

# Blower Design

Several smaller blowers are preferable to one large unit. It is not uncommon for SBR designs to incorporate a single blower per basin to provide aeration. However, operational efficiency can be enhanced when plants utilize several smaller blowers, instead of one large blower.

When a single blower per basin is used, it should be sized to provide maximum aeration under worst-case conditions. These conditions typically occur in the summer months, when higher temperatures decrease the amount of oxygen that can be dissolved in wastewater. For facilities that utilize a single blower per basin, a variable frequency drive should be considered.



In a plant configured with only one blower per basin, it is difficult to scale back on the aeration provided. With multiple smaller blowers, units can be taken off line when maximum aeration is not required. This results in electrical cost savings.

Fine-bubble membrane diffusers are preferable to coarse-air bubble aeration. Fine-bubble diffusers transfer more oxygen to the water due to increased surface area in contact with water. The same amount of air introduced in a big bubble has less surface area in contact with water than an equal amount of air divided into smaller bubbles. The amount of surface area in contact with water is proportional to the amount of oxygen transferred into water. Depth of aerators also plays a part in oxygen transfer, due to contact time. The deeper the aerator, the longer it takes for the bubble to come to the surface. Aerator depth is deepest when a tank is filled to the high-water level. If a plant is utilizing time-paced batch reactions, aerator depth is not optimal and oxygen contact

time is not maximized.

Blowers in multiple units should be sized to meet the maximum total air demand with the single largest blower out of service.