



COMPRESSED AIR LEAK DETECTION TECHNIQUES HELP YOU SAVE

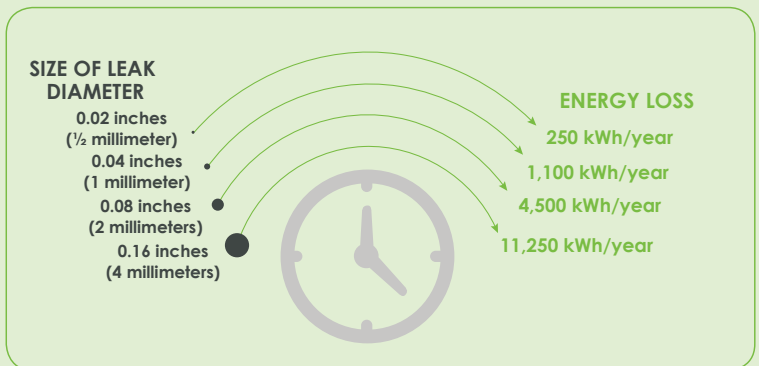
Is your compressed air system operating as efficiently as it could? Leaks in compressed air systems result in a significant source of wasted energy and can be difficult to detect. In fact, the U.S. Department of Energy (DOE) estimates that leaks can waste up to 30% of a compressor's output. Understanding and implementing a leak detection program can save you money, energy and improve your system's operation.



What You Need to Know

Compressed air leaks can wreak havoc on a system, but putting in place a plan to monitor and fix leaks can make a big impact. Leaks often occur at connections and joints at end-use applications. Other common areas include hoses, tubes,

Based on a compressor operating 2,500 hours/year at 6 bar (87 psi), the following losses would be experienced:



REFERENCE: Managing Your Energy, www.energystar.gov/ia/business/industry/downloadsManaging_Your_Energy_Final_LBNL-3714E.pdf

Because you can never save too much.

fittings, couplings and valves. If a leak exists, it can result in:

- Excess compressor capacity, which means higher operating costs
- Fluctuating system pressure, which can impact how well air-operated tools function
- Increased run time and unnecessary cycling, which equates to decreased service life and higher maintenance costs


Planned or Unplanned Leak?

Leaks fall into two categories: Planned leaks are designed into the system; unplanned leaks cause energy waste and maintenance issues. The Compressed Air Challenge—a collaboration of industrial users, utilities, manufacturers and government agencies—recommends using an ultrasonic acoustic detector to locate problem areas.

Once a leak is identified, sites may opt to repair it immediately. Another option involves tagging the spot, logging it, evaluating all leaks and repairing them based on priority. The larger the leak, the larger the savings once it is fixed. Determining the leakage rate is a key factor in prioritizing leaks and the amount of energy wasted. Once the leakage rate is known, facilities can better assess the cost savings associated with fixing a leak.

The Compressed Air Challenge notes that facilities can also determine the leak load for systems with other controls by estimating the total system volume. First, bring the system to the normal operating pressure, turn off the compressor, measure the time it takes for the system to drop to one-half of the operating pressure and calculate the leakage.

Leakage Rates (CFM)



Pressure (psig)	1/64	1/32	1/16	1/8	1/4	3/8
70	0.3	1.2	4.8	19.2	76.7	173
80	0.33	1.3	5.4	21.4	85.7	193
90	0.37	1.5	5.9	23.8	94.8	213
100	0.41	1.6	6.5	26	104	234
125	0.49	2	7.9	31.6	126	284

According to the Compressed Air Challenge, multiply values by 0.97 for well-rounded orifices; multiply values by 0.61 for sharp-edged orifices. Data courtesy of www.compressedairchallenge.org/.

Cost Savings Calculation



$$\text{Number of leaks} \times \text{Leakage rate (CFM)} \times \text{kW/CFM} \times \text{Annual operating hours} \times \text{\$/kW} = \text{Estimated cost savings of leak repair}$$

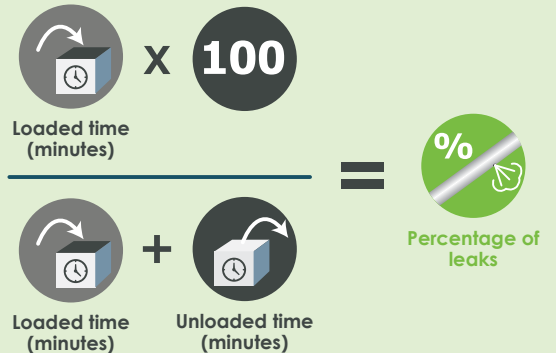
Because you can never save too much.

COMPRESSED AIR LEAK DETECTION CHECKLIST

Use this easy-to-follow checklist to locate leaks in a compressed air system and implement an ongoing management plan to save money and energy.

- Establish a baseline** of compressed air usage.
- Determine leak loss** by starting the compressor when there are no demands on the system. Set the system at normal operating pressure, open the supply valves for all air-operated end-use equipment and use shut-off valves to isolate open, blowing applications. Take measurements to calculate the average time it takes to load and unload the compressor.
- Assess leak loss percentage.** A well-maintained system will experience a leak loss of less than 10%; poorly maintained system can have losses of 30%. Losses above 10% indicate a prime candidate for improvements.
- Calculate energy cost of leaks.**
- Repair or tag leaks.** This process could range from tightening a connection to replacing a section of pipe. Use high-quality tubing, hoses, fittings and disconnects and ensure the thread sealant is applied properly.
- Document leakage rates and cost savings.** Compare results to the baseline to help gauge the effectiveness of the leak detection program and cost savings.
- Set a target leak loss percentage, and establish a quarterly detection and repair program.**

Leak Loss Percentage



Energy Cost of Leaks*



*Assumes electricity rate of \$0.10/kWh, constant operation and an efficient compressor.

Fast Fact

According to the Compressed Air Challenge, a plant that has a lax leak detection program can have a leak rate equal to 20% of its total compressed air production capacity.

LEARN MORE

CALL | 800.342.6335
 EMAIL | commercial@nvenergy.com
 WEB | www.nvenergy.com/commercial