

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804+A2



Carl Stahl ARC GmbH FRAMEWORKX® XT3 - stainless steel frame system with X-TEND® mesh





Owner of the declaration

Carl Stahl ARC GmbH Siemensstraße 2 73079 Süßen Germany

FRAMEWORKX® XT3 - stainless steel frame system with X-TEND® mesh

Declared product / Declared unit

This declaration is based on Product **Category Rules**

EN 15804:2012 + A2:2019, NPCR 013 Part B for Steel and Aluminium Construction Products

Program operator:

EPD Norway Majorstuen P.O. Box 5250 N-0303 Oslo Norway

Declaration number

NEPD-10258-10258-2

Registration number NEPD-10258-10258-2

Issue date

03.09.2025

Valid to 02.09.2030

EPD Software Emidat EPD Tool v1.0.0



General Information

Product

FRAMEWORKX® XT3 - stainless steel frame system with X-TEND® mesh

Program Operator

EPD Norway Majorstuen P.O. Box 5250 N-0303 Oslo Norway

Phone: +47 23 08 80 00 Email: post@epd-norge.no

Declaration Number

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EN 15804:2012 + A2:2019,

NPCR 013 Part B for Steel and Aluminium Construction Products

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 kg

General information on verification of EPD from EPD tools

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPDNorway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Verification of EPD tool

Charlotte Merlin, FORCE Technology (no signature required)

Owner of the declaration

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Manufacturer

Carl Stahl ARC GmbH Siemensstraße 2 73079 Süßen, Germany

Place of production

Süßen, Germany

Management system

-

Issue date

03.09.2025

Valid to

02.09.2030

Year of study

2024

Comparability

EPDs of construction products may not be comparable if they do not comply with EN 15804 and are not seen in a building context. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database (including primary and secondary data).

Development and verification of EPD

The declaration was created using the Emidat EPD tool v1.0, developed by Emidat GmbH. The EPD tool has been approved by EPD Norway.

Developer of EPD: Marc Schmidtke
Reviewer of company-specific input data and EPD:
Christian Hummel

Approved

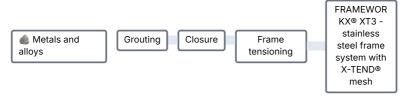
Håkon Hauan, CEO EPD-Norge



Product

Product description

FRAMEWORKX® XT3 is a ready-to-install stainless steel frame system in which the X-TEND® stainless steel cable mesh is enclosed internally in slotted frame profiles. The frames consist of welded stainless steel profiles and are manufactured to fit precisely. The result is a smooth, filigree surface without visible connection points or surrounding cables - ideal for transparent fall protection on floor-to-ceiling windows, Juliette balconies or as railing infill.



FRAMEWORKX® XT3 is ideal for a wide range of indoor and outdoor architectural applications. As a railing infill, it offers reliable fall protection for stairs, balconies, galleries and walkways - both in private residential buildings and in public spaces, e.g. in schools, administration buildings or shopping centers. In outdoor areas, it is used on terraces, roof gardens and bridges and impresses with its weather resistance and corrosion protection. The system is also used as vertical fall protection, e.g. on facades or between storey openings.

Product specification

Name of ingredient	Share of total weight	Country of origin
Metals and alloys	80 - 100 %	Various

Technical data

	Unit	Value
Density	kg / m³	8030.0
Total mass	kg	1.0

Market

Germany



LCA: Calculation rules

Declared unit

1kg

Reference service life

Not defined

Data quality

The foreground data are based on extensive and detailed data collection at the production site of the manufacturer, covering key processes such as raw material sourcing, formulation, and manufacturing. These foreground data are fully linked with corresponding datasets from the background database (ecoinvent 3.10) or with EN15804+A2-compliant EPDs, ensuring consistency, reliability, and maintaining alignment with the latest industry standards.

The overall data representativeness is rated as good with an overall score of 4.28/5, in accordance with EN 15804+A2 Annex E guidance on data quality assessment, considering geographical, technical, and temporal representativeness.

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

	Pro	ducti	ion	Insta	llation		Use stage			End-of-Life				Next product system			
	Raw material supply	Transport	Manufacturing	Transport	Installation Process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Demolition	Transport	Waste Processing	Disposal	Benefits and loads beyond the system boundary
Module	A1	A2	АЗ	A4	A5	B1	B2	В3	В4	B5	В6	В7	C1	C2	СЗ	C4	D
Modules declared	х	х	x	х	MND	MND	MND	MND	MND	MND	MND	MND	х	х	х	x	х
Geography			DE	DE	MND	MND	MND	MND	MND	MND	MND	MND	DE	DE	DE	DE	DE

For the geographies modeled in A1 and A2, refer to Product specification.

Type of EPD: Cradle to gate with options A4, C1, C2, C3, C4 and D

Stage of Material Production and Construction

Module A1: Extraction and processing of raw materials

Module A2: Transportation of raw materials to the plant

Module A3: Steel component production at the plant and waste treatment

Module A4: Transportation to the construction site

Disposal Stage

Module C1: Demolition/Dismantling

Module C2: Transportation of steel demolition waste for processing

Module C3: Sorting of waste components and recycling of steel

Module C4: Disposal of steel to landfill

Credits and burdens outside the system boundaries $% \left(\mathbf{r}\right) =\left(\mathbf{r}\right)$

Module D: Credits and burdens from the use of recycled steel as a replacement for primary steel

Cut-off criteria

No cut-offs were applied.

Allocation

Elementary flows (energy and fuels, ancillary materials and waste) data was collected on production-process-level. Using the total output of the production process in 2024, elementary flows are assigned to 1 declared unit based on



mass.



LCA: Scenarios and additional technical information

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

Transport to the building site (A4)	Value	Unit	
Transported mass	1.00	kg	
Truck: Distance	500.00	km	
Truck: Energy demand	1.58	MJ / t*km	
Truck: Activity	transport, freight, lorry >32 metric ton, EURO6	-	
Truck: Capacity utilization	53.30	%	

Demolition (C1)	Value	Unit	
Diesel dismantling and sorting	0.04	MJ	
Electricity for sorting	0.01	kWh	

90.0% of the steel is recycled, 10.0% is sent to landfill.

Transport to the waste facility (C2)	Value	Unit	
Mass to recycling	0.90	kg	
Mass to landfill	0.10	kg	
Distance to recycling by truck	50.00	km	
Distance to landfill by truck	50.00	km	
Truck: Activity	transport, freight, lorry >32 metric ton, EURO6	-	
Truck: Capacity utilization	53.30	%	
Truck: Distance	50.00	km	
Truck: Energy demand	1.58	MJ / t*km	

Waste processing (C3)	Value	Unit
Material for recycling	0.90	kg

Disposal (C4)	Value	Unit
Material for landfill	0.10	kg

Reuse, recovery and/or recycling potentials (D)	Value	Unit
Amount of secondary material that the system takes in	0	kg
Substitution of primary steel	0.90	kg

Calculation of benefits and loads per EN 15804+A2.



LCA: Results

Core environmental impact indicators

Indicator	Unit	A1-3	A4	C1	C2	С3	C4	D
GWP-total	kg CO₂-eq.	2.95e+00	5.18e-02	8.55e-03	5.18e-03	3.37e-01	6.26e-04	-1.25e+00
GWP-fossil	kg CO₂-eq.	2.93e+00	5.18e-02	8.07e-03	5.18e-03	3.27e-01	6.25e-04	-1.26e+00
GWP-biogenic	kg CO₂-eq.	1.74e-02	2.60e-05	4.64e-04	2.60e-06	9.76e-03	6.47e-08	1.30e-02
GWP-Iuluc	kg CO₂-eq.	2.64e-03	1.84e-05	8.98e-06	1.84e-06	1.53e-04	3.25e-07	-2.87e-04
ODP	kg CFC-11-Eq	1.65e-07	1.08e-09	1.03e-10	1.08e-10	4.18e-09	1.81e-11	-3.26e-09
AP	mol H+-Eq	1.59e-02	1.22e-04	4.38e-05	1.22e-05	1.07e-03	4.43e-06	-4.28e-03
EP-freshwater	kg P-Eq	1.00e-03	3.64e-06	5.84e-06	3.64e-07	1.30e-04	5.19e-08	-6.04e-04
EP-marine	kg N-Eq	3.07e-03	3.21e-05	1.92e-05	3.21e-06	2.77e-04	1.69e-06	-1.02e-03
EP-terrestrial	mol N-Eq	3.27e-02	3.47e-04	1.99e-04	3.47e-05	3.01e-03	1.84e-05	-1.09e-02
POCP	kg NMVOC-Eq	1.06e-02	2.12e-04	5.97e-05	2.12e-05	1.03e-03	6.60e-06	-3.81e-03
ADPE	kg Sb-Eq	6.50e-05	1.48e-07	9.54e-09	1.48e-08	1.13e-06	9.92e-10	-2.92e-08
ADPF	MJ, net calorific value	3.67e+01	7.77e-01	1.17e-01	7.77e-02	4.52e+00	1.53e-02	-1.16e+01
WDP	m³ world Eq deprived	1.30e+00	3.90e-03	9.85e-04	3.90e-04	2.90e-01	4.29e-05	-1.27e-01

GWP-total: Global Warming Potential - total **GWP-fossi**l: Global warming potential - fossil **GWP-biogenic**: Global Warming Potential - biogenic **GWP-luluc**: Global Warming Potential - luluc **ODP**:

Depletion potential of the stratospheric ozone layer **AP**: Acidification potential, Accumulated Exceedance **EP-freshwater**: Eutrophication potential - freshwater **EP-marine**: Eutrophication potential - marine **EP-terrestrial**: Eutrophication potential - terrestrial **POCP**: Photochemical Ozone Creation Potential **ADPE**: Abiotic depletion potential - non-fossil resources **ADPF**: Abiotic depletion potential - fossil resources **WDP**: Water (user) deprivation potential

Additional indicators

Indicator	Unit	A1-3	A4	C1	C2	C3	C4	D
PM	disease incidence	2.16e-07	5.04e-09	1.04e-09	5.04e-10	4.49e-08	1.01e-10	-6.40e-08
IRP	kBq U235-Eq	3.56e-01	9.44e-04	1.04e-03	9.44e-05	8.60e-02	9.77e-06	4.13e-02
ETP-fw	CTUe	7.07e+01	1.84e-01	2.18e-02	1.84e-02	2.46e+00	2.10e-03	-1.15e+02
HTP-c	CTUh	6.45e-08	3.31e-10	2.25e-11	3.31e-11	6.83e-09	2.83e-12	-4.37e-07
HTP-nc	CTUh	6.52e-08	5.13e-10	3.75e-11	5.13e-11	1.50e-08	2.75e-12	4.59e-10
SQP	dimensionless	1.70e+01	7.82e-01	1.46e-02	7.82e-02	1.57e+00	3.02e-02	-1.87e+00

PM: Potential incidence of disease due to PM emissions IRP: Potential Human exposure efficiency relative to U235 ETP-fw: Potential Comparative Toxic Unit for ecosystems HTP-c: Potential Comparative Toxic Unit for humans - cancer effects HTP-nc: Potential Comparative Toxic Unit for humans - non-cancer effects SQP: Potential Soil quality index

IRP: 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.



ETP-fw, HTP-c, HTP-nc and SQP: The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with these indicators.

Use of resources

Indicator	Unit	A1-3	A4	C1	C2	C3	C4	D
PERE	MJ	8.00e+00	1.23e-02	1.65e-02	1.23e-03	1.57e+00	1.42e-04	9.70e-01
PERM	MJ	1.21e-01	0	0	0	-1.09e-01	0	0
PERT	MJ	8.12e+00	1.23e-02	1.65e-02	1.23e-03	1.46e+00	1.42e-04	9.70e-01
PENRE	MJ	2.57e+01	7.77e-01	1.17e-01	7.77e-02	4.52e+00	1.53e-02	-1.16e+01
PENRM	MJ	1.55e+00	0	0	0	-1.39e+00	0	0
PENRT	MJ	2.72e+01	7.77e-01	1.17e-01	7.77e-02	3.13e+00	1.53e-02	-1.16e+01
SM	kg	1.45e-01	0	0	0	0	0	9.00e-01
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m³	3.76e-02	1.13e-04	3.25e-05	1.13e-05	7.02e-03	1.59e-05	-2.08e-03

PERE: Primary energy resources - renewable: use as energy carrier PERM: Primary energy resources - renewable: used as raw materials PERT: Primary energy resources - renewable: total PENRE: Primary energy resources - non-renewable: use as energy carrier PENRM: Primary energy resources - non-renewable: used as raw materials PENRT: Primary energy resources - non-renewable: total SM: Use of secondary material RSF: Renewable secondary fuels NRSF: Non-renewable secondary fuels FW: Net use of fresh water

Waste flows

Indicator	Unit	A1-3	A4	C1	C2	сз	C4	D
HWD	kg	2.98e-01	1.13e-03	2.18e-04	1.13e-04	3.89e-01	1.70e-05	8.52e-02
NHWD	kg	9.21e-01	2.26e-02	2.87e-02	2.26e-03	4.66e-01	3.90e-04	-3.59e+00
RWD	kg	1.80e-05	2.34e-07	3.09e-07	2.34e-08	1.99e-05	2.38e-09	8.61e-06

HWD: Hazardous waste disposed **NHWD**: Non hazardous waste disposed **RWD**: Radioactive waste disposed

Output flows

Indicator	Unit	A1-3	A4	C1	C2	сз	C4	D
CRU	kg	0	0	0	0	0	0	0
MFR	kg	1.39e-04	0	0	0	9.00e-01	0	0
MER	kg	0	0	0	0	0	0	0
EEE	MJ	0	0	0	0	0	0	0
EET	MJ	0	0	0	0	0	0	0

CRU: Components for re-use MFR: Materials for recycling MER: Materials for energy recovery EEE: Exported electrical energy EET: Exported thermal energy

Name	Value	Unit
Biogenic carbon content in product	0	kg C
Biogenic carbon content in accompanying packaging	0	kg C



Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

Electricity consumption in the manufacturing phase is composed from the source below. Electricity is represented by data in ecoinvent 3.10 regionalised for Germany.

Electricity	Unit	Value
Electricity from grid	kg CO₂-eq. / kWh	0.84

Dangerous substances

The product contains no hazardous substances given by the REACH Candidate List or the Norwegian Priority List.

Additional environmental information

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

Indicator	Unit	A1-3	A4	C1	C2	C3	C4	D
GWP-IOBC	kg CO₂-eq.	ND	5.18e-02	8.11e-03	5.18e-03	3.28e-01	6.26e-04	-1.26e+00

GWP-IOBC: Global Warming Potential - Instantaneous oxidation of biogenic carbon



Bibliography

DIN EN ISO 14025:2011-10 DIN EN ISO 14040:2021-02 DIN EN ISO 14044:2021-02

EN 15804:2012+A2:2019

DIN CENTR 15941:2010-11

DIN EN 15942:2022-04

ISO 21930:2017-07

ecoinvent v3.10

PCR

Environmental labels and declarations - Type III environmental declarations - Principles and procedures

Environmental management - Life cycle assessment - Principles and framework

Environmental management - Life cycle assessment - Requirements and guidelines

Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data

Sustainability of construction works - Environmental product declarations - Communication format

business-to-business

Sustainability in buildings and civil engineering works - Core rules for environmental product declarations

of construction products and services

ecoinvent, Zurich, Switzerland, database version 3.10

NPCR 013 Part B for Steel and Aluminium Construction Products

Basic principles and recommendations for describing the dismantling, post use, and disposal stage of construction products: https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2020-07-06_texte_13 0-2020_quidance-document-construction-industry.pdf

ILCD Handbook: https://epica.jrc.ec.europa.eu/uploads/ILCD-Handbook-LCIA-Background-analysis-online-12March2010.pdf

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