

Statement of Verification

BREG EN EPD No.: 000710

Issue 01

This is to verify that the
Environmental Product Declaration
provided by:
Wrekin Products Ltd



is in accordance with the requirements of:
EN 15804:2012+A2:2019
and
BRE Global Scheme Document SD207

This declaration is for:
1 kg of Street ironwork covers and frames (Unite range)

Company Address

Wrekin Products Ltd
Europa Way,
Britannia Enterprise Park,
Lichfield
WS14 9TZ



Signed for BRE Global Ltd

Hayley Thomson
Scheme Operator

17 June 2025
Date of this Issue

17 June 2025
Date of First Issue

16 June 2030
Expiry Date



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Environmental Product Declaration

EPD Number: **000710**

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE 2023 Product Category Rules (PN 514 Rev 3.1) for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019
Commissioner of LCA study	LCA consultant/Tool
Wrekin Products Ltd Europa Way, Britannia Enterprise Park, Lichfield WS14 9TZ	LCA Tool: BRE LINA A2 LCA Consultant: Bala Subramanian
Functional Unit	Applicability/Coverage
1 kg of Street ironwork covers and frames (Unit range)	Other (please specify). Product specific
EPD Type	Background database
Cradle to Grave	Ecoinvent 3.8
Demonstration of Verification	
CEN standard EN 15804 serves as the core PCR ^a	
Independent verification of the declaration and data according to EN ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	
(Where appropriate ^b)Third party verifier: Jiacheng (Francis) Yu	
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)	
Comparability	
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance	

Information modules covered

Product			Construction		Use stage							End-of-life				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	Related to the building fabric					Related to the building						D
B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4						
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, Recovery and/or Recycling potential
<input checked="" type="checkbox"/>																

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Manufactured at Mamara region of north western Turkey

Distribution facility:
 Wrekin Products Ltd
 Europa Way,
 Britannia Enterprise Park,
 Lichfield
 WS14 9TZ

Construction Product:

Product Description

Street ironwork covers and frames are products made from iron, used to cover holes in the ground surface leading to infrastructure below. They support the loads from traffic or people on the ground surface. For ease of access and function most of them are sited in roads or footways. They typically comprise an openable cover or grate, which sits in a frame that transfers loads to the structure beneath.

The Unite range of products comply with the minimum requirements of the appropriate European and British standards and incorporate enhancements to ensure durability in service. They are specifically intended to provide the lowest whole life cost in situations of high traffic intensity.

The Unite ironwork covers and frames are available in various dimensions and weights. The unite range covers the products which are used for the vehicular and pedestrian areas. To know more about the list of products available in the vehicular and pedestrian areas, please contact the Wrekin products technical team.

Since the manufacturing process and composition are the same across different types, this EPD models 1 kg of Street ironwork covers and frames (Unite range).

Note: Please refer to the end user guidance note at the end of this EPD.

Technical Information

The Unite range of street ironwork covers and frames are made from ductile iron (spheroidal graphite cast iron). One benefit of casting iron is that thicknesses can easily be varied across a component to make provision for different loads that will arise at different locations within the structure which they form. Typically, the minimum thickness of iron that can be reliably cast is 5mm, so the lowest loaded parts may be as thin as this. Elsewhere the thicknesses will be greater, and it can be difficult to determine whether local thickening to incorporate ribs or seatings should be considered to be matters of thickness or profile.

Manhole covers and gully grates comply with:

Property	Standard
<i>Gully tops and manhole tops for vehicular and pedestrian areas Part 1: Definitions, classification, general principles of design, performance requirements and test methods.</i>	BSEN124-1:2015
<i>Gully tops and manhole tops for vehicular and pedestrian areas Part 2: Gully tops and manhole tops made of cast iron.</i>	BSEN 124-2:2015
<i>The products have been manufactured in spheroidal graphite iron in accordance with the designation EN-GJS-500-7, as defined in European Standard EN 1563: 2018. Testing has verified that the required minimum tensile strength of 500Nmm⁻², and minimum elongation of 7% has been achieved.</i>	
Iron is a very dense material and has a density of 7.86 g/cm ³ .	

Note: The technical properties are the same for all unite range street ironwork covers and frames and is taken from the Wrekin products technical data sheet. For more information, please contact the Wrekin Products technical team and please visit <https://www.wrekinproducts.com/>



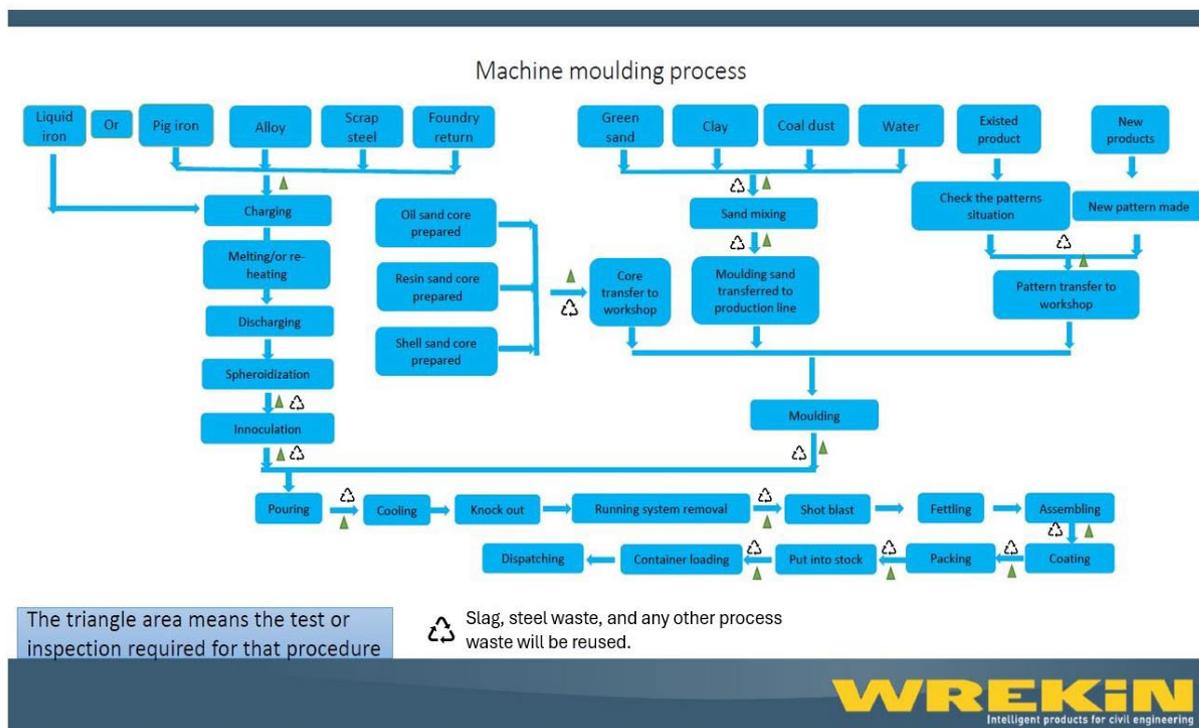
Main Product Contents

Material/Chemical Input	%
Pig Iron	40
Scrap steel	58
Others	2

Note: The above product content is same for all the unite range street ironwork covers and frames.

Manufacturing Process

Process flow diagram



Construction Installation

Iron chamber covers and gully gratings can be considered as either part of the road surface construction or as part of the construction of the chamber beneath. If a cover or grating fails, only the cover and bedding are renewed but some surfacing material is also needed. The aspect which is common to all these is the placement of the iron unit on a mortar bed.

End of Life

C1- Deconstruction:

Selected and installed properly, the end of life should be about 100 years in the future, as the typical service life on average should be extremely long based on case studies of 20-year-old products and their evident stability and low wear. The circumstances that far ahead are difficult to predict but for those outlier products where earlier failures may occur, the iron can be completely recycled and a recycling industry for iron and steel is already well established. Therefore, the products which reached their end-of-life will be removed from the deconstruction sector by using power tools. The fuel used to remove the cover and frame from the deconstruction sector is included in this module C1. Removed frames will be sent to the disposal unit, along with any attached substrate or asphalt pavement.

C2 – Transport:

100km by road has been modelled for module C2 as a typical distance from the demolition site to the disposal unit. However, end-users of the EPD can use this information to calculate the impacts of a bespoke transport distance for module C2 if required.

C3 - Waste Processing:

It is assumed that 95% of the product will be recycled, and the remaining 5% of the product will be sent to landfill.

C4 – Disposal: Unrecovered waste sent to landfill.

Module D: “Benefits and loads beyond the system boundary” (module D) accounts for the environmental benefits and loads resulting from Iron and steel that is used as raw material in the EAF or BOF and that is collected for recycling at end of life. These benefits and loads are calculated by excluding the pre-existing recycled steel that is used in the primary process.

Life Cycle Assessment Calculation Rules

Functional unit description

1 kg of Street ironwork covers and frames (Unite range)

System boundary

This is a Cradle to Grave LCA, reporting all production life cycle stages of modules A1 to A3 and A4 and A5 (transportation and installation), B1-B7 Use stage and end of life stages C1-C4, and D in accordance with EN 15804:2012+A2:2019 and BRE 2023 Product Category Rules (PN 514 Rev 3.1).

Data sources, quality and allocation

The quantity used in the data collection for this EPD is the total quantity of Street ironwork covers and frames (Unite range) manufactured as a proportion of the total manufactured during the data collection period (01/01/21-30/11/21), that was calculated at 5.1% by mass. Generally, Wrekin Products Ltd receives the product from their manufacturing partners and the data used for the LCA modelling is the original data completed by the foundry which is considered to be a contractor to Wrekin in the production of the products given the design and extensive quality control provided by Wrekin. Other products are manufactured in addition to the Street ironwork covers and frames (Unite range), therefore, the allocation of electricity and water consumption and discharge are required, and this has been done by “mass” according to the provisions of the BRE PCR PN514 and EN 15804.

Once the product is manufactured in the foundry, it will be transported to the Wrekin distribution sector which is located in the UK. The transportation used to deliver the products from Turkey to the UK via roadways and waterways has been included in this LCA analysis. In the UK distribution sector, the product will be packed and delivered to the customer site. Therefore, the quantities used in the distribution sector, such as packaging, electricity, natural gas, and water, have been covered. The Wrekin distribution sector distributes another product in addition to the unite range. Therefore, the allocation is required, and this has been done based on the percentage of unite range products distributed, which has been calculated at 6.1% by mass. In other words, by using the mass allocation. Furthermore, during additional processing at the UK distribution site, it has been confirmed that no product wastage has been recorded, except for packaging waste such as wood and metal waste. Non-production waste has been allocated as a percentage of the product processed in a year.

In the foundry, other products are produced in addition to the Unite range therefore the allocation to water, fuel, packaging, waste, non-production waste, water consumption and discharge is required, and it has been allocated by using the “mass” allocation. The manufacturer has confirmed that any slag produced during the melting process has no market value, it is sent to authorised material recycling companies for use as an infill material for road construction.

The functional unit used for this LCA modelling is 1 kg of street ironwork covers and frames (Unite range) this is to allow the end-user of this EPD to enable the impacts to a range of products with the different weight. The original data collection form has been used while doing an LCA analysis and there was a no uplift in the given data. The manufacture has used FeSi in the raw material input but there are no suitable datasets in the Ecoinvent 3.8 therefore the suitable proxy has been used to complete the LCA analysis.

Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e., raw material production) from the ecoinvent 3.8 database. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN15804. During the foundry process, the manufacturer confirmed that scrap metal is used as an input material; therefore, the scrap metal dataset from ecoinvent has been used.

ISO14044 guidance. Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e., identical technology).	There is approximately 1-2 years between the Ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific European datasets have been selected from the ecoinvent LCI for this LCA. Manufacturing unit and the distribution unit uses the national grid electricity so therefore the national grid electricity dataset has been used for the LCA modelling (Ecoinvent 3.8) i.e., Electricity, Turkey consumption mix (kWh) used for the manufacturing and Electricity, UK consumption mix (kWh) used for the UK distribution.

The GWP carbon footprint for using 1 kWh of electricity, Turkey is 0.6572 in kgCO₂e/kWh and for 1 kWh of electricity, UK is 0.3122 in kgCO₂e/kWh.

The manufacturer and distributor also used the Natural gas for office heating, so therefore the emission factor for Natural gas (EU), which is used at turkey manufacturing unit for using 1kWh of natural gas is 0.2564 and for the UK natural gas emission factor is 0.232 kgCO₂e/kWh.

The quality level of time representativeness is also Very Good as the background LCI datasets are based on ecoinvent v3.8 which was compiled in 2021. Therefore, there is less than 5 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

In the foundry process, all raw materials and energy input to the manufacturing process have been included, except for direct emissions to water and soil, which are not measured. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items.

In the UK distribution unit, the energy, water, and packaging involved in product distribution are included. No ancillary materials are used in the distribution facility, as there is some additional packaging involved, and the packaging quantity is accounted for in the analysis. No direct product waste has been recorded, and there are no emissions to air, water, or soil.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			GWP-total	GWP-fossil	GWP-biogenic	GWP-luluc	ODP	AP	EP-freshwater
			kg CO ₂ eq	kg CFC11 eq	mol H ⁺ eq	kg (PO ₄) ³⁻ eq			
Product stage	Raw material supply	A1	1.02E+00	1.02E+00	1.59E-04	6.26E-04	8.31E-08	4.32E-03	4.12E-04
	Transport	A2	1.84E-01	1.84E-01	1.02E-04	9.17E-05	4.07E-08	2.38E-03	1.01E-05
	Manufacturing	A3	1.17E+00	1.18E+00	-1.73E-02	7.39E-03	2.92E-08	7.02E-03	1.12E-03
	Total	A1-3	2.38E+00	2.39E+00	-1.70E-02	8.11E-03	1.53E-07	1.37E-02	1.54E-03
Construction process stage	Transport	A4	3.31E-02	3.31E-02	2.82E-05	1.30E-05	7.65E-09	1.34E-04	2.13E-06
	Construction	A5	9.54E-03	9.53E-03	3.03E-06	4.29E-06	1.90E-09	4.56E-05	7.20E-07
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% Recycling and 5% Landfill (Company scenario)									
End of life	Deconstruction, demolition	C1	3.24E-01	3.24E-01	1.14E-04	3.24E-05	6.93E-08	3.37E-03	1.00E-05
	Transport	C2	1.66E-02	1.66E-02	1.42E-05	6.53E-06	3.85E-09	6.75E-05	1.07E-06
	Waste Processing	C3	6.70E-02	3.09E-02	3.47E-02	2.27E-05	3.03E-09	1.53E-04	9.42E-06
	Disposal	C4	2.64E-04	2.63E-04	2.61E-07	2.49E-07	1.07E-10	2.48E-06	2.41E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-6.23E-01	-6.25E-01	1.96E-03	-1.77E-04	-2.50E-08	-2.27E-03	-2.47E-04

GWP-total = Global warming potential, total;
 GWP-fossil = Global warming potential, fossil;
 GWP-biogenic = Global warming potential, biogenic;
 GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;
 AP = Acidification potential, accumulated exceedance; and
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

			Parameters describing environmental impacts						
			EP-marine	EP-terrestrial	POCP	ADP-mineral & metals	ADP-fossil	WDP	PM
			kg N eq	mol N eq	kg NMVOC eq	kg Sb eq	MJ, net calorific value	m ³ world eq deprived	disease incidence
Product stage	Raw material supply	A1	9.28E-04	9.78E-03	4.67E-03	9.62E-06	1.31E+01	1.49E-01	2.50E-07
	Transport	A2	6.14E-04	6.79E-03	1.84E-03	5.26E-07	2.65E+00	1.04E-02	1.27E-08
	Manufacturing	A3	1.18E-03	1.06E-02	2.93E-03	1.54E-06	1.47E+01	3.47E-01	2.99E-08
	Total (Consumption grid)	A1-3	2.72E-03	2.72E-02	9.43E-03	1.17E-05	3.05E+01	5.06E-01	2.93E-07
Construction process stage	Transport	A4	4.04E-05	4.42E-04	1.35E-04	1.15E-07	5.00E-01	2.25E-03	2.85E-09
	Construction	A5	1.38E-05	1.46E-04	4.39E-05	3.41E-08	1.36E-01	1.99E-03	7.75E-10
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% Recycling and 5% Landfill (Company scenario)									
End of life	Deconstruction, demolition	C1	1.49E-03	1.63E-02	4.50E-03	1.67E-07	4.45E+00	1.03E-02	9.19E-08
	Transport	C2	2.03E-05	2.22E-04	6.80E-05	5.78E-08	2.51E-01	1.13E-03	1.43E-09
	Waste processing	C3	6.90E-05	4.64E-04	1.31E-04	7.19E-07	2.99E-01	6.54E-03	2.65E-09
	Disposal	C4	8.61E-07	9.42E-06	2.74E-06	6.01E-10	7.35E-03	3.37E-04	4.99E-11
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.38E-04	-5.71E-03	-3.14E-03	-4.71E-07	-6.32E+00	-4.48E-02	-4.18E-08

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;
 EP-terrestrial = Eutrophication potential, accumulated exceedance;
 POCP = Formation potential of tropospheric ozone;
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and
 PM = Particulate matter.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts			IRP	ETP-fw	HTP-c	HTP-nc	SQP
			kBq U ²³⁵ eq	CTUe	CTUh	CTUh	dimensionless
Product stage	Raw material supply	A1	6.42E-02	2.96E+01	4.94E-09	1.80E-08	2.60E+00
	Transport	A2	1.32E-02	1.95E+00	8.37E-11	1.86E-09	1.41E+00
	Manufacturing	A3	3.30E-02	1.29E+01	4.44E-10	3.49E-08	4.24E+00
	Total (Consumption grid)	A1-3	1.10E-01	4.44E+01	5.47E-09	5.47E-08	8.26E+00
Construction process stage	Transport	A4	2.57E-03	3.90E-01	1.26E-11	4.09E-10	3.44E-01
	Construction	A5	8.25E-04	1.07E-01	4.97E-12	1.10E-10	8.96E-02
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% Recycling and 5% Landfill (Company scenario)							
End of life	Deconstruction, demolition	C1	2.00E-02	2.60E+00	1.01E-10	1.89E-09	5.66E-01
	Transport	C2	1.29E-03	1.96E-01	6.35E-12	2.06E-10	1.73E-01
	Waste processing	C3	3.37E-03	2.86E+00	5.04E-11	8.44E-10	9.56E-01
	Disposal	C4	3.27E-05	4.64E-03	1.18E-13	3.05E-12	1.54E-02
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.12E-02	-1.87E+01	-3.34E-09	-1.29E-08	-1.23E+00

IRP = Potential human exposure efficiency relative to U235;
ETP-fw = Potential comparative toxic unit for ecosystems;
HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and
SQP = Potential soil quality index.

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	5.74E-01	0.00E+00	5.74E-01	1.20E+01	8.76E-01	1.29E+01
	Transport	A2	3.20E-02	0.00E+00	3.20E-02	2.60E+00	0.00E+00	2.60E+00
	Manufacturing	A3	2.73E+00	3.20E-01	3.05E+00	1.57E+01	2.29E-02	1.58E+01
	Total (Consumption grid)	A1-3	3.33E+00	3.20E-01	3.65E+00	3.04E+01	8.99E-01	3.13E+01
Construction process stage	Transport	A4	7.04E-03	0.00E+00	7.04E-03	4.91E-01	0.00E+00	4.91E-01
	Construction	A5	-8.20E-02	8.47E-02	2.71E-03	-6.58E-02	1.87E-01	1.21E-01
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% Recycling and 5% Landfill (Company scenario)								
End of life	Deconstruction, demolition	C1	2.49E-02	0.00E+00	2.49E-02	4.36E+00	0.00E+00	4.36E+00
	Transport	C2	3.54E-03	0.00E+00	3.54E-03	2.47E-01	0.00E+00	2.47E-01
	Waste processing	C3	2.56E-02	0.00E+00	2.56E-02	1.58E-01	0.00E+00	1.58E-01
	Disposal	C4	6.27E-05	0.00E+00	6.27E-05	7.22E-03	0.00E+00	7.22E-03
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-1.30E-01	0.00E+00	-1.30E-01	-6.26E+00	0.00E+00	-6.26E+00

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
 PERM = Use of renewable primary energy resources used as raw materials;
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy 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 resource

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m ³
Product stage	Raw material supply	A1	1.69E-03	0.00E+00	0.00E+00	3.87E-03
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	2.57E-04
	Manufacturing	A3	2.09E-03	1.01E-07	0.00E+00	9.32E-03
	Total (Consumption grid)	A1-3	3.78E-03	1.01E-07	0.00E+00	1.34E-02
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	5.57E-05
	Construction	A5	1.48E-05	0.00E+00	0.00E+00	4.74E-05
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% Recycling and 5% Landfill (Company scenario)						
End of life	Deconstruction, demolition	C1	1.70E-03	0.00E+00	0.00E+00	2.54E-04
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	2.80E-05
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	1.61E-04
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	7.88E-06
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-7.47E-04	0.00E+00	0.00E+00	-1.09E-03

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing waste categories			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	1.02E-01	1.93E+00	3.26E-05
	Transport	A2	3.10E-03	4.57E-02	5.78E-02
	Manufacturing	A3	8.87E-02	5.23E+00	2.37E-05
	Total (Consumption grid)	A1-3	1.94E-01	7.21E+00	5.79E-02
Construction process stage	Transport	A4	5.51E-04	9.79E-03	3.38E-06
	Construction	A5	1.98E-04	3.31E-03	8.36E-07
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00
95% Recycling and 5% Landfill (Company scenario)					
End of life	Deconstruction, demolition	C1	5.85E-03	4.09E-02	3.07E-05
	Transport	C2	2.77E-04	4.92E-03	1.70E-06
	Waste processing	C3	2.06E-03	6.59E-02	9.21E-07
	Disposal	C4	7.65E-06	1.08E-04	4.82E-08
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	-5.77E-02	-1.19E+00	-6.70E-06

HWD = Hazardous waste disposed;
 NHWD = Non-hazardous waste disposed;
 RWD = Radioactive waste disposed

LCA Results (continued)

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Other environmental information describing output flows – at end of life								
			CRU	MFR	MER	EE	Biogenic carbon (product)	Biogenic carbon (packaging)
			kg	kg	kg	MJ per energy carrier	kg C	kg C
Product stage	Raw material supply	A1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Transport	A2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Manufacturing	A3	0.00E+00	2.23E-03	6.16E-09	1.99E-04	0.00E+00	-8.77E-03
	Total (Consumption grid)	A1-3	0.00E+00	2.23E-03	6.16E-09	1.99E-04	0.00E+00	-8.77E-03
Construction process stage	Transport	A4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Construction	A5	0.00E+00	1.57E-02	2.00E-10	0.00E+00	2.69E-03	0.00E+00
Use stage	Use	B1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Maintenance	B2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Repair	B3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Replacement	B4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Refurbishment	B5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational energy use	B6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Operational water use	B7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
95% Recycling and 5% Landfill (Company scenario)								
End of life	Deconstruction, demolition	C1	0.00E+00	1.58E-08	2.53E-10	0.00E+00	0.00E+00	0.00E+00
	Transport	C2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Waste processing	C3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Disposal	C4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EEE = Exported Electrical Energy
EET = Exported Thermal Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Products are manufactured in Turkey and then transported to the UK warehouse for final distribution. When dispatching from the three warehouses in mainland Britain, records are kept of the customer site address and the quantity of ironwork ordered. The postcodes to which goods were dispatched from the three warehouse sites, along with the weight of the product, and the straight-line distance from the warehouse to the grid coordinates of the postcode are recorded. A modification factor of 1.29 is applied to the straight-line distance to derive the estimated road distance. This factor was derived by comparing straight-line distances with the road route distance using Google Maps for 1% of all journeys		
	Road transport (Warehouse to construction site)	Lorry 16-32 metric ton	199 km
	Capacity utilisation (incl. empty returns)	%	26
	Bulk density of transported products	kg/m ³	915.9
A5 – Installation in the building	Iron chamber covers and gully gratings can be considered either as part of the road surface construction or as part of the chamber construction beneath. If a cover or grating fails, only the cover and bedding are renewed, though some surfacing material may also be required. The common factor in all these cases is the placement of the iron unit on a mortar bed.		
	The Street ironwork covers and frames will be installed by using machinery. In this LCA analysis, the energy used by the machines is included in the analysis and the sand, mortar, and water quantities used to install the product are not included, as they are not provided by Wrekin products. To calculate the installation impacts, please refer to the relevant product EPD.		
	The quantity used to pack the product in the factory is considered as a waste during the installation and it's reported in the A5 waste section.		
	Electricity	kWh	0.0005
	Water for mixing mortar	kg	0.025
Reference service life	50 years		
B1-B7 Use stage	There won't be any activities on site once the product is installed, therefore no impacts in use stage (B1-B7).		
End of life	At the end of life, manholes are removed from the pavements and will be sent to recycling unit. The end-of-life stage starts when the product is replaced, dismantled, and does not provide any further function.		
C1- Deconstruction	Selected and installed properly, the end of life should be about 50 years in the future, as the typical service life on average should be extremely long based on case studies of 20-year-old products and their evident stability and low wear. The circumstances that far ahead are difficult to predict but for those outlier products where earlier failures may occur, the iron can be completely recycled and a recycling industry for iron and steel is already well established. Therefore, the products which reached their end-of-life will be removed from the deconstruction sector by using the power tools. The fuel used to remove the frames from the deconstruction sector is mentioned below. Removed cover and frame will be send to the disposal unit, along with any attached substrate or asphalt pavement.		
	At the deconstruction site, its assumed as 100% recovery for the product.		
	Diesel used to remove paving and old bedding material	0.092	Litres
Waste	Road paving materials (Broken tarmac, concrete and mortar) to recycling	kg	0.22

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
C2 – Transport	100km by road has been modelled for module C2 as a typical distance from the demolition site to the disposal unit. However, end-users of the EPD can use this information to calculate the impacts of a bespoke transport distance for module C2 if required.		
	Recovered product taken to the recycling unit	Road transport	16–32-ton
	Distance: Deconstruction unit to pre-processing unit	Km	100
C3 - Waste processing	The street ironwork covers and frames are manufactured using a moulding process. During this process, iron and scrap steel are mixed with certain chemicals to produce the final product, which is considered the finished ironwork cover. According to the BRE PCR EN 15804 3.1, 95% of the steel product will be recycled, while the remaining 5% is treated as a natural loss during the recycling process and sent to landfill.		
	Waste ironwork covers and frames to recycling	%	95
	Iron waste to recycling	Kg	0.95
C4 – Disposal	95% of iron are recycled at the End of life and it is assumed as 5% as Landfill	kg	0.05
Module D	<p>“Benefits and loads beyond the system boundary” (module D) accounts for the environmental benefits and loads resulting from Iron and steel that is used as raw material in the EAF or BOF and that is collected for recycling at end of life. These benefits and loads are calculated by excluding the pre-existing recycled steel that is used in the primary process.</p> <p>1 kg of the product at the end of its working life, becomes 0.95 kg of scrap iron as a small percentage will have been lost due to wear, this 95% of the product will be recycled. In order to calculate the benefits of the product at Module D, the pre-existing recycled content will be excluded, i.e., 0.58kg arising from the original input of scrap steel should be avoided, and the amount recovered from the original input of pig iron recovered at C1, i.e., 0.37, should be considered in Module D. Therefore, the benefits of recycling pig iron have been accounted for in Module D.</p> <p>In line with this, 0.37 kg of Iron recovered from the demolition sites can be used to offset the impacts of 0.37 kg of virgin iron material in A1, and it is assumed that there is a 100% recycling yield from the recycling process.</p> <p>Benefits due to recycling of Pig Iron – 0.37 kg</p>		

End user guidance:

EN15804 A2 EPD Unite product refers to the following products from Wrekin Products Limited defined by their clear opening and depth of frame with the following features:

- At least two cover elements manufactured from spheroidal cast iron
- A largely rectangular or circular frame aperture
- Near vertical frame side walls
- Horizontal frame flanges to interface with surrounding paving
- Both lifting keyways and prising features to aid cover removal
- Either or both raised chequer or grill features to increase traction
- Cover security features comprising either a hinge or depth of insertion not less than 25mm
- Assemblies over 50kg feature frame lifting features
- Where hinged, hinges open to 100 degrees and/or lock out
- Flanges textured on both sides to engage and encourage adhesion with mortar
- Bulbous flange edges, the diameter of which is at least 250% x flange thickness

- Solid surface covers are equipped with safety keyways and anti-blockage features to aid lifting key entry
- Solid surface covers have indexed corners to ensure correct fitment
- Cover elements feature at least one universal beam with a depth of at least 75mm from the cover surface
- 3-point seating to remove the opportunity for any rocking under traffic loads
- Frame gussets compliant with BS7903
- Frames fitted with raised non-return lifting features to enable safe, ergonomic lifting with BS7903 lifting keys
- A minimum weight of 40kg
- A maximum weight of 480kg.

The below product families are for the Unite range products,

- **Unite D400 double triangular access covers**
- **Unite E600 double triangular access covers**
- **Unite D400 hinged double triangular gully gratings**

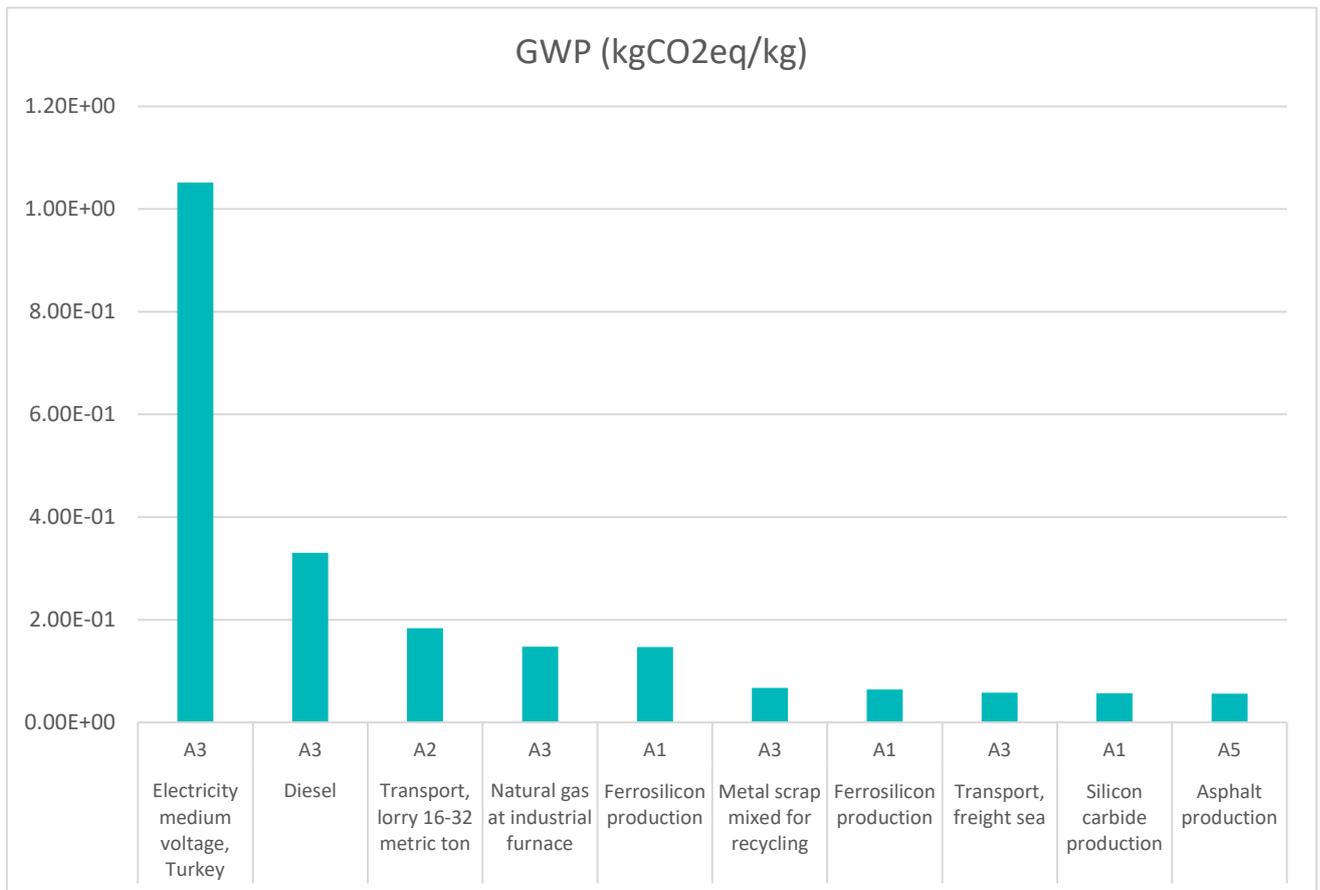
Note: To know more about the individual product name, dimension and code, please contact Wrekin products technical team.

How to use the results of this EPD:

The GWP total of 1 kg of street ironwork covers and frames (Unite range) is 2.39E+00 kgCO₂eq (A1 to A3). Therefore, the end user of this EPD can multiply the weight of the manhole product by this value to calculate the bespoke impact.

Interpretation of results

The bulk of the environmental impacts are attributed to the manufacturing of Street ironwork covers and frames (Unite range) covered by information modules A1-A3 of EN15804:2012+A2:2019. The bar chart represents the Global Warming Potential (GWP) in kg CO₂-equivalent per kg for various activities and materials. The highest GWP contributor is "Electricity medium voltage, Turkey" (A3). "Diesel" (A3) follows as a major contributor, indicating the environmental impact of fuel combustion. Transportation via lorries (A2) and industrial processes such as "Ferrosilicon production" (A1) and "Natural gas at industrial furnace" (A3) also have significant emissions. Lower GWP contributors include "Metal scrap mixed for recycling" (A3), "Transport, freight sea" (A3), and "Asphalt production" (A5). The results suggest that decarbonising electricity production, improving fuel efficiency, and optimising industrial processes could significantly reduce carbon emissions.



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- BS EN 124-1:2015 - Gully tops and manhole tops for vehicular and pedestrian areas - Definitions, classification, general principles of design, performance requirements and test methods
- BSEN 124-2:2015 - Gully tops and manhole tops for vehicular and pedestrian areas Part 2: Gully tops and manhole tops made of cast iron.
- BS EN 1563 - Founding. Spheroidal graphite cast irons.