

# GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION



Environmental  
Product  
Declaration

**EN ISO 14025:2010**  
**EN 15804:2012+A2:2019/AC:2021**

## CACESA

Caucho Celular del Centro, S.A.



# AENOR

## Expansion joints

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The holder of this Declaration is responsible for its content, as well as for keeping during the period of validity the supporting documentation that justifies the data and statements included

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AENOR is a founding member of ECO Platform, the European Association of Environmental Product Declaration Verification Programmes

The European Standard EN 15804:2012+A2:2019 serves as PCR

Independent verification of the declaration and data, in accordance with  
the Standard EN ISO 14025:2010

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Verification Body

**AENOR**

Product certification body accredited by ENAC with accreditation Nº 1/C-PR468

## 1. General Information.

### 1.1. The organization

Caucho Celular del Centro S.A., hereinafter CACESA, is a company specialized in tailor-made rubber solutions for construction and industry.

They have facilities of more than 7,500 m<sup>2</sup> with all the necessary equipment to manufacture rubber processing, with their own technology and qualified professionals who guarantee quality, flexibility and durability in their products.

Throughout its more than 60 years of experience, it has collaborated in initiatives in more than 30 countries worldwide, developing and supplying its materials adapted to each type of project through a network of distributors that allows shortening delivery times both in customized solutions and in stock parts.

CACESA products are certified with the CE marking according to the EN 1337-3:2005 standard. In addition, they work according to other standards such as AASHTO, BS-5400, MCV-5, etc.

Cacesa, in order to have a greater presence in the international market, in 2000 created the company Interbuna, S.L., which belongs to the same group and whose main activity is to promote and sell the products manufactured by Cacesa, although doing so under its own brand "Interbuna". Interbuna was created to operate mainly in markets outside the EU.

### 1.2. Scope of the Declaration.

This environmental product declaration describes the environmental information relating to the life cycle of cradle to door, modules C1-C4 and module D (A1-A3 + C + D) of the expansion joints manufactured

by Cacesa at its plant in Moraleja de Enmedio (Spain).

### 1.3. Life cycle and Compliance.

This EPD has been developed and verified in accordance with the UNE-EN ISO 14025:2010 and EN 15804:2012+A2:2019 / AC:2021 Standards.

**Table 1-1. Product Category Rule.**

Title	Sustainability in construction. Environmental product declarations. Basic Product Category Rules for Building Products.
Registration /Version	UNE EN 15804:2012+A2:2020/AC: 2021
Date of issue	2020-03
Administrator	AENOR

**Table 1-2 System limits.**  
**Information modules considered**

Product Stage	A1	Supply of raw materials	X
	A2	Transport to factory	X
	A3	Manufacturing	X
Construction	A4	Transport to the construction site	ND
	A5	Installation / Construction	ND
Stage of use	B1	Utilization	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Substitution	ND
	B5	Rehabilitation	ND
	B6	Energy Use In-Service	ND
	B7	Use of water in service	ND
End of life	C1	Deconstruction / demolition	X
	C2	Transportation	X
	C3	Waste treatment	X
	C4	Elimination	X
	D	Potential for reuse, recovery and/or recycling	X
X = Module included in the LCA; ND = Undeclared Module			

This EPD may not be comparable with those developed in other Programmes or according to different reference documents; in particular, it may not be comparable with Declarations not developed and verified in accordance with the EN 15804 Standard.

Similarly, EPDs may not be comparable if the source of the data is different (e.g. databases), not all relevant information modules are included, or are not based on the same scenarios.

The comparison of construction products must be made on the same function, applying the same declared unit and at the level of the building (or architectural or engineering work), i.e. including the behaviour of the product throughout its life cycle, as well as the specifications of section 6.7.2 of the EN ISO 14025 Standard.

#### 1.4. Differences with previous versions of this EPD.

There are no previous versions of this EPD.





## 2. The product.

### 2.1. Product Identification

Rubber expansion joints with a metal core are deformable devices that accommodate the movements of the structure where they are installed, such as bridges and roads, allow a comfortable circulation of vehicles on the road and waterproof the structural opening.

The steel-reinforced rubber composition of the expansion joints combines the characteristics of both materials: the elastomeric part provides elasticity, weather resistance and durability, while the metal reinforcements transfer loads, increase rigidity and allow the structural opening to be bridged.

The joints are located at the ends of the bridge between the deck and the abutments, as the length of the bridge increases, lines of intermediate joints are placed between decks. They must work simultaneously with the elastomeric supports, allowing their movements and the structure.

The main functions of expansion joints are:

- Ensure that movement is transferred to the joints without deteriorating the structure.
- To give continuity to the tread of the bridge, making traffic quiet and comfortable.
- Waterproofing and evacuating water quickly and safely, protecting concrete and elastomeric supports.

The selection of expansion joints for bridges and roadways is critical for the safety of these civil constructions, which is why it must be carried out under the supervision of a specialist technician and have materials, manufacturing, assembly

and maintenance processes that ensure the highest quality.

The geometry of the CACESA joints absorbs movements transmitting less effort to the anchors, guaranteeing rubber-to-metal adhesion reaching minimum values of 7N/mm, which allow greater forces to be absorbed. All parts are manufactured under the ISO 9001:2015 Quality System and are subjected to demanding performance tests.

CPC Code: 3627 – Articles of vulcanized rubber; hard rubber; hard rubber articles.

### 2.2. Product Composition

The following composition of the product is declared:

**Tabla 2-1.** Composition

Material	% by weight
Rubber	35,6 %
Steel	61,6 %
Painting	2,8 %

During the life cycle of the product, no hazardous substances listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorisation" are used at a rate greater than 0.1% of the weight of the product.

### 2.3. Packaging

The primary packaging used in the shipment of the product (distribution packaging) has been included in the study:

**Tabla 2-2.** Packaging

Material	kg / declared unit
Palets	2,18E-02
Film PE	1,09E-04
Strapping PE	3,89E-04



### 3. LCA information.

#### 3.1. Life Cycle Analysis.

The Life Cycle Analysis Report for the EPD of the elastomeric supports of Caucho Celular del Centro S.A, of December 2025, has been carried out by the company Abaleo S.L.

The LCA study follows the recommendations and requirements of the international standards ISO 14040:2006, ISO 14044:2006 and the European Standard EN 15804:2012+A2:2019 / AC:2021.

#### 3.2. Scope of the study.

The scope of this EPD is the production of the cradle to door and the C and D modules (A1-A3 + C + D) of the expansion joints of Cacesa.

The specific data on the production process come from the Cacesa plant located in Moraleja de Enmedio (Madrid) and correspond to the production data for the year 2019, which is considered representative.

The product is manufactured in Spain, although the calculation of the LCA has been carried out for Europe.

The LCA has not included:

- All equipment whose useful life is greater than 3 years.
- The construction of the plant buildings, or other capital goods.

- Staff work trips; nor the trips to or from work of the staff.
- Research and development activities.
- Long-term emissions.

#### 3.3. Declared unit.

The declared unit is one kilogram (1 kg) of product, plus its distribution packaging.

#### 3.4. Allocation criteria.

In accordance with the criteria of the reference standard, the inputs and outputs of the system have been assigned on a mass basis. This allocation criteria has been applied for the general consumption of the plant (consumption of raw materials and energy), transport, and for waste.

The quantities of the different materials used and produced in the manufacturing process come from measurements made in the plant itself.

It has not been necessary to apply economic allocation criteria.

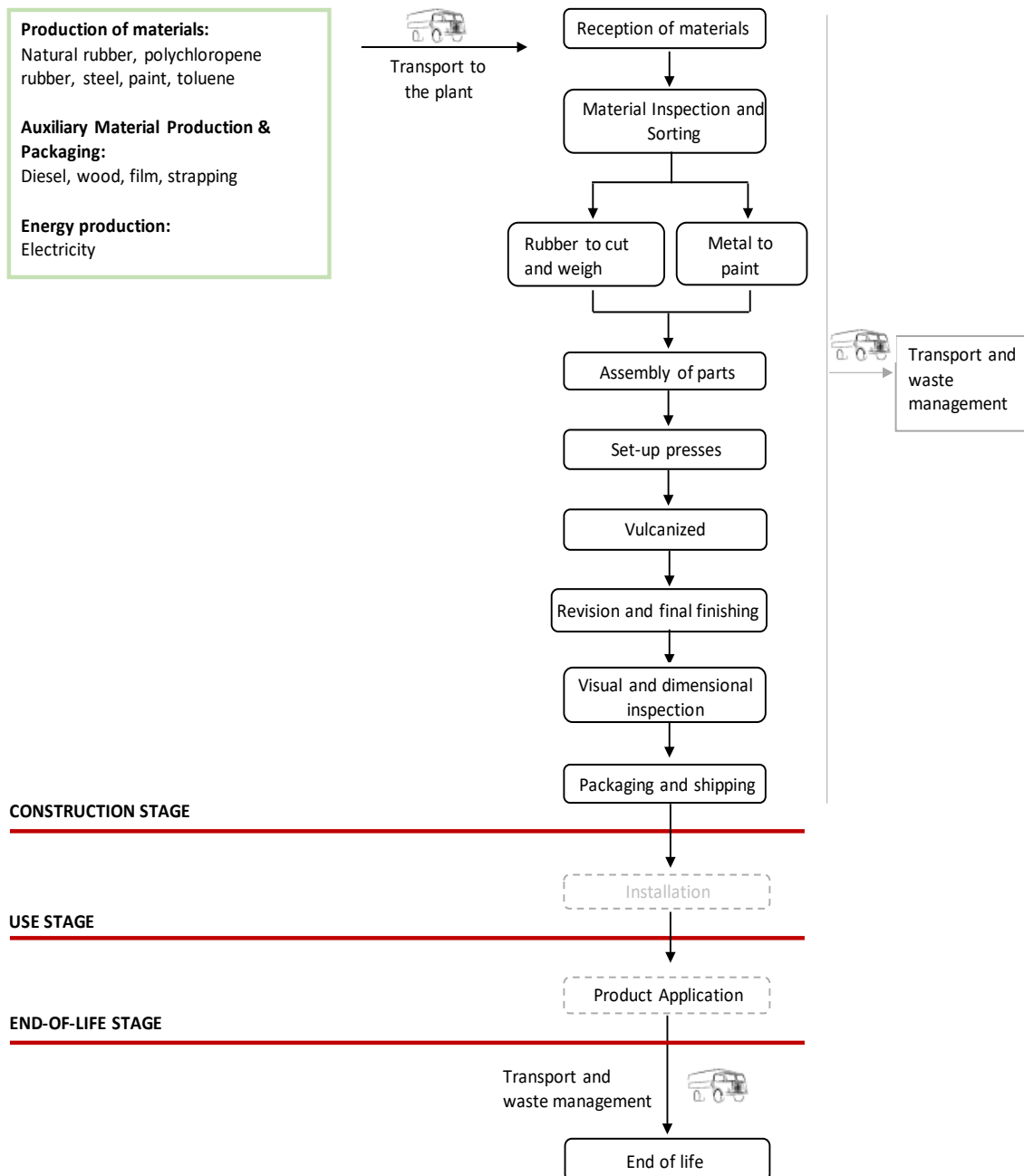
#### 3.5. Cut-off rules.

The LCA has included the gross weight/volume of all the materials used in the manufacturing process, so that at least 99% of the impacts on the environment are obtained.

There has been no exclusion of energy consumption.

### 3.6. Manufacturing Process Diagram

#### PRODUCT STAGE



The manufacturing process begins with the supply of rubber laminate at the manufacturer's premises. After receiving and verifying the goods at CACESA's facilities, the manufacturing processes of the supports are carried out.

The manufacture of CACESA products begins with the cutting of the materials and the shaping of the parts, distributing layers of rubber and steel in specific quantities and places according to the product to be manufactured and the design demanded by the customer; Once the design has been defined, the material undergoes a



vulcanization process to give it the final stability necessary for its correct use.

As a final step, the product is packed to proceed with its shipment to the customer.

### 3.7. Representativeness, quality and selection of data.

To model the manufacturing process of the product studied, the specific production data of the Moraleja de Enmedio plant, from 2019, which is a period with representative production data, have been used. From this factory, data have been obtained on: material and energy consumption; transport and waste generation.

When necessary, the Ecoinvent 3.11 database (March 2025) has been used, which is the latest version available at the time of the LCA. For the inventory data, to model the LCA and to calculate the environmental impact categories required by the reference standard, the SimaPro 10.2.0.0 software has been used, which is the most up-to-date version available at the time of the study.

To assess the quality of the primary data used in the LCA, the semi-quantitative

assessment criteria of the quality of the data proposed by the European Union in its Guide to the Environmental Footprint of Products and Organizations are applied. The following results have been obtained:

- Very good integrity. Score 1.
- Good methodological suitability and coherence. Score 2.
- Reasonable temporal representativeness. Score 3.
- Good technological representativeness. Score 2.
- Very good geographical representativeness. Score 1.
- Data uncertainty is low. Score 2.

According to the above data, the Data Quality Rating (DQR) takes the following value: 1.83, which indicates that the quality of the data is very good.

To better understand the assessment of data quality, it is indicated that the score for each of the criteria varies from 1 to 5 (the lower the score, the higher the quality) and that the following table is applied to obtain the final score:

Overall Data Quality Score (DQR)	Overall data quality score
≤ 1,6	Excellent quality
1,6 a 2,0	Very good quality
2,0 a 3,0	Good quality
3 a 4,0	Reasonable quality
> 4	Insufficient quality

## 4. System limits, scenarios, and additional technical information.

### Module A1: Production of raw materials.

This module includes the production process of raw materials, in which the following are considered:

- The extraction of resources and production of raw materials.
- Transport to the processing/production centres of raw materials.
- Energy and fuel consumption, during the production of raw materials.
- The consumption of other resources (such as water) during the production of raw materials.
- The generation of waste and emissions into the air and discharges into water and soil, during the production of raw materials.
- The generation of electricity used in the manufacturing process.

### Module A2: Transport.

The trucking of raw and auxiliary materials from the production sites (suppliers) to the production plant has been considered. The transport distances of the plants have been provided by the plant managers, knowing the location of the facilities of their suppliers.

Internal plant transports are also included.

### Module A3: Manufacturing.

In this stage, they have been considered: the consumption of auxiliary materials to production and the general plant consumption; the production of the packaging necessary for the distribution of the product to the customer; and the transport and treatment of the waste generated during this stage of the life cycle. The transport distances of the waste have been provided by plant managers, knowing the location of the facilities of its waste managers.

### Module C1 – Deconstruction/demolition.

For the modelling of the demolition process of the products studied, the default values defined by *Erlandsson et al. (2015)* for the demolition of buildings are used.

### Module C2: Transport to the waste treatment/recovery site.

At the end of its useful life, the product under study is considered to be transported to the waste management point by EURO 5 truck (18-32 tonnes) over a distance of 200 km.

Table 4-1. Life Cycle Information Stages and Modules according to UNE-EN 15804.

Life Cycle Information													Additional information	
A1 a 3			A4 - A5		B1 a 7					C1 a 4				D
Product Stage			Stage Construction Process		Stage of use					End-of-life stage				Benefits and burdens beyond the system
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Supply of raw materials	Transportation	Manufacturing	Transportation	Construction/Installation Process	Utilization	Maintenance	Repair	Substitution	Rehabilitation	Deconstruction, demolition	Transportation	Waste treatment	Waste disposal	Potential for reuse, recovery and recycling
Sce nario			Sce nario		Sce nario	Sce nario	Sce nario	Sce nario	Sce nario	Sce nario	Sce nario	Sce nario	Sce nario	
B6. Use of Energy In-Service					Scenario					ND				
B7. Use of water in service					Scenario					ND				

X: Module evaluated

ND: Undeclared module

X: Module evaluated

ND: Undeclared module

### Module C3 - Waste treatment, and Module C4 - Waste disposal.

To determine the percentages of recycling and sending to landfill and incineration of the products studied, the criteria of Part C of Annex 2 V2.1 (May 2020) of the *Circular Footprint Formula* of the European Union Environmental Footprint methodology (COMMISSION RECOMMENDATION (EU) 2021/2279 of 15 December 2021, on the use of environmental footprint methods to measure and communicate the environmental performance of products and organizations throughout their life cycle).

Table 4-2. Module Parameters C1-C4

Paremeter	Valor (por ud. declarada)
Demolition	1.1 kWh (diesel)
Recovery system, specified by type	0 kg - reusability 0,524 kg of steel-recycled..
Deletion, specified by type	0.211 kg of rubber and 0.051 kg of steel - final disposal (landfill) 0.173 kg of rubber and 0.042 kg of steel - incineration
Scenario Development Assumptions	Transport waste to the manager: Truck: 200 km

### Module D: Benefits and Burdens Beyond the System.

This module declares the benefits and burdens resulting from the net flow of fuels or secondary materials leaving the product system, excluding flows classified as co-products. It is assumed that metals reach the final state of waste when they arrive at the facility where they undergo a process of classification, shredding and compaction. The treatment, as well as the net benefits and burdens of the reuse or recycling

potentials (for the net quantity of scrap only), are grouped in this module. Potential environmental benefits are presented for net steel scrap produced at the end of the product's useful life, calculated as follows:  $\text{Net scrap} = \text{Amount of recycled steel at the end of life} - \text{Scrap from life cycles prior to the product}$ . A reduction coefficient of 10% material loss is applied in the recovery of avoided product. The percentages of scrap that consider the processes of the Ecoinvent database used to represent the raw material have been considered.



## 5. Declaration of the environmental parameters of LCA and LCI.

The results of the end-of-life stages (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

The estimated impact results are relative and do not indicate the final value of the impact categories, nor do they refer to threshold values, safety margins or risks.

The EN 15804 characterization factors are based on EF 3.1.

### Mandatory impact category indicators according to EN 15804

Paremeter	A1-A3	C1	C2	C3	C4	D
GWP-total	3,81E+00	3,75E-01	3,07E-02	2,65E-03	1,06E+00	-5,34E-01
GWP-fossil	4,31E+00	3,75E-01	3,07E-02	2,64E-03	5,47E-01	-5,34E-01
GWP-biogenic	-4,98E-01	1,88E-05	1,06E-06	4,12E-06	5,12E-01	-5,23E-05
GWP-luluc	2,53E-03	1,54E-05	4,84E-07	5,33E-06	1,83E-06	-8,38E-05
ODP	9,19E-08	5,70E-09	6,96E-10	4,02E-11	2,27E-10	-2,07E-09
AP	1,34E-02	3,46E-03	7,92E-05	1,67E-05	9,62E-05	-1,80E-03
EP-freshwater	1,15E-04	3,53E-07	1,89E-08	1,76E-07	1,43E-07	-2,60E-05
EP-marine	2,67E-03	1,63E-03	3,02E-05	5,00E-06	3,56E-05	-3,87E-04
EP-terrestrial	2,95E-02	1,79E-02	3,30E-04	5,51E-05	3,91E-04	-4,55E-03
POFP	1,01E-01	5,34E-03	1,31E-04	1,67E-05	1,06E-04	-1,59E-03
ADP-minerals&metals <sup>2</sup>	8,30E-06	1,31E-08	7,99E-10	1,47E-10	2,92E-09	-7,33E-08
ADP-fossil <sup>2</sup>	7,48E+01	4,90E+00	4,08E-01	5,31E-02	1,18E-01	-5,54E+00
WDP <sup>2</sup>	1,14E+00	3,66E-03	1,30E-04	3,83E-04	-2,70E-02	-3,27E-02

**GWP – total:** Global warming potential; **GWP-fossil** = Global Warming Potential fossil fuels; **GWP-biogenic** = Global Warming Potential biogenic; **GWP-luluc** = Global Warming Potential land use and land use change; **ODP** = Depletion potential of the stratospheric ozone layer; **AP** = Acidification potential, Accumulated Exceedance; **EP-freshwater** = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-marine** = Eutrophication potential, fraction of nutrients reaching marine end compartment; **EP-terrestrial** = Eutrophication potential, Accumulated Exceedance; **POCP** = Formation potential of tropospheric ozone; **ADP-minerals&metals** = Abiotic depletion potential for non-fossil resources; **ADP-fossil** = Abiotic depletion for fossil resources potential; **WDP** = Water (user) deprivation potential, deprivation-weighted water consumption.

The balance of biogenic CO<sub>2</sub> and the energy used as raw material for the packaging has been carried out in modules A1-A3.



**Additional indicators of mandatory and voluntary impact categories**

Paremeter	A1-A3	C1	C2	C3	C4	D
GWP-GHG*	4,32E+00	3,75E-01	3,07E-02	2,65E-03	5,47E-01	-5,34E-01
PM	1,98E-07	9,97E-08	2,04E-09	2,57E-10	7,44E-10	-3,93E-08
IRP <sup>1</sup>	2,07E-01	4,07E-04	3,91E-05	3,71E-04	1,08E-04	-1,72E-03
ETP-fw <sup>2</sup>	1,61E+01	1,40E-01	1,46E-02	3,68E-03	9,33E-01	-1,39E+00
HTP-c <sup>2</sup>	2,40E-09	2,00E-11	2,07E-12	2,35E-13	6,65E-12	-7,84E-10
HTP-nc <sup>2</sup>	3,81E-08	3,68E-10	2,03E-10	9,91E-12	1,87E-10	-1,03E-09
SQP <sup>2</sup>	1,11E+01	8,32E-03	5,18E-04	4,77E-03	1,31E-01	-5,40E-01

**GWP-GHG:** Global warming potential excluding biogenic carbon; **PM:** Potential incidence of diseases due to particulate matter emissions; **IRP:** Human exposure potential relative to U235; **ETP- fw:** Comparative unit toxic potential for ecosystems - freshwater; **HTP-c:** Comparative unit toxic potential for ecosystems - carcinogenic effects; **HTP- nc:** Comparative unit toxic potential for ecosystems - non-carcinogenic effects; **SQP:** Soil Quality Potential Index.

*Disclaimer 1. This impact category deals primarily with the potential impacts of low doses of ionizing radiation on human health from the nuclear fuel cycle. It does not consider the effects of potential nuclear accidents or occupational exposure from the disposal of radioactive waste in underground facilities. The ionizing radiation potential of soil, due to radon or certain building materials, is also not measured in this parameter.*

*Disclaimer 2. The results of this environmental impact indicator should be used with caution as the uncertainties of the results are high and experience with this parameter is limited.*

*\*This indicator accounts for all greenhouse gases except for the absorption and emissions of biogenic carbon dioxide and the biogenic carbon stored in the product. Therefore, the indicator is identical to the total GWP, except that the conversion factor for biogenic CO<sub>2</sub> is set to zero.*



## Resource use indicators

Paremeter	A1-A3	C1	C2	C3	C4	D
PERE	4,10E+00	1,05E-02	1,00E-03	5,14E-01	4,64E-01	-6,15E-02
PERM	9,65E-01	0,00E+00	0,00E+00	-5,05E-01	-4,59E-01	0,00E+00
PERT	5,06E+00	1,05E-02	1,00E-03	9,07E-03	4,11E-03	-6,15E-02
PENRE	7,38E+01	4,90E+00	4,08E-01	6,11E-01	6,25E-01	-5,54E+00
PENRM	1,07E+00	0,00E+00	0,00E+00	-5,58E-01	-5,07E-01	0,00E+00
PENRT	7,48E+01	4,90E+00	4,08E-01	5,31E-02	1,18E-01	-5,54E+00
SM	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	4,58E-02	1,48E-04	7,89E-06	2,50E-05	-7,23E-05	-9,38E-04

**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 material; **RSF** = Use of renewable secondary fuels; **NRSF** = Use of non-renewable secondary fuels; **FW** = Use of net fresh water.

## Waste indicators

Paremeter	A1-A3	C1	C2	C3	C4	D
HWD	5,46E-04	3,36E-05	2,71E-06	1,59E-07	1,72E-06	-6,19E-05
NHWD	1,98E-01	1,75E-04	1,37E-05	2,73E-05	2,99E-01	-6,95E-03
RWD	1,03E-04	2,29E-07	2,46E-08	3,05E-07	8,56E-08	-1,18E-06

**HWD**: Hazardous waste disposed; **NHWD**: Non-hazardous waste disposed; **RWD**: Radioactive waste disposed.

## Output flow indicators

Paremeter	A1-A3	C1	C2	C3	C4	D
CRU	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	4,16E-02	0,00E+00	0,00E+00	5,24E-01	0,00E+00	0,00E+00
MER	2,30E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	7,35E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	1,53E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

**CRU (kg)**: Components for reuse; **MFR (kg)**: Materials for recycling; **MER (kg)**: Materials for energy recovery; **EEE (MJ)**: Electricity exported; **EET (MJ)** - Thermal Energy Exported.

## 6. Additional environmental information.

### 6.1. Other indicators.

The manufacture of the expansion joints studied does not generate co-products.

### 6.2. Indoor air emissions.

The manufacturer declares that the products studied do not generate emissions into indoor air during their useful life.

### 6.3. Emissions to soil and water.

The manufacturer declares that the products studied do not generate significant emissions to the soil or water during their useful life.

### 6.4. Biogenic carbon content.

The biogenic carbon content of the product and packaging is due to the content of

natural rubber and wood and paper, respectively.

**Table 6-1. Biogenic Carbon**

Paremeter	kg biogenic C (per declared unit)
Product	1,40E-01
Packaging	9,61E-03

### 6.5. Electric mix used.

The residual electricity mix of the marketers for 2019, obtained from the CNMC's annual report, has been used.

**Table 6-2. Electric mix.**

Mix	GWP - gCO <sub>2</sub> eq/kWh
Average Mix	303,81

## References

- [1] EN 15804:2012+A2:2019/AC:2021. Sustainability in construction. Environmental product declarations. Basic product category rules for building products.
- [2] General Instructions of the GlobalEPD Program, 3rd revision. AENOR. October 2023.
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- [4] EN ISO 14040:2006/A1:2021. Environmental Management. Life Cycle Analysis. Principles and frame of reference. Modification 1. (ISO 14040:2006/Amd 1:2020).
- [5] EN ISO 14044:2006/A1:2021. Environmental Management. Life cycle assessment. Requirements and guidelines. Modification 2. (ISO 14044:2006/Amd 2:2020).
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