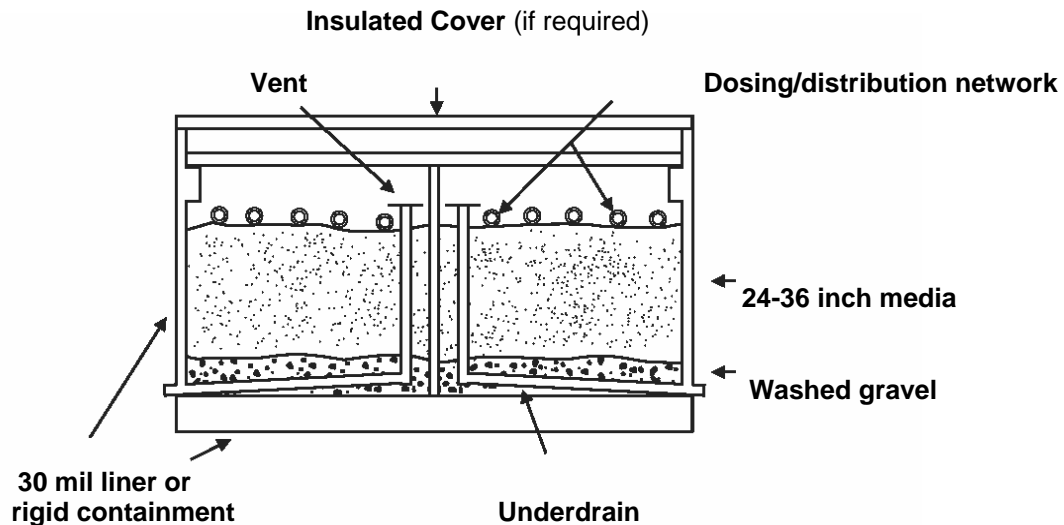


System Type: *Single Pass Intermittent Sand Filter/Bioreactor*

Basic Design: Single Pass Intermittent Sand Filters (ISFs) are fixed-film biological treatment units. In ISFs, wastewater is applied in intermittent doses to a bed of sand or other suitable media. The wastewater first receives primary treatment in a septic tank or an aerobic treatment unit, and then is pumped from a screened vault in the septic tank or separate dosing tank to the water-tight lined sand bed or module where it is evenly distributed over the top of the sand filter bed. Media alternative to sand has been utilized in some designs. As the wastewater passes through the sand filter, treatment is accomplished by physical, chemical and biological actions. The main treatment is accomplished by the microorganisms attached to the filter media. The treated wastewater is collected in underdrains at the bottom of the sand filter and is then transported to the soil absorption system. ISFs are designed such that the pretreated wastewater passes through the sand filter bed once. With proper design and media sizing ISF's achieve reductions in biochemical oxygen demand (BOD), total suspended solids (TSS), and fecal coliform. However, this pretreatment device has not been approved in Ohio for soil absorption or soil depth credit reductions.



Advantages: Intermittent Sand Filters (ISFs) are simple in design and relatively passive to operate because the fixed-film process is very stable and few mechanical components are used. High flow variations after equalization in a septic tank are not a problem because the residual peaks and valleys are absorbed in the pressurization tank or in the last compartment of the preceding septic tank. A malfunctioning ISF backs up rather than release poorly treated effluent. ISFs tolerate fluctuations in flow, especially changes from negligible flow to very high flows thus are appropriate for seasonal use. Construction costs for ISFs are moderately low, and the labor is mostly manual.

Disadvantages: Cost is somewhat higher than those of conventional systems due to cost of sand media, pump(s) and possible engineering design fees. The land area required may be a limiting factor. Regular (but minimal) maintenance is required. If appropriate filter media are not available locally, costs could be higher. Premature clogging of the filter media can result from exceeding design loading rates.

Operation and Maintenance: Intermittent Sand filters require annual maintenance, although the complexity of maintenance is generally minimal. The majority of operation and maintenance involves monitoring the influent and effluent and checking the dosing equipment periodically. Pumps and controls should be checked every 3 months, and the septic tank or aerobic unit should be checked for sludge and scum buildup and pumped as needed. Regular pumping of the septic tank (every 2-5 yrs) at a cost of \$50-\$100 annually. Annual service contract estimated \$150-\$300 annually.