INDIANA

TOOLKIT

Pollution prevention guidance for businesses.

Pollution Prevention & Air Compressor Leaks

Information Sheet

Background

Air compressors are used across a variety of industries for a variety of purposes. No matter the size, type, or application of air compressor, air leaks can occur. Leaks in compressed air systems are significant sources of lost and wasted energy; as 20-30% of a system's output is often lost through leaks alone. Whether an air system appears to have leaks or not, leak reduction is one of the most cost-effective ways to reduce energy costs and improve profits. When not addressed, leaks can have consequences for entire operating systems, including loss of profit, productivity, and efficiency. Reducing and preventing air compressor leaks can improve a compressor's overall system life and help businesses reduce wasted energy, save money, and improve their environmental impacts.

STEP 1: Identifying & Locating Leaks

Leaks can occur anywhere in an air system, including valves, hoses, connectors, drains, pipes, seals or gaskets, filters, and regulators. A leak could be caused by improperly installed systems, poor sealing and materials, damaged pipes, valves, fittings or connectors, operator mistakes, and normal wear and tear.

There are multiple ways to identify when a leak maybe present within a compressed air system. Onlyuse these methods to identify or locate leaks whenproduction is shut down. To know if a leak is present perform a Leak Time Test to calculate the Total Leak Percentage of a system by recording the time (minutes) it takes to load the compresor (T1) and the time (minutes) it takes to unload the compressor (T2).

Total Leak Percentage = [(T1 * 100)] / [(T1 + T2)]

Additional methods of identifying and locating leaks:

- **Listen for hisses or whistles along the system:** Eliminate as much surrounding noise as possible when listening for leaks as the leaks will be difficult to hear in noisy environments. Keep in mind that only larger leaks may be heard, and some leaks may go undetected by using this method.
- **Apply soapy water to the system:** To detect air leaks, mix 1 part dish soap (like Dawn) with 3 parts water. Use a spray bottle to apply the soapy water along hoses and pipes. Turn on the air system and look for growing soap bubbles. Bubbles indicate where air is leaking. *See photo above.*
- **Ultrasonic leak detection:** Ultrasonic leak detectors are the most accurate method for identifing and locating leaks. These handheld devices use microphones, amplifiers, and audio filters to convert high-frequency sounds into audible signals heard-through headphones. When pointed at a system, the device captures the high-frequency sound of a leak, releasing an audio signal upon detection. Contact CTAP for free, on-site ultrasonic leak detection tests.

The actions outlined do not replace or ensure compliance with regulatory standards set by the Indiana Department of Environmental Management (IDEM). If regulatory or compliance assistance is needed, refer to IDEM's **Compliance and Technical Assistance Program (CTAP)**.

STEP 2: Tag and Log Leaks

Once a leak is identified and located, tag and label it so it can easily be found again. Tag the valve that has the air leak, with a bright and durable tag, with the date, and severity of the leak. Create and maintain a system for logging all identified leaks. Log each leak along with its location, date found, size, and potential costs for repair. Once all leaks are identified, determine which ones need to be addressed immediately. Consider the size and potential costs of each leak when addressing priorities.

STEP 3: Repairing Leaks

There are several ways to repair and fix leaks depending on the size and location of the leak. Tightening connections at connectors, couplings, seals, gaskets and valves may stop leaks. Some leaks may require the replacement of parts. Hoses or tubes may need to be swapped for new, well-fitting replacements. Parts like O-rings or valve seals can become worn or damaged over time and may need to be replaced.

STEP 4: Preventing Leaks

Preventing leaks is one of the most cost-effective ways to reduce energy costs and improve profits. To prevent leaks from occurring within an air system, keep up with maintenance and regularly scheduled leak checks. Replacing or repairing old or worn parts as needed will help prevent future costly leaks and wasted energy. Regularly scheduled leak checks will help detect leaks early and maintain a minimal leak system. Leak detection is an ongoing action, and air compressor maintenance should be practiced no matter the size of the system or the leak.

Ultrasonic Leak Detector

Resources

IDEM's Compliance and Technical Assistance Program (CTAP) is a free and confidential service available to all Indiana businesses and regulated entities for on-site and remote assistance. Contact **CTAP** at **(317) 232-8172** or use the **CTAP online Portal** at https://portal.idem.IN.gov/ctap/ to submit a request for confidential regulatory and technical assistance. For more information, visit idem.IN.gov/CTAP.

CTAP is available to assist in identifying and locating leaks with an ultrasonic leak detection test.

For more information and resources on air compressor leaks and pollution prevention strategies, visit idem.IN.gov/prevention. Or sign up for CTAP related emails at on.IN.gov/IDEMsubscribe.