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ENVIRONMENTAL PRODUCT DECLARATION

**DAPcons®.100.003**



IN ACCORDANCE WITH STANDARDS  
ISO 14.025 and UNE EN 15804 + A1

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PRODUCT

**KRION®**  
**Porcelanosa Solid**  
**Surface**

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COMPANY

**SYSTEMPOOL**  
PORCELANOSA Grupo

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PRODUCT DESCRIPTION

KRION® Porcelanosa Solid Surface is a non-porous and homogeneous surfacing material, composed of two thirds of natural minerals and a low percentage of High-resistance.

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PCR REFERENCE

RCP100 - Productos de construcción en general – V.2 (2016)

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PRODUCTION PLANT

SYSTEMPOOL, S.A.  
Ctra. Villarreal - Puebla Arenoso (CV20)  
Km 1  
12540 Villarreal (Castellón) SPAIN

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VALIDITY

From: 22/12/2017  
To: 22/12/2022

The validity of DAPcons®.100.003 is subject to the conditions of DAPcons® regulations. The relevant version of this DAPcons® is included in the register kept by the CAATEEB; for more information, consult the Program Operator's website: [www.csostenible.net](http://www.csostenible.net)



## Environmental Product Declaration KRION® Porcelanosa Solid Surface Executive Summary

<p><b>PROGRAM OPERATOR DAPconstrucción®</b></p> <p>Environmental product declarations in the construction sector <a href="http://www.csostenible.net">www.csostenible.net</a></p>	
<p><b>ADMINISTRATOR OF THE PROGRAM OPERATOR</b></p> <p>Col·legi d'Aparelladors, Arquitectes Tècnics de Barcelona i Enginyers de l'Edificació (CAATEEB) Bon Pastor, 5, 08021 Barcelona <a href="http://www.apabcn.cat">www.apabcn.cat</a></p>	
<p><b>HOLDER OF THE DECLARATION</b></p> <p>SYSTEMPOOL, S.A. Ctra. Villarreal - Puebla Arenoso (CV20) Km 1 12540 Villarreal (Castellón) SPAIN</p> <p><b>DECLARATION CARRIED OUT BY:</b> ReMa-INGENIERÍA, S.L. Calle Crevillente 1, entlo, 12005 - Castellón - SPAIN</p>	
<b>DECLARATION NUMBER</b>	DAPcons®.100.003
<b>PRODUCT DECLARED</b>	KRION® Porcelanosa Solid Surface
<p><b>PRODUCT DESCRIPTION</b></p> <p>The product KRION® Porcelanosa Solid Surface is a new generation material that thanks to its characteristics can be applied in very different settings, making possible projects that with other materials are impossible. In addition, thanks to these properties, the material does not generate any negative impact on air or water during its application, and once finished its life it can be regenerated and reused or landfilled as inert material.</p>	
<b>REGISTRATION DATE</b>	22/12/2017
<p><b>VALIDITY</b></p> <p>This verified declaration authorizes the holder to use the DAPcons® eco-label logo. The declaration is applicable exclusively to the product in question and for five years as of the date of registration. SYSTEMPOOL, S.A. is responsible for the information contained in this declaration.</p>	
<p><b>ENDORSED BY CAATEEB:</b></p> <p>Mr. Jordi Gosalves i López, President of CAATEEB</p>	<p><b>ENDORSED BY AUTHORISED VERIFIER:</b></p> <p>Mr. Ferran Pérez, Verifier accredited by the Program Operator DAPconstrucción®</p>
<p>This environmental product declaration complies with standards ISO 14025 and UNE EN 15804 + A1 and contains information of an environmental nature about the life cycle of KRION® Porcelanosa Solid Surface manufactured by SYSTEMPOOL, S.A. in its production center in Daejeon (South Korea). This declaration is based on the document RCP 100 Productos de construcción en general - Versión 2 - 29.02.2016. The environmental product declaration (DAPcons®) may not be comparable to another EPD if it is not based on the UNE EN 15804 + A1 standard</p>	

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## Environmental Product Declaration KRION® Porcelanosa Solid Surface

### 1. Description of the product and its use

KRION® Porcelanosa Solid Surface is a pleasant and warm to the touch material similar to natural stone. It is made of two thirds of natural minerals (ATH - alumina trihydrate) and a low percentage of high strength resins. This composition gives Krion® a series of exclusive features: product without pores, durable, resistant and easy to repair, it only requires minimal maintenance and is easy to clean.

KRION® is a material that can be worked in a similar way to wood, allowing us to cut the sheets, join them and thermoforming them to create curved sections. It can also be cast during the production process obtaining shapes (sinks, bathtubs ...), making it possible to create different designs and projects unimaginable to achieve with other materials. KRION® has been classified as Euroclass B S1 d0 according to UNE-EN 13501-1: 2003 and as unrestricted material B1 according to DIN 4102

It has been declared non-toxic material by external laboratories and certified Greenguard Gold by UL, ANSI 51 "Food Equipment Materials" by NSF, REACH by SGS and free of Bisphenol A among others certificates.

This product is available in a wide range of colors and sheets of different thickness (3 mm, 6 mm, 9 mm, 12 mm and 19 mm).

The main recommended uses for this product are: exterior cladding, interior cladding and furniture.

**Table 1:** Main technical characteristics of the product.

Property	Test Method	Test Result	Units
Density	ISO 1183 ASTM D792	1.71 - 1.77	g/cm <sup>3</sup>
Flexural modulus of elasticity	ISO 178 / ASTM D790	8500 - 11900	MPa
Flexural strength		60 - 78	MPa
Elongation	ISO 178 / ASTM D638	0.7 - 0.85	%
Tensile modulus	ISO 527 / ASTM D638	9380 - 11325	MPa
Tensile strength		40 - 60	MPa
Compressive strength	ISO 604	97 - 117	MPa
Impact resistance (ball drop)	ISO 19712-2 UNE EN 438-2 ISO 4586-2 NEMA LD 3	Satisfactory (No break)	324g ball / Height 1.9m (2m)
Abrasion resistance	UNE EN 438-2 ISO 4586-2	0.028	% mass / Δmass(%) every 25 rev.
Resistance to boiling water	UNE EN 438-2 ISO 4586-2 NEMA LD 3	0.1 - 0.30	% weight
		0.1 - 0.30	% thickness
		Level 5: No change	Levels 1-5
Resistance to bacteria	ISO 846 / ASTM G22	No proliferation	
Resistance to fungi	ISO 846 / ASTM G21		
Anti-slip properties depending of grit finish from (40-600)	UNE ENV 12633	Rd = 40 Class 2 - Rd = 12 Class 0	SR (Roughness) Pendulum
	ASTM C1028	0.8 - 0.69	Dry Static Coefficient
		0.82 - 0.62	Wet Static Coefficient
	ANSI A.137.1:2012	0.7 - 0.35	Wet Dynamic Coefficient
Dimensional stability	ISO 4586-2 UNE EN 438-2	0.02 (90% HR & 23°C)	% change in length
		0.08 (23% HR & 23°C)	
Dimensional stability at high temperatures	UNE-EN 438-2	0.18 (70°C)	% change in length
		0.10 (95% HR & 40°C)	
Linear thermal expansion	ISO 11359-2 ASTM D696 UNE-EN 14581	3.5 x 10 <sup>-5</sup>	λ (mm/m °C)
Coefficient of thermal expansion		0.112	3*λ (mm <sup>3</sup> /m <sup>3</sup> °C)
Resistance to artificial weathering. Xenon arc (3000h)	ISO 4586-2 UNE EN 438-2 ISO 4892-2	Level 5: No change	Grey scale. Levels 1-5
Resistance to ultra-violet light. UV-313 lamp (1500 hrs)	UNE EN 438-2 ISO 4892-3	Level 4.5: Slight change	Grey scale. Levels 1-5
Lightfastness (122 hrs)	ISO 19712-2 UNE 56868:2002	Level 5: No change	Grey scale. Levels 1-5
Colour fastness	ISO-19712-2	>6	"blue wool"
Thermal resistance	UNE EN 12667	q = 104.8	W / m
		R = 0.05	m <sup>2</sup> . K / W
		λ = 0.396	W / m . K
Thermal shock resistance (90 - 20 °C / 194 - 68 °F)	ISO-19712-2	Satisfactory	250 Cycles
Surface resistance to damp heat	ISO 19712-2 ISO 4586-2	Satisfactory Level 5: No change	Levels 1-5
Surface resistance to dry heat	ISO 19712-2 UNE-EN 438-2 ISO 4586-2 UNE 56867 UNE 56842	Satisfactory Level 4: Slight change in gloss degree only visible from certain angles.	Levels 1-5

(continuation).

Boiling water resistance	NEMA LD3	Without visible changes	
High temperature resistance		Without changes	
Surface defects	ISO-19712-2	Satisfactory	No defects
Barcol hardness	ISO-19712-2 ASTM D 2583	60 - 65	Units
Rockwell hardness	ISO-19712-2 ASTM D785 ISO-2039-2	> 85	Units
Falling ball test	ISO-19712-2 ISO-2039-1	240 - 280	N/mm <sup>2</sup>
Resistance to cigarette burns	ISO 19712-2 UNE-EN 438-2	Satisfactory. Level 4: Slight change in gloss degree only visible from certain angles.	Levels 1-5
Load test	ISO-19712-2	Satisfactory (No cracks or fissures were observed after the test)	0.12 mm (residual deflection)
Chemical resistance (Method A)		Satisfactory 5 (In all cases, except acetone with level 4)	Levels 1-5
Chemical resistance (Method B)		27	Cleanliness rating from 0 to 75
Chemical resistance	UNE 56867	Satisfactory	
Fire rating	UNE-EN 13501-1	B s1 d0 (using standard material)	Euroclass
	ASTM E84	Class A	"IBC class"
	DIN 4102-1	B1 (with no restrictions)	
	UL94HB	Satisfactory	
	NFPA 259	Satisfactory	
Scratch resistance	UNE-EN 438-2	4	Levels 1-5
	Eq. Mohs	3	
Cracking resistance	UNE-EN 438-2	5	Levels 1-5
Surface permeability	NF T 30-801	8	g/m <sup>2</sup> day
Resistance to water vapor	UNE 56867 UNE 56842	Satisfactory (6.04 KJ/g)	
Specific heat	UNE 23721	1.361	J/g K
Water absorption	ASTM D570	0.03	%
Deflection temperature (load 1.82 N/mm <sup>2</sup> )	ASTM D648	>95	°C
Wear & Cleanability	CSA B45.5-11 IAMPO Z124-2011	Complies	
Cutting powder toxicity	UNE-EN ISO 11348-3 MTA/MA - 014 / A11 UNE EN 12457-4	Without effects	



**Illustration 1.** KRION® Porcelanosa Solid Surface.

## 2. Description of the life cycle phases

PRODUCT STAGE		CONSTRUCTION PROCESS STAGE			USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE LIFE SYSTEM BOUNDARY
Raw materials supply		Manufacturing	Product Transport	Construction – Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy use	Operational water use	Decosntruction and dermolition	Transport	Waste processing	Disposal	Reuse, recovery, recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X: Declared module

MND: Module not declared

### 2.1. Manufacture (A1, A2 and A3)

#### Raw materials (A1 and A2)

The product KRION® Porcelanosa Solid Surface is composed of 2/3 parts of natural mineral ATH (alumina trihydrate) and 1/3 part of last generation acrylic resins developed by SYSTEMPOOL, S.A. The exclusive composition of KRION®, allows the material to inherit the technical and aesthetic characteristics of the mineral and combine them with the technical characteristics of the polymers, with clear unique characteristics: antibacterial without any type of additive, hardness, resistance, durability, ease of repair, low maintenance and easy cleaning.

The raw materials used in the production of KRION® come from PRC, USA and, mainly, South Korea. For transportation to the productive center of the KRION® of raw materials in South Korea, it is carried out by truck.

The import raw materials (PRC and USA) are transported by truck to the port of departure and from there to the port of Busan by freighter. Finally, by truck to the production center in Daejeon.

#### Manufacture (A3)

##### MIXING PROCESS

Once the raw materials are in the factory, they are first dosed and mixed in the required proportions. Then vacuum is applied to the mixture to eliminate possible air bubbles and thus ensure the compactness of the product.

##### CONTINUOUS CASTING

Then a plate is formed by casting the material in line by continuous steel bands that determine, according to their height, the thickness of each plate. After this, the material undergoes a curing process at room temperature.

##### SUPERFICIAL FINISHING

Once the piece is cold, the surface finishing is carried out, consisting of cutting (if necessary), then sanding and calibrating of the surfaces. Finally, dust is removed with compressed air.

## PACKAGING

Finally, a plastic film is placed on each plate and then stacked on a pallet. The plates stacked are then covered with cardboard and strapped.

### **2.2. Construction**

Not included within the limits of the study system.

### **2.3. Use of product**

Not included within the limits of the study system.

### **2.4. End of life**

Not included within the limits of the study system.

### **2.5. Module D: potential environmental benefits and burdens derived from reuse, recovery and recycling activities.**

Not included within the limits of the study system.

## **3. Life cycle assessment**

The life cycle assessment on which this declaration is based was carried out in keeping with ISO standards 14040 and 14044 and the document *RCP 100 Productos de construcción en general Versión 2 – 29.02.2016*.

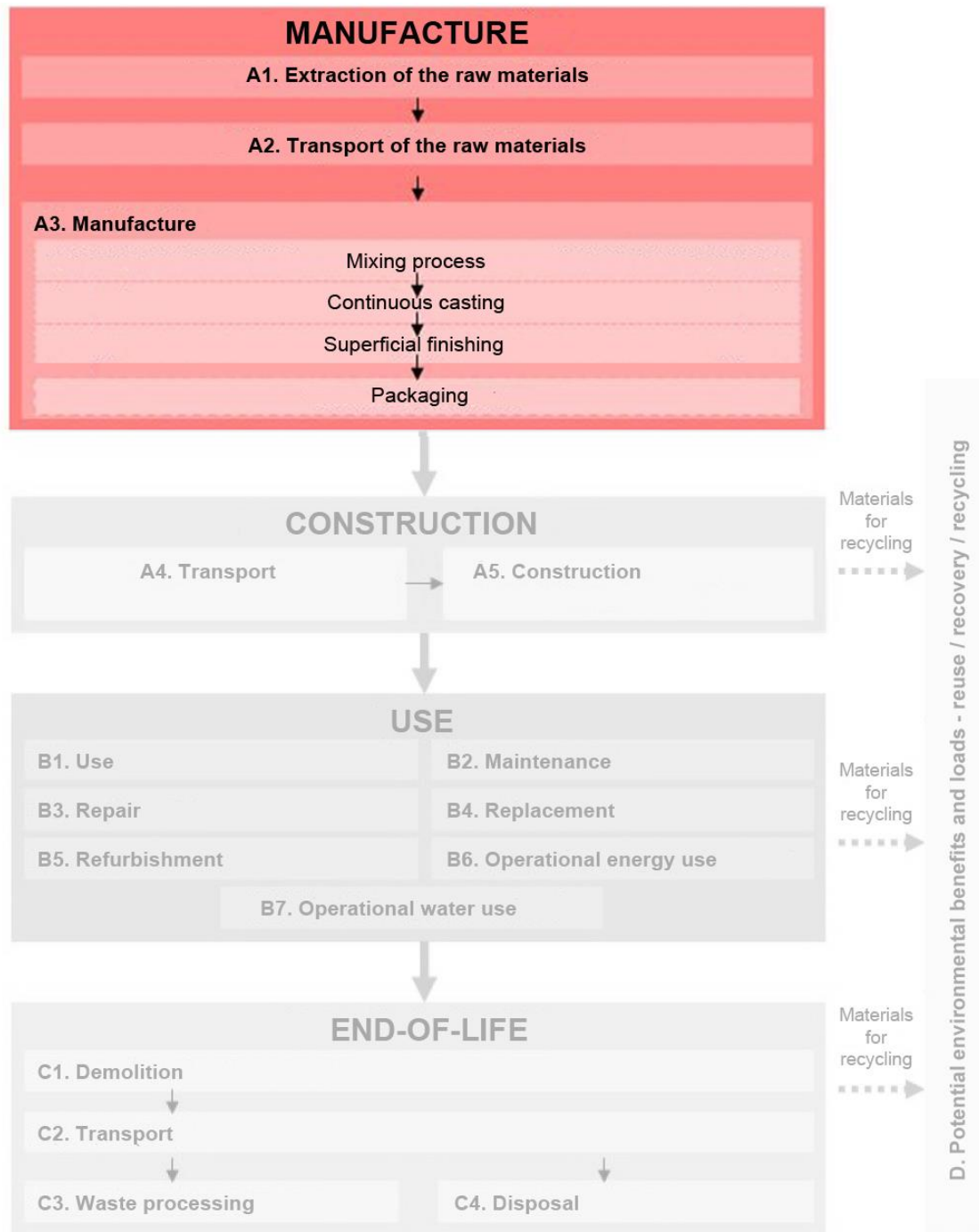
This LCA is “**cradle to gate**”, that is, it covers the Production phase.

Specific data from the SYSTEMPOOL, S.A. plant (Daejeon, South Korea) corresponding to the year 2016 has been used to inventory the manufacturing phase. For the rest of the phases, generic data has been used, taken mostly from the official database of the DAPconstrucción® Program Operator and the ELCD database.

### **3.1. Declared Unit**

The declared unit is “1 m<sup>2</sup> of KRION® Porcelanosa Solid Surface of 12-mm thick surface”

### 3.2. System boundaries



**Figure 1.** System boundaries



### 3.3. Indicators of the evaluation of impacts

Table 2. Indicators of environment impact		Life Cycle Phase				
		Manufacture	Construction		Use	End Of Life
Parameter	Unit per m <sup>2</sup> of panel	A1. - A3.	A4.	A5.	B1. - B7.	C1. - C4.
<b>Abiotic Resources Depletion Potential (Elements)</b>	Kg of Sb eq.	6,93E-05	MND	MND	MND	MND
<b>Abiotic Resources Depletion Potential (Fossil fuels)</b>	MJ, net calorific value	1068,51	MND	MND	MND	MND
<b>Acidification Potential</b>	Kg of SO <sub>2</sub> eq.	3,47E-01	MND	MND	MND	MND
<b>Ozone Depletion Potential</b>	Kg of CFC11 eq.	1,64E-06	MND	MND	MND	MND
<b>Global Warming Potential</b>	kg of CO <sub>2</sub> eq.	66,11	MND	MND	MND	MND
<b>Eutrophication Potential</b>	Kg of PO <sub>4</sub> -3 eq.	5,59E-02	MND	MND	MND	MND
<b>Photochemical Ozone Formation Potential</b>	kg of C2H4 eq.	1,69E-02	MND	MND	MND	MND

<p>A1. Supply of raw materials A2. Transport A3 Manufacture according to figure 1) A4. Transport A5. Precesses of installation and construction</p>	<p>B1. Use B2. Maintenance B3. Repair B4. Replacement B5. Refurbishment B6. Operational energy use B7. Operational water use</p>	<p>C1. Deconstruction and demolition C2. Transport C3. Waste management for reuse, recovery and recycling C4. Disposal</p>	<p>MND. Non Declared Module.</p>
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### 3.4. Life cycle inventory data (LCI)

Parameter		Unit per m <sup>2</sup> of panel	Life Cycle Phase				End Of Life
			Manufacture	Construction	Use		
			A1. - A3.	A4.	A5.	B1. B7.	C1. - C4.
<b>renewable primary energy resources, PERT</b>		MJ	1,39E+01	MND	MND	MND	MND
<b>Total use of non-renewable primary energy resources, PENRT</b>		MJ	1,13E+03	MND	MND	MND	MND
<b>Use of renewable secondary fuels, RSF</b>		MJ	0,00	MND	MND	MND	MND
<b>Use of non-renewable secondary fuels, NRSF</b>		MJ	0,00	MND	MND	MND	MND
<b>Net use of fresh water, FW</b>		m3	5,06E-02	MND	MND	MND	MND
<b>Waste production</b>							
Hazardous waste disposed, HWD		kg	1,99E-02	MND	MND	MND	MND
Non-hazardous waste disposed, NHWD		kg	8,27E+00	MND	MND	MND	MND
Radioactive waste disposed, RWD		kg	7,76E-04	MND	MND	MND	MND
<b>Output material for</b>							
Components for reuse, CRU		kg	0,00	MND	MND	MND	MND
Materials for recycling, MFR		kg	2,45E-02	MND	MND	MND	MND
Materials for energy recovery, MER		kg	0,00E+00	MND	MND	MND	MND

A1. Supply of raw materials  
 A2. Transport  
 A3. Manufacture according to figure 1)  
 A4. Transport  
 A5. Processes of installation and construction  
 B1. Use  
 B2. Maintenance  
 B3. Repair  
 B4. Replacement  
 B5. Refurbishment  
 B6. Operational energy use  
 B7. Operational water use  
 C1. Deconstruction and demolition  
 C2. Transport  
 C3. Waste management for reuse, recovery and recycling  
 C4. Disposal  
 MND. Non Declared Module

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### **3.5. Potential environmental benefits and impacts derived from activities of reuse, recovery and recycling**

Not included within the limits of the study system.

### **3.6. Recommendations of this DAP**

Construction products should be compared by applying the same functional unit and level of building, i.e. including the product's behaviour throughout its life cycle.

Environmental product declarations of different systems of type III eco-labelling are not directly comparable, as the rules of calculation may be different.

This declaration represents the average behaviour of the product KRION® Porcelanosa Solid Surface manufactured by SYSTEMPOOL S.A.

### **3.7. Cut-off rules**

Over 95% of all the inputs and outputs of mass and energy of the system have been included, excluding, among others, diffuse emissions in the factory.

### **3.8. Additional environmental information**

The KRION® Porcelanosa Solid Surface does not release hazardous substances in indoor air, soil and water during the use phase. It is considered an inert solid waste and can be removed, once its life cycle has finished, as a construction material.

### **3.9. Other data**

Waste from this product is included as "non-hazardous waste" in the European List of Waste under LOW code 17 09 04.

## **4. Technical information and scenarios**

### **A) Transport**

Not included within the limits of the study system.

### **B) Processes of installation**

Not included within the limits of the study system.

### **C) Operational use of energy and water**

Not included within the limits of the study system.

### **D) Maintenance and repair**

Not included within the limits of the study system.

### **E) End of life**

Not included within the limits of the study system.

## 5. Información adicional

Technical characteristics of the product	- Greenguard Gold Certificate 24139-420 - Euroclass reaction to fire: B s1 d0 - NSF/ANSI 5 Food Equipment Materials Certificate - Reach Compliance HKHL 1501002788JL certificate - Certificates of the company: ISO 9001 (ES15 / 17872) and ISO 14001 (ES15 / 17871)
Transport and construction	Not included within the limits of the study system.
Use and maintenance	Not included within the limits of the study system.
End of life	Not included within the limits of the study system.

## 6. PCR and verification

This declaration is based on the document RCP 100 Productos de construcción en general - Versión 2 - 29.02.2016.

RCP 100 Productos de construcción en general - Versión 2 was revised by the Advisory Board of the Program Operator DAPconstrucción®.	
Independent verification of the declaration and data, in accordance with standards ISO 14025 and UNE EN 15804 + A1 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> external	
Third-party verifier and label of accreditation:  - Ferran Pérez Ibáñez	
 Oficina d'Acreditació d'Entitats Col·laboradores <b>Verificació VEDAP-001-10</b>	
Date of verification: 2017, 18 <sup>th</sup> December	

## References

- INFORME DE ANÁLISIS DE CICLO DE VIDA DE KRION® Porcelanosa Solid Surface Y KRION® EAST® K-LIFE Porcelanosa Solid Surface DE SYSTEMPOOL. ReMa-INGENIERÍA, S.L. 2017 (not published)

### ADMINISTRATOR OF PROGRAM OPERATOR

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