SEIKI SYSTEMS

SEIKI SYSTEMS LTD

Manufacturing Software Solutions

NETWORKED MANUFACTURING SYSTEM

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Networked Manufacturing System
CASE STUDY

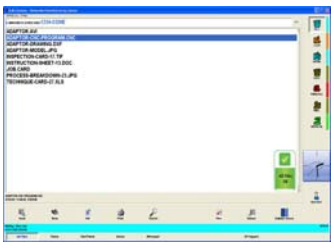
Software Helps ABS Production Control the Flow

With more than 100 years experience, ABS offers one of the most complete wastewater technology portfolios in the world. Divided into three business segments – domestic and commercial wastewater, wastewater collection networks and wastewater treatment - the company's wastewater products have to compete in a global market. The efficient manufacture of these products is supported by Seiki Systems' Networked Manufacturing System (NMS).

ABS Production has been operating for 35 years at its facilities in Wexford, Ireland, producing wastewater pumps for a global market. Approximately 250 people work at this site, with two thirds employed on the shopfloor. A large research and development facility was opened three years ago where next generation products are designed and tested prior to launch, and larger existing products are life tested to failure.

Equipped with an extensive array of CNC machine tools the company's workshop operates around-the-clock. The CNC machines are arranged as 12 manufacturing cells, with most cells containing a lathe and machining centre, as well as component washing plant. Operating a cellular system means that material flow is very efficient as all parts are completed within the cell. "For example," says production support engineer, Sean Mahoney, "a main component like the cast iron motor housing is produced in a dedicated cell, while the oil chamber, which is also machined from cast iron, would be produced in another dedicated cell. This allows us to invest in the best machine tool technology to suit the part being produced."

The cellular manufacturing method also allows one skilled operator to run all the machines within the cell to gain the maximum labour efficiency. Daily production meetings set the targets for the machine shop based on the global sales forecast by the company and works orders are issued to the cells.



Each operator has a PC in the cell running Seiki Systems' Networked Manufacturing System (NMS) where all the NC programs required for that particular cell are stored. Each program has associated operation notes, including tool types and positions, fixturing required and raw material. The operator is also able to call down the part drawing via Seiki Systems software so that visual and dimensional checks can be made during set up. Sean Mahoney states: "This is a great aid to operators and gives them the confidence to produce the parts correctly."

Any NC program changes are automatically logged via the NMS software so that engineering changes can be monitored and controlled. "Seiki Systems software ensures we have the correct revision drawing automatically available for each operation eliminating the risk of setting up and machining to an outdated drawing, which would waste production time and, in the worse case, scrap parts," Sean Mahoney explains.

Updates are authorised in the engineering office so any changes, new drawings, or new components issued to the shopfloor will be done through the company's central server via Seiki Systems software, so the only version that will be available to the shopfloor on the screen is the correct one.

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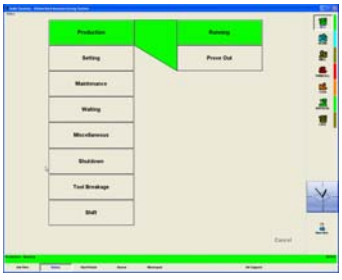
Recent investment in the new impeller cell takes the engineering capability of the company to the next level, as parts are completed by just one multi-tasking machine tool. That said, there are two machines in the new cell and each is configured to suit a range of parts, controlled predominantly by the size of the finished component. The variety of impellers – there are 205 different impeller designs - require different jaws and back stops, so the cell operator can call up the setting drawing through the NMS software, which will contain a jaw and back stop number. Sean Mahoney has constructed a spreadsheet which is viewed by the operator through the Seiki Systems software. It contains details of the raw material type, the pump model it is fitted to, first and second operation jaw numbers, availability and storage positions for each of the first and second operation jaws, as well as the back stop required. The Seiki software also highlights if the component has been proven.

James Fletchmoore, director of JCNC, Seiki Systems agent in Ireland, says: "The Seiki software provides all the set up information. If it is a proven program it is literally a case of loading the jaws and back stops, setting the datum points and pressing cycle start, so efficiencies have been dramatically improved."

Because the company works on a daily production basis to match order fluctuation the shopfloor needs to be able to change from one part to another very quickly. Sean Mahoney recalls: "The production batches are very small and there could be eight different impellers going through the cell in a day. Before using the cellular manufacturing system a change over might have taken 1.5 to 2 hours by the time the operator retrieves the parts required from the tool store and the fixture store. Now everything is contained within the cell, including the prepared raw material blanks, and all the necessary data is available thanks to Seiki Systems. This is one of the reasons changeovers can now be completed within 30 minutes. Although, the part-to-part target with the new impeller cell is just 15 minutes."

Pumps produced in Wexford cover a wide range of performance characteristics to suit various applications supported by ABS. The variety could easily lead to mistakes so the information available from Seiki Systems becomes a vital part of the quality assurance system. New product introduction is also a lot more efficient and will keep improving, as Sean Mahoney says: "Any new products designed are done with single machining operation in mind."



As well as sending information to the shopfloor the Seiki Systems Monitoring software is used to gather data on the machines' performance, with relays wired into the machine's controller to log run time, waiting and stoppages. From the engineering office Sean Mahoney can see a graphical plan view of the machine shop with the status of each machine shown in real-time. He says: "Live data provides feedback from the shopfloor with the machine tools shown in green if the machine is running in production, amber for a maintenance/waiting condition and red for switched off." Periodic analysis can be carried out on each cell to show production time, down time and waiting time in a chart form for the management team, the actual Resource Utilisation

"ABS Production has migrated away from a produce for stock operation towards a much more efficient make to order business but to achieve this it has needed to cut the changeover times and introduce the flexibility required to be able to efficiently produce a batch of one. Seiki Systems' NMS has been fundamental in aiding this transition," confirms James Fletchmoore. Sean Mahoney concludes: "We are moving forward as a company, machine tool investments and new system structures have been put in place to remain competitive in a global market. The key is to keep the spindles running and that's what Seiki Systems helps us achieve.

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