

# Mac Drain® N

## Research & Development

To evaluate the performance of Mac Drain® N under various hydraulic conditions and pressures, a series of tests are normally carried out to simulate different working conditions.

Detailed information is included on the Mac Drain® N data sheets. Tailored products are available upon request; different types of filter geotextiles and cores can be combined to meet specific requirements.

## Guidelines to specifying Maccaferri Drainage Composites

### HYDRAULIC PROPERTIES

- In plane flow (to meet application requirement)
- Filter flow rate (consider soil permeability and grading)

### FILTER PROPERTIES

- Nonwoven heatbonded
- O90 appropriate for soil conditions
- Strength with high tensile modulus to resist deformation of the filter into the core

### CORE AND FILTER POLYMER

- Resistance to chemical and bacterial attack
- Resistance to creep
- UV resistance

### CORE CRUSHING CAPACITY

- Resistance to long term earth pressures
- Depth of installation
- Live loading from vehicles, etc

### BOND BETWEEN FILTER AND CORE

- In-plane shear (when used on inclined slopes)

### CBR PUNCTURE RESISTANCE

- Construction installation (exposed to damage)
- Protection of geomembranes in waste management and hydraulic applications

### TENSILE STRENGTH

- Exposure to damage during installation
- Protection of geomembranes
- Predicted settlements (deformation in waste tip applications)

### LAPPING

- Minimum lap (as per supplier's instructions)
- Method (as per supplier's instructions)

### ROLL SIZE

- Minimum width (to avoid excessive jointing) - rolls available 2 or 4 m wide
- Minimum length (to avoid excessive jointing)

### ROLL WEIGHT

- Handling safety (one or two persons per roll depending on roll size)

Detailed technical information on the performance of the Mac Drain® N are included in the Technical Data Sheet. For more information on the use, applications and performance of any other Maccaferri solution, please contact us.

## Mac Drain® N range for drainage applications

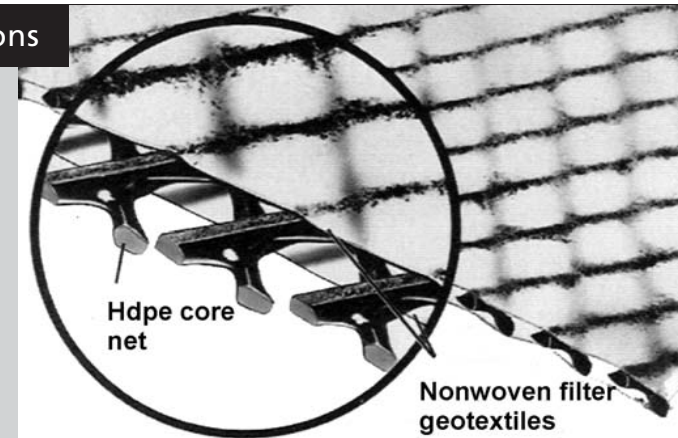
Drainage geo composites are prefabricated sub-surface drainage products which directly replace conventional drainage aggregates.

These materials consist of:

- A water transport medium; a three dimensional HDPE core with high compressive resistance and available in different thicknesses and weights
- A filtration material; one or two, non-woven, continuous filament, UV stabilized, heatbonded, polypropylene or polyethylene, filter geotextile layers
- A low density polyethylene membrane in place of one of the filter geotextile layers (when the product needs to be impermeable)

The use of a drainage geocomposite to replace a natural gravel layer offers many benefits;

- Provides and maintains high flow paths for water and gases, maintaining soil stability
- The geocomposite can be selected on request to suit specific soil conditions and requirements
- Robustness prevents puncturing and tearing during installation
- Separates and protects structures from fill material
- Being light and easy to handle, geocomposites are



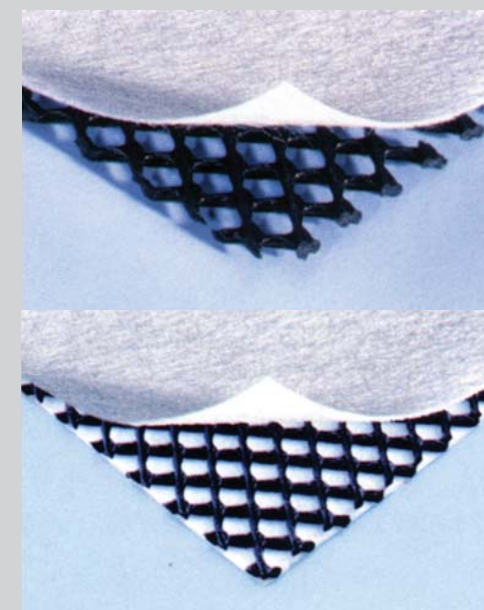
rapid to install and require less manpower and equipment than traditional gravel drain installations

- Consistency of performance is guaranteed as the geocomposites are manufactured within stringent quality controlled conditions

To be effective, drainage geocomposites need to meet the following criteria:

- They must be robust;
- They must survive the design life of structure;
- The geotextile must filter the soil and allow passage of water into the core;
- The geotextile must not deform excessively and restrict flow;
- They must have a high chemical and bacteria resistance

## PRODUCTS RANGE



A black polymer extruded net covered on one side (type 1) or on both sides (type 2) with 100% polyolefin nonwoven geotextile (either heatbonded or needlenpunched) filter by full thermal bonding. Type 1 is suitable for vertical structure applications where waterproofing is not a requirement; Type 2 is also suitable for inclined structures base drainage and protecting geomembranes and structure waterproofing.



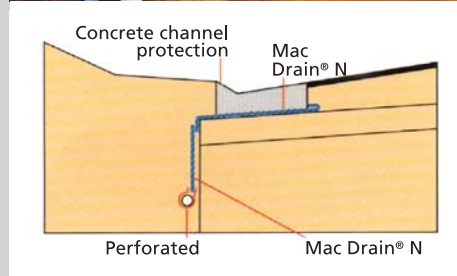
A black polymer extruded net core with 100% polyolefin nonwoven geotextile (either heatbonded or needlenpunched) filter on one side and an LDPE film on the other, both fully thermally bonded. Suitable for vertical or inclined structures and ground drains. The geocomposite has an impermeable surface making it ideal for cut-off drains and methane gas control in waste management applications.

BVQI Certified Quality System Company with SINCERT's and UKAS' s accreditation.



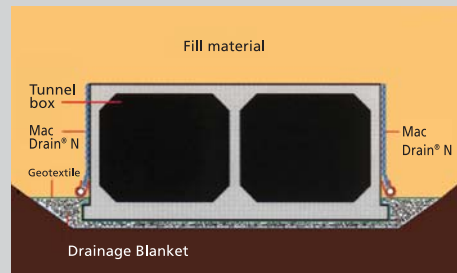
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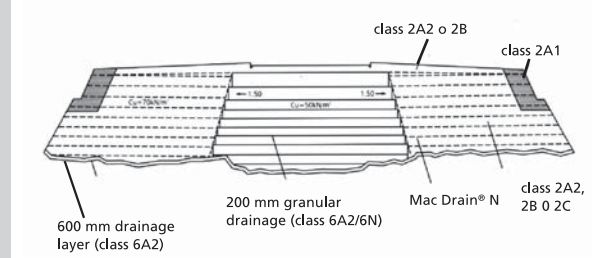


**ROADS AND RAILWAYS CONSTRUCTION**

Vertical edge drains running parallel to the roadway are necessary to intercept the lateral flow of ground water.

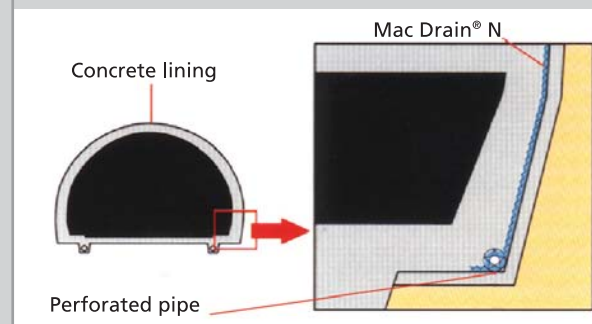


This is necessary in order to maintain the desired moisture content within the base and sub-base layers. The use of a composite fin drain system in this application offers a rapid installation and reduces the amount of excavation and backfill. Factory manufactured under quality controlled conditions, the products provide peace of mind, in service, under all construction conditions. A drainage mat is sometimes required as an anti-capillary layer, offering full drainage capacity at the base or within an embankment. The performance characteristics of Mac Drain® N (e.g. Compressive strength or transmissivity under high pressure) can be tailored to suit specific applications by selecting an appropriate core and fabrics. The drainage geocomposite, at the base of an embankment, will also provide effective separation from the sub-base layer and increase the bearing capacity



**Tunnel and buried structures and basements**

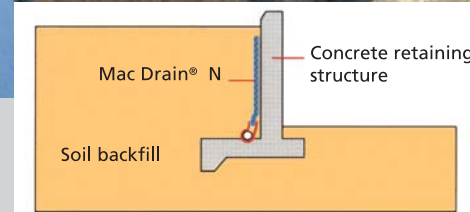
Efficient and robust drainage systems capable of high in-plane flow rates are necessary to overcome the water seepage problems encountered in tunnels and in areas of construction such as basements, culverts, car parks, reservoirs and many other subsurface applications. The drainage geocomposite intercepts ground water seepage flows, which are then transported away via a drainage pipe.



**Retaining walls, bridge abutments & steep slopes**

To maintain the stability of a retaining structure (wall or steep reinforced earth slope), it is important to provide an efficient drainage system behind it. Maccaferri drainage geocomposites reduce pore water pressure dramatically reducing the threat of saturated ground conditions.

Simple and rapid to install, Mac Drain® N provide superior performance at less cost than conventional drainage systems.



**Waste management**

Besides the standard drainage requirements in this application, the system must be capable of draining aggressive liquids and venting volatile gases. The polymers must also be resistant to chemical and bacteria attack. Drainage composites applied to a slope and loaded from above with fill material (as in a typical capping applications) are subject to in-plane shear forces.

Therefore the method of bonding the core to the geotextile is an important consideration. Maccaferri drainage geocomposites are available in 4m wide rolls, ideal for this application by reducing overlaps and jointing.

