Global Synthetics
LEADERS IN GEOSYNTHETICS

ProTube® Dewatering Tube

High-flow Geotextile Tubes for Ultra-efficient Dewatering

Efficient and cost effective dewatering solutions



Product Information

The Global Synthetics dewatering ProTube is made from a specially constructed geotextile that has excellent tensile strengths and filtration characteristics suitable for the manufacture of dewatering tubes and for the dewatering of a range of sludge materials.

Dewatering of sludge material using the ProTube product works by:

- Containing the fine grained sludge material within the unique weave of the Global Synthetics ProTube geotextile.

- Dewatering of the excess water through the specially constructed pores of the Global Synthetics ProTube geotextile.

There is significant volume reduction of the sludge material which allows for repeated filling of the ProTube product in many cases. Consolidation occurs after the final cycle of filling and dewatering. The fine grained solids contained within the ProTube product continue to consolidate through desiccation with residual water continuing to escape through the geotextile pores. This results in the most effective residue state for final disposal of the waste.

Applications

Sludge is pumped into ProTube dewatering tubes with or without flocculants depending on the sludge particle sizes. During and after the filling process, the water dissipates through the fabric while the solid particles are retained within the geotextile tubes with low moisture contents.
The volume of consolidated sludge continues to reduce over time, reducing disposal costs. Installation costs for ProTube dewatering bags are very low compared to traditional or mechanical methods.

Use of polymer flocculate is recommended to speed up the dewatering process.

ProTube® Dewatering Tubes

Benefits

- Cost-effective alternate to traditional methods
- Minimal environmental impact
- Small footprint
- Dewater faster
- Work with a large variety of sediments, sludge and sand
- High-strength, permeable geotextile
- Tough, UV resistant

Features

- Custom fabrication to suit the application
- High strength factory seam strength
- High-flow geotextile for ultra-efficient dewatering





ProTube® Dewatering Tubes

Product Data Sheet

GT50/50 and GT100/100 high flow textile fabric used in the manufacture of the ProTube is composed of high-tenacity polypropylene filaments which are woven into a stable network such that the yarns retain their relative positions. GT50/50 and GT100/100 is inert to biological degradation and resistant to naturally encountered chemicals, alkalis and acids. GT50/50 and GT100/100 textile fabric has been constructed to maintain excellent tensile strengths and filtration properties required for the application of ProTube.

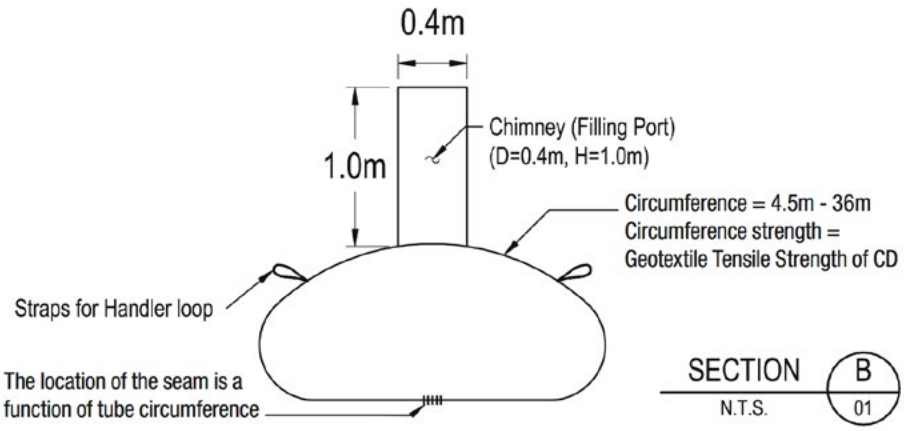
Mechanical Properties	Test Method	Units	ProFab GT50/50		ProFab GT100/100	
Tensile Strength	ASTM D4595	kN/m	50	50	100	100
Elongation	ASTM D4595	%	18	10	13	13
Trapezoidal Tear Strength	ASTM D4533	N	600	550		
Static Puncture Resistance	ASTM D6241	N	4200		11000	
Hydraulic Properties	**Test Method**	**Units**	**ProFab GT50/50**		**ProFab GT100/100**	
Permittivity	ASTM D4491	sec-1	0.6		0.7	
Flow Rate (50mm Head)	ASTM D4491	l / min / m^2	1800		2100	
Apparent Opening Size (O_{95})	ASTM D4751	mm	0.425		0.425	
Roll Size		**Units**	**ProFab GT50/50**		**ProFab GT100/100**	
		m	4.57 x 50		5.1 x 50	

1. The values are indicative and correspond to typical average values obtained during production and from independent testing.
2. MD and CD refer to values obtained in the machine direction (roll length) and cross machine direction (cross roll)

Nominal Circumference (m)	Recommended Max Fill Height (m)	Approximate Volume (m^3/m)
4.5	1.1	1.4
6.8	1.3	3.0
9.0	1.5	4.5
13.5	1.9	9
18.0	2.2	14.5
27.0	2.3	24
36.0	2.5	36

* Approximates based on Slurry weight 11kN/m^3

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N.B. ProTube may be constructed to a variety of sizes in both length and diameter.
Please speak to Global Synthetics for your specific project requirements













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ProTube® Filling Procedure

PREPARE THE AREA FOR PLACEMENT
of the ProTube product by ensuring that the site is made level and that all debris is removed that may damage the ProTube. There may be a requirement for the installation of a suitable membrane to the base of the site. An effective future drainage blanket may be incorporated to the underside of the ProTube product (such as ProCell drainage cell) in conjunction with a suitable nonwoven geotextile (such as ProFab geotextile). Adequate area for access to the tubes is to be allowed for. It is advisable to place the ProTube product within a "bunded" cell area to minimise the risk of potential spillage. A slight "fall" in grade of 0.5% maximum may be helpful in the direction of ProTube length such that there can be a collection point for effluent water within the "bunded" cell area.

UNROLL THE PROTUBE
product in the desired position. The tube cannot be moved once material has been placed in the tube. The tube position should allow for a sump within the "bunded area such that the effluent water may be pumped from the cell. If necessary use the webbing loops sewn into the seams to secure the ProTube during filling operations. These loops should be released as the ProTube is filled.

POLYMER ADDITION
to the Protube should be considered to maximise the benefit of ProTube use. Speak to our consultants for specific advice on polymer addition.

THE PROTUBE IS THEN PUMPED
full of material, to a predetermined height (safe fill height) and then left to dewater under gravity over time. Dewatering rates of ProTube will depend on type of waste material pumped into the tube. Excessive pumping pressures are to be avoided, as rupture of the ProTube may occur if the seams are over-stressed.

ONCE SUFFICIENT DEWATERING
has taken place the ProTube may be pumped full again, to the same height and pressure restrictions as set for the first fill cycle. This cycle can be repeated until it is assessed that the ProTube contains sufficient solids that further filling is not warranted. The number of fill cycles is dependent upon the waste material to be dewatered.

CONSOLIDATION OF THE FINES
within the ProTube starts occurring after the final cycle of filling and dewatering through desiccation with residual water continuing to escape through the unique pore structure of the GT100/100 textile. When it is assessed that the material within the ProTube has dried sufficiently the ProTube may be cut open and may be left to further air dry. The fill material may be disposed to a suitable waste site. Alternatively, small tubes can be manhandled and suitably disposed including the contained dewatered sludge.



About Us

Leaders in Geosynthetics

Global Synthetics is a 100% Australian-owned company, proud to offer a complete range of high-quality geosynthethic products backed by over 200 years of combined staff experience in the industry.

We have supplied products to some of the largest recent infrastructure works in Australia. Global Synthetics provides major benefits to any geotechnical engineering project with the right products and our technical expertise.

Global Synthetics products are used in the following applications:

- Pavement Stabilisation
- Ground Improvement
- Soil Reinforcement and Retaining Structures
- Water Management
- Drainage Systems & Hydraulic Works
- Landfills
- Coastal Erosion Structures

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