



Mansfield Brick's state-of-the-art production facility in Nottinghamshire

Making Better Bricks

ConSpare's 'Make it better' approach to maintenance issues helps improve efficiency and boost production at Mansfield Brick

Founded in 1926 to produce calcium silicate bricks for the building trade, Mansfield Brick now produce a wide range of concrete products. Operating from their state-of-the-art production facility in Nottinghamshire, they produce more than 3 million units a month, including concrete commons, coursing bricks and infill slips for the block and beam flooring market. The company supplies many of the major builders' merchants, buying groups and independent suppliers, as well as producing bespoke products to meet the needs of the industry.

Part of the concrete brick production line



In May 2017, Mansfield Brick's production director, Dominic Delich, approached ConSpare at a concrete exhibition. Mr Delich had recently been recruited by the firm with a remit to improve its operations in order to increase production capacity to 30 million bricks per year. Having recruited a dedicated team of maintenance engineers to review the plant, equipment and setup, and drawn up a plan to bring about the improvements required to meet this ambitious target, he invited ConSpare to 'walk the plant' to see what improvements they could suggest.

The challenge

The concrete produced by the batch plant was of variable quality and clearly an issue at Mansfield Brick. Problems with the way the plant was set up were having a big impact on overall efficiency, leading to wide variations in the quality of the units coming off the production line.

Varying moisture levels in the raw materials were affecting the company's ability to achieve the optimal mix design on a consistent basis, often resulting in wet batches of concrete being delivered into the plant. This not only led to inconsistent product quality from one batch to the next, but also resulted in small variances in the overall size and shape of each individual brick, which, in turn, led to bottlenecks and failures at key points in the automated process, and increased the amount of maintenance downtime during any given shift.

The batch plant used by Mansfield Brick was of good quality, but a lack of preventative maintenance meant that many of the key pieces of equipment, largely centred around the mixing system, were under-performing and needed to be brought back up to specification.

The solution

ConSpare assessed the entire plant and identified that, to improve concrete batch accuracy, control of moisture in the batch was critical to the whole operation. They recommended the installation of a Hydronix moisture-measurement system in the mixer for accurate control over the addition of water

to the mix. However, whilst this would be a significant step towards solving the problem, they also recognized that this upgrade on its own would not deliver maximum benefit for Mansfield Brick.

ConSpare's 'Make it better' approach allowed the development of a solution for Mansfield Brick that would deliver the maximum possible benefit. By 'walking the plant', understanding the problems and developing a holistic plan to solve multiple issues in the most logical sequence, ConSpare were able to make a real difference. As part of the works, they specified:

- Refurbishment of the mixer with new wear parts – to improve mixing
- Servicing of the existing mixer washout system – to keep the pan clean
- Refurbishment of the mixer venting filter – to control dust on the mixer platform
- Installation of two belt scrapers and Matrox chute liners
- Supply and commissioning of a Hydronix HydroControl automatic moisture-control system.

To derive the most benefit for the client, the above solutions were deployed in a specific order. Had the Hydronix system simply been installed in a mixer that was not being cleaned properly and had worn mixing tools, it would have prevented the sensor from operating to its full potential.

'Make it better' allowed ConSpare to assess Mansfield Brick's entire concrete production process and utilize specialist products to provide solutions to improve specific parts of the plant. The core of 'Make it better' is all about collaborating with the customer to 'transform' their concrete production process. Whilst solving problems individually provides plant improvement, delivering that improvement across the whole plant provides transformation.

The result

The 'Make it better' approach and the solutions supplied allowed Dominic Delich and his team to get back on top of maintenance of not only the concrete batch plant, but also the rest of the production line. The problems they were suffering with wet batches often would not come to light until the bricks were reaching the end of the process, which could be 24h after they had left the block machine to be cured.

Moisture levels were often being judged by trial and error by plant operators and it could sometimes take up to an hour each morning to adjust the moisture levels sufficiently to get consistent batches running through the plant. The Hydronix system has eliminated this and means consistent batches of concrete are produced by the mixer within minutes of production starting each day, leading to more consistent product quality and fewer breakdowns caused by 'fat bricks'.

This extra production time directly resulted in the manufacture of an additional 1.67 million bricks per annum, whilst the increased accuracy reduced scrappage by 75,000 bricks per annum. Successes in improving the batch process have unlocked further improvements throughout the plant,



Hydronix Hydro-Control VI automatic water control system

which is now more efficient and able to keep up with the higher demand.

In particular, plant run time increased from 64.9% in 2015 to 74.1% in 2018, while waste fell from 0.84% to just 0.18% during the same period. This allowed Mansfield Brick to increase production from 26 million bricks in 2015 to 31 million last year, with the company on track to deliver a similar number of units this year. Reducing the amount of downtime has also allowed the firm to increase production time by 2h each day and take a more proactive approach to maintaining the plant, with an additional 18 dedicated maintenance days introduced into the budget in 2018.

The improvements to the plant have led to an increase in confidence among both production and sales staff. Benefitting from longer production runs, the company has significantly expanded its stockholding from 1 million units to 6.5 million units, allowing it to satisfy immediate customer demand. The bricks also sit on the yard longer, providing more control over when the bricks reach full strength. An increase in both sales and order enquiries has followed, and the production team now has full confidence that the concrete being produced by the plant will not lead to

stoppages and maintenance issues further along the production process.

The cumulative effect of all the upgrades specified by ConSpare has had a far bigger impact than would have been the case if each had been implemented individually. Although the initial investment was more, Mansfield Brick have gained a significant improvement in return. As a result, with the bricks now achieving such consistent strengths, the company is able to move forward and improve other elements of the process, with the team looking to refine the mix design and implement reductions in cement usage per batch.

Testimonial

Commenting on the improvements, Dominic Delich said: 'We've been blown away by the solutions ConSpare provided, which have had a huge impact on production efficiency here at Mansfield Brick. I was always confident that if we got the plant operations right, I'd be able to deliver 30 million bricks a year, and the improvements ConSpare have made have played a huge part in achieving that target.'

'Not only have they allowed us to get back on top of the maintenance of the plant and take a much more proactive and preventative approach, but the whole team now has confidence in the plant and the consistency of the concrete it produces.'

'The problems we were suffering with wet batches and fat bricks before ConSpare's solutions were installed have been all but eliminated. Breakdowns were once a regular occurrence and we often had to stop production to clear up pallets of spilled bricks from the floor. Now, all the team have confidence in the plant and take pride in keeping it running smoothly, which, in turn, helps us to not only achieve our numbers, but also ensure that the bricks are all of the consistent quality that Mansfield Brick have built their reputation on.'

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