

BIO-TOWER

A **Bio-Tower** or tower trickling filter is basically a housing in which wastewater trickles through a bed of slime covered media and is treated by the action of the microorganisms in the slime layer, utilizing the contents of the wastewater as a food source. Tower trickling filter *media or packing* provide the surface over which microorganisms grow. Crushed stone or plastic are the most commonly used materials. From time to time dislodging or washing off of slime from the trickling filter media occurs, something commonly referred to as *sloughing*. Anaerobic activity at the slime media boundary is thought to be the mechanism responsible for this periodic biological growth stripping or wash out. .

Biological filtration is thus a process of passing a liquid through a bed of appropriate media thus permitting contact with characteristically *smooth, gelatinous biofilms* attached to the media that assimilate fine suspended, colloidal and dissolved solids, and release end products of biochemical oxidation. Although the *contact time* is relatively short there is need to insure large inventories of filter microorganisms. However as excess growth is not necessarily well/easily removed in unduly loaded trickling filters, *clogging* can occur.

There are several industrial installations where two stage biological treatment comprising stone or plastic media trickling filter (also known as **packed bed bio-tower**) followed by activated sludge process based aeration tank, followed by secondary clarifier have been in operation.

The common advantages of **Packed bed bio-tower** are as follows:

- Fixed film media provides additional surface area for bio-film to grow on it and degrade the organic impurities that are resistant to biodegradation or may even be toxic to some extent.
- The overall efficiency of two stage bio-treatment system is better than activated sludge process alone.
- Fixed film processes are more effective in nitrification of the wastewater than activated sludge process.
- The overall foot-print for a fixed film process based system is smaller than the activated sludge process system.
- Due to less sludge wastage, the sludge handling and dewatering facility is smaller compared to the activated sludge process.

The common disadvantages of **Packed bed bio-tower** are as follows:

- Low loading rates and large reactor volumes
- Stripping of volatile organic chemicals
- Release of odours