



# Duferco Danish Steel

**Duferco** GROUP



THE INTERNATIONAL EPD® SYSTEM

ENVIROMENTAL PRODUCT DECLARATION (IN ACCORDANCE WITH ISO 14025 AND EN 15804:2012+A2:2019) FOR ROLLED STEEL PRODUCTS

CPC CODE

4219 - OTHER STRUCTURES (EXCEPT PREFABRICATED BUILDINGS) AND PARTS OF STRUCTURES, OF IRON, STEEL OR ALUMINIUM

PROGRAM: The International EPD® System, [www.environdec.com](http://www.environdec.com)

PROGRAM OPERATOR: EPD International AB

AREA OF GEOGRAPHICAL APPLICATION: EUROPE

ENVIROMENTAL PRODUCT DECLARATION VALIDATED

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# THE GROUP

**Duferco Danish Steel**

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Duferco is the world's leading global steel trader with a "hybrid" business model, which includes distribution, industrial as well as trading activities. Duferco's activities span over 40 countries.

In early June 2006, Duferco, acquired Kontiværket, the bar mill originally established in 1940 by Det Danske Stålvalseværk, Denmark's glorious steel plant. The production assets were transferred to Duferco Danish Steel A/S, a new company established in connection with the acquisition. The work force was re-employed and implemented, and operations restarted in the second half of June 2006.

Duferco Danish Steel A/S is a significant producer of merchant bars generally employed in building, in construction for industrial and civil works, in agriculture, in the mechanical industry and shipbuilding applications.

Duferco Danish Steel A/S invested over 17 million Euros for the plant's modernization and downstream which began during the summer of 2007. The steel mill has extended its storage capacity and production range.



# THE PRODUCT

**Duferco Danish Steel**


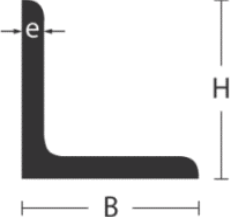
**Duferco** GROUP


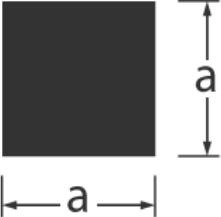
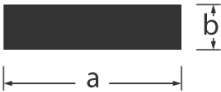
The products in this study are merchant bars, U-profiles and angles.

Due to the fact the products has different dimensional properties, in the Environmental Product Declaration an average value is considered.

The product characteristics are described below.

**Steel grade and reference standards:** from S235 to S355, C45, boron steel and spring steel according to EN 10025, EN 10089 and EN ISO 683-2:2018

PRODUCTS	REFERENCE STANDARD (dimension and shape tolerances)	Width (B)		Height (H)		Thickness (e)		Shape
		from (mm)	to (mm)	from (mm)	to (mm)	from (mm)	to (mm)	
U-PROFILE round edged	EN10279	33	42	30	65	5	6	
EQUAL LEG ANGLES round edged	EN10056-1	40	80	40	80	4	10	

PRODUCTS	REFERENCE STANDARD (dimension and shape tolerances)	Width (a)		Height (b)		Thickness (e)		Shape
		from (mm)	to (mm)	from (mm)	to (mm)	from (mm)	to (mm)	
ROUND BARS	EN10060	16	70	-	-	-	-	
SQUARE BARS	EN10059	16	50	-	-	-	-	
FLAT BARS	EN10058 EN 10092-1	20	150	5	50	-	-	

## Content information

The product considered is made of the components listed below:


Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Recycled steel	852,2	852,2	-
Primary steel	147,8	-	-

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
The product doesn't contain any dangerous substances.			



# ENVIRONMENTAL PERFORMANCE DECLARATION





Specific data were collected on the rolling mill involved in the process and these refer to the year 2020. The contribution of the proxy was less than 10%. The electrical mix used to model the electrical consumption at medium voltage in the A1 module is based on the Danish residual mix (Source: AIB, "European Residual Mixes - Results of the calculation of Residual Mixes for the calendar year 2020", 506 g CO<sub>2</sub> eq/ kWh).

Module C1 considers the decommissioning phase, including the demolition of the product from the construction site. The necessary energy consumption was considered equal to 239 MJ, in accordance with the JRC Technical Report "Model for Life Cycle Assessment (LCA) of buildings" (page 41).

Module C2 includes transportation of the steel products for recycling or disposal. For this module, a transport scenario of 50 km to the waste treatment center is considered.

Module C3 considers the preparation processes for waste treatment (reuse, recycling and/or incineration). This module evaluates a 90% return-for-recycling scenario.

Module C4 includes all waste disposal processes. 10% of residual material is considered to be disposed of in landfills.

Module D includes the avoided impacts of all net flows at the end of life. Impacts avoided related to 90% of material sent for recycling are included.

This document uses the French style of the international measurement system (comma as a decimal separator).

The declared unit is 1 ton of rolled steel product.

A close-up photograph of industrial machinery, likely a steel mill, with a glowing orange light emanating from a central opening. The machinery is dark and complex, with various pipes, valves, and structural elements visible. The light is bright and warm, creating a strong contrast with the dark surroundings.

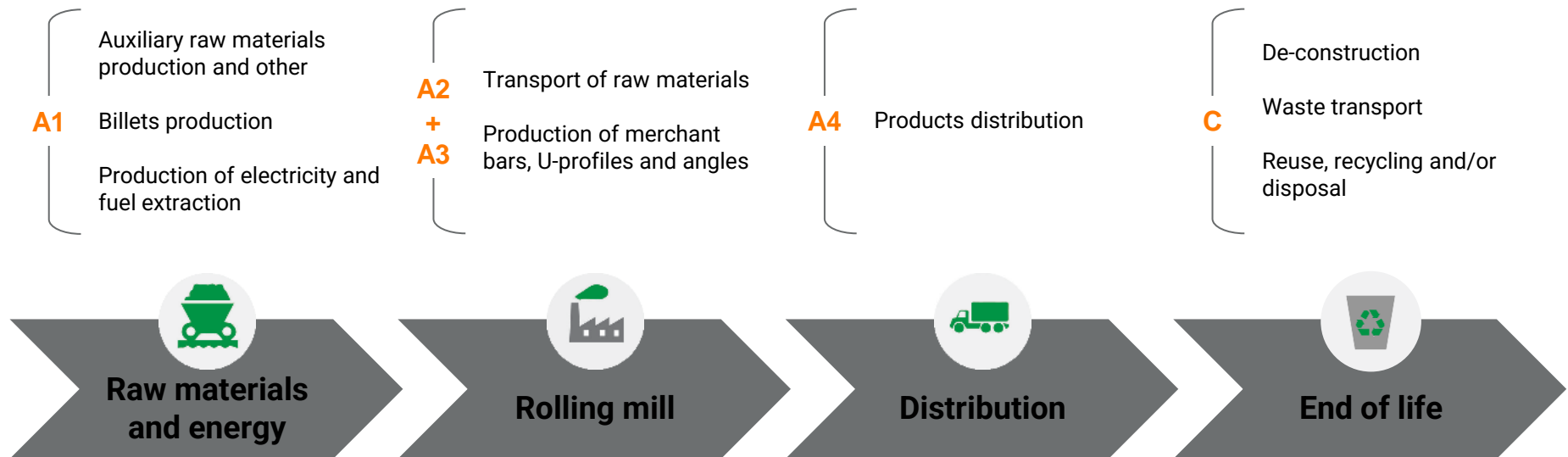
# SYSTEM BOUNDARIES

In compliance with the PCR reference and EN 15804 standard, the system boundaries are divided into the following three life cycle phase:

- Upstream processes (A1 – Raw Materials Supply)
- Core processes (A2 – Transportation; A3 – Manufacturing)
- Downstream processes (A4 – Distribution; C – End of life stage)

Module D accounts benefits and loads beyond the system boundary.

The life cycle phases included in the system boundaries are shown in the following figure:



With respect to EN 15804 standard, the study conducted is classified as “cradle-to-gate with options” EPD (declared unit): modules A1-A4, C and D are included.

	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	
<b>Module</b>	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
<b>Modules declared</b>	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X	
<b>Geography</b>	EU	EU	EU	EU	-	-	-	-	-	-	-	-	EU	EU	EU	EU	EU	
<b>Specific data used</b>	>90%					-	-	-	-	-	-	-	-	-	-	-	-	
<b>Variation – products</b>	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Variation – sites</b>	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-	-

## Environmental impacts

Data refer to the declared unit.

Impact category		Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	A1-A4 + C	D
Climate change	Fossil	kg CO <sub>2</sub> eq	950,49	50,14	94,54	<b>1.095,17</b>	140,03	20,55	6,84	11,12	0,25	<b>1.273,96</b>	-1.505,95
	Biogenic	kg CO <sub>2</sub> eq	3,69	0,14	0,00	<b>3,83</b>	0,05	0,01	0,00	0,12	0,00	<b>4,01</b>	-0,88
	Land use and LU change	kg CO <sub>2</sub> eq	0,36	0,01	0,00	<b>0,37</b>	0,00	0,00	0,00	0,01	0,00	<b>0,38</b>	-0,31
	Total	kg CO <sub>2</sub> eq	954,55	50,29	94,54	<b>1.099,38</b>	140,08	20,56	6,84	11,25	0,25	<b>1.278,36</b>	-1.507,14
	GWP-GHG	kg CO <sub>2</sub> eq	928,43	49,85	94,47	<b>1.072,75</b>	139,28	20,37	6,80	11,03	0,25	<b>1.250,49</b>	-1.435,00
Ozone depletion	kg CFC11 eq	5,26E-05	9,97E-06	2,01E-07	<b>6,28E-05</b>	3,35E-05	4,60E-06	1,64E-06	1,90E-06	5,24E-08	<b>1,04E-04</b>	-6,22E-05	
Acidification	mol H <sup>+</sup> eq	3,26	1,50	0,03	<b>4,79</b>	0,66	0,22	0,03	0,10	0,00	<b>5,80</b>	-5,33	
Eutrophication, freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	0,36	0,13	0,01	<b>0,50</b>	0,08	0,03	0,00	0,01	0,00	<b>0,64</b>	-0,64	
Eutrophication, freshwater	kg P eq	3,75E-02	4,28E-04	4,33E-07	<b>3,79E-02</b>	8,13E-05	1,45E-05	3,53E-06	3,73E-04	8,96E-07	<b>3,84E-02</b>	-7,38E-02	
Eutrophication, marine	kg N eq	0,69	0,39	0,02	<b>1,10</b>	0,24	0,10	0,01	0,04	0,00	<b>1,49</b>	-1,16	
Eutrophication, terrestrial	mol N eq	7,84	4,30	0,17	<b>12,31</b>	2,68	1,09	0,13	0,44	0,01	<b>16,66</b>	-13,37	
Photochemical ozone formation	kg NMVOC eq	2,80	1,10	0,04	<b>3,94</b>	0,69	0,30	0,03	0,12	0,00	<b>5,09</b>	-7,48	
Resource use, fossils	MJ	13.473,97	683,38	11,98	<b>14.169,33</b>	2.003,50	284,29	97,80	180,29	3,36	<b>16.738,57</b>	-15.248,88	
Resource use, minerals and metals	kg Sb eq	4,57E-03	8,88E-07	3,67E-08	<b>4,57E-03</b>	6,14E-06	1,06E-06	3,00E-07	5,86E-07	1,22E-08	<b>4,58E-03</b>	-3,57E-04	
Water use	m <sup>3</sup> depriv.	119,72	0,75	1,04	<b>121,50</b>	-0,32	0,07	-0,02	0,82	0,00	<b>122,06</b>	-72,03	

## Use of resources

Data refer to the declared unit.

Parameter	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	A1-A4 + C	D	
Primary energy sources - renewables	Used as energy carrier	MJ, net calorific	676,26	14,59	0,02	<b>690,87</b>	3,38	0,46	0,15	13,20	0,01	<b>708,07</b>	-185,18
	Used as raw material	MJ, net calorific	70,37	1,86	0,00	<b>72,24</b>	0,69	0,09	0,03	1,59	0,01	<b>74,65</b>	-23,43
	Total	MJ, net calorific	746,64	16,46	0,02	<b>763,12</b>	4,07	0,55	0,18	14,79	0,02	<b>782,73</b>	-208,62
Primary energy sources - non-renewables	Used as energy carrier	MJ, net calorific	14.322,98	724,55	12,72	<b>15.060,25</b>	2.127,03	301,85	103,83	190,49	3,57	<b>17.787,02</b>	-16.062,91
	Used as raw material	MJ, net calorific	0,00	0,00	0,00	<b>0,00</b>	0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00
	Total	MJ, net calorific	14.322,98	724,55	12,72	<b>15.060,25</b>	2.127,03	301,85	103,83	190,49	3,57	<b>17.787,02</b>	-16.062,91
Secondary materials	kg	897,50	0,00	0,00	<b>897,50</b>	0,00	0,00	0,00	0,00	0,00	<b>897,50</b>	0,00	
Renewable secondary fuel	MJ, net calorific	0,00	0,00	0,00	<b>0,00</b>	0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	
Non-renewable secondary fuel	MJ, net calorific	0,00	0,00	0,00	<b>0,00</b>	0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00	
Net water consumption	m <sup>3</sup>	11,40	0,07	0,29	<b>11,76</b>	0,01	0,00	0,00	0,06	0,00	<b>11,84</b>	-2,17	

## Waste production

Data refer to the declared unit.

Parameter	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	A1-A4 + C	D
Hazardous waste	kg	2,06	0,02	0,00	<b>2,07</b>	0,03	0,00	0,00	0,01	0,00	<b>2,12</b>	-0,69
Non-hazardous waste	kg	476,15	0,14	0,00	<b>476,29</b>	0,09	0,02	0,00	0,11	99,90	<b>576,41</b>	-18,98
Radioactive waste	kg	0,04	0,00	0,00	<b>0,05</b>	0,01	0,00	0,00	0,00	0,00	<b>0,07</b>	-0,02

## Output flows

Data refer to the declared unit.

Parameter	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	A1-A4 + C	D
Components for reuse	kg	0,00	0,00	0,00	<b>0,00</b>	0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00
Materials for recycling	kg	0,00	0,00	67,55	<b>67,55</b>	0,00	0,00	0,00	900,00	0,00	<b>967,55</b>	0,00
Materials for energy recovery	kg	0,00	0,00	0,00	<b>0,00</b>	0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00
Exported electric energy	MJ	0,00	0,00	0,00	<b>0,00</b>	0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00
Exported thermal energy	MJ	0,00	0,00	0,00	<b>0,00</b>	0,00	0,00	0,00	0,00	0,00	<b>0,00</b>	0,00



# INFORMATION



## Program information

Program:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	<a href="http://www.environdec.com">www.environdec.com</a>
E-mail:	<a href="mailto:info@environdec.com">info@environdec.com</a>

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction Products, Version 1.11
PCR review was conducted by: Martin Erlandsson, IVL Swedish Environmental Research Institute, <a href="mailto:martin.erlandsson@ivl.se">martin.erlandsson@ivl.se</a>
Independent third-party verification of the declaration and data, according to ISO 14025:2006:
<input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: Guido Croce
Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier:
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, please see EN 15804 and ISO 14025.

## References

General Programme Instructions for the International EPD® System, v.3.01.

PCR 2019:14. Construction Products Version 1.11.

EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

ISO 21930 Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services.

Database Ecoinvent v.3.8 ([www.ecoinvent.org](http://www.ecoinvent.org)).

LCA Report "Rolled Steel Products" Rev.2.

AIB, "European Residual Mixes - Results of the calculation of Residual Mixes for the calendar year 2020".

JRC Technical Report "Model for Life Cycle Assessment (LCA) of buildings".

## Glossary

**LIFE CYCLE ASSESSMENT (LCA):** a methodology regulated by ISO 14040-44 standards designed to quantify the energy and environmental load of the life cycle of a product or activity, by quantifying the energy and materials used and the emissions (solid, liquid and gaseous) released into the environment, from the extraction of raw materials to the disposal of final waste products.

**GLOBAL WARMING (GWP100):** the phenomenon of the global warming of the atmosphere, calculated for the next 100 years, due to release into the atmosphere of greenhouse gases such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), dinitrogen monoxide (N<sub>2</sub>O), etc.

**OZONE DEPLETION POTENTIAL (ODP):** degradation and reduction, caused by chlorofluorocarbons (CFC) or chlorofluoromethanes (CFM), of the ozone layer present in the stratosphere to filter ultraviolet light from sunlight with its particularly reactive compounds.

**ACIDIFICATION (AP):** lowering of the pH of soil, lakes, forests, etc. due to the release into the atmosphere of acids, with harmful consequences for living organisms (eg. "acid rain").

**EUTROPHICATION (EP):** reduction of the oxygen present in water bodies and necessary for the ecosystems due to the excessive richness of nutrients such as nitrogen and phosphorous.

**PHOTOCHEMICAL OZONE CREATION POTENTIAL (POCP):** formation of ozone on the earth's surface due to the release into the atmosphere of unburned hydrocarbons and nitrogen oxides in the presence of sunlight. This phenomenon is hazardous for living organisms, and often present in large urban centers.



## Reference for the Environmental Product Declaration

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