ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Qmax with ductile iron edge rail

Manufacturer name: ACO Technologies plc

EPD HUB, HUB-4260

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Valid until 30.10.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

GENERAL INFORMATION

MANUFACTURER

Manufacturer	ACO Technologies plc
Address	ACO Business Park, Hitchin Road, Shefford, Bedfordshire, UK SG17 5TE
Contact details	technologies@aco.co.uk
Website	www.aco.co.uk

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804:2012+A2:2019/AC:2021 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	N/A
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Adam Cane, Head of Sustainability, ACO Technologies plc
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Vera Durão, as an authorised verifier acting for EPD Hub Limited

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer 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 and if they are not compared in a building context.

PRODUCT

Product name	Qmax with Ductile Iron Edge Rail
Additional labels	None
Product reference	32990, 32991, 32800, 32801, 32810, 32811, 32820, 32821, 32830, 32831, 32840, 32841
Place of production	Jensa House, 1 Caxton Rd, Bedford, MK41 0LF, England
Place(s) of installation and use	United Kingdom and Europe
Period for data	Calendar year 2023
Averaging in EPD	Multiple products
Variation in GWP-fossil for A1-A3 (%)	Max +10% Min -1%
GTIN (Global Trade Item Number)	5030810329904, 5030810329911, 5030810328006, 5030810328013, 5030810328105, 5030810328112, 5030810328204, 5030810328211, 5030810328303, 5030810328310, 5030810328402, 5030810328419
NOBB (Norwegian Building Product Database)	N/A
A1-A3 Specific data (%)	100%

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg of Qmax 150 Q-Flow with ductile iron edge rail, 2000 mm long
Declared unit mass	1 kg
GWP-fossil, A1-A3 ($kgCO_2e$)	2.59E+00
GWP-total, A1-A3 ($kgCO_2e$)	2.51E+00
Secondary material, inputs (%)	45.3
Secondary material, outputs (%)	68.9
Total energy use, A1-A3 (kWh)	12.9
Net freshwater use, A1-A3 (m^3)	0.32

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

ACO is one of the world's leading water technology companies, particularly for rainwater and wastewater management. Our mission is "ACO. we care for water." Care in this sense means to be protective and attentive and is deeply anchored in the ACO WaterCycle. This cycle describes the collection, transportation, purification, storage and finally the reuse of this vital resource. Using innovative separation and filter technologies, ACO prevents the contamination of water from fats, fuels, heavy metals and microplastics. In all our products and systems, durability, reusability and a low carbon footprint are of great importance. Responsibility for people, the environment and the world of tomorrow is in ACO's DNA. For generations this belief has shaped the values at our locally rooted but globally active family corporation. Founded in Schleswig-Holstein in 1946, ACO is represented in over 50 countries around the world and is known for proximity to regional markets and business partnerships.

ACO Technologies plc as part of the ACO Group based in the UK specialises in sustainable surface water management systems. ACO Technologies operates advanced manufacturing facilities in Bedfordshire, and is committed to low-carbon, high-performance drainage solutions. ACO production sites are certified according to the ISO 14001 environmental management system, ISO 45001 Health and Safety management system and ISO 9001 quality management system. ACO Technologies plc are also a signatory to the Sciened Based Targets Initiative and United Nations Global Compact, ensuring we align our operations with the UN Sustainable Development Goals.

PRODUCT DESCRIPTION

ACO Qmax® is a high-capacity slot drainage system manufactured from rotationally moulded polyethylene. It has a ductile iron edge rail to protect the channel from vehicle movements. Designed for sustainable drainage (SuDS) and high-traffic applications, Qmax provides combined surface water conveyance and attenuation in a robust, lightweight unit.

Further information can be found at:
www.aco.com

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass %	Material origin
Metals	64.7	India, China and UK
Minerals	0	N/A
Fossil materials	35.3	UK
Bio-based materials	0	N/A

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0.000885
Biogenic carbon content in packaging, kg C	0.0293

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 kg of Qmax 150 Q-Flow with ductile iron edge rail
Mass per declared unit	1 kg
Functional unit	-
Reference service life	60 Years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x		x	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = ND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the energy mix utilised in the factory including Electricity and Natural Gas.

The Qmax channel is manufactured primarily from high-density polyethylene (MDPE), which includes internally recycled material from ACO's own production waste, using a rotational moulding process at ACO's Caxton Road production facility in Bedford, UK. Ductile iron edge rails are produced off-site via sand casting from processed iron ore and are supplied to ACO with a protective coating, ready for manual assembly into the channel body. mild steel components (washers, bolts, and fixings) are fabricated by cutting, bending, and threading operations at external suppliers before final integration.

The manufacturing process (A3) includes:

- Precision rotational moulding of MDPE bodies with minimal post-processing.
- Internal recycling of MDPE trim waste, with up to 16% of product mass re-used in regrind form.
- Manual assembly of ductile iron edge rails and metal fixings.
- Energy use from natural gas (RGGO-backed) for ovens and REGO-certified renewable electricity for all other site operations.
- Electricity calculations include 5% for transmission losses from HVA to MVA.
- No direct metal cutting, welding, or high-emission operations for Qmax at ACO sites; therefore, direct process emissions are minimal.

Packaging for shipment consists of:

- Wooden pallets (kiln-dried softwood, 37.37 kg per pallet) for range Qmax 150, Qmax 225 and Qmax 350.
- Polyester (PET) strapping and minimal PE film for stability.
- Labels and documentation in low-volume paper packaging. All packaging is designed for recycling or energy recovery under EU and UK standard scenarios.

A1–A3 system boundary assumptions include:

A. Upstream transport distances for raw materials and components, based on actual supply chain data and EN 15804 default values where specific distances were not available (e.g., 50 km road).
B. Production losses are allocated by mass, with MDPE trim recycled internally and non-recyclable residues sent for waste processing in line with UK practice.
C. Energy source profiles:
    a. Electricity = UK grid, 100% REGO
    b. Gas = UK grid, 100% RGGO

The use of green energy in manufacturing is demonstrated through contractual instruments (REGOs and RGGOs, etc), and its use is ensured throughout the validity period of this EPD.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Module A4 – Transport to Site

Transport from ACO's production and storage facilities to UK construction stockists and sites is included in Module A4.

Average transport distance

Based on ACO delivery records for Qmax products, an average of 173 km by 16–32 t Euro 6 articulated lorry has been applied. Load factor: between 25% - 58% utilisation is assumed for deliveries with empty return in line with EN 15804 guidance.

Calculation approach: Transport emissions are calculated using the One Click LCA EN 15804 EI 3.10 transport datasets.

Module A5 – Installation of Qmax channels on site includes:

- On-site vehicle movement considered Represents repositioning the unit from unloading to trench (~10 m at 1t load = 0.01 t·km). Rounded up conservatively using 16–32 t Euro 6 articulated lorry.
- On-site handling using compact mechanical lifting equipment (forklifts, telehandlers, or similar) for positioning the 1kg of channel units. Fuel consumption based on machines typically consume 4–8 l/hour. For a 3–5 min lift/move operation per unit, 0.2 l is a reasonable estimate.
- Bed and haunching with concrete to secure the channel in the ground, using ~0.135 m3 of average UK ready-mix C25/30 concrete per meter of channel to meet D400 loading, based on installation drawings for Qmax 150.
- 1% concrete waste considered for rinse water, leftover washout or minor site spillage. Based on WRAP/CIRIA concrete washout estimates.
- Application of ancillary materials such as lubricant jelly for joint sealing; no other auxiliary materials are required.

Waste and End-of-Life Handling in A5

- Packaging waste (wood pallets, PET straps, paper labels) is assumed to be collected separately and either recycled or sent for energy recovery according to UK DEFRA/WRAP 2023 data.
- Concrete waste from trimming or surplus is treated as inert construction waste and assumed to be transported 50 km by 32 t Euro 6 lorry to a local waste processing site.
- All A5 transport emissions are based on EN 15804 default heavy vehicle transport assumptions.

PRODUCT USE AND MAINTENANCE (B1-B7)

No emissions are associated with the use phase of the Qmax product (B1–B5), as the system is passive and has no operational energy, water, or material input during use. The product does not require maintenance or cleaning under normal operation, though periodic inspection for debris is recommended as part of standard SuDS upkeep (B2–B3). Refurbishment and replacement (B4–B5) are not expected within its 60-year design life. Operational energy and water use (B6–B7) are not applicable.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1 – Deconstruction / Demolition:

At end-of-life, Qmax channels and accessories are assumed to be manually removed from the site using mechanical equipment such as hydraulic breakers. Manual separation of metal edge rails (ductile iron, steel) and polymer bodies (MDPE) occurs on-site, as is standard for linear drainage systems.

C2-C4 End of life treatment:

The following used C2-C4 Standard Construction Industry templates from Ecoinvent 3.10.

HDPE, 24% - incineration with energy recovery, 49% recycled, 27% landfill in line with Plastics Europe 2020.

Rubber, 50% - incineration with energy recovery, 25% - recycled, 25% - landfill aligned with EN 50693 for disposal of rubber.

Ductile iron and metal, 85% - recycled, 15% - landfill aligned with World Steel Association, 2020 for treatment of metals.

Concrete, 70% - recycled, 30% - landfill aligned with RC Technical report, 2018.

C2 – Transport to Waste Processing:

Transportation from site to waste processing or recycling facilities where standard ECO Invent data sets where not used (silicone and paper) modelled using a 16–32 tonne truck (average load factor, 85%, backhaul 50%) over a default distance of 150 km, aligned with EN 15804+A2 standards and One Click LCA assumptions.

Module D: Benefits and Loads Beyond the System Boundary:

Module D captures net benefits from material recovery at end-of-life. These include:

Polyethylene (PE / MDPE) components (channel body) follow a 2020 Plastics Europe scenario: 24% recycled, 50% incinerated for energy and heat recovery.

Rubber: Rubber seals and elastomers are treated under EN 50693 with an assumed 50% incineration with electric energy and heat recovery.

Ductile Iron components (e.g. edge rails) are considered to be 95% recycled based on EU end-of-life scenarios following World Steel Association data (2020).

Steel components are assumed to be 85% recycled following World Mild 2024 & ICDA 2023 guidance.

Concrete: 85% recycled and used for Gravel production following RC Technical report, 2018.

Module D: Packaging Paper

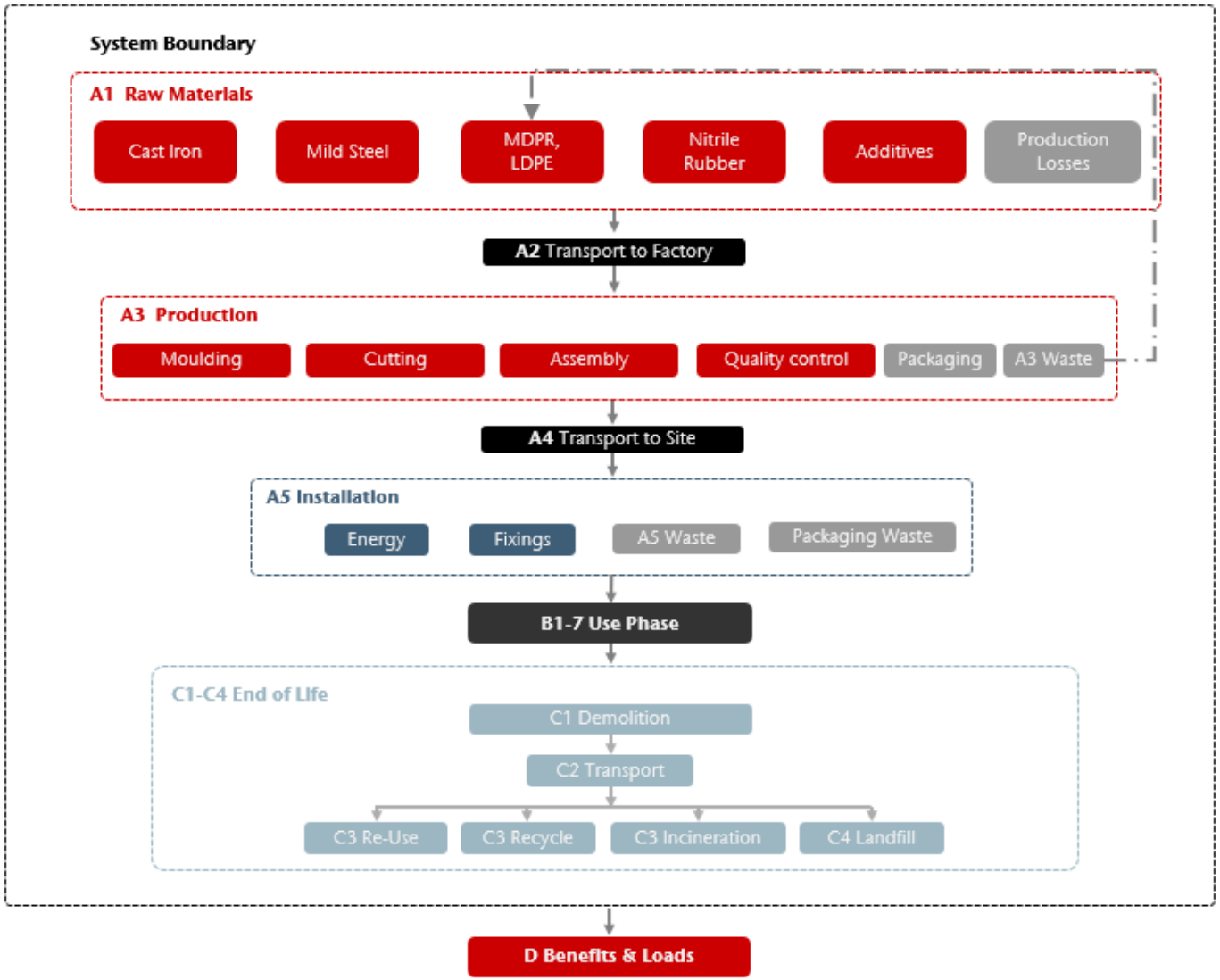
100% of all packaging follows EU disposal pathways aligned with One Click LCA's end-of-life waste scenarios.

Paper: is recycled and used for electrical energy and heat recover.

Plastic Packaging: Polyethylene recycled and/ and used for electrical energy and heat recover.

Wood: chipped for recycling and used for electrical energy and heat recover.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study includes all modules or processes which are stated mandatory in the reference standard and the applied PCR namely A1 – A3, C and D. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

In the analysis only minor components for larger Qmax covered in the appendix (Q550, Q700 and Q900) were not considered. These where additional components to the standard product range and constituted less than 1% of the total product weight.

Staff commuting, maintenance of manufacturing equipment, and capital goods (e.g., tooling, moulds, infrastructure) were excluded from the system boundary in accordance with EN 15804+A2. All exclusions are justified as having a negligible contribution to the overall impacts.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. This include manufacturing output compared to BOM data, Energy use calculations from actual energy used and manufacturing output, packaging data used on the products was validated using site audits and actual transport distance from suppliers. For the later generic transport factors have been used from DEFRA. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage namely Ductile Iron. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	Allocated by mass or volume
Packaging material	Allocated by mass or volume
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

All materials data is based on BOM data from internal product management systems and accurate. 100% of Qmax 150 to Qmax 350 and 99.1% of the Qmax 550 to Qmax 900 materials, components and packaging are covered in the analysis.

Reprocessed Waste was allocated at 10% for each product based on the average volume added to the mix. This is based on annual waste generation, 16% of mass.

Site-specific data was used for ductile iron manufacturing from EPDs supplied by manufacture.

Steel and processing assumptions all come from the ECO Invent library data.

Packaging materials were estimated based on the packaging specification developed for the product. This provides an accurate account of the packaging used. For the Qmax 550 to Qmax 900 range no packaging is used, accept labels, wallets and paper items which have been accounted for in the analysis.

Transport distances have been calculated for all incoming and outgoing transport using google maps (www.google.com/maps) for land journeys and (www.searates.com) for port to port distances. Where assumptions for transport have been made the following table stands.

Destination Region	Standard Distance (km)	Transport Method
UK (Domestic Projects)	200 km	Articulated lorry, 27–32 t, EURO6
EU Export	1,200 km	Articulated lorry, 27–32 t, EURO6
International Export	100 km (road) + 8,000 km (sea)	Lorry + Container Ship

For installation (A5), generic values were applied for diesel, electricity, and handling equipment per guidance from DEFRA and CIRIA. The use of Concrete for haunching are estimated based on typical installation specifications from ACO installation details for D400 loading.

Ecoinvent Construction Library datasets were used for the disposal of plastic, metals, concrete and packaging for recycling, incineration and landfill for C2-4 and D at end of life.

Electricity Mix and Gas Mix were built from REGO and RGGO backed data for upstream energy inputs based on retired assets.

Manufacturing energy was calculated based on the total amount of energy used by the manufacturing site, divided by the total mass of products manufactured. Gas use was calculated for each product based on the total volume of gas, manufacturing time and the number of moulds used.

PRODUCT & MANUFACTURING SITES GROUPING

Type of grouping	Multiple products
Grouping method	Based on a representative product
Variation in GWP-fossil for A1-A3, %	Max +10% Min -1%

The data represents production at a single manufacturing site (ACO Technologies plc, Caxton Road, Bedford, UK) and is based on annual average production volumes for the Qmax range. The dataset is geographically representative of UK production and temporally representative of the 2023 calendar year. Product-specific primary data was used where available.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.10.1 and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology ‘allocation, Cut-off, EN 15804+A2‘.

ENVIRONMENTAL IMPACT DATA

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2.14E+00	8.15E-02	2.89E-01	2.51E+00	1.92E-02	3.17E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.10E-01	6.27E-01	8.23E-02	-1.61E+00
GWP – fossil	kg CO_2e	2.17E+00	8.15E-02	3.38E-01	2.59E+00	1.92E-02	3.07E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.10E-01	6.27E-01	7.57E-02	-1.62E+00
GWP – biogenic	kg CO_2e	-3.85E-02	1.45E-05	-4.90E-02	-8.75E-02	4.18E-06	1.00E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.21E-05	-4.55E-05	6.56E-03	1.06E-02
GWP – LULUC	kg CO_2e	1.61E-03	4.14E-05	5.68E-04	2.22E-03	7.46E-06	3.82E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.12E-04	3.33E-05	3.17E-05	-7.31E-04
Ozone depletion pot.	kg CFC-$_{11}$e	4.05E-08	1.20E-09	1.14E-08	5.31E-08	4.00E-10	1.26E-07	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.96E-09	1.62E-09	1.60E-09	-1.39E-08
Acidification potential	mol H^+e	1.16E-02	1.63E-03	2.04E-03	1.53E-02	4.52E-05	1.02E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.75E-04	1.03E-03	3.93E-04	-7.24E-03
EP-freshwater[2)]	kg Pe	3.36E-04	3.85E-06	1.21E-04	4.60E-04	1.34E-06	1.91E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.09E-05	1.27E-05	4.63E-06	-6.49E-04
EP-marine	kg Ne	1.90E-03	4.05E-04	3.79E-04	2.69E-03	1.19E-05	5.65E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.27E-04	4.44E-04	1.77E-04	-1.51E-03
EP-terrestrial	mol Ne	2.00E-02	4.50E-03	4.13E-03	2.86E-02	1.28E-04	3.44E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.56E-03	4.78E-03	1.63E-03	-1.67E-02
POCP ("smog")[3)]	kg NMVOCe	8.91E-03	1.27E-03	1.47E-03	1.16E-02	7.87E-05	9.91E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.51E-03	1.41E-03	5.87E-04	-5.90E-03
ADP-minerals & metals[4)]	kg Sbe	1.05E-05	1.44E-07	4.32E-06	1.50E-05	5.49E-08	8.06E-06	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.01E-06	9.91E-07	8.93E-08	-1.24E-05
ADP-fossil resources	MJ	4.28E+01	1.05E+00	4.63E+00	4.85E+01	2.88E-01	2.16E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.35E+00	1.40E+00	1.35E+00	-2.08E+01
Water use[5)]	m^3e depr.	9.42E+00	3.71E-03	9.32E-02	9.52E+00	1.47E-03	1.69E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.13E-02	2.02E-02	4.60E-03	-6.44E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. 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 experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	1.72E-07	3.75E-09	2.02E-08	1.96E-07	1.87E-09	5.69E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.45E-08	1.73E-07	8.90E-09	-1.02E-07
Ionizing radiation[6)]	kBq U235e	1.45E-01	6.39E-04	3.55E-02	1.81E-01	3.47E-04	6.43E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.33E-03	2.35E-03	8.62E-04	-5.35E-02
Ecotoxicity (freshwater)	CTUe	9.39E+00	1.09E-01	1.16E+00	1.07E+01	3.39E-02	5.76E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.83E-01	3.33E-01	1.75E-01	-4.91E+00
Human toxicity, cancer	CTUh	9.23E-10	1.60E-11	1.80E-10	1.12E-09	3.19E-12	4.31E-10	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.27E-11	4.10E-11	1.10E-11	-2.72E-10
Human tox. non-cancer	CTUh	1.82E-08	4.11E-10	4.78E-09	2.34E-08	1.86E-10	2.63E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.73E-09	1.72E-09	3.51E-10	-1.25E-08
SQP[7)]	-	1.34E+01	3.13E-01	1.76E+01	3.13E+01	2.90E-01	2.66E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.62E+00	4.99E-01	2.66E+00	-7.16E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	**Unit**	**A1**	**A2**	**A3**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Renew. PER as energy[8)]	MJ	7.45E+00	1.06E-02	4.61E+00	1.21E+01	4.69E-03	1.09E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	7.35E-02	4.54E-02	-2.26E-02	-1.46E+00
Renew. PER as material	MJ	3.16E-02	0.00E+00	8.71E-01	9.02E-01	0.00E+00	-8.71E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	-3.16E-02	4.90E-02
Total use of renew. PER	MJ	7.48E+00	1.06E-02	5.48E+00	1.30E+01	4.69E-03	2.20E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	7.35E-02	4.54E-02	-5.42E-02	-1.41E+00
Non-re. PER as energy	MJ	2.86E+01	1.05E+00	4.62E+00	3.43E+01	2.88E-01	2.20E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.35E+00	-8.32E+00	-2.30E+00	-2.09E+01
Non-re. PER as material	MJ	1.41E+01	0.00E+00	1.03E-02	1.42E+01	0.00E+00	-1.03E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	-1.03E+01	-3.81E+00	3.43E+00
Total use of non-re. PER	MJ	4.28E+01	1.05E+00	4.63E+00	4.85E+01	2.88E-01	2.20E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.35E+00	-1.87E+01	-6.11E+00	-1.75E+01
Secondary materials	kg	4.53E-01	4.92E-04	3.27E-03	4.57E-01	1.25E-04	1.18E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.99E-03	1.02E-03	3.44E-04	6.17E-01
Renew. secondary fuels	MJ	3.37E-04	2.97E-06	1.33E-04	4.73E-04	1.57E-06	6.48E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.51E-05	1.34E-05	7.11E-06	-1.13E-04
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.15E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	3.17E-01	9.94E-05	2.42E-03	3.19E-01	4.25E-05	1.70E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.86E-04	3.03E-04	1.05E-03	-1.46E-02

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1.52E-01	1.55E-03	2.46E-02	1.78E-01	4.17E-04	5.34E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.38E-03	7.69E-03	1.84E-03	-3.66E-01
Non-hazardous waste	kg	9.38E+00	2.46E-02	6.17E-01	1.00E+01	8.34E-03	1.13E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.33E-01	2.59E-01	4.93E-01	-4.31E+00
Radioactive waste	kg	3.16E-04	1.56E-07	8.87E-06	3.25E-04	8.58E-08	9.87E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.32E-06	5.95E-07	2.10E-07	-1.32E-05

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-GHG[9)]	kg CO_2e	2.18E+00	8.15E-02	3.38E-01	2.60E+00	1.92E-02	3.07E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.10E-01	6.27E-01	7.57E-02	-1.62E+00

9) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH4 fossil, CH4 biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.2.5 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO2 is set to zero.

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	100% renewable electricity mix, REGO, UK
Electricity CO2e / kWh	0.07 kg CO_2e/kWh
District heating data source and quality	100% Renewable Gas, RGGO, UK
District heating CO2e / kWh	0.0115 kg CO2e / MJ

Transport scenario documentation A4

Scenario parameter	Value
Fuel and vehicle type. Eg, electric truck, diesel powered truck	Transport, freight, lorry >32 metric ton, EURO6 - Europe
Average transport distance, km	173
Capacity utilization (including empty return) %	10%
Bulk density of transported products	440.09kg/m3
Volume capacity utilization factor	25%

End of life scenario documentation

Scenario information	Value
Collection process – kg collected separately	Scrap metal recycling): 14 kg collected separately Polyethylene (plastic recyclable): 7.5 kg collected separately
Collection process – kg collected with mixed waste	0 kg (All recoverable components assumed to be sorted onsite or at recycling facility)
Recovery process – kg for re-use	0 kg (Product not designed for reuse without reprocessing)
Recovery process – kg for recycling	21.5 kg (14 kg ductile iron + 7.5 kg polyethylene recycled)
Recovery process – kg for energy recovery	0.5 kg (Assumed residuals from polymer components sent to energy recovery)
Disposal (total) – kg for final deposition	0.2 kg (Non-recyclable adhesive, labels, or minor components)
Scenario assumptions e.g. transportation	Materials transported 50 km by road to regional recycling and disposal facilities. End-of-life treatment based on UK construction waste management best practices.

THIRD-PARTY VERIFICATION STATEMENT

EPD Hub declares that this EPD is verified in accordance with ISO 14025 by an independent, third-party verifier. The project report on the Life Cycle Assessment and the report(s) on features of environmental relevance are filed at EPD Hub. EPD Hub PCR and ECO Platform verification checklist are used.

EPD Hub is not able to identify any unjustified deviations from the PCR and EN 15802+A2 in the Environmental Product Declaration and its project report.

EPD Hub maintains its independence as a third-party body; it was not involved in the execution of the LCA or in the development of the declaration and has no conflicts of interest regarding this verification.

The company-specific data and upstream and downstream data have been examined as regards plausibility and consistency. The publisher is responsible for ensuring the factual integrity and legal compliance of this declaration.

The software used in creation of this LCA and EPD is verified by EPD Hub to conform to the procedural and methodological requirements outlined in ISO 14025:2010, ISO 14040/14044, EN 15804+A2, and EPD Hub Core Product Category Rules and General Program Instructions.

Verified tools

Tool verifier: Magaly Gonzalez Vazquez
Tool verification validity: 27 March 2025 - 26 March 2028

Vera Durão, as an authorised verifier acting for EPD Hub Limited

31.10.2025

APPENDIX 1

Below is the list of ACO Qmax channels with ductile Iron edge rails, their corresponding mass and the GWP-total for production stage A1 – A3 and install A5.

GWP-GHG QMAX RANGE (1KG)

Product No.	Product name	Wei (kg)	A1-A3 kg CO2e	A5 kg CO2e
32990	Qmax 150 Q-Flow	1.00	2.59	3.07
32991	Qmax 150 Q-Guard	1.00	2.62	3.07
32800	Qmax 225 Q-Flow	1.00	2.55	4.98
32801	Qmax 225 Q-Guard	1.00	2.63	4.98
32810	Qmax 350 Q-Flow	1.00	2.52	5.30
32811	Qmax 350 Q-Guard	1.00	2.59	5.29
32820	Qmax 550 Q-Flow	1.00	2.61	5.12
32821	Qmax 550 Q-Guard	1.00	2.65	5.12
32830	Qmax 700 Q-Flow	1.00	2.59	5.31
32831	Qmax 700 Q-Guard	1.00	2.63	5.31
32840	Qmax 900 Q-Flow	1.00	2.57	9.38
32841	Qmax 900 Q-Guard	1.00	2.71	9.38

GWP-GHG QMAX RANGE (PRODUCT MASS)

Product No.	Product name	Wei (kg)	A1-A3 kg CO2e	A5 kg CO2e
32990	Qmax 150 Q-Flow – 2m	22.2	57.50	68.22
32991	Qmax 150 Q-Guard – 2m	23.10	60.53	70.99
32800	Qmax 225 Q-Flow – 2m	24.0	61.28	119.5
32801	Qmax 225 Q-Guard – 2m	25.0	65.67	124.5
32810	Qmax 350 Q-Flow – 2m	28.3	71.42	149.9
32811	Qmax 350 Q-Guard – 2m	29.3	75.95	155.1
32820	Qmax 550 Q-Flow – 2m	44.0	114.8	225.2
32821	Qmax 550 Q-Guard – 2m	45.0	119.3	230.3
32830	Qmax 700 Q-Flow – 2m	49.7	128.8	263.8
32831	Qmax 700 Q-Guard – 2m	50.7	133.2	269.1
32840	Qmax 900 Q-Flow – 2m	65.3	167.8	612.5
32841	Qmax 900 Q-Guard – 2m	66.3	179.6	621.9

GWP-GHG QMAX RANGE (PER LINEAR METER

Product No.	Product name	Wei (kg)	A1-A3 kg CO2e	A5 kg CO2e
32990	Qmax 150 Q-Flow – 1m	11.1	28.75	34.11
32991	Qmax 150 Q-Guard – 1m	11.55	30.26	35.49
32800	Qmax 225 Q-Flow – 1m	12	30.64	59.75
32801	Qmax 225 Q-Guard – 1m	12.5	32.84	62.24
32810	Qmax 350 Q-Flow – 1m	14.15	35.71	74.96
32811	Qmax 350 Q-Guard – 1m	14.65	37.98	77.54
32820	Qmax 550 Q-Flow – 1m	22	57.40	112.6
32821	Qmax 550 Q-Guard – 1m	22.5	59.66	115.1
32830	Qmax 700 Q-Flow – 1m	24.85	64.41	131.9
32831	Qmax 700 Q-Guard – 1m	25.35	66.59	134.6
32840	Qmax 900 Q-Flow – 1m	32.65	83.90	306.3
32841	Qmax 900 Q-Guard – 1m	33.15	89.84	310.9