



## **SELF-DECLARED ENVIRONMENTAL CLAIM OF THE RARX® ADDITIVE PRODUCED BY CIRTEC**

**According to ISO 14021 and UNE-EN 15804**

*Madrid, 22 October 2020*



## INDEX

1. OWNER OF THE SELF-DECLARED ENVIRONMENTAL CLAIM.....	3
2. AUTHOR OF THE SELF-DECLARED ENVIRONMENTAL CLAIM. ....	4
3. PRODUCT INFORMATION. ....	4
Product specification. ....	4
Content declaration of materials and chemicals. ....	5
4. STANDARDS. ....	6
5. SCOPE OF THE SELF-DECLARED ENVIRONMENTAL CLAIM. ....	6
Declared unit. ....	6
Reference service life (RSL). ....	6
Units and quantities. ....	6
Geographical scope of the self-declared environmental claim. ....	6
Intended use of the self-declared environmental claim. ....	7
6. LIFE CYCLE ANALYSIS INFORMATION. ....	7
Process diagram if the system boundaries studied in this self-declared environmental claim. ....	7
Life cycle stages studied in the self-declared environmental claim. ....	8
Data reference year. ....	9
Cut-off rule ....	9
Allocation rules. ....	10
Data quality assessment. ....	10
7. ENVIRONMENTAL INFORMATION. ....	12
Environmental impacts. ....	12
Use of resources.....	13
Waste categories.....	14
Other environmental information regarding to output flows. ....	14
9. DIFFERENCE WITH PREVIOUS VERSIONS OF THIS SELF-DECLARED ENVIRONMENTAL CLAIM. ....	15
10. REFERENCES.....	15
11. ANNEX. EXPLANATION OF THE SPANISH ELECTRICITY GENERATION MIX. ....	16



## 1. OWNER OF THE SELF-DECLARED ENVIRONMENTAL CLAIM.

**Owner of the Self-Declared Environmental Claim: Cirtec – Círculo Tecnológico 2020 S.L.**

At. Miguel Angel Sanz Coll.

C/ Narciso Monturiol s/n, Pol. Ind. Rompecubas

28340 Valdemoro (Madrid)

Tel: 918 950 968.

<https://cirtec.es/>



The owner of the Self-declared environmental claim is responsible for its content and for custody of the supporting documentation that substantiates the data and the statements included therein.

**CIRTEC** was founded with the aim of creating a company capable of implementing a real circular economy in highway construction and maintenance works with a commitment to project sustainability and environmental protection.

**CIRTEC's** core mission is to provide government authorities, construction companies, asphalt mixture manufacturers, engineering firms, designers, etc. with technological products and solutions for highway works in order to turn the concept of circular economy into a reality, providing technical solutions for asphalt mixtures based on the use of products (crumb rubber) obtained from recycling end-of-life tires (ELTs) and other waste-derived co-products.

**CIRTEC** is endowed with top quality human, technical and material resources in order to manufacture and supply its customers with a range of bitumen and rubber-based products and the RAR-X additive, but also to provide highly-qualified technical consultancy in the fields of testing, working methods, product dispensing, work-site delivery and quality control so as to ensure the best design and execution of these types of asphalt mixtures with rubber.

**CIRTEC** has signed the "Agreement for a Circular Economy" promulgated by the Government of Spain within the framework of the "European Growth Strategy 2020" of the European Commission with the mission of harnessing crumb rubber made from end-of-life tires to produce economically sustainable, high-performance asphalt mixtures, thus helping to reduce the waste generated by society (tires) and generating new, high-quality products



through R&D+i projects and industrial activity. RAR-X, a high-tech product made from 60% ELT crumb pretreated with bitumen and other additives of mineral origin for use in asphalt mixtures, was developed in this context.

CIRTEC is certified under the ISO 9001:2015 and ISO 14001:2015 standards.

## 2. AUTHOR OF THE SELF-DECLARED ENVIRONMENTAL CLAIM.

The study of Life Cycle Analysis and the Self-declared environmental claim have been prepared by the company Abaleo S.L.



- Contact information: José Luis Canga Cabañes; +34 639 901 043; [jlcanga@abaleo.es](mailto:jlcanga@abaleo.es) ; [info@abaleo.es](mailto:info@abaleo.es)

## 3. PRODUCT INFORMATION.

### Product specification.



- Trade name: RARX®
- This self-declared environmental claim includes the manufacture of the RARX® additive for asphalt mixtures.
- CPC code: 3794 – Bituminous mixtures based on natural and artificial stone materials and bitumen, natural asphalt or related substances as a binder.
- The intended use of the RARX® is as additive for asphalt mixtures.
- Production country: Spain
- Geographical scope: global.
- Reference year of the data used in the study: 2019.
- Technical description of the product.

<b>Physical state</b>	Solid, dark gray powder
<b>Odor an appearance</b>	Fine grain, grayish granules
<b>Apparent density</b>	0.6 [ $\pm$ 0.03] gr/cm <sup>3</sup>
<b>Specific weight</b>	1.031 gr/cm <sup>3</sup> [ $\pm$ 0.03]
<b>Flash point [°C]</b>	> 300 (°C)
<b>Solubility</b>	Insoluble in water
<b>Chemical stability</b>	Incompatible as a strong oxidant



## Content declaration of materials and chemicals.

The following is the composition of one ton of RARX<sup>®</sup> additive for asphalt mixtures:

RARX <sup>®</sup> materials	% by total weight
ELT crumb	60%
Bitumen	16% (±3%)
Limestone filler and additives	24% (±3%)

No hazardous substance listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” comprising more than 0.1% of the weight of the product was used during its entire life cycle.



## **4. STANDARDS.**

The following standards has been considered in this self-declared environmental claim:

- Standard UNE-EN 15804:2012+A1:2014. Sustainability of construction works. Environmental Product Declaration. Core rules for the product category of construction products.
- Standard ISO 14021. Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling).

## **5. SCOPE OF THE SELF-DECLARED ENVIRONMENTAL CLAIM.**

### **Declared unit.**

The declared unit is one ton. of RARX® additive, including the corresponding part of the packaging material.

### **Reference service life (RSL).**

The reference service life of the RARX® additive is not specified, as this is a cradle-to-gate study.

### **Units and quantities.**

The units used are those required by the LCA standard. Decimals are indicated by commas, in the SI style (French version); for example, 2.156,234.

### **Geographical scope of the self-declared environmental claim.**

The geographical scope of this self-declared environmental claim is global. It is valid for the sale of all production of CIRTEC and sold anywhere in the world.



## Intended use of the self-declared environmental claim.

The results presented in this report do not constitute comparative statements.

## **6. LIFE CYCLE ANALYSIS INFORMATION.**

### Process diagram if the system boundaries studied in this self-declared environmental claim.

All phases of the life cycle, from cradle to gate of CIRTEC, have been studied without omitting any material, energy or process

The following production process diagram shows the limits of the system under study in the Life Cycle Assessment of the RARX® additive:

INPUTS		OUTPUTS
<ul style="list-style-type: none"> <li>• Crumb rubber</li> <li>• REPSOL conventional bitumen (Puertollano)</li> <li>• Calcium carbonate</li> <li>• Lime</li> <li>• Polypropylene bags</li> <li>• Mains water</li> <li>• Natural gas</li> <li>• Thermal/lube oil</li> <li>• Electric power</li> </ul>	A1. Raw material production	<ul style="list-style-type: none"> <li>• RAR-X additive</li> <li>• Emissions to air</li> </ul>
	↓	
	A2. Transport to factory	
	↓	
	A3. Production process of the RARX® additive	



## Life cycle stages studied in the self-declared environmental claim.

The system studied in the Life Cycle Assessment of the production of the RARX® additive for asphalt mixtures is from cradle to gate of CIRTEC. Stages A1, A2 and A3 were studied:

- A1: production of the electricity consumed in the core process and of the raw materials that form part of the final product.
- A2: transport of raw materials to CIRTEC premises.
- A3: RAR-X production at the Vademoro factory.

Building Assessment Information														Supplementary information beyond building Life Cycle
A1 a 3			A4 - 5		B1 a 7					C1 a 4				D
Product stage			Construction process stage		Use stage					End of life stage				Benefits and loads beyond system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Raw material supply	Transport	Manufacturing	Transport	Construction/instalación process	Use	Maintenance	Repair	Replacement	Refurbishment	Deconstruction / demolition	Transport	Waste processing	Disposal	Reuse – recovery - recycling potential
Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario	Scenario
B6. Operational energy use										MND				
Scenario														
B7. Operational water use										MND				
Scenario														

X –Module declared in LCA

MND – Module not declared

**X** –Module declared in LCA

**MND** – Module not declared



**Figure 1. Stages and information modules for the assessment of buildings. Building life cycle**

Subsequent processes of using the RARX® additive are beyond the scope of this self-declared environmental claim.

More than 99% by weight of the materials used in manufacturing were studied in the LCA of the RARX®. The following were not included in the LCA:

- Equipment with a useful life greater than 3 years.
- Construction of the plant buildings or other capital goods.
- Production of machinery and equipment to produce RARX® additive.
- Working trips and travel to or from work by personnel.
- Research and development activities.

Two principals have been followed in the LCA: the polluter pays principle and the modularity principle (environmental charges are assigned to the stage where the impact occurs).

This self-declared environmental claim only covers the cradle to gate stages because all the other stages are highly dependent on scenarios of use.

### Data reference year.

The collected data for this EPD cover one year, 2019, a period with representative production. Spain's renewable electricity generation mix in 2019, was used for production of the electric power. The Annex provides detailed information on how the renewable electricity production process in Spain was updated in 2019.

### Cut-off rule

In accordance with the PCR criteria, the gross weight/volume of all the materials used in the manufacturing process of the RARX® are included in the LCA so that at least 99% of the product unit weight is obtained.

No energy source was excluded from the LCA.



### Allocation rules.

The allocation criterion applied in the RARX® additive study is allocation of the inputs and outputs of the system based on physical properties (mass) in accordance with the PCR criteria. It was not necessary to apply other types of allocation criteria such as economic allocation.

### Data quality assessment.

The production data from the Cirtec factory in Valdemoro corresponding to the year 2019, which is a representative year of production, have been used to model the RARX® manufacturing process. Data have been obtained from this plant on: consumption of matter and energy; transport distances from suppliers; and emissions into the air.

To represent the production of bitumen used as raw material at REPSOL's Puertollano oil refinery, it has been used EPD of conventional asphalt bitumens from the GlobalEPD program with the GlobalEPD designation code EN15804-011, valid until July 2025.

The december 2019 Ecoinvent 3.6 database, the latest version available at the time of the LCA, was used as required.

The criteria to be used for a semi-quantitative assessment of data quality proposed by the European Union in its Product Environmental Footprint and Organizations Environmental Footprint Guides are applied to assessment of the quality of the primary data in this LCA. The results are as follow:

- Very good integrity. Score 1.
- Good methodological suitability and consistency. Score 2.
- Insufficient temporal representativeness. Score 4.
- Reasonable technological representativeness. Score 3.
- Good geographical representativeness. Score 2.
- Reasonable data uncertainty. Score 3.

In accordance with the above data, the Data Quality Rating (DQR) has the following value:  $15/6 = 2.5$ , indicating that the data quality level is satisfactory.



For a better understanding of the data quality assessment, it should be noted that each criterion is awarded a score between 1 and 5 (the lower the score, the higher the quality) and that the following table is applied to obtain the final score:

**Overall data quality level according to the achieved data quality rating**

Overall data quality rating (DQR)	Overall data quality level
$\leq 1.6$	"Excellent quality"
$>1.6$ to $\leq 2.0$	"Very good quality"
$>2.0$ to $\leq 3.0$ <sup>71</sup>	"Good quality"
$>3$ to $\leq 4.0$	"Fair quality"
$>4$	"Poor quality"



## 7. ENVIRONMENTAL INFORMATION.

### Environmental impacts.

The following are the results obtained for production of 1 ton of the RARX® additive from end-of-life tires in the environmental impact categories requested by the PCR in the stages A1, A2 y A3:

Potential environmental impacts of 1 ton. RARX®					
Impact category	Unit	A1	A2	A3	A1-A3
Global Warming Potential (GWP)	kg CO <sub>2</sub> eq.	191,22	12,81	2,01	206,04
Acidification potential (AP)	kg SO <sub>2</sub> eq.	4,74E-01	3,80E-02	5,65E-03	5,18E-01
Eutrophication potential (EP)	kg PO <sub>4</sub> <sup>3-</sup> eq.	6,44E-02	6,26E-03	4,82E-04	7,12E-02
Tropospheric ozone formation potential	kg C <sub>2</sub> H <sub>4</sub> eq	3,31E-02	1,35E-03	1,22E-02	4,66E-02
Abiotic resource depletion potential - Elements	Kg Sb eq	6,73E-05	7,58E-07	2,89E-07	6,84E-05
Abiotic resource depletion potential - Fossil fuels	MJ, net cal.power	8.261,54	182,10	75,17	8.518,81
Stratospheric ozone depletion potential	kg CFC-11 eq	1,48E-05	2,36E-06	3,32E-08	1,72E-05

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.



## Use of resources

The following table shows the consumption of natural resources and other types of resource used by functional unit, differentiated between product stages A1, A2 and A3.

Use of resources by 1 ton of RARX®						
Indicator		Unit	A1	A2	A3	Total
Primary energy resources - renewable	Use of energy	MJ, net cal.power	1.002,43	2,55E-01	8,98E-01	1.003,58
	As raw materials	MJ, net cal.power	0,00	0,00	0,00	0,00
	TOTAL	MJ, net cal.power	1.002,43	2,55E-01	8,98E-01	1.003,58
Primary energy resources - non-renewable	Use of energy	MJ, net cal.power	1.526,17	182,49	78,89	1.787,55
	As raw materials	MJ, net cal.power	7.449,1	0,00	0,00	7.449,10
	TOTAL	MJ, net cal.power	8.975,27	182,49	78,89	9.236,65
Secondary materials		kg	600,00	0,00	0,00	600,00
Renewable secondary fuels		MJ, net cal.power	0,00	0,00	0,00	0,00
Non-renewable secondary fuels		MJ, net cal.power	0,00	0,00	0,00	0,00
Net consumption of fresh water		m <sup>3</sup>	2,50E-01	9,06E-03	3,69E-03	2,62E-01

*Note: Data obtained using the Cumulative Energy Demand methodology and analysis of the raw material compartment in the SimaPro inventory.*



## Waste categories.

The following table shows the amount of waste generated to manufacture the RARX® additive of CIRTEC, obtained from the analysis in SimaPro using the EDIP 2003 V1.07 methodology:

Waste generation by manufacture of 1 ton of RARX®					
Indicator	Unit	A1	A2	A3	Total
Hazardous waste generated	kg	2,11E-03	4,79E-04	2,84E-06	2,59E-03
Non-hazardous waste generated	kg	2,16	9,77E-03	2,06E-02	2,19
Radioactive waste	kg	7,81E-03	1,32E-03	2,99E-05	9,17E-03

*Note: The materials considered to constitute waste generated during the production process are those sent to landfill for final disposal (not reused, recycled and/or recovered).*

## Other environmental information regarding to output flows.

Indicators of flows discharged from the system to manufacture 1 ton of RARX®					
Indicator	Unit	A1	A2	A3	Total
Components for reuse	kg	0,00	0,00	0,00	0,00
Material for recycling	kg	1,34E-03	0,00	0,00	1,34E-03
Materials for energy recovery	kg	0,00	0,00	0,00	0,00
Exported energy	MJ	2,46	0,00	0,00	2,46



## 9. DIFFERENCE WITH PREVIOUS VERSIONS OF THIS SELF-DECLARED ENVIRONMENTAL CLAIM.

There are no previous versions of this self-declared environmental claim.

## 10. REFERENCES.

- UNE-EN 15804:2012+A1:2014 standard. Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.
- Ecoinvent 3.6 (december 2019)
- Environmental Impact Assessment Methodologies:
  - CML-IA baseline V3.06 / EU25+3,2000.
  - EDIP 2003 V1.07
  - Cumulative Energy Demand (LHV) V1.00
- Databases and environmental impact methodologies applied through SimaPro 9.1.0.8.
- LCA, by Abaleo S.L., of the production of: crumb rubber from recycling end-of-life tires (ELTs), RARX® additive for asphalt mixtures and manufacture of the asphalt mixtures themselves.
- EPD GlobalEPD EN15804-011, *Betunes asfálticos convencionales*, from the GlobalEPD program. Valid until 07-19-2025.
- ISO 14040 standard. Environmental management. Life cycle assessment. Principles and framework. 2006.
- ISO 14044 standard. Environmental management. Life cycle assessment. Requirements and guidelines. 2006.
- UNE-EN ISO 14021 standard. Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling). 2017.
- COMMISSION RECOMMENDATION 2013/179/EU of 9 April 2013 on the use of common methods to measure and communicate the life cycle environmental performance of products and organizations (published in the Official Journal of the European Union on 4/05/2013).



## 11. ANNEX. EXPLANATION OF THE SPANISH ELECTRICITY GENERATION MIX.

The National Electric renewable electricity generation mix for 2019 obtained from the annual Spanish Electricity System Report issued by Red Eléctrica of Spain was used to draw up the LCA. The GHG emissions from this electricity mix are 5.69 gCO<sub>2</sub>e/MJ, assessed using the IPCC 2013 methodology with a horizon of 100 years.

The following are the data table obtained from the aforesaid report.

*National electrical energy balance <sup>(1)</sup>*

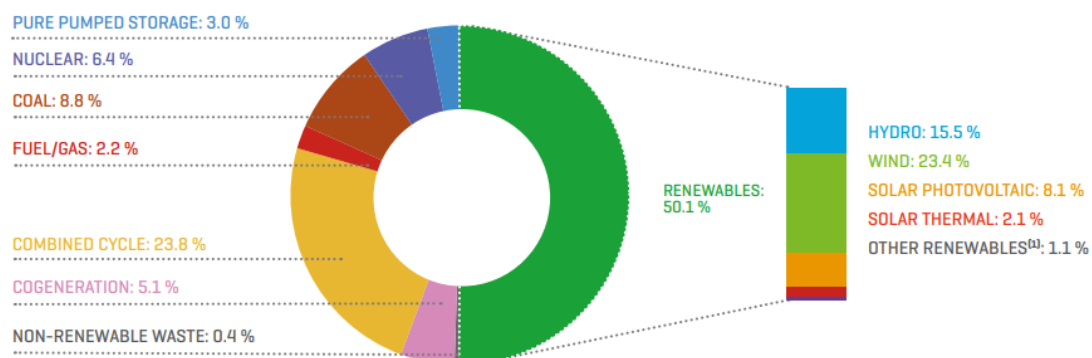
	Peninsular system		Non-peninsular systems		National total	
	GWh	%19/18	GWh	%19/18	GWh	%19/18
Hydro	24,709	-27.6	4	7.1	24,712	-27.6
Hydro-wind	-	-	23	-1.7	23	-1.7
Wind	53,094	8.5	1,144	82.9	54,238	9.4
Solar photovoltaic	8,841	19.8	400	3.7	9,240	19.0
Solar thermal	5,166	16.8	-	-	5,166	16.8
Other renewables <sup>(2)</sup>	3,607	1.7	11	6.3	3,617	1.7
Renewable waste	739	0.8	151	6.9	890	1.8
<b>Renewable generation</b>	<b>96,155</b>	<b>-3.0</b>	<b>1,733</b>	<b>45.6</b>	<b>97,888</b>	<b>-2.4</b>
Pumped storage (net supply) <sup>(3)</sup>	1,642	-17.6	-	-	1,642	-17.6
Nuclear	55,824	4.9	-	-	55,824	4.9
Coal	10,672	-69.4	2,000	-16.5	12,672	-66.0
Fuel/gas <sup>(4)</sup>	-	-	5,696	-14.8	5,696	-14.8
Combined cycle <sup>(5)</sup>	51,140	93.7	4,099	12.6	55,239	83.9
Cogeneration	29,580	2.1	34	-1.6	29,614	2.1
Non-renewable waste	2,072	-9.7	151	6.9	2,222	-8.7
<b>Non-renewable generation</b>	<b>150,931</b>	<b>2.2</b>	<b>11,979</b>	<b>-7.1</b>	<b>162,910</b>	<b>1.4</b>
Pumped storage consumption	-3,025	-5.4	-	-	-3,025	-5.4
Peninsula-Balearic Islands link <sup>(6)</sup>	-1,695	37.4	1,695	37.4	0	-
International exchange balance <sup>(7)</sup>	6,862	-38.2	-	-	6,862	-38.2
<b>Demand (b,c,)</b>	<b>249,228</b>	<b>-1.7</b>	<b>15,407</b>	<b>0.6</b>	<b>264,635</b>	<b>-1.6</b>

*[1] Allocation of generation units based on primary fuel. The net production of non-renewable and non-Hydro Management Units (HMU) facilities have their own consumption discounted. In these types of production, negative generation indicates that the electricity consumed for the power station's uses exceeds its gross production. [2] Includes biogas, biomass, marine and geothermal. [3] Pure pumped storage (net supply) + estimate of mixed pumped storage (net supply). [4] The Balearic Islands electricity system includes generation with auxiliary generation units. [5] Includes operation in open-cycle mode. The Canary Islands electricity system uses diesel as its main fuel. [6] Positive value: energy input into the system; negative value: energy output from the system. [7] Positive value: importer balance; negative value: exporter balance. Increment values are not calculated when exchange balances have different signs*

Source: Annual Spanish Electricity System Report 2019 issued by Red Eléctrica of Spain.



**Breakdown of installed power capacity as at 31.12.2019. National electricity system [%]**



[1] Includes biogas, biomass, geothermal, marine, wind-hydro and renewable waste.

Source: Annual Spanish Electricity System Report 2019 issued by Red Eléctrica of Spain.

