ENVIROTUBES™

by Industrial Fabrics, Inc.

Industrial Fabrics, Inc.
510 O' Neal Lane
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(225) 273-9600 or (800) 848-4500
www.envirotubes.com

ENVIROTUBE INFORMATION & CAPACITY CHART

The tubes are sized and measured by circumference and length. A tube cannot be measured by diameter because it never becomes round. Even when full, the cross section of the tube is elliptical.

The tubes are made from a woven geotextile that is in a 15 ft. width. This makes 15 ft. the common denominator for the circumference sizes. The tubes are 15 ft., 30 ft., 45 ft. and sometimes 60 ft. in circumference. Standard lengths are 50 ft., 100 ft., 150 ft. and 200 ft. When the tube has been pumped, it can be measured by height and width. The maximum height that a tube can be pumped will vary some with the material and by application. The height also determines the width.

Envirotubes are fabricated from Propex® Geotex® 4x6 structural soil reinforcement geotextile. The fabric has a 400 pound per inch strength lengthwise, and 600 pounds per inch crosswise. The weave of this fabric passes water easily, but retains solids well. The geotextile fabric is very slippery and releases the filter cake well.

Dewatering in a tube is a factor of gravity, time and chemistry that separates the water from the solids and allows the water to escape through the fabric. This is not a filter press function. The water must separate from the solids to escape through the fabric, and escapes through the top of the tube. A polymer is usually used to speed up the process, and to clear up the decant water. The dewatering process usually works best when more than one tube is used and the input flow is alternated between tubes, allowing still decant time.

How much material can be pumped into the tube with each pumping is determined by measuring the height of the tube. How many times the tube can be pumped is determined by measuring the stretch of the fabric. If the tube is not pumped over the safe height the tube may be pumped many times. The capacity of the tube can be determined by using the capacity chart and the hanging bag shrink test. This will give an estimate of how many feet of tube will be needed for a particular job. Sand, of course, does not shrink at all, whereas normal lake sediment will shrink about 50%, organic sludge will often shrink 75% to 90%. The best way to determine this is by using the hanging bag, which comes with instructions how to run a test.

The side by side direction of the lay-down area should be level or nearly level. If there is a grade, the first tube must be laid at the lowest point. The subsequent tubes can then lean against the first tube to prevent rolling. The first tube will probably have to be restrained. The handles on the tubes will only hold the tube in place on the level surface, or hold the tube next to the previous tube for positioning while the filling process is started. The handles are designed to fail before the tube fabric fails. Sandbags can by placed under the low side of the tube to make up for a slight grade or dip. A plastic covered berm or concrete barriers for the tube to lean against make the best restraints. A dewatering tube will climb over too low a barrier like a slinky toy.

The tube does not easily roll lengthwise. The amount of lengthwise grade will however affect the capacity of the tube. A 1% grade will lose 1 foot of elevation per 100 ft. on the high end. A 200 ft. tube will lose 2 ft. on the high end. This will average out to a 1 ft. loss on the capacity chart. The height of the tube must be measured at the lowest ground elevation. The lay-down width dimension of the 45 ft. circumference tube will be 21 ft. wide when empty, and 18 or 19 ft. when full.

A large volume of water will have to be dealt with; erosion is definitely a factor. Plastic should be used under the tube to prevent erosion on soft ground. The water exits the top of the tube, and cascades over the sides. Creating an exit path for the water allows you to easily control the direction of the water flow (water will not flow out under or between the tubes).

PROPEX
Geotex® woven geotextiles for stabilization, separation, filtration, erosion protection and waste containment applications.

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ENVIROTUBE CAPACITY CHART

Height Feet	15' Circumference per linear foot		30' Circumference per linear foot		45' Circumference per linear foot	
	Gallons	Cubic Yards	Gallons	Cubic Yards	Gallons	Cubic Yards
1	46	0.2	102	0.5	156	0.8
2	80	0.4	191	0.9	296	1.5
3	106	0.5	265	1.3	424	2.1
4	130	0.6	330	1.6	536	2.7
5			393	1.9	624	3.2
6			135	2.2	732	3.6
6 ½			468	2.3	781	3.9
7					822	4.1
7½					894*	4.4
8					900*	4.45

*Above safe efficient height for some materials

The above capacities are the actual displacement of the tube. The shrinkage factor will vary greatly from one material to another. Sand will not shrink from the insitu volume to be dredged. One CY of tube capacity will be needed for each CY of sand to be dredged. Organic or fine grain materials will shrink more than 50%. How much material can be put into a tube will depend on how many times the tube is pumped and how much time is allowed for dewatering. The dewatering time is affected by whether or not a polymer is used, although some materials will not dewater without a polymer being added. A shrink factor can be established with a shrink test using a hanging bag. The tube releases water faster if not pumped to full height; only pump the tube to full height on the last filling.

Photographed by David A. Wentland, P.E., Coastal Engineer, davewentland@gmail.com, Docks & Marinas, Inc.