



AcoustiCORK®
by Amorim

BUILDING COMFORT WITH SUSTAINABILITY

FLOORING SOLUTIONS

AMORIM CORK SOLUTIONS



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



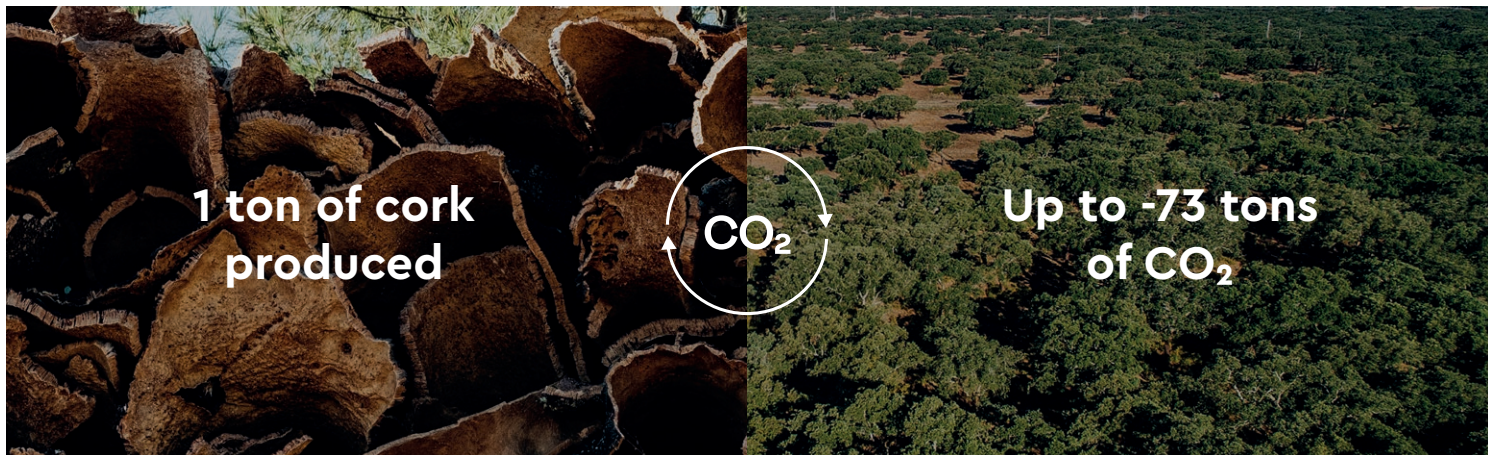
Good resilience
Excellent compressibility
and recovery



Extremely light



Natural, reusable
and recyclable

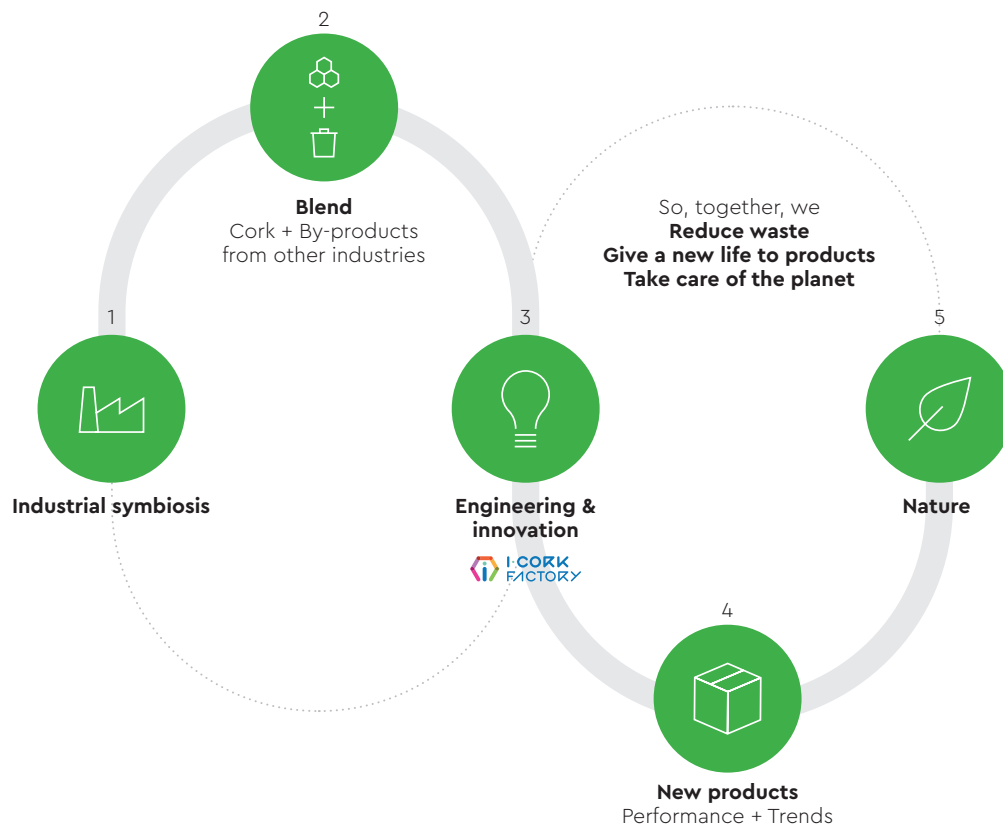


THE COMMITMENT TO CREATE A POSITIVE IMPACT ON THE PLANET

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

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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.

ACOUSTICORK NATURAL BASE MATERIALS FOR DEMANDING APPLICATIONS

Amorim Cork Solutions 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.

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.

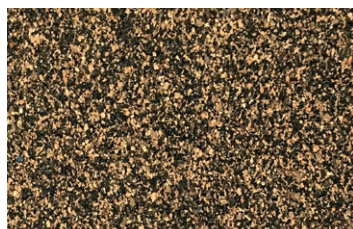
Cork Inside formulations combine cork with other materials from other industries and are developed and rigorously tested by Amorim Cork Solutions' innovation, quality and engineering teams. Cork Inside responds to stringent requirements and guarantees the needed performance required for the application.



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.

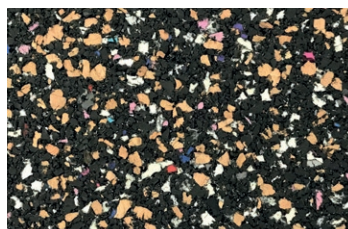
When applied beneath a flooring system, a cork-based underlayment provides greater comfort, protection and longevity to the final floor.



T66 Performance



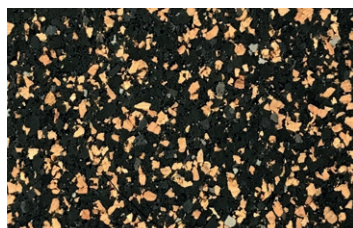
T61 Balance



T04 Maximum



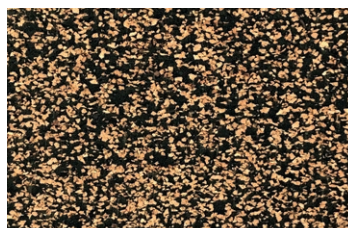
T27 Force



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		O	O	O	●

- 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	2.0 mm
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		O	O	O	O	O	●

- 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		O	O

- 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		O

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		○	●

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	

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		○

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		○	●

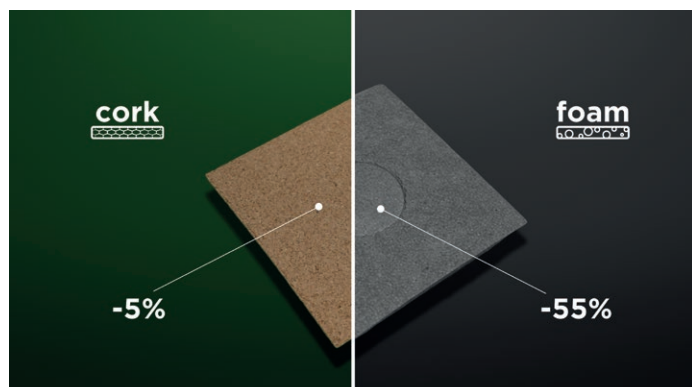
LONG-TERM DURABILITY • CORK VS FOAM UNDERLAYMENTS

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

TEST #01 • DYNAMIC LOAD TEST (DL)^①

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.



RESULT #01 • DYNAMIC LOAD TEST (DL)^①

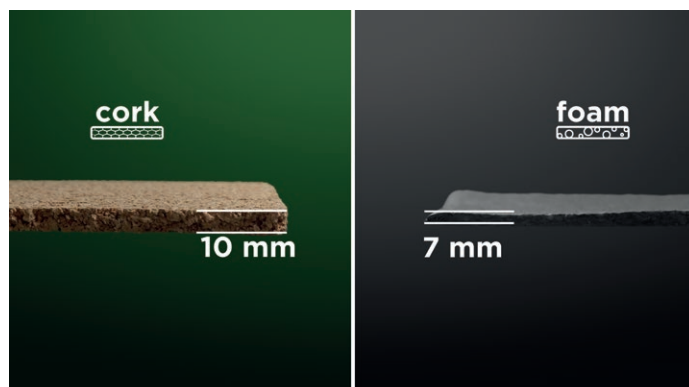
Cork delivers superior performance and shows almost the same thickness after being compressed. Less than 10% of thickness loss.

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 #02 • COMPRESSIVE CREEP (CC)^②

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 #02 • COMPRESSIVE CREEP (CC)^②

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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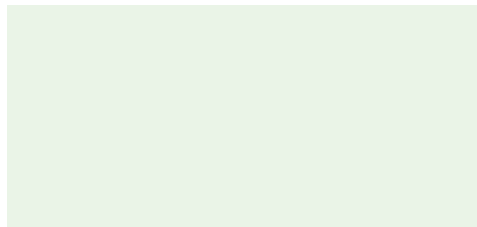
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Representative



Acousticork solutions are tested at highly qualified laboratories.

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