

DRAINTUBE®

Multi-linear Drainage Geocomposite

Provides benefits of drainage, cushioning and separation in one layer



Product Information

DRAINTUBE® is a proven, multi-linear, horizontal drainage solution that provides all the benefits of a drain as well as providing a cushion geotextile within the one install.

DRAINTUBE® is a multi-linear drainage Geocomposite as defined by ASTM (D4439-17). Widely specified and installed in Europe and North America, DRAINTUBE® is designed for high performance drainage applications in the civil construction, landfill and mining sectors.

DRAINTUBE® design and specification is supported via technical experience and software, namely the Lymphéa design software. The Lymphéa® software was developed in association with the University of Grenoble and le Laboratoire des Ponts et Chaussées (France) to calculate the requirements for DRAINTUBE® CONDUCTIVE in civil applications.

Applications

- Building and sports fields - synthetic and natural turf sport fields
- Civil- drainage of roads/highways foundations
- Mining and tailings management
- Environmental
- Landfill gas management

DRAINTUBE®

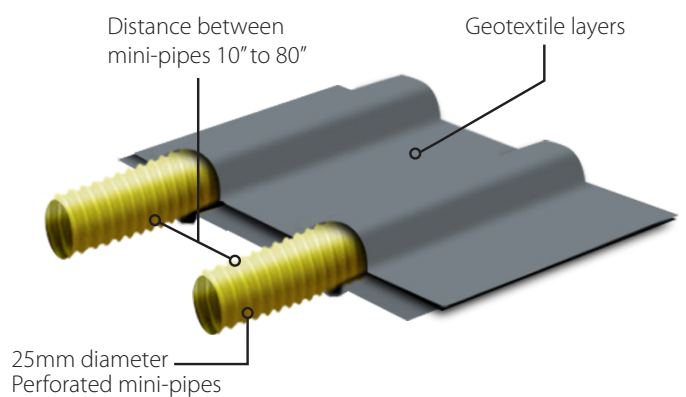
Benefits

- Lower costs
- Faster construction
- Less excavation and/or backfill
- Better performance
- Lower greenhouse gas emissions

Features

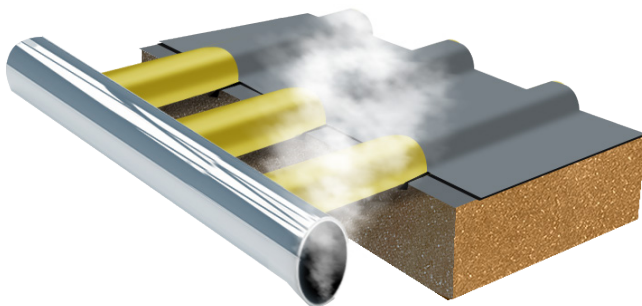
- Economical alternatives to traditional containment methods
- Quality products
- Ultra-wide rolls to minimise installation costs
- Seepage reduction
- Canal / channel lining / protection

DRAINTUBE® LFG to collect and control gas at each stage of the Landfill's Life



During operation Horizontal-LFG collection within the waste mass

Landfill gas (LFG) needs to be effectively extracted from active landfill to comply with air regulation and reach the 75% lifetime gas capture rate recommended for MSW landfill. Placed directly within the waste mass, DRAINTUBE® 500P LFG4 D25 replaces the traditional horizontal LFG trenches. It is unrolled directly on the waste and connected to the LFG system conveyance piping using Quick Connect System.



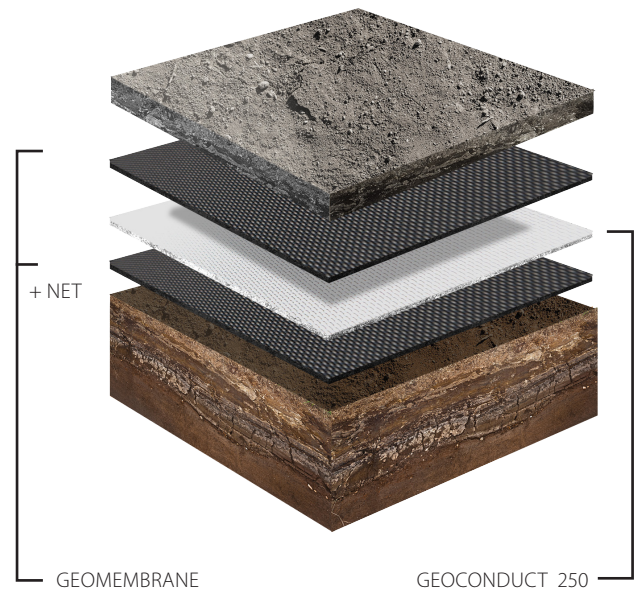
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Leak detection and geomembrane protection

A double liner system using geomembranes allows for an increase in overall system safety against environmental risks.

Leak detection through geoelectrical methods post installation ensures that even the smallest leaks can be discovered and repaired to maintain the complete impermeability of the system.

GEOCONDUCT can be installed within the DRAINTUBE (product creating DRAINTUBE(R) CONDUCTIVE) and 250-550 allows geoelectrical detection of leaks while also providing puncture protection to the geomembrane.

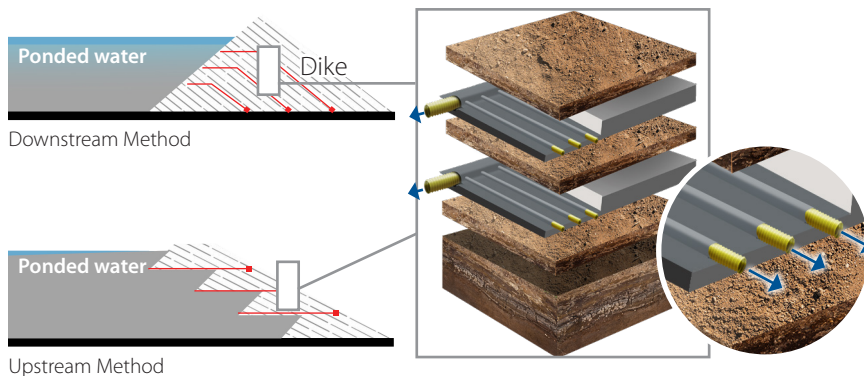


Tailings Dam Drainage

Tailings dams are often built using the upstream method because they are more economical. The limitation of this method is the eventual rise in the water table within the structure, creating stability problems. Safety can be greatly increased through the use of DRAINTUBE® between built-up sections.

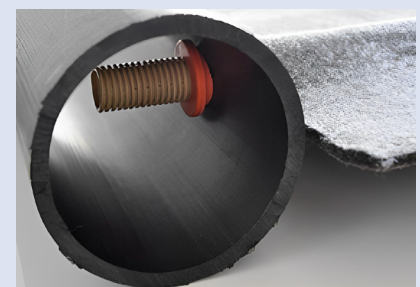
Another issue in mining operations is the management of sand and its storage using dikes. To ensure total safety of work sites, the stability of these dikes is a central design challenge. The saturation rate of sand and the slopes are thus controlled, and depend on the nature of the sand, its permeability, its internal cohesion and lastly, its saturation. DRAINTUBE® is used at various levels in dike construction, between two layers of soil, to accelerate desaturation of the layers and hence increase the overall stability of the structure.

Optimised Solution with DRAINTUBE®



Quick Connect System™

The DRAINTUBE® mini-pipes can be positively connected to interceptor drains without trenches with the Quick Connect System. Quick Connect System creates airtight connection between the gas piping network and DRAINTUBE®.



DRAINTUBE®

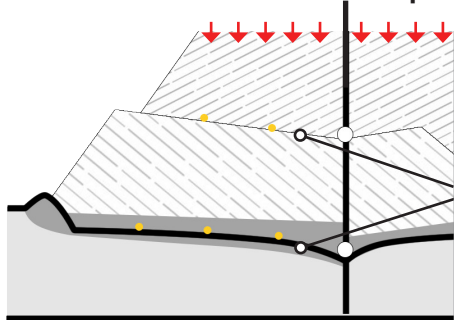
Leachate drainage in metals extraction using heap leaching techniques

Heap Leach Pads pose a particular challenge. Their economic viability depends on the quality of drainage and the efficient recovery of metals requiring both protection of the geomembrane against puncture and a complete and rapid collection of the metals-rich solution.

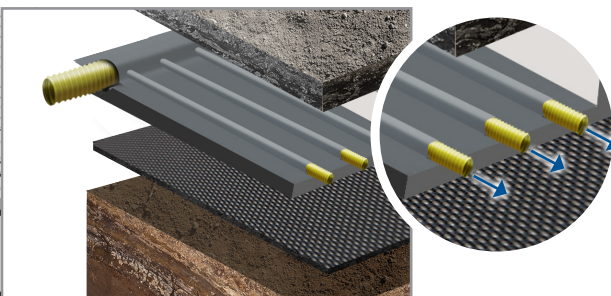
In addition, their design must comply with strict requirements regarding stability and isolation from the environment. DRAINTUBE® is widely used beneath waste storage sites

involved in the collection of leachate and the preservation of impermeable barriers. Once confined, DRAINTUBE® is capable of resisting very high compressive loads. Finally, because of the high chemical stability of its components, DRAINTUBE® does not undergo advanced degradation, even at high temperatures. With its excellent hydraulic capacity, DRAINTUBE® has proven to be an efficient substitute for a portion of the granular and perforated pipe network.

Traditional Solution

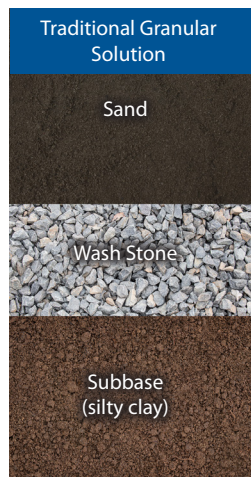


Optimised Solution with DRAINTUBE®



The use of DRAINTUBE® allows the replacement of a part of the stone layer and a part of the secondary drains system

For Roadwork Engineering



Geotextiles
Replacement of washed stone with 3 Geotextiles
Geotextiles



For Roadwork Engineering



For backfilled Slope or Reinforced Walls

For Backfilled Slope or Reinforced Walls



DRAINTUBE™ does away with the need for a layer of clean stone and two geotextile separators and it saves excavation time. DRAINTUBE™, specifically sized for the project, provides the same hydraulic capacity as a layer of clean stone.

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Comparison between a stone layer and the DRAINTUBE® Sport

Transmissivity Comparison

Tests were conducted at the CTT Group – Sageos Laboratory, in June, 2006. The objective was to compare the hydraulic behavior of DRAINTUBE® to 150 mm of clean stone under various gradient pressures and loads. The results indicate that DRAINTUBE® Sport is equal in performance for a 0.01 gradient. Clean stone = DRAINTUBE® = $10^{-2} \text{ m}^3/\text{s}/\text{m}$.



Performance Comparison

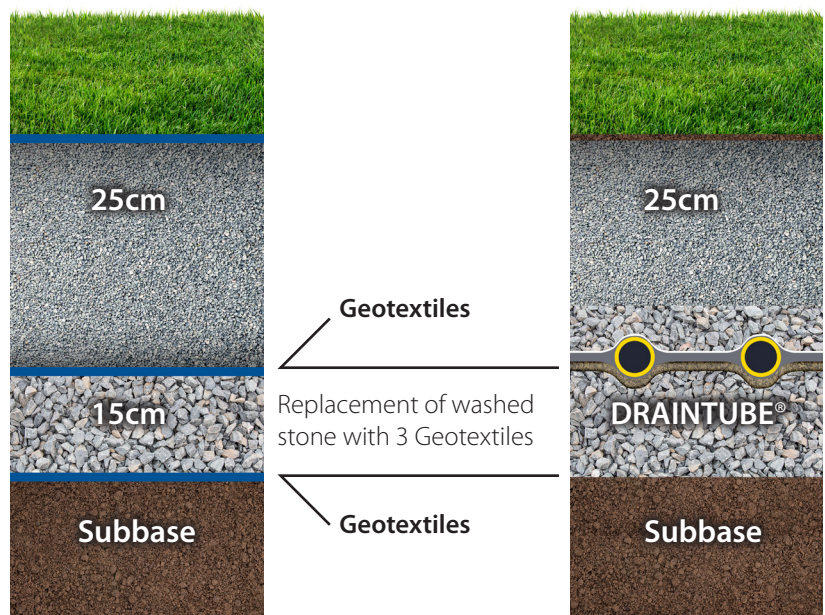
(Defargo-Sagéos bench test - January 2007)

Large scale rainfall bench tests were conducted in January 2007, with the support of Defargo, Inc - Carignan (Qc) under the independent control of the Sagéos laboratory. Large scale rainfall bench tests were conducted. The results indicate equivalent Flow Rate capacity under continuous flow, which resulted in no saturation of the systems despite significant rainfall events.

Calculated Performance

(Using Lymphéa® Software)

The Lymphéa® software was developed in association with the University of Grenoble and le Laboratoire des Ponts et Chaussées (France) to calculate the requirements for DRAINTUBE® in civil applications. The performance of both systems was comparable in typical hydraulic conditions for standard sports applications.



Environmental Balance (sustainable development)

NATURAL RESOURCES

Non Renewable

The excavation and replacement of 150mm of material over a 10,000m² area requires 240 trucks.



VS

MANUFACTURED RESOURCES

Renewable

The installation of 10,000m² of DRAINTUBE® requires only 1 truck and 3 labourers working for 2 days.



DRAINTUBE®

Most common applications - DRAINTUBE® CONDUCTIVE

1. Leak Detection

DRAINTUBE® CONDUCTIVE adds a conductive stainless-steel grid inside a DRAINTUBE® product. This allows for the benefit of geo-electrical leak detection in addition to the drainage, filtration and mechanical protection of DRAINTUBE®, all in a single product requiring a single installation. The stainless-steel conductive grid also protects the geomembrane from being punctured and drains any leakage during operation.

The benefits of DRAINTUBE® CONDUCTIVE include:

- Homogeneous diffusion of electric currents under the geomembrane
- Compatibility with geo-electrical leak location surveys for both exposed geomembranes (Water Puddle and Arc test methods) and covered geomembranes (Dipole test method).
- Cost-effective and environmentally friendly solution as it replaces granular layers

DRAINTUBE® CONDUCTIVE is a great alternative to other products (e.g. aluminium or other conductive materials), as it will remain functional for many years even in humid environments, instead of degrading within a few months after installation.

2. Building and Sport Fields- Synthetic and natural turf sport fields

DRAINTUBE® CONDUCTIVE Sport drainage geocomposite offers a better, more effective solution for drainage with the following advantages:

- Significant cost reductions
- Simple installation
- Variable design options
- Improved performance
- a better environmental footprint through a significant reduction of greenhouse gases.



3. Civil- Drainage of roads/highways foundations

DRAINTUBE® CONDUCTIVE Civil drainage geocomposite offers a better, more effective solution for drainage with the following advantages:

- No loss of drainage capacity over time and under loads
- Light and Robust
- Easy to install
- Cost effective alternative to No-Fines concrete
- Simple connection details for discharge of fluids



DRAINTUBE®

4. Mining and Tailings Management

Fluid management is critical for most civil engineering applications. The development of pore pressure in soils can compromise the stability of installations. Over the past 10 years, Aftex-Textel Inc. has been using DRAINTUBE® CONDUCTIVE drainage geocomposites to eliminate interstitial pressure and ensure the long term performance of environmental and civil engineering projects.

These products rely on the combination of various geotextile layers (filtration, separation and protection layers) that are needle-punched together with integrated perforated mini-pipes for high capacity drainage.

Based on the experience gained over many years of draining waste storage facilities, DRAINTUBE® CONDUCTIVE is especially suited to mining related drainage. The mining industry requires customised solutions specifically adapted to the following situations;

- Drainage for waste storage covers/caps
- Tailings Storage Facilities drainage
- Heap leachate pad drainage
- Groundwater drainage under storage ponds (freshwater, leachate, mining waste)
- Leak detection and geomembrane protection



5. Environmental

DRAINTUBE® CONDUCTIVE combines standard pipe and geosynthetic technology into a unique package offering superior long-term drainage capacity and performance.

DRAINTUBE® CONDUCTIVE drainage Geocomposites allow geomembrane leak detection surveys using standard geoelectrical methods.

Standard rolls of DRAINTUBE® CONDUCTIVE are delivered in 75m lengths eliminating embankment benches, which results in maximised landfill cell volume and lessened overlap wastage. Installation of the DRAINTUBE® CONDUCTIVE very much follows the best practices of geotextile installation allowing for non-specialised labour to be used. Whereas Geocomposite Geonets require cable-ties and the overlapping of the adjacent geotextiles to join the panels, the DRAINTUBE® CONDUCTIVE simply overlaps together.



6. Landfill Gas Management

DRAINTUBE® CONDUCTIVE LFG collects and controls gas at each stage of the landfill's life.

During operation: Horizontal LFG collection within the waste mass. Landfill gas (LFG) needs to be effectively extracted from active landfill to comply with air regulation and reach the 75% lifetime gas capture rate recommended.

During operation: Temporary cap with LFG collection. Temporary caps are used on open landfill cells to limit rainfall infiltration into the waste and prevent gas from escaping the sides of the land.

Closure: LFG drainage within the final cover system. The final cover system must include a gas venting layer to provide a conduit for LFG to travel to gas wells.

Our Lympha design software, plus our talented professionals are available to help make your project a success from concept to completion.

About Us

Leaders in Geosynthetics

Global Synthetics is a 100% Australian-owned company, proud to offer a complete range of high-quality geosynthetic products backed by over 200 years of combined staff experience in the industry.

We have supplied products to some of the largest recent infrastructure works in Australia. Global Synthetics provides major benefits to any geotechnical engineering project with the right products and our technical expertise.

Global Synthetics products are used in the following applications:

- Pavement Stabilisation
- Ground Improvement
- Soil Reinforcement and Retaining Structures
- Water Management
- Drainage Systems & Hydraulic Works
- Landfills
- Coastal Erosion Structures

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