



Greentank System

Pre-applied waterproofing solution for foundation and tanking

Waterproofing



Sustainability



Performance



Why use Greentank pre-applied waterproofing system?

The importance of a good design starting from the base

The development of urban areas together with the increase in their population density and the costs of building areas has increasingly encouraged the use of the underground spaces of buildings, courtyards and roads for the most varied purposes: car parks, technological rooms, spaces intended for storage or as extension for residential and commercial buildings.

Therefore, the designer is increasingly called upon to tackle the problems related to masonry works in direct contact with the ground, having to make choices which are never simple, aware that repairs are hardly possible and that an important economic damage ensues in the event of an incorrect design.

The incorrect design or a defect of a waterproof system significantly reduces the duration of buildings and infrastructures, compromising their intended use. In fact, water, whether meteoric or groundwater, is a vehicle for all aggressive agents that penetrate inside the materials, reducing their technical and qualitative performance.

Infiltrations into foundations involve expensive structural restoration works, very often of an invasive and sometimes even destructive nature, damage and deterioration of internal finishes, operational downtime and consequences for the indoor environment due to humidity and condensation.

The geo-composite waterproof solution developed by the **General Membrane R&D laboratory** can be used in all types of residential and commercial foundations, but also in prefabricated tunnels where the reinforced concrete structure must be protected from groundwater or rising water, even when under pressure*.

The system is designed for a totally cold and single layer environmentally friendly application: for horizontal surfaces, directly on the lean concrete before creating the slab and for vertical walls with a pre-cast solution (Blind Side Walls) and a post-cast one. Its cold application feature allows it to be used in narrow and closed environments, respecting the health of the operators.

* for further information check section "Scientific tests"



General Easy Seal: active external surfaces protection

Greentank is an innovative pre-applied and self-healing waterproofing system with the innovative properties of **General Easy Seal** technology. This "active" geo-composite waterproofing system is made of a needle-punched PP-non-woven geotextile impregnated with a super absorber and a water-activated swelling polymer (**General Easy Seal** technology) combined with a flexible and resistant bituminous layer. It is easy to handle and to install, it offers a strong adhesion to the concrete, is self-healing and swells upon contact with water

The exceptional properties that distinguish the Greentank system are based on three levels: the first is the natural waterproofing function of the external bituminous component, the second is the controlled water absorption due to the special fibers and the third is the sealing and self-repairing characteristic which is activated only if the external bituminous layer is damaged and the water activates the **General Easy Seal** technology. If the water passes through the bituminous part, the polymer reacts. When in contact with water it swells creating a film, similar to a gel, which permanently seals the damaged part avoiding contact with the concrete.

In addition, the swelling characteristic and the self-repairing function combined with the permanent mechanical adhesion between the geotextile and the freshly poured concrete, prevent the migration of water between the membrane and the concrete structure.



1. Greentank FB in a dry situation



2. Greentank FB reacts with swelling polymer when in contact with water (General Easy Seal technology)

Sustainable commitment

General Membrane renews its sustainable commitment by expanding its Ecofriendly range of products. The company, in line with its mission and vision, has extended the **Ecofriendly** line to the world of foundations, creating the **Greentank system** with a range of sustainable, high recycled content products.

Respect for the environment also passes through sustainable construction which, to be such, must use durable products with high percentages of recycled raw materials in their manufacturing cycle, while maintaining excellent technical performances.

Greentank system is **sustainable** because:

1. comes with **high recycled content**
2. is a **flame-free system**
3. increase **building's durability**



Strengths

Performance 

GREENTANK



Very high adhesion to concrete and pre-applied



Prevents water migration



Anti-root



Easy and fast installation



Self-sealing



High recycled content



Increases the durability and sustainability of the building

THE COMPANY



Drawing up of customized **Technical specifications**



Supply of the **Installation Manual**









Our **Technical Department** on hand throughout all phases of the design, installation and maintenance of waterproof systems

For complete design information and for customized technical specifications — tecnico@generalmembrane.com

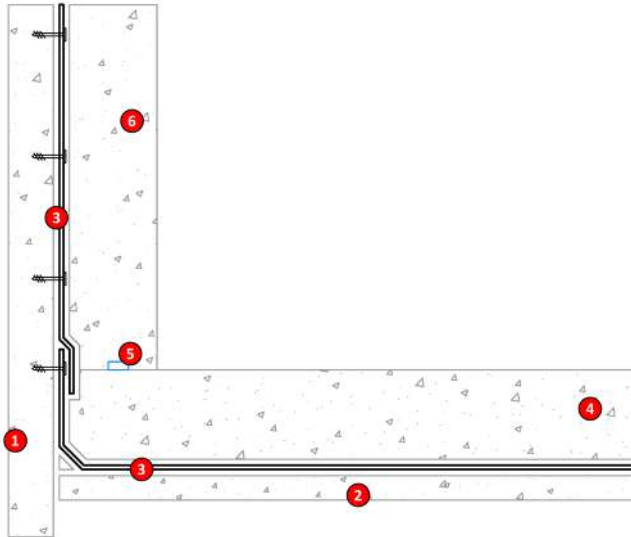


Characteristics of Greentank range of products

	GREENTANK FB	GREENTANK SA	GREENTANK SA HDPE
DESCRIPTION	<p>Greentank FB characterizing element of the system, for use in pre-cast situations. Consisting of a bituminous waterproofing part combined with a geo-fabric which, in addition to offering protection to the system, also guarantees exceptional mechanical bonding to concrete.</p>	<p>Greentank SA is the self-adhesive membrane for vertical walls to be used when in combination with thermal insulation boards against the ground. The external finishing is made of non-woven polypropilene to help the adhesion of the insulation board with specific glue.</p>	<p>Greentank SA HDPE is the self-adhesive membrane for vertical walls with a high-density polyethylene (HDPE) protective film finish that offers mechanical protection during backfill operations.</p>
COMPOUND	<p>Innovative H.R.C. (High Recycled Content) compound with a specific formulation consisting of bitumen modified with high quantities of special polymers coming from the most modern recycling plants. Specially selected by General Membrane's Research and Development laboratory, these polymers guarantee excellent compatibility with bitumen, maintaining the same performance of the standard bituminous waterproofing compounds and lowering environmental impact.</p>		
REINFORCEMENT	Non-woven polyester fabric reinforced with glass fibre in the longitudinal and transversal direction	Non-woven polyester fabric reinforced with glass fibre in the longitudinal direction	Non-woven polyester fabric reinforced with glass fibre in the longitudinal direction
UPPER FINISHING	 <p>Non-woven polypropilene fabric with General Easy Seal technology reactive with water</p>	 <p>Polypropilene textured film</p>	 <p>High Density Polyethylene (HDPE) film</p>
LOWER FINISHING	 <p>Polypropilene textured film</p>	 <p>Silicon release film</p>	 <p>Silicon release film</p>
FIELD OF APPLICATION	Pre-applied under base slabs and on blind side vertical walls	Post applied on retaining walls combined with thermal insulation	Post applied on retaining walls



Guidelines for installation



- ① Existing Wall or Blind Side Wall
- ② Lean Concrete
- ③ Greentank FB
- ④ Base Slab
- ⑤ General Hydrostop
- ⑥ Vertical Wall

Pre-applied system for horizontal and blind side applications

When adjacent properties or other site conditions make it impossible to have open trench around the perimeter of the foundation, confined excavations are carried out whose access is limited to some sides.

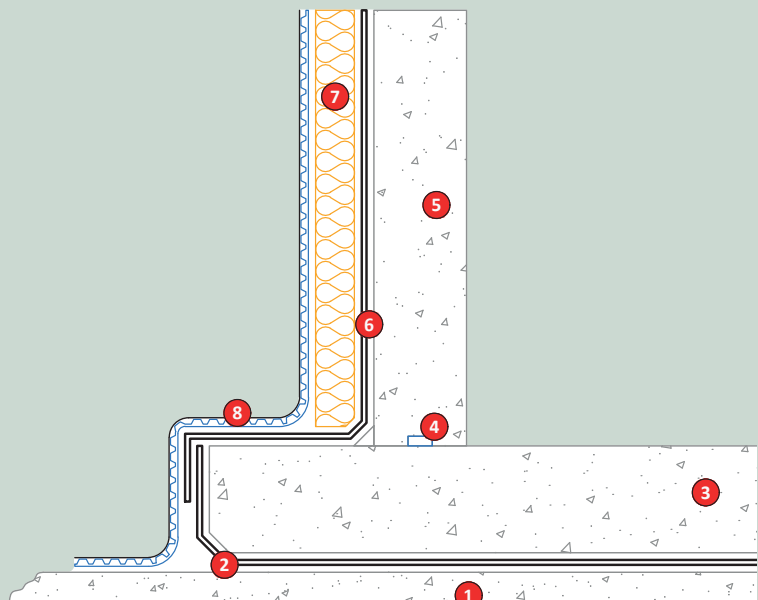
Greentank FB pre-cast membrane is adopted for waterproofing under the slab and blind side walls, fixing the membrane on a retaining wall or on disposable formworks, or even against the existing wall of an adjacent building. The remaining sides, therefore accessible from the outside, can instead be waterproofed as a work subsequent to the construction of the vertical wall*.

Waterproofing of conventional foundations on casted and pre-casted walls

The open trench allow access to the retaining wall directly from the external side of the vertical wall.

In this situation, for practical reasons, the pre-cast **Greentank FB** membrane is used exclusively for waterproofing under the slab, thus leaving the waterproof coating of the vertical as a subsequent work to the construction of the vertical wall.

Depending on the project, it can be adopted a membrane with polypropilene textured film finish suitable for bonding the insulating panels for the external insulation of the foundation walls* **Greentank SA**. Alternatively with high-density polyethylene (HDPE) protective film finish to offer mechanical protection during backfill operations (**Greentank SA HDPE**).



- ① Lean Concrete
- ② **Greentank FB**
- ③ Base Slab
- ④ **General Hydrostop**
- ⑤ Vertical Wall
- ⑥ **Greentank SA** or **Greentank SA HDPE**
- ⑦ Thermal Insulation (bonded to Greentank SA)
- ⑧ **General Protection GEO**

* for further information check the "Installation manual"

Accessories



General Mastic SD

General Corner

General Injectors

General Washer FB

General Primer SA

General Protection GEO

General Hydrostop SW

General Hydrostop Bentonite

* for further information check the "Installation manual"



Scientific tests

General Membrane R&D department has carried out several tests to evaluate the performance of the Greentank system, highlighting following characteristics:

1. High adhesion to concrete

The pre-applied **Greentank FB** membrane, hooks itself to the building structure during the hardening phase of the concrete, with an adhesion strength greater than **0,15 N/mm²**, ensuring a full bonded system directly to the building structure (Fig. 1).

2. Radon gas barrier

Greentank FB has been designed to be a radon gas barrier that may be present in the ground. Tests were carried out to determine the transmittance of the Radon gas through the material highlighting the low permeability to the gas. The value achieved of **7,5 x 10⁻¹² m/s** guarantees adequate protection of the entire building and consequently to its habitants (Fig. 2).

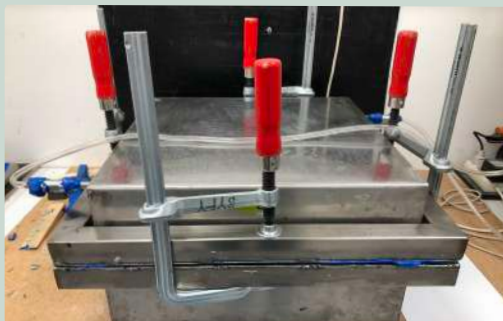


Fig. 2 Radon test - SP method 3873



Fig. 1 High adhesion to concrete test - DIN EN 1348

3. Watertightness

The watertightness test showed the resistance of the **Greentank FB** to hydraulic pressure, passing the tests at a pressure of **600 kPa**. This value was also confirmed by carrying out the test in the overlapping area, thus ensuring waterproofing even in foundations particularly subject to rising water (Fig. 3).



Fig. 3 Watertightness test - UNI EN 1928

Greentank system technical data



CHARACTERISTIC	TEST METHOD	UNITS	GREENTANK	GREENTANK	GREENTANK	TOLLERANCES
			FB	SA	SA HDPE	
			NOMINAL VALUES			
Visible defects	EN 1850-1	Visible	No defects	No defects	No defects	-
Leght	EN 1848-1	m	15,00	10,00	10,00	minimum value
Width	EN 1848-1	m	1,10	1,00	1,00	minimum value
Straightness	EN 1848-1	mm	20mm x 10 m	20 mm x 10 m	20 mm x 10 m	minimum value
Thickness	EN 1849-1	mm	3	3	3	± 5%
Mass per u.a.	EN 1849-1	Kg/sqm	2,2	3,0	3,0	± 10%
Tear Resistance (Longitudinal/Transversal)	EN 12310-1	N	500 / 400	200 / 200	200 / 200	± 20%
Waterthightness (A)	EN 1928	kPa	>600	>60	>60	minimum value
External Fire Performance	EN 13501-5	Class	F roof	F roof	F roof	-
Reaction to fire	EN 13501-1	Class	E	E	E	-
Dimensional Stability (Longitudinal/Transversal)	EN 1107-1 (met. A)	%	± 0,3	± 0,3	± 0,3	-
Tensil Strenght (Longitudinal/Transversal)	EN 12311-1	N/50mm	600 / 600	600 / 500	600 / 500	minimum value
Elongation at break (Longitudinal/Transversal)	EN 12311-1	%	50 / 80	35 / 35	35 / 35	± 20%
Resistance to impact (Method A)	EN 12691	mm	1250	700	1250	± 15 absolute
Resistance to static loading (Method A and B)	EN 12730	Kg	25	15	25	minimum value
Flexibility at low temperatures	EN 1109	°C	-20	-25	-25	minimum value
Flow resistance at elevated temperatures	EN 1110	°C	130	100	100	minimum value
Determination of water tightness after artificial aging through long-term exposure to elevated temperatures	EN 1296 / EN 1928	kPa	≥600	≥60	≥60	minimum value
Determination of watertightness after exposure to chemical agents	EN 1847 / EN 1928	kPa	≥600	≥60	≥60	minimum value
Self-adhesive properties	ASTM D 1000	N/10mm	-	20	20	-5
Strength of adhesion to concrete	DIN EN 1348	N/mm ²	≥0,150	-	-	-
Permeability to Radon gas (K)	SP Method nr. 3873	m/s	7,5 x 10 ⁻¹²	-	-	-
Resistance to root penetration	EN 13948	Visibile	pass the test	-	pass the test	-
Minimum value of recycled content	EN ISO 14021	%	13	12	12	minimum value



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