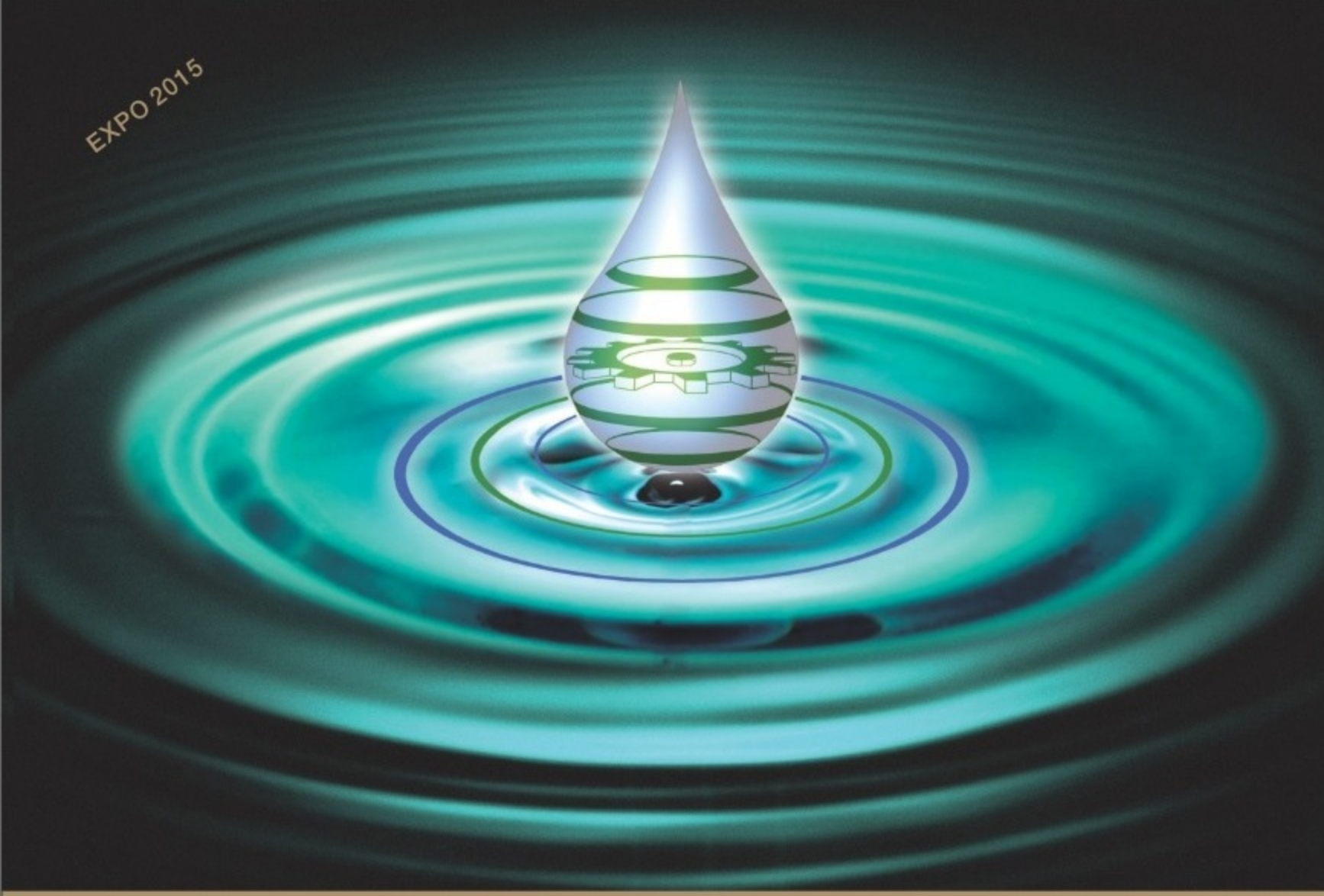


EXPERIENCE | INNOVATION | FLEXIBILITY

SINECO
INTERNATIONAL

3D MONOFILAMENTS GRIDS
FOR CIVIL ENGINEERING AND HI-TECH COMPOSITE MATERIALS

SIN.ECO Group & SINECO International

SIN.ECO is an Italian industrial group active in the environmental and renewable-energy sectors, with its own production units and R & D centers.

SINECO INTERNATIONAL benefits from the 30 years of experience of its founder,who was the first in Italy and third in the world to have designed and built systems based on technology of thermoplastic monofilaments, to produce materials for the civil engineering world, advanced composite materials, and for many other uses.

The production unit has it's headquarters in Northern Italy, located on the highway knot between Milan and Malpensa airport, giving it a logistical strategic advantage.

TECNOLOGY AND PRODUCT

The company designs and produces plastic nets and 3D mat and grids, obtained through the extrusion of polymeric monofilaments, heat-sealed to each other in order to obtain three dimensional thermoformed carpets with different morphologies. Main features: high void ratio, up to 99%; lightness, mechanical performance, large planar permeability and / or retention capacity of the soil or other materials.

COUPLINGS - During the same production process the carpets can be coupled with fabrics, filters, waterproof and / or breathable membranes, grids or reinforcing elements, for an infinite range of applications in many fields of civil engineering, industrial, environmental and agricultural use.

VISION E MISSION

VISION AND MISSION

SINECO INTERNATIONAL is presented to the B2B market as a technologically advanced partner, competent in the field of application of the products, ideal for developing innovative products, new applications, and improving the competitiveness of its product mix.

Sustainability of production and product applications, the improvement of the performance / cost ratio, with business models replicable in international markets, represent our long-term goals.

RESEARCH AND DEVELOPMENT

This is our main activity.
Our R & D departement is continuosly engaged in the search for improvements on current products, new uses for the production technology of nets, grids and composites originated by extrusion and thermoforming of extruded polymer monofilaments, in many markets and application sectors.

QUALITY

The Company is certified ISO 9001 and the products are guaranteed by the CE Mark.

PRODUCTION FLEXIBILITY

A significant competitive advantage is the result of advanced technology and a streamlined structure, which allow real-time production and realization - from the preliminary study to industrial production - of special products, tailor made to "draft measure", even for small quantities.

RENEWABLE ENERGY

The energy used for production is self-produced from renewable sources.

• APPLICATIONS IN CIVIL ENGINEERING

DRAINAGE AND STABILIZATION OF SOIL

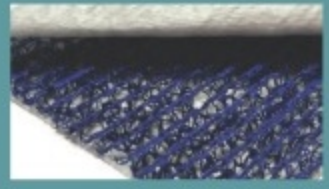
The proper water regulation is the first factor of stability of sloping land affected by human settlements.
Even man-made structures, if not protected from rainwater or groundwater rise, get ruined rapidly creating dangerous and unhealthy situations.
SINDRAIN is a high drainage capacity mat, consisting of a three-dimensional structure of polymeric monofilaments, bonded to geotextile filters, which guarantees security, longevity, health, design and manufacturing precision, economy and sustainability to man-made structures, by substituting the indiscriminate use of aggregates (sand, gravel), obtained by digging our mountains and the beds of our rivers.

SINDRAIN is good for the Environment and Human constructions.

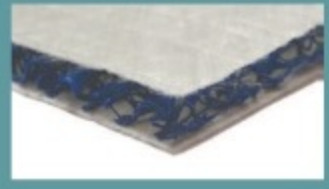
Technical features (some examples of product and data)

	Test Method	Units	SINDRAIN B22-550 FCF100		SINDRAIN C10-700 FCF130	
Mass per unit area	EN ISO 9864	g/sqm	750		960	
Thickness at 2 KPa	EN ISO 9863-1	mm	22		10	
Tensile strength MD/CMD	EN ISO 10319	kN/m	15		20	
Composite drainage capacity						
Load	Test Method	Units	Hydraulic gradient i=1	Hydraulic gradient i=0,1	Hydraulic gradient i=1	Hydraulic gradient i=0,1
20kPa	EN ISO 12958	l/ms	5,48	1,59	3,54	0,83
100kPa	EN ISO 12958	l/ms	0,44	0,08	3,14	0,69
200kPa	EN ISO 12958	l/ms	0,13	0,022	2,77	0,67

SINDRAIN C10-700 FCF130



SINDRAIN B22-550 FCF100

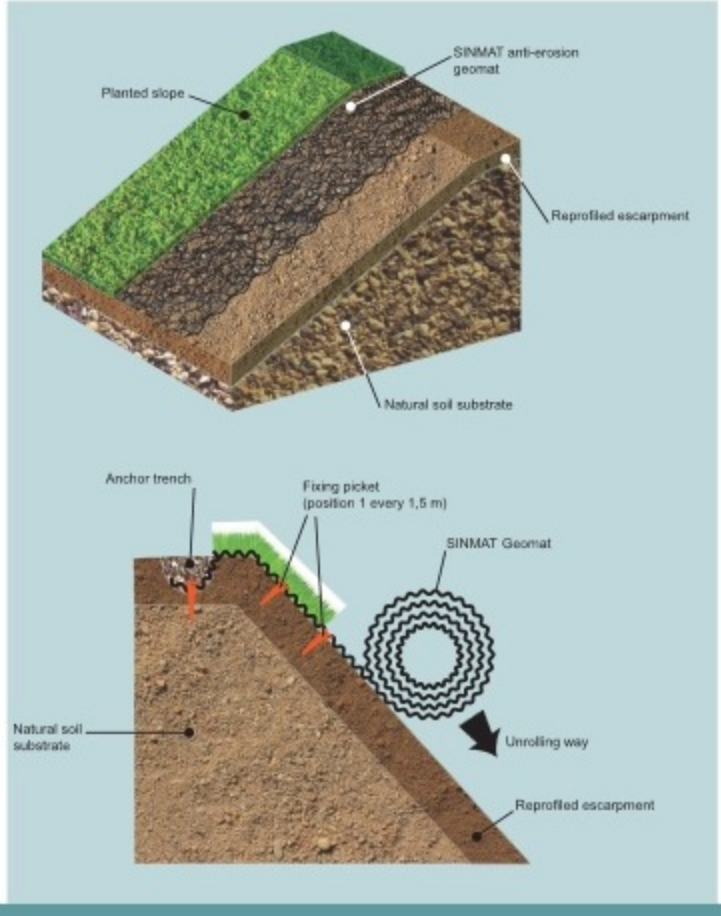


• APPLICATIONS IN CIVIL ENGINEERING

CONTROL OF EROSION OF SURFACE SLOPES OR LAPPED BY WATERWAYS.

The natural revegetation of a sloping ground or lapped by a waterway, ensures its stability, preventing surface erosion due to rains (ex .: embankments and trenchs of roads, railroads, slopes and embankments). The same function applies to soils in contact with water flow (river beds, lake and sea shores, etc.).

SINMAT is a three-dimensional geomat made with mono filaments polymeric that, positioned on the surface of sloping land, and saturated with the ground itself, prevents surface erosion, surface runoff, slipping downstream of the sown or planted essences, both during construction, both for the entire life of the work, thanks to the containment function and soil reinforcement.



TECHNICAL FEATURES

(some examples of products and data)

	Test Method	Units	SINMAT P13-300	SINMAT P18-500 G80/30
Mass per unit area	EN ISO 9864	g/sqm	300	740
Thickness at 2 KPa	EN ISO 9863-1	mm	13	18
Tensile strength MD	EN ISO 10319	kNm	1,4	80

SINMAT P10-450

SINMAT B22-650

BUILDING

The possible applications are indicated in the drawing. The waterproofing of an underground perimeter depends on the material used, the perfection of the installation, the sealing over time under the mechanical action of the thrust of the ground, the chemistry and biochemistry of the aggression of the terrain, and the hydraulic thrust exerted by the hydrostatic pressure in the critical junction points of the sheaths.

SINDRAIN performs 4 actions:

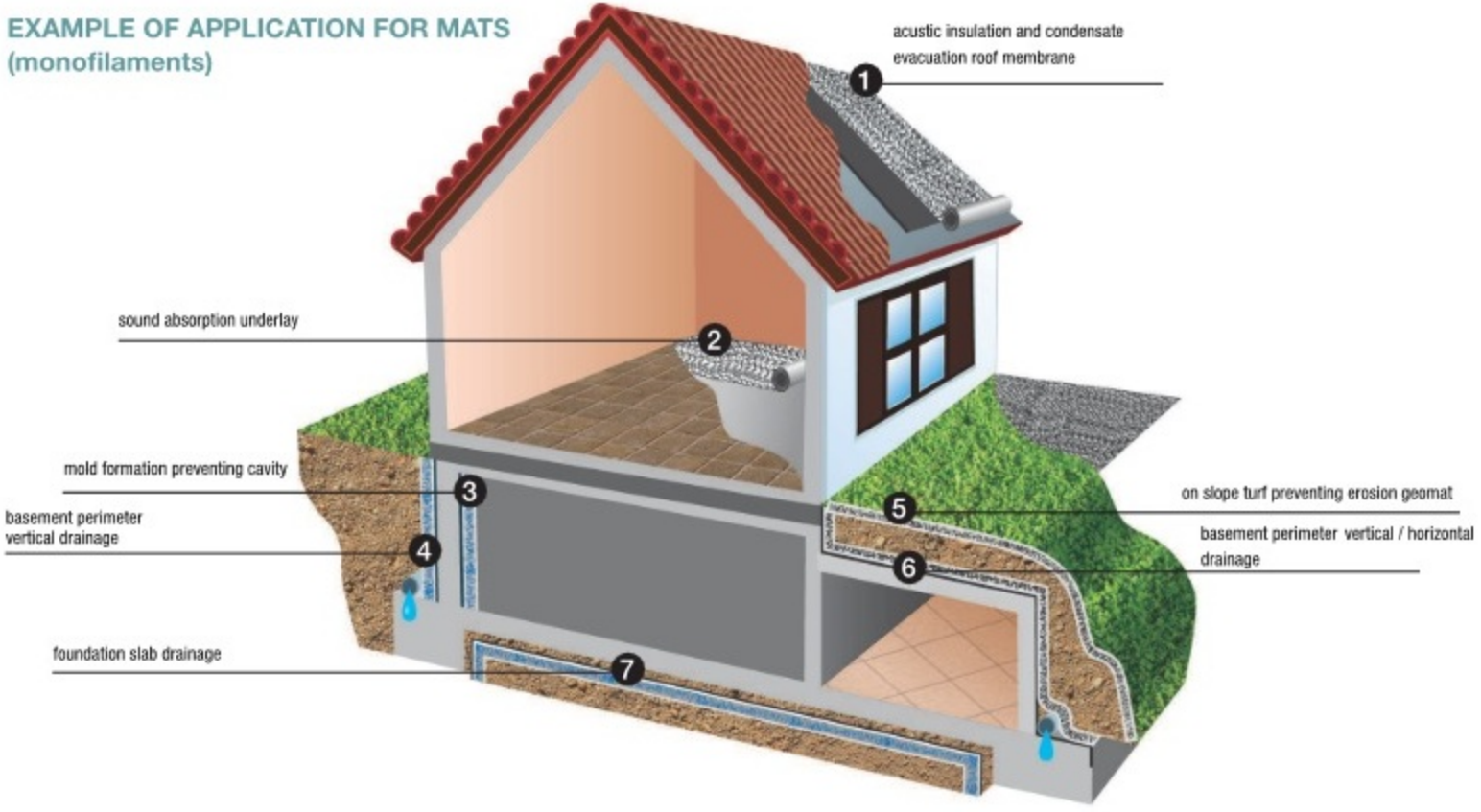
- **mechanically protects** the sheath during the step of backfilling and throughout the life of the work
- **filters** the water from the ground to avoid the clogging of the drainage section
- **drains** and conveys water from the ground, eliminating the hydrostatic pressure
- **constitutes** an air knife in top surface of the structure, contributing to the thermal insulation.

SINDRAIN prevents water infiltration and formation of molds and moisture in basements

SINFLOOR is used for sound insulation between floors by beating noise (anti-trampling).

SINROOF, positioned under the tiles, guarantees waterproofing, evacuation of indoor humidity and sound insulation from beating rain noise.

EXAMPLE OF APPLICATION FOR MATS (monofilaments)



• INDUSTRY and examples of structures and morphologies

INDUSTRY

SINCORE, thanks to its flexible three-dimensional structure, with large planar transmissivity, it's used as the core and for reinforcement of composite materials, structure allowing a perfect diffusion of the filler resins. (Stamping, infusion, injection, etc.).

3D CHANNELS STRUCTURE

Enables the increased resistance to compression with thickness from 2 to12 mm, together with unidirectional high drainage capacity and scrolling speed of the fluids.

3D PYRAMID STRUCTURE

It makes the structure isotropic with reference to the fluid transmission capacity, and gives good adhesion and retention capacity of the soil particles.

3D BUBBLE STRUCTURE

It improves the compression resistance, enabling a high transport capacity of the fluids in the plane, in all directions.

3D RANDOM STRUCTURE

Suitable for an extremely well apportioned and homogeneous distribution of a material or filling liquid.

2D STRUCTURE
3D FLOW MEDIA

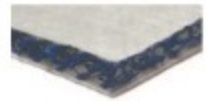
For vacuum infusion processes, the structure is placed between the film for vacuum and the material that has to be filled, where a rapid and homogeneous distribution of the resin or of the filling is required

REINFORCED 3D STRUCTURE

For applications where a high tensile strength and / or an elongation control is required.

3D MADE STRUCTURE

Coupled with filters and / or membranes, mats for draining and protection



TECHNICAL PARAMETERS MODIFIABLE BY SPECIAL PRODUCTIONS

Raw material | Structure thickness | Length, width and diameter of the roll | Morphology | Monofilament diameter | Weight per unit area | Compressive strength | Tensile strength | Drainage capacity vertically or horizontally | Void ratio | Stiffness vs network softness | UV and fire resistant | Chemical compatibility

CIVIL ENGINEERING
- Drainage
- Erosion control
- Reinforcement

BUILDING
- Ventilation
- Drainage
- Insulation

INDUSTRY
- Spacer
- Vehicular flow

NATURE
- Pets
- Gardens
- Filtration

SURFACES & SPORT
- Flooring
- Ventilation
- Water dissipating
- Sports fields

CUSTOM
- Design
- Architecture
- Fashion

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