

# Compressed air for waste management and recycling



**Compressors use large amounts of energy, in very inefficient fashion, but these losses can be cut in half by introducing a few simple measures, explains Mark Whitmore, General Manager at BOGE Compressors.**

Compressed air is critical to many industries, and the waste and recycling sector is no exception. It is most commonly used at the heart of waste stream separation, in the form of 'air knives'. As mixed waste moves along a conveyor belt, elements of it are removed by judicious blasts of compressed air.

First, paper and card are removed by these air jets. Later in the process, plastic bottles – which are usually made from polyethylene or PET – are scanned and identified by infrared camera. Precise air jets are then used to move the different plastics to separate areas.

The largest cost associated with compressed air is energy – yet the process is notoriously wasteful. Only around 45% of input energy is actually used to compress the air: the rest is lost through leaks, heat loss and other inefficiencies. It seems ironic that the recycling industry – with its focus on waste reduction – should be plagued by such inefficiency.

These losses are already being tackled, due in part to legislation. The recently introduced ISO 11011: 2013 standard sets out the requirements for conducting and reporting the results of a compressed air system assessment – or audit – for the entire system. It sets requirements for analysing the data from the audit, reporting and documenting the findings, and identifying an estimate of energy savings from the assessment.

A set of relatively simple alterations can cut the energy consumption of compressors in half. This is just as well, considering that compressed air can account for one-third of a site's electricity bill.

## Fixing leaks

Compressed air losses are not unique to the recycling sector. Some of the main factors that drag down efficiency are system leaks and heat loss. The good news is that these – and other problems – can be solved.

Leakage is a huge concern. According to the Carbon Trust, a 3mm hole in a compressed air line can cost a business up to £700 a year in wasted energy. However, it can easily be prevented with regular pressure checks or by conducting a leak detection survey. Air escaping through a leak hole

# Compressed air for waste management and recycling



creates a tiny sound that is inaudible to the human ear – but detectable by specialist ultrasound detection equipment, which converts it into an audible signal and indicates it optically. Once leaks have been identified, a maintenance schedule must be put in place to plug them and ensure future leak detection surveys are carried out – or the benefits will only be temporary.

Many compressed air lines also run at excessive pressure, and this can be identified during an energy audit. Lowering system pressure could mean that fewer compressors are needed. As well as reducing energy and service costs, it will also cut down on maintenance.

## Heat recovery

Much of the energy used to power an air compressor is converted to heat. Traditionally, this was wasted. Now, up to 94% of this 'wasted' heat can be recovered – and routinely used for heating water or offices, or in industrial process application where hot water is required.

Before investing in heat recovery, end users can calculate the potential energy and cost savings by assessing the heat or hot water demand in areas adjacent to the compressor installation. Comparing this assessment with the average operating hours of the existing compressed air system will highlight the possible payback in terms of reductions in fuel, oil and gas costs. It makes sense to get help from a compressor specialist when making these calculations.

## Central control

Operating two or more compressors via a central controller can also lead to savings. These controllers boost energy savings in two ways. Firstly, they constantly monitor pressure – keeping it within a much narrower range by switching compressors on and off as needed. And secondly, they predict the best combination of compressors to use, in order to meet demand. This is particularly useful when using a combination of fixed- and variable-speed machines, as it minimises off-load and part-load running of the compressors.

Multi pressure systems can make significant savings – with every 1 bar saved on pressure equating to a 7% saving on electrical running costs.

It is measures like these that make an energy audit vital. Air compressors will always consume large amounts of energy, but running them more efficiently – and recovering 'waste' heat – will help to take the edge off utility bills.

**To find out more about BOGE Compressors, please contact us or visit our website:**

[www.boge.com/uk](http://www.boge.com/uk)

