SIEMENS
Ingenuity for life

Industrial machinery and heavy equipment

AGCO Corporation

Digitalization supports global manufacturing at AGCO

Product

Teamcenter,Tecnomatix

Business challenges

Implement design anywhere, build anywhere strategy

Adopt a platform product strategy

React quickly to changing conditions

Accelerate new product introductions

Maintain quality in assembly lines

Keys to success

Use Teamcenter to implement a common platform for manufacturing engineers

Expose rich design data to manufacturing in multiple sites around the world

Use Tecnomatix to share process plans, MBOMs and electronic work instructions globally

Replace hardcopy work instructions with electronic versions

Results

Improved data and production quality

Faster response to changes

Global leader in agricultural solutions uses Teamcenter and Tecnomatix to support design anywhere, build anywhere strategy

A global leader in agricultural solutions

AGCO Corporation is a global leader in the design, manufacture and distribution of agricultural solutions, supporting more productive farming through a full line of equipment and related services. AGCO products are sold through five core brands, Challenger®, Fendt®, GSI®, Massey Ferguson® and Valtra®, supported by Fuse® precision technologies and farm optimization services. AGCO products are distributed globally through a combination of approximately 3,000 independent dealers and distributors in more than 140 countries. AGCO is headquartered in Duluth, Georgia, and had net sales of $7.5 billion in 2015.

Founded in 1990, AGCO has grown dramatically through a series of acquisitions that have brought together decades of collective agricultural equipment history and know-how, and now has a strong global presence with more than 40 manufacturing sites around the world.

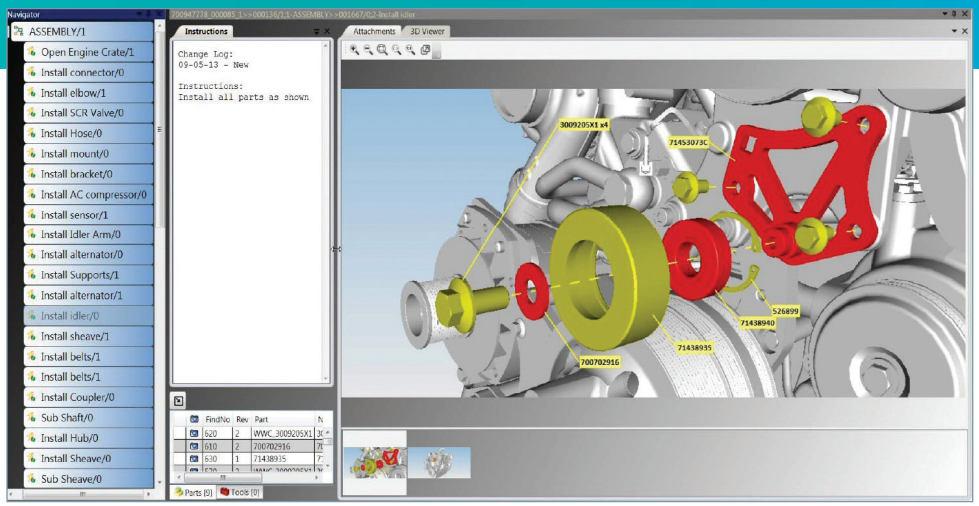
Design anywhere, build anywhere

With its global footprint, AGCO has pursued a design anywhere, build anywhere strategy in tandem with a platform product architecture. The goal is to more efficiently develop, manufacture and manage the company's large portfolio of products.

Results *continued*

Extensive re-use of data across manufacturing sites

Reduced ramp-up time for new product introduction



"Using a system like Teamcenter that understands where each of the parts came from in the EBOM, where they're going to go in the MBOM, where they are going to be produced globally, and weaving that thread all the way through the structures is a key requirement for us."

Gary D'Souza
Manufacturing Engineering Lead
Global Manufacturing PLM
AGCO Corporation

With that objective in mind, AGCO adopted Teamcenter® software for product lifecycle management (PLM) and Tecnomatix® software for digital manufacturing – both from Siemens PLM Software – first deploying the software at the company's Hesston, Kansas facility. Several factors influenced AGCO's decision to deploy Teamcenter and Tecnomatix in manufacturing: the need for manufacturing work instructions and the use of standalone, paper-based work instructions; the need to better manage design engineering process changes; issues with the use of the engineering bill of materials (EBOM) in the company's manufacturing resource planning (MRP) system and manufacturing execution system (MES); and to better serve the needs of manufacturing engineering in developing the manufacturing bill of materials (MBOM) and process plans.

"We build the same product at various sites," explains Susanne Lauda, global project lead, manufacturing automation at AGCO. "We want to re-use the bill of process, we want to re-use the MBOM, we want to re-use the majority of our electronic work instructions, so it makes a lot of sense that our manufacturing engineers are working on a common global platform, which for us is Teamcenter. With the use of Teamcenter, we are able to have one site basically doing 80 percent of the work that is necessary for all sites that are building the same product, so that's a huge savings."

"In the case of design anywhere, build anywhere, all of our new product introductions are going to be platform-oriented, and will re-use data," says Gary D'Souza, manufacturing engineering lead, global manufacturing PLM at AGCO.

"In our design engineering, we're trying to standardize the part numbers, the designs of parts so we can re-use them from platform to platform and from module to module, region to region," says D'Souza. "In the manufacturing world we use that same data to build robust processes that can be standardized through the regions. The idea is that any module that we use should be built the same way in any factory to help us ensure quality."

"Teamcenter helps us to meet the objective of design anywhere, build anywhere by allowing us to take the rich data that is created by design and expose it to different users in manufacturing at multiple sites around the world. The process that we are trying to use to achieve that is to have a single bill of material that we use as our master data, and then have multiple ways of building that product in the bill of process, which is essentially the digital twin of the real-world production process represented inside of Teamcenter."

Streamlined creation of BOMs and process plans

Working from the EBOM, AGCO manufacturing engineers use Teamcenter and Tecnomatix to create a separate MBOM, reorganizing components and configuring subassemblies that can be sourced externally, or for key components like cabins or engines, from AGCO's internal supply chain. When developing MBOMs and

"The new operators coming in can pick up very easily compared to what it was when we had paper bundle work instructions. These electronic work instructions have created better training material, not just for the shop floor, but they are also used in new product introductions to analyze and establish a better process."

Anvesh Kulkarni
Manufacturing Engineer
AGCO Corporation

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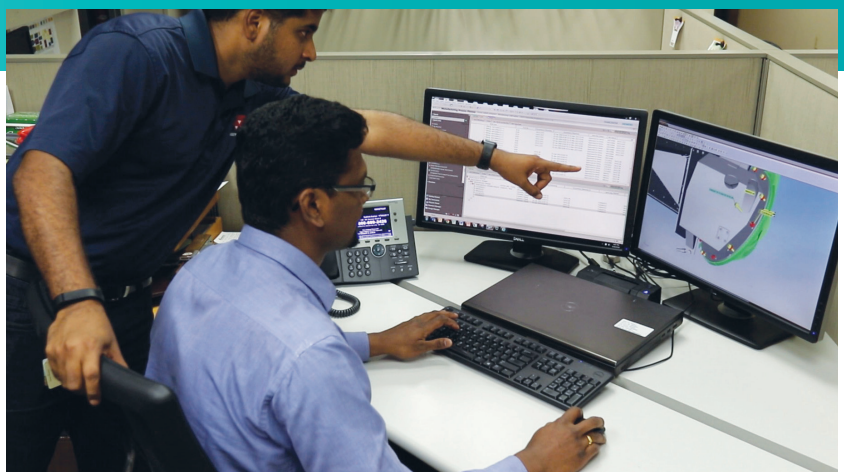

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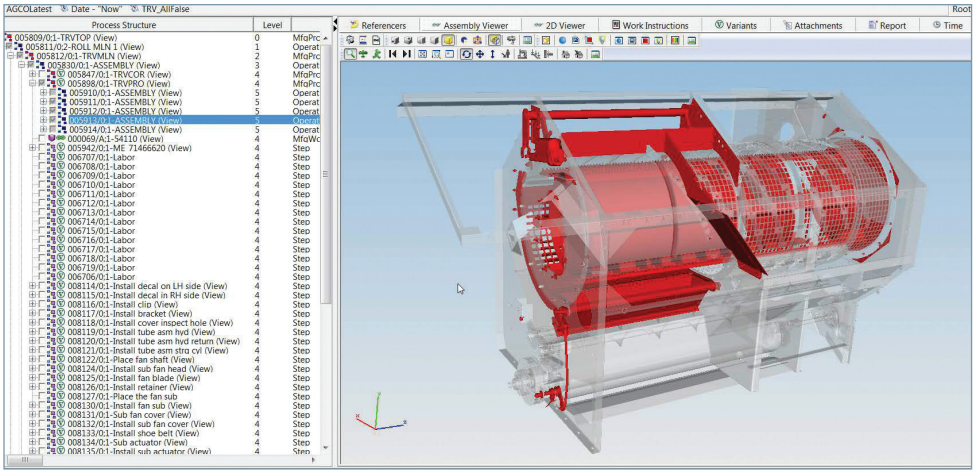
Global Project Lead
Manufacturing Automation
AGCO Corporation

process plans, manufacturing engineers take advantage of the capability to view a multilevel product structure with live links to the 3D CAD model displayed on the same screen. Using the intuitive user interface of Teamcenter, building a BOM or process plan can be as simple as copying and pasting, and engineers can visually validate the accuracy of the steps in a process. "Using a system like Teamcenter that understands where each of the parts came from in the EBOM, where they're going to go in the MBOM, where they are going to be produced globally, and weaving that thread all the way through the structures is a key requirement for us," says D'Souza.

Electronic work instructions for global manufacturing

One of AGCO's first initiatives using Teamcenter and Tecnomatix was aimed at providing electronic work instructions (EWIs) to replace hardcopy work instructions at its manufacturing sites. "We begin by getting the engineering data into Teamcenter using the tools that Siemens provides, then hand it over to a manufacturing engineer," explains Anvesh Kulkarni, a manufacturing engineer at AGCO's Hesston plant. "Then we audit the EBOM and start creating the MBOM, and then go to the bill of process – the replication of what we do on the shop floor – and then start creating the work instructions for the bill of process."

The goals of providing EWIs are to achieve more traceability for model year changes, to provide a better understanding of the product structure, and to better manage different structures at different manufacturing sites.



Solutions/Services

Teamcenter
www.siemens.com/teamcenter

Tecnomatix
www.siemens.com/tecnomatix

Customer's primary business

AGCO Corporation is a global leader in the design, manufacture and distribution of agricultural solutions. Through well-known brands including Challenger®, Fendt®, GSI®, Massey Ferguson® and Valtra®, AGCO delivers agricultural solutions to farmers worldwide with a full line of tractors, combine harvesters, hay and forage equipment, seeding and tillage implements, grain storage and protein production systems, as well as replacement parts.
www.agcocorp.com

Customer location

Duluth, Georgia
United States

Using Teamcenter, the manufacturing engineers create work instructions that include a list of steps in each operation, along with a text version of the instructions, the BOM for the active task that includes a change log, and multiple visual depictions of the process and components, taken directly from CAD models of the product. "This is a detailed step-by-step process of how to assemble a machine, which gives the operator better visibility of the process," says Kulkarni. "The new operators coming in can pick up very easily compared to what it was when we had paper bundle work instructions. These electronic work instructions have created better training material, not just for the shop floor, but they are also used in new product introductions to analyze and establish a better process."

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