

Preventive Maintenance Technology Keeps Metal Forming Company One Step Ahead

Safety Note

Need for a Solution

Many of A.J Rose Manufacturing Company's customers require just-in-time delivery. Because of their need to meet production schedules, the company has always strived to maintain a comprehensive preventive maintenance program. A.J. Rose recently added infrared thermography and airborne ultrasonic services, provided by Honeywell Combustion Safety, to its preventive maintenance (PM) program to make it even better. Airborne ultrasonic services deployed at A.J. Rose by Honeywell Combustion Safety were compressed air system leak detection and bearing monitoring. Infrared thermographic work focused on the sites' electrical systems.

Benefits

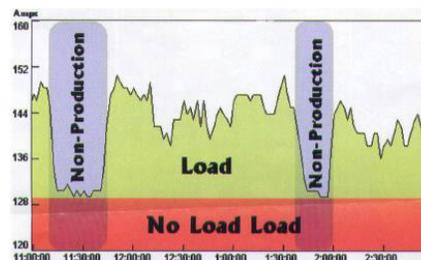
In addition to being successful in a PM sense by better directing maintenance dollars and flagging impending failures, the work done by Honeywell Combustion Safety identified ways to cut compressed air costs by more than 15 percent. This adds more than \$32,000 per year to Rose's bottom-line in reduced electrical costs alone.

Compress Air System Leak Detection

Compressed air used in metal-forming and fabricating operations is critical. Finding leaks and keeping the system in good shape is not just something the user should do to save money. Leaks also need to be found to make certain that operations using compressed air will have the pressures and flows needed for optimum performance.

Consider this: a single, tiny leak measuring just ½ in. at 100 psig can cost upwards of \$5,000 per year in wasted electricity required to compress the wasted air. In addition, it's important to recognize that everyone with a compressed air system has leaks. Five minutes after existing leaks are repaired, a typical system of any size will have leaks again. The idea is to identify leaks and manage this parameter so that it is no more than 5% of the total load.

Comparing overall system "no load/load" status is an excellent place to begin analysis of an air system. For an eye opener, use power data loggers to measure the compressor power profile at lunch and again after quitting time. The amount of energy consumed at no load operation may not be that different from energy consumption at full loads during production hours (see chart).



Why Ultrasound?

Most maintenance personnel do leak testing using soaps, water and a paintbrush. This crude approach usually can detect 20 to 30 leaks a day, but this is a serious misallocation of one of your plant's highly valuable tradesman's time and talents.

A skilled airborne ultrasonic technician usually can find more than twice as many leaks in the same amount of time as the traditional approach. What's more, this technology can detect leaks in hard-to-access, out-of-reach areas that are dangerous or next to impossible for soapy brushes and maintenance people to reach.

Finding leaks is only part of the answer. Fixing them is another story. There usually aren't resources to find and fix them right away. That's why the compressed air user needs to include a tagging system, a database to store leak information, and a plant layout drawing that can be used to identify leak locations. Without a well-planned system to find leaks, document them well, and find them again when there is time to fix them, they're not worth finding.

Leaks Can Cause Equipment Failure

Compressors must deliver exactly what is needed to even the most remote points in a plant. When a clutch or brake is required to activate, the right conditions better be there. Many facilities compensate for inadequate pressures by kicking compressor outputs up. This wastes energy and does not always guarantee that correct pressures will be delivered. If a line is oversized and a system has lots of receiver capacity (especially distributed receivers out in the plant), leaks may not hinder system performance.

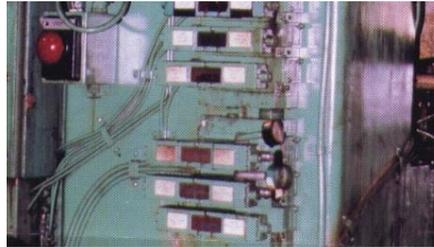
Eventually, seemingly minute and insignificant leaks can wreck dies, render presses inoperable, slow production and create angry customers. Metal-forming companies can do nothing and wait for this to happen, or they can be proactive like A.J. Rose and address the problem before it gets out of hand.

Counterbalance Cylinder Seals

Leaking counterbalance seals not only waste a lot of compressed air, they also degrade press performance. Airborne ultrasonic technology can find counterbalance leaks in just seconds from a technician standing on the ground while a press is running in a noisy plant. Try doing that with a soapy brush and water.

Pneumatic Control Systems

Pneumatic control systems, like anything else using compressed air to operate, will be compromised without the correct air pressure. Air leaks are an obvious factor that can lead to control inaccuracies, sluggish performance and breakdowns. Pneumatic control systems rely on air flowing to field devices, such as switches and valves, for timely actuation or positioning.



Any failure to actuate a switch or accurately position valves has obvious negative implications on final product quality and plant equipment operation.

Bearing Analysis

Most bearings consist of rotating elements in a cage or raceway. When bearings fail, usually it is the result of degradation or spalling of the bearing's rolling elements or raceways. As this degradation occurs, the sound signature emitted by the bearing changes. This changed sound normally is not detectable by humans without help. Airborne ultrasonic equipment in the hands of trained technicians can find bearing problems as their characteristic signature sounds change over time.

There are other technologies that can identify bearing problems. These include vibration analysis and infrared thermography. The latter is used to measure temperature increases. Both of these technologies provide valuable information; however, subtle ultrasonic warning provide a lot more lead time to correct problems, before bearings are bad enough to shake or get hot.

ABOUT US

Honeywell Combustion Safety is a part of Honeywell Thermal Solutions, an industry leader in commercial and industrial combustion solutions. Honeywell Combustion Safety, formerly known as CEC Combustion Safety, has been in business since 1984. With engineers and staff members that sit on Code committees such as NFPA 56, NFPA 85, NFPA 86, and NFPA 87, our inside expertise is integrated within all of our practices, and our global reach ensures that customers around the world are kept safe. Honeywell offers testing and inspections, engineering & upgrades/retrofits, gas hazards management, training, and field services for all industrial facilities and different types of fuel fired equipment. By assisting organizations and their personnel with the safe maintenance and operation of their combustion equipment, Honeywell aims to save lives and prevent explosions while increasing efficiency and reliability of combustion equipment.

Infrared Thermography

A manufacturer that's not using infrared thermography to review electrical systems at least once a year can't have an effective preventive maintenance program. Infrared technology has a place in identifying electrical components that are overloaded, loose or corroded, before they fail.



Whenever an electrical circuit carries a load, the current passing through the circuit creates heat. This heat is a function of the resistance encountered. Any increase in flow or resistance will generate more heat.

When components cycle, things get thermally stressed. Expansion and contraction makes things loose. Loose things make for poor connections and major resistance.

Infrared thermography allows us to see these pending failures and correct them before it's too late. Finding hot spots means simple tightening, cleaning or component replacement on a scheduled basis, instead of unexpected downtime, lost production and preventable catastrophes.

For more information

Learn more about Honeywell Combustion Safety, contact info@combustionsafety.com, visit www.combustionsafety.com or contact your Honeywell Sales Engineer.

Honeywell Process Solutions

Honeywell Combustion Safety
2100 Apollo Drive
Brook Park, OH 4 4142 USA
Tel: +1 216-749-2992

How These Technologies Work

Ultrasonic and infrared equipment allows humans to see images and hear sounds that ordinary humans can't. The airborne ultrasonic technology converts frequency noise to audible tones. Usually the frequencies scanned are in the 20,000 to 100,000 Hz range. The ear ceases to hear sounds in the neighborhood of 15,000 Hz.

A trained technician knows how to make sense of the snaps, crackles and pops. Likewise, the infrared detector picks up only wavelengths of infrared energy. The eye cannot see wavelengths this long. The infrared viewer converts them to viewable images so that a trained technician can make sense of them.

An infrared viewer can allow someone to read a newspaper in the dark by holding a household clothes iron to the page. The instrument is totally blind to normal light but the human eye can see.