

**TATA STEEL**



**EN 15804 verified EPD programme**  
Product Category Rules Part 1



V1 January 2017

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## 1 Introduction

Clients and building occupiers are increasingly demanding whole life environmental assessments of buildings, which include the potential embodied impacts of the materials used within the building. As a consequence, Environmental Product Declarations (EPDs) are becoming a requirement for companies working in, and supplying to, the construction sector. In particular there is a demand for ISO Type III environmental declarations, which conform to the core Product Category Rules described in EN 15804.

With a strong focus on sustainability, Tata Steel have become the first steel manufacturer to develop and operate an EPD programme. The programme covers the development of Type III environmental declarations in accordance with the requirements of EN 15804+A1:2013 (Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products), which is referred to as EN 15804 in this document. It also conforms to ISO 14025 (Environmental labels and declarations – Type III environmental declarations – Principles and procedures).

This document describes the Product Category Rules (PCR) Part 1 for Tata Steel's EPD programme. In addition to the Part 1 PCR, complementary rules are specified for product specific groupings, in separate PCR Part 2 documents.

As the relevant standards develop, both the Part 1 and Part 2 PCR will be revised and updated as necessary.

## 2 Scope

This is a PCR document for the assessment of the environmental performance of Tata Steel's construction products, and those of its subsidiaries and supply chain partners. It describes the methodology for the Life Cycle Assessment (LCA), which is used to create an EPD or an EPD tool for any construction product or service. EPDs may also be produced for construction products marketed by other companies operating in the steel supply chain.

The methodology follows the core PCR set out in EN 15804 (core rules for the product category of construction products).

## 3 Objective of the core PCR

The core PCR are used to produce EPDs and EPD tools for construction products and services, and provide verifiable and consistent data based upon an LCA that enables assessment of their environmental performance. They also enable interested parties to compare the environmental impacts of different construction products based on equivalent functionality.

## 4 Product Category Rules

The PCR are set out in EN 15804 and can be accessed in this standard. An outline of these PCR is given by the following relevant section headings taken from EN 15804:

1. Scope.
2. Normative references.
3. Terms and definitions.
4. Abbreviations.
5. General aspects including objective, type of EPD and comparability.
6. Product Category Rules for LCA including Life Cycle stages, calculation rules, inventory analysis and impact assessment.
7. Content of the EPD.
8. Project report.
9. Verification and validity.

## 5 Required documents

Each EPD or EPD tool will be accompanied by a project or background report that presents information on the LCA declared as part of an EPD. The background report comprehensively summarises the work done in generating the EPD or EPD tool, and the objective of the report is to support verification of the EPD or EPD tool.

The background report demonstrates that the LCA model and calculation of indicator results, comply with the requirements of these PCR. It will include all assumptions made, as well as showing the validity of any additional information contained in the EPD. It provides clear evidence of how the declared data and the information in the EPD have been derived from the LCA, and of the methodologies for additional information. The structure of the background report follows the guidance in this PCR document which is based on EN 15804.

The background report is made available to the verifier under condition of confidentiality (see ISO 14025) and it is not intended to be part of any public communication.

## **6 Specific requirements for the LCA**

### **6.1 Declared unit**

The LCA shall be calculated for a declared unit, of the construction product, as described in the relevant Part 2 PCR for the product specific grouping. Examples of declared units are 1 tonne of steel or 1 square metre of steel wall or floor.

If the use stage is reported in the EPD, the declared unit will be defined in terms of a reference service life, which will be established in accordance with European product standards and ISO 15686, Buildings and constructed assets – Service life planning, Parts 1, 2, 7 and 8.

If the EPD is a cradle-to-grave type (see section 6.2), the declared unit will become a functional unit. The functional unit defines the way in which the identified functions or performance characteristics of the product are quantified. If the precise function of the product is not stated or known, a declared unit is used.

## 6.2 Life cycle stages and inventory analysis

Some of the following requirements and assumptions relate to the product stages defined in EN 15804 and for reference, are:

- A1 to A3 – product stage including raw material extraction and processing, transport to manufacturer, and manufacturing
- A4 to A5 – construction process stage including transport to site (A4) & installation (A5)
- B1 to B7 – use stage including maintenance, repair, replacement and refurbishment
- C1 to C4 – end of life stage including disposal (C4)
- D – benefits and loads beyond the system boundary (from re-use, recovery, recycling)

The EPD can either be cradle-to-gate (with options) or cradle-to-grave, depending upon the product type. Therefore, some of the product stages above may not be declared, and these shall be stated clearly in the EPD.

Impacts from the production of packaging materials for the product and their disposal, are included in the product stage (A1 to A3), or specifically mentioned as not being included in the EPD.

Any production losses occurring during product manufacturing (such as process scrap) are included in A1 to A3. This also includes intermediate packaging that might be used to transport a product from one manufacturing site to another.

Any impacts from transporting the product to site will be declared in A4, and impacts from the fixing of that product to the building shall be declared in A5.

With regard to co-product allocation, EN 15804 states that 'if a process can be sub-divided but respective data are not available, the inputs and outputs of the system under study should be partitioned between its different products or functions in a way which reflects the underlying physical relationships between them'. Therefore, for blast furnace slag, the partitioning of environmental burdens between products and co-products will be applied as described in the EUROFER document 'A methodology to determine the LCI of steel industry co-products', issued in February 2014 in co-operation with the World Steel Association (worldsteel). It is important to note that this methodology is not the official position of worldsteel or EUROFER.

Process gases will be accounted for using the system expansion method, which is also referenced in the same EUROFER document.

The impacts of co-product allocation, during manufacture, are accounted for in the product stage (A1 to A3).

End of life assumptions for recovered steel and steel recycling shall be accounted for as per the current methodology from worldsteel (2011 Life Cycle Assessment methodology report). A net scrap approach will be used, to avoid double accounting, and the net impacts shall be reported as benefits and loads beyond the system boundary (module D).

### 6.3 Selection of data and data quality

Selection of data and issues relating to data quality are described in EN 15804, which outlines the requirement for the application of generic and specific data. In accordance with the standard, the steel manufacturer's average or specific data shall be used for at least the processes the manufacturer has influence over and generic data shall only be used for upstream and downstream processes.

Tata Steel's own processes are the most relevant data source for the development of an EPD or EPD tool for a Tata Steel product, and in accordance with EN 15804, these data are used where available. Resource and energy use data are collected on a monthly basis at most Tata Steel sites, and one year of emissions data are collected approximately every five years as part of the World Steel Association's regular data collection exercise. All these data are checked by Tata Steel's LCA practitioners and the data submitted to worldsteel are also checked by them, to produce robust third party validated data sets.

Where a partner of Tata Steel is involved in the manufacture of the product for which the EPD is derived, or a company formerly owned by Tata Steel, primary data from that partner or company will be used where available.

Where Tata Steel or Tata Steel partner data are not available (for raw material extraction for example), generic data will be used. This could be average industry data such as that provided by worldsteel, or data from proprietary databases which charge for access, for example from the GaBi LCA software supplied by thinkstep – formerly known as PE International.



## 6.4 Impact assessment indicators

Section 6.5 of EN 15804 specifies the indicators or impact categories that are to be used in the EPD. Annex C states that the characterisation factors for these indicators are taken from CML-IA version 4.1 October 2012 (Institute of Environmental Sciences, Faculty of Science, University of Leiden, Netherlands). However, there are no CML2001 indicators with an October 2012 reference available in GaBi (compilation 7.2) and an alternative version must be used in the EPD.

On the thinkstep website (<http://www.gabi-software.com/support/gabi/gabi-modelling-principles/>), page 114 of the document 'GaBi Database & Modelling Principles (version 1.0, November 2014)' discusses the use of a more recent version of the CML indicators, from April 2013. It concludes that the differences in impact between the 2013 and 2012 versions are small, and recommends the use of the CML April 2013 version indicators to comply with the requirements of EN 15804. Therefore, the CML April 2013 version indicators will be used, identified in GaBi as 'CML2001 – Apr.2013'.

The characterisation factors for impact categories (indicators) are explained in Table C.8 of Annex C in EN 15804 and the indicators themselves are reproduced below. Where specific ADP for fossil resources is known, these should be stated separately (from ADP for non-fossil resources).

- Global Warming Potential – GWP (kg CO<sub>2</sub> equiv.)
- Depletion Potential of the stratospheric Ozone layer – ODP (kg CFC 11 equiv.)
- Acidification Potential of soil and water – AP (kg SO<sub>2</sub> equiv.)
- Eutrophication Potential – EP (kg PO<sub>4</sub><sup>3-</sup> equiv.)
- Formation Potential of Tropospheric Ozone – POCP (kg ethene equiv.)
- Abiotic Depletion Potential for non-fossil resources – ADP elements (kg Sb equiv.)
- Abiotic Depletion Potential for fossil resources – ADP fossil fuels (MJ)

The background report shall reference the impact categories and characterisation factors used in the life cycle impact assessment.

## 7 References

1. Tata Steel's EN 15804 verified EPD programme, General programme instructions, V1 January 2017
2. EN 15804:2012+A1:2013, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
3. ISO 14044:2006, Environmental management - Life cycle assessment - Requirements and guidelines
4. ISO 14025:2010, Environmental labels and declarations - Type III environmental declarations - Principles and procedures
5. ISO 14040:2006, Environmental management - Life cycle assessment - Principles and framework
6. ISO 15686:2011, Buildings and constructed assets – Service life planning, Parts 1, 2, 7 and 8
7. EUROFER in cooperation with the World Steel Association, 'A methodology to determine the LCI of steel industry co-products', February 2014
8. World Steel Association: Life cycle assessment methodology report, 2011 (12/2012)
9. thinkstep; GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2013.
10. GaBi 6: Documentation of GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Echterdingen, 1992-2013. <http://documentation.gabi-software.com>
11. CML LCA methodology, Institute of Environmental Sciences (CML), Faculty of Science, University of Leiden, Netherlands





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