

Compressed Air Systems

Leaks in a compressed air system can waste as much as 20% to 30% of the compressor’s output. The leaks not only waste energy, but can add up to significant monetary losses. The best way to detect air leaks is to use an ultrasonic acoustic detector. These are portable devices that are easy to use. They vary in cost and sensitivity, but a good one can be purchased for a relatively low cost.

To operate efficiently, facilities with compressed air systems need to incorporate a leak prevention program into their maintenance operations. ADEQ’s Office of Enterprise Services (OES) can help your business get started. The OES has an ultrasonic leak detector and we will be happy to come to your facility to check for leaks and show you how to use the equipment. Contact Audree Miller, pollution prevention coordinator, at 501.682.0015 or email miller@adeq.state.ar.us.

Leaks are most commonly found where parts connect, such as couplings, pipe joints, quick disconnects, valves, etc. Leakage rates depend on the supply pressure and are proportional to the square of the orifice diameter. (See table below.)

Leakage rates ^a (cfm) for different supply pressures and approximately equivalent orifice sizes ^b						
Pressure (psig)	Orifice Diameter (inches)					
	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	26.0	104	234
125	0.49	2.0	7.9	31.6	126	284

^a For well-rounded orifices, multiply the values by 0.97, and for sharp-edged orifices, multiply the values by 0.61.

^b Source: http://www.energystar.gov/ia/business/industry/compressed_air3.pdf

To calculate the savings from a leak in a compressed air system, use the following equation:

$$\text{Cost savings} = \# \text{ of leaks} \times \text{leakage rate (cfm)} \times \text{kW/cfm} \times \# \text{ hours} \times \$/\text{kWh}$$

Example

$$\text{Cost savings from } 1/32'' \text{ leaks} = 100 \times 1.5 \times 0.61 \times 0.18 \times 7000 \times 0.05 = \$5,765$$

For more information on reference materials and training, see the Compressed Air Challenge™ website: <http://www.compressedairchallenge.org/>.