

Hy-Tex Terrastop™ Silt Fences for Stormwater Run-Off Control

Hy-Tex Terrastop silt fence in use on National Grid's Milford Haven to Aberdulais gas pipeline project



Hy-Tex Terrastop silt fence in use on National Grid's Felindre to Brecon gas pipeline project



News: Terrastop HighFlow trapped approx. 5 tonnes of silt per 10m fence run over 1 month on potato field trials in Scotland

Terrastop™ Premium (W1380)



1137-CPR-0613/29

Sand bags in both grades also available for no-dig solutions. Call for further details

Many construction, forestry and farming activities result in disturbed or bare ground that is vulnerable to weather erosion. The silt laden run-off, plus site debris and other pollutants, often contaminates surrounding land, watercourses, lakes and drains - resulting in significant environmental diffuse pollution and potentially costly fines.

However, due to the on-going nature of such work, it is generally not possible to protect exposed surfaces until the project is complete. So stormwater from such sites represents a major non-point source of diffuse water pollution in the UK.

Solution: Hy-Tex *Terrastop™ Premium*, and *HighFlow* silt fences, offer a proven, practical, economic and effective method to reduce stormwater run-off pollution from such locations. They are special, high quality, permeable, technical filter fabrics, that can be installed as an entrenched vertical barrier fence, and are designed to intercept and detain run-off - trapping harmful silt through settlement and filtration before it leaves the site.

Performance: The benefits of silt fences are increasingly becoming recognised in Britain: The Environment Agency/SEPA Pollution Prevention Guidelines (PPG5) now recommend the use of silt fences to reduce silt transport from exposed ground and stock piles; and research at The James Hutton Institute, using Terrastop silt fencing, demonstrated that even after post-harvest contour grubbing of potato fields an estimated 80 tonnes of soil containing 60-70 kg phosphate-P contaminants was trapped from a 17ha field [[Dr Andy Vinten](#)].

While in other countries where silt fences have been used extensively for many years, their proven performance (Intercepting up to 86% of suspended solids [Horner et al. 1990]) has made them a standard *Best Management Practice* on a diverse range of projects.

From this in-depth research, and practical experience, Hy-Tex *Terrastop™ Premium* and *HighFlow* were developed to exceed the highest standards, with many unique features for ease of use, reliability and effective results.

Key Features: General purpose non-woven and woven geotextiles are unsuitable for silt fence use as they clog, overtop and inadequately filter sediment due to poor hydraulic properties (typically less than 10 l/m²/sec) and often fail: tearing and fraying (as they are too weak to withstand the forces of stormwater/silt build-up without costly additional wire support fences) or becoming brittle quickly (due to lack of UV protection). *Terrastop™ Premium* and *HighFlow* are manufactured specifically as silt fences so have high tensile and burst strengths, premium UV stabilisation, woven structures with tear resistant non-fraying reinforced edges, that are durable and self supporting between fixing posts for reliability, as well as having a visually pleasing subtle green colour.

The CE Mark certified *Terrastop Premium* also has an special fibrous weft yarn, combined with a high quality weave, to enhance filtration, maintain flow and minimise clogging.

Installation Aids: Silt fences also often fail through poor installation or aftercare, therefore *Terrastop™ Premium* incorporates pre-marked lines for burial depth and maximum silt accumulation level to ensure correct set-up and maintenance; as well as a top ribbon strip to simplify post attachment and tensioning.

Kirsty Liddon's Edinburgh University Dissertation "Prevention of Diffuse Pollution from Active Forestry Harvesting Sites:" concluded "the Hy-Tex [Terrastop Premium] material appears to be the most suitable material for use as sediment retention as it has the most consistent performance between differing soil types retaining the highest volumes of sediment for both gley and peat solutions."

Specification	Terrastop™ Premium (Terrasilt GR180)	Terrastop™ HighFlow
Tensile Strength	22kN/m	32kN/m
Puncture Resistance (CBR)	3,500N	3,700N
Permeability (ISO 11058)	21 l/m ² .s (45 l/m ² .s to AS 3706.9)	190 l/m ² .s
Opening Size (ISO 11058)	180µm	320µm
Weight	200g/m ²	145g/m ²
Material	1000µ thick, green/black, 400kLy UV stabilised, polypropylene, tear resistant non-fraying edges.	500µ thick, green/black, 450kLy UV stabilised, polyethylene, tear resistant non-fraying edges.
Roll Size	0.75 x 100m	1.00 x 100m
Other Key Features:	Fibrous weft yarn, burial depth and max silt height marker lines, top tying-off + tensioning ribbon.	

"Basic" grade also available for less stringent applications

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Installation Guidelines

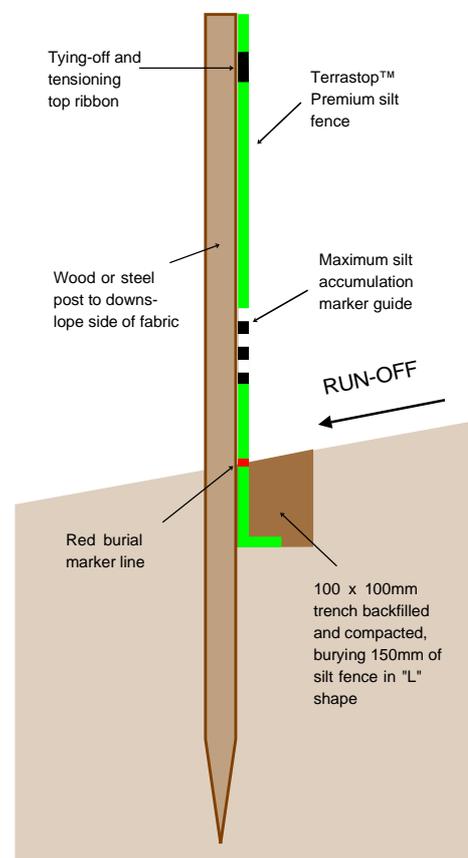
SCOPE

1. This practice covers common installation requirements for temporary silt fence applications.
2. This practice is applicable to the use of silt fences as vertical permeable interceptors designed to remove suspended soil from overland, non-concentrated water flow. The function of a temporary silt fence is to trap and allow settlement of soil particles from sediment-laden water and to filter particles from water permeating through the fabric. The purpose is to greatly limit the transport of eroded soil from the construction site by water runoff.
3. The practices presented herein are intended to ensure good workmanship and quality and are not necessarily adequate for all purposes in view of the wide variety of possible sediments and performance objectives.
4. This standard does not purport to address all safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

CONDITIONS WHERE PRACTICE APPLIES

1. Below disturbed areas where erosion would occur in the form of sheet and rill erosion, and where ponded run-off will not cause damage.
2. Where the size of the drainage area is no more than 0.30 hectares per 100.00m of silt fence length; the maximum slope length behind the barrier is 30.00m; and the maximum gradient behind the barrier is 50 percent (2:1).
3. In minor swales or ditch lines where the maximum contributing drainage area is no greater than 0.80 hectares.
4. Under no circumstances should silt fences be constructed in live streams or in swales or ditch lines where flows are likely to exceed 0.03m³/s.

Figure 1: Hy-Tex Terrastop™ Premium



5. Silt fence should not be used in areas where rock or hard surfaces prevents the full and uniform depth anchoring of the barrier.

DESIGN CRITERIA

1. An effort should be made to locate silt fence at least 1.50 to 2.00m beyond the base of disturbed slopes with grades greater than 7%.
2. Properly supported silt fence which stands 0.60 metres above the existing grade tends to promote more effective sediment control (higher fences are vulnerable to excessive wind resistance or may impound volumes of water sufficient to cause failure of the structure).
3. A minimum 150mm of silt fence shall be embedded.
4. Maximum post spacing shall be 1.50m.

CONTROLLING MATERIAL SPECIFICATIONS

1. The material used for temporary silt fence shall be Hy-Tex Terrastop™ Premium, or similar approved, with CE Mark certification for EN13253: erosion control works and conforming to the following specification requirements:

Grab tensile strength [ASTM D4632]: minimum 0.98kN warp, 0.95kN weft. Water permeability [NBN EN ISO 11058]: minimum 21 l/m².s. Opening size [EN ISO 12956]: maximum 180µm. Composition: 400kLy UV stabilised woven polypropylene with split tape warp and fibrillated fibre weft yarns, burial depth and maximum silt accumulation marker lines, top tying-off and tensioning ribbon, tear resistant non-fraying edges and 0.75m fabric width.

2. The contractor shall provide to the engineer all certifications required by the controlling material specification.

3. Silt fence materials shall be subject to sampling and testing in accordance with, and to verify conformance with, the controlling material specification.

4. All posts shall be a minimum length of 1.20m, have sufficient strength to resist damage during installation and to support the applied loads due to material build up behind the silt fence.

[Note 1]: Generally, for wooden posts the cross section must be minimum 30 x 30mm for hardwood and 50 x 50mm for softwood; while steel posts (standard "U", "T" or "L" section) must be a minimum weight of 2kg/m).

INSTALLATION

1. Silt fences sections should be continuous and transverse to the flow. The silt fence should follow the contours of the site as closely as possible. Place the fence such that the water cannot runoff around the end of the fence, extending ends upslope enough to allow water to pond behind the fence (See figure 2).

2. A trench shall be excavated approximately 100mm wide and 100mm deep on the upslope side of the proposed silt fence location.

3. Bury bottom 150mm of silt fence (To top of RED MARKER LINE on Terrastop™ Premium) in a "L" configuration in the trench so that no flow can pass under the silt fence. Backfill the trench and compact the soil over the geotextile so that the compacted soil completely fills the trench.

4. Compaction prior to installing posts is generally recommended. Compact the backfill soil immediately next to the silt fence geotextile. Compact the upslope side first, and then the downslope side. The soil adjacent to the buried silt fence geotextile shall be compacted to achieve no less than 50% of its original insitu strength, unless otherwise specified.

[Note 2]: Poor compaction is one of the main causes of silt fence failure. Installed posts may interfere with compaction by large equipment adjacent to the silt fence. Compaction is commonly accomplished with the front wheel of a tractor, skid steer, roller or other device, as well as with manual tamping or other manual means, taking care not to damage the silt fence.

5. When joints are unavoidable, the fabric shall be spliced together only at a support post, with a min. 300mm overlap, and securely sealed so that there are

no gaps, voids, or other loss of integrity of the barrier, ideally by wrapping the overlap around the post.

6. Place the posts tight to the downslope side of the silt fence at 1.50m spacing. Drive posts a minimum of 500mm into the ground. Increase depth to 600mm if fence is placed on a slope of 3:1 or greater.

[Note 3]: Where 500mm depth is impossible to attain, posts should be adequately secured/braced to stop overturning of the fence due to sediment loading.

7. Fasten the filter fabric securely and taut to the upslope side of the posts using top ribbon (see figure 3), wire/cable ties threaded through the silt fence, or 30mm long extra wide head galvanised clout nails (The fabric shall not be stapled to existing trees). Where required, tighten top edge of fabric by looping top ribbon over posts, and strain/brace posts to maintain fence tension and stability (See figure 1).

[Note 4]: If a silt fence is to be constructed across a ditch line or swale, the fence length must be sufficient to eliminate endflow, the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope. and post spacing a maximum of 1.00m.

MAINTENANCE

1. The contractor shall inspect all temporary silt fences immediately after each rainfall, and at least daily during prolonged rainfall. The contractor shall immediately correct any deficiencies.

2. The contractor shall also make a daily review of the location of silt fences in areas where construction activities have altered the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, as determined by the engineer, additional silt fence shall be installed as directed by the engineer.

3. Repair damaged or otherwise ineffective silt fences or replace promptly.

4. Either remove sediment deposits when the accumulation reaches one third the height of the exposed fence (Top of BROAD WHITE/BLACK MARKER BAND on Terrastop™ Premium), or install a second silt fence as directed by the engineer.

5. The silt fence shall remain in place until the engineer directs it be removed. Upon removal the contractor shall remove and dispose of any excess sediment accumulations, dress the area to give it a pleasing appearance, and vegetate all bare areas in accordance with contract requirements.

6. Removed silt fence may be used at other locations provided the geotextile and other material requirements continue to be met to the satisfaction of the engineer.

Figure 2: Silt Fence Placement

Alignments called 'U' or 'J' hooks ensure water & sediment pond behind each silt fence.

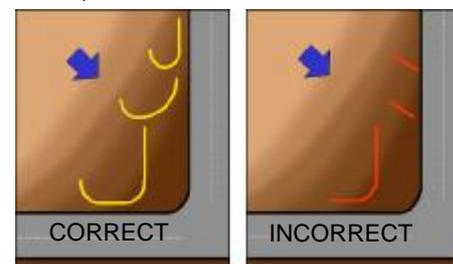
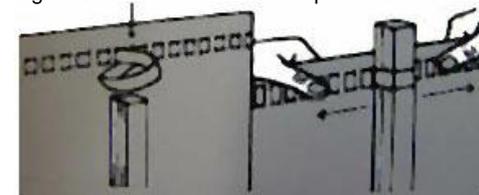


Figure 3: Ribbon attachment to post



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