

Aerospace and defense • Automotive and transportation • Consumer products

Duqueine Group

PLM-ERP-MES integration enables 30 percent faster time-to-market for Duqueine

Products

Teamcenter, SINUMERIK,
SIMATIC IT

Business challenges

Support expansion into new
regions and new markets

Improve ability to innovate

Manage risk

Reduce time-to-market

Keys to success

Single repository for all design
and manufacturing data

Teamcenter integration with
CATIA software

Teamcenter data flowing
automatically to MES and
ERP system

Multi-CAD assemblies created
with JT data

Highly responsive PLM vendor
support

Results

Integrated product and
production modeling

Multi-site concurrent engi-
neering, enabling delivery of
global expansion targets

**Teamcenter serves as the
linchpin for the company's
integrated and growing global
design and production
environment**

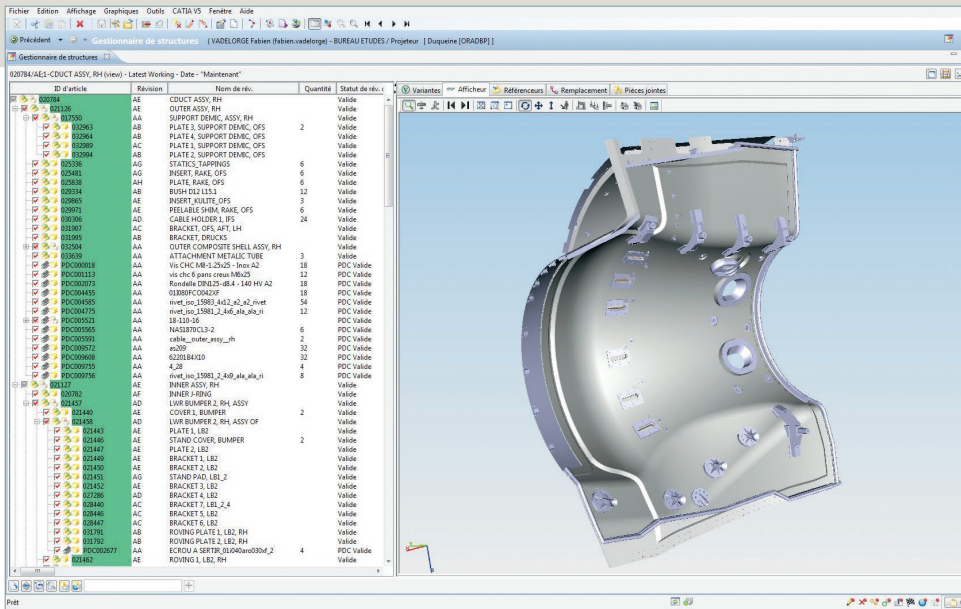
Nothing but composites

Duqueine Group (Duqueine) designs and manufactures parts and subassemblies made of composite materials. The company's products are used in aircraft and race cars. The company was founded in 1982 by Gilles Duqueine, a specialist in composite materials who developed the first carbon shell for race cars. Over time, he found other applications for his expertise, such as test nacelle equipment for airplane engines, aircraft interiors and aerostructure parts and subassemblies. Today, the aeronautical sector represents more than 60 percent of the company's business. General industry accounts for 25 percent, while high-end sports and leisure applications (such as Mavic cycles) and head and neck support systems (for race car drivers) represent the remaining 15 percent. The company's future plans include diversification into the space and defense industries.

Duqueine has a global presence for optimal customer satisfaction, and the company's sales have been rapidly increasing. Sales in 2010 were €40 million, of which 35 percent were exports. The company has a staff of more than 500 people, up from only 100 people in 2006.



The evolution of Duqueine's business is reflected in a series of strategic moves that began in 2003 with the creation of a production site in Romania to support Mavic, a long-term customer. The moves proved to be adroitly executed, confirming the company's ambition to play a leading role in the new Airbus programs, which integrate a lot of structural composite parts (fuselage frames and window frames) originally made of metal. The objective of the programs: Make it lighter! "We are developing innovative and specialized processes, which will result in delivery contracts for parts of the structure of the A350 with Airbus and its RSPs (Risk



"We had to accompany this expansion with better organization and management of project and technical information," notes Xavier Danger. "Our management team decided to launch a large consultation with PLM (product lifecycle management) solution providers, focusing on those whose products were adapted to the needs of small and medium enterprises."

"The Teamcenter solution from Siemens PLM Software arrived late in the decision cycle," Danger recalls. "But it managed to establish itself. Teamcenter

has very good integration with our CAD (computer-aided design) system, CATIA, which we use at the request of our aeronautical customers." Other reasons for the selection of Teamcenter® software included the proven responsiveness of Siemens, which Danger says was "better than that of the other market players"; the large installed base of Teamcenter; the fact that neither the deployment nor the ongoing administration of Teamcenter would require a large team of developers; and that Teamcenter could be configured with a simple data model that could be easily extended when necessary.

For its first use, Teamcenter was implemented on an extremely ambitious joint engineering project for the Oreca Le Mans

Results (continued)

Quick access to and easy sharing of product information, saving time and money

More effective collaboration

Less nonvalue-added work, including data entry/checking; higher productivity

Significantly improved ability to meet tight deadlines

Substantially improved ability to manage risks

With PLM as the conduit, PLM-ERP-MES integration enables 30 percent faster time-to-market

Sharing Partners) – Aerolia, Premium Aerotec, Spirit AeroSystems," says Xavier Danger, head of engineering at Duqueine.

The desire to tap into the North American market led Duqueine to look into the future implementation of a 3,000 square-meter industrial site in Mexico.

The birth of the PLM project

Duqueine must satisfy aeronautical companies' requirements for precision and innovation, including the production of composite parts that are increasingly complex. In addition, today's deadlines require that projects be completed in half the time, sometimes faster, compared with deadlines just a few years ago.

"And with JT2Go...it is possible for us to share detailed information about design and manufacturing, even with those who don't have access to CAD software."

Xavier Danger
Head of Engineering
Duqueine

prototype car. Duqueine was asked to create the aerodynamic part of the car's chassis. Manufacturing was completed in record time (five months). "The customer delivered CATIA data and we were able to immediately experience the benefits of what we feel is a seamless integration of Teamcenter with CAD," says Danger.

In 2010, the transition to Teamcenter on the unified architecture enabled improvements in performance, as well as deployment of PLM on several sites while retaining a single centralized base. The unified architecture of Teamcenter addressed the development needs of Duqueine in opening its Atlantique and Reyrieux (Ain) sites. "We quickly needed a new multi-site solution," explains Fabien Vadelorge, administrator and material engineer at Duqueine, who is also in charge of PLM user support. "The migration was preceded, for several months, by the implementation of a data model to see the benefits. This led us to retain one base for the whole group in order to respond appropriately to technical questions, adapt the data model to the skills of the organization, integrate new digital media, and ensure the accompanying technology met the company's business expansion needs

by bringing together of all the IT solutions implemented within Duqueine. In this respect, PLM's technical reference system must be connected to tools such as MES (manufacturing execution system) to ensure traceability of parts in mass production, and ERP (enterprise resource planning) to create all the ranges in the management system. In short, it is PLM that is the information source that feeds the other building blocks of our information system."

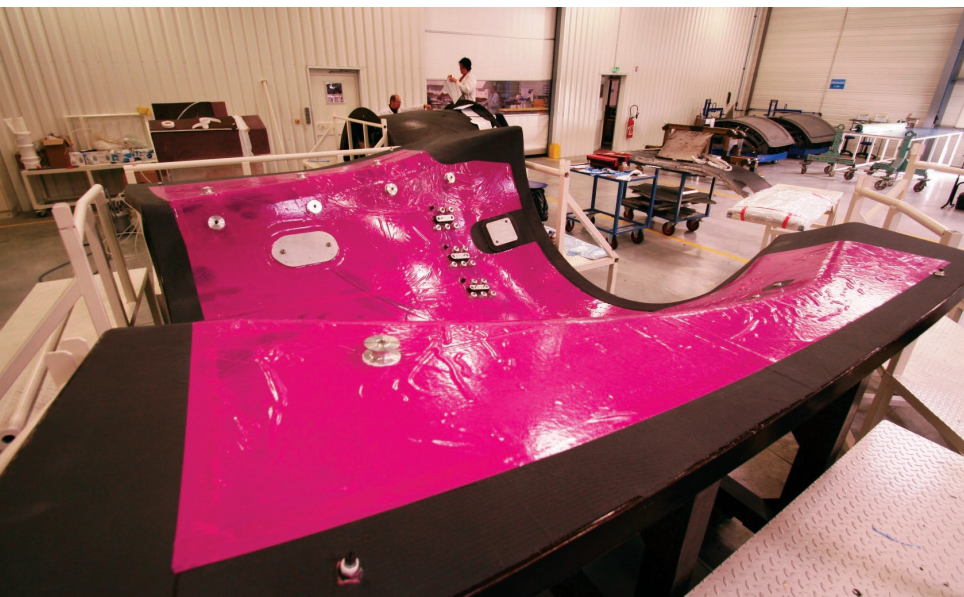
The linchpin of the Duqueine information system – Teamcenter

PLM was the first building block of Duqueine's information system. "PLM is the linchpin, the information source that feeds the other building blocks of our information system," says Vadelorge.

Today, it is the PLM system that creates the unique reference system for Duqueine's technical and design data. Product references are the same in the PLM, MES and ERP systems. PLM is the master and helps to guarantee the consistency of the reference system at all times. It is the conductor that organizes, disseminates and validates all new information, new references, new subjects and new configurations.

"Teamcenter is the essential tool for growth and for industrial development."

Gilles Duqueine
Founder and President
Duqueine



"Composite structural components have become increasingly complex, thereby automation processes and product and process data management are key success factors in managing this complexity with the required accuracy, which is what Teamcenter allows us to do."

Xavier Danger
Head of Engineering
Duqueine

“As soon as a new product is designed in CATIA and exported into the JT data format, it is available to the Process Planning department, which does not have access to all the capabilities of CATIA. Process planners simply use the JT visualization tool to produce exploded views, and then use Teamcenter to circulate the information.”

Fabien Vadelorge
PLM Administrator and
Material Engineer
Duqueine

“And with JT2Go, a 2D/3D visualization tool, it is possible for us to share detailed information about design and manufacturing, even with those who don't have access to CAD software.”

Xavier Danger
Head of Engineering
Duqueine

Teamcenter is used daily by those who design and engineer Duqueine's composite products. PLM allows the management of “as-designed” and “as-planned” configurations. Products are planned using different types of components, which define the successive stages of work. This information is transferred into the ERP system and also into the MES system, which allows for the management of the “as-built” configuration. The traceability of operations is managed using MES, which recalls the specific as-built configuration that was implemented, including date, operator and the batch number for the raw materials. The company can now determine, well ahead of production, which manufacturing methods and approaches will be used, with MES checking the consistency of the as-designed, as-planned and as-built configurations.

The Process Planning department uses data from the PLM system to prepare for manufacturing, and all manufacturing data is generated as early as possible in a project. The data is organized within Teamcenter in such a way that it is completely consistent with the manufacturing vision. Teamcenter is used to document the operations involved in manufacturing the products, and this data is transferred automatically, via a dedicated interface, into the company's ERP system (Louxor software). By eliminating the need to re-enter this information manually, Duqueine has eliminated potential sources of error,

as well as some non-value added work. This one change alone has measurably accelerated the company's product development process.

Duqueine uses structural analysis to validate its designs prior to manufacturing. Engineers use the SAMCEF™ software suite, a reference tool for sizing aeronautical structures made of composite materials. “This tool generates data that is also leveraged using Teamcenter,” says Danger.

Supplier relationship management (SRM) technology represents another area in which Duqueine plans to make use of Teamcenter data. Danger explains, “When these two systems are integrated, Duqueine will be able to open up sourcing information to suppliers of equipment, raw materials and so on. This should save suppliers time in preparing bids. It will also allow Duqueine to make better supply choices by making it easy to compare offers and negotiate for better deals.”

End-to-end system includes Siemens controllers

The Duqueine site at Reyrieux, France manages the production of Airbus® A350® aircraft structural parts. This facility uses Siemens' MES technology, SIMATIC IT, which receives all of the information required for production from Teamcenter. This includes the technical instructions for manufacturing, the standards that must be followed, the SIMATIC S7 automatic

“The ability of Teamcenter to handle complex data relationships provides us with a much more accurate view of information, and it saves us time in searching for information.”

Stéphanie Burgun
Purchasing Manager
Duqueine

“Teamcenter is the essential tool for growth and for industrial development.”

Gilles Duqueine
Founder and President
Duqueine

programs, and the SINUMERIK 840D digital commands for driving the laying and curing machines.

“From the design of the products to manufacturing and after (including the creation of a ‘life data sheet’ for each product), we have an integrated system that manages the end-to-end flow of information,” says Danger. “This includes linking up with the Siemens drives and complying with the global integration of the digital network, promoted by the TIA (Totally Integrated Automation) concept, developed by Siemens.”

The importance of JT

Duqueine’s goal is to give its employees and partners access to product data, regardless of where they are located. “This technical data is often complex – metadata, plans, 3D models and so on,” says Danger. “The neutral JT data format, which is becoming a market standard for 3D visualization, particularly in aeronautics, is very helpful to us in this regard.” The JT™ data format from Siemens PLM Software is recognized by the International Organization for Standardization (ISO).

“A converter automatically transforms our CATIA data into JT format,” Danger continues. “Thanks to the Teamcenter integration with CATIA, there is no manual effort, no re-keying of information to import the

CATIA data into Teamcenter. The integration is great and the data is consistent in CAD and PLM.”

Another benefit of the JT data format is that Duqueine can create multi-CAD assemblies, which are digital assemblies consisting of components created in a variety of CAD systems. “And with JT2Go, a no-cost visualization tool, it is possible for us to share 2D/3D information, even with those who don’t have access to CAD software,” adds Danger.

The 3D presentation of future products makes it possible to represent what each one will physically look like in the workshop.

The benefits of PLM, including 30 percent faster time-to-market

Duqueine’s use of Teamcenter benefits the company in many ways, especially in four primary areas: support of expanding business operations globally, improving time-to-market, managing risks, and delivering innovation (in terms of both products and processes).

Support of expanding business operations globally:

Expansion is the reason the company originally decided to invest in Teamcenter, and the software has proved itself valuable in this respect by enabling simultaneous work across sites. “Teamcenter helps the company to conduct



“I use Teamcenter daily. The accuracy of the data that is sent to me is without equal, and any changes made by engineering are made known to us immediately. Overall, by making product data automatically available to the ERP system, we are getting to market significantly faster, in fact, in the neighborhood of 30 percent faster.”

Guillaume Fouere
Methods Manager
Duqueine

“The ability of Teamcenter to handle complex data relationships provides us with a much more accurate view of information, and it saves us time in searching for information. The next step will be the interaction of SRM with Teamcenter, which will allow suppliers to visualize designs and submit more competitive bids.”

Stéphanie Burgun
Purchasing Manager
Duqueine

Solutions/Services

Teamcenter

www.siemens.com/teamcenter

JT and JT2Go

www.siemens.com/plmcomponents

SINUMERIK 840D Controller

www.siemens.com/sinumerik

SIMATIC IT

www.siemens.com/simaticit

Customer's primary business

Duqueine Group specializes in the design and manufacture of composite parts and subassemblies.

www.duqueine.fr

Customer location

Massieux

France

"PLM is the linchpin, the information source that feeds the other building blocks of our information system."

Fabien Vadelorge
PLM Administrator and
Material Engineer
Duqueine

concurrent engineering by bringing each user a guide to best practices that promotes the structuring of project data, working methods and the division of tasks across design sites," says Danger.

As an example of its use of concurrent engineering across sites, Danger points to a project involving engine test nacelle equipment. Mold manufacturing and part production, along with molding and curing, was done at Duqueine Atlantique (Nantes, France), while the assembly and shipping were done at the Duqueine Rhône-Alpes site (Ain, France). For another project related to the Airbus A350, different suppliers were asked to work together from remote locations, with the aim of saving time in the design phase. All design data was stored and managed in a single Teamcenter database.

Another advantage of Teamcenter is that it serves as a repository for the company's knowledge, making it more widely available. This is particularly useful to new employees, and it helps ensure that all participants in a project have the same vision of the product and follow the same processes.

Improving time-to-market: Cutting cycle time is a challenge for Duqueine, particularly on projects related to aircraft cabin interiors. The company makes parts related to passenger seats, such as the housing for the in-flight entertainment system, the tray table, cabling, seat covers, paint, and decorative films. "The customers' requirements often arrive fairly late, which means we must fit out the interior of an airplane in less than 14 weeks for the first group of

aircraft, and in less than 10 weeks for the rest, assuming the aircraft have the same configuration," explains Danger. "This involves a multitude of very complex products whose associated constraints must be taken into account. Also, they are susceptible to variation from one seat to another, from one airplane to another. Teamcenter makes it possible to manage the configuration of each airplane in a very precise manner, and helps us meet our deadlines."

Managing risks: Siemens' PLM technology helps Duqueine break new ground in safety by enabling the short-term to long-range (20+ years) planning of future products and production systems. "Composite structural components have become increasingly complex, thereby automation processes and product and process data management are key success factors in managing this complexity with the required accuracy, which is what Teamcenter allows us to do," says Danger. "Our main goal remains the reliability of each component manufactured."

Delivering innovation: Finally, Teamcenter has helped Duqueine improve its ability to innovate. "Innovation is in Duqueine's DNA, and many of the projects we've won in the aeronautical sector, such as the work on the Airbus A350, are the result of this capability," Danger notes. "In joint-development projects with Airbus, we have been able to propose compelling alternative solutions, turn them into prototypes, and have them accepted by Airbus. This can happen rapidly thanks to Teamcenter."

Siemens Industry Software

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