

ENERGAIR CASE STUDY



SMURFIT KAPPA

Saving a packet on compressed air

Packaging processor Smurfit Kappa reduces energy costs by over 27% on compressed air

After a proactive compressed air audit carried out at the Smurfit Kappa corrugated packaging plant in Weston Super Mare found that the compressed air system was wasting over 30% of the energy it was consuming, the site management team were relieved to find that an improved control system could prevent most of the losses.

The figure of 30% losses looks surprisingly high, but is not unusual in this industry, the plant was operating with fixed speed compressors on a cascade pressure switch control system, which consumes a large amount of energy while offload. Following recommendations from compressed air

control specialist JM Control Solutions Ltd. a new EnerAir management control system and a Variable Speed Drive (VSD) compressor were installed, thus reducing Smurfit's yearly energy costs on compressed air by over 27%.

Smurfit Kappa is making every effort to improve efficiency and reduce energy usage, the organisation is eager to reduce its energy consumption not only to help lower its overheads, but also to reduce its carbon footprint. As most site managers know, compressed air systems use a lot of energy and Mr. Andy Bale Site Engineering Manager at Smurfit had singled the system out for investigation.



Richard Peutril of JM Control Solutions Ltd. comments, 'There are various reasons why a compressed air system may not be running efficiently. Switching fixed speed compressors on and off via a cascade pressure switch control system for example is massively inefficient, often running a compressor when only a small amount of output is needed from it. With the relentless energy price rises currently being seen at the moment it is essential for companies to challenge this convention.'

When operating on a cascade system with fixed speed compressors the demand for compressed air will likely vary between the capacities of the installed compressors. This leads to an increase in offload running, and a deterioration in system efficiency. The Smurfit Kappa site shows a perfect example of this, often running a second 90kW compressor when just a small amount of additional capacity was needed meaning 84% of energy consumed by that compressor was wasted.

Buying a new compressor can sometimes damage efficiency if the wrong size is chosen, so it is important to profile the demand for compressed air on a site and work out the most efficient combination of compressors needed. Variable Speed Drive (VSD) compressors are often purchased with good intentions but unmanaged by an effective management control system such as EnerAir's Metacentre control system; it will rarely deliver any overall savings.

Pete Tomlins of EnerAir says "There are varying solutions offered for improving compressed air energy efficiency, these can range from replacing auxiliary equipment and piping to finding and blocking leaks, but these often lessen the problem rather than solving it. At EnerAir we believe that customers deserve a solution that ensures their system will run as efficiently as possible, and getting hard and fast site data is an essential first step"

The audit included monitoring air usage very precisely for 165 hours with a high frequency data log rate of every five seconds.



The site's two larger 90kW compressors and a smaller 60kW compressor were all fixed speed at the time.

In total, non-productive energy made up 35.58% of the energy cost for running Smurfit Kappa's system which was adding thousands of pounds to the annual energy bill.

The varying capacity requirements of the site meant that equipment was rarely operating optimally. When one compressor wasn't producing sufficient capacity, a second was started, loading and unloading to satisfy any shortfall, often using only 16% of its energy consumption productively. In addition, the cascade

operating system which was in use added to the poor overall performance of the system.

After the audit two recommendations were made which, combined, would make an estimated saving of over 27% on Smurfit Kappa's energy bill for compressed air. Firstly, in order to manage the compressed air system in an efficient way, and provide the platform to coordinate the different compressors with the factories demand for compressed air, it was recommended that a new EnerAir Metacentre management control system be installed.



The EnerAir system was linked to pressure sensors throughout the compressed air ring main which could then monitor the entire compressed air system and eradicate over pressurisation.

Secondly, it was recommended that a VSD be retrofitted to one of the compressors or a new VSD compressor be installed. With precision VSD regulation controlled by the Metacentre system, this would ensure that all compressors were utilised to generate the required output capacity as efficiently as possible. A new VSD compressor was chosen and now installed these recommendations have made a considerable difference to the sites energy usage - the compressed air system is using 29.01% less kW/M3/min which is saving thousands of pounds per year.

When examining the energy efficiency of a sites compressed air system it is important to consider ways in which waste can be avoided. There are some essential questions which should be asked of your system in order to identify how best to upgrade: Has the demand profile been mapped? Are the compressors on site the right combination of sizes? Has energy use been recorded and benchmarked so

that the impact of changes made can be validated? Are multiple compressors being controlled by an effective management system? Is a new VSD compressor the right solution, and can its capability for energy saving actually be realised?

Pete Tomlins "For many in industry the rising energy prices are seen as a problem that cannot be avoided. We are able to provide customers with a way to combat these price rises. By installing EnerAir equipment it is possible to ensure that the energy wasted by a plant's compressed air system is kept at an absolute minimum. The savings that this system is capable of providing often means that the equipment will pay for itself within a matter of months."





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