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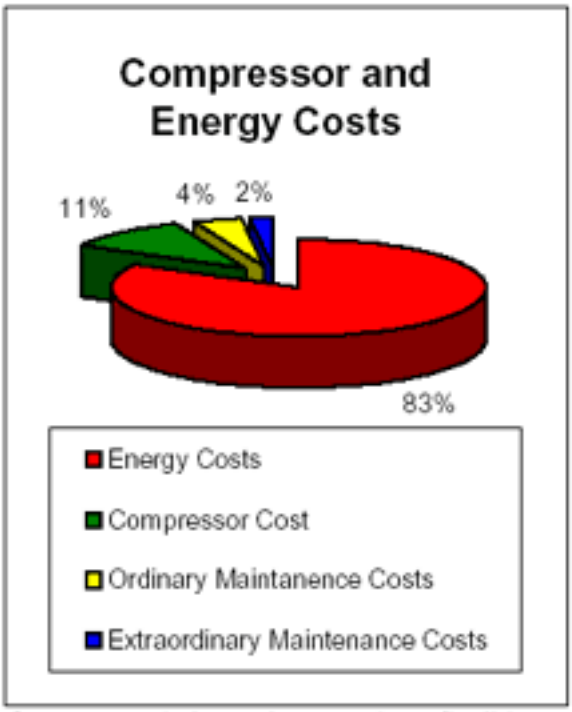
The Myth of Free Air

By Ed Sullivan, Lans Company

Without the proper compressor technology, plants face premature failures, high maintenance costs, additional compressor unit purchases and exorbitant downtime



Compressed air continues to be a flexible and extremely important element of industry's production processes. Compressed air represents over 10% of total industrial costs. The growing emphasis on environmental protection and awareness on saving energy are pushing research toward the improvement of air compressor efficiency.

The air we breathe may be free, but the notion that this applies to the compressed air that drives processes and production tools is a myth that no plant can really afford. Although the costs of air compressors may appear minor when compared to pricey production equipment, inefficient or unreliable air systems may be stealing you blind in terms of electrical costs, maintenance, premature failures, and worst of all – unplanned downtime.

True, there was a time when compressed air systems could be more or less taken for granted. Compressor technology was somewhat rudimentary, energy costs were low, processes less sophisticated and JIT deliveries was a thing of the future – not to mention lights-out manufacturing.

But for many companies today, most - or all - of that has changed. Air compressor design has a great bearing on efficiency and reliability, electric power is expensive and even penalizing, on-time deliveries are often critical and 24/7 demand on systems is commonplace. Today, an inefficient, inadequate, unreliable or failed compressed air system can take down millions of dollars of automated equipment, and waste precious production time as well as putting customer relationships at risk.

"Any equipment failure we experience usually occurs because of compressed air problems," says Hans Hermann, Purchasing Manager at Magor Mold (San Dimas , CA). "We may have been planning on running the equipment lights-out overnight. But when one of the technicians comes in to set up a new job, he has to re-start and finish the job from the night before. So we'd be behind, as much as a day, and that is a big expense."

That sort of problem seldom occurs at Magor Mold, which has been designing and building precision injection molds for over 30 years. A leader in producing molds for injection molders serving the medical industry, Magor Mold uses the latest in manufacturing technology, including robotics and automated runnerless systems, to maximize production and ROI for its extensive capital investments.

With over 30 years experience in the injection mold making industry, Hermann knows that even advanced, microprocessor controlled equipment is dependent on having reliable compressed air available when and where it's needed.

"We depend on having compressed air systems that are very consistent, very reliable," he says. "We have machines that require a high volume of air 24/7, because we do a lot of lights-out manufacturing. So, in order to

get that reliability, we're very willing to invest in the right compressor systems."

The compressors Magor Mold uses are rotary-vane models from Mattei Compressors, a favorite of the injection mold industry.

"The rotary vane design is much more efficient than the old piston compressors," he says. "The piston compressors go up to a pressure, shut off, let the tanks go down, and then the compressor starts again until they go back up. So, if you want to keep your shop pressure 120 at psi, then your piston compressor has to run from 150 to 130 (psi) and you regulate the shop to 120. What's great about the rotaries is that they'll run constantly at 125 psi, and you don't need to have regulated air in the shop. Every 2 psi lower equates to a one percent savings in power consumption."

Hermann adds that rotary vane compressors such as the Mattei units can run continuous at full pressure or in the automatic mode where it cycles internally. If the compressor controls sense a drop in pressure, as when a machine goes down, it automatically shuts off.

The primary compressor that Magor Mold uses is a 30 HP model that was purchased in 2002. As the company continues to expand and add machinery, Hermann started to see issues with production timing when the Mattei required service. So he contacted his distributor, Lans Company (Glendora, CA), a major provider of compressed air systems.

Mattei air compressors are high quality systems capable of positively impacting business operations and their bottom line.

"We told Lans what we wanted a backup compressor for when ours required maintenance, in order to minimize downtime," Hermann explains. "They had been providing us with a diesel powered unit for that purpose. But if you are going to schedule maintenance around the availability of your vendor's backup compressor, that doesn't always fit your production schedule, and could put you at risk of a failure."

In order to avoid maintenance scheduling difficulties due to the unavailability, Magor Mold decided to purchase another 30 HP Mattei compressor, certain it would pay for itself. Now if the primary compressor requires service, Hermann switches over to the auxiliary unit and doesn't miss a beat. Today, a service call does not affect the production schedule at all.

While the cost of electric power needed to drive its compressors is not a major issue with some users, excessive use of power may be a significant cost that is often swept under the rug. For example, older models of compressors often cause a spike in the electric power load during peak usage periods, resulting in a demand profile that could cost many thousands of dollars per year.

In some businesses, such as body shops and cabinet shops, the air compressor is the biggest piece of equip

ment," says Stuart Silverman, president of Lans. "Maybe it's a 20 or 30 horsepower motor, but it is essential and can cause a lot of expense. The Mattei compressors have a 'part winding start' at no extra charge. That allows the motor to ramp up to speed, which lowers the usage spike during peak periods. By making the peak smaller, we can lower a sizable electric bill. And the savings will be more than enough to justify the cost of a high-efficiency air compressor. Shops that are running 60 horsepower compressor motors could save as much as $1,000 per month."

Power savings aside, the dependable efficiency of a rotary vane compressor can make a huge difference in the operating success of many shops, directly affecting the bottom line. For example, in auto body shops compressed air is critical to painting operations. Insurance companies require quick and dependable turnaround on the repair and repainting of their client's cars in order to avoid exorbitant charges for rental cars. If a paint job gets botched because of faulty air, the resulting rework will throw off the shop schedule, not to mention profits.

Silverman advises that oil or water in a compressed air system can present major problems to even smaller shops. With auto paint costing upward to $100 a quart and special paints such as iridescent types costing even more, a small amount of oil in the air system can cause problems such as "fish eyes" that will cost plenty to redo.

Hermann says Magor Mold is very conscientious about keeping moisture and oil out of their expensive systems. "The pneumatics of the machines would foul and deteriorate pretty quickly if we didn't use preventive measures," he says. All air is run through a tank where moisture is collected and drained daily. The air is also routed through an air drier. Although the Mattei compressors have very little oil carryover, Hermann also runs the air through an oil removal filter.

With over 40 years in the compressed air industry, Silverman attributes many in-plant air system problems to leaks and negligent maintenance. He has seen many an operation where punctured hoses and improper repairs have not only caused system inefficiencies, but have also led to the purchase of additional compressors that were not actually needed.

"A 1/8-inch hole in a hose is going to cost as much air as put out by a 10 horsepower compressor," he explains. "We had a customer with a 50 horsepower Mattei, and the manager said he needed another one. I knew the operation, and just couldn't believe it was necessary. So, I went to the shop and found that there were leaks everywhere that had been fixed with tape and sometimes not fixed at all. So I went in there with a spool of hose, and for about $2,000 I eliminated probably 75% of the leaks. And after that, the compressor was usually running at 60-70% duty cycle. Of course, there could have been a lot more unnecessary maintenance cost, or even premature failure of the compressor."

In the overall, Silverman sees inadequate maintenance as creating heat problems – the main enemy of air compressors of all types. If you run them dirty or run the oil low or don't change the oil often enough, they'll run hot. If you have a leaky system, it will make them run harder, which means hot. If your air filter is clogged or belts are out of adjustment, you'll be running slower and hotter. The outcome will be inefficient systems, high maintenance costs, premature failures and, worst of all, unscheduled downtime.

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