

PROPEX[®]
FABRICS

GEOTEXTILE PRODUCTS

WOVEN AND NONWOVEN FABRICS FOR SOIL CONTROL



BLUE STRIPE: LEADING THE WAY.

 **Hancor**[®]
Technology • Innovation • Solutions™

I.D.

THE HANCOR/PROPEX SOLUTION

Today, two industry leaders, Hancor, Inc. and Propex Fabrics, have joined forces to provide you with a comprehensive line of geotextiles for civil and environmental engineering applications. Hancor's HDPE single wall and dual wall pipe are the industry standard for drainage pipe. Propex is North America's largest producer of woven and needle-punched nonwoven fabrics for soil stabilization and reinforcement, erosion control, drainage, filtration, separation and other construction needs. The Propex line of geotextiles is strong, durable, chemically inert, environmentally compatible, and is virtually unaffected by the effects of ground conditions, weather and aging.

The acceptance and use of geotextiles in construction has increased dramatically since their introduction in the 1960s. Growth accelerated in the 1980s with the establishment of minimum performance standards by many federal and state agencies, and the development within the industry of uniform testing methods and measurement criteria.

Geotextiles in combination with drainage pipes have been used on countless projects, becoming the state-of-the-practice in civil engineering and waste containment applications. The partnership of Hancor, Inc. and Propex offers customers unparalleled availability, service and engineering support.

Propex woven and nonwoven fabrics represent the highest quality of geotextiles available in the industry today. Fabrics critical to your success are available at Hancor sales and service locations throughout the country. Whether it's for heavy construction, major civil engineering projects or a home septic system, you'll find the right fabric, plus the world's best-selling line of corrugated polyethylene drainage pipe and fittings in 3"-60" diameters.

PRODUCT SELECTION GUIDE

Matching the right Propex geotextile product with your application is paramount for the success of your project. Propex provides the widest variety of woven and nonwoven geotextile products in the industry to meet your drainage, separation, stabilization and soil reinforcement needs. Refer to the chart to begin the process of selecting the appropriate Propex product for your project. While helpful, this guide is only the first step that should culminate with the design of a project using established engineering principles.



Application	Specification	Category	Propex Style Nonwoven	Propex Style woven
Subsurface Drainage	AASHTO ¹ M288	Class 2	601	-
		Class 3	401	-
Roadway Separation	AASHTO M288	Class 2	601	250ST
		Class 3	401	180ST
Roadway Stabilization	AASHTO M288	Class 1	801	315ST
		Class 2	601	250ST
Erosion Control	AASHTO M288	Class 1	801	104F
		Class 3	401	104F
Railroad Stabilization	AREMA ² /Ch. 1, Part 10	Regular	1201	-
		Heavy	1601	-
		Extra Heavy	1701	-
Erosion Control	EPA ³ /GRI Report No. 15		651	111F
			861	111F

1. AASHTO is an acronym for the American Association of State and Highway Transportation Officials.
 2. AREMA is an acronym for the American Railway Engineering Maintenance-of-Way Association.
 3. GRI is an acronym for the Geosynthetic Research Institute.

NONWOVEN GEOTEXTILES

Hancor markets a full line of Propex nonwoven geotextiles from Propex Fabrics, a world-renowned innovative and experienced producer of polypropylene textile fibers.

Nonwoven geotextiles are designed to filter soil particles from drainage systems, and stabilize roadways to increase the performance life of these structures. With the world's largest nonwoven facility and ISO-9002 certification, Propex is dedicated to the production of high quality, needle-punched, staple fiber geotextiles. Continuous filaments of polypropylene are extruded on the world's largest fiber extrusion line. Fibers are then cut, opened, laid into a web, needle-punched, heat-set and rolled to create Propex nonwovens. After careful inspection and testing, these engineered products are then ready for shipment to job sites all over the world.

Whether constructing a roadway, designing an erosion control plan or installing a subsurface drainage system, you can count on the proven benefits of Propex needle-punched nonwoven geotextiles. Nonwoven geotextiles are approved by many local, state and federal agencies, including the Federal Highway Administration, U.S. Army Corps of Engineers, the Environmental Protection Agency and AASHTO. Nonwovens are ideal for a variety of civil engineering applications, including:

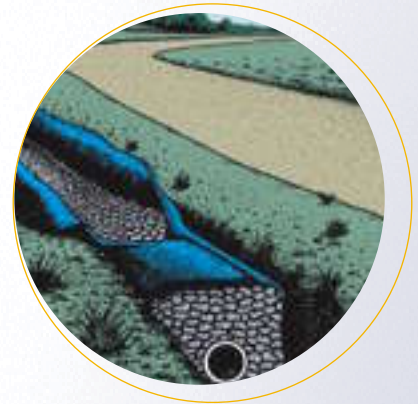
- Subsurface Drainage
- Roadway Separation
- Railroad Stabilization
- Hard Armor Underlayment
- Landfill Leachate Collection
- Underground Detention/Retention Systems

SUBSURFACE DRAINAGE

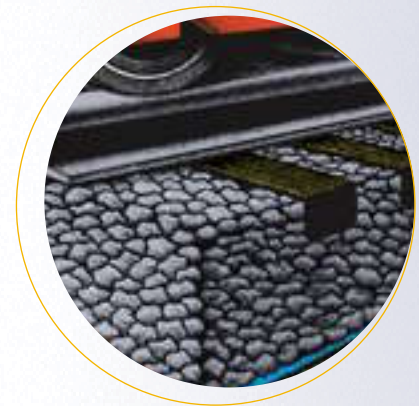
Propex lightweight and medium-weight nonwoven geotextiles prove to be excellent filters in subsurface drainage applications. The needle-punch construction of the fabric allows subsurface water to pass into the drainage pipe for proper channeling. At the same time, the nonwoven prevents adjacent soil from clogging the system and causing costly excavation and repair. When properly selected, nonwoven geotextiles are effective in most soils, particularly in environments where silt and clay are prominent.

ROADWAY SEPARATION/RAILROAD STABILIZATION

Deploying a Propex nonwoven geotextile directly on subgrades extends road life by preventing fine subgrade soil particles from migrating and intermixing into the aggregate and ballast base course. Propex 401 meets AASHTO M288 Class 3 standards, and Propex 801 exceeds the requirements for Class 1 textiles used in roadways.



Wrapping a subsurface drainage system with a Propex nonwoven geotextile will improve roadway life.



Robust Propex nonwovens stabilize subgrades and prevent the fouling of ballast beneath railway track.

NONWOVEN GEOTEXTILES

HARD ARMOR UNDERLAYMENT

Soil migration and the build-up of hydrostatic pressure are two of the leading causes of failure in hard armor, such as rock riprap and concrete block systems, along shorelines and waterways. Propex nonwoven geotextiles act as a filter to help prevent subsurface soil migration and relieve hydrostatic pressure beneath hard armor erosion control systems. Propex 801 and 401 meet the requirements for Class 1 and Class 3 erosion control geotextiles, respectively, as outlined in AASHTO M288.

LANDFILL LEACHATE COLLECTION

When placed in intimate contact with a geonet or drainage stone, medium-weight Propex nonwoven geotextiles can filter soil and waste while allowing water and leachate to pass. An efficient design utilizing recommended Propex nonwoven geotextiles can lead to proper leachate management in new landfill cells, and rapid surface water collection and removal in closure plans.

SUBSURFACE RETENTION/DETENTION SYSTEMS

Underground storm water retention systems incorporate large diameter pipe to hold runoff in a defined area until the surrounding soil can accept it. Detention systems, on the other hand, consist of large diameter pipe that detains all runoff exceeding the allowable amount and releases it through an outlet pipe at a controlled rate. Some systems are a combination of both. In each case, subsurface retention/detention systems provide maximum use of land, require little maintenance, and do not diminish the aesthetics of the development.

Nonwoven geotextiles play a key role in maintaining the effectiveness of these underground retention and combination systems. The pipe and surrounding angular stone backfill are wrapped with nonwoven geotextile to prevent encapsulated soil intrusion into the angular stone backfill/water storage area. Propex 601 and 801 nonwoven geotextiles meet AASHTO M288 classification separation requirements for such applications.



Propex heavy weight nonwoven geotextiles allow the construction of landfill drainage layers without fear of liner damage.



Underground retention/detention systems use Hancor large diameter pipe and Propex geotextiles to effectively control storm water runoff.



WOVEN MONOFILAMENT GEOTEXTILES

Engineers around the world are specifying Propex woven monofilament filtration geotextiles and Hancor pipe for a variety of civil and environmental engineering applications.

The Propex fabrics are manufactured from extruded polypropylene monofilaments woven together to form a dimensionally stable construction fabric. This process produces a premium filter that is extremely resistant to soil and biological clogging. A full range of high quality filtration fabrics has been created to offer designers several choices for percent open area (POA), the single most important property in the selection of a woven geotextile filter.

These types of geotextiles are used primarily for:

- Hard Armor Underlayment
- Subsurface Drainage
- Landfill Leachate Collection

HARD ARMOR UNDERLAYMENT

Soil migration beneath flexible hard armor systems is the primary cause of failures. Woven monofilament filtration geotextiles prevent soil migration by retaining particles while still allowing water to flow through the fabric. These monofilaments offer various hydraulic and filtration properties such as percent open area, apparent opening size and water flow rate. Cutoff pipe drains placed above hard armor systems are often beneficial to the structure.

Proper geotextile selection will ensure excellent clogging resistance, thus eliminating the build-up of pore water pressure. Propex 104F and 111F are typically used in both inland waterway and shoreline erosion control systems. Propex 117F features the highest percent open area (17%) and water flow rate of all Propex's monofilaments. This geotextile has been engineered for high impact shorelines, where large hydraulic gradients and clogging are the primary concerns.

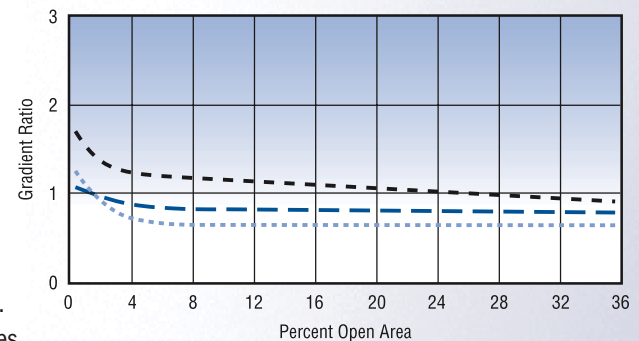
SUBSURFACE DRAINAGE

Propex 104F and 111F are also ideal filtration products for subsurface drainage systems. For example, a high groundwater table warrants the use of these styles of premium woven monofilament geotextile filters. Drainage pipes wrapped with a monofilament geotextile provide greater resistance to soil particle clogging, adding years of service life to the drainage structure. All Propex woven filtration geotextiles exceed the American Association of State Highway Transportation Officials' (AASHTO) M288 physical requirements for Class 2 subsurface drainage and permanent erosion control.

LANDFILL LEACHATE COLLECTION

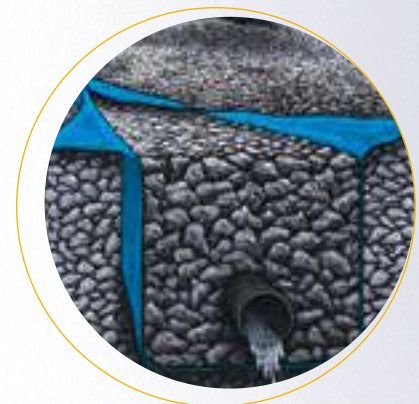
Propex 111F and 117F woven filtration geotextiles provide excellent filtration characteristics when encapsulating coarse gravel in leachate collection systems in solid waste landfills. The monofilament yarns have less surface area for potential biological growth, which helps to eliminate long-term clogging concerns.

Five years of testing conducted at the Geosynthetics Research Institute resulted in a recommendation to the U.S. Environmental Protection Agency (EPA) that, when using a woven monofilament geotextile in leachate collection systems, a minimum POA of 10 percent should be specified (e.g. Propex 111F). Some industry experts are more conservative and opt for Propex 117F which possesses the properties required to ensure long-term functionality in leachate collection systems.



Relationship Between Gradient Ratio and Percent Open Area of Woven Geotextiles

KEY	
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...	SILTY SAND
- - -	SILT



Propex woven monofilament geotextiles are very resistant to biological clogging, making them ideal for landfill leachate collection systems.

WOVEN SLIT TAPE GEOTEXTILES

Since Propex's first involvement in the geotextile industry more than 20 years ago, hundreds of millions of square yards of high quality woven fabrics have been produced and installed all over the world.

After extruding and slitting a polypropylene film, an ISO-9002 certified manufacturing process weaves individual flat yarns into geotextiles featuring high tensile strengths at low elongation (high tensile modulus). These characteristics allow Propex woven geotextiles to distribute loads, reduce rutting and extend the life of paved and unpaved roadways.

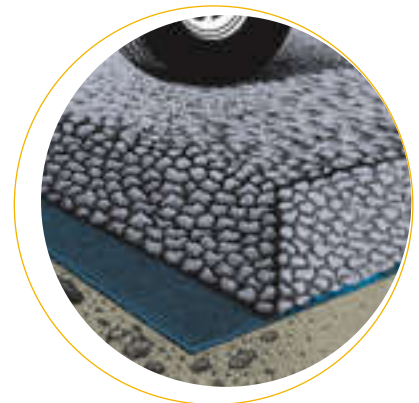
UNPAVED ROADWAYS

Propex woven geotextiles help save on aggregate placement and repair costs associated with constructing and maintaining unpaved roadways. A soft subgrade covered with the appropriate Propex woven geotextile stabilizes an access or haul road by spreading applied loads over a wider foundation, reducing rut depths and preventing aggregate contamination by the underlying subgrade soils. This reduces maintenance costs, improves roadway life and permits unrestricted flow of traffic.

Subgrade strength is often measured by the California Bearing Ratio (CBR). Depending upon the actual strength of the subgrade, Propex woven geotextiles have the ability to perform several different functions. These range from Reinforcement on weak subgrades (CBR \leq 3%) to Separation on firm foundation soils (CBR \geq 8%). As expected, weaker subgrades demand stronger woven geotextiles and more favorable soils require less robust geotextiles.



Propex "ST" series of woven geotextiles can reduce aggregate thickness in unpaved roads by as much as 50%.

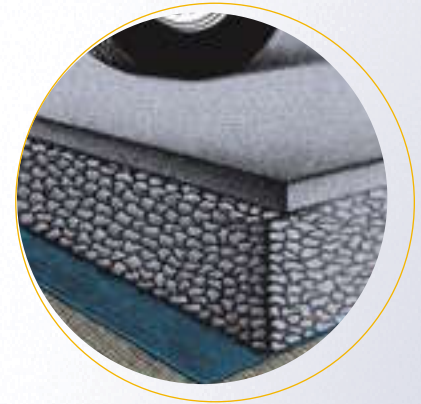


These geotextiles are also effective in paved roads.



PAVED ROADWAYS

The “ST” series of Propex woven geotextiles offer an inexpensive and time-proven means of extending the life of paved roadways and parking lots. Since subgrade contamination is the leading cause of pavement failure, highway engineers typically thicken aggregate layers using sacrificial aggregate to offset the expected losses. By unrolling a high modulus Propex woven geotextile directly on the subgrade during construction, aggregate is permanently separated from finer soils below. This prevents intrusion of the subgrade into the aggregate and improves the subsurface drainage of roadways. Even with the rigors of heavy truck traffic, a Propex woven geotextile allows aggregate layers to maintain their original design thickness.



The expected life of paved roads and parking lots is extended with a Propex woven geotextile by permanently separating the subgrade from the aggregate.

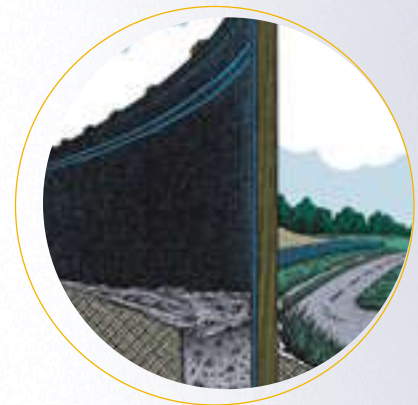
WOVENS FOR SEDIMENT CONTROL

Once fastened to posts and properly installed, Propex woven geotextiles are also effective in controlling sediment laden runoff from construction sites. These woven silt fence fabrics have been recognized by the EPA as a Best Management Practice (BMP) and offer a unique combination of UV resistance, strength and hydraulic properties.

PICKING THE RIGHT WOVEN GEOTEXTILE

Propex offers five standard woven geotextiles for soil separation, stabilization and reinforcement functions in paved and unpaved roadways. Propex 180ST, 250ST and 315ST meet AASHTO M288 construction requirements.

For more demanding soil reinforcement applications exceeding the AASHTO criteria, Propex offers high strength woven geotextiles. When you encounter very soft soils or other critical soil reinforcement applications, these unique twill weaves form robust fabrics with high tensile strengths and superior hydraulic characteristics.



Propex silt fences trap sediment before it can pollute surface waterways.



DIRECT CONTACT

Customer Service

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ELECTRONIC MEDIA

Web Site

Find market- and application-specific information and the latest industry news at our On-Line Pipeline – www.hancor.com

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