdturkey.org TURKEY EPD® THE INTERNATIONAL EPD® SYSTEM	The International EPD® System www.environdec.com EPD® THE INTERNATIONAL EPD® SYSTEM
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ÖZKAN
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