Don & Low
MEMBER OF THRACE GROUP

# geosynthetics

***Lotrak® - designed for engineering groundwork solutions***

Separation

Filtration

Reinforcement

Erosion Control

Drainage

Hazard Identification

Landfill Membranes

# Don & Low

## Engineering tomorrow's technical textiles

Don & Low
MEMBER OF THRACE GROUP

**About Us**

From our origins in 1792 as a linen and flax textile weaver, Don & Low has evolved into an internationally recognised innovative polyolefin textile manufacturer. Today, we are part of the multinational Thrace Group, expanding our profile across the globe. We focus on producing high performance, cost effective solutions to our clients' demands, which has led us to become one of the most versatile manufacturers serving global markets.

**Quality**

Quality is a key focus at Don & Low. We never compromise on quality, from the raw materials we purchase, right through to the finished goods we produce. Continuous investment, quality management systems and experience have all contributed to us being awarded ISO 9001. Combined, this gives us confidence that our products meet the exact specifications required by our diverse range of customers.

**Environment**

The need for truly sustainable options remains one of Don & Low's crucial challenges. We are committed to improving our impact on the environment through our proactive environmental policies, energy reduction measures and recycling programs.

**Innovation & Growth**

Innovation, flexibility and a proactive approach to the ever evolving markets have contributed to our success. Don & Low has many long standing relationships with both customers and suppliers with whom we work closely to develop tomorrow's technical textiles. Enabling growth along with our customers, lies at the heart of our innovation philosophy.

www.donlow.co.uk

# Don & Low | geosynthetics

***Continuous changes in infrastructure place a heavy demand on contractors to deliver safe, sustainable development while safeguarding the environment. Widely recognised as a design component in most building projects, geosynthetics play an essential role, not only in the construction phase, but throughout the entire service life.***

Under the brand name **Lotrak®**, Don & Low has been at the forefront of geotextile application and design since the mid 1970s. We have developed a comprehensive range of geotextiles with excellent mechanical and hydraulic properties for a wide range of construction, landscaping and civil engineering applications.

Designed for performance, all **Lotrak®** geosynthetics offer the key functions of separation, filtration and reinforcement, limiting the movement of soil and aggregate and ensuring ground stabilisation.

Typically used in the groundwork for highways schemes, paved areas and coastal protection, specialised grades are also available for hazard identification, flooding protection and floating access roads for challenging sites such as wind farms.

With high resistance to installation damage and durability throughout their entire service life, **Lotrak®** geosynthetics can help to both reduce the construction costs and limit future expenditure for repairs.

Don & Low
MEMBER OF THRACE GROUP

# geosynthetics

## Functions

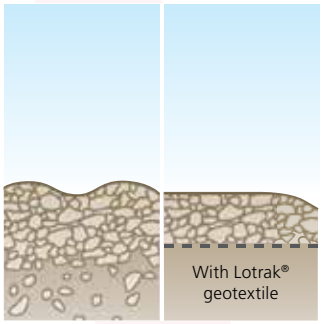
Geotextiles and geotextile-related products have to be tested according to their intended end use. There are five different functions that a geotextile may have to fulfil:

| F | S | R | D | P |
|---|---|---|---|---|
| Filtration | Separation | Reinforcement | Drainage | Protection |

The type of geotextile and the properties it requires will depend on the function it will perform in the end use. This may just be one function or a combination of the above functions.

## Separation

Lotrak® is used to separate the sub base from the sub grade and prevent intermixing of construction layers, while maintaining the construction thickness. Expensive aggregates are therefore kept apart from the soil. Lotrak® separation geotextiles also have a water filtration characteristic, where the pore size of the geotextile is small enough to control the particle movement of the soil, but large enough to avoid clogging and maintain waterflow by creating a bridging zone to promote natural soil filtration.

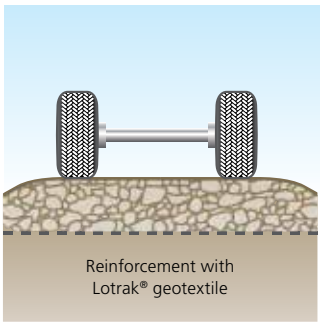



## Reinforcement

All Lotrak® reinforcing woven geotextile grades are designed to provide higher tensile stiffness for unpaved road applications, such as those found in sites for wind farm construction. Lotrak® reinforcing grades act as the reinforcement, separator and filtration membrane, providing all functions in one geotextile, eliminating the need for multiple products and offering clear cost benefits.

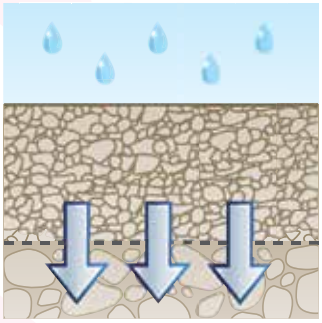
Designed to perform at low strain values (2% and 5%), when small movements take place within the construction, the Lotrak® woven reinforcing grades have a high modulus (high strength at low elongation) and improve the mechanical properties of the soil and other construction materials.

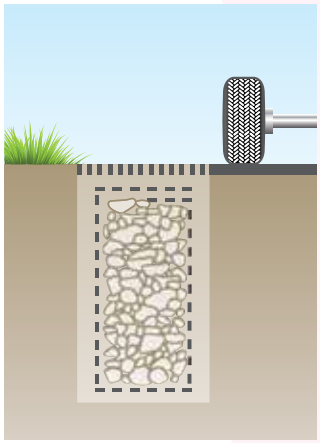
Where the functions of both reinforcement and high water-flow filtration are required, reinforcement by our Lotrak® biaxial grids used in combination with one of our nonwoven geotextiles is the preferred choice.

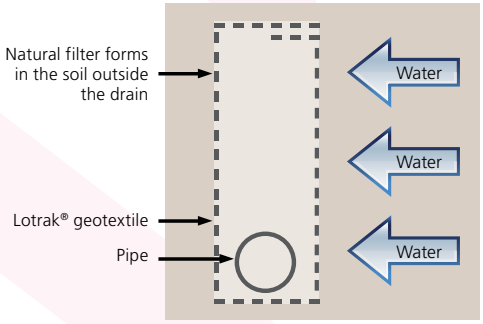



## Filtration and Drainage

Lotrak® filtration geotextiles are designed to provide rapid filtration, allowing water to pass into a filter drain without the carriage of fine soil particles. These geotextiles are commonly used in drains and trenches.








Geotextile wrapped filter drain

## Protection

Geotextiles are frequently used to protect impermeable geomembranes or sealing layers from damage from aggregate or fill materials. In particular, Lotrak® nonwoven geotextiles provide puncture protection to the membrane.

# products

***There is a product in the Lotrak® range to suit most applications. However, it is important to ensure the correct product is selected as this can be critical to the success of the overall project. In some cases, the best solution can be the use of a combination of products.***

***Our technical team is available to help with the selection and specification of Lotrak® geosynthetics for all civil engineering projects.***

## Lotrak® Woven Geotextiles

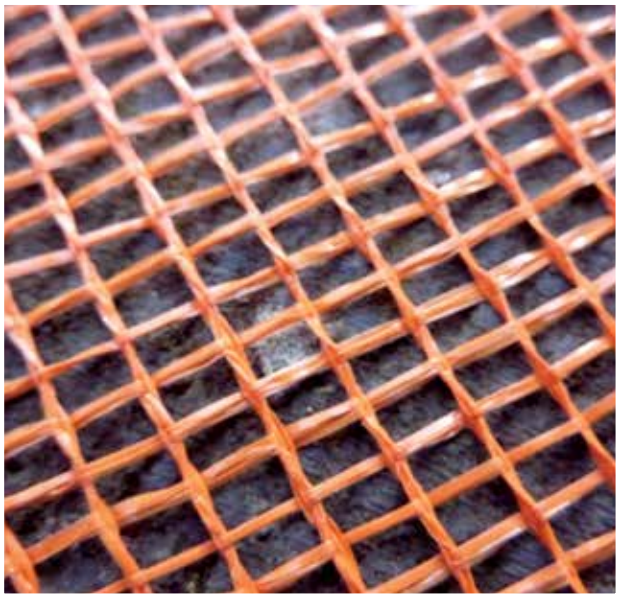
Constructed from extruded polypropylene (PP) tapes, Lotrak® woven geotextiles have a proven record in a wide range of civil engineering applications. Offering a comprehensive range of solutions, Lotrak® geotextiles are ideal for use in the construction of access, temporary or permanent roads, car parks, drainage systems, and stabilisation of embankments. Lotrak® woven grades can act as the separator, reinforcement and filtration membrane, providing all functions in one geotextile, and eliminating the need for multiple products.

- Separation and filtration in one product
- High tensile strength with low elongation for reinforcement

## Lotrak® Nonwoven Geotextiles

Don & Low also offer a range of nonwoven geotextiles enabling us to address a wider variety of civil engineering applications. Drainage applications, for example, demand higher water filtration rates and Lotrak® nonwoven geotextiles are the ideal solution. Lotrak® nonwoven geotextiles are needlepunched, which provides more consistent waterflow performance than traditional thermally bonded alternatives.

- Protection function to impermeable membranes and sealing layers
- Excellent filtration characteristics



## Lotrak® Biaxial Grids

Lotrak® extruded biaxial geogrids provide ground stabilisation and reinforcement. Through the interlock mechanism, the geogrid is specifically designed to control movement of aggregate materials. The use of a geogrid results in a reduction in the quantity of required fill material, by increasing the bearing capacity of the underlying ground, offering performance and cost benefits to the project.

- Effective reinforcement and soil confinement
- High tensile strength with low elongation for reinforcement

## Lotrak® High Visibility Warning Barriers

Highly visible, Lotrak® Alarm18 and Lotrak® Signet have been specifically developed as contaminated ground warning or marker barriers. With increasing demand for good building land, reclamation of industrial zones is becoming more common place and potential hazards are now often buried and contained underground as an alternative to removal. Good environmental construction practice utilises Lotrak® Alarm18 and Lotrak® Signet to notify future contractors and excavators of these hidden hazards, while performing a separation function.

- Highly visual
- UV resistant and durable

## Environmental Landfill Membranes

With growing emphasis on the environmental impact, it has become necessary to ensure that landfill sites are carefully designed, managed and maintained.

Usually the regulations for the site require a 'solution' - the use of more than one type of membrane - that must offer drainage, protection, reinforcement and capping functions.

Lotrak® geosynthetics and Lobrene® industrial fabrics are durable, high strength materials used alone or as a component of a composite to create a landfill solution.

This is a growing market in which our fabric is used to produce landfill liners.

Landfill membranes currently available are:

- Daily capping material
- Geosynthetic Clay Liner (GCL substrates)
- Woven reinforcement textiles
- Nonwoven protection textiles

# certification

***The use of geotextiles and geotextile-related products in Europe is governed by a series of standards developed by the Technical Committee CEN/TC 289 "Geosynthetics". These standards define the characteristics relevant to the intended use of the geotextile or geotextile-related product.***

## Standards for Geotextile Products

| | |
|---|---|
| EN 13249 | Roads and other Trafficked areas |
| EN 13250 | Railways |
| EN 13251 | Earthworks, Foundations and Retaining Structures |
| EN 13252 | Drainage Systems |
| EN 13253 | Erosion Control and Bank Revetments |
| EN 13254 | Reservoirs and Dams |
| EN 13255 | Canals |
| EN 13256 | Tunnels and Underground Structures |
| EN 13257 | Solid Waste Disposal |
| EN 13265 | Liquid Waste Containment |

***Manufacturers are able to define the performance of their materials on the basis of declared values. Designers and specifiers can use these values to identify the characteristics required of that material to perform the required function of separation, reinforcement, filtration, drainage and protection, in the intended application.***

| Geosynthetic Characteristic | Test Standard |
|---|---|
| Tensile Strength | EN ISO 10319 |
| Elongation | EN ISO 10319 |
| Dynamic Perforation Resistance | EN ISO 13433 |
| Resistance to Static Puncture (CBR) | EN ISO 12236 |
| Opening Size | EN ISO 12956 |
| Water Permeability | EN ISO 11058 |

## CE Marking

As of 1st July 2013, the 'Construction Product Regulations 2011' (CPR), will make it compulsory for all construction products, including geotextile and geotextile-related products, to be CE marked within the UK and across Europe.

Don & Low has been CE marking geotextile products, in line with the standard, since 2002, giving customers the confidence that all our product fully comply.

At Don & Low, production of each geotextile is monitored from raw material to finished product, with quality assessments carried out at every stage. Our test data has been continually monitored since 2002 and is used extensively to ensure all properties of the product meet the declared values.

All geotextiles are printed with the product name for identification and supplied with an accompanying technical properties document. A Declaration of Performance is available on request.

## Standards for Geotextile Products

| Lotrak® Grade | Type | Typical End Use |
|---|---|---|
| Advance | Woven | Basic separation / filtration |
| 15 | Woven | Basic separation / filtration |
| 1800 | Woven | Basic separation / filtration |
| 2300 | Woven | Higher strength separation / filtration |
| 2800 | Woven | Higher strength separation / filtration |
| 25R | Woven | Basic reinforcement |
| 50R | Woven | Reinforcement on soft ground |
| 70R | Woven | Reinforcement on very soft ground |
| HF550 | Woven | High waterflow application |
| 100 | Nonwoven | Basic separation / filtration |
| 200 | Nonwoven | Higher strength separation / filtration |
| 300 | Nonwoven | Higher strength separation / filtration |
| 20/20S | Biaxial Grid | 20kN reinforcement grid |
| 30/30S | Biaxial Grid | 30kN reinforcement grid |
| 40/40S | Biaxial Grid | 40kN reinforcement grid |

Other specialised Lotrak® grades are also available, including Alarm18 and Signet hazard identification membranes.

Don & Low
MEMBER OF THRACE GROUP

# case study

| | |
|---|---|
| Project | **South West Inverness Flood Prevention Scheme** |
| Project Duration | **October 2011 - October 2012** |
| Client | **Highland Council** |
| Design | **AECOM** |
| Contractor | **R J McLeod Contractors** |
| Works Value | **£5.7 million** |

The South West Inverness Flood Prevention Scheme has been a four phase, multi-million pound project.

The final phase of the £16 million south west Inverness flood relief channel lies between Oldtown of Leys and the Alt na Skiah Burn to the south of Fairways golf course. The scheme intercepts four watercourses; Lochardil Burn, Slackbuie Channel, Slackbuie Springs and Alt na Skiah Burn and channels the waters into the River Ness, via the Holm Burn.

Phase 4 spanned a length of 1.6km, comprised of 50% open channel and 50% closed box culvert. The scheme diverts water from the south of the town, around the local community housing and into the River Ness.

The works were designed by AECOM based in Leeds and supervised by Highland Council.

Don & Low provided Lotrak® 200, a mechanically bonded (needlepunched) nonwoven geotextile and Lotrak® 70R, a woven reinforcing geotextile.

The function of Lotrak® 200 was to protect the geosynthetic clay liner (GCL) during the installation of Type 6U stone and to provide stabilisation. Lotrak® 70R was installed for separation and reinforcement of rock armour, while offering protection to the lower layers of the installation.

**The main contractor RJ McLeod faced a number of key issues including:**

- Deep excavations, including some in poor ground conditions
- Extensive service/public utility works, including a high pressure water main diversion and several service crossings
- Working in and alongside existing watercourses including ecological and archaeological constraints

**(source www.rjmcleod.co.uk)**

**Don & Low supplied Lotrak® geosynthetics for two different applications in the flood channel.**

- Lotrak® 200, a medium-weight mechanically bonded (needlepunched) nonwoven geotextile, with increased strength and filtration properties, was positioned between the Class 6U confinement layer and the geosynthetic clay liner (GCL)
- Lotrak® 70R, a high-strength woven reinforcing geotextile, was used to separate the heavyweight rock armour from the Class 6U confinement layer

# commitment

***By offering a comprehensive range of woven and nonwoven geotextiles and biaxial geogrids, Don & Low have a Lotrak® product to suit a diverse range of applications. This offers specifiers and contractors choice and flexibility to design a solution to meet both the technical and commercial requirements of every contract.***

We know the importance of product selection and ensuring the correct choice is made for each engineering project. Often the best solution is use of a combination of products, and our team is always available to help with the selection and specification of Lotrak® products.

At the same time, our extensive network of distribution partners ensures Don & Low's Lotrak® geosynthetics are delivered to your site quickly and effectively.

With a high commitment to quality, we work closely with our suppliers and customers and continue to expand our product range, offering new solutions to an ever-developing market.

Don & Low
MEMBER OF THRACE GROUP

**Don & Low Ltd**
Newfordpark House Glamis Road Forfar Angus DD8 1FR Scotland UK
**t** +44 (0)1307 452200 **f** +44 (0)1307 452300 **e** enquiries@donlow.co.uk **www.donlow.co.uk**

*Printed on paper produced with 75% recycled fibre*

**bluesquare**design 01382 223111 www.blue2.co.uk