TENCATE Geotube®

PDS
Product Description Sheet

Geotube® LES™ (Lake Embankment System)

Marine Containment Structure

OUR COMPANY

TenCate develops and produces materials that function to increase performance, reduce cost, and deliver measurable results by working with our customers to provide advanced solutions.

Completed project

OUR PRODUCT

The Geotube® LES™ (Lake Embankment System) is a low cost, embankment erosion counter-measure system. Unlike conventional erosion control methods, such as rock rip-rap, Geotube® LES™ can be buried and revegetated to be made virtually invisible. The system utilizes a small tube constructed of nonwoven geotextile, which is filled with onsite sand or soil. The soil is contained and compressed inside of the tube where it remains to serve as a structural mass. Geotube® LES™ tubes can even be stacked to create a taller structure when necessary.

The Geotube® LES™ installation process is simple. The tube is placed at the toe of the embankment where erosion occurs. Slight excavation of the area may be required to obtain the desired finished elevation of the installed tube. The tube is then held in place by driving suitable stakes through the anchor flap, which is integrated along the back side of the Geotube® LES™ tube. The tube can easily negotiate changes in embankment alignment by simply utilizing a greater frequency of stakes at the location of the curve. Sand or soil is hydraulically injected into the tube through self-closing ports, which are spaced at 50 ft. intervals along the top of the tube. Once installed, the surface of the Geotube® LES™ tube and the void area behind the tube are backfilled with onsite sand or soil. The entire construction zone may then be revegetated to create a natural appearing embankment.

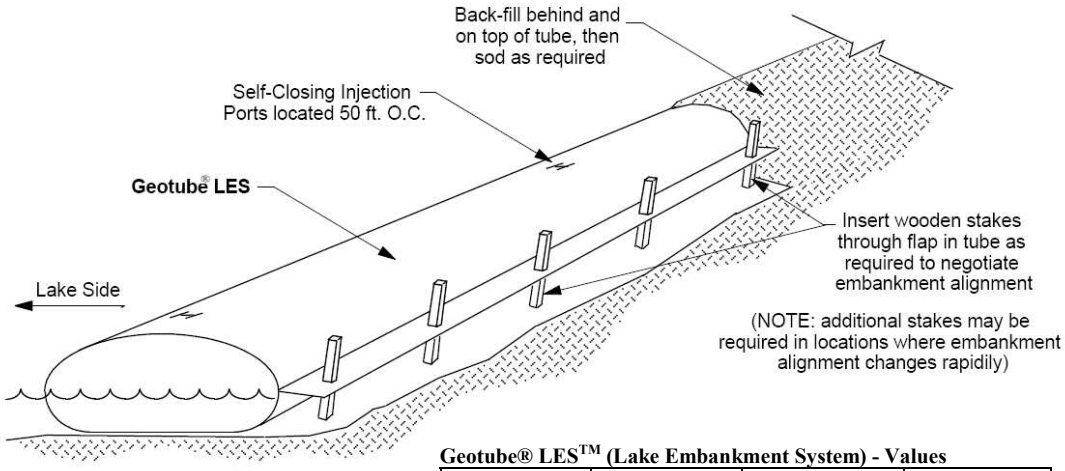
Geotube® LES™ being installed

OUR SERVICE

TenCate offers comprehensive service that includes assistance during design and specification. With extensive knowledge and great customer service, TenCate makes the difference.

TENCATE

Geotube®



Geotube® LES™ (Lake Embankment System) - Values

Filled Height	Filled Width	Filled Volume (lin. Ft.)	*Est. Weight (lin. Ft.)
1.5 ft.	**5.5 ft.**	**0.3 c.y.**	**950 lbs.**

*with sand in-fill

Geotube® LES™ (Lake Embankment System) is a nonwoven textile composed of polypropylene fibers, which are formed into a stable network such that the fibers their relative position. Geotube® LES™ (Lake Embankment System) is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.3 (300)	1.3 (300)
Grab Tensile Elongation	ASTM D 4632	%	50	50
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.5 (115)	0.5 (115)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	4030.0 (585)	
Puncture Strength[1]	ASTM D 4833	kN (lbs)	0.8 (175)	
CBR Puncture Strength	ASTM D 6241	kN (lbs)	3.6 (800)	
Apparent Opening Size (AOS)	ASTM D 4751	mm (U.S. Sieve)	0.15 (100)	
Permittivity	ASTM D 4491	sec^{-1}	0.8	
Flow Rate	ASTM D 4491	$l/min/m^2$ ($gal/min/ft^2$)	2648.1 (65)	
UV Resistance (at 500 hours)	ASTM D 4355	% strength retained	70	

[1] ASTM D 4833 has been replaced with ASTM D 6241

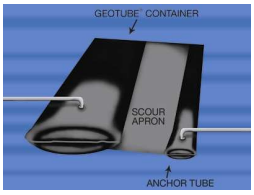
How Geotube® Marine Containment Structure Technology Works

Building a marine containment structure with Geotube® technology is a three-step process.

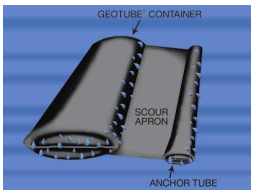
In the ***filling*** stage, the Geotube® container is filled with dredged sand or similar materials. The Geotube® containers are constructed of a unique fabric, specially engineered for a marine structure.

In the ***containment*** stage, the durable and high retention fabric allows the dredged materials to fall out of suspension and form a dense monolithic structure.

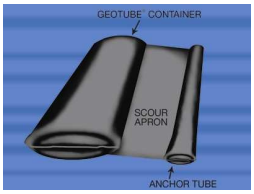
In the final stage, ***structural***, the contained and densified material serves as a structural mass. When utilized with an accompanying Scour Apron, the Geotube® container may be utilized as a sand dune core or other shoreline re-nourishment or erosion prevention medium.



Step 1: Filling



Step 2: Containment



Step 3: Structural

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