

AcoustiCORK®
by Amorim

BUILDING COMFORT WITH SUSTAINABILITY

FLOORING SOLUTIONS

AMORIM CORK COMPOSITES



CORK, AN EXCEPTIONAL RAW MATERIAL

Cork is the outer bark of the cork oak tree (*Quercus Suber L.*), the 100% natural plant tissue covering the trunk and branches.

It consists of a honeycomb-like structure of microscopic cells filled with an air-like gas and composed mainly with suberin, lignin, and polysaccharides. One cubic centimetre of cork contains about 40 million cells.

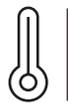
Cork is also known as "nature's foam" due to its alveolar cellular structure. It has a closed-cell structure making it lightweight.

It is sustainably harvested by specialised professionals without damaging the trunk, thus enabling the tree to grow another layer of outer bark that, in time, will be re-harvested. Over the course of the cork oak tree's life, that lasts 200 years on average, the cork may be stripped around 17 times. This means that cork is not only a natural raw material, it is also renewable and recyclable.

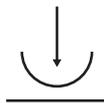
KEY FEATURES



Excellent
acoustic insulator



Excellent
thermal insulator



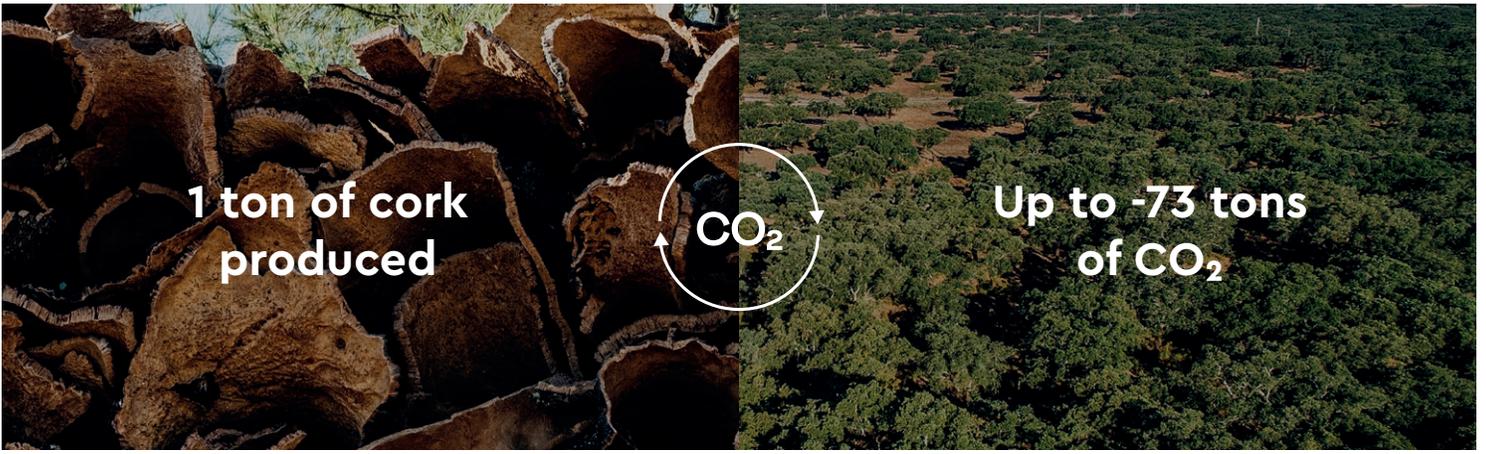
Good resilience
Excellent compressibility
and recovery



Extremely light



Natural, reusable
and recyclable

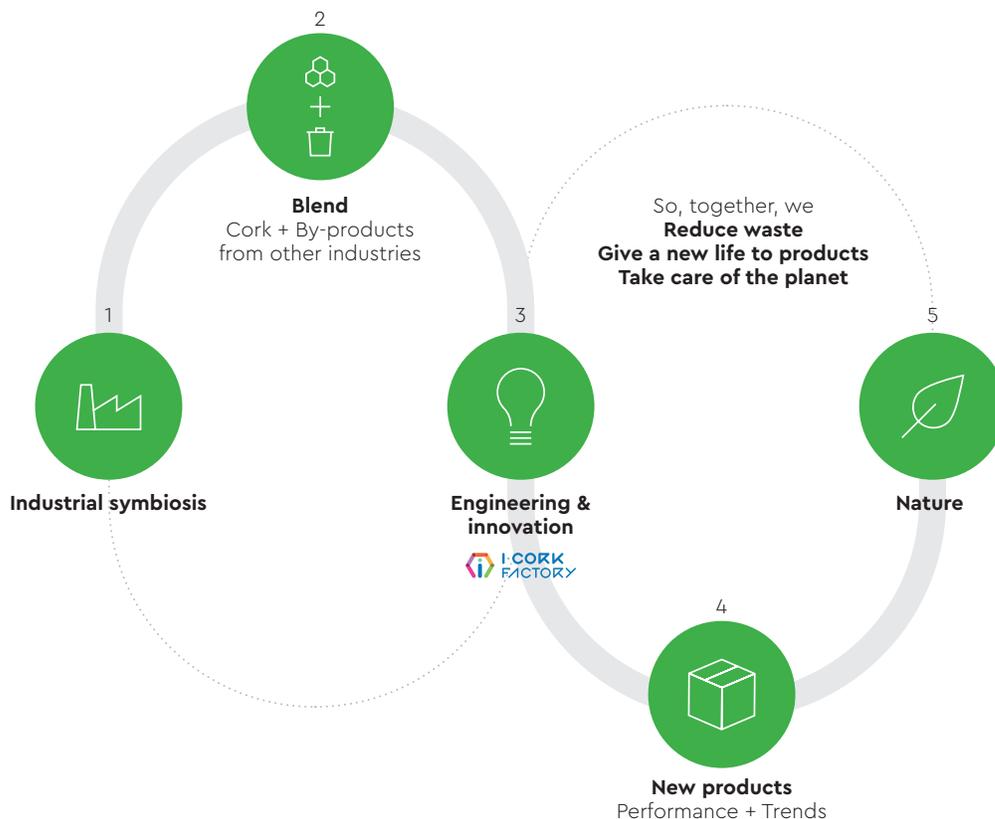


THE COMMITMENT TO CREATE A POSITIVE IMPACT ON THE PLANET

Cork products maintain the CO₂ storage capacity throughout their life cycle, which makes it possible to reduce the carbon footprint of various cork-based products.

With cork at the core, blended with other materials that are by-products from other industries (industrial symbiosis), we give materials a new life by creating new products leveraging cork's attributes while taking care of the planet.

At the i.cork factory, our innovation hub, we achieve the perfect match between performance and sustainability. New, innovative and high performance products from circular economy are arising.



* Source: Instituto Superior de Agronomia (ISA), 2016 (<http://uaonline.ua.pt/pub/detail.asp?lg=pt&c=45245>)

BUILDING COMFORT WITH SUSTAINABILITY

AcustiCORK®
by Amorim



Thermal insulation and resistance

Acoustic insulation

Decoupling layer to avoid ceramic crack

Performance over time and high compressive creep



WHY ACOUSTICORK?

Ensuring peace and quiet isn't a mere luxury. It's already a human need - to guarantee quality of life and work in our fast-moving era.

FAST-MOVING TIMES REQUIRE ACOUSTIC COMFORT

Growing urbanization and rising populations in urban areas are leading to more stringent noise and vibration standards and norms. As a result, is higher demand for high-quality and efficient sound insulation and vibration isolation (from internal or external sources in each building).

Every day, new buildings are being erected on plots of land subject to vibrations, in areas with dense infrastructures. Sources of disturbance are often located near railway lines, roads or industrial complexes. Unless appropriate action is taken, buildings are defenceless against such vibrations.

Many apartments blocks also have underground car parks, commercial establishments on the ground floor (such as a shopping mall) or even a gym on an intermediate floor. In these situations, various factors may subject buildings to shocks, which have an impact on their structure and are perceived by residents as noticeable vibrations or secondary airborne noise.

CORK INSIDE

When cork isn't so visible, this seal assures that cork is present in the optimal amount - guaranteeing the performance of the material.

Cork Inside formulations combine cork with other materials from other industries and are developed and rigorously tested by Amorim Cork Composite's innovation, quality and engineering teams. Cork Inside responds to stringent requirements and guarantees the needed performance required for the application.

ACOUSTICORK NATURAL BASE MATERIALS FOR DEMANDING APPLICATIONS

Amorim Cork Composites develops specific compound formulations, which offer highly insulation or damping materials in compliance with a wide range of environmental conditions.

Cork absorbs energy due to its unique compressibility and recovery characteristics, yielding higher loss factors that are essential for the damping function. Cork's extremely low Poisson Ratio improves the behaviour of such materials in dynamic loading applications. Cork also brings durability to the applied solution.



FLOORING SOLUTIONS

Sustainable and highly durable and performing solutions made of agglomerated cork to assure sound insulation, improve thermal comfort and protect the floor of any space. Cork is a common denominator used in all our underlayments.

When applied beneath a flooring system, a cork-based underlayment provides greater comfort, protection and longevity to the final floor.



T66 Performance



T61 Balance



T04 Maximum



T27 Force



T85 Comfort



T10 Essence



T47 Versatile



T92 Selection

T66 PERFORMANCE

- ▶ Agglomerated cork and recycled rubber underlayment for impact, noise and thermal insulation.
- ▶ Ceramic/Natural stone tiles and wood floor.



| | | Ceramic/Natural Stone | | Wood | |
|--------------------------------|---|-----------------------|------------------|------------------|------------------|
| | | 4.5 mm | 3.0 mm | 3.0 mm | 2.0 mm |
| Density | kg/m ³ lb/ft ³ | 560-650 35-40 | 560-650 35-40 | 560-650 35-40 | 560-650 35-40 |
| Tensile Strength | kPa | > 600 | > 600 | > 600 | > 600 |
| Acoustic Performance ① | | | | | |
| Impact Sound (IS) ② | dB (ISO) | 18 | 16 | 16 | 18 |
| Impact Insulation IIC ΔIIC ③ | dB (ASTM) | — — | — — | — — | 50 22 |
| Sound Transmission (STC) ④ | dB (ASTM) | — | — | — | — |
| Thermal Performance | | | | | |
| Thermal Resistance (TR) | m ² ·°C/W | 0.037 | 0.024 | 0.024 | 0.016 |
| Floor Durability | | | | | |
| Punctual Conformability (PC) | mm | NA | NA | NA | NA |
| Compressive Strength (CS) | kPa | NA | NA | >200 | >200 |
| Compressive Creep (CC) | kPa | — | — | — | > 140 |
| Water Vapor Resistance (SD) | m | NA | NA | NA | > 75 |
| Vapor Barrier | | ○ | ○ | ○ | ● |

T61 BALANCE

- ▶ Agglomerated cork underlayment for impact noise and thermal insulation designed to be a 100% natural solution.
- ▶ Wood floor and ceramic/natural stone tiles.

| | | | Ceramic/Natural Stone | | Wood | | |
|--------------------------------|---|------------------|-----------------------|-----------------|-----------------|--------------------|-------------------|
| | | | 6.0 mm | 6.0 mm | 3.0 mm | 2.5/1.5 mm profile | 3.0 mm perforated |
| Density | kg/m ³ lb/ft ³ | 150–220 9–14 | 150–220 9–14 | 150–220 9–14 | 150–220 9–14 | 150–220 9–14 | 150–220 9–14 |
| Tensile Strength | kPa | > 200 | > 200 | > 200 | > 200 | > 200 | > 200 |
| Acoustic Performance ① | | | | | | | |
| Impact Sound (IS) ② | dB (ISO) | — | — | 16 | 20 | 18 | 20 |
| Impact Insulation IIC ΔIIC ③ | dB (ASTM) | 78 (ceiling) — | 76 (ceiling) — | 75 37 | — — | — — | 76 38 |
| Sound Transmission (STC) ④ | dB (ASTM) | 74 | 75 | 77 | — | — | 77 |
| Thermal Performance | | | | | | | |
| Thermal Resistance (TR) | m ² ·°C/W | 0.137 | 0.137 | 0.069 | — | — | 0.046 |
| Floor Durability | | | | | | | |
| Punctual Conformability (PC) | mm | NA | > 1.0 | > 0.5 | — | NA | > 0.5 |
| Compressive Strength (CS) | kPa | NA | > 60 | > 200 | NA | NA | > 200 |
| Compressive Creep (CC) | kPa | — | — | — | > 50 | — | — |
| Water Vapor Resistance (SD) | m | NA | NA | NA | NA | NA | > 75 |
| Vapor Barrier | | ○ | ○ | ○ | ○ | ○ | ● |

T04 MAXIMUM

- ▶ Agglomerated cork and recycled rubber underlayment for impact noise reduction, crack suppression and easy installation.
- ▶ Ceramic and natural stone tiles.



| | | Ceramic/Natural Stone | |
|--------------------------------|---|-----------------------|------------------|
| | | 10.0 mm | 5.0 mm |
| Density | kg/m ³ lb/ft ³ | 490–570 30–36 | 490–570 30–36 |
| Tensile Strength | kPa | > 250 | > 250 |
| Acoustic Performance ① | | | |
| Impact Sound (IS) ② | dB (ISO) | — | — |
| Impact Insulation IIC ΔIIC ③ | dB (ASTM) | 76 — | 51 — |
| Sound Transmission (STC) ④ | dB (ASTM) | 71 | 55 |
| Thermal Performance | | | |
| Thermal Resistance (TR) | m ² ·°C/W | 0.099 | 0.050 |
| Floor Durability | | | |
| Punctual Conformability (PC) | mm | NA | NA |
| Compressive Strength (CS) | kPa | NA | NA |
| Compressive Creep (CC) | kPa | — | — |
| Water Vapor Resistance (SD) | m | NA | NA |
| Vapor Barrier | | ○ | ○ |

T27 FORCE

- ▶ Agglomerated cork underlayment for high impact noise reduction and thermal insulation. Designed to be a 100% natural solution.
- ▶ Ceramic and natural stone tiles.

| | | Ceramic/Natural Stone | |
|--------------------------------|---|-----------------------|--|
| | | 12.7 mm | |
| Density | kg/m ³ lb/ft ³ | 160–220 10–14 | |
| Tensile Strength | kPa | > 400 | |
| Acoustic Performance ① | | | |
| Impact Sound (IS) ② | dB (ISO) | — | |
| Impact Insulation IIC ΔIIC ③ | dB (ASTM) | 78 — | |
| Sound Transmission (STC) ④ | dB (ASTM) | 74 | |
| Thermal Performance | | | |
| Thermal Resistance (TR) | m ² ·°C/W | 0.261 | |
| Floor Durability | | | |
| Punctual Conformability (PC) | mm | NA | |
| Compressive Strength (CS) | kPa | NA | |
| Compressive Creep (CC) | kPa | — | |
| Water Vapor Resistance (SD) | m | NA | |
| Vapor Barrier | | ○ | |

T85 COMFORT

- ▶ Agglomerated cork and recycled PU foam underlayment for impact.
- ▶ Laminate floor.



| | | Laminate | |
|--------------------------------|---|------------------|------------------|
| | | 2.0 mm | 2.0 mm |
| Density | kg/m ³ lb/ft ³ | 240–340 15–22 | 240–340 15–22 |
| Tensile Strength | kPa | > 150 | > 550 |
| Acoustic Performance ① | | | |
| Impact Sound (IS) ② | dB (ISO) | 20 | 20 |
| Impact Insulation IIC ΔIIC ③ | dB (ASTM) | 54 — | 54 — |
| Sound Transmission (STC) ④ | dB (ASTM) | 53 | 53 |
| Thermal Performance | | | |
| Thermal Resistance (TR) | m ² ·°C/W | 0.038 | 0.038 |
| Floor Durability | | | |
| Punctual Conformability (PC) | mm | > 1 | > 1 |
| Compressive Strength (CS) | kPa | > 200 | > 200 |
| Compressive Creep (CC) | kPa | > 20 | > 20 |
| Water Vapor Resistance (SD) | m | NA | > 75 |
| Vapor Barrier | | ○ | ● |

T47 VERSATILE

- ▶ Agglomerated cork and recycled PU foam underlayment for impact noise.
- ▶ LVT floor.



| | | LVT |
|--------------------------------|---|------------------|
| | | 1.9 mm |
| Density | kg/m ³ lb/ft ³ | 320–420 20–26 |
| Tensile Strength | kPa | > 350 |
| Acoustic Performance ① | | |
| Impact Sound (IS) ② | dB (ISO) | 18 |
| Impact Insulation IIC ΔIIC ③ | dB (ASTM) | 74 35 |
| Sound Transmission (STC) ④ | dB (ASTM) | 76 |
| Thermal Performance | | |
| Thermal Resistance (TR) | m ² ·°C/W | — |
| Floor Durability | | |
| Punctual Conformability (PC) | mm | > 0.5 |
| Compressive Strength (CS) | kPa | > 200 |
| Compressive Creep (CC) | kPa | — |
| Water Vapor Resistance (SD) | m | NA |
| Vapor Barrier | | ○ |

T10 ESSENCE

- ▶ Agglomerated cork underlayment for impact noise and thermal insulation.
- ▶ Laminate floor.



| | | Laminate | |
|--------------------------------|---|------------------|------------------|
| | | 2.0 mm | 2.0 mm |
| Density | kg/m ³ lb/ft ³ | 160–280 10–18 | 160–280 10–18 |
| Tensile Strength | kPa | > 200 | > 550 |
| Acoustic Performance ① | | | |
| Impact Sound (IS) ② | dB (ISO) | 17 | 17 |
| Impact Insulation IIC ΔIIC ③ | dB (ASTM) | — — | — — |
| Sound Transmission (STC) ④ | dB (ASTM) | — | — |
| Thermal Performance | | | |
| Thermal Resistance (TR) | m ² ·°C/W | 0.039 | 0.039 |
| Floor Durability | | | |
| Punctual Conformability (PC) | mm | > 1 | > 1 |
| Compressive Strength (CS) | kPa | > 200 | > 200 |
| Compressive Creep (CC) | kPa | > 100 | > 100 |
| Water Vapor Resistance (SD) | m | NA | > 75 |
| Vapor Barrier | | ○ | ● |
| Carbon Balance | kg/eqCO ₂ per m ² | -12.4 | |

T92 SELECTION

- ▶ Agglomerated cork for impact, noise and protection of the floor joins.
- ▶ LVT floor.

| | | LVT | |
|--------------------------------|---|------------------|------------------|
| | | 1.6 mm | 1.6 mm |
| Density | kg/m ³ lb/ft ³ | 250–350 15–22 | 250–350 15–22 |
| Tensile Strength | kPa | > 500 | > 550 |
| Acoustic Performance ① | | | |
| Impact Sound (IS) ② | dB (ISO) | 17 | 17 |
| Impact Insulation IIC ΔIIC ③ | dB (ASTM) | — — | — — |
| Sound Transmission (STC) ④ | dB (ASTM) | — | — |
| Thermal Performance | | | |
| Thermal Resistance (TR) | m ² ·°C/W | 0.025 | 0.025 |
| Floor Durability | | | |
| Punctual Conformability (PC) | mm | < 0.5 | < 0.5 |
| Compressive Strength (CS) | kPa | > 400 | > 400 |
| Compressive Creep (CC) | kPa | > 50 | > 50 |
| Water Vapor Resistance (SD) | m | NA | > 75 |
| Vapor Barrier | | ○ | ● |

① MDS available for further test details and additional acoustic results ② Standard ISO 717-2:2013 ③ Standard ASTM E413 ④ Standard ASTM E989-89
 TBD To be determined NA Not applicable ● Yes ○ No

LONG-TERM DURABILITY • CORK VS FOAM UNDERLAYMENTS

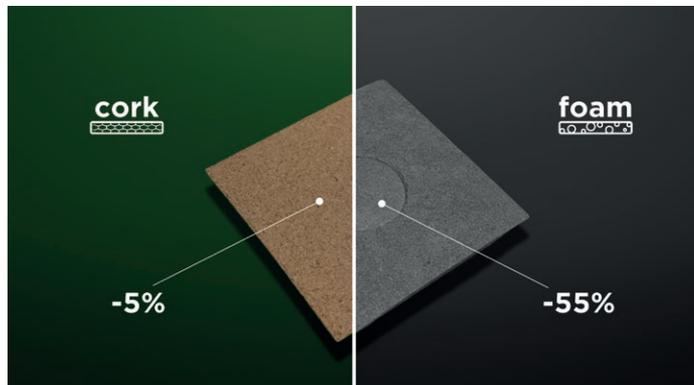
Installing a cork underlayment is the best option to ensure your floors' durability while improving buildings' comfort and efficiency.

This layer of material, applied between the concrete (or the previous flooring, in case of renovation work) and the final flooring, is essential to ensure the durability of the floor over time, and to prove this, we run the following tests:

TEST #01 • DYNAMIC LOAD TEST (DL)®

The dynamic load test is a laboratory test that simulates the pressure exerted on the floor by foot traffic, trolleys and office chairs with casters, among others. To be effective, the underlayment must be able to withstand this pressure without losing its absorption characteristics.

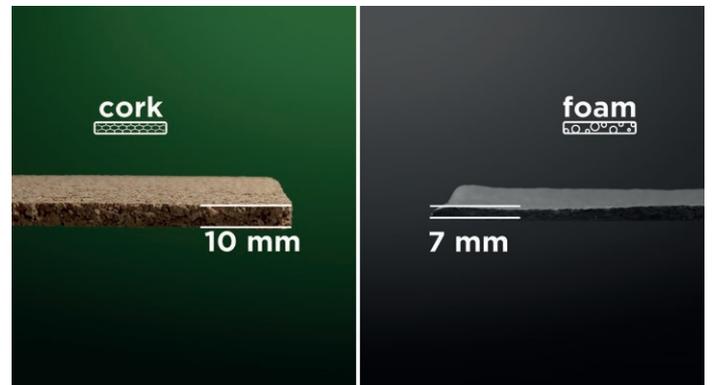
To assess the material performance, we submitted a sample of cork, and another composed entirely of foam, both 10 mm thick, to 100 000 cycles at 75 KPa pressure.



TEST #02 • COMPRESSIVE CREEP (CC)®

The creep test determines the weight that can be placed on a given floor over time, using as reference a period of 10 years. We are talking about furniture weight, for example.

This means that, as it is compressed over the years, cork maintains its thickness and, consequently, the performance of the system where it is applied, whereas with foams (PE, XPS, or PP), whenever pressure results in cell breakage, the underlayment loses density and effectiveness.



RESULT #01 • DYNAMIC LOAD TEST (DL)®

Cork delivers superior performance and shows almost the same thickness after being compressed. Less than 10% of thickness loss.

RESULT #02 • COMPRESSIVE CREEP (CC)®

Cork proved to be more resilient, with just 5% thickness loss after 100,000 charge cycles.

FLOORING ACCESSORIES FOR A SUSTAINABLE FUTURE

The Negative Carbon Balance seal certifies that when taking into account the carbon sequestration from cork oak forests, the manufacture of Acousticork products sequesters more CO₂ than it emits.

T10 Essence has -18.6 kg/eqCO₂ per m².^③
T10 Essence VB has -18.0 kg/eqCO₂ per m².^③



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Representative



Acousticcork solutions are tested at highly qualified laboratories.

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