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TECHNICAL BULLETIN #26 **Blower Speed and Reliability**

Questions are often raised regarding the reliability of rotary lobe blowers at various speeds such as: why do various manufacturers have different speed blowers? Do blowers run better and last longer at slower speeds? Is there an optimum speed to run blowers? These questions are made more difficult because many blower specifications throughout the world have imposed speed and operating limitations on blowers. Many of these specifications are obsolete, misleading and often actually reduce the life of modern blowers.

In the past, certain limitations were appropriate due to lower blower performance, older manufacturing methods, rotor balancing limits, looser tolerances, and less sophisticated bearings, gears and seals. The modern designs and more sophisticated manufacturing in M-D blowers allow the blowers to run to maximum speeds and still observe conservative design practices.

As blower performance has increased, the need to run a blower faster is even more important. Since the lobes of a blower are designed to have clearances, a small portion of the higher pressure air or gas will leak past the rotors on "slip" back to the suction port. This slip directly affects the discharge or operating temperature of the blower. Slip also reduces capacity and operating efficiency of the blower. This is demonstrated by examining the temperature rise curves of a blower to the running RPM. It is not uncommon to see a 150°F higher operating temperature from minimum to maximum design speeds of the blowers. Higher operating temperatures on bearings, seals, gears and oil films have a much greater effect on reducing blower life.

A precision rotary lobe blower is designed to run faster not slower. There are no inherent speed limitations on any of the bearings, gears or seals on any M-D blowers up to their maximum design speeds.

For many applications, a good, general rule is to keep the blower speed in the range of 70 to 80% of maximum design speed. This allows the blower to run efficiently but still have some extra capability if ever required. Sometimes other factors such as direct coupled motors or certain noise considerations may limit speeds.

It is not uncommon to find specifications with gear tip speed limits. However, exceptions are made sometimes for reduced sound blowers. This requirement is done with the sole purpose of giving one manufacturer an advantage over another by limiting speeds on certain blowers. Noise may be an important issue and criteria, and slower speeds can reduce noise. This, however, does not provide greater reliability. If noise is an issue, then overall noise requirements should be specified and alternatives such as M-D's ACOUSTICAIR™ blowers should be considered.

In most cases the customer can have the best of all worlds by not artificially limiting speeds. They can save money by getting a smaller blower which runs faster. It runs cooler and more efficiently, saving horsepower. Reliability is improved and often additional money is saved by lower installation costs.

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