

Environmental Product Declaration

In accordance with ISO 14025:2006 for:

ER1711

from

SEPR ITALIA S.p.A.

VIA DEL TEROLDEGO 1/F, MEZZOCORONA (TN) - 38016- ITALY



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| Programme: | The International EPD® System, www.environdec.com |
| Programme operator: | EPD International AB |
| EPD registration number: | S-P-08603 |
| Publication date: | 2023-05-15 |
| Valid until: | 2028-05-14 |

This EPD has been developed in accordance with ISO 14025. An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.

Programme information

| | |
|-------------------|---|
| Programme: | <p>The International EPD® System</p> <p>EPD International AB Box 210 60 SE-100 31 Stockholm Sweden</p> <p>www.environdec.com info@environdec.com</p> |
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| Accountabilities for PCR, LCA and independent, third-party verification |
| Product Category Rules (PCR) |
| PCR: Fabricated Metal Products, Except Construction Products, 2023:01, version 1.0 |
| Product category classification: UN CPC 412, 414, 416, 42 |
| PCR review was conducted by: Hüdai Kara |
| Life Cycle Assessment (LCA) |
| LCA accountability: <i>LCA of ER1711 block of SEPR Italia S.p.A., Bureau Veritas Nexta</i> |
| Third-party verification |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: |
| <input checked="" type="checkbox"/> EPD verification by individual verifier |
| Third-party verifier: Marcel Gomez Ferrer, Marcel Gómez Consultoria Ambiental, info@marcelgomez.com Phone: +34 630 64 35 93 Email: info@marcelgomez.com Approved by: The International EPD® System |
| The procedure for follow-up during EPD validity, as defined in the GPI, involves third-party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |

EPDs within the same product category but from different programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

Name and contact information of LCA practitioners:

Bureau Veritas Nexta Srl
www.nexta.bureauveritas.it

Company information

Owner of the EPD: SEPR ITALIA S.p.A.

Contacts: Andrea Bertamini, Andrea.Bertamini@saint-gobain.com
Giorgio Tait, Giorgio.Tait@saint-gobain.com

Description of the organisation:

SEPR Italia S.p.A. was born in the 1960 and became part of the Saint-Gobain group in the 1971. The company produces refractory blocks for glass furnaces and iron and steel markets.

The main products include:

- Electrofused material based on zirconium, alumina and silica for the construction of glass furnaces
- Magmalox, product directed to the iron and steel industry
- Anti-wear products for applications subjected to high wear at high temperatures and in aggressive environments

SEPR ITALIA is part of Saint-Gobain SEFPRO, an international group dedicated to offering specific solutions for the glass industry, which has been playing a key role in the evolution of the offer of refractory products for forty years.

The plant has the following certifications:

- ISO 9001:2015
- ISO 14001:2015
- ISO 45001:2018
- ISO 50001:2018
- ISO 14064-1:2018.

Name and location of production site:

SEPR Italia S.p.A.
Via del Teroldego 1/F,
38016 Mezzocorona (TN), Italy

Product information

Product name: ER1711

Product description and identification:

ER1711 is an electrocast product, designed for the manufacture of glass furnaces. Composed of Alumina, Zirconia, Silica melted in an electric arc furnace, it is cast at very high temperatures in molds and worked to obtain the blocks in their final shape.

Technical specification:

| | |
|------------------|----------------------------------|
| Physical state | Solid |
| Colour | White. Light grey |
| Fusion point | 1800°C |
| Apparent density | From 3,5 to 4 kg/dm ³ |

The product contains traces of natural radioactive material from Uranium and Thorium impurities U+Th< 500 ppm (U238, U235 and Th232 series).

UN CPC code: 416 Other non-ferrous metals and articles thereof (including waste and scrap of some metals); cermets and articles thereof

Geographical scope: Global

LCA information

Declared unit: 1 ton of product.

The product is an electrofused block that will be a part of a furnace. The study comprises the raw material extraction, raw material transportation and manufacturing.

Reference service life: not applicable

Time representativeness: primary data refer to 2021 year. The generic data has been updated in 2022 (Ecoinvent 3.8).

Geographical representativeness: primary data are obtained from SEPR ITALIA S.p.A. management system. The secondary data are obtained by database Ecoinvent 3.8 (RER or GLO records).

Technological representativeness: primary data are obtained from processes of SEPR Italia S.p.A. under study. The secondary data are obtained from databases of SEPR ITALIA S.p.A. similar technology.

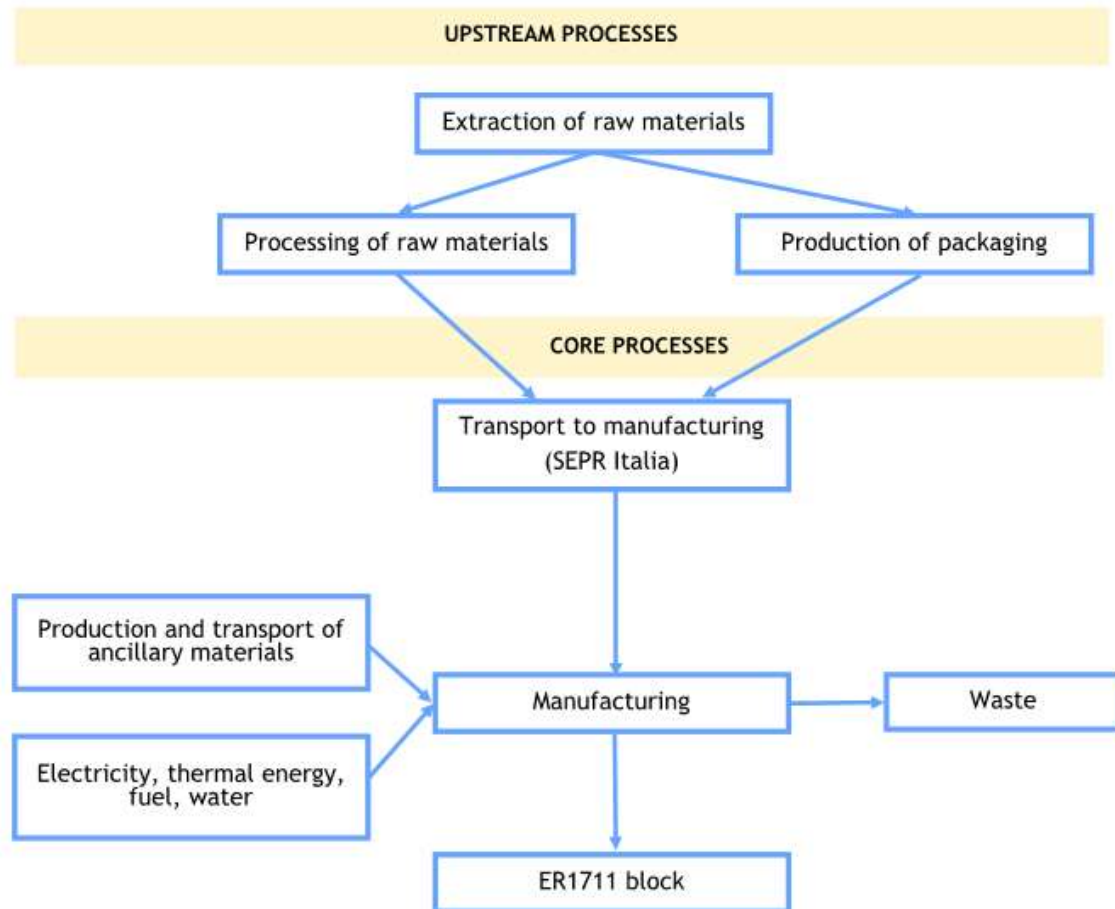
Database(s) and LCA software used: for the elaboration of data SimaPro v. 9.3.0.3; the database used is Ecoinvent 3.8.

Data quality

The data used for the study are assessed following the method defined in the Recommendation of European Commission of 16.12.2021. The results obtained are:

- Upstream processes: Excellent quality
- Core processes: Excellent quality

System diagram:



Description of system boundaries: Cradle to gate

The upstream process includes the raw materials and packaging production. The scraps used in productive process are pre- and post-consumer scraps.

The core processes include the transport of raw materials from producer to SEPR Italia, the production and transport of ancillary materials (for the molds used in productive process), the use of energy resources, the management of waste and the emissions in atmosphere. The electricity consumed in core process is 100% renewable. The CO₂ emissions released by processing of raw materials (decarbonisation) are accounted and included in the study.

Excluded lifecycle stages: as indicate in PCR the downstream stages of LCA are excluded from the study. The product will be a component of a furnace.

Additional information:

- The allocation is applied in the LCA study: when necessary, mass allocation is used.
- Cut-off: at least 95% of the energy and materials used by module has been introduced, as well as 99% of the total use of energy and materials
- The polluter payer principle has been followed
- The long-term emissions have not been included.
- The next processes have not been included since its impact is not significant:
 - Environmental impact from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process.

- Personnel-related impacts, such as transportation to and from work.

The verifier and the program operator do not make any claim nor have any responsibility of the legality of the product.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Content declaration

Product

| Product components ER1711 | Typique % |
|--|------------|
| Alumina Oxide (Al ₂ O ₃) | 46 |
| Zirconium oxide (ZrO ₂) | 40 |
| silica oxide (SiO ₂) | 12,5 |
| sodium oxide (Na ₂ O) | 1 |
| CaO+TiO ₂ +Fe ₂ O ₃ | 0,3 |
| Impurities | 0,2 |
| Total | 100 |

None of the components are classified as dangerous.

Packaging

The packaging included in the study for the final product is:

- Packaging film
- Pallet

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product:

The scraps used in the production phase are pre- and post-consumer.

Results of the environmental performance indicators

Impact category indicators

The following results are valid for 1 ton of ER1711:

| PARAMETER | | UNIT | Upstream | Core | TOTAL |
|---|----------------------------------|-----------------------------------|----------|----------|----------|
| Global warming potential (GWP) | Fossil | kg CO ₂ eq. | 1,64E+03 | 5,36E+02 | 2,18E+03 |
| | Biogenic | kg CO ₂ eq. | 8,50E-01 | 3,14E+01 | 3,22E+01 |
| | Land use and land transformation | kg CO ₂ eq. | 1,10E+00 | 2,19E+02 | 2,20E+02 |
| | TOTAL | kg CO ₂ eq. | 1,65E+03 | 7,86E+02 | 2,43E+03 |
| Ozone layer depletion (ODP) | | kg CFC 11 eq. | 2,36E-04 | 7,62E-05 | 3,12E-04 |
| Acidification potential (AP) | | mol H ⁺ eq. | 1,10E+01 | 7,04E+00 | 1,80E+01 |
| Eutrophication potential (EP) | Aquatic freshwater | kg P eq. | 7,11E-02 | 5,57E-03 | 7,66E-02 |
| | Aquatic marine | kg N eq. | 1,87E+00 | 2,88E+00 | 4,75E+00 |
| | Aquatic terrestrial | mol N eq. | 2,03E+01 | 3,16E+01 | 5,19E+01 |
| Photochemical oxidant creation potential (POCP) | | kg NMVOC eq. | 5,42E+00 | 7,88E+00 | 1,33E+01 |
| Abiotic depletion potential (ADP) | Metals and minerals | kg Sb eq. | 7,10E-04 | 1,27E-04 | 8,37E-04 |
| | Fossil resources | MJ, net calorific value | 2,25E+04 | 8,34E+03 | 3,08E+04 |
| Water deprivation potential (WDP) | | m ³ world eq. deprived | 6,67E+02 | 1,33E+04 | 1,40E+04 |

For Abiotic depletion minerals, Abiotic depletion fuels, Water Deprivation Potential: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Resource use indicators

The following results are valid for 1 ton of ER1711:

| PARAMETER | | UNIT | Upstream | Core | TOTAL |
|--|-----------------------|-------------------------|----------|----------|----------|
| Primary energy resources – Renewable | Use as energy carrier | MJ, net calorific value | 6,07E+02 | 2,25E+04 | 2,31E+04 |
| | Used as raw materials | MJ, net calorific value | 1,72E+02 | 7,34E+02 | 9,06E+02 |
| | TOTAL | MJ, net calorific value | 7,79E+02 | 2,32E+04 | 2,40E+04 |
| Primary energy resources – Non-renewable | Use as energy carrier | MJ, net calorific value | 2,35E+04 | 7,79E+03 | 3,13E+04 |
| | Used as raw materials | MJ, net calorific value | 5,31E+01 | 9,00E+02 | 9,53E+02 |
| | TOTAL | MJ, net calorific value | 2,36E+04 | 8,69E+03 | 3,23E+04 |
| Secondary material | | kg | 3,71E+02 | 0,00E+00 | 3,71E+02 |
| Renewable secondary fuels | | MJ, net calorific value | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Non-renewable secondary fuels | | MJ, net calorific value | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Net use of fresh water | | m ³ | 2,04E+01 | 9,63E+00 | 3,00E+01 |

Waste indicators

The following results are valid for 1 ton of ER1711:

| PARAMETER | UNIT | Upstream | Core | TOTAL |
|------------------------------|------|----------|----------|----------|
| Hazardous waste disposed | kg | 1,98E-02 | 1,30E-02 | 3,28E-02 |
| Non-hazardous waste disposed | kg | 6,61E+02 | 5,03E+00 | 6,66E+02 |
| Radioactive waste disposed | kg | 3,42E-02 | 3,35E-02 | 6,77E-02 |

Output flow indicators

The following results are valid for 1 ton of ER1711:

| PARAMETER | UNIT | Upstream | Core | TOTAL |
|-------------------------------|-----------------------|----------|----------|----------|
| Components for reuse | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Material for recycling | kg | 0,00E+00 | 8,54E+02 | 8,54E+02 |
| Materials for energy recovery | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, electricity | MJ per energy carrier | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Exported energy, thermal | MJ per energy carrier | 0,00E+00 | 0,00E+00 | 0,00E+00 |

Additional information

No further information is provided.

This document is the first emission of EPD.

References

- General Programme Instructions of the International EPD® System. Version 4.0.
- PCR 2023:01 Fabricated metal products, except construction products (version 1.0)
- ISO 14040:2006 Environmental management - Life Cycle Assessment - Principles and framework
- ISO 14044:2006 Environmental management - Life Cycle Assessment- Requirements and guidelines
- ISO 14025:2010 Environmental labels and declarations-Type III Environmental Declarations - Principles and procedures
- Project report rev. 2 of 26/04/2023 – Life cycle assessment: Magmalox and ER1711



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