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# Fixing Compressed Air Leaks

## **FIXING COMPRESSED AIR LEAKS**

### **FACT SHEET**

Compressed air leaks usually have an invisible impact on the environment, which makes it difficult to see the losses that occur. Industry often uses compressed air as a power source for tools and equipment making it a vital part of the production process. Compressed air usually comes from a compressed air system, consisting of multiple valves and piping that have leaks occurring at regular intervals due to various factors such as worn valves and strained piping.

#### **WHY implement?**

Leaks are a significant source of wasted energy in a compressed air system, often wasting as much as 20%-30% of the compressor's output resulting in excess compressor capacity. Compressed air leaks can also contribute to problems with system operations, which include: Fluctuating system pressure, which can cause air tools and other air operated equipment to function less efficiently, possibly affecting production. Decreased service life and increased maintenance of equipment due to unnecessary cycling and increased run time.

Fixing leaks within a compressed air system renders:

- Stable system pressure resulting in higher operational efficiency, and uninterrupted production.
- Up to 17 % energy savings due to a reduction of compressor running time.
- Increased service life and reduced maintenance on equipment, resulting in reduced maintenance costs.

#### **HOW to implement?**

Firstly do an audit to identify the leaks. This can be done by searching and finding leaks within the compressed air system. To facilitate this process use a magnifying instrument such as an ultrasonic acoustic detector or by applying soapy water with a paintbrush to a suspected area to find leaks (for more information on ultrasonic detectors visit the [flow control network](#) web page).

Secondly fixing leaks can be done mainly by:

- Sealing leaking pipe unions.
- Tightening and replacing gaskets on filters or lubricating bowls.
- Repairing damaged flexible hoses.
- Replacing old worn-out nozzles.
- Closing off air supply to non-operating equipment that could be a source of leaks.

## WHAT is required to implement?

- Set up a monitoring plan to allow for continuous auditing, fixing and monitoring of system efficiency
- Assign staff that are well acquainted with the status and positioning of the compressed air system, to do the audits and fix leaks.

## Example

A company operating at a 650kPa system pressure decided to do a leaks audit to eliminate leaks within their system. Several leaks of various sizes were identified all over the system. After fixing identified leaks it was calculated that 17% energy savings were made, equivalent to R7 705 annual savings in 2005.

A Table representing Air Leakage and Annual Energy Wastage.

Equivalent hole diameter (mm)	Quantity of air lost in leaks (l/s)	Annual energy waste (kWh)	Annual cost of leaks (Rands)
0.4	0.2	133	20.04
0.8	0.8	532	80.17
1.6	3.2	2128	320.69
3.2	12.8	8512	1282.76
6.4	51.2	3404	512.98
12.7	204.8	136192	20524.13

This table lists the estimated amount of air leaks for system operating at 700kPa, 2000hours/year and current electricity cost of R0.1507/kWh

For more information on improving compressed air system performance visit the [EERE](#) web site.

Non-operating equipment could be a source of leaks and should be Isolated from the compressed air system if no longer in use.

If there is a difference between the current inlet air temperature to your compressor and the ambient temperature, potential savings can be achieved by retrieving outside air that is at lower temperature. To calculate potential savings visit the [energysmart](#) web page.

Sources and Useful Links:

- Energy Star: [http://www.energystar.gov/ia/business/industry/compressed\\_air3.pdf](http://www.energystar.gov/ia/business/industry/compressed_air3.pdf)
- Energy Rating: <http://www.energyrating.gov.au/library/pubs/aircomp-guide2.pdf>
- Flow control network: <http://www.flowcontrolnetwork.com/PastIssues/sep1999/2.asp>
- Energy smart: <http://www.energysmart.com.au/sedatoolbox/compressedair.asp>
- EER (energy efficiency and energy renewal):  
<http://www.eere.energy.gov/industry/bestpractices/pdfs/airmaster.pdf>

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The entire range of fact sheets can be found by visiting the [www.capegateway.gov.za](http://www.capegateway.gov.za) web page.