

Engineered for the impossible

Arfinio[®] technical data

Arfinio[®]



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01

Introducing Arfinio®

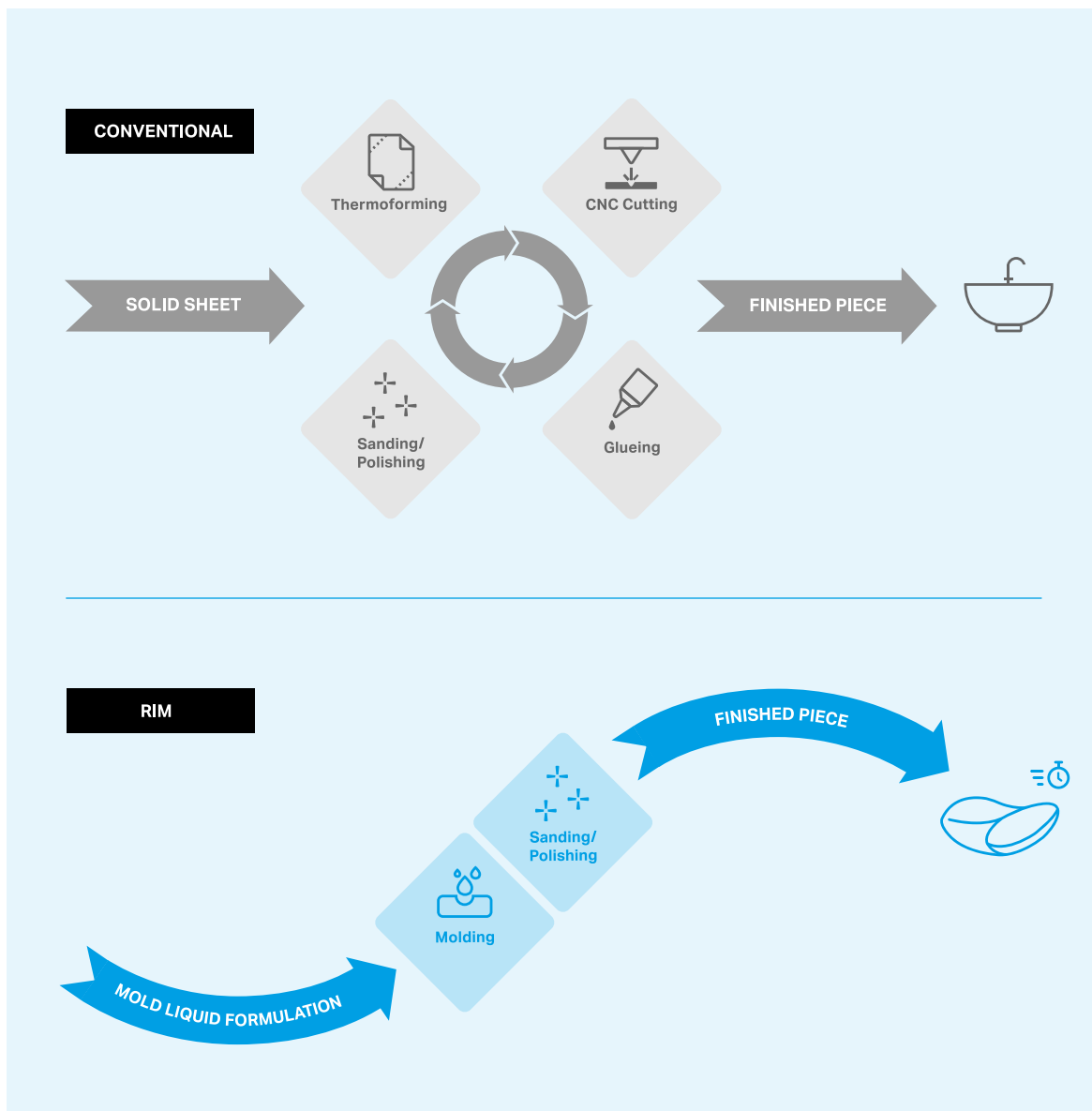
Arfinio® was engineered to realize the impossible with sustainability in mind: its low weight, durability, reparability, and mono-material character leads to lower material consumption, a longer lifetime, and easy recyclability.



Unlimited expression has arrived

An injection-moldable solid-surface material

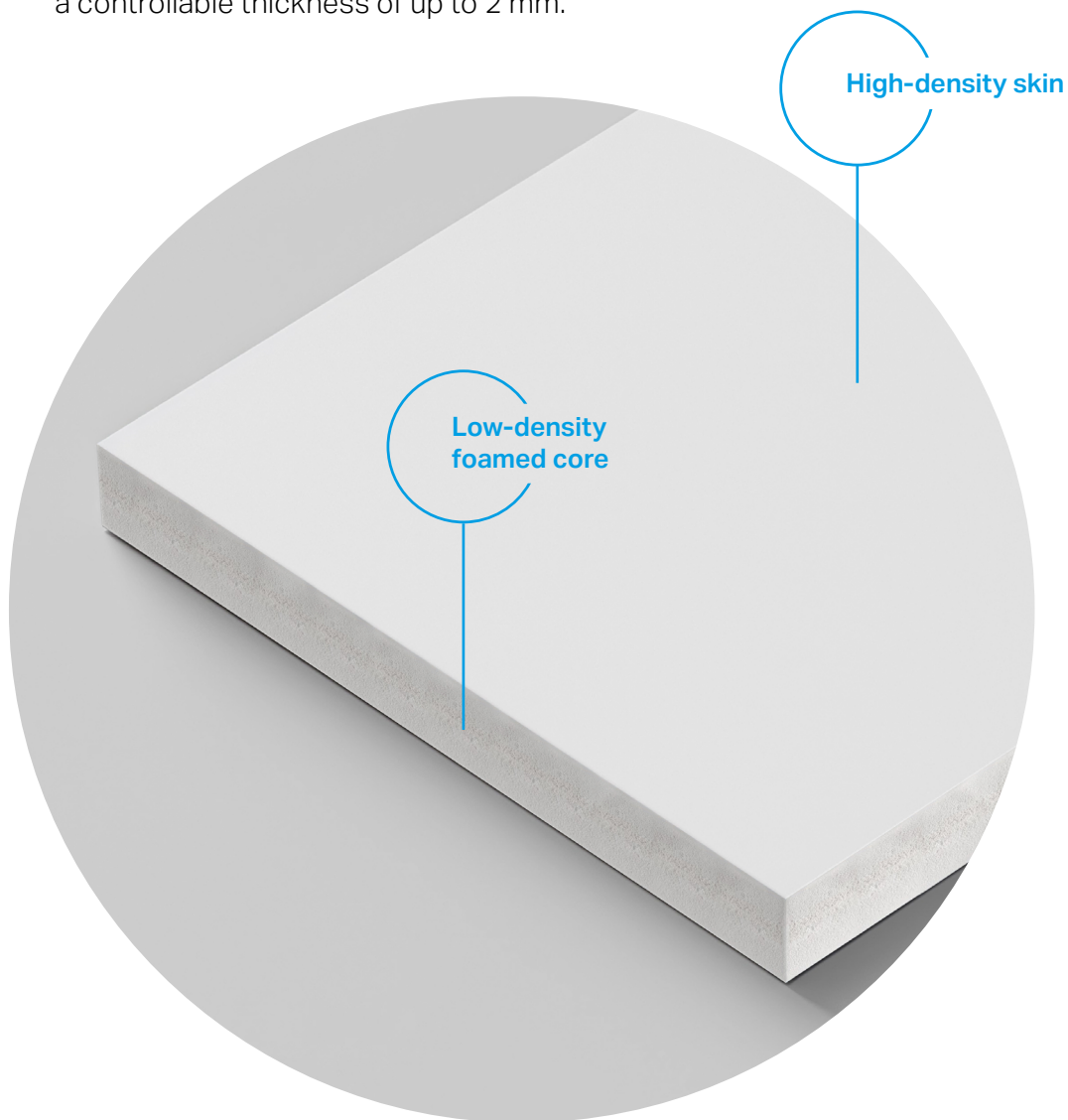
Arfinio® is an innovative material with the look and feel of a solid-surface material, but that can be produced in one piece using reaction injection molding (RIM).



A lightweight solid surface for next-generation products

Mono-material composition with varying densities:

- Low-density foamed core.
- Compact and perfectly even surface with a controllable thickness of up to 2 mm.

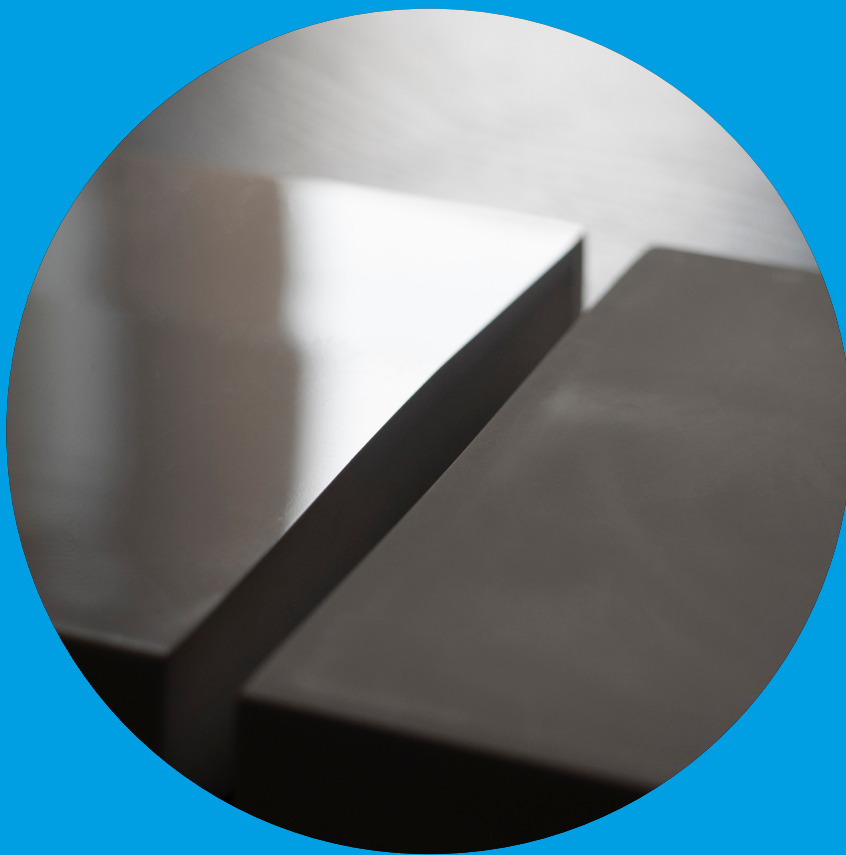


The skin becomes thicker on the convex edges of the piece, making it more durable in the most exposed areas.

02

Mechanical properties

Arfinio® combines the best of two worlds: the character of a solid surface and the outstanding performance of polyurethane. Because durability is the first step to sustainability.



Mechanical properties

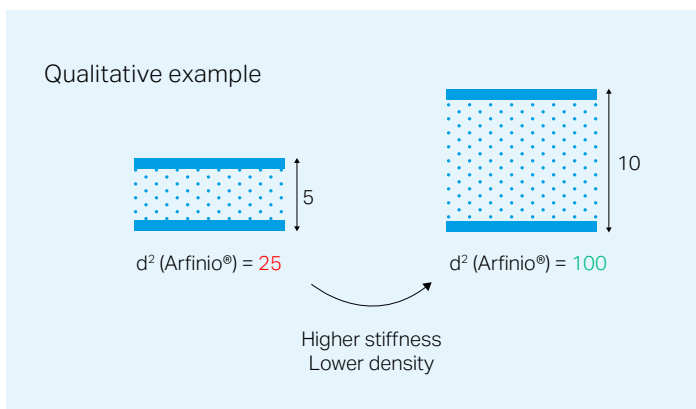
Engineered to perform

| | TEST | NORM | RESULT | UNIT |
|---------------------------|--------------------------------------|----------------------------|---------|-------------------|
| ELONGATION | | | | |
| | Tensile analysis | DIN EN ISO 527 : 07 / 2012 | | |
| | Elongation at break* | | 5.97 | % |
| | E-modulus* | | 1,310 | MPA |
| IMPACT RESISTANCE | | | | |
| | Charpy impact test* | DIN EN ISO 179 : 11 / 2010 | | |
| | at complete break* | | 14.53 | KJ/m ² |
| | with big diameter ball (drop height) | ISO 19712-2 | > 2,000 | mm |
| HARDNESS | | | | |
| | Shore D | ISO 48-4:2018 | 80 | SHD |
| | Barcol | (ASTM D 2583)/ ISO 19712-1 | 9 | |
| | Brinell | ISO 19712-1 | 62.1 | N/mm ² |
| | Rockwell | (ISO 2039-1) | PENDING | |
| SCRATCH RESISTANCE | | | | |
| | Classification | UNE EN 438-2 Ap 25 | Grade 3 | (4 N)* |
| ABRASION | | | | |
| | Loss of weight | UNE EN 438-2 | 97 | mg/100 cycles |
| | Loss of weight | UNE EN 438-2 | 0.018 | M%/100 cycles |

*Unique data that we obtained from a 10.5 mm thick plate with a density of 800 kg/m³.

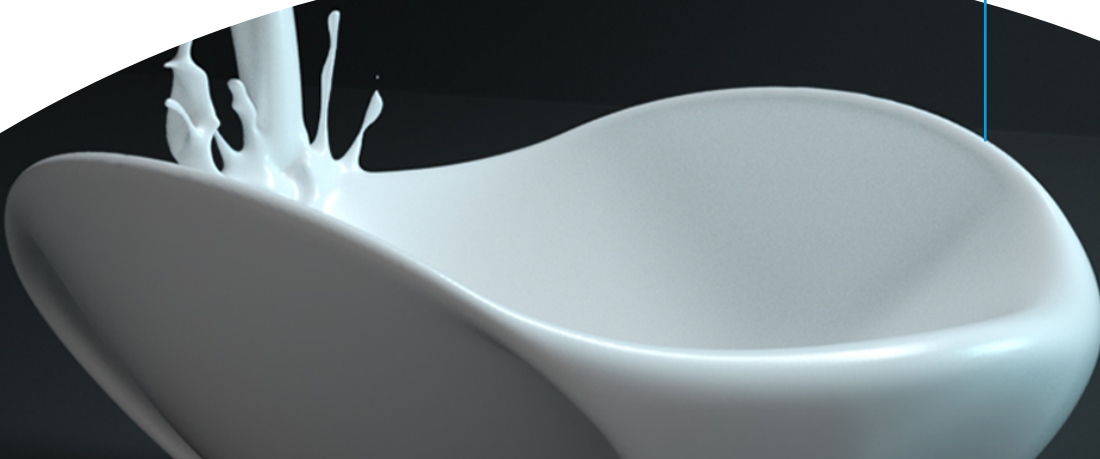
| | TEST | NORM | RESULT | UNIT |
|---------|-----------------------|-----------------------------------|---|-------------------|
| DENSITY | | | | |
| | Density | DIN EN ISO 845 | 650 – 750 (adjustable on request) | kg/m ³ |
| FLEX | | | | |
| | Bending test | DIN EN ISO 178 - A : 09 / 2013 | | |
| | Tension at 3.5% flex* | | 36.3 | MPA |
| | E-modulus* | | 1,867 | MPA |

*Unique data that we obtained from a 10.5 mm thick plate with a density of 800 kg/m³.



- Moment of inertia, directly related to the stiffness of a piece, increases with the square of the thickness, d^2 .
- **Arfinio®'s** sandwich structure with a low-density core allows for an increase in thickness with hardly any increase in weight.
- Therefore, **Arfinio®** can achieve a required stiffness at significantly lower material consumption compared to a mono-density material.

Explore the possibilities.



03

Staining and chemical properties

Arfinio® is hard to soil. Its surface is non-porous, so even nasty stains do not penetrate.

Non-cleanable stains (e.g. permanent marker) can easily be removed by light sanding.



Staining and chemical resistance

Stain resistance

- All tests carried out in accordance with ISO 19712-2.
- Based on a battery of tests with different reagents used in the domestic environment, such as selected chemical agents.

| GROUP | AGENT | TEST PERIOD | RESISTANCE LEVEL | RESULT |
|---------|-------------------------|-----------------|------------------|----------------------------------|
| GROUP 1 | | | | |
| | Coffee at 80 °C | 16 hours | 5 | No visible change |
| GROUP 3 | | | | |
| | Sodium hydroxide (25%) | 10 min | 5 | No visible change |
| | Hydrogen peroxide (30%) | 10 min | 5 | No visible change |
| | Acetone | 10 min | 5 | No visible change |
| | Shoe polish | 10 min | 5 | No visible change |
| GROUP 4 | | | | |
| | Citric acid (10%) | 20 min (100 °C) | 1 | Blistering* (due to the heating) |

*Despite the product presenting a very high resistance to soiling, the standard requires that the test for the last group is carried out by applying a metal plate at 100 °C. Under these conditions, the material presents a characteristic swelling.



Cleanability

- All tests carried out in accordance with ISO 19712-2.
Soiling agents are cleaned using common cleaning agents of increasing aggressiveness on a scale of one to five.

| AGENT | GRADE OF AGGRESSIVENESS | RESULT |
|--------------------------|-------------------------|----------------------|
| Distilled water | 0 | No visible change |
| Ethanol (50%) | 0 | No visible change |
| Ammonia for domestic use | 0 | No visible change |
| Citric acid (10%) | 0 | No visible change |
| Vegetable oil | 0 | No visible change |
| Coffee | 0 | No visible change |
| Tea | 0 | No visible change |
| Ketchup | 1 | No visible change |
| Mustard | 1 | No visible change |
| Tincture of iodine | 0 | No visible change |
| Acetone | 0 | No visible change |
| Black permanent marker | 2 | No visible change |
| HB hardness pencil | 0 | No visible change |
| Wax crayon | 2 | No visible change |
| Shoe polish | 3 | No visible change |
| Valuation | 9 | PASS (<16) |

- Immersion of a matte **Arfinio**® surface in eight different commercially available aggressive cleaning agents for 15 days did not result in any defects.

Repairability

Can parts made of **Arfinio®** be repaired?

Arfinio® is a non-porous material, so stains do not penetrate through the surface. Therefore, parts made of **Arfinio®** can be completely renewed by sanding the surface with the same grain as the original polishing. In addition, the extraordinary abrasion resistance of the material allows this process to be repeated several times.

| | | | |
|---------------------|--------------|------|-----------|
| Abrasion resistance | CS 17 (500U) | 11.8 | Very good |
| Abrasion resistance | S33 (500U) | 644 | Very good |

Results of internal tests normally used to evaluate the abrasion of a parquet coating.

Resistance to microorganisms

| TYPE | NORM | RESULT |
|---|-------------------------|--|
| UNTREATED ARFINIO® | | |
| RESISTANCE TO FUNGI | ISO 846:2019 (Method A) | Not resistant to attack by fungi or bacteria. Once the incubation time is over and the material cleaned with alcohol, no type of staining is observed. |
| RESISTANCE TO BACTERIA | ISO 846:2019 (Method C) | Not resistant to attack by fungi or bacteria. Once the incubation time is over and the material cleaned with alcohol, no type of staining is observed. |
| ARFINIO® WITH BIOCIDES ADDED IN BULK | | |
| RESISTANCE TO BACTERIA | ISO 22196 | 99.99 % bacteria eliminated |

04

Thermal properties

Arfinio® is a surprising material with many additional features – more than you'd expect.



Thermal properties

- Highly effective insulating properties, thanks to outstanding thermal coefficient when compared to standard solid surfaces

| TEST | NORM | RESULT | UNIT |
|---|------------------------------|-----------|--------|
| Thermal conductivity | DIN 52616 11 / 1977 | 0.074 | W/mK |
| Thermal dilation | Range: -20 ° – 60 ° | 0.065 | mm/m°K |
| HDT | DIN EN ISO 75 -2 : 08 / 2013 | 55.3 | °C |
| T _g per DSC | | 107 | °C |
| Dimensional stability at high temperature | UNE EN 438-2 | 1.33–1.50 | % |

| TEST | NORM | RESULT | UNIT |
|--|------------------|--|-------------|
| Resistance to cigarette burns | UNE EN 19712-2 | Severe brown mark with surface deterioration | |
| Resistance to dry heat at 180 °C appearance (assessment) | UNE EN 19712-2 | 1 | Not passed |
| Resistance to dry heat at 180 °C appearance (defect) | UNE EN 19712-2 | Blisters | Degradation |
| Resistance to humid heat, method A | UNE EN 19712-2 | Bubbles and cracks | Degradation |
| Resistance to hot/cold water cycles (*) | EN 14688:2016+A1 | Pass | OK |

*Washbasin version

Partially bio-based raw materials help close the carbon loop.

Other properties

Lightfastness

| TYPE | NORM | RESULT |
|----------|---|-------------------------------------|
| UV LIGHT | ISO 105-A02 (gray scale) | 5 No effect (passed if $\geq 4-5$) |
| SUNLIGHT | Results after 3 years exposed to sunlight are excellent. In all cases, the colorimeter indicates a difference of the order of 1% (in Delta E) between the covered and the uncovered part, imperceptible to the eye. | |

Slip resistance

| TYPE | NORM | RESULT |
|----------------|--------------------|------------------------------------|
| WET SLIP CLASS | UNE ENV 12633:2003 | 3 Suitable for swimming pool areas |

Homologation of parts produced with Arfinio®

| TYPE | NORM | RESULT |
|--------------------------|-----------------------|--------|
| CE MARKING SHOWER PLATES | UNE-EN 14527:2016 CL1 | Passed |
| CE MARKING WASHBASIN | UNE-EN 14688:2016 | Passed |

Fire resistance

| TYPE | NORM | RESULT |
|--------------|-------------------------|--------------------------------------|
| FLAMMABILITY | UNE EN 60695-11-10:2014 | V0 Self-extinguishing, highest level |



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