ENVIRONMENTAL PRODUCT DECLARATION

STEEL PRODUCTS:
STRETCHED COIL
ELECTROWELDED MESH
COLD ROLLED

Certification N°: EPDITALY0016
Date of issue: 2019 - 10 - 18
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Eco Platform N°: 00001098

Based on:
PCR ICMQ-001/15 rev2.1
EN15804:2014 + A1
ISO 14025

CPC code: 41
GENERAL INFORMATION

EPD REFERENCES

EPD OWNER: FERALPI SIDERURGICA SPA - FERALPI GROUP, VIA NICOLA PAGINI 11, 25017 LONATO, BRESCIA - ITALY
MANUFACTURING PLANT IS LOCATED IN THE SAME SITE

PROGRAM OPERATOR: EPDITALY, VIA GAETANO DE CASTILLIA 10, 20124 MILANO - ITALY

INDEPENDENT VERIFICATION

This declaration has been developed referring to EPDItaly, following the General Programme Instruction; further information and the document itself are available at: www.epditaly.it
EPD document valid within the following geographical area: Italy and other countries according to sales market conditions (North Africa and Europe).

CEN standard EN 15804 served as the core PCR (PCR ICMQ-001/15 rev 2.1)
PCR review was conducted by Daniele Pace, contact via info@epditaly.it

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

Third party verifier: ICMQ SpA, via De Castillia, 10 20124 Milano (www.icmq.it)

Accredited by: Accredia

Environmental declarations published within the same product category, though originating from different programs, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804.

CONTACTS

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Technical support to Feralpi Group was provided by Life Cycle Engineering, Italy.
(info@lcengineering.eu, www.lcengineering.eu).
COMPANY PROFILE

The Feralpi Group is one of Europe’s leading manufacturers of steels for use in building construction. The parent company Feralpi Siderurgica, which was set up in 1968 in Lonato del Garda, near Brescia, has developed steadily over the years to form a group of industries that currently more than two million tonnes of steel and rolled products a year, and has a workforce of 1500 permanent employees in Italy, Europe and North Africa.

In over fifty years of business, the company has branched out to foreign markets and have been able to face the challenge of an increasingly globalized steel industry. Starting from its lengthy tradition in steel manufacturing, the Group has developed according to a strategy of diversification into new products and markets, which has involved not only the internal organisation but also external transactions thanks to the acquisition of numerous enterprises operating in this industry. The Feralpi Group also operates in the field of special steels, cold working, structural steelwork, the environment and fish farming, not to mention financial activities and investments.

Since its very origins, Feralpi has focused not only on producing the best steel grades for building construction but also on doing it in the most sustainable possible way, which has involved reducing energy consumption and emissions by using the latest technology available or developing in-house new solutions covered by patents as a result of intensive innovation and research.
# SCOPE AND TYPE OF EPD

The approach used in this EPD is “Cradle to Gate with Options” one.

## Table of Modules

<table>
<thead>
<tr>
<th>PRODUCT STAGE</th>
<th>CONSTRUCTION PROCESS STAGE</th>
<th>USE STAGE</th>
<th>END OF LIFE STAGE</th>
<th>BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material supply</td>
<td>Transport</td>
<td>Manufacturing</td>
<td>Transport from the gate to the site</td>
<td>Assembly</td>
</tr>
<tr>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>A4</td>
<td>A5</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>MND</td>
</tr>
</tbody>
</table>

**SOFTWARE:** SimaPro ver. 9.0.0.47  
**MAIN DATABASE:** Ecoinvent 2.2  
**REPORT LCA:** Life Cycle Assessment (LCA) applied to steel mill products and derivatives for EPD® purposes - final report  
**GEOGRAPHICAL SCOPE OF THE EPD:** World according to sales market conditions  
**TYPE OF EPD:** specific for cold rolled steel products
THE PRODUCT

Electro-welded mesh is obtained from drawn wire (5 mm) or hot-rolled coil (6-16 mm), by joining the longitudinal and transversal wires using electric resistance welding to form a panel of the desired dimensions.

Stretched coil is extremely easy to use with a high quality content. The mechanical properties of weldable hot-rolled coils, combined with a compact packaging size which is nevertheless of considerable weight, facilitate storage in confined spaces.

The special coil-on-coil processing ensures accurate and faster coil unwinding, giving considerable increases in output. The reduced number of daily changes results in fewer downtimes, less scrap and a higher level of safety.

Declared unit for the study is one tonne of cold rolled products.

<table>
<thead>
<tr>
<th>INFORMATION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT IDENTIFICATION</td>
<td>Steel products: stretched coil - electrowelded mesh - cold rolled</td>
</tr>
</tbody>
</table>
| PRODUCT FEATURES | Stretched coil: Cross section range 6 < Ø < 16 mm  
Total wire length up to 22 000 m  
Electrowelded mesh: Diameters from 4.5 to 16 mm  
Cold rolled: Diameters from 4.5 to 12 mm |
| PRODUCT PROPERTIES (UNDER EN10080:2005) | Steel coming from post and pre consumer steel scraps produced in electric arc furnace route (EAF) and further hot and cold rolling process.  
Adherence and surface geometry fR or fP :  
- for 5 ≤ Ø ≤ 6 mm   fR or fP 0.035  
- for 6 < Ø ≤ 12 mm  fR or fP 0.040  
- for Ø >12 mm       fR or fP 0.056  
Weldability: Ceq < 0.52  
Typical yield stress: Re > 400 MPa and/or Rp0.2 < 700 MPa  
Elongation: Agt > 5%  
Successful in bend and rebend test  
Successful in strength test and oligocyclic strength test |
| PLANT FEATURES | Total amount of products covered by this EPD, year 2018: 506 842 t  
Total production, for selling purpose, year 2018: 1 122 481 t  
On-site air emission control system  
On-site system to recycle process water  
On-site system to recycle water used in process  
In/out materials/products and melting process monitored to prevent nuclear radiation  
In house photovoltaic plant of 625 kW peak capacity operating since 2011 |
# ENVIRONMENTAL PERFORMANCE

The detailed environmental performance (in terms of use of resources, pollutant emissions and waste generation) is presented for the three phases, Upstream, Core and Downstream and related sub-phases (A1-A2-A3-A4). The numbers reported in the following tables are the outcome of rounding. For this reason total results could slightly differ from the sum of contributions of the different phases.

## TABLE OF MODULES

<table>
<thead>
<tr>
<th>POTENTIAL ENVIRONMENTAL IMPACTS</th>
<th>UNITS / D.U.</th>
<th>UPSTREAM</th>
<th>CORE</th>
<th>DOWNSTREAM</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>GWP</td>
<td>kg CO₂ eq</td>
<td>449</td>
<td>100</td>
<td>111</td>
<td>54</td>
</tr>
<tr>
<td>ODP</td>
<td>g CFC 11eq</td>
<td>0.053</td>
<td>0.018</td>
<td>0.002</td>
<td>0.010</td>
</tr>
<tr>
<td>POCP</td>
<td>kg C₂H₄ eq</td>
<td>0.066</td>
<td>0.015</td>
<td>0.008</td>
<td>0.008</td>
</tr>
<tr>
<td>AP</td>
<td>kg SO₂ eq</td>
<td>1.4</td>
<td>0.4</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>AP</td>
<td>kg PO₄³⁻ eq</td>
<td>0.18</td>
<td>0.09</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td>ADPE</td>
<td>g Sb eq</td>
<td>0.0486</td>
<td>0.0002</td>
<td>0.0895</td>
<td>0.0001</td>
</tr>
<tr>
<td>ADPF</td>
<td>MJ</td>
<td>8 477</td>
<td>1 428</td>
<td>413</td>
<td>766</td>
</tr>
</tbody>
</table>

**GWP** Global warming potential  
**ODP** Depletion potential of the stratospheric ozone layer  
**POCP** Formation potential of tropospheric ozone photochemical oxidants  
**AP** Acidification potential of land and water  
**EP** Eutrophication potential  
**ADPE** Abiotic depletion potential for non-fossil resources  
**ADPF** Abiotic depletion potential for fossil resources
## RESOURCE USE PER DECLARED UNIT

<table>
<thead>
<tr>
<th>USE OF RENEWABLE MATERIAL RESOURCES</th>
<th>UNITS / D.U.</th>
<th>UPSTREAM</th>
<th>CORE</th>
<th>DOWNSTREAM</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERE</td>
<td>[MJ]</td>
<td>298</td>
<td>16</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>PERM</td>
<td>[MJ]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PERT</td>
<td>[MJ]</td>
<td>298</td>
<td>16</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>PENRE</td>
<td>[MJ]</td>
<td>9,336</td>
<td>1,451</td>
<td>547</td>
<td>770</td>
</tr>
<tr>
<td>PENRM</td>
<td>[MJ]</td>
<td>140</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PENRT</td>
<td>[MJ]</td>
<td>9,476</td>
<td>1,451</td>
<td>547</td>
<td>770</td>
</tr>
<tr>
<td>SM</td>
<td>[kg]</td>
<td>1,047</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RSF</td>
<td>[MJ]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NRSF</td>
<td>[MJ]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>FW</td>
<td>[m³]</td>
<td>2.19</td>
<td>0.10</td>
<td>1.56</td>
<td>0.04</td>
</tr>
</tbody>
</table>

**PERE**: Use of renewable primary energy excluding renewable primary energy resources 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 resources

**SM**: Use of secondary raw materials

**RSF**: Use of renewable secondary fuels

**NRSF**: Use of non-renewable secondary fuels

**FW**: Use of net fresh water
# Output Flows and Waste Categories per Declared Unit

<table>
<thead>
<tr>
<th>Waste Generation and Treatment</th>
<th>Units / D.U.</th>
<th>Upstream</th>
<th>Core</th>
<th>Downstream</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>A4</td>
</tr>
<tr>
<td>HWD</td>
<td>[kg]</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>NHWD</td>
<td>[kg]</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>RWD</td>
<td>[kg]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CRU</td>
<td>[kg]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MFR</td>
<td>[kg]</td>
<td>0</td>
<td>0</td>
<td>112</td>
<td>0</td>
</tr>
<tr>
<td>MER</td>
<td>[kg]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>EEE</td>
<td>[MJ]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>EET</td>
<td>[MJ]</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **HWD** Hazardous waste disposed
- **NHWD** Non-hazardous waste disposed
- **RWD** Radioactive waste disposed
- **CRU** Components for re-use
- **MFR** Materials for recycling
- **MER** Materials for energy recovery
- **EEE** Exported electrical energy
- **EET** Exported thermal energy
CALCULATION RULES

The environmental burden of the product has been calculated according to EN 15804:2014 and PCR 2012:01 v 2.3.

This declaration is a cradle to gate with options EPD type, based on the application of Life Cycle Assessment (LCA) methodology to the whole life-cycle system. In the whole LCA model, infrastructures and production equipments are not taken into account.

Cold rolled steel products at plant level were described by using specific data from manufacturing facility (Lonato del Garda, BS, Italy) for year 2018.

Customized LCA questionnaires were used to gather in-depth information about all aspects of the production system (for example, raw materials contents and specifications, pre treatments, process efficiencies, air and water emissions, waste management), in order to provide a complete picture of the environmental burden of the system from raw materials supply (A1) to Transport (A2) and Manufacturing (A3).

The use phase and end of life were not considered according to EN:15804 and PCR 2012.01 v 2.3 , while transport to final destination was considered (A4).

According to ISO 14040 and 14044, allocation is avoided whenever possible by dividing the system into sub-systems. A mass allocation criterion has been applied to the steel mill process to consider the environmental impact of the Greenstone construction aggregate made from steel slag.

Data quality has been assessed and validated during data collection process.

According to EN:15804 the applied cut-off criterion for mass and energy flows is 1%.
SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

UPSTREAM

Scrap pretreatment

Shearing

Shredding

Sorting

Raw material and Energy production

A1

CORE

Supplying transport

Billets production

Hot and cold rolling process

Packaging

Internal handling

Ancillary materials and activities

Air emission

Water emission

Waste management

A2+A3

DOWNSTREAM

Market transport

A4

Broad scheme of Greenstone construction aggregate production, in which the main activities included in the system boundaries, are listed and divided in the three subsystems: UPSTREAM Process, CORE Module and DOWNSTREAM Process.
UPSTREAM PROCESS

Steel scrap collection (shredded both in external and internal plants) and other raw materials production

Specific secondary materials pre-treatments, where appropriate

A1 - Raw Materials Supply

Production of alloy elements

Scheme of the considered system boundaries (Upstream processes)

Generation of electricity and other fuels from primary and from secondary energy resources (excluding waste treatments)
CORE PROCESS

A2 - Transportation

Raw materials transportation from production or collection facilities to the production plant

A3 - Manufacturing

Steel mill production, including utilities

UPSTREAM

Raw materials transportation from production or collection facilities to the production plant

Scheme of the considered system boundaries (core processes)

Steel mill production, including utilities

Core

A2 - Transportation

A3 - Manufacturing

Downstream

Hot and cold rolling, including utilities

Packaging materials

Internal transportation

Treatment of waste generated from the manufacturing processes
DOWNSTREAM PROCESS

Transport to the customers (general market average). Distances estimated considering the transported quantities and the distances from Brescia’s plant to the client.

From Lonato (northern Italy) final products are delivered to many national (53% of the total sold product) and international areas (47% of the total sold product) such as France, Germany and Switzerland, mentioning the main countries.

The means of transport used to deliver steel bars and coils can be truck, train and freight ship. On average, cold rolled products are transported for 391 km by truck and for 90 km by train.

A4 - Distribution
OTHER OPTIONAL ADDITIONAL ENVIRONMENTAL INFORMATION

Feralpi plant in Lonato del Garda (BS) is equipped with prevention and reduction systems for air emissions, a recirculating loop cooling to minimize water consumption and a waste management plan to prevent and reduce waste generation.

In accordance with general EPD® requirements the LCA study used specific, generic and proxy data. These last data are contributing to the environmental indicators less than 10%.

<table>
<thead>
<tr>
<th>OTHER ENVIRONMENTAL INDICATORS</th>
<th>UNIT</th>
<th>UP</th>
<th>CORE</th>
<th>DOWN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR EMISSIONS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust from electric-arc furnace</td>
<td>[g]</td>
<td>-</td>
<td>1.60</td>
<td>-</td>
<td>1.60</td>
</tr>
<tr>
<td>CO₂ from electric-arc furnace</td>
<td>[kg]</td>
<td>-</td>
<td>32.55</td>
<td>-</td>
<td>32.55</td>
</tr>
<tr>
<td>NOₓ from hot rolling process</td>
<td>[g]</td>
<td>-</td>
<td>20.10</td>
<td>-</td>
<td>20.10</td>
</tr>
<tr>
<td>SO₂ from hot rolling process</td>
<td>[g]</td>
<td>-</td>
<td>0.17</td>
<td>-</td>
<td>0.17</td>
</tr>
<tr>
<td>WATER EMISSIONS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>[g]</td>
<td>-</td>
<td>0.158</td>
<td>-</td>
<td>0.158</td>
</tr>
</tbody>
</table>

Other environmental indicators per 1 t of cold-rolled reinforcing steel

Recycled content of cold rolled products > 95%
REFERENCES

- EN 15804:2014
- ISO 14040
- ISO 14044
- Life Cycle Assessment (LCA) applied to steel mill products and derivatives for EPD® purposes - final report
- EPD Italy General Programme Information V 4
- PCR ICMQ-001/15 rev2.1