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The wide range of low pressure technology available offers numerous choices when it comes to efficiently meeting the needs of low pressure applications. Indeed, for most applications, there are several technologies capable of powering a specific installation. The challenge is to closely examine the application needs and select the right technology to ensure a reliable, stable, and energy efficient air supply.

The advent of rotary screw blowers has been heralded as *the* energy efficient solution for most aeration and other low pressure processes. While this technology has the potential to significantly reduce energy costs and greatly improve system reliability, these promises are only achievable when the technology is properly applied.

This whitepaper will examine two common technologies found in wastewater and industrial processes: rotary lobe blowers and rotary screw blowers. In addition to comparing and contrasting the compression and efficiencies inherent with these two designs, this paper will open by defining ideal applications for both types of technology and close with operating case scenarios that illuminate proper application of both blower types.

Package Integration

The scope of this whitepaper is limited to comparing rotary lobe and rotary screw blower integrated packages. This is significant as it is still a fairly common practice to specify and source individual blower package components and build the package from the ground up. This piecemeal approach to blower

package design results in highly customized, one-off packages with components from multiple suppliers, making troubleshooting and technical support difficult. Further, it complicates accurately assessing the true package efficiency as each component contributes to the overall pressure drop and efficiency losses within the package.

Having a single-source package enables clear package efficiency testing, reporting, and evaluating, and greatly simplifies technical support and troubleshooting. There are advanced integrated packages that include controls to improve blower operation, enable performance monitoring, and allow integration into the IIoT and plant communications systems. For the purposes of this whitepaper, we are comparing integrated blower packages (which include an onboard package controller).

Applications

Rotary lobe and rotary screw blowers utilize positive displacement. This means they pressurize air by trapping a fixed amount and forcing (or displacing) it into a discharge pipe. Industrial applications include fluid aeration (wastewater treatment, bioreactors, and flotation), process air, pneumatic conveying, as well as fluidization.

Although all of these applications generally operate within a low pressure range (up to 14.5 psi), most have vastly different running periods and load times. Fluid aeration applications in particular require a variable flow rate, yet have a virtually constant pressure profile.



Image 1: Pressure increasing—the images show the cross-section flow chamber of Kaeser's rotary lobe blower block.