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Piston Versus Rotary Screw Compressors

A Short Comparison

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Air Quality Affects the End Product

Piston compressors are still the most common choice for many small compressed air system users. For many of these applications, the relatively low air demand and quality needed make the piston a cost effective choice. There is, however, a segment of compressed air users that may require a higher level of air quality. A collision repair shop, for example, would typically use much more compressed air and have higher air quality needs than other automotive service businesses.

These days, small compressed air system users who rely on a steady supply of higher quality air are finding out their needs are similar to larger industrial facilities and that rotary compressors

offer significant operational benefits. Rotary compressors provide an extremely reliable supply of clean, dry compressed air. This may not be as critical for general repair or simple sanding, but when applying any kind of finish or coating, the end product is directly affected by air quality. When deciding between rotary and piston compressors, it is important to consider duty cycle and performance, energy efficiency, air quality, maintenance, and installation costs.

Duty Cycle and Flow

An important difference between piston and rotary compressors is their duty cycle. Duty cycle is the percentage of time a compressor may operate without the risk of overheating and causing excessive wear. A piston compressor may provide adequate flow for a short period, but its allowable duty cycle must be considered. Most small piston compressors have an allowable duty cycle of 60-70%. For this reason, piston compressors are usually oversized to allow the compressor to periodically shut down and cool off because of the relatively high operating temperatures. Even with adequate



FIGURE 1: Woodworking shops are part of the unique segment of smaller compressed air system users that often need larger volumes of higher quality air for applying high quality finishes.