

## **IS 16391 : 2015 Geosynthetics — Geotextiles Used in Sub-Grade Separation in Pavement Structures — Specification**

Geotextiles are synthetic permeable fabrics used in pavement construction to improve road performance and longevity. In sub-grade separation for pavement structures, geotextiles primarily act as a separation layer between different soil layers, such as between the sub-grade and sub-base. This separation prevents the intermixing of the fine particles from the weak sub-grade soil with the coarser particles of the sub-base material, which is essential for maintaining structural integrity.

The four main applications of geosynthetics (geogrids and geotextiles) in roads are sub-grade separation, subgrade stabilization, base reinforcement and overlay stress absorption and reinforcement. Sub-grade stabilization and base reinforcement involve improving the road structure as it is constructed by inserting an appropriate geosynthetic layer. Base reinforcement is the use of geosynthetics to improve the structure of a paved road. Sub-grade separation and stabilization applies geosynthetics to both unpaved and paved roads

### **Key Roles of Geotextiles in Sub-Grade Separation**

**Separation:** Geotextiles prevent finer sub-grade soil particles from migrating into the sub-base, maintaining the design thickness and strength of the pavement layer. This reduces the risk of road failure due to mixing or contamination.

**Filtration and Drainage:** These textiles allow water to pass through, ensuring that the pavement layers remain drained, reducing the risk of waterlogging which can lead to soil weakening and pavement deterioration.

**Load Distribution:** Geotextiles provide improved load distribution by reinforcing the sub-grade, which helps to reduce rutting and improve the load-bearing capacity of the pavement.

**Erosion Control:** By acting as a stable barrier, geotextiles help prevent soil erosion beneath the pavement, particularly in areas prone to high water flow or dynamic load conditions.

### **Types and Properties**

Geotextiles used in sub-grade separation can be woven or non-woven fabrics. Non-woven geotextiles are generally preferred for separation because of their higher permeability and better filtration characteristics. These fabrics are selected based on their tensile strength, puncture resistance, and permeability to ensure compatibility with the expected traffic loads and environmental conditions.

### **Benefits in Pavement Structures**

Using geotextiles in pavement sub-grade separation extends pavement life, minimizes maintenance costs, and enhances the overall durability of roads.

This standard covers general and performance requirements for geotextiles used to prevent mixing of a sub-grade soil and an aggregate cover material (subbase, base, select embankment, etc) in pavement structures. This specification is also applicable to situations other than beneath pavements where separation of two dissimilar materials is required but where water seepage through the geotextile is not a critical function.