

Project Report

JAMES CROPPER PLC
ESTABLISHED 1845

CUSTOMER

James Cropper is a world-class advanced materials and paper products group, with an operational reach in over 50 countries. The company's paper mill needed to replace an ageing system.

PROJECT

BOGE offered consultancy, supplied and installed compressors to provide oil free, class 0 compressed air, integrated equipment and oil converters.

BOGE PRODUCTS IN USE

- 2x BOGE convertor bluekat BC 330 oil converters
- 2x 110 kW S111-4 oil-flooded compressors
- 1x 90 kW SLF 111-4 oil-flooded compressor
- 2x DS460 refrigerated air dryer
- 2x F745P Pre-filters
- 2x F745M After-filters
- 1 x 10,000 litre horizontal galvanised "wet" air receiver
- 1 x BOGE Airintelligence Provis 2 controller



Oil-free compressed air and easy maintenance – without oil-free compressors

James Cropper has grown its business providing niche solutions such as materials essential for a hydrogen fuel cell, a bespoke colour and texture for a luxury brand's packaging or moulded fibre alternatives to single use plastics. Due to the company's focus on bespoke projects and high-quality innovative responses to customer demands, the site had expanded to accommodate the growth in the three business divisions – Technical Fibre Products, Paper and Colourform.

The sites growth and subsequent increase in demand for oil-free compressed air, combined with a 30-year-old compressor and standby unit, led to a range of problems for the site's project manager, Brad Ireland, and his colleagues. Brad comments: "Reliability was becoming an issue for us with regards to providing stable air quality across the whole site.

Demand for compressed air is inconsistent in a paper mill and as such the compressed air system has to be able to respond quickly when needed. The old compressor and receiver were unable to react fast enough and also the air output would pulse up and down as the system struggled to meet demand across the plant."

As well as unstable air delivery, the increased demand for compressed air meant that the mill's standby compressor was often called upon to help support day-to-day supply. This left the plant vulnerable, as at times there was no back-up supply if the compressors failed whilst in use. In addition, the compressor and standby unit were showing their age and maintenance costs had been rising and reliability had become an increasing issue.

PROJECT INFORMATION

> THE CHALLENGE

James Cropper has expanded significantly over the past 10 years with the production of non-woven technical fibres, speciality papers and moulded fibre packaging. The 30-year-old compressors were struggling to maintain compressed air levels throughout the extended plant. The standby compressor was being used more and more meaning there was no back up if either failed.

> THE BOGE SOLUTION

Consulting with the project team at James Cropper, BOGE installed an integrated system including BOGE BC oil converters, new oil-flooded screw compressors and a BOGE Airintelligence Provis 2 controller predictive maintenance solution.

> THE RESULT

Although annual energy consumption is on a similar level to the previous system, the real benefits ensure sufficient capacity for future growth and the consistency of oil-free compressed air supply throughout the entire plant. James Cropper has also taken out a maintenance contract with BOGE and according to project manager, Brad Ireland: 'they have been very reliable and any issues have been quickly resolved.'



The solution

Working with Neil Gibson, project manager at BOGE, it was decided that the most cost-effective way to not only provide the mill with oil-free compressed air for present and future needs, but also to reduce maintenance costs was to install BOGE oil-flooded compressors, BC oil converters and a predictive maintenance monitoring system.

After analysing air consumption patterns at the paper mill, the team at BOGE were able to identify the size and type of compressors – and related components – that would be needed to supply present requirements, as well as to meet future growth demands. Neil comments: “After spending time with Brad and the project team, the air supply reliability and maintenance issues on site became clear very quickly. We needed to make sure that any solution we installed was cost-effective to run, reliable, easy to maintain and had capacity for future plant growth.”

With this in mind, the installation included two fixed speed low-wear, low-maintenance 110 kW BOGE S111-4 oil-flooded screw compressors and one variable speed compressor which could be auto-rotated. This built 100% redundancy into the solution for when a machine is being serviced. They are all water cooled and a duty stand-by closed loop cooling system was incorporated for added security. Two BOGE bluekat BC 330 oil converters were also included, as the units convert oil hydrocarbons from the air into carbon dioxide and water to enable the delivery of Class 0 compressed air. BOGE DS460 refrigerant driers and additional pre- and post-filters were also included to maximise contaminant extraction. A BOGE Airtelligence Provis 2 controller was added to enable the system to be run efficiently at all times and any maintenance issues flagged to the BOGE team - who now manage the system’s maintenance and servicing.

The original compressor units were housed outdoors; however, it was decided that a space within the plant be allocated for the new compressors. This area was refurbished, and the new compressors were subsequently installed whilst the old units continued to operate. Commissioning took place during the week and the switch over from the old to new units was carried out over a weekend, to ensure that there were no production disruptions.



Oil-free compressed air essential

Reliability and speed are key in the paper making industry and compression equipment needs to achieve both, if it is to keep the plant operating at maximum efficiency. In paper mills, the compressors are used for a wide variety of tasks, including feeding the paper presses, the agitation of solutions, adjusting rollers, facilitating the cutting and pressing process and the spraying of coatings onto the paper.

Oil-free air compressors tend to be used because they help to produce the highest quality paper that is free from contamination. However, it is possible to achieve the same high-quality delivery of ‘class 0’ oil-free compressed air, that complies with ISO 8573-1, using an oil-flooded compressor and a catalytic converter.



Results in brief

- High-quality air – oil concentration complying with ISO 8573-1 in terms of residual oil content (<math><0.0025\text{mg oil/ Nm}^3</math>) as well as oil-free condensate
- Improved air stability throughout the paper mill plant with no fluctuations in levels
- Improved system reliability and peace of mind for the project team
- Future proofing compressed air provision – with increase in compressor power from 149 kW to 184 kW
- No unexpected maintenance costs thanks to the outsourcing of servicing and maintenance contract to BOGE.

Customer satisfaction

The best results are achieved when a supplier and their customer can work together as a team. In this instance the James Cropper project team and BOGE worked to make sure that the end result met both today's needs and future requirements for the plant.

Brad concludes: "We knew what we wanted from a compressed air system and the new system has made that a reality. We wanted a cost-effective solution that would deliver high-quality, oil-free air, when and where we needed it. The responsiveness of the BOGE solution is fantastic and it has been running for a while now. They have been very reliable and any issues have been quickly resolved."

