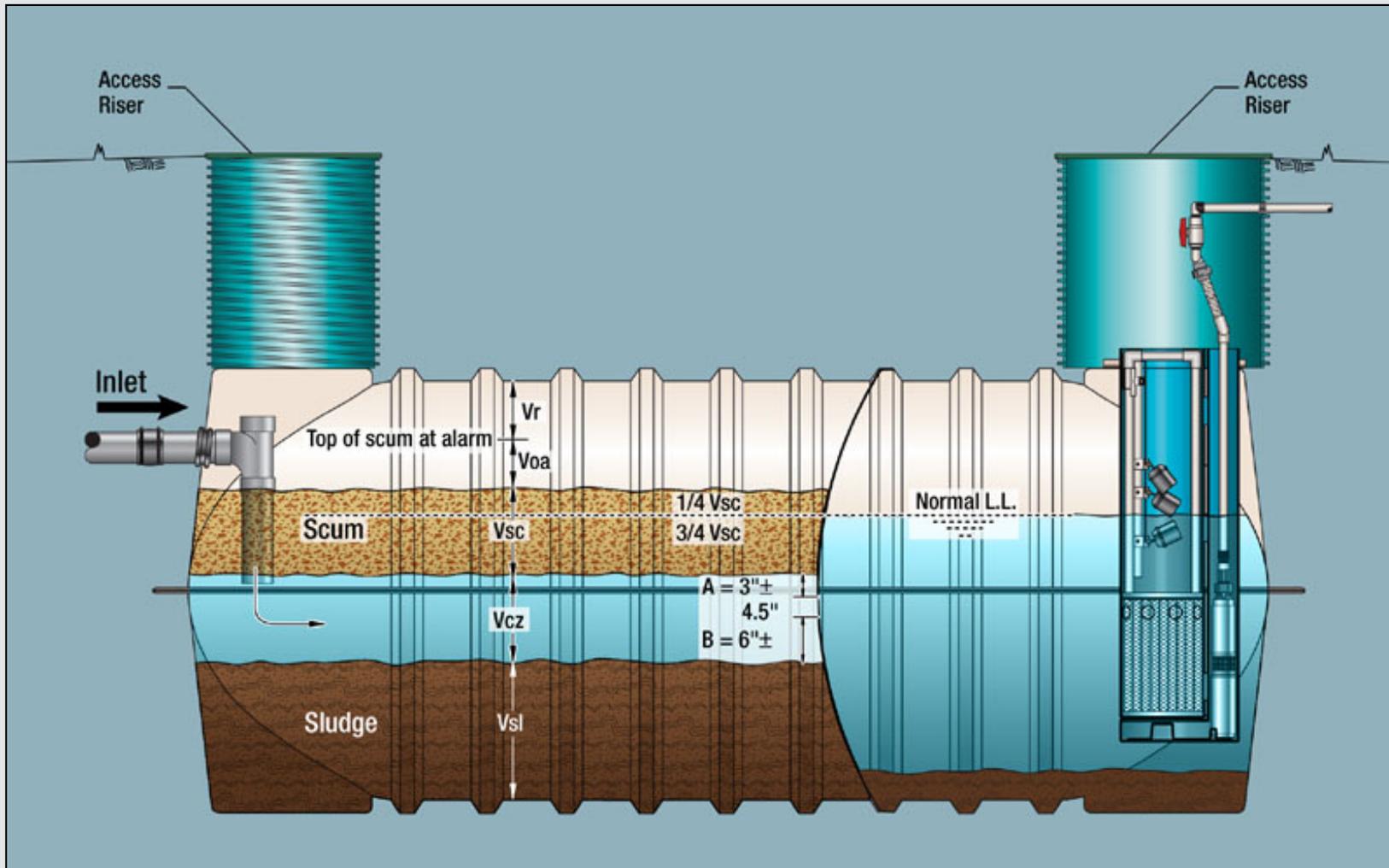


Tanks, Risers, Lids and Filtration

Tanks

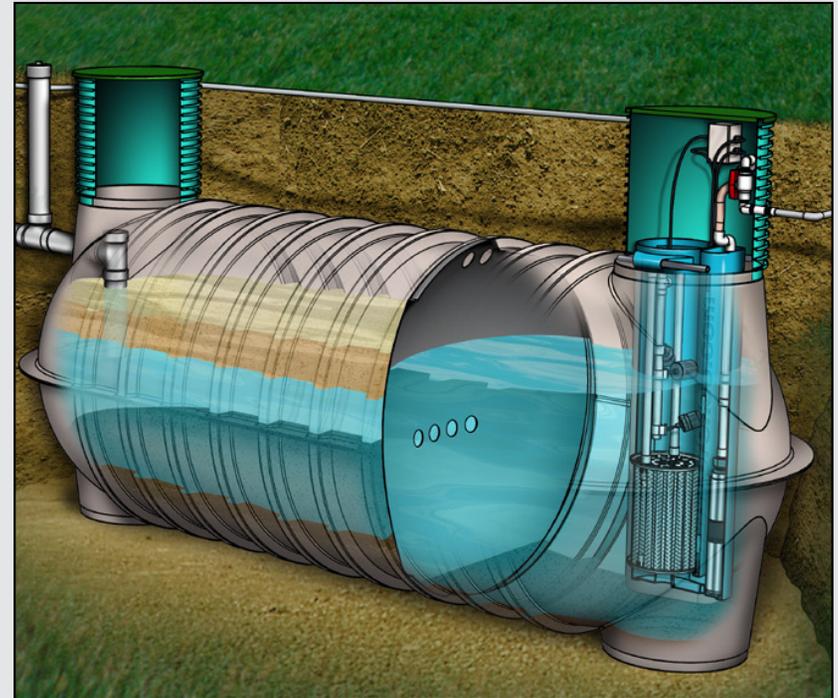
Simple Yet Complex



Properly sized and configured tanks ensure optimum performance.

Onsite Systems Begin with a Watertight Tank

- Orenco insists that tanks are
 - ~ Watertight
 - ~ Structurally sound
- With well designed and constructed septic tanks:^{*}
 - ~ BOD₅ removal greater than 65%
 - ~ TSS removal of 70% or more
 - ~ FOG removal of at least 85%
 - ~ Reduce maintenance time/cost
- Protect public health, groundwater, and the environment



^{*} *Small and Decentralized Wastewater Management Systems*, Crites & Tchobanoglous, 1998, p.183.

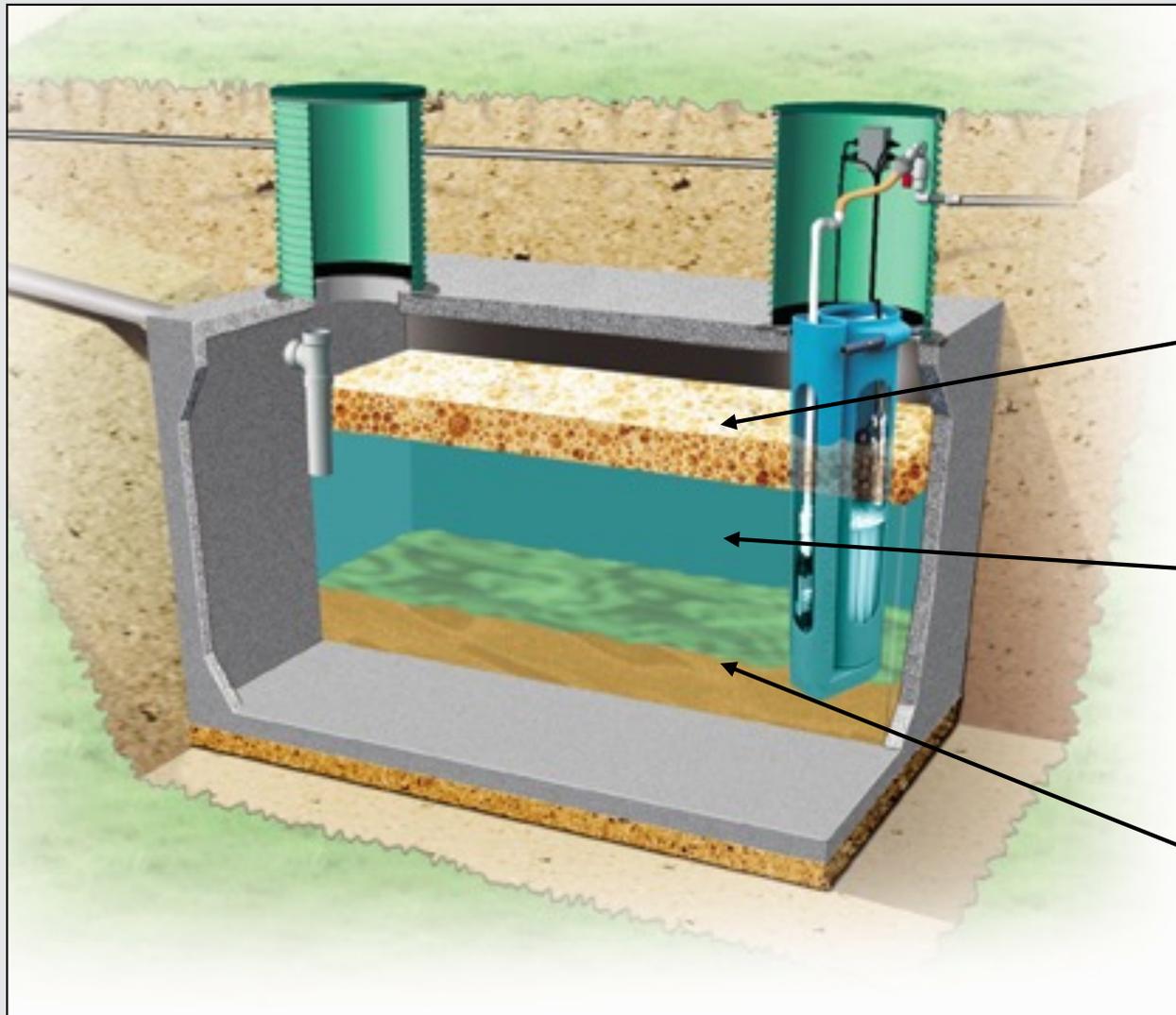
When Specifying Tanks, Consider ...

- Proper sizing
 - Tank configuration
 - Structural integrity and watertightness
 - Site and access constraints
 - Materials of construction
-
- So let's talk about **sizing** first

Typical Tank Sizing Criteria

- 3-bedroom home or smaller
 - ~ 1000 gallons
- 4- to 5-bedroom home
 - ~ 1500 gallons
- 6-bedroom home or larger
 - ~ Consult Orenco

Tank Configuration: One Compartment

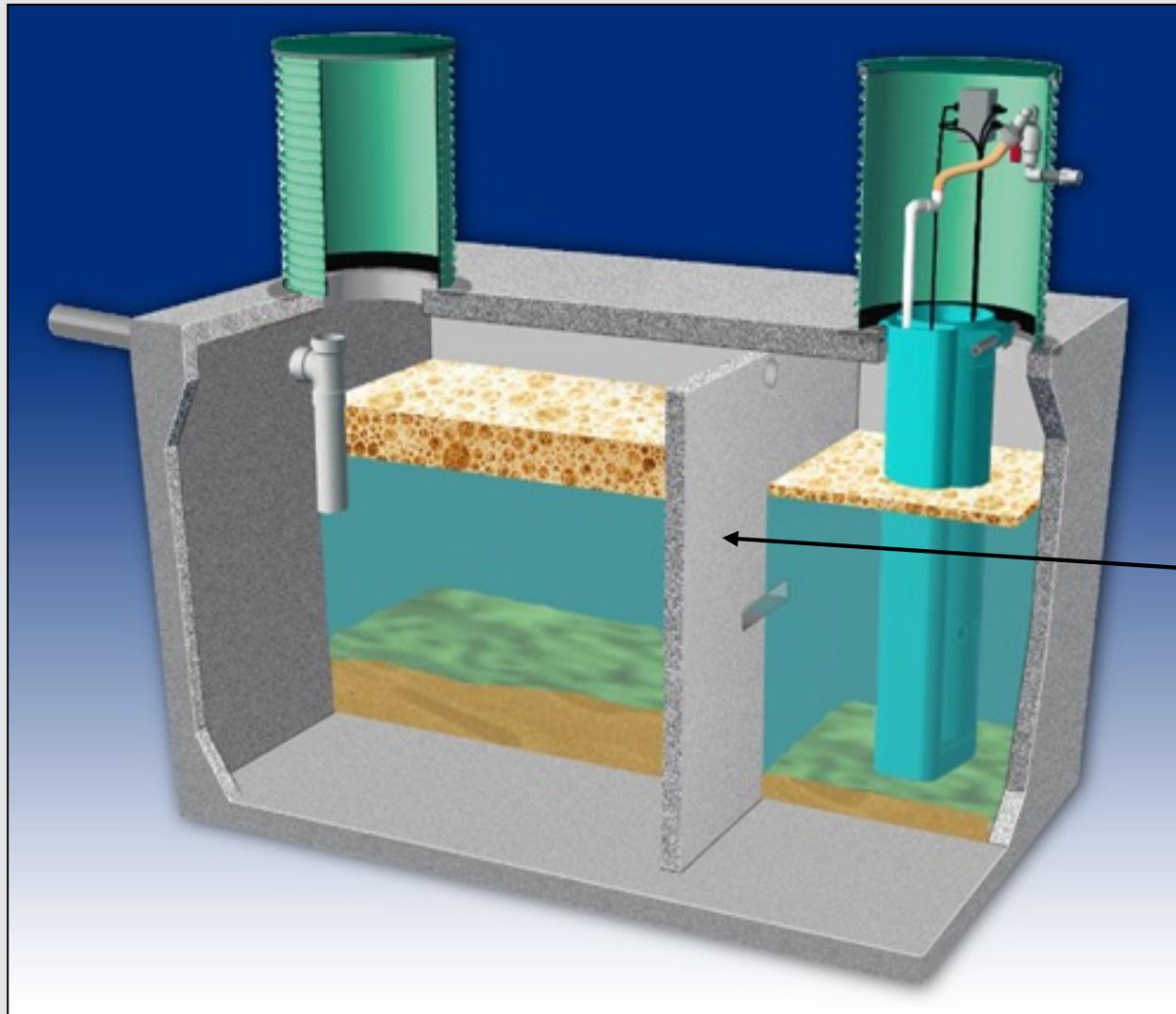


Scum layer

Clear zone

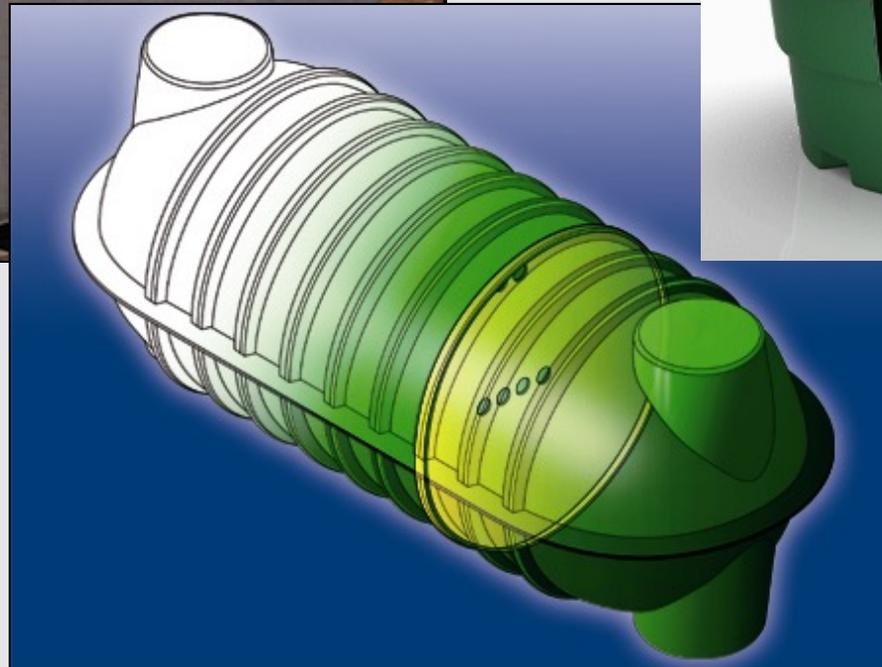
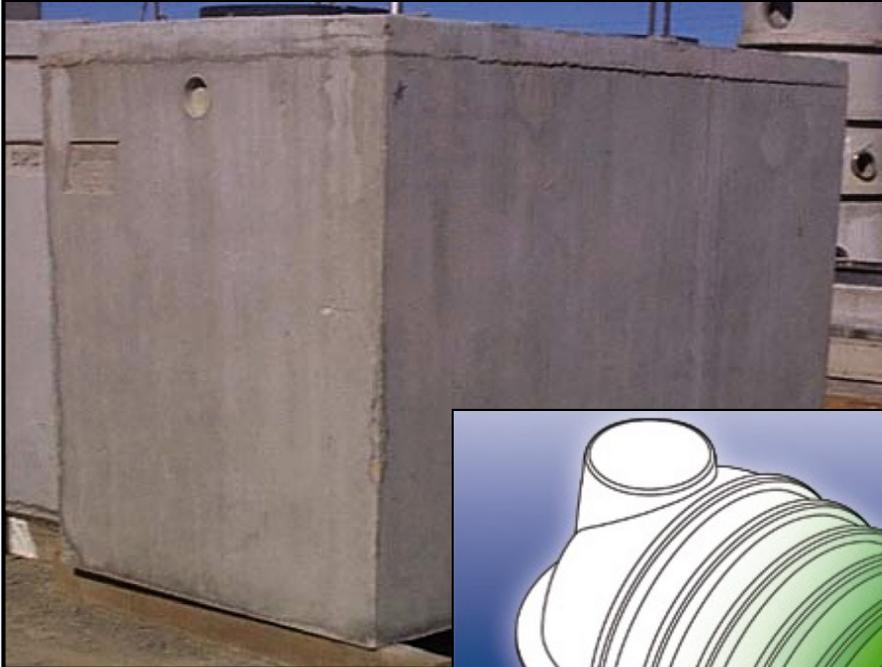
Sludge layer

Tank Configuration: Two Compartments



Baffle

Materials of Tank Construction

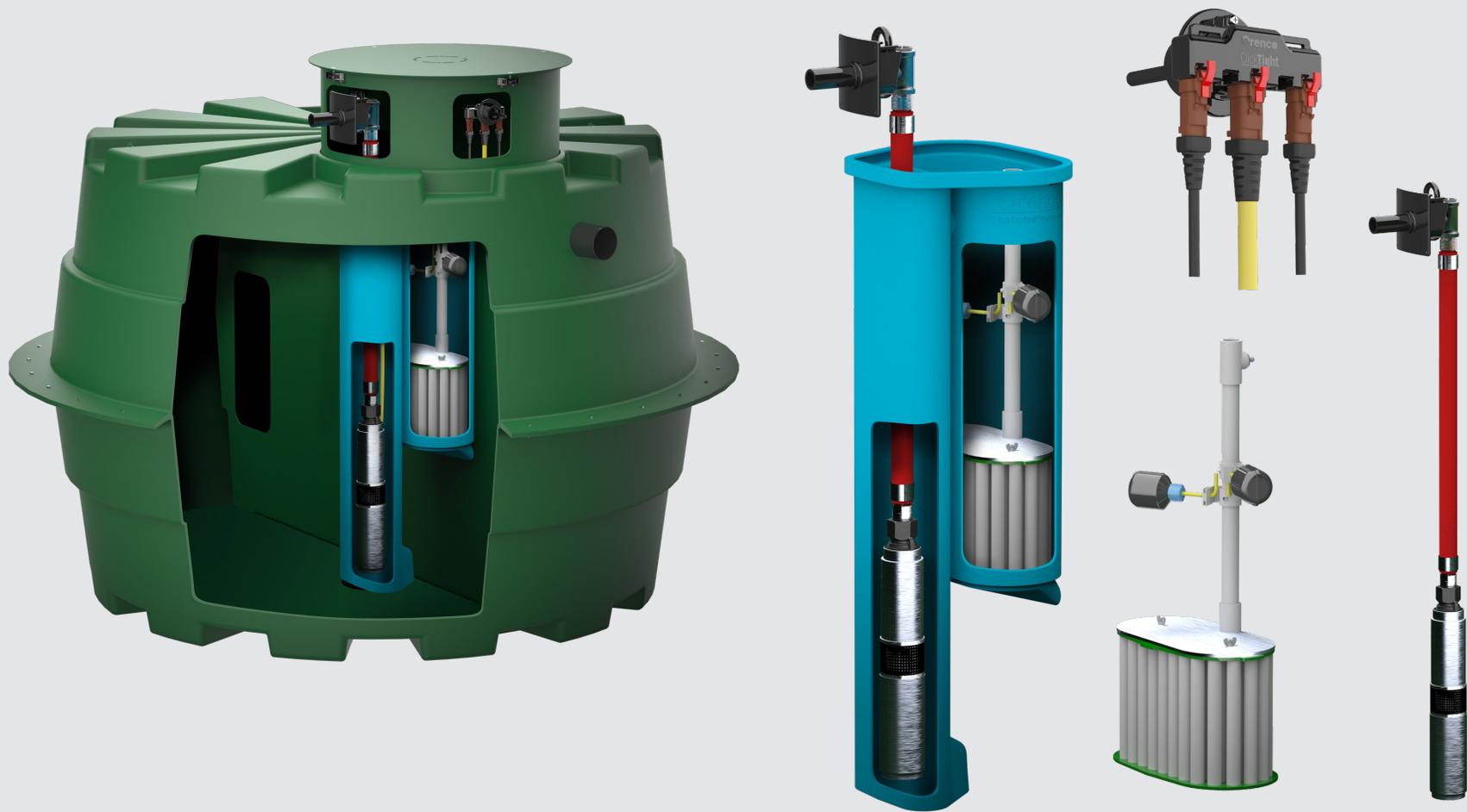


Orenco Meander Tank

- 1000 and 1500 gallon
- Unique Meander tank design
- Comes as gravity or pump tank.
- Made of DCPD; Incredibly Strong
- Injection-molded
- Industry leading 5-year warranty
- Watertight processor provides primary wastewater treatment
- Lightweight; easy to install
- Directly accepts Orenco standard fiber wound risers



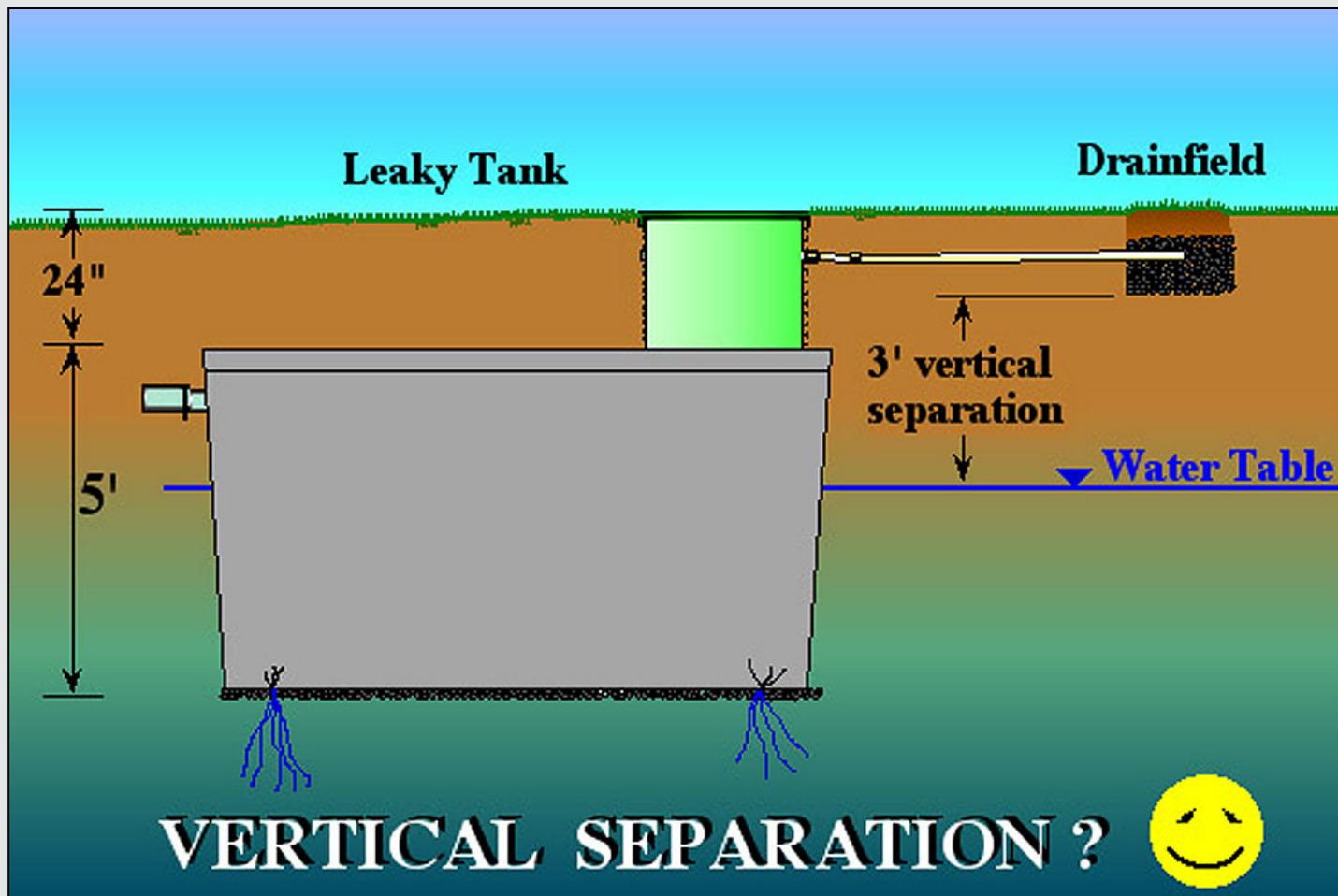
Orenco Meander Tank Components



Tank Structure Concerns and Watertightness

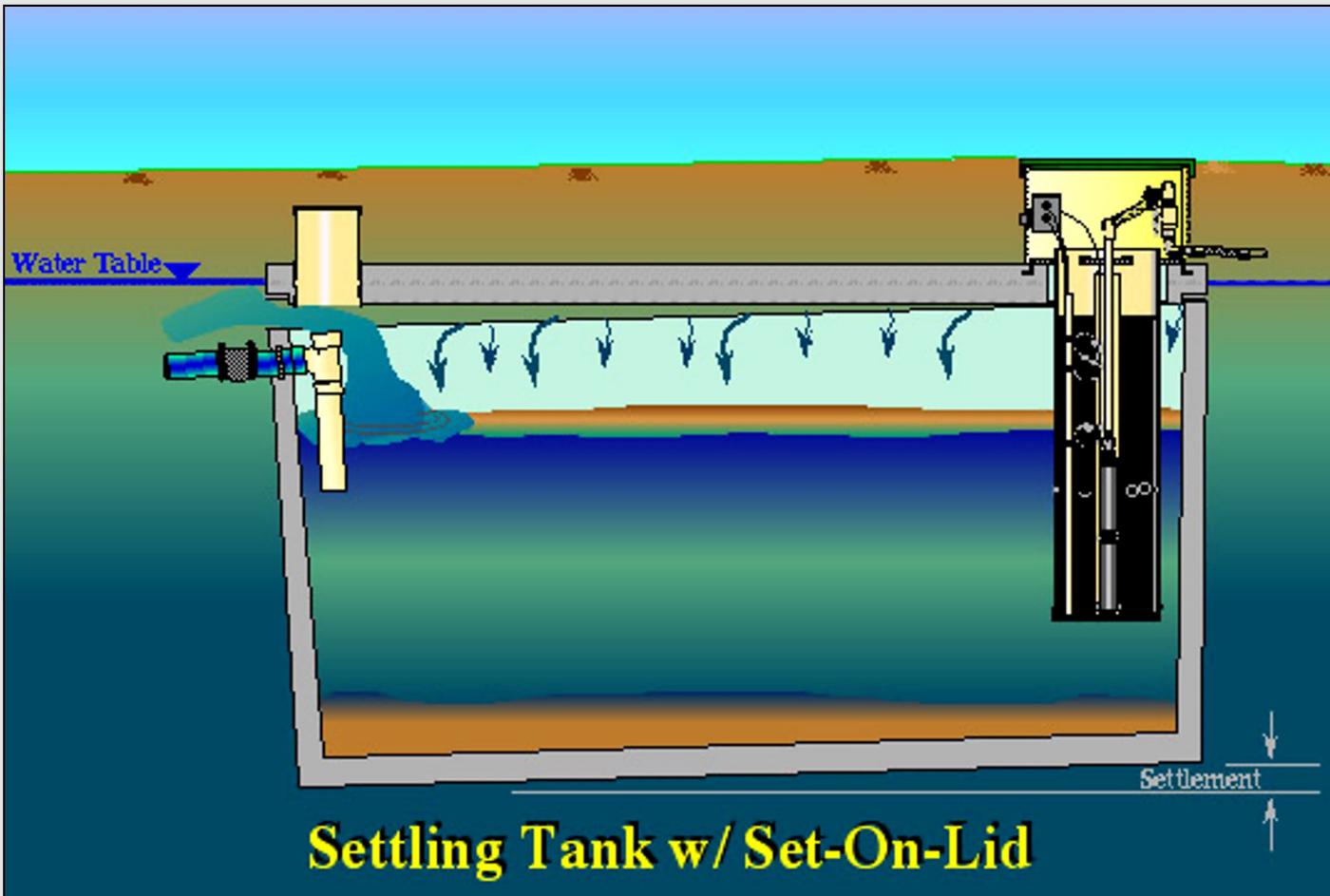
- Watertight tanks not available in some regions
- Leaking, deforming tanks
- Some sites require lightweight tanks and equipment
- For structural integrity and watertightness, consider ...
 - ~ Materials of construction
 - ~ Reinforcement
 - ~ A design for all loading conditions

Leaky Tanks Result in Exfiltration



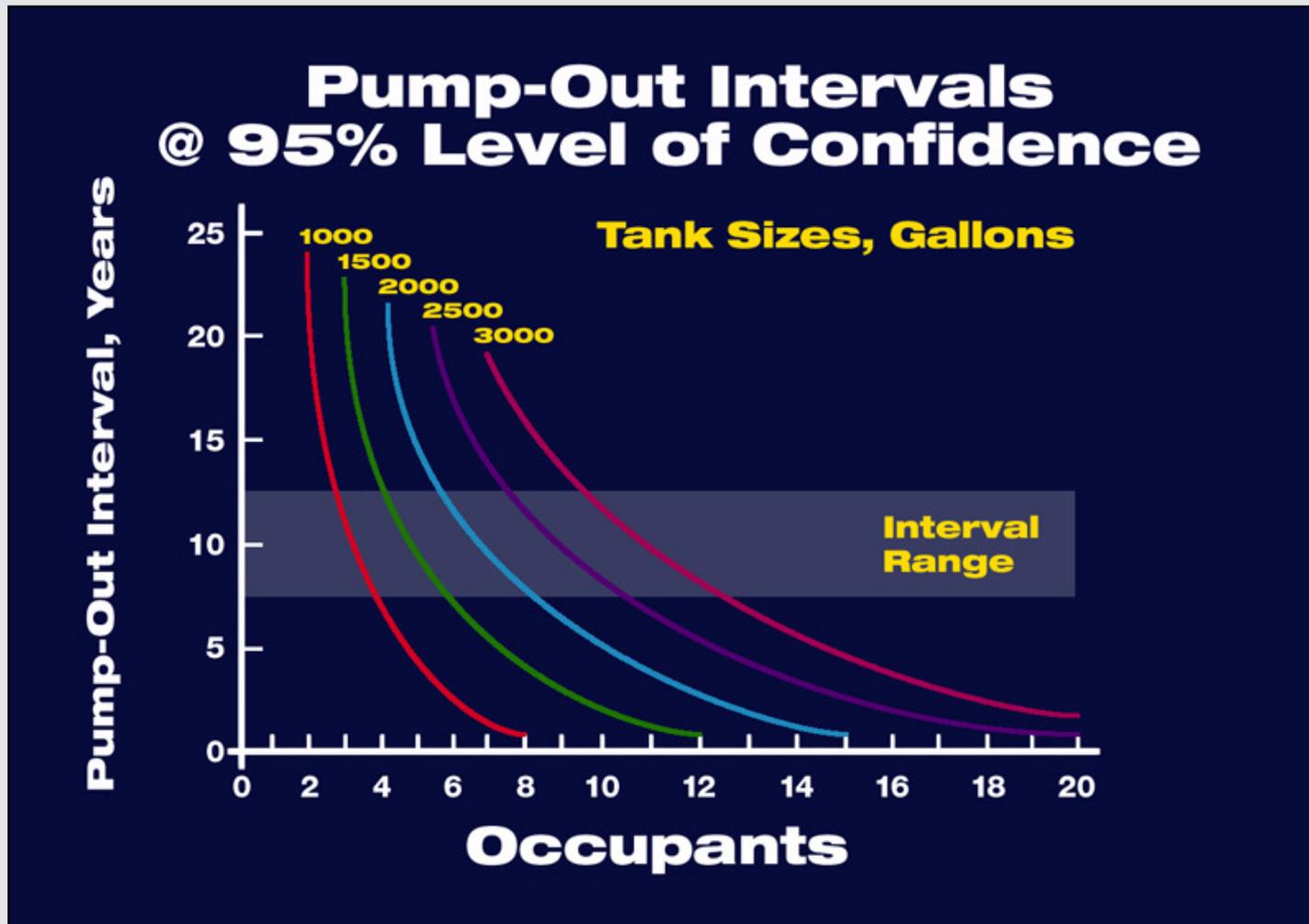
Wastewater from leaky tanks bypasses the collection system/drainfield and goes into the groundwater.

Leaky Tanks Result in Infiltration



1/8" or 1/4" separation in top seam can result in 30 gpm infiltration, disrupting the tank's treatment process.

Tank Configuration and Pump-Out Intervals



*The pumping interval for properly sized and managed watertight tanks is about 12-20 years.**

*Data gathered by Orenco during an audit of 450 tanks in Glide, Oregon, in 1986.

Risers and Lids

Access Risers



Orenco® Technical Data Sheet

Orenco® Fiberglass Access Risers

Applications

Orenco® Fiberglass Access Risers provide access to septic tank openings. They can be cast into the tops of concrete tanks or bonded to an Orenco riser tank adapter. They can also be used as valve enclosures.



Orenco® Fiberglass Access Risers are available in 36- and 48-inch (914- and 1219-mm) diameters.

General

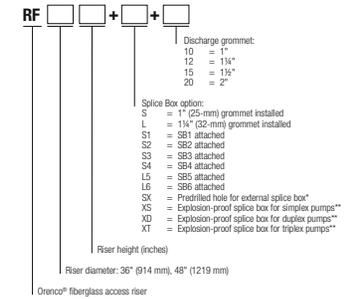
Orenco Fiberglass Access Risers are constructed of filament-wound fiberglass, making them lightweight, corrosion resistant, and extremely strong.

Risers are available in diameters of 36 inches and 48 inches (914 mm and 1219 mm), with lengths available in 3-inch (75-mm) increments. They have an integral top flange with threaded bronze inserts for securing access riser lids.

Standard Models

RF36XX, RF48XX.

Nomenclature



* Minimum riser height 18" (457 mm)
 ** Used in Class I Division 1 environments

Materials of Construction

Access riser	Fiberglass reinforced polyester
Threaded inserts	Silicone, bronze

Specifications

Dimensions, nominal	RF36XX	RF48XX
Flange O.D., in. (mm)	42.0 (1067)	54.0 (1372)
O.D., in. (mm)	36.5 (927)	48.6 (1234)
I.D., in. (mm)	36.0 (914)	48.0 (1219)
Wall thickness, in. (mm)	0.25 (6.4)	0.30 (7.6)
Weight, lb/ft (kg/m)	24.0 (35.7)	36.0 (53.6)

Riser Tank Shield RTS



Orenco Tank Shield™

Applications

Orenco's Tank Shield is a secondary safety barrier, designed to prevent unintended entry and accidental falls into tanks and pump basins. It can be installed in a new or existing tank access riser or pump basin. Tank Shield is compatible with Orenco's 24in (600mm) and 30in (750mm) FRP pipe, as well as 24in (600mm) Ultra Rib™ pipe.

General

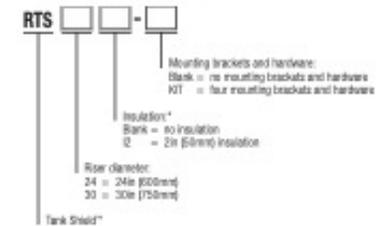
Orenco's Tank Shield is capable of supporting a load of up to 250lbs (113kg), providing more security and safety for tanks and pump basins than access riser lids alone. It locks securely into mounting brackets that are attached to the access riser with stainless steel hardware, eliminating the need for additional bolts or screws. It can be installed over pumping equipment.

Tank Shield is molded of co-polymer polypropylene (CPPP) for exceptional durability. Tank Shield mounting brackets and hardware can also be ordered individually (RTS-MB). For cold weather applications, optional insulation is available.

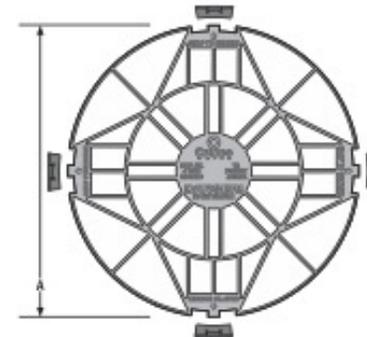
Standard Models

RTS24-KIT, RTS30-KIT

Product Code Diagram



* Insulation has an R-value of 10 per 2in increment (R9 1.8 per 50mm)



RTS30 Tank Shield, top view (shown with mounting brackets)



RTS30 Tank Shield, side view



Orenco's Tank Shield locks securely into mounting brackets without the need for additional bolts or screws.

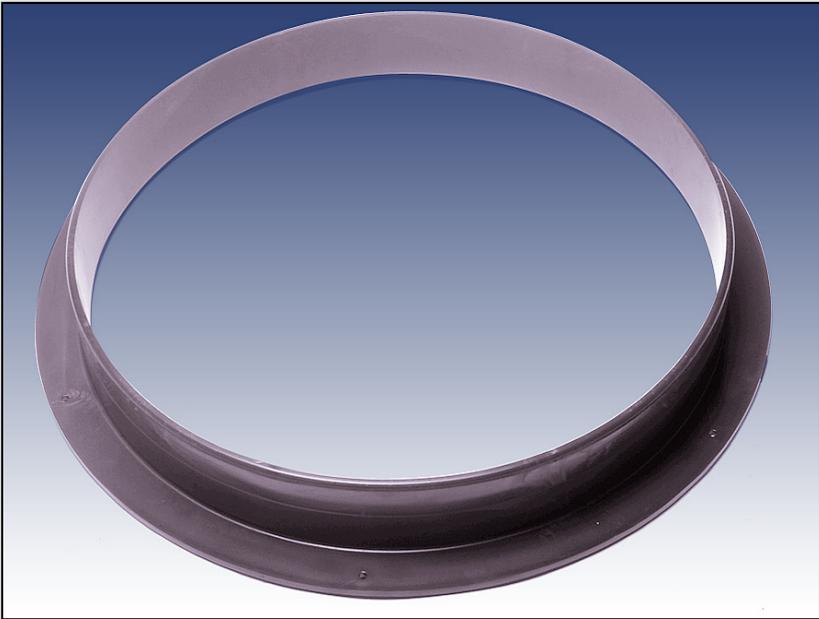
Materials of Construction

Tank Shield	Co-polymer polypropylene
Brackets	ABS
Hardware	Stainless steel
Insulation, optional	Closed-cell foam

Specifications

Model	RTS24	RTS30
A Diameter, in (mm)	23 (584)	29 (738)
B Height, in (mm)	1.5 (38)	1.9 (48)
Load rating, lbs (kg)	250 (113)	250 (113)
Insulation R-value (RSI value)	10 (1.8)	10 (1.8)

Riser-to-Tank Adapters



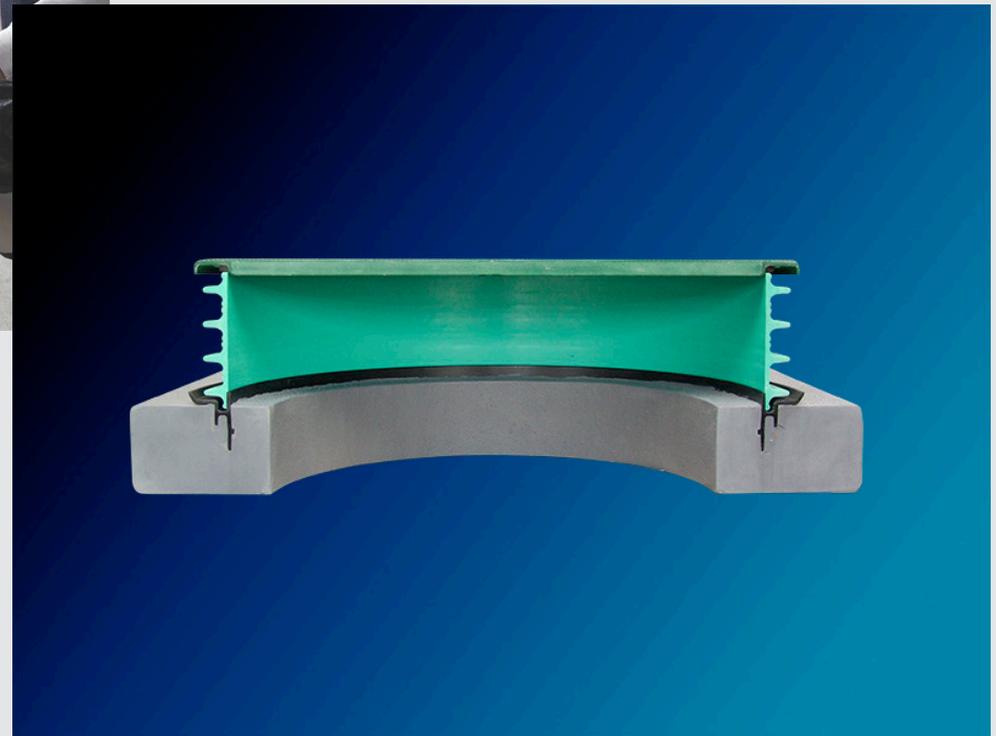
Bolt-Down Kit



Bolt-Down Kit, cont.



Cast-In PRTA



Grade Rings



Types of Adhesive

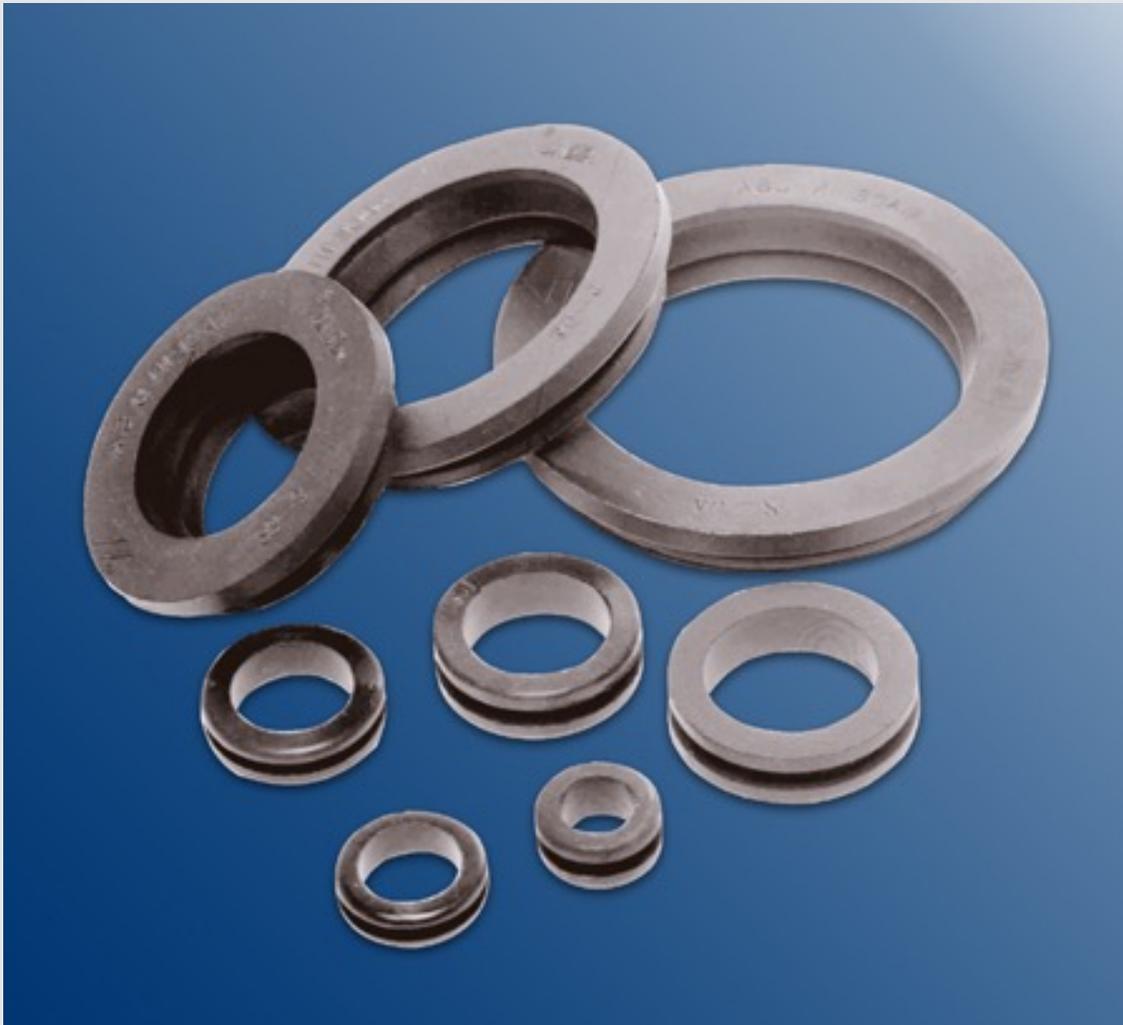
- MA320
- ADH200
- ADHP10



Riser Tools



Grommets



Grommet Installation



Orenco Durafiber™ Lid



Logo Lids



Filtration

Solids Removal

- Prevents solids from leaving tank
- Improve quality of effluent
- Extend drainfield life

Tank Treatment With and Without Filter

	Crites/Tchobanoglous*		Orenco Systems	
	BOD ₅ (mg/L)	TSS (mg/L)	BOD ₅ (mg/L)	TSS (mg/L)
Tank <u>with</u> effluent filter	130 - 140	30	134	35
Tank <u>without</u> effluent filter	180 - 190	80 - 85	149	84
% reduction	>25%	>60%	11%	65%

* Small and Decentralized Wastewater Management Systems, *Crites & Tchobanoglous*, p.183, 1998.

Tank Treatment With and Without Filter



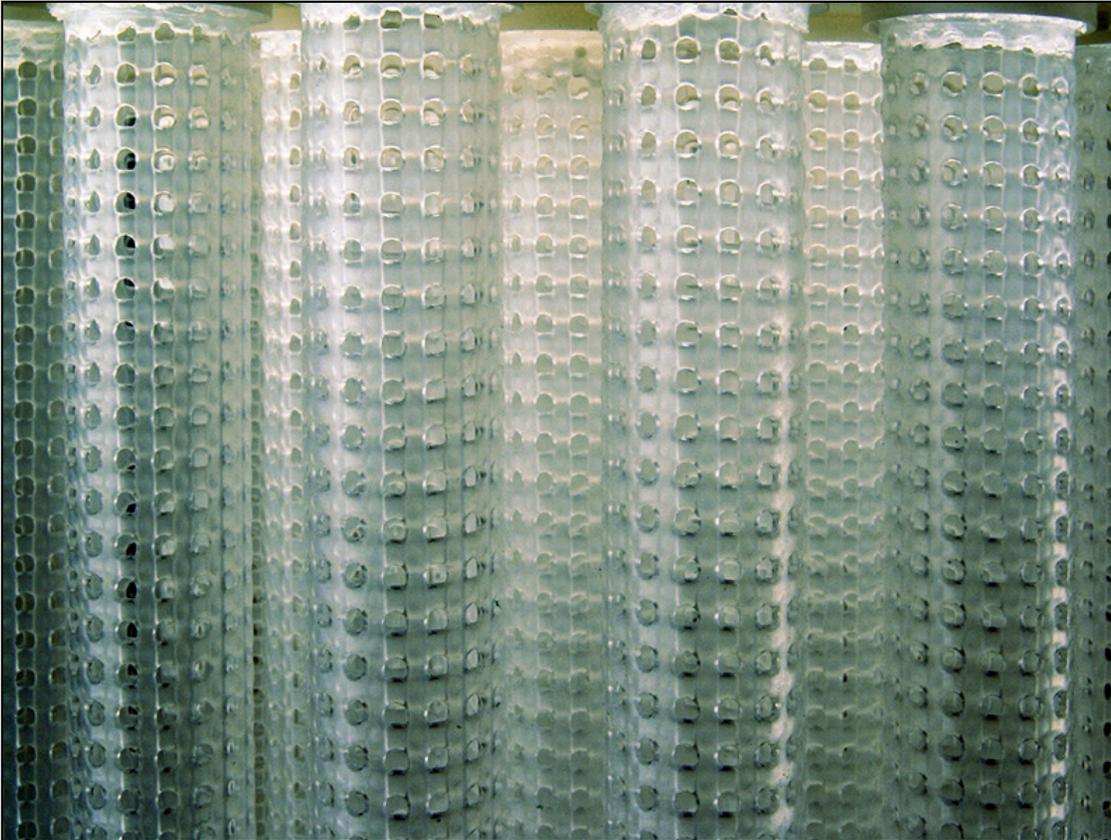
Septic tank effluent w/o effluent filter



Septic tank effluent with an Orenco effluent filter

Filter Surface Area vs. Flow Area

- In evaluating effluent filters, it's important to compare both total filter surface area and total flow area
- Orenco flow area = 30% of total area



Filter Surface Area

Solids are collected mainly on the surface area. However, the open area is where the outflow takes place.

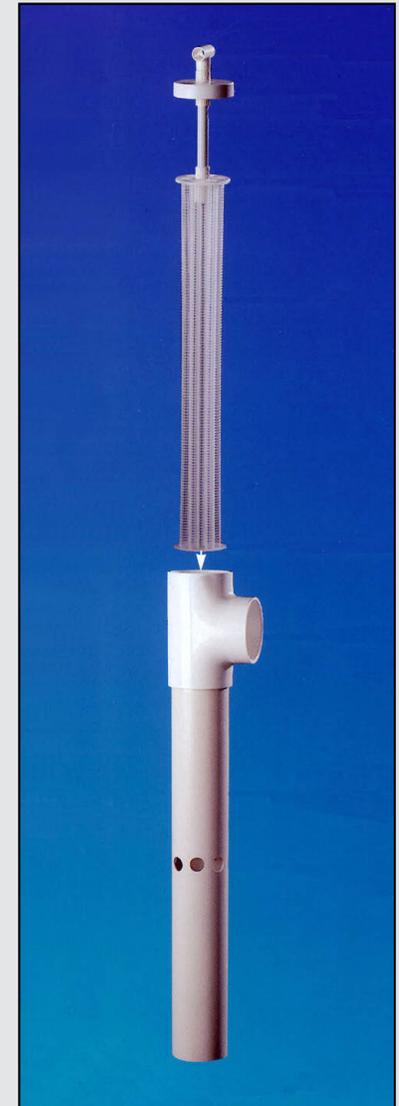


Selection Criteria: Effluent Filter

- Large flow surface area to resist clogging
- Removable cartridge for easy maintenance
- Corrosion-proof to last

Orenco's Biotube[®] Effluent Filters

- For gravity applications
 - ~ 2 to 10 times more flow area than other brands
 - ~ Longer cleaning intervals
 - ~ Easy to clean
 - ~ Extendable tee handle
 - ~ Corrosion-proof
 - ~ Alarm and flow modulation plate available
 - ~ Patented design
 - ~ Custom and commercial sizes available
 - ~ Lifetime warranty on residential filters



Residential Effluent Filters

Orenco® Technical Data Sheet
4-inch (100-mm) Biotube® Effluent Filters

Applications
 Orenco® 4-inch Biotube® Effluent Filters are designed to remove solids from effluent leaving residential septic tanks. They can be used in new and existing tanks at flows of up to 1200 gpd.

General
 Orenco 4-inch Biotube Effluent Filters (U.S. Patents Nos. 4,439,323 and 5,492,635) are used to improve the quality of effluent exiting a septic tank in a residential septic system. Increased effluent quality improves system performance and extends drainfield life. The Biotube cartridge fits tightly in the vault and is removable for maintenance. The tee handle can be extended for easy removal of the cartridge.

Standard Models
 FTS0444-36, FTS0444-36M, FTW0436-28, FTW0436-28M
 FTW0444-36, FTW0444-36M

Product Code Diagram

FT [] [] 04 [] - [] - []

Flow modulator and float switch bracket options:
 Blank = no options selected
 M = flow modulation plate installed
 A = float switch bracket installed

Cartridge height, in. (mm):
 28 = 28 (711), standard
 36 = 36 (914), standard

Filter housing height, in. (mm):
 36 = 36 (914), standard
 44 = 44 (1118), standard

4-in. (100-mm) filter diameter

Outlet tee:
 W = fits Type 3034 outlet tee
 S = fits Schedule 40 outlet tee

Filter mesh option:
 Blank = 1/8-in. (3-mm) filter mesh
 P = 1/16-in. (1.6-mm) filter mesh

Biotube® effluent filter

Materials of Construction

Vault	PVC
Biotube® cartridge	Polypropylene and polyethylene
Handle components	PVC, polyethylene, stainless steel

Orenco Systems® Inc., 814 Airway Ave., Sutherlin, OR 97479 USA • 800-348-9843 • 541-439-4449 • www.orenco.com
 MTD-FT-FTS-1 Rev. 1.3, 01/06/14 Page 1 of 2

Product Code Diagram

FT [] [] 04 [] - [] - []

Flow modulator and float switch bracket options:
 Blank = no options selected
 M = flow modulation plate installed
 A = float switch bracket installed

Cartridge height, in. (mm):
 28 = 28 (711), standard
 36 = 36 (914), standard

Filter housing height, in. (mm):
 36 = 36 (914), standard
 44 = 44 (1118), standard

4-in. (100-mm) filter diameter

Outlet tee:
 W = fits Type 3034 outlet tee
 S = fits Schedule 40 outlet tee

Filter mesh option:
 Blank = 1/8-in. (3-mm) filter mesh
 P = 1/16-in. (1.6-mm) filter mesh

Biotube® effluent filter

Residential Applications



Residential Applications



Orenco WATER Technical Data Sheet PSC-Series Biotube® Effluent Filters

Applications

Orenco PSC-Series Biotube Effluent Filters are designed to remove solids from effluent leaving wastewater tanks.

General

Orenco's patent-pending PSC-Series Biotube Effluent Filters are used to improve the quality of effluent from wastewater tanks. Improved effluent quality extends drainfield life in onsite dispersal systems and improves the performance of downstream treatment in effluent sewers.

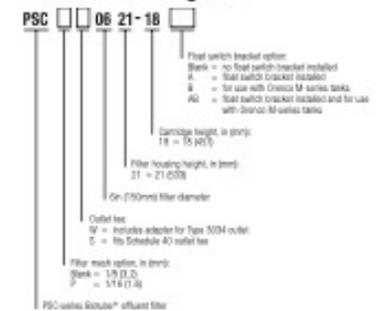
The Biotube filter cartridge fits tightly in the housing while being easy to remove for maintenance. The passively self-cleaning design extends maintenance cycle intervals. Filter mesh is available in 1/8in or 1/16in (3.2mm or 1.6mm) mesh opening sizes.

The handle can be extended with PVC pipe (not included) for better access to the cartridge. A 3/4in (19mm) diameter tee handle is included. Models PSCS0621-18 and PSCW0621-18 are NSF-46 certified.

Standard Models

PSCS0621-18, PSCW0621-18, PSCP0621-18, PSCPW0621-18

Product Code Diagram



Materials of Construction

Housing	PVC, ABS
Biotube filter cartridge	Polypropylene, DCPD
Handle components	PVC, stainless steel
Deflector plate	ABS

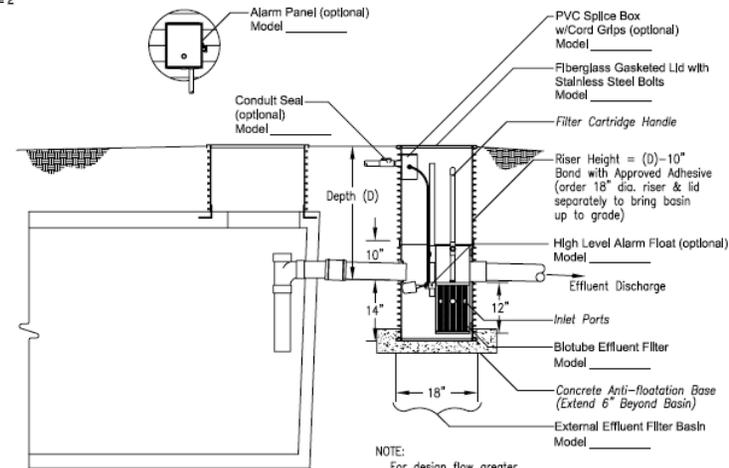
All product and performance assertions are based on proper design, installation, operation, and maintenance according to Orenco's current published documentation.

External Effluent Filter Basin



External Effluent Filter Basin

Scale: 1" = 2'



Patents # 4,439,323 & 5,492,635
Foreign Patents Pending
© 2006, Orenco Systems, Inc.



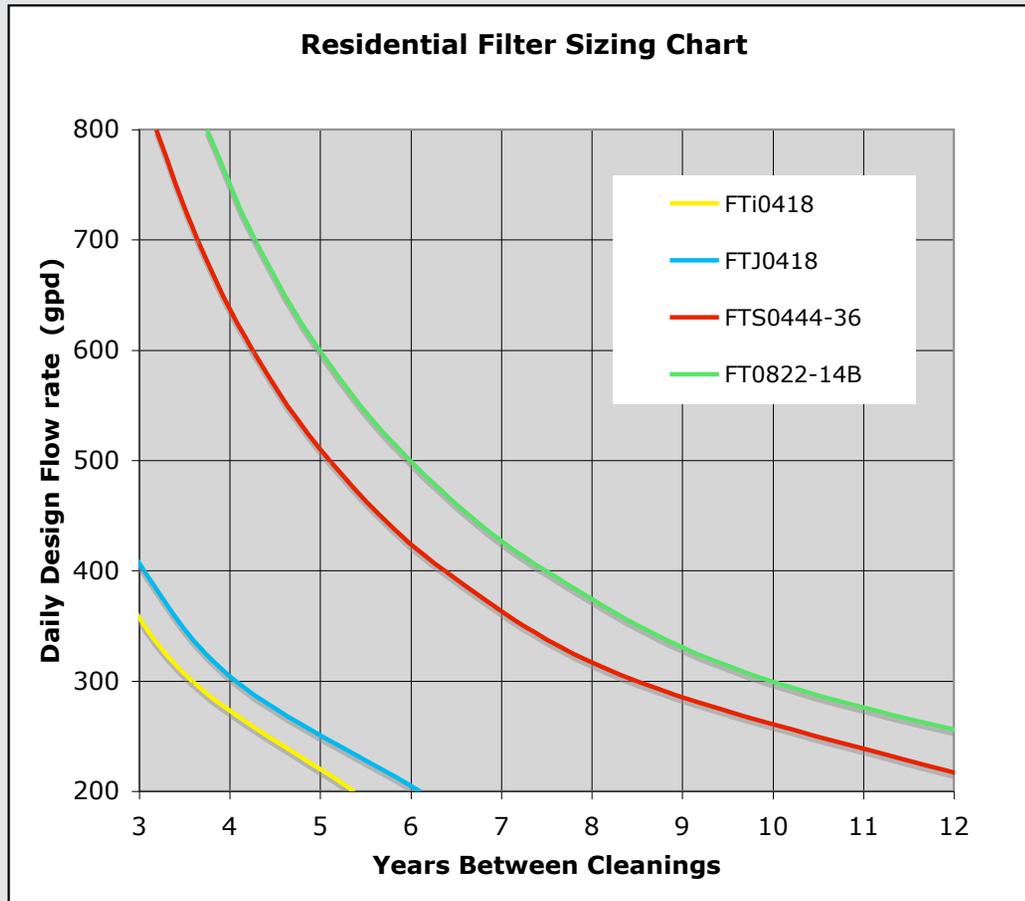
Orenco Systems[®]
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TELEPHONE:
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(541) 459-2884

NDW-TD-FT-05
Rev. 3.0 (03/06)

External filter basins, were designed for upgrades/repairs for residential systems.

Selecting a Residential Effluent Filter

- Flow rates, waste-strength and septic tankage all effect cleaning frequencies



Commercial Applications



Commercial Effluent Filters

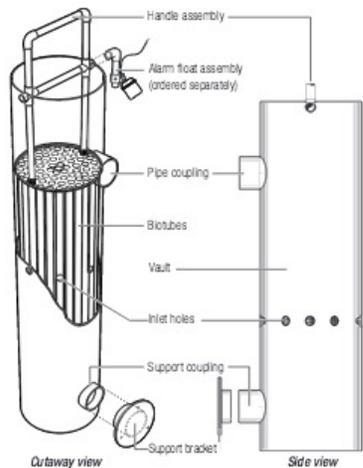
Orenco® Technical Data Sheet 8-in. to 15-in. Dia. Biotube Effluent Filters

Applications

Orenco® 8-inch to 15-inch Biotube® Effluent Filters are designed to remove solids from effluent leaving commercial septic tanks. They can be used in new and existing tanks.

General

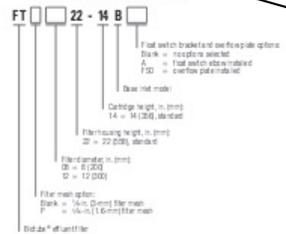
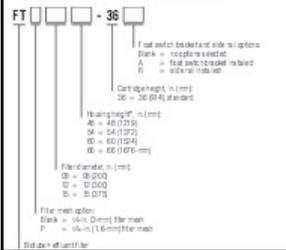
Orenco® 8-inch to 15-inch Biotube® Effluent Filters are used to improve the quality of effluent exiting a commercial septic tank. The Biotube cartridge fits snugly in the vault and is removable for maintenance, the handle assembly snaps into the notches in the top of the vault, and the tee handle can be extended for easy removal of the cartridge. A "base inlet" model (see p. 2) is available for low-profile tanks. An optional slide rail system, available on larger models, simplifies installation and provides tank access for servicing.



Standard Models

FT0854-36, FT1254-36, FT1554-36, FT0822-14B, FT1254-36AR

Product Code Diagrams



Materials of Construction

Vault	PVC
Pipe coupling	PVC
Handle components	PVC
Support coupling and bracket	PVC
Biotube® cartridge	Polypropylene and polyethylene

Product Code Diagrams



Float switch bracket and slide rail options:
Blank = no options selected
A = float switch bracket installed
R = slide rail installed*

Cartridge height, in. (mm):
36 = 36 (914), standard

Housing height*, in. (mm):
48 = 48 (1219)
54 = 54 (1372)
60 = 60 (1524)
66 = 66 (1676-mm)

Filter diameter, in. (mm):
8 = 8 (203)
12 = 12 (305)
15 = 15 (375)

Filter mesh option:
Blank = 1/8-in. (3-mm) filter mesh
P = 1/16-in. (1.6-mm) filter mesh

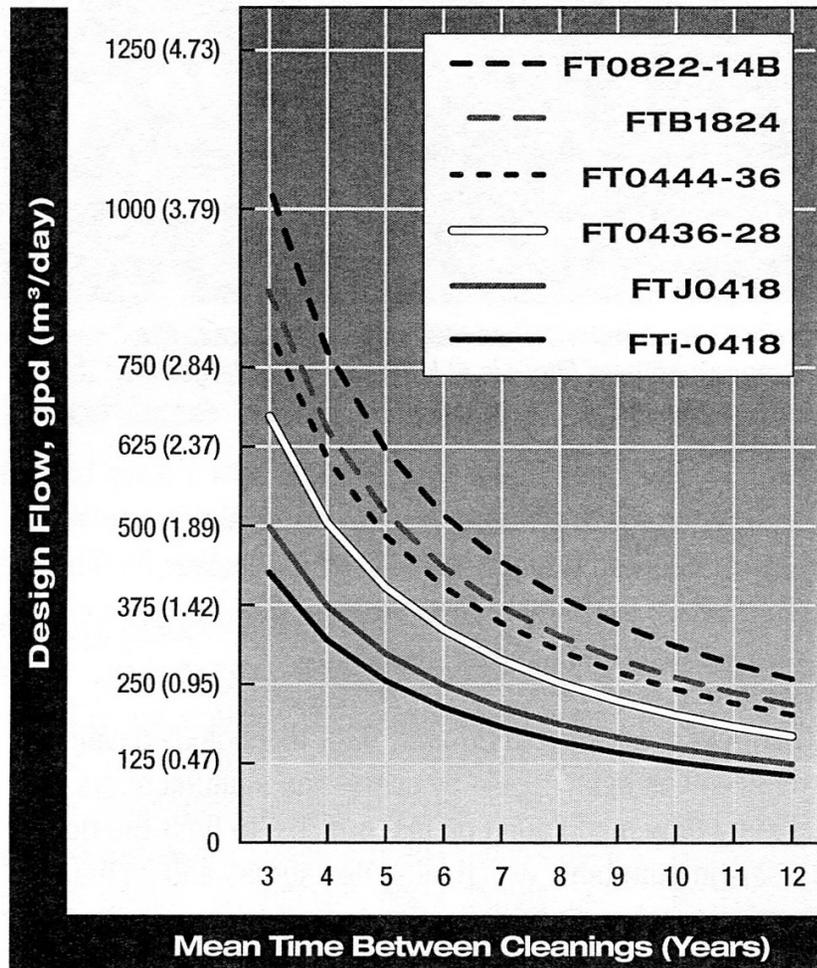
Biotube® effluent filter

* Orenco® Biotube® Effluent Filters are covered under multiple U.S. and international patents.

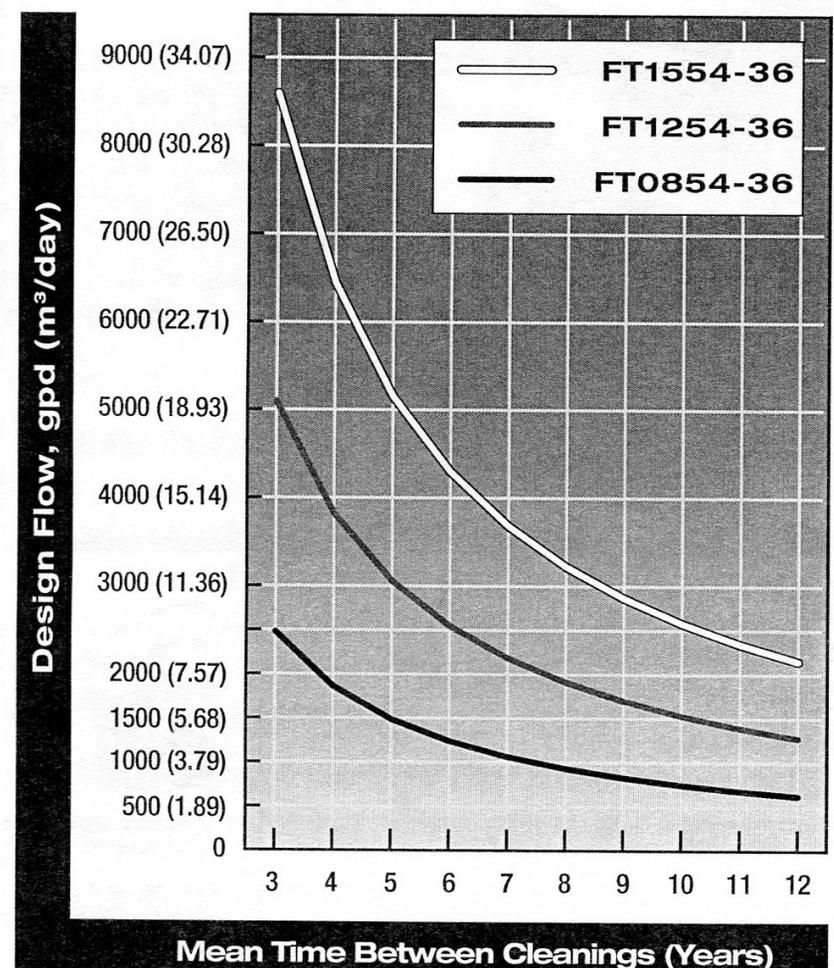
Note: Support coupling and support bracket are available on 12-inch and 15-inch filters only.

Expected Cleaning Interval

Time Between Cleanings for Residential Biotube® Filters

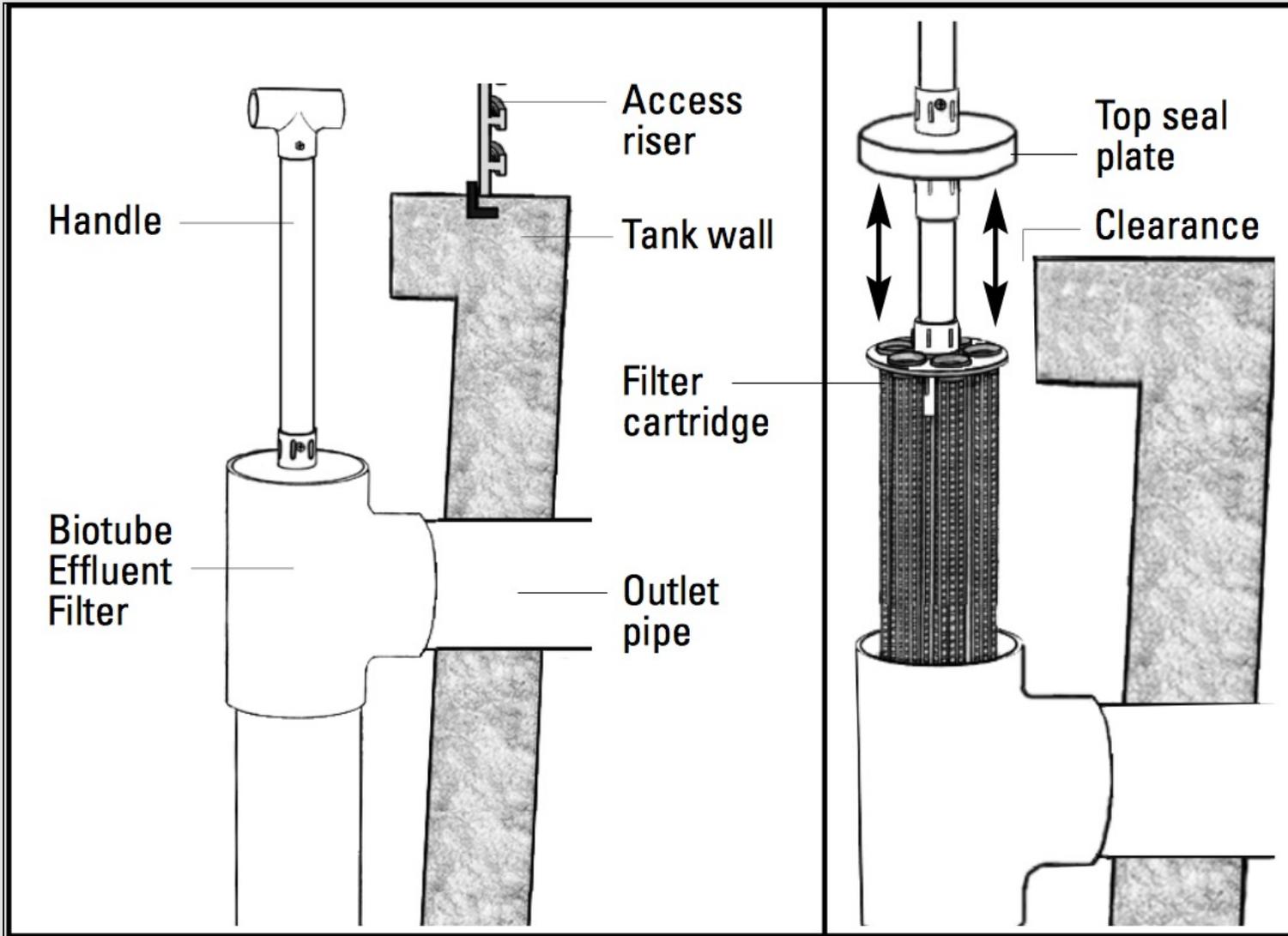


Time Between Cleanings for Commercial Biotube® Filters

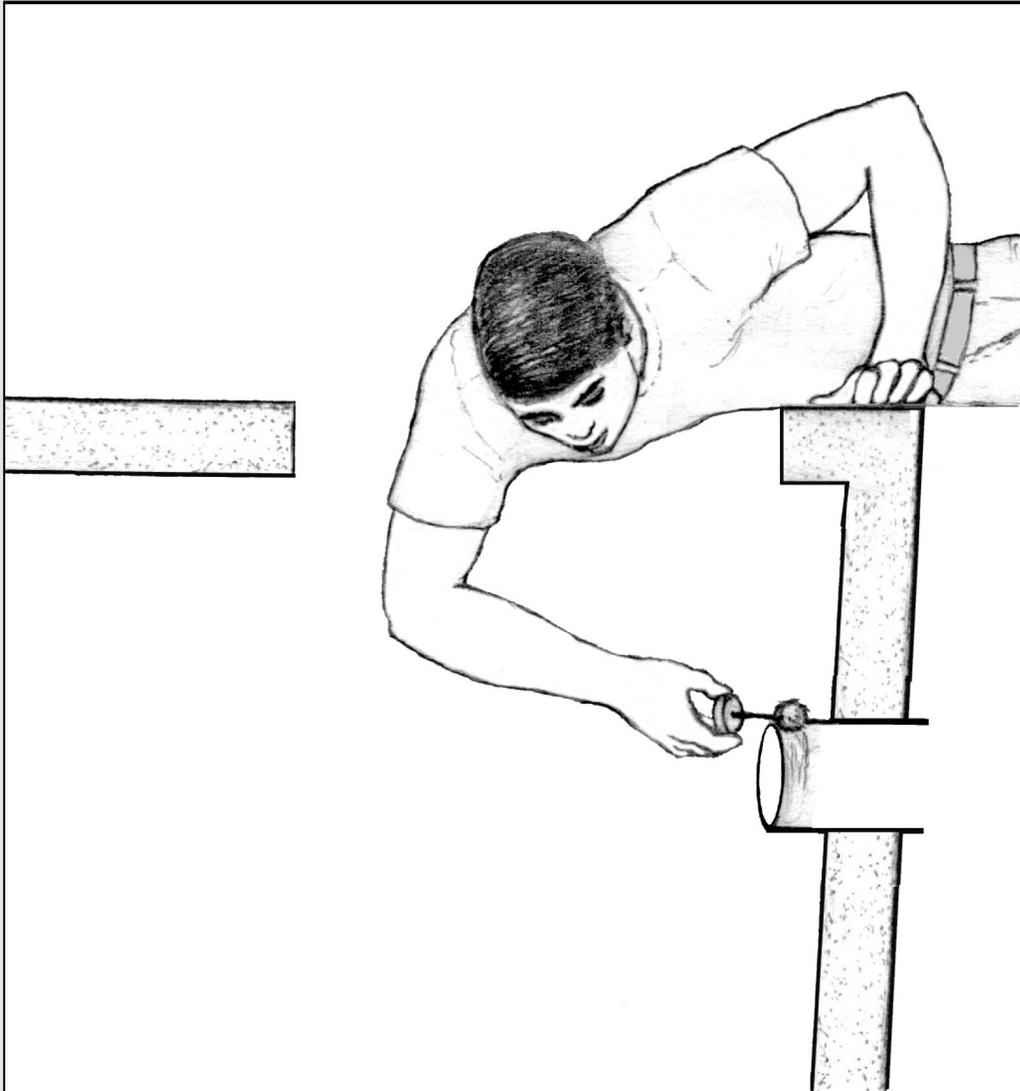


Effluent Filter Installation

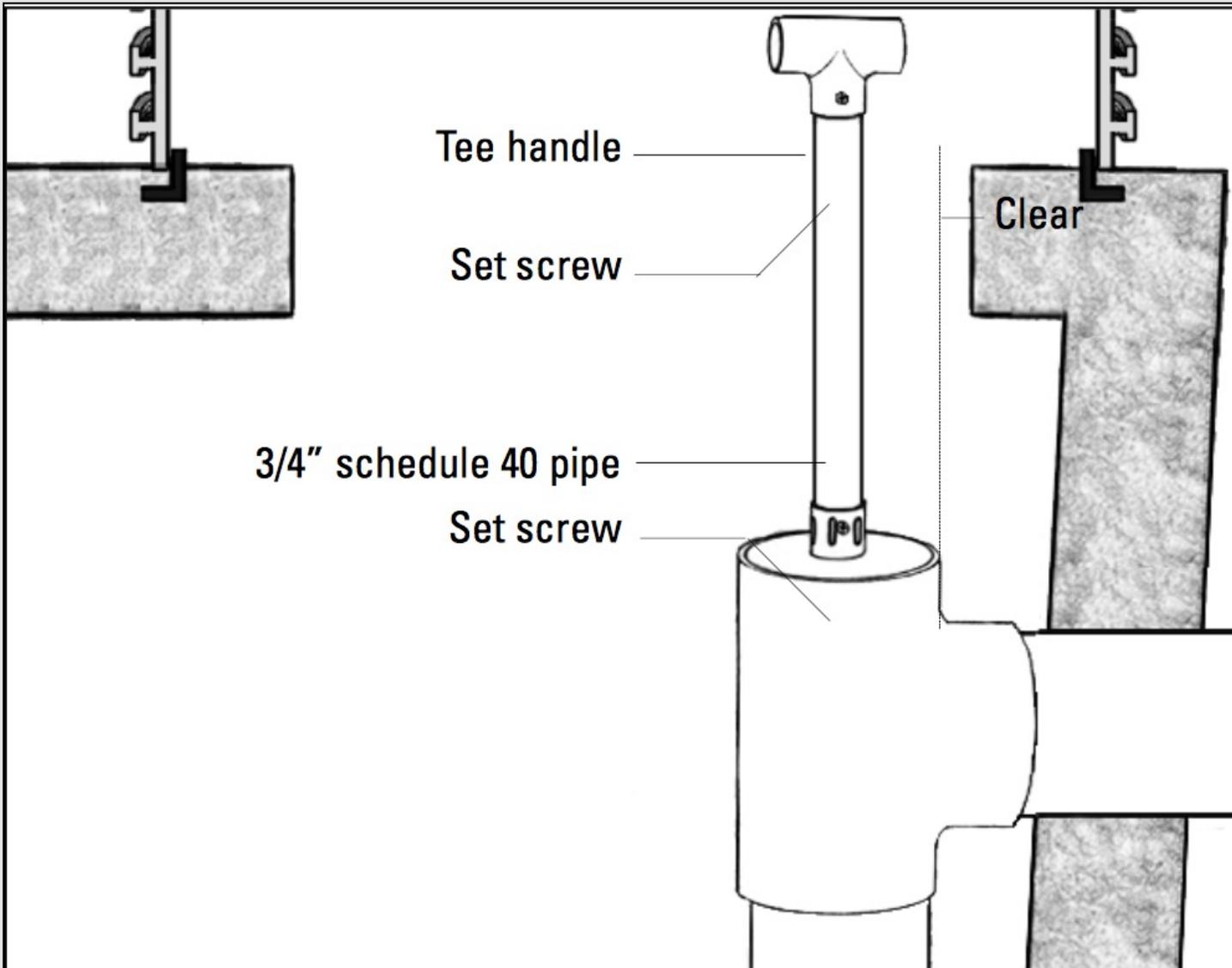
Step 1: Test-Fit Effluent Filter



Step 2: Attaching Filter to Tank

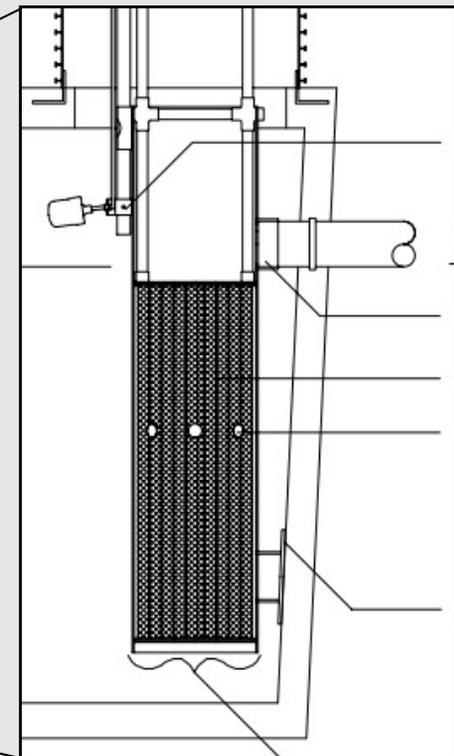
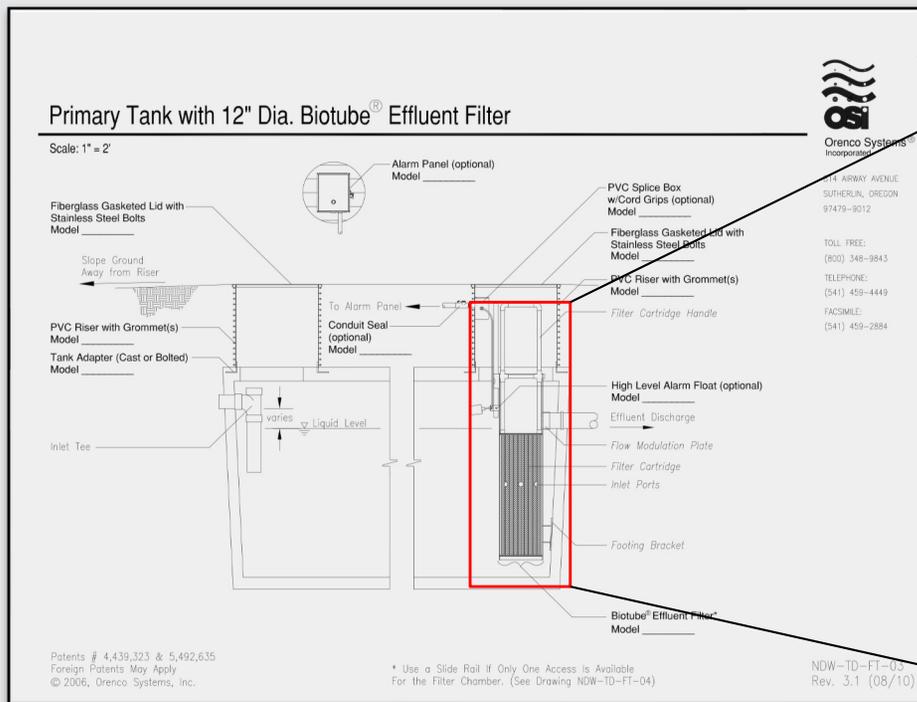


Step 3: Extending Cartridge Handle



Effluent Filter Installation

- Attach filter to the tank's outlet pipe
- For 12" & 15" diameter commercial filters, attach the foot brace to the floor of the tank (fiberglass or concrete tanks), or to the sidewall (concrete tanks only).
- Extend cartridge handle, for easy access.



Effluent Filter Maintenance

- Remove and hold cartridge over inlet of tank
- Carefully spray buildup into tank
- Reinsert cartridge into effluent filter housing



Solutions for Decentralized Wastewater Treatment

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