

## Statement of Verification

BREG EN EPD No.: 000274

Issue 02

This is to verify that the  
**Environmental Product Declaration**  
provided by:  
**Midland Lead**



is in accordance with the requirements of:  
**EN 15804:2012+A1:2013**  
and  
**BRE Global Scheme Document SD207**

This declaration is for:  
**Cast Lead Sheet**

### Company Address

Kiln Way  
Woodville  
Swadlincote  
Derbyshire  
DE11 8ED



Emma Baker  
Operator

06 October 2023  
Date of this Issue

31 March 2020  
Date of First Issue

30 March 2025  
Expiry Date



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## Environmental Product Declaration

**EPD Number: 000274**

### General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	LCA consultant/Tool
Midland Lead Kiln Way Woodville Swadlincote Derbyshire DE11 8ED	BRE LINA v 2.0
Declared Unit	Applicability/Coverage
1 tonne of Cast Lead Sheet.	Manufacturer specific product
EPD Type	Background database
Cradle to Gate	ecoinvent v3.2

#### Demonstration of Verification

CEN standard EN 15804 serves as the core PCR <sup>a</sup>

Independent verification of the declaration and data according to EN ISO 14025:2010

Internal  External

(Where appropriate <sup>b</sup>)Third party verifier:  
Jane Anderson

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+A1:2013. 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+A1:2013 for further guidance.

## Information modules covered

Product			Construction		Use stage							End-of-life				Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building						
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

## Manufacturing site

Midland Lead  
 Kiln Way  
 Woodville  
 Swadlincote  
 Derbyshire  
 DE11 8ED

## Construction Product

### Product Description

Lead sheet cladding of varying thickness usually (0.44mm to 3.55mm) are widely used in the construction industry for roofing and flashing applications. They are also used for radiation protection (sheet lead-lined boards) in X-ray rooms in hospitals and scanning equipment.

### Technical Information

The table below covers the basic technical properties of the lead sheet product.

Property	Value, Unit
Purity	99.9%
Quality Standard	BBA 86/1764
Tolerance	+/- 5%
Recycled Content	100%
Guarantee	60 years



### Main Product Contents

Material/Chemical Input	%
Recycled lead	100

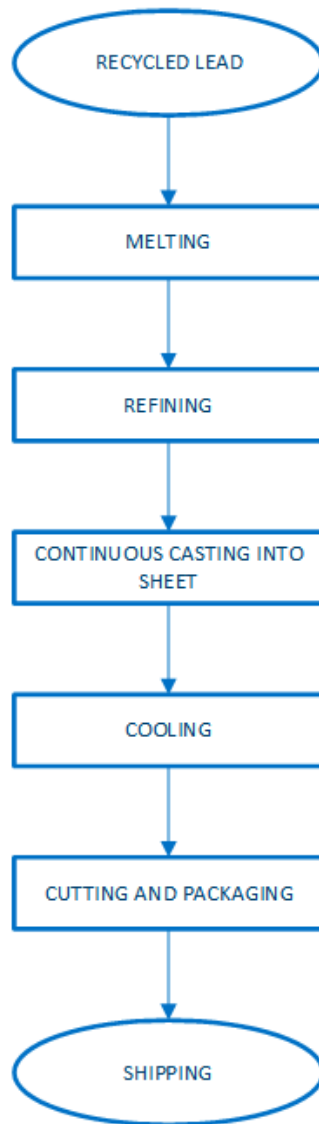
### Manufacturing Process

The process starts with recycled lead, consisting mostly of old roofing sheets and pipes which is separated into two batches based on the bismuth content. It is then loaded into the melting furnace with appropriate proportions of the two batches as melting just the recycled lead with high bismuth content would result in large emissions from the furnace. The furnace is heated to 440°C using a natural gas burner. Impurities and dross that arise during the melting process are collected using a mechanical skimmer. The dross collected is stored in metal barrels, which are sent for further recovery.

The molten lead is transferred to a refining kettle where it is churned with an oxidising agent such as sodium nitrate for several hours (Harris Process). Impurities present in recycled lead are predominantly antimony, arsenic and tin. These elements are more reactive than lead and as a result can be chemically removed by preferential oxidation. The impurities are separated from the lead and get suspended in the flux as sodium arsenate, antimonate and stannate (tin); any zinc is removed as zinc oxide. The flux and lead are separated, and impurities may be extracted from the flux.

The refining process results in 99.99% pure lead which is then transferred to a large casting tank. This is the stage where continuous casting of the sheet begins. The sheet is then cut into the correct length for each product, and then packaged and shipped.

Process flow diagram



## Life Cycle Assessment Calculation Rules

### Declared unit description

1 tonne of Cast Lead Sheet.

### System boundary

This is a cradle-to-gate LCA following the modular design defined in EN 15804:2012+A1:2013. The LCA models and reports the production stage modules, A1 to A3.

The product stage covered by these modules includes the provision of all materials, products and energy, as well as waste processing up to the end-of-waste state (i.e. no longer considered a waste) or disposal of final residues during the product stage.

Upstream processes relating to resource extraction are included in the system. All energy used in the factory and factory support offices on site is included. Maintenance of equipment is not included.

### Data sources, quality and allocation

Manufacturer-specific data from Midland Lead covering a production period from 1<sup>st</sup> January 2018 to 31<sup>st</sup> December 2018 from the Kiln Way site has been used for this EPD.

Only Cast Lead Sheet is made at the Kiln Way site so no allocation of site data was required.

The supporting LCA study was carried out using BRE LINA v2.0. Secondary data is from the BRE LINA database v2.0.59 and the background LCI datasets are based on ecoinvent v3.2 (2015). Where no exact match datasets were available to represent ancillary materials, other ecoinvent v3.2 proxy datasets were used.

### Cut-off criteria

No inputs or outputs have been excluded. The inventory process in this LCA includes all data related to raw material, packaging material and consumable items, and the associated transport to the manufacturing site. Process energy and water use, direct production waste and non-production waste are included.

## LCA Results

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

### Parameters describing environmental impacts

			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO <sub>2</sub> equiv.	kg CFC 11 equiv.	kg SO <sub>2</sub> equiv.	kg (PO <sub>4</sub> ) <sup>3-</sup> equiv.	kg C <sub>2</sub> H <sub>4</sub> equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	1.11E+02	2.17E-05	6.82E-01	1.79E-01	8.86E-02	3.62E-04	2.56E+03

GWP = Global Warming Potential;  
ODP = Ozone Depletion Potential;  
AP = Acidification Potential for Soil and Water;  
EP = Eutrophication Potential;

POCP = Formation potential of tropospheric Ozone;  
ADPE = Abiotic Depletion Potential – Elements;  
ADPF = Abiotic Depletion Potential – Fossil Fuels;

### Parameters describing resource use, primary energy

			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	7.22E+2	3.50E-4	7.22E+2	2.89E+3	0.00E+0	2.89E+3

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

### 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 <sup>3</sup>
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	1.34E+3	0.00E+0	0.00E+0	1.16E+0

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)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG
	Total (of product stage)	A1-3	1.11E+0	3.04E+1	1.30E-2

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

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	3.33E+2	5.53E+0	0.00E+0	0.00E+0

CRU = Components for reuse;  
 MFR = Materials for recycling

MER = Materials for energy recovery;  
 EE = Exported Energy

## References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

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CIRIA Water Key Performance Indicators and benchmarks for offices and hotels. Waggett, R; Arotzky, C. Publication C657, London, CIRIA, 2006.