

## Statement of Verification

BREG EN EPD No.: 000392

Issue 02

This is to verify that the

### Environmental Product Declaration

provided by:

**CCL Scandinavia A/S**



is in accordance with the requirements of:

**EN 15804:2012+A1:2013**

and

**BRE Global Scheme Document SD207**

This declaration is for:

**1 kilogram of CE-marked Corrugated Duct according to EN 523 "Steel strip sheats for prestressing tendons", Category 1 and Category 2**

### Company Address

Ny Vestergårdsvej 11  
DK 3500 Værløse  
Denmark



*Emma Baker*

Emma Baker  
Operator

29 March 2022  
Date of this Issue

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Date of First Issue

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Expiry Date



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## Environmental Product Declaration

EPD Number: 000392

### General Information

| EPD Programme Operator                                                                                                                                                                                                                                                                                                                  | Applicable Product Category Rules                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| BRE Global<br>Watford, Herts<br>WD25 9XX<br>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                                                                                                                                     |
| CCL International<br>Unit 8,<br>Millennium Drive,<br>Leeds,<br>LS11 5BP                                                                                                                                                                                                                                                                 | Pat Hermon BRE LINA v2                                                                                                                                  |
| Declared Unit                                                                                                                                                                                                                                                                                                                           | Applicability/Coverage                                                                                                                                  |
| 1kg Corrugated Duct                                                                                                                                                                                                                                                                                                                     | Product Average.                                                                                                                                        |
| 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<br><input type="checkbox"/> Internal <input checked="" type="checkbox"/> External                                                                                                                                                                   |                                                                                                                                                         |
| (Where appropriate <sup>b</sup> ) Third party verifier:<br>Nigel Jones                                                                                                                                                                                                                                                                  |                                                                                                                                                         |
| a: Product category rules<br>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 |
|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|-----------------------------|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|--------------------------|-----------------------------------------------|
| A1                                  | A2                                  | A3                                  | A4                       | A5                          | Related to the building fabric |                          |                          |                          |                          | Related to the building  |                          | 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"/> | <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

CCL Scandinavia A/S  
Ny Vestergårdsvej 11  
DK 3500 Værløse

## Construction Product

### Product Description

This LCA covers corrugated steel ducts. Corrugated steel ducts are used in bonded post-tensioning and precast concrete elements and can also be used to create recesses.

All standard ducts are manufactured in accordance with the harmonized standard EN523 and are CE-marked, as per EU building materials regulations. The Declaration of Performance for standard ducts can be downloaded from the website.

Ducts are available in a range of sizes and types where:

- Type BR are ducts according to EN523 Category 1.
- Type BRM are ducts according to EN 523 Category 1 working as couplers.
- Type KR are ducts according to EN523 Category 2.
- Type KRM are ducts according to EN 523 Category 2 working as couplers.

| Description: | Ø inside / Weight (Functional unit):                       |
|--------------|------------------------------------------------------------|
| BR range     | Ø 30 mm / 0,41 kg per meter - Ø 130 mm / 2,20 kg per meter |
| KR range     | Ø 80 mm / 1,42 kg per meter - Ø 130 mm / 2,70 kg per meter |

Standard dimensions and weights according to product specification.

Other diameters can be manufactured on request.

This is an average EPD covering all corrugated ducts produced over the course of 1 year

## Technical Information

Type BR:

| Essential characteristics                    | Document                                 | Standard                       |
|----------------------------------------------|------------------------------------------|--------------------------------|
| Material thickness                           | Declaration of Performance, B-07-30-03-E | EN 523 Category 1              |
| Water tightness                              | Declaration of Performance, B-07-30-03-E | EN 523 Category 1,<br>EN 524-6 |
| Flexural behaviour                           | Declaration of Performance, B-07-30-03-E | EN 523 Category 1,<br>EN 524-2 |
| Lateral load resistance                      | Declaration of Performance, B-07-30-03-E | EN 523 Category 1,<br>EN 524-4 |
| Tensile load resistance                      | Declaration of Performance, B-07-30-03-E | EN 523 Category 1,<br>EN 524-5 |
| Length, diameter, relative volume and weight | Product Specification, B-07-30-06-E      | EN 523 Category 1,<br>EN524-1  |

Type KR:

| Essential characteristics                    | Document                                 | Standard                       |
|----------------------------------------------|------------------------------------------|--------------------------------|
| Material thickness                           | Declaration of Performance, B-07-30-04-E | EN 523 Category 2              |
| Water tightness                              | Declaration of Performance, B-07-30-04-E | EN 523 Category 2,<br>EN 524-6 |
| Flexural behaviour                           | Declaration of Performance, B-07-30-04-E | EN 523 Category 2,<br>EN 524-2 |
| Lateral load resistance                      | Declaration of Performance, B-07-30-04-E | EN 523 Category 2,<br>EN 524-4 |
| Tensile load resistance                      | Declaration of Performance, B-07-30-04-E | EN 523 Category 2,<br>EN 524-5 |
| Length, diameter, relative volume and weight | Product Specification, B-07-30-07-E      | EN 523 Category 2,<br>EN 524-1 |

## Main Product Content

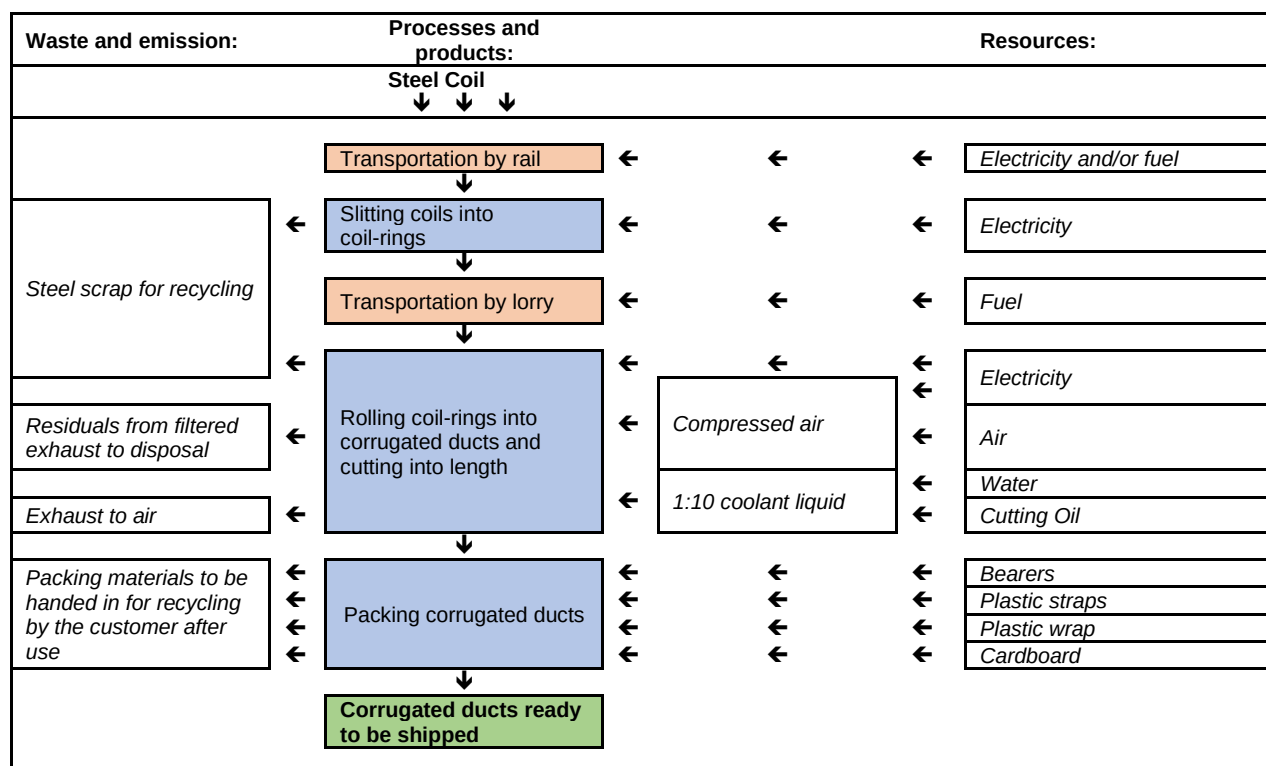
| Material/Chemical Input | %    |
|-------------------------|------|
| Steel                   | 100% |

Material composition of all products assessed within this average EPD

## Manufacturing Process

The input material is cold rolled Steel Coils. Coils are transported to a third party for slitting into coil rings which are then transported to the manufacturer where they are rolled into ducts, cut to length and packed.

### Process flow diagram



## Life Cycle Assessment Calculation Rules

### Declared unit description

1 kg of corrugated duct as used in precast and post tensioning concrete

### System boundary

This is a cradle to gate EPD, reporting all production life cycle stages of modules from A1 to A3 inclusive in accordance with EN 15804:2012+A1:2013.

### Data sources, quality and allocation

Data collected by the manufacturer for the production of corrugated ducts for the period 1st January 2020 to 31<sup>st</sup> December 2020 has been used for this EPD.

The manufacturing site is a combination of a manufacturing unit and a maintenance and repair shop. Electricity consumption was determined by measuring the consumption on the manufacturing unit for different representative dimensions (types) of the products. The measurements have been carried out by an authorized company. The specific power consumptions for the remaining dimensions (types) of the products is calculated using interpolation.

The consumption of water is calculated based on the factual consumption.

Figures for the raw materials, ancillary materials and packaging were from actual usages. Allocation of energy, water, and waste has been done according to the provisions of the BRE PCR PN514 and EN 15804. Secondary data has been drawn from the steel manufacturer's EPD for cold rolled steel coils and the BRE LINA database v2.0.83. The background LCI datasets are based on ecoinvent v3.2 (2015) which was used for all other material energy and waste data requirements.

### Cut-off criteria

All inputs or outputs have been included and all raw materials, packaging and transport, energy, water use and wastes, are included, except for direct emissions to air, water and soil, which are not measured. Upstream extraction and/or processing of inputs are included within the use of the background datasets within LINA.

## 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   | 2.42E+00                  | 6.87E-14         | 3.99E-03                  | 4.30E-04                                   | 4.73E-04                                | 6.19E-07     | 2.58E+01                 |
|               | Transport                | A2   | 7.00E-02                  | 1.03E-08         | 3.46E-04                  | 1.32E-04                                   | 4.90E-05                                | 1.66E-07     | 1.02E+00                 |
|               | Manufacturing            | A3   | -1.07E-02                 | 1.65E-09         | 6.53E-05                  | 2.54E-05                                   | 1.56E-05                                | 8.89E-08     | 2.98E-01                 |
|               | Total (of product stage) | A1-3 | 2.48E+00                  | 1.20E-08         | 4.40E-03                  | 5.87E-04                                   | 5.38E-04                                | 8.74E-07     | 2.71E+01                 |

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   | 1.63E+00 | 0.00E+00 | 1.63E+00 | 2.69E+01 | 0.00E+00 | 2.69E+01 |
|               | Transport                | A2   | 6.51E-02 | 8.40E-08 | 6.51E-02 | 1.16E+00 | 0.00E+00 | 1.16E+00 |
|               | Manufacturing            | A3   | 6.44E-01 | 3.37E-07 | 6.44E-01 | 3.21E-01 | 0.00E+00 | 3.21E-01 |
|               | Total (of product stage) | A1-3 | 2.34E+00 | 4.21E-07 | 2.34E+00 | 2.84E+01 | 0.00E+00 | 2.84E+01 |

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)

| Parameters describing resource use, secondary materials and fuels, use of water |                          |      |          |                           |                           |                |
|---------------------------------------------------------------------------------|--------------------------|------|----------|---------------------------|---------------------------|----------------|
|                                                                                 |                          |      | SM       | RSF                       | NRSF                      | FW             |
|                                                                                 |                          |      | kg       | MJ<br>net calorific value | MJ<br>net calorific value | m <sup>3</sup> |
| Product stage                                                                   | Raw material supply      | A1   | 2.69E-02 | 0.00E+00                  | 0.00E+00                  | 2.10E-02       |
|                                                                                 | Transport                | A2   | 0.00E+00 | 0.00E+00                  | 0.00E+00                  | 4.94E-04       |
|                                                                                 | Manufacturing            | A3   | 0.00E+00 | 0.00E+00                  | 0.00E+00                  | 3.31E-04       |
|                                                                                 | Total (of product stage) | A1-3 | 2.69E-02 | 0.00E+00                  | 0.00E+00                  | 2.18E-02       |

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

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

| Other environmental information describing waste categories |                          |      |          |          |          |  |
|-------------------------------------------------------------|--------------------------|------|----------|----------|----------|--|
|                                                             |                          |      | HWD      | NHWD     | RWD      |  |
|                                                             |                          |      | kg       | kg       | kg       |  |
| Product stage                                               | Raw material supply      | A1   | 9.31E-03 | 6.12E-02 | 4.78E-04 |  |
|                                                             | Transport                | A2   | 1.25E-03 | 2.47E-02 | 7.20E-06 |  |
|                                                             | Manufacturing            | A3   | 3.94E-04 | 2.57E-03 | 9.53E-07 |  |
|                                                             | Total (of product stage) | A1-3 | 1.10E-02 | 8.85E-02 | 4.86E-04 |  |

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



## LCA Results (continued)

| 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   | 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              |
|                                                                          | Manufacturing            | A3   | 0.00E+00 | 3.62E-02 | 0.00E+00 | 0.00E+00              |
|                                                                          | Total (of product stage) | A1-3 | 0.00E+00 | 3.62E-02 | 0.00E+00 | 0.00E+00              |

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.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.