

Staple Fiber Nonwoven Geotextile

Product Introduction

"Staple Fiber Nonwoven Geotextile" it refers to a type of nonwoven geosynthetic material made from short, discrete lengths of synthetic fibers. These staple fibers are typically processed and then mechanically bonded, usually by needle-punching, to create a stable fabric.



Staple Fiber Nonwoven Geotextile Works (Functions):

Filtration:

- This is a primary and highly effective function. The random, interlocking arrangement of short polyester fibers creates a tortuous network of pores within the fabric. This pore structure is designed to allow water to pass through freely, while simultaneously retaining soil particles. This prevents fine soil from migrating into drainage systems (like aggregate layers or perforated pipes), thereby preventing clogging and maintaining the efficiency and longevity of the drainage system. The flexibility of the short fibers also helps the geotextile adapt to varying soil conditions and resist clogging over time.

Separation:

- When placed between two layers of different materials (e.g., a granular base course and a soft subgrade soil), the geotextile acts as a physical barrier. It prevents the intermixing of these dissimilar materials, which could otherwise lead to contamination of the granular layer, a loss of its structural integrity, and ultimately, a reduction in the bearing capacity of the overall structure (e.g., a road or railway).

Drainage (In-Plane):

- While water primarily flows perpendicular to the geotextile during filtration, the network of entangled short fibers also provides channels for water to flow horizontally within the plane of the fabric. This "in-plane" drainage capacity is crucial for dissipating excess pore water pressure in saturated soils, which helps improve the stability of structures like embankments, retaining walls, or cut slopes by reducing the water content and associated pressures within the soil mass.

Protection:

- Due to their relatively thick, cushion-like, and deformable nature, needle-punched staple fiber nonwoven geotextiles provide excellent protection to geomembranes (impermeable liners). When placed beneath a geomembrane in applications like landfills or ponds, they absorb and distribute localized stresses from sharp aggregate particles or irregularities in the subgrade, preventing punctures or tears in the delicate geomembrane liner. This ensures the long-term integrity of the containment system.

Reinforcement (Moderate):

- Although continuous filament geotextiles are generally preferred for heavy-duty reinforcement due to their higher tensile strength and lower elongation, staple fiber nonwoven geotextiles still offer a degree of reinforcement. By introducing tensile strength into the soil mass, they help to distribute applied loads over a wider area and improve the overall shear strength and stability of soil structures, such as unpaved roads or embankments on soft ground. Their ability to elongate without immediate rupture makes them adaptable to some ground movements.

Key Characteristics of Staple Fiber Nonwoven Geotextiles:

- Excellent Filtration Properties: The random fiber orientation creates a highly effective filter medium.
- Good Puncture Resistance: The thick, nonwoven structure provides cushioning and resistance to localized damage.
- High Elongation: Can stretch significantly before breaking, making them adaptable to ground deformation.
- Chemical and Biological Resistance: Polyester resists degradation from common soil chemicals, acids, alkalis, and microbial attack, ensuring long-term performance in various environments.
- Versatile: Suitable for a wide range of applications due to their balanced properties.

In essence, polyester staple fiber nonwoven geotextiles are indispensable engineering fabrics that provide essential func.

Product Specifications

Index Properties	Unit	3	5	8	10	15	20	25	30	40
Longitudinal And Transverse Tensile Strength	KN/m	3.0	5.0	8.0	10.0	15.0	20.0	25.0	30.0	40.0
Tensile Elongation	%	20~100								
CBR Puncture Strength	KN	0.6	1.0	1.4	1.8	2.5	3.2	4.0	5.5	7.0
Longitudinal And Transverse Tear Strength	KN	0.10	0.15	0.20	0.25	0.40	0.50	0.65	0.80	1.00
Apparent Opening Size $O_{90}(O_{95})$	mm	0.07~0.20								
Vertical Permeability Coefficient	cm/s	$K \times (10^{-1} \sim 10^{-3})$ inside: $K=1.0 \sim 9.9$								
Acid & Alkali Resistance	%	80								
Antioxidant Resistance	%	80								
UV Resistance	%	80								

Product Gallery

