

## Polyfelt® Filter Geotextiles for Subsurface Drainage Applications



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# Polyfelt® Filter Geotextiles for Subsurface Drainage Applications

## 1. General

This document is prepared to help ensure that the filter geotextile, once installed, will perform its intended design functions. To do so, the product must be identified, handled, stored and installed in such a way that its physical property values are not affected and the design conditions are ultimately met as intended. This document does not account for every possible construction scenario. This document contains information consistent with generally accepted practices of identifying, handling, storing and installing filter geotextiles for most subsurface applications. Failure to follow these guidelines may result in the unnecessary failure of the geotextile in an otherwise properly designed application.

## 2. Product and Application

Polyfelt® filter geotextiles are manufactured using UV stabilized polypropylene fibers, needlepunched together to form a variety of robust and durable filtration fabrics with optimum permeability and pore size to cover a wide matrix of base soils and drainage aggregate sizes coming in contact with the geotextile (*see Figure 1*).

The filter geotextile acts similar to a sand filter by allowing water to move through the filter medium while retaining all upstream soil particles. For example, geotextiles are used to prevent soils from migrating into drainage aggregate or pipes while maintaining flow through the system. Typical applications include filters for road edge drains, behind gabions and other porous retaining structures, sports field drainage blankets, etc. (*see Figure 2*).

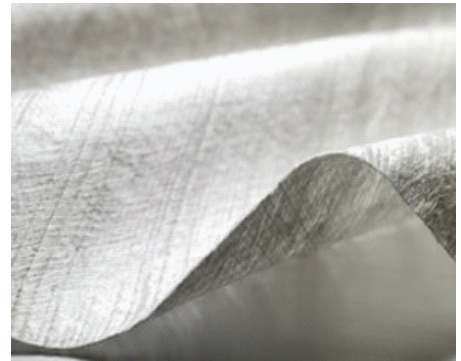


Figure 1. Polyfelt® filter geotextile

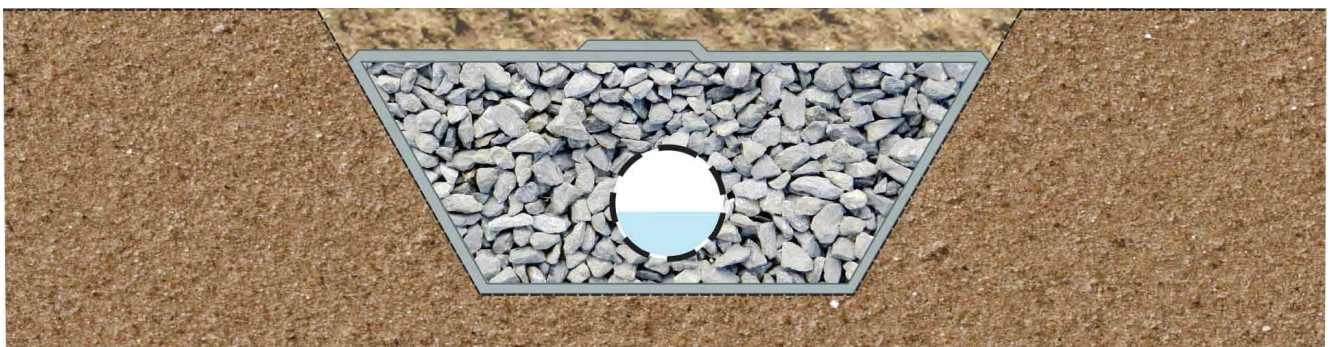


Figure 2. Typical use of Polyfelt® filter geotextile in subsurface drainage application

## 3. Material Identification, Storage and Handling

The geotextile shall be rolled on cores having strength sufficient to avoid collapse or other damage from normal use. Each roll shall be wrapped with a plastic covering to protect the geotextile product from damage during shipping and handling. Each roll shall be identified with a durable gummed label or the equivalent, clearly legible on the outside of the roll wrapping. The label shall indicate the manufacturer's name, the style number and the roll number.

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Upon delivery, check the roll labels to verify that the correct geotextile product has been received. Immediately inspect the geotextile rolls to ensure it is free of any flaws or damage that might have occurred during shipping or handling. While unloading or transferring the geotextile from one location to another, care should be taken to prevent damage to the wrapping, core, label or the geotextile itself.

If the geotextile is to be stored for an extended period of time, the geotextile shall be located and placed in a manner that ensures the integrity of the wrapping, core and label as well as the physical properties of the geotextile product. This can be accomplished by elevating the geotextile rolls off the ground on dunnage (see Figure 3).

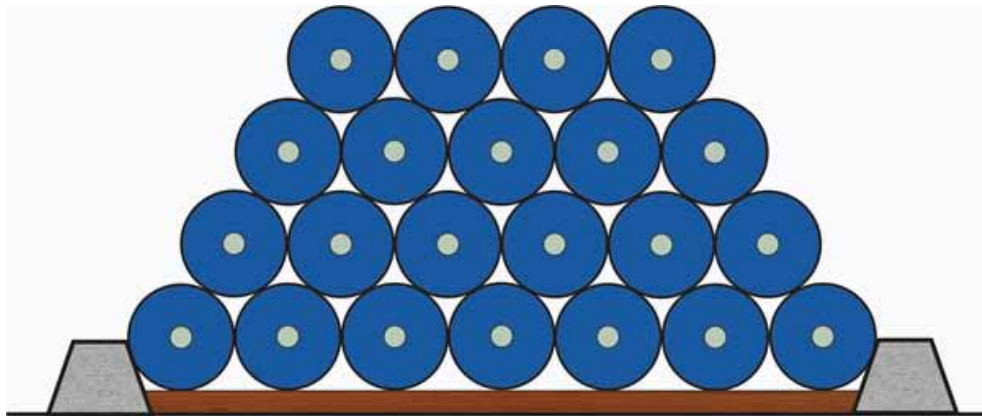


Figure 3. Recommended setup for safe onsite stacked storage of Polyfelt® filter geotextile rolls

Care should be taken to ensure that the geotextile rolls are adequately covered and protected from ultraviolet radiation, chemicals that are strong acids or strong bases, fire or flames including welding sparks, temperatures in excess of 60°C, and human or animal destruction.

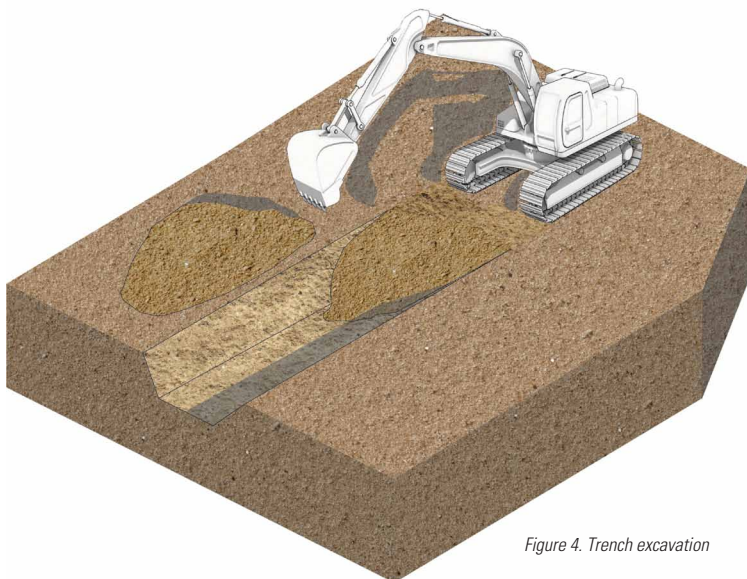


Figure 4. Trench excavation

### 4. Ground Preparation

Excavate and grade the ground surface, including trenches, according to the Engineer's design and drawings (see Figure 4). The excavated material should be removed for disposal or storage well away from the trenches to prevent trench side instability. Trim or remove any large roots or sharp objects that might puncture or tear the geotextile, refilling any voids created if necessary.

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## 5. Installation

Polyfelt® filter geotextiles are supplied generally in standard rolls of specific roll length and width. Before unrolling the geotextile, verify the roll identification, length, and installation location with the contract drawings. While unrolling the geotextile, inspect it for damage or defects. Discard or repair any damage that occurred during storage, handling or installation as directed by the Engineer.

### 5.1 For Trench Drains

*Prepare and cut the geotextile to proper width prior to the installation of the trench drain. Next, place the prepared geotextile along the excavated trench. Anchor the edge of geotextile with heavy objects or pin the geotextiles on ground to prevent movement of geotextile during the installation process. Figure 5 shows a trench drain construction, in-laid with filter geotextile and drainage materials.*

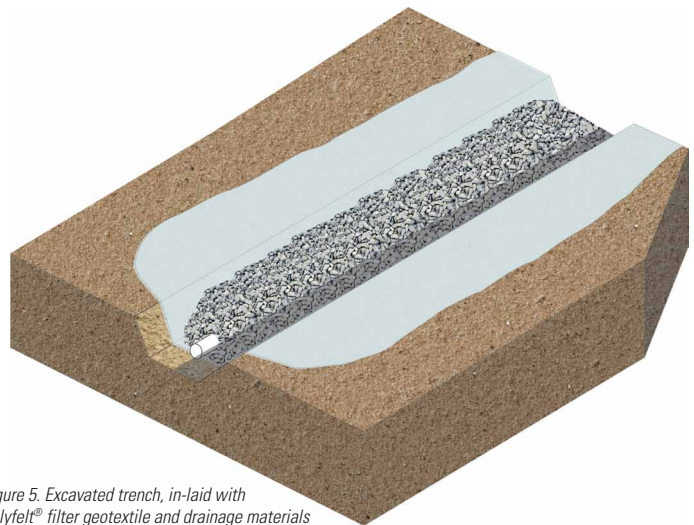


Figure 5. Excavated trench, in-laid with Polyfelt® filter geotextile and drainage materials

### 5.2 For Blanket Drains

*For blanket drains, the geotextile is typically laid in full roll widths. Place the geotextile over the prepared ground to be as smooth and wrinkle free as possible. When the blanket drains include intermittent trench drains the geotextile may be laid in the trenches first according the manner outlined in section 5.1 above, before the general horizontal laying for the blanket drain. Alternatively, the geotextile may laid over the trench and blanket drain in one go; for this the geotextile laying is adjusted such that it drapes over the trench adequately.*

## 6. Jointing

A nominal geotextile edge overlap of 300 mm is generally sufficient to prevent formation of filter discontinuity during backfilling operation (see Figure 6). However, in some applications this may not be adequate. For example, when blanket drains are constructed, due to the large footprint area involved, it would be necessary for machinery to traverse on top of aggregate placed over the filter geotextile. Under such conditions the overlap may need to be larger than nominal overlap if the subgrade is soft. Table 1 shows the recommendation for Polyfelt® filter geotextile edge jointing under different subgrade CBR conditions for blanket drain applications.

Table 1. Recommendation for Polyfelt® filter geotextile edge jointing under different subgrade CBR conditions for blanket drain applications

Subgrade CBR	Recommended Joint
> 3	0.3 m overlap
2 - 3	0.45 m overlap
1 - 2	0.6 m overlap
< 1	consider sewing

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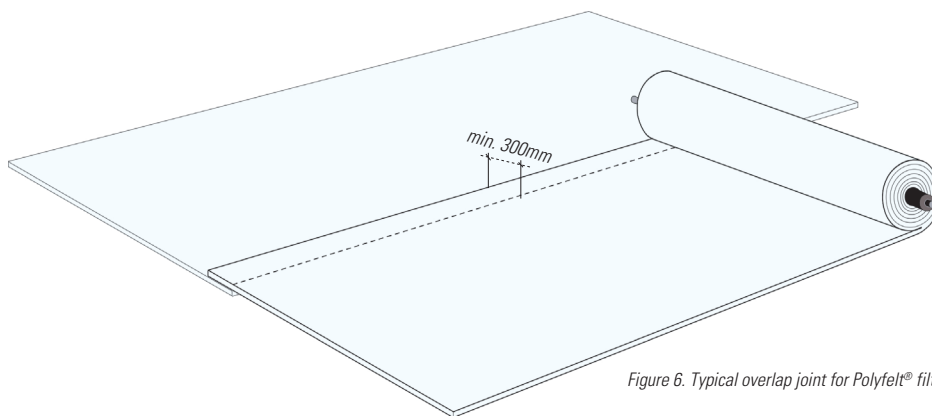


Figure 6. Typical overlap joint for Polyfelt® filter geotextile

## 7. Backfilling and Compaction

Placement of drainage aggregate and pipe (if required) should proceed immediately following placement of the geotextile. If drainage pipes are to be used, place a layer of drainage aggregate on top of the geotextile before installing the drainage pipe to the required grade.

### 7.1 For Trench Drains

*For trench drains the drainage aggregate is usually compacted using plate compactors. Ensure that no foreign material is included in the aggregate. Compact the aggregate to ensure the geotextile conforms to the excavation sides.*

### 7.2 For Blanket Drains

*For blanket drains place the aggregate using lifts such that no equipment is operated directly on the geotextile. Unless otherwise instructed by the Engineer, a minimum aggregate fill thickness of 150 mm over the geotextile is required before construction equipment is allowed on.*

### 7.3 Compaction Standard

*Level the aggregate to the grade designed by the Engineer before folding over of the filter geotextile (in the case of trench drains) or placing a top filter geotextile layer (in the case of blanket drains) on top of the aggregate. The trench drains or blanket drains typical require a soil cover layer. Unless otherwise instructed by the Engineer, the aggregate and soil cover fills are generally compacted to a minimum of 95% of the optimum dry density and +2% of the optimum moisture content, according to the AASHTO T-99.*

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**TenCate Geosynthetics Asia Sdn. Bhd.** (264232-U)  
 14, Jalan Sementa 27/91, Seksyen 27,  
 40400 Shah Alam, Selangor Darul Ehsan, Malaysia.  
 Tel: +60 3 5192 8568 Fax: +60 3 5192 8575  
 Email: info.asia@tencategeo.com www.tencategeo.asia

