

GlobalEPD

A VERIFIED ENVIRONMENTAL DECLARATION



Environmental Product Declaration

EN ISO 14025:2010
EN 15804:2012+A2:2020



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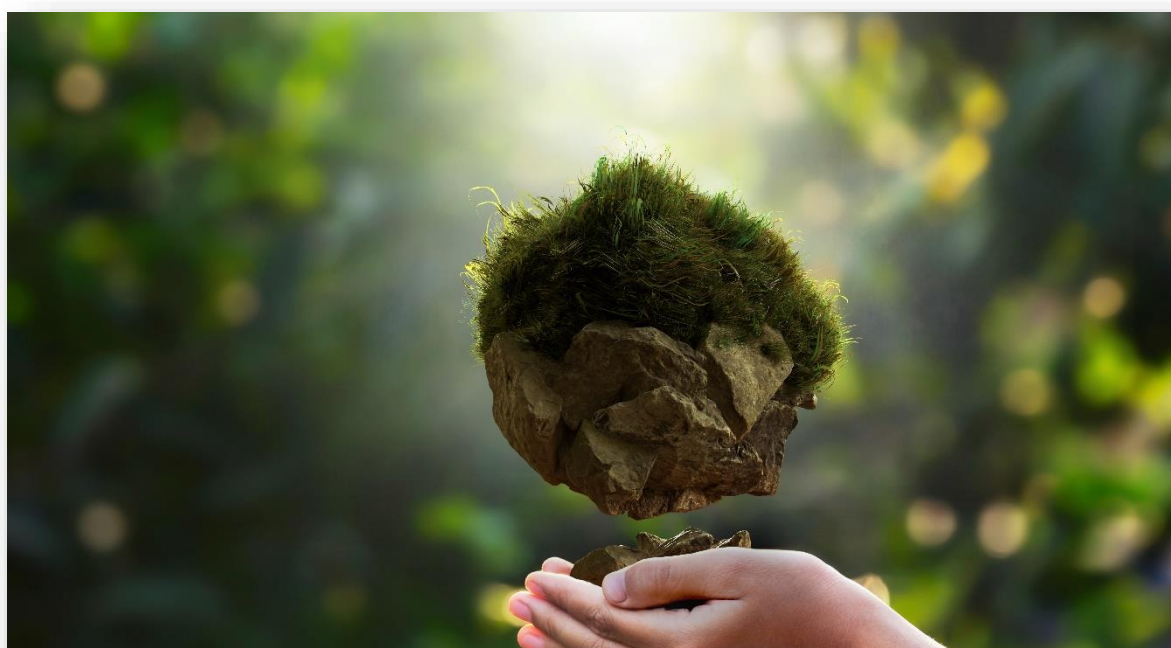
Recycled aggregates

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Federación de Áridos - FdA



The holder of this declaration is responsible for its content, as well as for the retention of supporting documents for the data and declarations included during the period of validity.



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EN 15804:2012+A2:2020
Independent verification of declaration and data in accordance with EN ISO 14025:2010
<input type="checkbox"/> Internal <input checked="" type="checkbox"/> External
Verification body


1. General information

1.1. Organization

The Federación de Áridos, hereinafter FdA, incorporated in 2007, is a non-profit organisation, composed of ANEFA, ARIGAL, ARIVAL, EUSKAL ÁRIDO and GREMI D'ÀRIDS DE CATALUNYA, which represents the interests of aggregates producing companies in Spain, both nationally and internationally.

The objectives of the FdA include the promotion of the sustainable development of the sector, environmental protection and corporate social responsibility, through technical improvement, the application of good practices and compliance with standards and regulations on production and product quality, environment, etc.

With this sectoral EPD, the FdA focuses on promoting corporate social responsibility strategies, in addition to:

- The circular economy.
- Facilitate the marketing of their products.
- Reduce the risk associated with changes in environmental legislation or customer purchasing criteria.
- Communicate, in a standardized way, the environmental performance of its products and services.

The holder of this sectoral Environmental Product Declaration - DEP - is the FdA, whose contact details can be found on page 2 of this declaration.

This sectoral DEP is for the exclusive use of the undertakings and establishments listed in ANNEX I.

1.2. Scope of the Declaration

This sectoral D E P includes only modules A1- A3, product stage according to the modular scheme defined in UNE- EN 15804+A2.

This EPD is therefore of the "cradle to door" type.

1.3. Lifecycle and Compliance

This EPD has been developed and verified in accordance with UNE-EN ISO 14025:2010 and UNE-EN 15804:2012+A2:2020.

Product Category Rules Information	
Descriptive title	Sustainability in construction. Environmental product declarations. Basic rules of product categories for construction products.
Registration code and version	UNE-EN 15804:2012 + A2:2020
Date of issue	2020-03
Compliance	UNE-EN 15804:2012 + A2:2020
Program Officer	AENOR Internacional S.A.U.

This environmental statement includes the following stages of the life cycle:

System limitations. Information modules taken into account

Product stage	A1	Supply of raw materials	X
	A2	Transport to the factory	X
	A3	Manufacture	X
Construction	A4	Transport to the construction site	MNE
	A5	Installation / construction	MNE
Stage of use	B1	Usage	MNE
	B2	Maintenance	MNE
	B3	Repair	MNE
	B4	Replacement	MNE
	B5	Rehabilitation	MNE
	B6	In-service energy consumption	MNE
	B7	In-service water consumption	MNE
Later life	C1	Deconstruction / demolition	MNE
	C2	Transport	MNE
	C3	Residue treatment	MNE
	C4	Elimination	MNE
D	Potential for reuse, recovery and/or recycling	MNE	
X = Module included in the LCA; NR = Module no relevant; EMN = Unassessed module			

This EPD may not be comparable with those developed in other programs or according to different reference documents, in particular it may not be comparable with EPD not developed according to UNE-EN 15804+A2.

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

The comparison of construction products must be made on the same function, applying the same functional 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 UNE-EN ISO 14025.



2. The product

2.1. Product identification

Aggregates are normally defined as fragments or grains of mineral materials, inert solids that, with appropriate particle size, can be used in construction (buildings and infrastructure) and in many industrial applications, alone or with the addition of cement, lime or bituminous binder.

Aggregates are classified according to their origin:

- Natural aggregates.
- Artificial aggregates.
- Recycled aggregates.

This sectoral EPD applies to recycled aggregates.

Before we start talking about recycled aggregates, it is worth mentioning what DCD (construction and demolition waste) is, i.e. all materials from the deconstruction or demolition of buildings, warehouses, civil structures, etc. Also included under this name, although they are not strictly speaking WFD, are soils resulting from emptying, clearing and public works.

With this term explained, we can move on to the definition of recycled aggregates, which are all construction and demolition waste (DCD) that has been subject to a recovery process. In other words, a treatment comprising several stages of crushing, classification and washing, which separates the stony fraction from the non-stony fraction (unsuitable) and makes it possible to obtain a quality aggregate that can be used as a building material.

2.2. Product Uses

The main areas of application of aggregates can be summarized as follows:

- Aggregates for mortar, according to UNE EN 13139.
- Aggregates for concrete, according to UNE EN 12620.
- Aggregates for hydrocarbon mixtures and surface coatings used in the construction of pavements, aerodromes and other traffic areas, according to UNE EN 13043.
- Aggregates for materials treated with hydraulic binders and untreated materials used for civil engineering works and for pavement construction, according to UNE EN 13242.
- Aggregates for railway ballasts, according to UNE EN 13450.
- Aggregates for riprap – Part 1: Specifications, according to UNE EN 13383-1.

2.3. Product Performance

The performance of aggregates can be summarized in the indicator describing the fragmentation strength of the Los Angeles coefficient.

Performance	Calculation or test method	Value	Units
Resistance to fragmentation (Los Angeles coefficient)	A-EN 1097-2	≤45	Dimensionless

2.4. Composition of the product

The composition of the product refers in all cases to the nature of the recycled aggregate or to the weighted composition of the recycled aggregate. Normally, it is described in the following table:

Weighted composition of weighted recycled aggregates

Components	Content	
	Mass percentage	
Rc	≥ 90	
	≥ 80	
	≥ 70	
	≥ 50	
	< 50	
	No requirements	
Rc + Ru + Rg	≥ 90	
	≥ 70	
	≥ 50	
	< 50	
	No requirements	
Rb	≤ 10	
	≤ 30	
	≤ 50	
	< 50	
	No requirements	
Ra	≥ 95	
	≥ 80	
	≥ 50	
	≥ 40	
	>30	
	≤ 30	
	≤ 20	
	≤ 10	
	≤ 5	
	≤ 1	
No requirements		
Rg	≤ 2	
	≤ 5	
	≤ 25	
	No requirements	
X	≤ 1	
	≤ 2	
	≤ 3	
	≤ 5	
	Content cm ³ /kg	
FL	≤ 2	
	≤ 5	
	≤ 10	

NOTE 1 Recycled concrete aggregate: recycled aggregate from construction and demolition residues whose components, determined in accordance with European standard prEN 933-11:2021, exceed 90% by weight of concrete, concrete products, mortars, concrete masonry materials, aggregates and natural stone, as well as materials treated with hydraulic binders; not more than 2% by weight of glass. It must consist of at least 50 % concrete, concrete products, mortars and concrete masonry elements. .

NOTE 2 Mixed recycled aggregates: recycled aggregates from construction residues whose components, determined in accordance with European standard prEN 933-11:2021, exceed 70% by weight of concrete, concrete products, mortars, concrete masonry elements, aggregates and natural stone, as well as materials treated with hydraulic binders; not more than 2 % by weight of glass. The rest will

consist of ceramic materials of clay masonry (bricks and tiles) or calcium silicate, non-floating aerated concrete.

And where,

Symbols and abbreviations for recycled aggregates

Symbol	Component of recycled aggregates
Rc	Concrete
	concrete products, concrete blocks
	concrete mortar
Ru	Rn natural stone
	Hr Hydraulic binder mixtures - not concrete
	Rs Comparable materials
Rb	Materials from the metallurgical industry
	1. Fired clay elements
	2. Ceramic products
	3. Lightweight concrete
	4. Masonry mortar
	5. Calcium silicate elements
6. Other comparable materials	
Ra	Hydrocarbon mixtures
Rg	glass
X	1. Cohesive materials
	2. Bitumen roofing materials and bitumen sheets
	3. plastic, rubber
	4. Wood, organic materials
	5. Metals
	6. Plaster
	7. Materials from thermal processes
	8. Other contaminants (not limited)
FI	particles with a density ≤ 1,000 kg/m ³

The composition of the recycled aggregates resulting from the survey is as follows:

Type of material	Total (%)
Pre-treated materials from another aggregate operation	4,52%
Other residues	3,42%
Construction and demolition waste - DCD *	66,14%
Non-hazardous waste	0,07%
Soil and stones excavated for recovery	25,85%
Grand total	100,00%

3. Information about LCA

3.1. Life Cycle Assessment

This EPD is based on a life cycle assessment A1-A3 "from cradle to door", carried out by IECA with the collaboration of Marcel Gómez Consultoría Ambiental.

3.2. Declared unit

1 tonne of recycled aggregates.

3.3. Reference useful life (RSL)

In general, the reference service life will be that of the element or application in which the aggregates are used, ranging from 50 to 100 years.

3.4. Distribution criteria

For flows associated with the production process, such as energy consumption and residue generation, a physical criterion (mass) was applied to allocate inputs and outputs from the production system to each product, based on production. No simplification has been made to these flows and they are taken into account in their entirety. The distribution of co-products, if any, was a financial distribution.

3.5. Representativeness, quality and selection of data

To model the aggregates treatment process, production data from companies participating in this EPD were used for the year 2019, which is considered the reference year.

From these sites, data were obtained on: energy consumption for processing in the site until shipment, consumables, transport distances, waste generation and all production operations likely to generate environmental impacts.

Activity data is typically obtained through complete records of annual production through accurate measurement processes for each of the production sites associated with the FdA.

The data are all for the year 2019, with a temporal correlation between 1 and 10 years compared to the sets in the database. With a satisfactory Spanish geographical

correlation with representative sets of the European context and, finally, with an equal or similar technological correlation, concerning flows for processes such as the use of machinery or transport equipment.

Data management and control ensure data quality in terms of representativeness and consistency, as required by the FdA.

The Ecoinvent Data Quality system was used as a methodology for data quality assessment during LCA development.

3.6. Other calculation rules and assumptions

The inventory data used is the weighted average of the data specific to recycled aggregates. The weights are based on the output of each individual farm in relation to total production.

These aggregates include all the variability of the typologies of the population of the holdings considered, both from the point of view of the type of farm, the technology used and the origin of the aggregate (see section 3). It includes operations throughout the country.

The aggregates production considered represents 71.0% of the production integrated into the FdA and 57.1% of the total in Spain.

With regard to the source of the data, data from the Ecoinvent 3.8 Manufacturer Survey and Processes were used when these data were not available or when modelling transport and similar processes.

Weighted averages were applied for site-attributable energy use for both electricity, diesel and natural gas.

The electricity mix is that of 2019 based on REE data. The percentage of renewable electricity produced and consumed in the facility represents 2.37% of the total.

Transport was considered from the origin of the aggregate or consumable, whether by truck, sea or rail. Each site also reported the road transport distance for each of the secondary materials (explosives and detonating cords, diesel, gasoline, fuel oil, lubricants, additives and flocculants).

The total quantity transported and the weighted average distance for each production site were therefore determined. For consumables and raw materials, the aggregate tonne*kilometre ratios are 0.048 t*km and 19.610 t*km respectively.



4. System limitations, scenarios and additional technical information

The "cradle-to-door" approach was a cradle-to-door approach, i.e. an A1-A3 declaration where:

A1, acquisition of demolition waste according to the polluter-pays principle.

A2, transport of aggregates to the treatment site. Transport of consumables and fuels to the processing site.

A3, treatment site for recycled aggregates.

Information modules not considered should be marked as "Unassessed Module (UNM)". The cradle-to-door approach is justified because, in most of the aforementioned applications, aggregates lose their physical identity as they are constituents of other building products such as concrete, mortars, road surfaces, etc.

The following criteria were used to select the most representative processes:

- That it be representative data on the technological development actually applied.
- In general, the data provided by the manufacturers were taken into account according to the proximity criterion, i.e. the use of the data provided by the manufacturers.

Simplifications have been avoided as far as possible, retaining all the variability of the input data in terms of their type, nature and processing.

4.1 Process upstream of manufacturing

The process begins with the acquisition of demolition residues and similar residues.

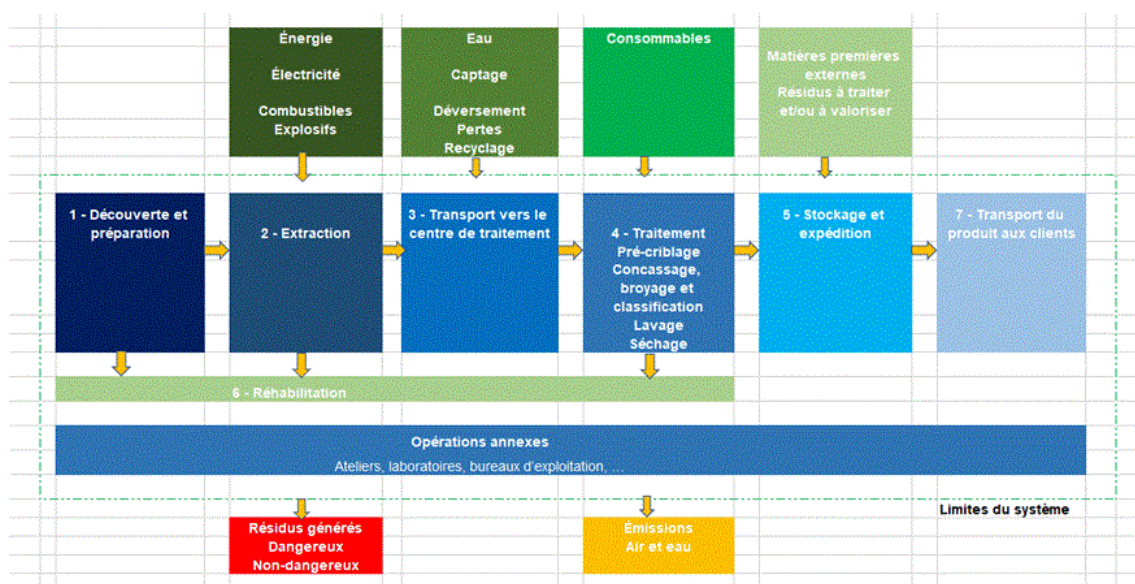
4.2 Transportation processes

Module A2 includes the transport of aggregates to processing centres as well as the transport of consumables, spare parts and fuels to farms.

4.3 Product Manufacturing

Module A3 includes the treatment of recycled aggregates in the site in a way totally equivalent to that of natural aggregates. Sites may include a wide variety of processes, including the usual crushing, grinding and classification.

The general approach used is described in the diagram below:



5. LCA and ICV Environmental Parameter Declarations

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

Environmental impacts.

Parameter	Unit	A1	A2	A3	A1+A2+A3
PRP - total	kg CO ₂ eq.	0,00E+00	2.65E+00	2.36E+00	5.02E+00
GWP - fossil	kg CO ₂ eq.	0,00E+00	2.65E+00	2.35E+00	5.01E+00
GWP - biogenic	kg CO ₂ eq.	0,00E+00	1.55E-04	8.54E-03	8.69E-03
GWP - luluc	kg CO ₂ eq.	0,00E+00	2.15E-05	1.29E-03	1.31E-03
ODP	kg CFC 11 eq.	0,00E+00	6.31E-07	4.65E-07	1.10E-06
AP	mol H ⁺ eq.	0,00E+00	5.28E-03	2.21E-02	2.74E-02
EP - freshwater	kg PO ₄ ³⁻ eq.	0,00E+00	5.21E-04	4.25E-03	4.77E-03
EP - marine	kg N eq.	0,00E+00	8.75E-04	1.06E-02	1.15E-02
EP - terrestrial	mol N eq.	0,00E+00	9.74E-03	1.01E-01	1.10E-01
POCP	kg NMVOC eq.	0,00E+00	3.43E-03	2.79E-02	3.14E-02
ADP - minerals and metals ¹	kg Sb eq.	0,00E+00	1.15E-07	3.18E-06	3.30E-06
ADP - fossil ¹	MJ	0,00E+00	3.76E+01	3.69E+01	7.46E+01
WDP ¹	m ³	0,00E+00	-6.34E-03	6.58E+00	6.57E+00

GWP - total: Global warming potential; **GWP - fossil:** Global warming potential of fossil fuels; **Biogenic Global GWP - Warming Potential;** **GWP - luluc:** Global warming potential of land use and land use change; **ODP:** Stratospheric ozone depletion potential; **AP:** Acidification potential, cumulative surplus; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching the final freshwater compartment; **EP-marine:** Eutrophication potential, fraction of nutrients reaching the final compartment of marine water; **EP-terrestrial:** Eutrophication potential, cumulative surplus; **POCP:** Tropospheric ozone formation potential; **ADP-minerals&metals** Potential for depletion of abiotic resources for non-fossil resources; **Fossil ODA:** Potential for depletion of abiotic resources for fossil resources; **WDP:** Water deprivation potential (user), weighted water deprivation consumption. **NR:** Not relevant

¹ The results of this environmental impact indicator should be used with caution as the uncertainties of these results are high and experience with this parameter is limited.

Resource utilization

Parameter	Units	A1	A2	A3	A1-A3
PERE	MJ	0,00E+00	5.77E-02	1.22E+00	1.28E+00
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	0,00E+00	5.77E-02	1.22E+00	1.28E+00
PENRE	MJ	0,00E+00	3.76E+01	3.50E+01	7.26E+01
PENRM	MJ	0,00E+00	0,00E+00	1.95E+00	1.95E+00
PENRT	MJ	0,00E+00	3.76E+01	3.69E+01	7.46E+01
SM	Kg	0,00E+00	0,00E+00	1.00E+03	1.00E+03
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	0,00E+00	9.67E-05	5.94E-02	5.95E-02

PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw material; **PERM**: Use of renewable primary energy used as raw material; **PERT**: Total use of renewable primary energy; **PENRE**: Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials; **PENRM**: Use of non-renewable primary energy used as raw material; **PENRT**: Total non-renewable primary energy consumption; **SM**: Use of secondary materials; **RSF**: Use of renewable secondary fuels; **NRSF**: Use of non-renewable secondary fuels; **FW**: Net use of piped water resources; **NR**: Not relevant

Residue categories

Parameter	Units	A1	A2	A3	A1-A3
HWD	Kg	0,00E+00	9.89E-05	3.53E-02	3.54E-02
NHWD	Kg	0,00E+00	1.55E-03	3.10E+01	3.10E+01
RWD	Kg	0,00E+00	2.69E-04	2.44E-04	5.14E-04

HWD: Hazardous waste disposed of; **NHWD:** Non-hazardous waste disposed of; **RWD:** Radioactive residues disposed of; **NR:** Not relevant

Output stream

Parameter	Units	A1	A2	A3	A1-A3
CRU	Kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	Kg	0,00E+00	0,00E+00	4.38E-01	4.38E-01
SEA	Kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EE	MJ	0,00E+00	0,00E+00	3.72E-02	3.72E-02

CRU: Components for reuse; **MFR:** Materials for recycling; **MER:** Materials for energy recovery; **EE:** Energy exported; **NR:** Not relevant

Information on biogenic carbon content

Biogenic carbon content	Units	Result per reported functional unit
Biogenic carbon content produced - kgC	kg C	0,00E+00

6. Additional Environmental Information.

Recycled aggregates are free of volatile organic compounds that may be emitted during use.

They also do not emit compounds into soil or water during the use phase, as the product does not undergo physical, chemical or biological transformation, is not soluble or combustible, does not react physically, chemically or otherwise, is not biodegradable, does not adversely affect other materials with which it comes into contact in a way that could lead to contamination of the environment or harm human health.

It is a non-leaching product and therefore does not pose a risk to surface or groundwater quality.

The product does not contain substances on the European Chemicals Agency's Candidate List of Substances of Very High Concern for Authorisation.

Appendix 1. Associated production sites

ARIDCAL, S.A.

EL CASTELLOT

ÁRIDOS BLESA, S.L.U.

ALTOS PEÑES Nº 3.001

ÁRIDOS CARASOLES, S.L.

CARASOLES-2943

ÁRIDOS LAVADOS, S.L.

RAQUEL

ÁRIDOS MIJARES, S.L.

VERTEDERO RNP 513/G04/CV

ÁRIDOS VALDEARCOS, S.L.

VALDEARCOS

ÁRIDOS Y EXCAVACIONES DEL NORTE, S.L.

CASCAJAL

ÁRIDOS Y EXCAVACIONES RUBERTE, S.L.

VILLANUEVA

ÁRIDOS GARCIA PEDRERA GAR1, S.L.

GAR-1

ASFALTOS URRETXU, S.A.

PLANTA DE DESKARGA

CALERAS DE LISKAR, S.A.

LISKAR

CANTERA ÁRIDOS PUIG BROCA, S.A.

PUIG BROCA

CANTERAS FERNANDEZ PASCUAL, S.L.

THE CAROLINA

CUARCITAS DEL MEDITERRÁNEO, S.A.

MONODEPÓSITO CONTROLADO DE RCD Y TIERRAS DE BOTARELL

DIONISIO RUIZ, S.L.

LA PLANA

PEDROLA

EIFFAGE INFRAESTRUCTURAS, S.A.U.

LA CABRERA

EKOTRADE RCD'S, S.L.

EKOTRADE RCDS

EXCAVACIONES GRASA, S.L.

GRASA NO. 3.023

EXPLOTACIONES DE ÁRIDOS CALIZOS, S.A.

LÓPEZ FONT

FELIX SANTIAGO MELIAN, S.L.

CORRALETE-DRAGUILLO

FORBISA

FUENTE DE LA VIRGEN

GUEROLA ÁRIDOS Y HORMIGONES, S.L.

ESTIVALIS NO. 627

HORMIGONES BIESCAS, S.L.

AYERBE

HORMIGONES GRAÑEN, S.L.

PLANTA DE ANGÜÉS

HORMIGONES RIOJA, S.A.

VILLALOBAR

HORMIGONES Y ÁRIDOS DEL PIRINEO ARAGONÉS, S.A.

HORMYAPA

HORMIGONES Y EXCAVACIONES GERARDO DE LA CALLE, S.L.U.

PLANTA RCD

INGENIERÍA TÉCNICA DEL HORMIGÓN, S.L.

CANTERA EL SALOBRAL

JULIO ANGULO, S.L.

IGATE II/PLANTA BY BENEFICIO URUÑUELA

LISTA GRANIT, S.A.U.

MONTE DA COSTA Nº 8

LOPEAN ASFALTOS Y CONSTRUCCIONES, S.A.

PIEDRA GRANDE

LORENZO ANDRÉS VALLÉS, S.L.

LAS GARGANTAS Nº 2.745

MASSACHS OBRES I PAISATGE, S.L.U.

RA 411 MAS PATXOT

MATERIALES Y HORMIGONES, S.L.

PRERESA MORATA

NEMESÍO ORDOÑEZ, S.A.

LOLA NO. 153

PROMOTORA MEDITERRÀNEA-2, S.A.

SANT VICENÇ DELS HORTS

PUIGFEL, S.A.U.

COVA SOLERA

RIBALTA I FILLS, S.A.

PLANTA ÀRIDS OLIANA

ROMÀ INFRAESTRUCTURES I SERVEIS, S.A.U.

ABOCADOR DE BALAGUER

ABOCADOR OF MIRALCAMP

ABOCADOR OF BRIDGES

SEFEL, S.A.

PLANTA ÁRIDOS RECICLADOS RIPOLLET

SERVEIS AMBIENTALS MONTASPRE, S.L.

SANT JULIÀ DE RAMIS

TAMUZ, S.A.

EL CASTELL

TRANSFEL, S.A.U.

PLANTA DE TRANSFERENCIA Y RECICLAJE DE ÁRIDOS RIPOLLET

VALERO Y ALARCON, S.L.

PLANTA RCDS

VIARIA AGLOMERADO, S.L.

PLANTA BERIAIN

7. References

[1] General Regulations of the GlobalEPD Programme, 2nd Revision. AENOR. February 2016

[2] UNE-EN ISO 14025:2010 Environmental labels. Type III environmental declarations. Principles and procedures (ISO 14025:2006).

[3] Standard UNE-EN 15804:2012+A2:2020 Sustainability in construction. Environmental product declarations. Basic rules for product categories for construction products

UNE-EN ISO 14040 standard. Environmental management. Life cycle assessment. Principles and terms of reference. 2006.

[4] UNE-EN ISO 14044 standard. Environmental management. Life cycle assessment. Requirements and guidelines. 2006

[5] LCA Report Marcel Gómez Consultoría Ambiental April 2022 version

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