

Krion®

01 PRODUCT NAME/MANUFACTURER

Product name: Krion®
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02 PRODUCT DESCRIPTION

Krion® is a new generation solid surface developed by KRION SOLID SURFACE, S.A., a company that forms a part of the PORCELANO-SA Group. Krion® has a warm and soft touch, which is solid, uniform throughout its entire thickness, and non-porous. It is available in sheets and moulded shapes, allowing different sections to be bonded with invisible seams.

Krion® is a hygienic, inert and non-toxic product that is virtually fireproof, easy to maintain and repair, which can be transformed into a limitless variety of shapes and is highly resistant to chemical agents, steam or outdoor conditions. This exclusive combination of visual and technical features make Krion® the ideal solution for a wide range of applications such as furnishings, kitchens, bathrooms, boat fixtures, wall coverings or architectural uses.

03 COMPOSITION

Krion® is composed of 2/3 natural mineral (ATH – aluminium trihydrate) and 1/3 latest-generation acrylic resins (PMMA) developed by KRION SOLID SURFACE S.A. KRION™ is manufactured solely and exclusively by KRION SOLID SURFACE S.A.

Thanks to its superior composition, Krion® combines all the technical and visual characteristics of minerals with the technical properties of polymers. This guarantees clear exclusive benefits: no bacterial growth (without the inclusion of anti-bacterial or other additives), hardness, resistance, durability, an easily repairable surface, and easy care and cleaning. For further information, see the Krion® safety data sheet at www.krion.com.

04 SERIES PRODUCTS

Krion® Sheet

Krion® is available in several different standard formats and thicknesses. Special formats can also be manufactured on request provided that conditions regarding minimum orders are met.

Table 1. Formats & thicknesses of Krion® sheets.

THICKNESSES	FORMATS	SNOW WHITE EAST	COLORS SERIES	COLORS+ SERIES	LIGHT SERIES	NATURE SERIES	STAR SERIES	ROYAL SERIES	ASTEROID SERIES	ROYAL+ SERIES	TERRAZZO SERIES	LUXURY SERIES	ART VEINS SERIES	OPALE SERIES	MATERIA SERIES
3 mm	2500 x 760 mm	✓													
	2500 x 930 mm	✓													
6 mm	2500 x 760 mm	✓	✓	✓	✓ (2)	✓	✓					✓ (3)			
	2500 x 930 mm	✓	✓ (1)		✓ (2)										
	2500 x 1350 mm (*)	✓	✓ (1)		✓ (2)										
	3680 x 760 mm	✓													
	3680 x 930 mm	✓													
	3680 x 1350 mm (*)	✓													
9 mm	3680 x 760 mm	✓													
12 mm	3680 x 760 mm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	3680 x 930 mm	✓	✓ (1)		✓ (2)										
	3680 x 1350 mm (*)	✓	✓ (1)		✓ (2)										
	3680 x 1520 mm (*)	✓	✓ (1)		✓ (2)										
19 mm	3680 x 760 mm	✓													

¹ Only available for the colours FROST WHITE (6101), CREAM (6501), PEARL (6502), LIGHT GREY (6902) and GREY (6903).

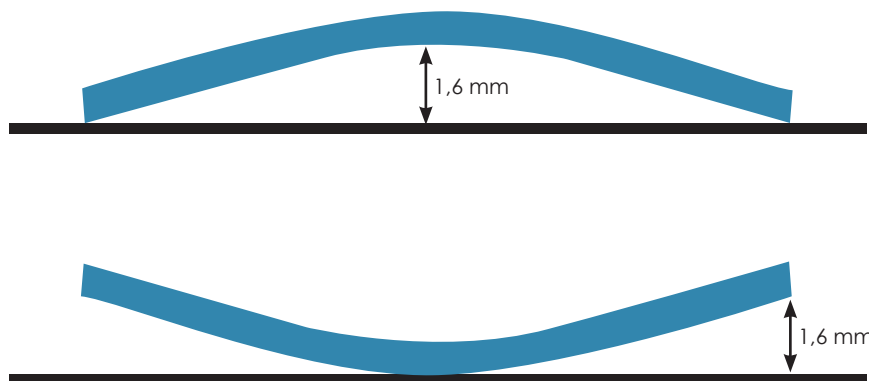
² Only available for the colour EXTREME LIGHT (4102).

³ Not available for the colour POMPEI (L501).

Krion® sheets undergo strict quality controls in our facilities in accordance with international standards and our own in-house ones. These are the established tolerances that all Krion sheets must comply with.

Table 2. Tolerances of Krion® sheets.

PROPERTIES		SPECIFICATIONS	TOLERANCE	CHECK METHOD
Thickness		3,0*/6,0 / 9,0 / 12,0 / 19,0 mm	- 0,3 / + 0,7 mm	Calibre 0,1 mm
Length		2500 / 3680 mm	-3 / + 20 mm	Tape measure 1 mm
Width		760 / 930 / 1350 / 1520 mm	-3 / +10 mm	
Deformation		0 mm	< 1,6 mm	
Damage to corners		0 mm	Corner break < 8 mm	
Top surface	Black /white dots (Except for Snow White)	None	As per the ISO 19712 standard Total covered area < 1 mm ² / m ²	Visual (TAPPI chart)
	Black/white dots (Only for Snow White)		Surpasses the requirements of the ISO 19712 standard Total covered area < 0.7 mm ² / m ²	
	Flaws: Pores, voids		Fewer than 3 pores ≤ 0.1 mm ² / sheet	Visual
Underside	Flaws: Pores, voids		< 15 mm ² / Plancha	Visual (TAPPI chart)
Top surface: Colour / Consistency within the same sheet		No difference	No applicable tolerance	Visual
Top surface: Colour / Same batch			ΔE ≤ 1	Visual or (Spectrophotometer)
Top surface: Colour / Different batch			ΔE ≤ 2	



Krion® Colors

Krion® is sold in a wide variety of colours and patterns:

- Solid colours: Snow series, Colors series, Colors + series
- Translucent colours: Light series, Opale series
- Colours with small flecks: Nature series
- Colours with big flecks: Royal series, Asteroid series, Royal + series, Terrazzo series
- Colours with veins: Luxury Series, Art Veins Series, Materia Series

If a colour not featured in the catalogue is required, it can be manufactured on special request provided that conditions regarding minimum orders are met.

To help clients choose suitable colours for their projects, a series of Technical Notes have been drawn up by KRION with recommendations on the different colours' applicable uses.

Table 3. Recommended technical notes for choosing colours.

NT-01	Recommended colours use
NT-06	Reflectance values colours KRION®
NT-11	The KRION® collection for façades
NT-12	KRION® level translucence
NT-15	KRION® kitchen worktop collection
NT-16	KRION® bathroom collection
NT-17	KRION® ral pantone colour guide
NT-19	Recycled contents
NT-20	Resistance to UV rays
NT-21	Scratch resistance
NT-22	Sanded finishes
NT-23	Thermoforming
NT-24	Thermal bending
NT-28	Veined colours

Krion® Elements

Due to its exclusive formula, Krion® can be used to cast complementary products (all in Snow White 1100), including sinks, washbasins, shower bases and bathtubs. These products can be used with Krion® sheets in seamless designs with no perceptible joins.

With the different fabrication techniques that can be used with Krion® and its different colours, an endless variety of designs and combinations can be created, guaranteeing design solutions to suit all possible settings, tastes or functional, dimensional and aesthetic requirements.

All cast Krion® products comply with the applicable standards.

Table 4. Regulations met by Krion® Elements.

STANDARD	RESULT
UNE-EN ISO 19712-3 "Products with solid surface shapes"	Meets the requirements
UNE-EN 14516 "Bathtub for domestic use"	Meets the requirements
UNE-EN 14527 "Shower tray for domestic use"	Meets the requirements
UNE-EN 14688 "Sanitary equipment. Basins. Functional requirements and test methods"	Meets the requirements
UNE-EN 13310 "Kitchen sinks. Functional requirements and test methods"	Meets the requirements

Table 5. Krion® Elements Tolerances.

PROPERTIES	SPECIFICATIONS	TOLERANCE	CHECK METHOD
Thickness of washbasins	10 mm	± 2 mm	Tape measure – 1 mm
Thickness of sinks	12 mm		
Thickness of bathtubs	18 mm		
Thickness of shower trays	12 mm		
Length	Nominal size as per price list	± 3 mm	
Width			
Cracks or breaks	None	None	Visual
Black dots: washbasins and sinks		None > 0,4 mm ² Maximum 6 dots	Visual (TAPPI chart)
Black dots: bathtubs		None > 0,6 mm ² Maximum 10 dots	
Black dots: shower trays		None > 0,6 mm ² Maximum 7 dots	
Internal flaws: pores, voids		None	
Flatness of top surface	0 mm	≤ 1 mm	1mm feeler gauge
Diameter of drain: washbasins	46 mm	As per the EN-31 standard +2 / -3 mm	Caliper 0.01 mm
Diameter of drain: sinks	90 mm	As per the EN-695 standard +3 / -2 mm	
Diameter of drain: bathtubs	52 mm	As per the EN-232 standard +3 / -2 mm	
Diameter of drain: shower trays	90 mm	As per the EN-251 standard +3 / -2 mm	

Krion® Adhesive

Krion® adhesive is a two-component acrylic adhesive for bonding and sealing Krion®. Formulated using cutting-edge technology for the solid surface sector, it ensures an excellent bond when used with solid surfaces. Likewise, users can also benefit from Krion® adhesive's environmentally friendly properties. Manufactured in accordance with the strictest standards, the adhesives are subjected to the most exacting quality controls prior to their sale and distribution. In this way, all cartridges are guaranteed as complying with the following properties and tolerances:

Table 6. Tolerances of Krion® adhesives.

PROPERTIES	SPECIFICATIONS	TOLERANCE	CHECK METHOD
Storage period	24 months from the manufacturing date, providing that it is stored in a dark, dry place at a temperature of 10-20°C (50-68°F).	None	See expiry date on cartridge
Physical state of cartridge	Hermetically sealed with no knocks or leaks.		Visual check
Drying time	40 minutes at a temperature of approx. 25°C (77°F)	± 10 minutes (depending on the humidity and temperature)	Visual check and thumbnail test to check hardness
Mixture of components A and B	The mixture should be uniform, with no veining or discolouration	None	Visual check, hard throughout, with no colour difference

Krion® adhesive is GREENGUARD certified as meeting the necessary requirements regarding low volatile organic compound emissions (VOC). It is also certified by the NSF as being food grade.

Thanks to their exclusive composition, as well as complying with the above requirements and certificates, Krion® adhesives also offer certain performance-related benefits, such as:

- ▶ Cures at room temperature.
- ▶ High waterproof resistance.
- ▶ Minimum preparation of the surface.
- ▶ Excellent impact resistance.
- ▶ Excellent bonding strength.
- ▶ Easy to handle and use.

For further information, see the Technical Note on Krion® Adhesives, the Fabricator's Manual or Safety Sheet.

05 PROPERTIES AND CHARACTERISTICS

Krion® is a material with the ideal technical features for use in commercial or residential settings, both indoors and outdoors, as it is durable, versatile and highly resistant.

A hygienic material that prevents the growth of microorganisms of any kind. Krion® is inert, non-toxic, almost totally fireproof, easy to care for and repairable. It has a high resistance to chemicals, vapour and outdoor weather conditions. It is also solid and non-porous with a uniform body throughout, and it can be bonded to create seamless surfaces with no perceptible joints.

06 PROCESSING / INSTALLATION

Krion® is sold in the form of sheets that are worked much like wood. It can be cut, sanded and milled and sheets can be joined. The Fabricator's Manual and Technical Notes published by KRION contain details of all the types of fabrication work that can be done with Krion®.

07 MAINTENANCE

How to prevent damage to Krion®

As a general rule, avoid any prolonged contact with chemical products such as strong acids, alkalis or organic solvents. Any spills should be removed as quickly as possible (see table on exposure to chemical products).

A K-Clean cleaning kit is available for Krion®, whose use is explained in the Technical Note on Using, Cleaning & Caring for Krion®. This guide to cleaning and caring for Krion® surfaces explains in simple style how to keep surfaces looking just like the very first day.

Repairing Krion®

In most cases, damage to Krion® can be repaired. Small cuts, scratches and stains can be removed using the K-Regeneration kit, following the indications in the Technical Note on the Krion® Regeneration Kit.

08 MAINTENANCE

TESTS

Table 7. Mechanical, structural and safety-related properties.

These properties allude to the material's capacity to withstand external forces. Details of the mechanical properties are fundamental when making structural calculations and determining design limits. Shown below are details of salient tests that have been conducted on Krion®:

PROPERTY	TEST METHOD	TEST RESULT
Flexural modulus	ISO 178 / ASTM D790	9300 - 12000 MPa
		1348850-1740452 psi
Flexural strength	ISO 178 / ASTM D790	68 - 78 MPa
		9862 - 11312 psi
Elongation at break	ISO 178 / ASTM D790	1% - 1,50 %
Tensile modulus	ISO 527 / ASTM D638	9500 - 11500 MPa
		1377858 - 1667933 psi
Tensile strength	ISO 527 / ASTM D638	40 - 50 MPa
		5800 - 7250 psi
Tensile elongation	ISO 527 / ASTM D638	0,6% - 0,7%
Compressive strength	ISO 604 / ASTM C365	98 - 115 MPa
		14213 - 16679 psi
Impact resistance (ball drop)	ISO 19712-2 (324 g) / NEMA LD3 (224 g)	> 200 cm
IZOD impact strength test	ISO 180 / ASTM D256	3,9 KJ/m ²
		4,2 KJ/m ²
Slip resistance (Pendulum Method)	UNE 12633	(Sanded finish ⁽¹⁾ : 40 - 1000 grit) USRV : 48 – 9
Slip resistance (coefficient of friction)	ASTM C1028	Dry static coefficient: 0.8-0.69
		Wet static coefficient: 0.82-0.62
Load test	ISO 19712-2	Passes test
Dimensional stability to 20°C	ISO 4586-2 / NEMA LD3	Passes test
Cracking resistance	UNE 432-2	Satisfactory
Frost resistance	ISO 10545-12	Passes test

Results for 12-mm thick sheets in solid colours (e.g. Snow White 1100). The values are informative, based on tests conducted in external laboratories, periodically checked in laboratories at Krion®. These values are not for use in engineering calculations. For precise calculations, contact Krion®.

⁽¹⁾ Please note that inferior sanding finishes offer a greater resistance to sliding. Nevertheless, on the contrary, these type of finishes may negatively affect the easy cleanliness of the surface.

Table 8. Physical, durability and use-related properties.

Physical properties allude to the material's performance when subject to external action. These are properties inherent to the material and they determine its use and applications.

Shown below are details of salient tests used to determine the use and application of Krion®:

PROPERTY	TEST METHOD	TEST RESULT
Density	ISO 1183 / ASTM D792	1,73 - 1,76 g/cm ³
Rockwell hardness	ISO 19712 (UNE-EN 2039-2) / ASTM D785	> 90
Barcol hardness	ISO 19712 / ASTM D2583	65-70
Falling ball test	ISO 19712 (UNE-EN 2039-1)	250 - 290 N/mm ²
Thermal expansion	ISO 11359-2 (EN 14581) / ASTM D696	3,5±0,3 · 10 ⁻⁵ °C ⁻¹
		1,9±0,3 · 10 ⁻⁵ °F ⁻¹
Heat deflection temperature 1.8 N/mm ²	ISO 75 / ASTM D648	95-105 °C
		203-221 °F
Thermal conductivity	EN 12667 / ASTM C518	(0 °C – 40 °C) 0,10 - 0,22 W/m · K
Resistance to dry heat	ISO 19712	Satisfactory
Resistance to wet heat		
Resistance to cigarettes		
Resistance to thermal shocks		
Resistance to high temperatures (dry heat)	NEMA LD3	Satisfactory
Resistance to wear and tear	ISO 4586	0,028 %/25 rev
Resistance to boiling water	ISO 4586 / NEMA LD3	Satisfactory
Water absorption	ASTM D570	0,02% - 0,04%
Resistance to artificial weathering. Xenon arc (3000 h)	UNE-EN 438 / ISO 19712 / ASTM G155	Satisfactory
Color stability	NEMA LD3	Satisfactory
Acoustic global insulation	ISO 717-1	33,5 dBA
Impact sound insulation (steps)	UNE EN ISO 10140-1:2016. Anexo H	17 dB
Electrical resistance and resistivity	UNE-EN 61340	2 · 10 ¹² Ω
Dragged furniture	UNE EN 424:2002	Correct (32 kg)
Effect of wheeled chair	UNE EN 425:2002	Correct (25000 cycles)
Static puncture	EN ISO 24343-1:2012	Indentation <0.01 mm / No deterioration
Surface pull-out	UNE EN 13329:2016. Anexo D	>2.1 N/mm ²

Results for 12-mm thick sheets in solid colours (e.g. Snow White 1100). The values are informative, based on tests conducted in external laboratories, periodically checked in laboratories at Krion®. These values are not for use in engineering calculations. For precise calculations, contact Krion®.

Table 9. Hygiene, care and sustainability-related properties.

These properties tend to condition a material's suitability for more sensitive applications, such as in clinics and hospitals or in direct contact with food. Likewise, they shed light on the cleaning and care that the material will need during its useful life. Shown below are details of salient tests conducted with Krion®, demonstrating its high level of hygiene and easy cleanability.

PROPERTY	TEST METHOD	TEST RESULT
Resistance to bacteria	ISO 846	No growth
Resistance to fungi	ISO 846 / ASTM G21	No growth
Resistance to microbes in building materials	UL 2824 (ASTM D6329)	No growth
Wear and tear and cleanability	CSA B45.5-11 IAPMO Z124-2011	Complies
Stain resistance - washability	NEMA LD3	Satisfactory
Chemical resistance	ISO 19712 (Method A)	Satisfactory
Stain resistance in bathroom products	UNE 56867	Satisfactory
Photocatalytic resistance to bacteria*	ISO 27447	Active
Photocatalytic self-cleaning properties*	ISO 10678	Active
Photocatalytic air purification*	ISO 22197	Active
Degradation of chemical substances*	ISO 10678	Active
Migration	Regulation 10/2011 of the European Commission	Compliant
Toxicity of dust from cutting activities	MTA/MA-014/A11	Non-toxic
	UNE-EN 12457-4	
	UNE-EN ISO 11348-3	
SiO ₂ content	Instituto Nacional Silicosis (INS)	Not found
Ecotoxicity (terrestrial and aquatic environments)	OECD 202:2004	Non-toxic
	OECD 203:1992	
	OECD 201:2006	
	OECD 207:1984	
	OECD 208:2006	

* Available with Snow White 1100 EAST

Results for 12-mm thick sheets in solid colours (e.g. Snow White 1100). The values are informative, based on tests conducted in external laboratories, periodically checked in laboratories at Krion®. These values are not for use in engineering calculations. For precise calculations, contact Krion®.

Table 10. Fire performance properties.

Fire is a hazard that can be indirectly offset through the use of certain building materials, preventing the spread of fire and generation of smoke from combustion. Fire performance, flammability and flame spread are some of the parameters that different international standards take into account to determine whether construction materials are apt for use in buildings. Shown below are details of salient tests conducted on Krion®, demonstrating its excellent fire performance.

PROPERTY	TEST METHOD	TEST RESULT
Specific heat	UNE-EN 23721	1,361 J/g · K
Thermal resistance	UNE-EN 12667	0,064 m ² · K/W
Marine	IMO Certificate	Mod.B & Mod. D
Marine. Toxicity of smoke	IMO FPTC Part 2	Complies
Ventilated façades	UNE-EN 13501-1	B-s1,d0
Fire performance	UNE-EN 13501-1	B-s1,d0 (without support)
Flammability	UL94HB	Complies
	UL94V	V0
Surface burning	ASTM E84 (NFPA 255)	Flame spread 0
		Generated smoke 5
Burnt floor surface	CAN/ULC-S102.2	Flame spread 0
		Generated smoke 0
Fire rating	DIN 4102-1	B1 No restrictions
Potential heat	ISO 1716 / NFPA 259	9,3 MJ/kg
Ignition	NFPA 268	Complies
Flammability. Surface combustion characteristics of building materials	NFPA 101	Class A
Flashpoint	ASTM D1929	440 °C
Auto-ignition temperature	ASTM D1929	490°C
Single combustion test for building materials and products	GB/T20284-2006	Complies
GOST standard	GOST	Complies

Results for 12-mm thick sheets in solid colours (e.g. Snow White 1100). The values are informative, based on tests conducted in external laboratories, periodically checked in laboratories at Krion®. These values are not for use in engineering calculations. For precise calculations, contact Krion®.

09 REFERENCE STANDARDS & TESTS

INTERNATIONAL STANDARDS

1. **ISO 1183:** Plastics - Methods for determining the density of non-cellular plastics.
2. **ISO 178:** Plastics - Determination of flexural properties.
3. **ISO 527:** Determination of tensile properties of plastics. Test conditions for moulding and extrusion plastics.
4. **ISO 604:** Plastics. Determination of compressive properties.
5. **ISO 19712-2:** Plastics. Decorative solid surfacing materials.
6. **ISO 4586-2:** High-Pressure decorative laminate - Sheets made from thermosetting resins.
7. **ISO 846:** Plastics. Evaluation of the action of microorganisms.
8. **ISO 11359-2:** Plastics - Thermomechanical analysis (TMA) Determination of coefficient of linear thermal expansion and glass transition temperature.
9. **ISO 4892-2:** Plastics. Methods of exposure to laboratory light sources. Xenon-arc lamps.
10. **ISO 4892-3:** Plastics. Methods of exposure to laboratory light sources. Fluorescent UV lamps.
11. **ISO-2039-2:** Plastics. Decorative solid surfacing materials.
12. **ISO-2039-1:** Plastics. Determination of hardness. Part 2: Rockwell hardness.
13. **ISO 6506:** Metallic materials. Brinell hardness test.
14. **ISO 22197:** Test methods for air-purification performance of semiconductor photocatalytic materials.
15. **ISO 27447: 2009:** Fine ceramics advanced technical ceramics –Test method for antibacterial activity of semiconducting photocatalytic materials.
16. **ISO 10678; 2010:** The 'Determination of photocatalytic activity of surfaces in an aqueous medium by degradation of methylene blue'.
17. **ISO 27448: 2009:** Test method for self-cleaning performance of semiconductor photocatalytic materials - measurement of water contact angle.
18. **OECD 201:2006:** Freshwater Alga and Cyanobacteria, Growth Inhibition Test.
19. **OECD 202:2004:** Daphnia sp. Acute Immobilisation Test.
20. **OECD 203:1992:** Fish, Acute Toxicity Test.
21. **OECD 207:1984:** Earthworm, Acute Toxicity Tests.
22. **OECD 208:2006:** Terrestrial Plant Test: Seedling Emergence and Seedling Growth Test.

US STANDARDS

23. **ASTM D792:** Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
24. **ASTM D790:** Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
25. **ASTM D638:** Standard Test Method for Tensile Properties of Plastics.
26. **ASTM G22:** Standard Practice for Determining Resistance of Plastics to Bacteria (Withdrawn 2002).
27. **ASTM G21:** Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
28. **ASTM C1028:** Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method (Withdrawn 2014).
29. **ASTM D696:** Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer.
30. **ASTM D 2583:** Plásticos. Materiales decorativos sólidos para el revestimiento de superficies.
31. **ASTM D785:** Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.
32. **ASTM E84:** Standard Test Method for Surface Burning Characteristics of Building Materials.
33. **ASTM D570:** Standard Test Method for Water Absorption of Plastics.
34. **ASTM D648:** Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
35. **ASTM G155:** Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
36. **UL94:** Flammability Standard.
37. **ASTM D1929:** Standard Test Method for Determining Ignition Temperature of Plastics.
38. **NFPA 101:** Life Safety Code.
39. **NFPA 268:** Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source
40. **NFPA 259:** Standard Test Method for Potential Heat of Building Materials

EUROPEAN & SPANISH STANDARDS

- 41. UNE EN 438-2:** High pressure decorative laminates. Sheets based on thermosetting resins (normally called laminates).
- 42. UNE EN 424:2002:** Resilient floor coverings - Determination of the effect of simulated movement of a furniture leg
- 43. UNE-EN ISO 11348-3:** Water quality - Determination of the inhibitory effect of water samples on the light emission of *Vibrio fischeri* (Luminescent bacteria test) - Part 3: Method using freeze-dried bacteria.
- 44. UNE-EN ISO 10140-1:2016 (Anexo H):** Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (ISO 10140-1:2016)
- 45. UNE-EN 12457-4:** Characterization of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. Part 4: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 10 mm (without or with size reduction).
- 46. UNE ENV 12633:** Method of determination of unpolished and polished slip/skid resistance value.
- 47. UNE EN 12667:** Building materials. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance.
- 48. UNE-EN 13501-1:** Fire classification of construction products and building elements.
- 49. UNE-EN 14581:** Natural stone test methods. Determination of linear thermal expansion coefficient.
- 50. UNE EN 13329:2016. Anexo D:** Laminate floor coverings - Elements with a surface layer based on aminoplastic thermosetting resins - Specifications, requirements and test methods
- 51. UNE 23721:** Reaction to fire test of building materials. Radiation test used for rigid materials or for materials on rigid substrates (flooring and finishes) of all thicknesses, and for flexible materials thicker than 5 mm.
- 52. EN ISO 24343-1:2012:** Resilient and laminate floor coverings - Determination of indentation and residual indentation - Part 1: Residual indentation
- 53. UNE 56842:** Kitchen furniture. Tests for surfacing materials.
- 54. UNE 56843:** Kitchen furniture. Physical testings.
- 55. UNE 56867:** Bathroom furniture. Testing of surface finishes.
- 56. UNE 56868:** Bathroom furniture. Physical test methods.
- 57. UNE-EN 61340:** Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements

10 PRODUCT CERTIFICATES



a. GREENGUARD GOLD

This certificate, awarded by the Greenguard Environmental Institute, guarantees that Krion® sheets and adhesives comply with indoor air quality standards regarding volatile organic compounds (VOC). The awarded labels confirm that the products are apt for use in educational and healthcare environments and the said certificate is recognized in many rating systems, including The Collaborative for High Performance Schools (CHPS) and Leadership in Energy and Environmental Design (LEED).



b. CLASS A+ LABEL

As from January 1st 2012, building products in France must be labelled with a VOC (volatile organic compound) rating. Krion Porcelanosa Solid Surface has been awarded the maximum A+ rating, guaranteeing low VOC emissions and thus safeguarding the indoor air quality of buildings.



c. NSF

NSF Certification (National Science Foundation), recognized body from the United States that acts in the issuance of health, hygiene, and environmental certificates, considers Krion® as a safe material for its direct contact with all kinds of food, without posing any health risk. See the list of certified colours on www.nsf.com



d. BISPHENOL A

Bisphenol (BPA), an organic compound mainly used to make plastics, is thought to be harmful to humans. Krion® therefore guarantees that no BPA is included in its formula. To confirm that it is not present in any of the raw materials used to make it, a study to this effect was conducted by an approved external laboratory.



e. REACH

The REACH regulation governs chemical products in the EU that are manufactured or included as substances in compounds or finished products. The main aim is to guarantee a high degree of protection for human health and for the environment. Krion® has conducted the necessary tests for its sheets, adhesives and cast shapes to be declared compliant with the REACH regulation, thus certifying that it does not contain any of the substances registered on the list of Substances of Very High Concern (SVHC).



f. DECLARE. LBC COMPLIANT

The aim of the Declare Programme is to boost manufacturer transparency, providing consumers with relevant information about the composition of the products they buy. The LBC Compliant certificate guarantees that none of the chemical products used to make Krion®, as specified on the Declare label, are included in the *Red List Building Materials*.



g. ETA. EUROPEAN TECHNICAL ASSESSMENT

European Technical Approval (ETA) is a document containing information by a manufacturer on the technical assessment of a product or kit's essential characteristics and fitness for an intended use. Each ETA is based on European Assessment Document (EAD) specifications for products and their intended uses. This is a tool for the obtainment of CE markings for innovative products not covered by a relevant harmonised European standard and for drawing up declarations of performance for products and systems. Krion® has been awarded an ETA for the K-BOLT system by BUTECH.



h. CSTB

The French certification body CSTB (Scientific and Technical Building Center) has granted Krion® its official certification. This certification is key to ensure its use in projects such as ventilated facades, which use Krion® as their main element.



i. SCS

A prestigious certificate with which Krion® complies, specifying that by reprocessing and recycling waste material, the need for new raw materials is reduced. This avoids potential flows of waste products and leads to materials with a minimum 6%, 12%, 20% or 40% recycled content.



j. HEATH PRODUCT DECLARATION (HPD)

The Health Product Declaration™ (HPD) provides a standardized way of reporting the material contents of building products, and the health effects associated with these materials. This declaration has been developed for both Krion® sheets and Krion® adhesives.



k. ENVIRONMENTAL PRODUCT DECLARATION (EPD)

Environmental Product Declarations (EPD) are one of the main data-gathering and control tools for determining the sustainability of a certain product or system. Krion® has an EPD, based on an inventory of quantified environmental data relating to its products, with categories defined in accordance with pre-established parameters as per ISO 14040 lifecycle analysis standards. This is quantitative environmental information verified by a third party.



In order to verify the environmental impact of our material, Krion® have developed 3 different Environmental Product Declarations (EPD) for our latest material Krion® SNOW WHITE EAST® according to the normative ISO 14025 EN UNE 15804 +A1. This three EPD correspond to the three main scenarios/use applications foreseen in the usual projects made with Krion® material: Exterior cladding, Interior cladding and Furniture.

All Krion® Product Environmental Declarations have been examined by an external auditor.

LCA and therefore EPD results show how Krion®, thanks to its photocatalytic properties, is a material capable to generate positive impacts in the environment, putting this way the architectural worldwide prescribers in an advantageous position for developing sustainable built environments.



11 ESTIMATION OF SUBSTANCE ATTACK

Shown below is a list of substances and products that have been tested on the surface of the material to ascertain its resistance to them.

Listed below are the substances or products that have been tested on the surface of Krion® to check its resistance to them. To conduct this test, drops of the said products were left on the surface for 18 hours. The stains were then removed using products developed by KRION SOLID SURFACE S.A. to clean and care for Krion®.

- ▶ **Type-1 substances:** The stain can be removed with a cloth and K-Clean cleaner.
- ▶ **Type-2 substances:** The stain can be removed with a cloth and K-Cream cleaner.
- ▶ **Type-3 substances:** The stain can be removed with a white scouring pad and K-Cream cleaner.
- ▶ **Type-4 substances:** The stain can only be removed by renewing the surface.

Table 11: Classification of substances tested on Krion®.

TYPE-1	TYPE-2	TYPE-3	TYPE-4
Cotton seed oil	Olive oil	Turpentine	Ethyl acetate
Mineral oil	Pine oil	Isopropyl alcohol	Acetone
Cooking oil	Amyl acetate	Cellosolve	Acetic acid (98%)
Acetic acid 10%	Citric acid 10%	Cigarette (nicotine)	Hydrofluoric acid (40%)
Tannic acid	Amylic acid	Drain cleaner	Formic acid (> 50%)
Uric acid	Betadine	Acid drain cleaners	sphoric acid (75%)
Hair dyes and bleaches	Coffee	Household bleach	Nitric acid (> 6%)
Distilled water	Cleaning bang	Methyl orange 1%	Perchloric acid (60%)
Aromatic alcohol	Iron chloride 10%	4-Chlorofenol	Sulphuric acid (> 33%)
Aluminon	Food colouring	Nail polish remover	Aqua regia
Ammonia (10%)	Chlorinated detergent	Tintas lavables	Methylene blue
Ammonia 30%	Carbon disulfide	Washable dyes	Benzyne
Saffron	Ethyl ether	Wine	Chlorobenzene
Sodium azide	Eucalyptol	Hydrochloric acid (> 20%)	Chloroform
Sugar	Liquids/powders for dishwashers	Butyl alcohol	Methylene chloride
Bromothymol blue	Pencil lead	Aromatic ammonia spirit	Cresol isomers (85%)
Lipstick	n-hexane	Potassium permanganate (2%)	Methylene chloride derivates (paint strippers)
Liquid bitumen	Tea	Hydrochloric acid	Dimethylformamide
Black shoe polish	Viacal	Malachite green	1,4-dioxane, dioxane (99.5%) ethanol
Sodium bisulphite	Vinegar	Eosin B	Ethanol
Zinc chloride 10%	Lemon juice / fruit and vegetable juice	Nail polish	Ammonium phosphate
Gram stain	Nitric acid (6%)	Wright's blood stain	Furfural
Quaternary ammonium compounds	Picric acid	Nigrosin	Sodium hydroxide in flakes
Zinc oxide cream	Picric acid 1,2% (0,05M)	Phosphorous pentoxide	Sodium hydroxide (> 5%)
Sodium chromate	Trypan blue	Monsel's solution	Iodine
EDTA	Eosin 2%	Penink	Methyl methacrylate
5% eosin methylene blue in alcohol	-	-	Methanol
Ethylene glycol	-	-	Methyl ketone
Phenolphthalein	-	-	Acridine orange
Formaldehyde	-	-	Silver nitrate (10%)
Formaldehyde 40%	-	-	MEK peroxide
Formalin	-	-	Products with methylene chloride
Formaldehyde 10%	-	-	Methyl red (solution in ethanol)
Sodium phosphate 30%	-	-	Permanent marker pen
Trisodium phosphate 30%	-	-	Safranin O

TYPE-1	TYPE-2	TYPE-3	TYPE-4
Oil	-	-	Tetramethylammonium hydroxide solution
Glutaraldehyde	-	-	Sudan III
Ammonia hydroxide 28%	-	-	98% tetrachloroethylene 1, 1, 2, 2.
Ammonia hydroxide 5%	-	-	Carbon tetrachloride
Calcium hypochlorite	-	-	Tetrahydrofuran
Sodium hypochlorite 15%	-	-	Thymol blue
Sodium hypochlorite	-	-	Thymol in alcohol
Domestic soaps	-	-	Haematoxylin colouring fluid
Ketchup	-	-	Mercurochrome
Bleach 1% and soap solution	-	-	Iodine
Mustard	-	-	Gentian violet
Naphthalene	-	-	Xylene
Naphthalene	-	-	Iodine (1% alcohol)
Urine	-	-	-
Paraffin	-	-	-
Toothpaste	-	-	-
Hydrogen peroxide	-	-	-
Procaine	-	-	-
Kerosene	-	-	-
Karl Fischer reagent	-	-	-
Cresol red	-	-	-
Methyl red 1%	-	-	-
Soy sauce	-	-	-
Tomato sauce	-	-	-
Blood	-	-	-
Shower Power	-	-	-
Benedict's solution	-	-	-
Saline solution (NaCl)	-	-	-
Ringer's lactate solution	-	-	-
Copper sulphate	-	-	-
Sodium sulphate (10%)	-	-	-
Phosphate-buffered saline (PBS)	-	-	-
Tetramethylrhodamine	-	-	-
Giemsa stain	-	-	-
Merthiolate	-	-	-
Calcium thiocyanate (78%)	-	-	-
Sodium thiocyanate	-	-	-
Sodium thiosulfate	-	-	-
Toluene	-	-	-
Chromium trioxide	-	-	-
Urea 6%	-	-	-
Vitroclean	-	-	-

* Despite the cleaning indications, it is important to note that all type-3 or type-4 stains must be removed immediately. Defects caused by exposure to type-4 products are not covered by the Krion® warranty.

Some products similar to the ones cited in the previous table are not shown in it. Check the label or safety data sheet of the said products. In the event of uncertainty or when special products are used, conduct a prior test with the product before carrying out your Krion® project. The information herein refers to 18-hour exposure periods.

Longer exposure periods might have different effects. Please bear this in mind and take the necessary steps to avoid such exposure (i.e. avoid drips and spills etc.).

12 LIMITATIONS

Krion® has drawn up a series of Technical Notes for clients, with recommendations of the colours and formats that are most suitable for certain applications. Its 3 and 6mm-thick sheets are suitable for certain very specific applications, such as cladding on furniture or on vertical surfaces.

Standard fabrication methods can be used with the 12 and 19mm-thick sheets for use in various applications.

In the case of dark colours, marks caused by wear and tear are more noticeable and this should be taken into account in places with high traffic. The same also applies to glossy and high gloss finishes. To choose the most suitable colour for each particular use, see the Technical Note on Scratch Resistance and/or the Krion® catalogue.

Krion® is largely made of natural raw materials and so there may be slight variations between batches. To avoid noticeable differences, use sheets from the same batch, if possible, with consecutive numbers.

Since Krion® has a non-porous surface, it is resistant to chemicals. Nonetheless, see the above Technical Note for a list of products that should not be allowed to come into contact with Krion®.

13 LEGAL TERMS & CONDITIONS

The images, texts and data are the property of KRION SOLID SURFACE, S.A., with registered offices at Ctra. Villarreal-Puebla de Arenoso (CV-20), Km 1, 12540 Vila-real (Castellón) SPAIN. The latter's express written consent shall be required for the use and dissemination of the said contents, whether totally or in part. KRION SOLID SURFACE, S.A. holds exclusive rights over the use of the said information, whatever the form, and, in particular, the rights to its reproduction, distribution, public dissemination and transformation. All this material is protected by intellectual property laws and any undue use may lead to sanctions, including criminal proceedings. KRION SOLID SURFACE, S.A. reserves the right to modify and update the information in this technical note and in its introduction at any time, with no need for advance warning. Likewise, the characteristics of the document may be altered to bring them in line with technical developments or to improve the contents through the incorporation of further data. KRION SOLID SURFACE, S.A. cannot be held liable for any outcomes or risks that are incurred as a result of the partial or total use of the information contained herein by fabricators, architects, designers, owners and/or users of the said Krion® materials. This document is merely for informative purposes and does not entail the transfer, in any way, of warranty regarding the use of products produced with Krion®.

14 WARRANTY

Krion® is a cutting-edge material. In addition to its compliance with all quality stipulations and standards relating to solid surfaces, it is manufactured in accordance with meticulous production processes. The quality of the Krion® is monitored throughout the whole of the production process, based on the quality management requirements of the ISO 9001 standard, the environmental management requirements of the ISO 14001 standard and, above all, criteria established by KRION SOLID SURFACE.

KRION SOLID SURFACE, S.A. provides a 10-year limited warranty for Krion® materials (sheets) used to make end products. The limited warranty consists of the free repair or replacement, at the manufacturer's discretion, of manufacturing defects in Krion® materials, depending on the time that has passed since the purchase date, provided that the fabrication and fitting of the material was done by a K™ Associate Quality Fabricator. The prior written agreement of KRION SOLID SURFACE, S.A. is required for the replacement or repair of material under guarantee and this work must be performed by a person appointed by KRION SOLID SURFACE, S.A. From the first year to the third, the warranty shall cover all the material and all labour. From the fourth year to the sixth, the warranty shall cover 75% of the material and 50% of the labour. From the seventh year to the ninth, it shall cover 50% of the material and 25% of the labour. The tenth year, it shall cover 25% of the material and no labour. In all cases, these percentages shall apply providing that the fault is attributable to a manufacturing defect in the Krion® made by KRION SOLID SURFACE, S.A. This warranty is applicable worldwide, with the provisions of the national legislation prevailing in each case. For further information, see the official Warranty Document.

15 OTHER INFORMATION

The handling, storage, use or elimination of the product will be carried out under the control and supervision of the material owner, KRION SOLID SURFACE S.A. being excluded from liability for loss, damage or expenses caused as a result of improper use.

This Technical Datasheet was prepared for and must only be used for this product. If the product is used as a component of another product, this information may not be applicable.



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