# AMORIM

## ISOLAMENTOS

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# Amorim Isolamentos

## WHO WE ARE

*The Insulation Business Unit (Amorim Isolamentos, S.A.) is dedicated to the production of insulation agglomerates with excellent technical performance and strictly 100% natural.*

Amorim Isolamentos is integrated in Corticeira Amorim and has a strong foothold in the world market, arising from a rigorous commitment to compliance with the quality standards and demands required primarily by the sustainable construction sector.

In 1987 Corticeira Amorim S.A., as part of a strategic plan for the Group about insulation cork products, created Expocor, a company of Portuguese-British capital devoted to the production and marketing of expanded insulation cork whose goal was to promote and disseminate a product from which new markets and applications would arise, by customizing the expanded insulation cork, a natural product of unmatched features.

Its history dates back to 1963, having appeared this year as a test tube for the agglomerates industry, proving it is an industry that survives per se.

Amorim Isolamentos appears in 1997 as a business unit Amorim Group, to produce expanded insulation cork and  is market leader with brands Amorim (corporate brand), Corkpan (Italy), Aglocork (Spain), Izora (Russia), Corktherm 040 (Austria, Germany and Switzerland), Corkisol (France) and Thermacork (USA).

In order to achieve certification and total quality, Amorim Isolamentos is a company seeking high levels of quality and productivity, where the protection of the environment and the preservation of natural resources are a constant, clearly demonstrating its position in the community in which it operates.

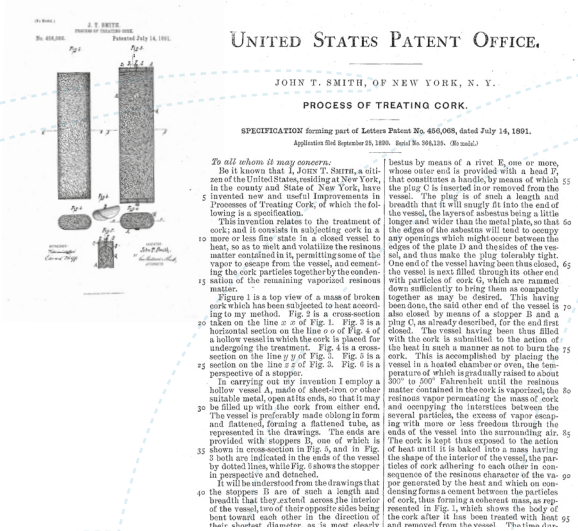
## THE ORIGIN OF THE MATERIAL

*Expanded Insulation Corkboard was discovered by accident.*

As early as 1891, U.S. Imports of cork were substantial. The cork was used for the manufacture of many materials: cork stoppers, buoys, life jackets, and other materials. One day in New Yorka discovery was made in the buoys and life jacket factory of John T. Smith.  At that time, the filling of lifejackets was done using a metal cylinder to keep the lifejacket open while the worker filled the cylinder with granulated cork. One of the cylinders was clogged and was set aside and inadvertently rolled over a hot brazier. It went unnoticed until the next morning.

The next day, Smith with the help of a worker while cleaning the ash from the brazier noticed that the cork inside the cylinder had not been burned, and the heat was sufficient to bind the entire mass in a single form-brown chocolate.

The original process was repeated intentionally to be able to prove that the material could bind without any additive or foreign substance and thus registering a patent on the manufacturing process.



UNITED STATES PATENT OFFICE.

JOHN T. SMITH, OF NEW YORK, N. Y.

PROCESS OF TREATING CORK.

SPECIFICATION forming part of Letters Patent No. 456,008, dated July 14, 1891.

Application filed September 29, 1890. Serial No. 366,135. (No model.)

*To all whom it may concern.*

Be it known that I, JOHN T. SMITH, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Processes of Treating Cork, of which the following is a specification.

This invention relates to the treatment of cork; and it consists in subjecting cork in a more or less fine state in a closed vessel to heat, so as to melt and volatilize the resinous matter contained in it, permitting some of the vapor to escape from the vessel, and cementing the cork particles together by the condensation of the remaining vaporized resinous matter.

Figure 1 is a top view of a mass of broken cork which has been subjected to heat according to my method. Fig. 2 is a cross-section taken on the line *x x* of Fig. 1. Fig. 3 is a horizontal section on the line *o o* of Fig. 4 of a hollow vessel in which the cork is placed for undergoing the treatment. Fig. 4 is a cross-section on the line *y y* of Fig. 3. Fig. 5 is a section on the line *z z* of Fig. 3. Fig. 6 is a perspective of a stopper.

In carrying out my invention I employ a hollow vessel A, made of sheet-iron or other suitable metal, open at its ends, so that it may be filled up with the cork from either end. The vessel is preferably made oblong in form and flattened, forming a flattened tube, as represented in the drawings. The ends are provided with stoppers B, one of which is shown in cross-section in Fig. 5, and in Fig. 3 both are indicated in the ends of the vessel by dotted lines, while Fig. 6 shows the stopper in perspective and detached.

It will be understood from the drawings that the stoppers B are of such a length and breadth that they extend across the interior of the vessel, two of their opposite sides being bent toward each other in the direction of their shortest diameter, as is most clearly

bestus by means of a rivet E, one or more, whose outer end is provided with a head F, that constitutes a handle, by means of which the plug C is inserted in or removed from the vessel. The plug is of such a length and breadth that it will snugly fit into the end of the vessel, the layers of asbestus being a little longer and wider than the metal plate, so that the edges of the asbestus will tend to occupy any openings which might occur between the edges of the plate D and the sides of the vessel, and thus make the plug tolerably tight. One end of the vessel having been thus closed, the vessel is next filled through its other end with particles of cork G, which are rammed down sufficiently to bring them as compactly together as may be desired. This having been done, the said other end of the vessel is also closed by means of a stopper B and a plug C, as already described, for the end first closed. The vessel having been thus filled with the cork is submitted to the action of the heat in such a manner as not to burn the cork. This is accomplished by placing the vessel in a heated chamber or oven, the temperature of which is gradually raised to about 300° to 500° Fahrenheit, until the resinous matter contained in the cork is vaporized, the resinous vapor permeating the mass of cork and occupying the interstices between the several particles, the excess of vapor escaping with more or less freedom through the ends of the vessel into the surrounding air. The cork is kept thus exposed to the action of heat until it is baked into a mass having the shape of the interior of the vessel, the particles of cork adhering to each other in consequence of the resinous character of the vapor generated by the heat and which on condensing forms a cement between the particles of cork, thus forming a coherent mass, as represented in Fig. 1, which shows the body of the cork after it has been treated with heat

# WHY SHOULD WE USE CORK IN CONSTRUCTION

## *Why Cork*

Cork is the outer bark of Quercus Suber L. (cork oak tree)

A noble tree that can live up to 200 years, during which time it may be harvested 15 to 18 times

The process of natural cork extraction is called harvesting, a highly specialized process that does not harm the tree

The bark renews itself

## *Favourable impact on cork forests:*

Total area 2.1 million hectares (5.2 million acres) of cork oak forests.

The cork tree produces cork every nine years (a renewable raw material).

Cork forests improve soil's organic matter and help regulate the hydrological cycle

Provides local employment in the forestry sector hence prevent population desertification.

Important in maintaining biodiversity (unique in Europe) - One of the 36 Biodiversity Hotspots.

Cork oak forests are natural CO2 retainers (Up to 14 million tons of CO2/year), the major cause of global warming

## *100% natural industrial process:*

Only cork as a raw material.

No additives ... agglomeration with its own resins (suberin).

93% of energy consumption is biomass (waste of its own industrial process).

The waste from the industrial process is 100% reusable (expanded cork granules + powder).

## *Natural Sustainability*

*Practically unchanging R-value / Lambda (thermal value) on temperature variations*

Compared to other insulation products with declining performance values, Thermacork maintains a steady insulation value over time

## *In general:*

100% Natural Product

Carbon Negative

Very Low Embodied Energy

Promotes Thermal Lag

High level of stability ... coping with major Thermal variations.

Deals with temperatures of between: -180C and +120C (- 292 F and 248 F).

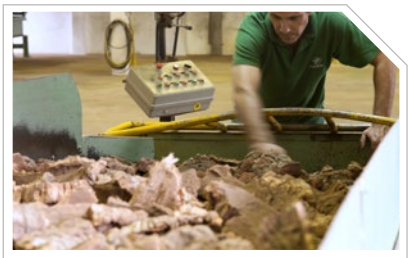
In case of fire, cork does not release toxic gases.

Unlimited durability, maintaining its technical characteristics (official tests demonstrate between 45 and 50 years).

# Amorim Isolamentos

## MANUFACTURING PROCESS. 100% NATURAL

Expanded insulation corkboard is derived from falca cork, a unique type of cork that is periodically harvested from the upper branches of the cork oak tree. Once removed, the falca cork is stored at the factory yard.



It is industrially produced without use of any additives. The process begins by grinding the cork into smaller cork granules.

Once placed into an autoclave and exposed to super-heated steam at 350 ºC (662F) the cork granules expand and release their own suberin, a natural binder within the cork. No binders or chemicals are added, since the cork is agglomerated into blocks using its own resin.

The blocks are then removed and subjected to a stabilization period.

The blocks are sawn-cut into expanded insulation corkboard, packed and shipped.

Any waste produced during the industrial process is 100% reusable. In fact, over 90% of energy consumption is obtained from biomass – as a by-product of the industrial process itself – which makes expanded insulation corkboard a very low-embodied energy material

# QUEST FOR EXCELLENCE AND INNOVATION

*Amorim Isolamentos is recognized by the constant search of excellence and innovation and has the support of and accreditation by the relevant authorities.*

Certificate ISO 9001 – APCER / IQNET

FSC Certificate

Sustainable Habitat Cluster
Gold Seal of Sustainability

*Product quality control according to EN 13170 and consequent CE marking* CE

DAPHABITAT SYSTEM
By Centrohabitat - Associação Plataforma para a Construção Sustentável - Environmental Product Declaration

NATUREPLUS
The International Association for Future-Oriented Building and Accommodation (Germany) - The label identifies the best products for sustainable building.

ACERMI
Association Pour La Certification Des Matériaux Isolants (France) - certifies specific insulation materials, assessing their technical performance;

ICEA
Instituto per la Certificazione Etica e Ambientale (Italy) certification of environmental and ethical aspects of products;

ARGE kdR Positivlisten (Germany)
Certifies energy consumption throughout the life cycle, resource depletion and emissions of materials;

MPA
Materials Testing Institute University of Stuttgart (Germany) - certification of construction materials in terms of their suitability and production process in accordance with existing standard;

LQAI
Laboratory of Indoor Air Quality (Portugal)
Certifies the non-emissions of VOCs, formaldehyde and other compounds for the product;

LBC
International Living Future Institute's Living Building Challenge (USA) - the label certifies Living Building Challenge Red List Free products

PCS
Portuguese Platform for Sustainable Construction (Portugal) – Certificate of Product Sustainability

Ecologic Certification
Japan Environment Association (Japan)
Certifies the environmental impacts of products;

www.amorimisolamentos.com

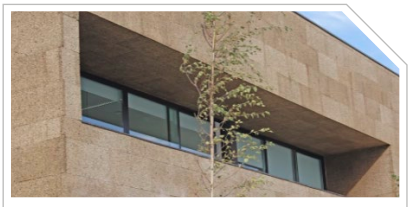
# Amorim Isolamentos

## PRODUCTS

*On the market with brands Amorim (corporate brand), Corkpan (Italy), Aglocork (Spain), Izora (Russia), Corktherm 040 (Austria, Germany and Switzerland), Corkisol (France) and Thermacork (USA).*

EXPANDED INSULATION CORKBOARD

Solution with high performance in thermal, acoustic and anti-vibration insulation, especially suitable for use in external, internal and cavity walls; slabs; flat and pitched roofs and radiant floor.



MDFACADE

Special range of Expanded Insulation Corkboard with high technical performance for exterior wall cladding. Interior walls and ceilings – cork at sight.

LAMBOURDE

Quick application system designed for low thickness insulation solutions and buildings renovations. For mechanical fixing to the floor or wall, ensuring excellent thermal and acoustic insulation and subsequent a wood finish or plasterboard.

EXPANDED CORK GRANULES

Solution of lightweight filling with acoustic insulation properties for use in screeds, flooring and interior cavity walls

CORKOCO

Solution that uses two natural products with unique characteristics, cork and coconut, ensuring high performance acoustic insulation. It is especially suited for application in ceilings, walls and floors.

COCO

Natural solution of the family of the hard fibers with unmatched stiffness and hardness. It is a versatile product given its strength durability and resilience that ensures high performance in sound insulation.

AMORIM
ISOLAMENTOS

# TECHNICAL CHARACTERISTICS

| ICB STANDARD | Unit | Value |
|---|---|---|
| Density | kg/m³ | 110-120 |
| Sizes | mm | 1000x500, 1200x600 or 915x610 |
| Thicknesses | mm | 10-300/40-300/12,5-300 |
| **Essential features (EN 13170)** | **Performance** | **Result** |
| Reaction to fire | Fire reaction | Euroclass E |
| Thermal resistance | Thermal Conductivity | 0,040 W/m.K |
| Water Permeability | Water Absorption | WS |
| Permeability to water vapor | Water vapor transmission | MU20 |
| Compressive strength | Compressive strength at 10% deformation | CS(10)100 |
| Durability of the reaction to fire with heat, weather agents, aging / degradation | Durability characteristics | satisfy |
| Durability of thermal resistance to heat, weather agents, aging / degradation | Thermal resistance and thermal conductivity | satisfy |
| | Durability Characteristics | satisfy |
| Tensile strength / bending | Tensile strength Perpendicular to surface | TR50 |
| Compressive strength durability with aging / degradation | Fluency by compression | CC(0,8/0,4/10)5 |
| Specific Heat | J/kg.ºC | 1560 |
| Global warming potential (GWP) | kg CO2 equiv./1m³ of ICB | -1,98E+02 |
| Total use of renewable primary energy resources (TRR) | MJ, P.C.I./1m³ of ICB | 6,79E+03 |

| ICB MDFACADE | Unit | Value |
|---|---|---|
| Density | kg/m³ | 140-160 |
| Sizes | mm | 1000x500 |
| Thicknesses | mm | 10-220 |
| **Essential features** | **Performance** | **Result** |
| Reaction to fire | Fire reaction | Euroclass E |
| Thermal resistance | Thermal Conductivity | 0,043 W/m.K |
| Compressive strength | Compressive strength at 10% deformation | 220 kPa |
| Water Permeability | Water Absorption | 0,17 kg/m² |

| ICB HIGH DENSITY | Unit | Value |
|---|---|---|
| Density | kg/m³ | 140-160/170-190 |
| Sizes | mm | 1000x500 or 915x610 |
| Thicknesses | mm | 10-220 |
| **Essential features** | **Performance** | **Result** |
| Reaction to fire | Fire reaction | Euroclass E |
| Thermal resistance | Thermal Conductivity | 0,042 W/m.K/0,044 W/m.K |
| Compressive strength | Compressive strength at 10% deformation | 223 Kpa/332 kPa |
| Compressive strength | Compression modulus of elasticity | 3506 Kpa/6747 kPa |

| EXPANDED CORK GRANULES | Unit | Value |
|---|---|---|
| Density | kg/m³ | 60-70 |
| Sizes | mm | 0-3/3-5/3-10/3-15 |
| **Essential features** | **Performance** | **Result** |
| Reaction to fire | Fire reaction | Euroclass E |
| Thermal resistance | Thermal Conductivity | 0,040 W/m.K |
| Acoustic Insulation | Airborne Sound Insulation | Rw (C;Ctr) = 51 (-2;-6) dB |

| LAMBOURDE | Unit | Value |
|---|---|---|
| Density | kg/m³ | 110-120 |
| Sizes | mm | 1000x500 |
| Thicknesses | mm | 40-100 |
| **Essential features (EN 13170)** | **Performance** | **Result** |
| Reaction to fire | Fire reaction | Euroclass E |
| Thermal resistance | Thermal Conductivity | 0,040 W/m.K |

| CORKOCO | Unit | Value |
|---|---|---|
| Density | kg/m³ | 100-140 |
| Sizes | mm | 1000x500 |
| Thicknesses | mm | 40 |
| Lines | | |
| Cork10/Coco20/Cork10 (2A+1C) | mm | 10+20+10 |
| Coco10/Cork20/Coco10 (2C+1A) | mm | 10+20+10 |
| Cork20/Coco20 (1+1) | mm | 20+20 |
| **Essential features** | **Performance** | **Result** |
| Thermal resistance | Thermal Conductivity | 0,043 - 0,045 W/m.K |
| Acoustic Insulation | Airborne Sound Insulation (false ceiling) | Rw (C;Ctr) = 58 (-2;-9) dB |
| Acoustic Insulation | Airborne Sound Insulation (interior partition) | 55 dB |

| COCO | Unit | Value |
|---|---|---|
| Density | kg/m³ | 100-140 |
| Lines | | |
| Coco stripes | mm | 1250x60/80/100/120x [10-13] |
| Coco boards | mm | 1250x625x[variable thickness] |
| Coco reels | mm | 10.000x1000x[variable thickness] |
| **Essential features** | **Performance** | **Result** |
| Thermal resistance | Thermal Conductivity | 0,043 - 0,045 W/m.K |
| Acoustic Insulation | Impact noise | ΔLW=32 dB |

# APPLICATIONS
## ROOFS

**100%**
**NATURAL CHOICE**

EXPANDED INSULATION CORKBOARD IS A SUSTAINABLE MATERIAL FOR A SUSTAINABLE INSULATION

THERMAL INSULATION
ACOUSTIC INSULATION
ANTI-VIBRATION INSULATION

PITCHED ROOF WITH CORRUGATED ROOFING SYSTEM

PITCHED ROOF WITH ROOF MEMBRANE

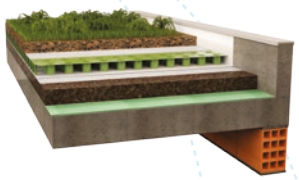
PITCHED ROOF WITH RIGID INSULATION OVER SLAB

PITCHED ROOF WITH LOOSE FILL INSULATION BETWEEN JOISTS

PITCHED ROOF WITH INTERNAL INSULATION BETWEEN RAFTERS

PITCHED ROOF WITH ABOVE RAFTER INSULATION

FLAT TAPERED ROOF



GREEN ROOF

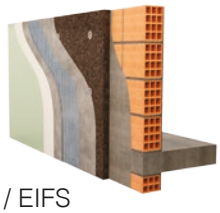
TRADITIONAL FLAT ROOF

# APPLICATIONS
## EXTERNAL WALLS

**100%**
**NATURAL CHOICE**

EXPANDED INSULATION CORKBOARD IS A SUSTAINABLE MATERIAL FOR A SUSTAINABLE INSULATION

THERMAL INSULATION
ACOUSTIC INSULATION
ANTI-VIBRATION INSULATION

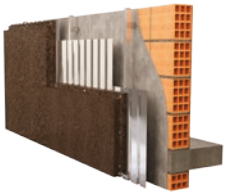


ETICS / EIFS

DOUBLE WALL WITH INSULATION PARTIALLY FILLING THE CAVITY

VENTILATED FAÇADE

EXTERIOR CLADDING
- CORK AT SIGHT

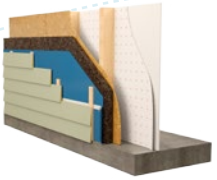


EXTERIOR CLADDING
WITH SHIPLAP SYSTEM
- CORK AT SIGHT

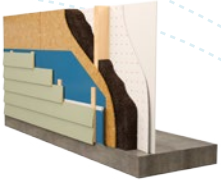
EXTERIOR CLADDING
- CORK AT SIGHT
WAVE FACADE S1

EXTERIOR CLADDING
OVER INSULATION
- CORK AT SIGHT

EXTERIOR CLADDING OVER
WOODEN SUBSTRATE
– CORK AT SIGHT



STANDARD LAP SIDING
WITH EXTERIOR RIGID
INSULATION

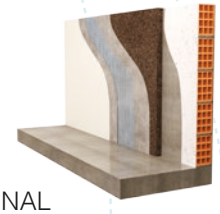


STANDARD LAP SIDING
WITH CAVITY INSULATION

## INTERNAL SOLUTIONS FOR EXTERNAL WALLS

SUPPORT FOR
GYPSUM BOARD

SUPPORT FOR
WOODEN WAINSCOT



INTERNAL
INSULATION
FOR EXTERNAL WALLS

# APPLICATIONS
# INTERNAL PARTITIONS

**100%**
**NATURAL CHOICE**

EXPANDED INSULATION CORKBOARD IS A SUSTAINABLE MATERIAL FOR A SUSTAINABLE INSULATION

THERMAL INSULATION
ACOUSTIC INSULATION
ANTI-VIBRATION INSULATION

INTERNAL PARTITIONS WITH INSULATION LINED ON BOTH SIDES

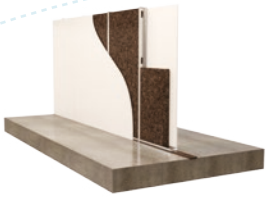
DOUBLE WALL WITH INSULATION FULLY FILLING THE CAVITY

METAL STUD OVER MASONRY WALL WITH INSULATION

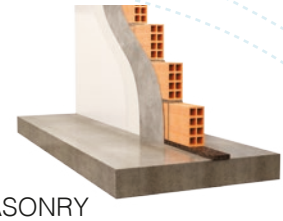
METAL STUD OVER MASONRY WALL WITH CORKOCO INSULATION

METAL STUD PARTITION WALL WITH INSULATION

FILLING THE INTERNAL DOUBLE WALLS WITH EXPANDED CORK GRANULES



METAL-STUD WALL AND SLAB DISCONTINUITY



MASONRY WALL AND SLAB DISCONTINUITY

# APPLICATIONS
## DECORATIVE SOLUTIONS

**100%**
**NATURAL CHOICE**

EXPANDED INSULATION CORKBOARD IS A SUSTAINABLE MATERIAL FOR A SUSTAINABLE INSULATION

THERMAL INSULATION
ACOUSTIC INSULATION
ANTI-VIBRATION INSULATION

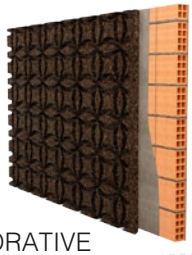
DECORATIVE BOARD
CORK AT SIGHT

DECORATIVE
CORK AT SIGHT TAPER

DECORATIVE
CORK AT SIGHT WAVE S1

DECORATIVE
CORK AT SIGHT WAVE L1

DECORATIVE
CORK AT SIGHT WAVE L2



DECORATIVE
CORK AT SIGHT CIRCLE

DECORATIVE
CORK AT SIGHT BARCODE

DECORATIVE CORK
AT SIGHT POINT CLOUD

DECORATIVE CEILING

# APPLICATIONS
## SLAB AND FLOORS

**100%**
**NATURAL CHOICE**

EXPANDED INSULATION CORKBOARD IS A SUSTAINABLE MATERIAL FOR A SUSTAINABLE INSULATION

THERMAL INSULATION
ACOUSTIC INSULATION
ANTI-VIBRATION INSULATION

FLOATING SLAB
WITH WOOD FLOORING

FLOATING SLAB
WITH MOSAIC FLOORING

FLOATING SLAB
WITH COCO FIBER

SUPPORT FOR
NAILED FLOORING

FLOORING
JOISTS CAVITY FILLING

BETWEEN JOISTS
LOOSE FILL

LIGHTWEIGHT CONCRETE
- SCREED FILLING

UNLINKING SCREED
FILLER TO THE WALL

TRADITIONAL
UNDERFLOOR HEATING

ELECTRIC
UNDERFLOOR HEATING

RESILIENCE ON NAILED
HARDWOOD FLOOR OVER
COCONUT FIBER

RUSTIC
DECORATIVE FLOOR

# APPLICATIONS
## CEILINGS + OTHER APPLICATIONS

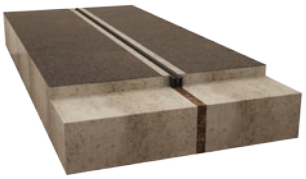
**100%**
**NATURAL CHOICE**

EXPANDED INSULATION CORKBOARD IS A SUSTAINABLE MATERIAL FOR A SUSTAINABLE INSULATION

THERMAL INSULATION
ACOUSTIC INSULATION
ANTI-VIBRATION INSULATION

FORMWORK INSULATION

ACOUSTIC FALSE CEILING



EXPANSION JOINTS

PIPE SECTION

HEAVY MACHINERY VIBRATION CONTROL

HVAC VIBRATION CONTROL

DOOR CORE INSULATION

DECOUPLING LAYER FOR WINDOW FRAMES AND CORE

AMORIM
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