

# Filter Facts

## Established Performance

A good effluent filter prevents large solids from leaving the tank, greatly improving the quality of effluent and extending drainfield life. Orenco's Biotube effluent filters reduce total suspended solids (TSS) by about two-thirds. Orenco's data was used by Dr. George Tchobanoglous in his leading textbook on decentralized wastewater systems, *Small and Decentralized Wastewater Management Systems*.

## Total Filter Surface Area vs. Total Flow Area

When comparing filters, compare both the Total Filter Surface Area and the Total Flow Area. Total Filter Surface Area is the total surface area of all the individual Biotubes within a filter cartridge. The Total Flow Area is the total open area (area of the mesh openings) of all the individual Biotubes within a filter cartridge. See Table 1 for calculating surface area and flow area for Biotube effluent filters.

Flow area is as important as surface area because it is what prevents premature clogging. As shown in Graphs 1a and 1b, the Total Flow Area of Orenco's Biotube effluent filters is typically 2 to 4 times higher than that of competing brands, and sometimes much higher than that. This means they can go longer between cleaning because the higher the total flow area, the slower the filter clogging process.



Biotube Effluent Filters reduce TSS by about two-thirds.

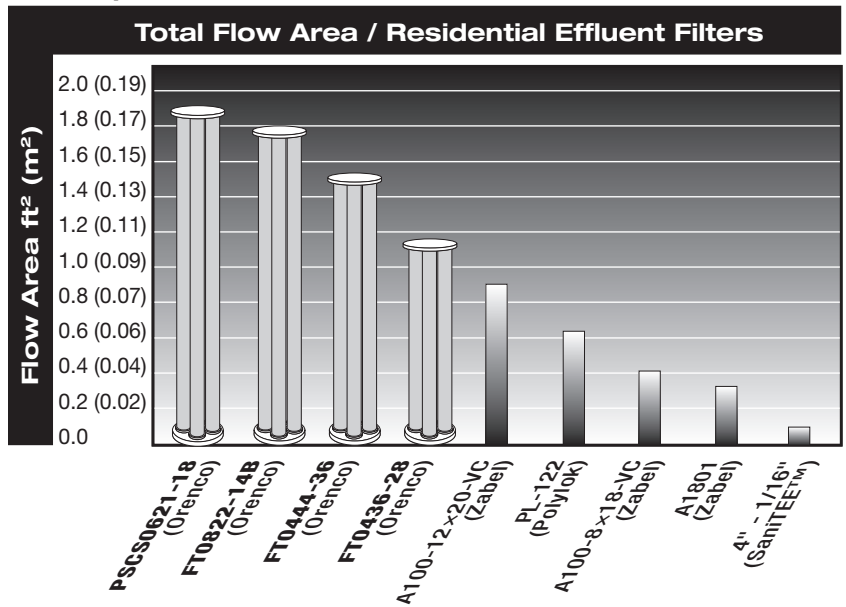
**Table 1: Calculating Surface Area and Flow Area for Biotube Effluent Filters**

**Filter Surface Area ( $A_s$ )**  $A_s = \pi d \times L$   
**Flow Area ( $A_f$ )**  $A_f = (\pi d \times L) \times 0.3$

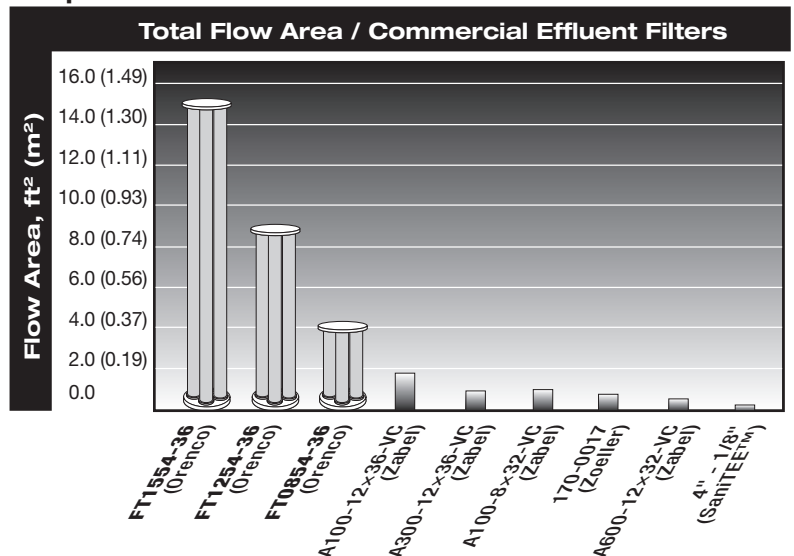
**where**  $d$  = diameter of filter tube material in feet or meters  
 $L$  = total length of filter tube material in feet or meters

**Example:** Orenco's FT0444-36 filter has 17.3 linear feet (5.3m) of 1.125in (28.6mm) diameter filter material. This equates to about 5.1ft<sup>2</sup> (0.47m<sup>2</sup>) of filter surface area. Since the flow area of a Biotube effluent filter is 30% of the filter surface area, you can find the flow area of the filter by multiplying the filter surface area by 0.3.

**Graph 1a: Total Flow Area for Nine Residential Effluent Filters**



**Graph 1b: Total Flow Area for Nine Commercial Effluent Filters**



## Flow Rates and Cleaning Intervals

Flow rates for effluent filters need to be tied to service intervals in order to be meaningful. Not all filter manufacturers make this connection clear. Filters with very low Total Flow Areas (which plug up easily) cannot handle very high flow rates unless they are cleaned frequently.

Graphs 2a and 2b show the relationship between Orenco's effluent filter models (residential and commercial), design flow, and the "mean time between cleaning." The larger the filter and the smaller the flow, the longer you can go between cleanings.

Based on maintenance records, we know that our standard 4in (100mm) FT0444-36 residential filter has an average maintenance interval in excess of 10 years, when used with typical residential flows.

## Level of Filtration

A good filter has a LARGE Total Flow Area to prevent premature filter clogging, along with many SMALL individual openings or holes, to prevent the passing of biosolids. That's what's meant by a good "level of filtration."

Some competitors compare their 1/16in (1.6mm) slots to our 1/8in diameter (3.2mm) holes, hoping you'll assume that their slots offer better filtration. But the proof is in TSS reduction. Our field test data from thousands of installations using filters with 1/8in diameter (3.2mm) holes prove that our effluent filters reduce Total Suspended Solids by an average of two-thirds (we also offer 1/16in diameter holes).

## Performance Verification

Our new PSC06 (1/8in mesh) filters are NSF46 certified. We also have long-term user data to back up how well our effluent filters work over time.

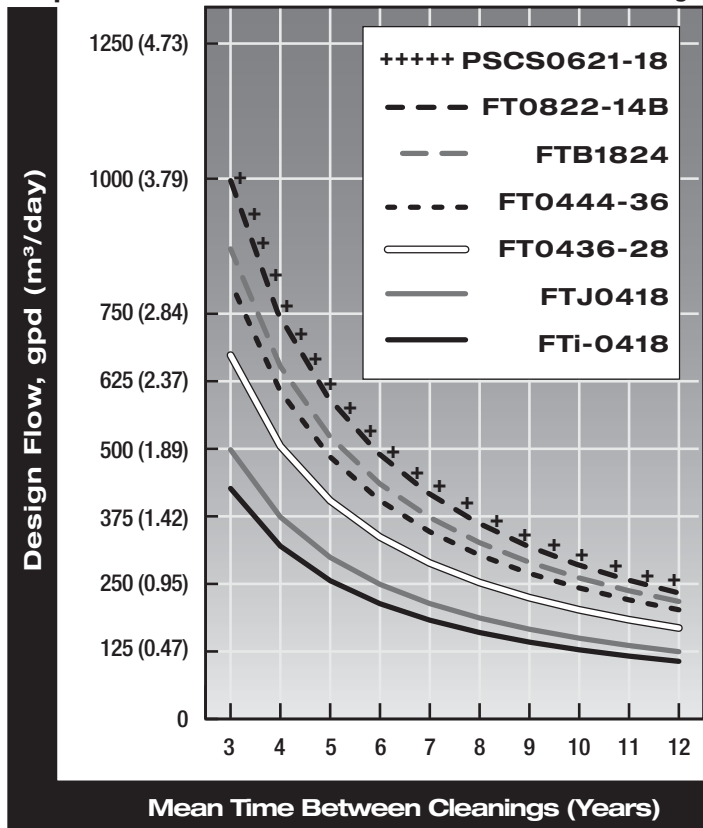
## Alarm Feature

Orenco's residential filters offer an alarm as an option.

## Lifetime Warranty

Orenco's Biotube effluent filters come with a lifetime warranty when used in residential applications.

Graph 2a: Time Between Residential Biotube Filter Cleanings



Graph 2b: Time Between Commercial Biotube Filter Cleanings

