GETRAG FORD
Better production planning hones competitive edge

Product
Tecnomatix

Business initiatives
Knowledge and IP management
Production efficiency

Business challenges
Production planning has become more complex following move to agile manufacturing cell structure
Production planning needed improvement to speed time-to-market

Keys to success
Planners provide design colleagues with computer simulations of manufacturing processes
Manufacturing bottlenecks and underused machines are identified via simulation
New tools and manufacturing processes are simulated prior to purchase decision

Results
Planning time reduced by 15 to 20 percent

Tecnomatix leverages three-dimensional simulation to optimize manufacturing process planning

Production planning faces new challenges
As a Tier 1 supplier to the automotive industry, GETRAG FORD Transmissions specializes in the development and production of manual and automated transmissions and associated engineering services. The company was established in 2001 as a 50/50 joint venture between Getrag, a transmissions specialist based in Untergruppenbach in Baden-Württemberg, Germany, and Ford of Europe. In addition to the many Ford plants in Europe and the United States, the company supplies customers such as Jaguar, Land Rover, Mazda and Volvo.

A transmission system can consist of between 25,000 and one million components. Every second of CNC machine time is vital, and it’s very costly when machines are idle. The growing requirement for flexibility in terms of product variations and batch sizes has resulted in a move away from conventional machining lines to an agile manufacturing cell structure that supports modern high-speed manufacturing and drying processes. This means that production planning has become more complex than ever before. To permit its production planning team to fulfill the new, more rigorous requirements, GETRAG FORD Transmissions’ manufacturing engineering department set out to find enabling tools.

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Successful pilot program streamlines clutch production
In December 2002, the company implemented a four-month pilot project to evaluate how well Tecnomatix® Part Manufacturing software would address these issues. “The project convinced us that with Tecnomatix we had a far more efficient, accurate and scientific means of setting up and specifying the production processes for the clutch housing,” says Johann Schüller, production planning manager at GETRAG FORD Transmissions. Specifically, the use of the simulation software made it possible to manufacture the clutch housing with one clamping rather than three. It reduced the manufacturing costs for the part by 10 percent and improved the efficiency of the production planning process for the part by 18 percent. With a planned output of 650,000 units and investment in no fewer than seven manufacturing cells, the effect of these changes was conclusive. These results justified a broader implementation of the software.

Tecnomatix works by reading in 3D CAD models of components, automatically recognizing features such as bores. Milling features are applied manually, tolerances and threads are added and the feature names (or drilling numbers) assigned. Resources, machines and tools are also specified and the cut data, feed and revolution rates per tool are defined. GETRAG FORD Transmissions’ best practice standards have been transferred to the database for definition of the best production methods. Most tools are automatically assigned to the processes (of which there are approximately 70). The toolpaths are applied, processing times computed and the processing sequence determined using Tecnomatix. Once the cycle time has been calculated, it is possible to determine the number of machines needed to produce...

Results (continued)
Change management time down by 15 to 20 percent
Time-to-market cut by three weeks (per product) – a 30 to 40 percent reduction
Manufacturing cost for clutch lowered by 10 percent

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Christoph Zeitler
Production Operations Planner
GETRAG FORD Transmissions
the required production volume. The system also produces a report outlining any necessary new investment, as well as tooling lists and a first production layout. Integrated software guarantees that the NC programs will run 100 percent collision-free, resulting in a substantially shorter ramp-up time.

**Benefits extend to supplier interactions and purchase planning**

Using Tecnomatix, planners are able to provide their design colleagues with realistic, onscreen simulations of manufacturing processes using full 3D representations of every part of the processes, including component parts, machine interiors and tooling mechanisms. “This solved our greatest problem,” says Schüller. “We can now simulate the machining process and calculate both the feasibility and cost of manufacturing the design.” GETRAG FORD Transmissions now encourages this type of interdisciplinary cooperation because of its productiveness.

“Tecnomatix helps us visualize the way in which the machines operate, so we can see where other arrangements might be possible,” Schüller adds. “We can now make better use of our manufacturing equipment and reduce machine processing and idle times, thereby reducing our manufacturing costs.” Christoph Zeitler, production operations planner at GETRAG FORD Transmissions, explains, “Our technical designers now come to us even if they wish to apply an extra drilling. We use the system to work with them and find the best solution.”

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The new procedures have not only allowed GETRAG FORD Transmissions to reduce the time it takes to design and develop a product; but while this is being done, it is now possible to design, procure and commission the requisite manufacturing systems. The most critical objective, however, has been to ensure that the cost of producing each component is competitive.

The new system is producing similar benefits in the company’s dealings with its external suppliers. GETRAG FORD Transmissions’ policy is to invite several suppliers to submit bids for any new investment in tools or machinery. An accurate analysis process is applied to the different quotations, using a combination of technical and financial analyses and manufacturing time computations developed by the different component suppliers. Tecnomatix makes it much quicker and easier to make first-round comparisons between suppliers. “We can see immediately whether we have a feasible proposal with a realistic manufacturing time,” says Zeitler. “It is possible, right from the preliminary stages of a product design – and without investing anything in test tooling – to determine whether or not it will be practicable and economical to proceed to trials of a new technology,” adds Schüller.

The software also helps GETRAG FORD Transmissions identify potential bottlenecks or underutilization of machinery and to reconfigure its entire manufacturing infrastructure in order to avoid these problems. The software’s reporting function is equally valuable in helping planners work more efficiently. “Most of a planner’s time is spent on administrative tasks,” says Schüller. “Knowledge management is handled by the software.” For example, once configured, the software automatically creates and updates reports. Among advantages, the pilot project demonstrated that the reporting module reduced administrative time by half.

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