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COMPREHENSIVE COMPRESSED AIR AUDITS

The 5-Step Process

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The U.S. Department of Energy estimates that air compressors use as much as 10% of all electricity generated in the United States. Further, the DOE calculates that as much as 50% of this energy is wasted. Compressed air leaks alone account for 25-30% of compressed air use.

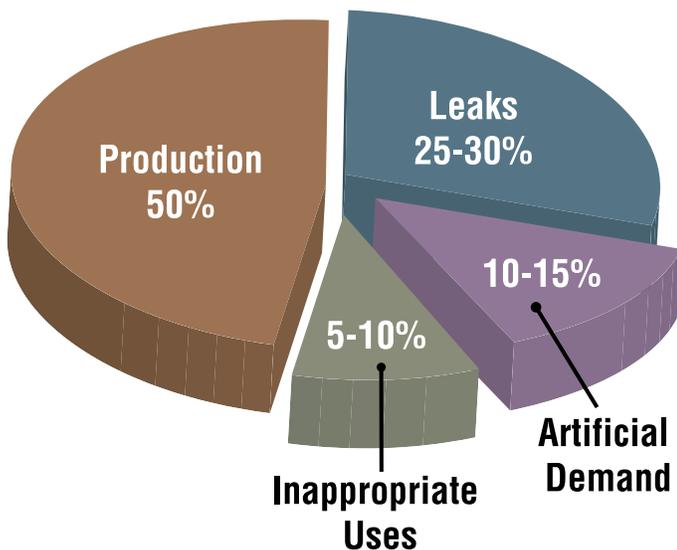
Consequently, many industrial companies are identifying ways to lower their compressed air system energy consumption. One of the most popular methods to do so is a comprehensive compressed air audit, or “air demand analysis.” The objective of this paper is to define the five steps required in a compressed air audit. We will use a real-world example with system information from a magnetic materials manufacturer to clearly illustrate each step. In the following case, the user achieved a 42% reduction in annual energy costs.

Step 1: Conduct a Site Survey

It is important to list and understand all the equipment in a compressed air system before installing any measurement devices so that 1) the devices are properly placed, and 2) system dynamics are properly understood. The person responsible for collecting information should note: environmental conditions, physical layout, details on all air system components including clean air treatment, piping, storage, and controls. Processes at the facility should also be documented. Many auditors will have a questionnaire which they will complete to compile the details into one document.

Case: This facility had two compressor rooms using rotary screw air compressors from three different manufacturers. They also had a mix of refrigerated air dryers, receiver tanks, and filters. The piping network was made up of 1.25, 1.5, and 2 inch lines.

Both Compressor #1 and #2 were operating in modulation control. Compressor #3 was also using modulation control, but was offline during the testing period.



The U.S. Department of Energy estimates that only 50% of compressed air is put to productive use - meaning most air systems have significant energy savings potential.

Compressor Room #1	
(1) Compressor #1, water-cooled screw compressor with modulating control	rated 267 cfm at 125 psig
(1) 240 gallon storage receiver prior to air treatment	
(1) Refrigerated air dryer with one pre-filter and two after filters	