

Energy Efficiency Fact Sheet: Air Compressors

Almost every industrial plant has some sort of air compression system on site. These systems typically account for only 10% of total energy consumption but up to 30% of the total energy wastage. Energy can be wasted on the supply side (compressor and air intake systems) and on the demand side (pipe networks and appliances). If you work together with an energy auditor and a compressed air specialist, wasted energy can be reduced significantly through energy efficiency.

Quick and easy things to do

- 💡 **Regularly check for leaks in the system.** Leaks in the system can easily add 30% to the energy cost. Check for leaks in pipes, connectors and joints using a leak detector. A simpler leak detection method is to apply soapy water to suspect areas and watch for bubbles.
- 💡 **Select the right operating pressure.** Air pressure should be the minimum required to do the job. When air pressure is too low, tool efficiency decreases and process time increases. When it is too high, false 'demand' is created at the outlets and pipe leaks may also form.
- 💡 **Keep intake air temperature cool.** Operating a compressor in hot areas increases energy consumption. If the compressor can't be moved, duct the outside air into the compressor intake. A 10°C drop in intake air temperature will reduce energy consumption by 5%.
- 💡 **Minimise distance between compressor and outlets.** The shorter the distance compressed air needs to travel, the lower the energy cost.
- 💡 **Turn compressors off when not in use.** Use timers and other controls to ensure compressor is on for the minimum amount of time.
- 💡 **Regularly clean and maintain air filters.** Dirt, oil, water and other contaminants can cause loss of pressure and damage to equipment. Keep filters clean and replace damaged filters immediately.
- 💡 **Avoid wasting air.** Compressed air should not be used for cleaning or drying, or left connected to unused appliances.

Energy Savers

Leak size	Energy loss
3 mm	5%
6 mm	20%
12 mm	80%

Fix all leaks

Extra Pressure	Energy Increase
50kPa	4%
100kPa	8%
200kPa	16%

Correct the pressure



Ducting intake air from outside



Timer control



Clean vs dirty air filter

Investments in Energy Efficiency

- 💡 **When replacing compressors, choose the right type for the job.** Use a screw compressor minimally-sized for constant loads, with a stand-by unit for extra loads. A reciprocating (piston) compressor is better for small, intermittent loads. A centrifugal compressor is energy efficient for larger applications.
- 💡 **Install and maintain appropriate anti-contaminant accessories.** Installing and maintaining correctly sized air filters, intercoolers & aftercoolers (for multi-stage compressors), moisture separators and air dryers will improve performance and reduce energy wastage.
- 💡 **Recover waste heat.** Installing a heat recovery system will allow waste heat from air compressors to be used elsewhere on-site. Up to 80% of compressor waste heat can be re-used. Check out this demonstration: http://www.compair.com/Products/Heat_Recovery.aspx
- 💡 **Install variable speed drives.** VSD's can be used to good effect in air compressors. Up to 50% energy savings are possible where running hours are long, with a high proportion in the mid to low-capacity range.
- 💡 **Upgrade to energy efficient products.** An energy audit will determine whether or not this is profitable for your business. Register for a free energy audit at 3eproject.org.au.

Did you know?

- 💡 Leaks from a 6mm hole waste four times more energy than leaks from a 3mm hole.
- 💡 Many air compressors are oversized for future loads that never eventuate.

“Our compressor used to switch on for 40 minutes every hour. The compressor guy checked our pipes with an ultrasound machine and found three small leaks. We fixed these and put a vent in the compressor room; now the compressor runs for half the time.”

- Boris, Greystanes

For further information contact the 3E Project Team on 1800 242 845 or by email at info@3eproject.org.au

Energy Savers



Fan-cooled piston compressor



Screw compressor



Portable heat recovery unit



Variable speed compressor

