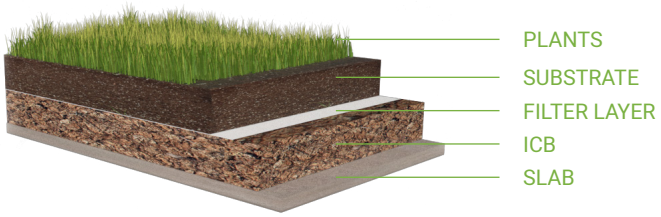
GREEN URBAN LIVING

— CORK GREEN ROOF SYSTEM —

POCI-01-0247-FEDER-003393

NEW GREEN ROOF SYSTEM

EXPANDED CORK AGGLOMERATE, COMMERCIALLY KNOWN AS INSULATION CORK BOARD — ICB

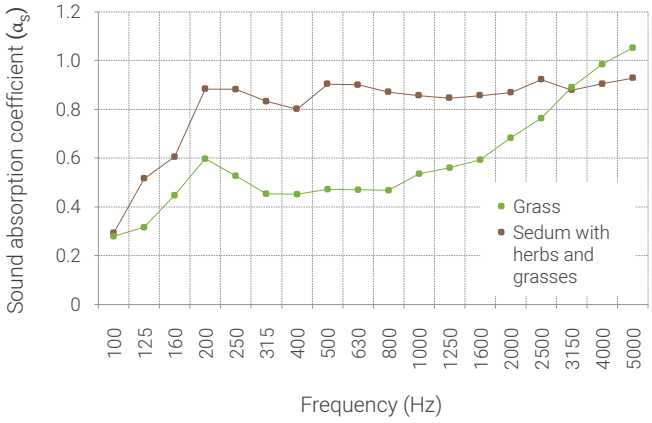


The slab must be properly waterproofed and protected with a root barrier.

Possibility of using medium density expanded cork agglomerate (MDCobertura).

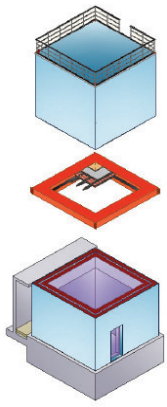
SOUND ABSORPTION

Determined in a reverberation chamber — EN ISO 354



AIRBORNE SOUND INSULATION

Determined in vertical acoustic chambers — ISO 10140



R_W = 59 (-2; -8; -1; -8) dB

Solution composed of reference slab, root barrier, 100 mm ICB of medium density 100 mm of substrate and grass or mixture of sedum with herbs and grasses.

THERMAL RESISTANCE

Substrate thickness (in mm)

Expanded cork agglomerate thickness (in mm)	80	100	120	140
50	1.11	1.19	1.27	1.35
60	1.26	1.34	1.43	1.51
70	1.42	1.5	1.58	1.66
80	1.57	1.65	1.74	1.82
100	1.88	1.96	2.05	2.13
120	2.19	2.27	2.36	2.44
140	2.5	2.58	2.67	2.75

ICB | saturated state	161.45 kg/m³
ICB | 40 mm thickness saturated state	6.46 kg/m²

Thermal resistance [m².ºC/W] of the cover solution, not considering the slab and the surface resistances. Calculation value for saturated materials.

For different water contents, u, the thermal conductivities, λ [W/(mºC)], shall be determined using the following expressions:

Selected substrate: λ(u)= 0.0917u + 0.0594

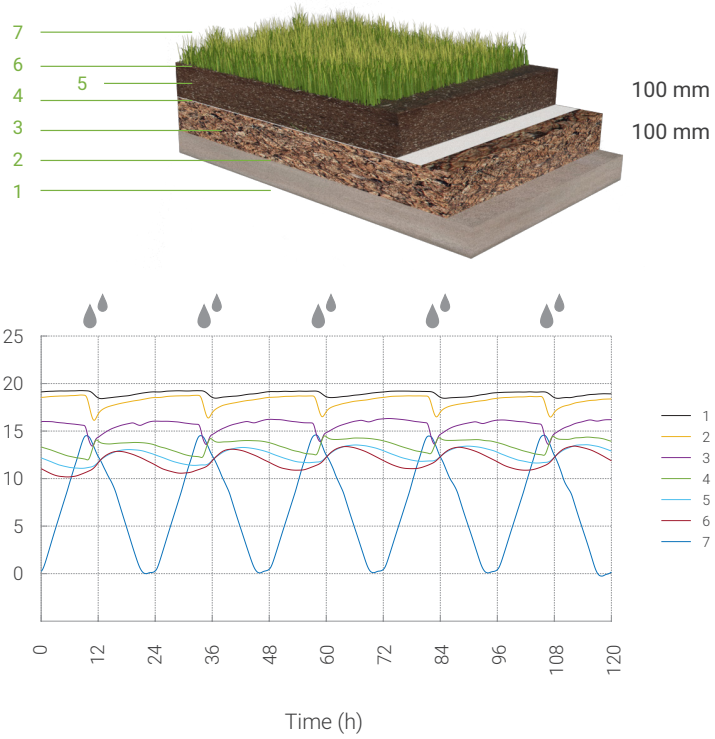
Medium density ICB: λ(u)= 0.0429u+ 0.0417

Substrate and ICB water contents in saturated conditions: u_{subs}=1.987 kg/kg e u_{ICB}=0.533 kg/kg.

HYGROTHERMAL BEHAVIOR IN BIOCLIMATIC CHAMBER

Simulations in a bioclimatic chamber show that after a period of precipitation the system recovers quickly, exhibiting a behaviour that is similar to that registered under normal conditions (without precipitation).

POSITION OF THE TEMPERATURE SENSORS



WATER DRAINAGE AND RETENTION CAPACITY

Solution composed of 100 mm of medium density ICB, 100 mm of substrate, and a mixture of sedum with herbs and grasses.

Maximum vertical drainage capacity of over 20 litres/(min.m^2) ou 20 mm/min.

Retention capacity of over 17 litres /m^2.

CARBON SEQUESTRATION

1 m^2 of ICB, 115 kg/m^3 with 40 mm thickness

[1]Global Warming: Capture of 7.92 kg CO_2 eq

Includes the CO_2 sequestered during the growing of the cork oak (A1) and the CO_2 produced in the product stage (A1-A3: from raw material extraction to processing and manufacturing).

[1]According to the Amorim Environmental Product Declaration (DAP), available on the European platform EcoPlatform.

INSULATION PROPERTIES

Medium density expanded cork agglomerate — ICB

Test	Relevant standards	Property
Bending behaviour, σ_b [kPa]	EN 12089	227.4
Dimensional stability under defined temperature and humidity conditions, Δ_{el}; Δ_{eb}; Δ_{ed} [%]	EN 1604	Δ_{el}: 0.3; Δ_{eb}: 0.3; Δ_{ed}: 0.4
Tensile strength perpendicular to the faces, dry, σ_{mt} [kPa]	EN 1607	67.8
Tensile strength perpendicular to faces, wet, σ_{mt} [kPa]	ETAG 004	64.2
Compressive behaviour at 10% deformation, σ_{10} [kPa]	EN 826	185
Shear behaviour, τ [kPa]	EN 12090	110
Behaviour under loading, F_p [kN]	EN 12430	0.93
Specific heat, c_p [J/kg.K]	—	1530
Water vapor diffusion resistance factor, μ [-]	EN 12086	54.6
Short term water absorption by partial immersion: Wp [kg/m^2]	EN 1609	0.18

Tests performed by Itecons.

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