

POWERTRAIN MANUFACTURING

Efficiency and quality are the keys to success of any powertrain manufacturer, even more so when it is a vertically integrated OEM which pours the metal, machines and assembles components to produce a finished motor ready for installation. So when this particular OEM needed help in identifying an effective process in an efficient manufacturing system, they turned to Godfrey and Wing.

THE CHALLENGE

The OEM was well versed in traditional vacuum impregnation methods. With two multi-million dollar systems installed that did not achieve their original objectives, their goals for the new system were clear and concise:

- Eliminate annual scrap costs of over \$1,100,000 due to poor performance from the current system
- Reduce floor space requirements for impregnation
- Integrate the process into the manufacturing flow, without labour
- Reduce per part processing cost
- Reduce maintenance costs

When Godfrey & Wing was contacted by the Japanese OEM, their current situation was not atypical. Their vacuum impregnation system not only failed to recover all porous engine block castings, but many of the parts it did seal were scrapped due to damage or sealant contamination. To the OEM this was 'normal' and what they believed to be the limitations of vacuum impregnation. With the impending launch of a new engine program they truly needed a better approach.

THE SOLUTION

Working with the engineering team from Godfrey & Wing, the OEM laid out their vision, and the GW team responded with the continuous flow impregnation (CFI) technology, customised to achieve the customer's goals.

To eliminate scrap resulting from casting porosity, the patented CFI DVP process was selected. The process incorporates a fast, deep vacuum to evacuate the air from the porosity. Then after moving sealant to the part, the system applies high pressure to allow the sealant to thoroughly penetrate deep into the walls of the casting.

To remove labour and save on sealant costs, robotic direct part handling was chosen. Non-compliant blocks are delivered to the CFI via conveyors and once detected the system automatically starts and the six axis robot moves the part throughout the process. This also allows the parts to be processed without damage and without intermediate process baskets or fixtures. The savings on sealant cost just from direct part handling was substantial.

Contamination was quickly set aside as a concern when the OEM saw the advanced washing technology of the rinse and cure stations in action.

The customer requested that the CFI be installed in an area of about 800 square feet so maintenance access needed to be improved to allow the CFI to be integrated into the existing manufacturing flow.

THE RESULTS

The data clearly showed that the system achieved or surpassed all of the OEM's goals. The results included:

- Scrap from porosity has been virtually eradicated with the CFI delivering a first time through (FTT) rating of over 99.4 per cent. This means that the castings known to leak now seal the first time through the CFI system at a rate of over 99.4 per cent. This represents a 10 point improvement over the OEM's previous impregnation method.
- The CFI has completely eliminated damage and sealant contamination and continues to run at Oppm.
- As far as operating costs go, the system has cut maintenance and consumables roughly in half. The variable cost for this particular customer to impregnate an engine block is less than \$0.70.
- The fixed cost savings realised from reducing floor space by 70 per cent also contributes to the positive financial impact of the CFI.

The customer has since purchased a second CFI for a new engine block program.

IN SUMMARY

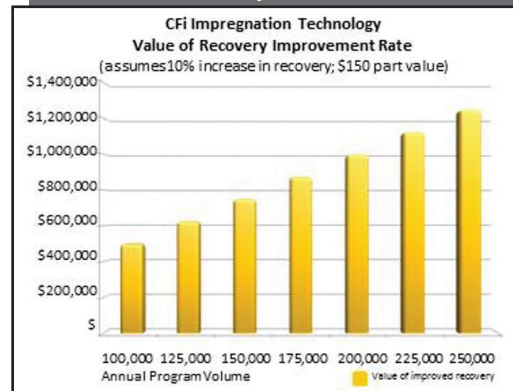
As OEMs continue their search for ways to reduce costs and increase quality, it will be necessary to challenge the status quo or old paradigms. This OEM found great value in doing so and saved over \$1,100,000 in scrap costs while reducing their process costs by 80 per cent.

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Fully integrated CFI impregnation system



Value of recovery improvement rate



Continuous flow vacuum impregnation system

