

Automotive and transportation

DENSO Thermal Systems

Comfort design

Products

NX, Teamcenter

Business initiatives

New product development

Commonization and re-use

Enterprise data management

Business challenges

Develop innovative, high-quality products

Reduce product development time

Increase productivity

Keys to success

Investments in advanced solutions

Digital product development including virtual and rapid prototypes

Scalable and open PLM environment

Lightweight JT data format

Results

Enhanced design capacity

Re-use of optimized processes

Faster product development cycle

A well-managed, efficient collaborative environment based on NX and Teamcenter ensures innovation, quality and customer satisfaction

Automotive comfort leader

DENSO Thermal Systems S.p.A. is among the world's leading manufacturers of air conditioning systems, engine cooling systems, heat exchangers, radiators and compressors.

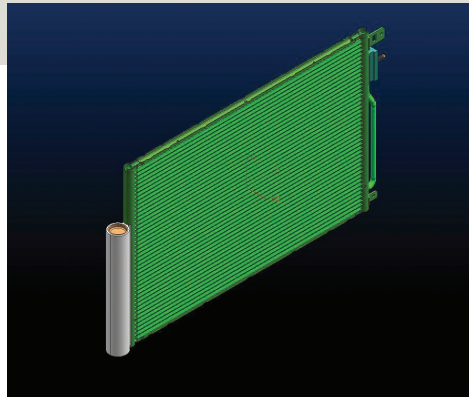
DENSO Thermal Systems has experienced constant growth over the last twenty years, to such an extent that in 2001 it created an international industrial group through which it develops solutions for cars, business and industrial vehicles and earthworking machines. Its collaborations include the design and production of dashboards, front panel modules, air conditioners, heating systems and engine radiators with Alfa Romeo, Audi, Ferrari, Fiat, GM, Renault, Peugeot, Iveco, Maserati, Opel, Scania, Toyota, Volkswagen, Case New Holland, Same and Massey Ferguson.



Results *(continued)*

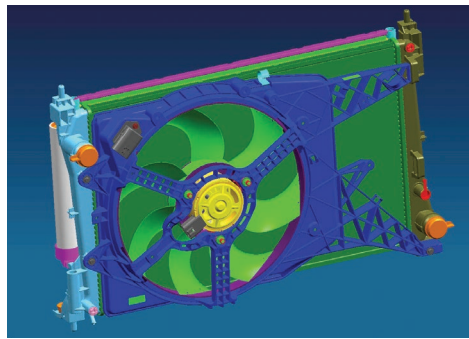
Huge cost savings from digital prototypes

Higher productivity



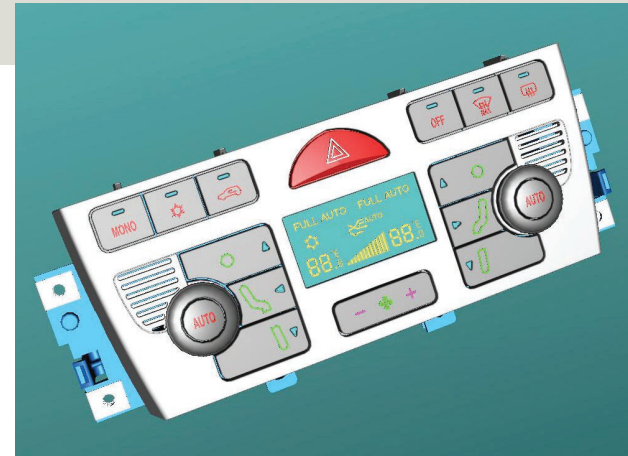
“This facilitates the acquisition and re-use of knowledge inside a managed collaborative environment. The visibility of information, of programs and of processes allows greater flexibility, clarity and efficiency.”

Angelo Peluso
Engineering Services Manager
DENSO Thermal Systems



Of the company's three Italian plants, the offices near Turin encompass 74,000 square meters (nearly 800,000 square feet) and employ 1,400 employees. The international holding, led by Japanese managers, controls three production facilities in Europe, two in South America and one in Asia for a total of more than 4,000 employees.

DENSO was built on the twin foundations of constant research into innovative, high-quality solutions and investments in the



best technologies. “Studying, designing, experimenting and anticipating advancements are the guidelines the company adopted in its constant efforts at customer satisfaction,” says Angelo Peluso, engineering services manager at DENSO Thermal Systems. Research and development form the heart of the company, influencing all stages of product development: design, experimentation, prototyping, implementation and project management.

“DENSO Thermal Systems product quality is determined by a good initial design followed by precise development,” says Peluso. In designing for car comfort, it is necessary to consider some important parameters: size, weight, aesthetics, performance, resistance to wear and of course, cost. In Poirino, the company not only makes products for the domestic market. It also develops prototypes for foreign joint partners, which they produce in their own plants.

“With NX, the digital development of the product goes beyond individual and department productivity and ensures a collaborative approach.”

Angelo Peluso
Engineering Services Manager
DENSO Thermal Systems

“Using NX and Teamcenter, we are able to manage projects in a safe way because information is traceable.”

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Next-generation practices

To achieve its design goals, the company adopted 3D CAD and simulation software and next-generation digital data management practices. These are provided by the NX™ digital product development system and the Teamcenter® digital lifecycle management solution from Siemens PLM Software. DENSO Thermal Systems also equipped its research and development center with two wind tunnel and climate labs.

“In our technical office in Italy, more than 55 designers work with our 3D design software,” Peluso says. “Another five analysts dedicate their work to structural calculations and fluid dynamic and optical simulations with specific CAE programs.”

According to Peluso, the design of a new product takes place entirely in NX, which permits the control of all product data (aesthetics analysis, weight, CAE analysis), as well as the ability to create a file in .stl format for making prototypes using rapid prototyping machines. “With NX, the digital development of the product goes beyond individual and department productivity and ensures a collaborative approach,” he explains. “This facilitates the

acquisition and re-use of knowledge inside a managed collaborative environment. The visibility of information, of programs and of processes allows greater flexibility, clarity and efficiency. The ability to perform simulations in real time in a single, integrated environment allows an immediate confirmation of performance and of the quality of the product, promoting a highly innovative design.”

Knowledge repository promotes re-use

For total project management – coordinating all development activities, improving collaboration and allowing constant improvement in design, engineering and production processes – CAD data must be integrated with capable management tools. That is the role of Teamcenter. “Teamcenter permits the acquisition, integration and control of all product and process information in a unique, scalable and open PLM environment,” Peluso explains. “It is a true repository of the company’s knowledge, allowing the re-use of optimized processes and the synchronization of activities performed by interdisciplinary teams.

“Using NX and Teamcenter, we are able to manage projects in a safe way because information is traceable,” he says. “And managing it with Teamcenter takes less

“We are also able to exchange and share product and project information with suppliers and clients virtually, from style and ergonomics data to the product structure. We manage important data such as technical changes and bills of material in Teamcenter as well. This solution makes it possible to re-use engineering knowledge and promotes collaboration.”

Angelo Peluso
Engineering Services Manager
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Solutions/Services

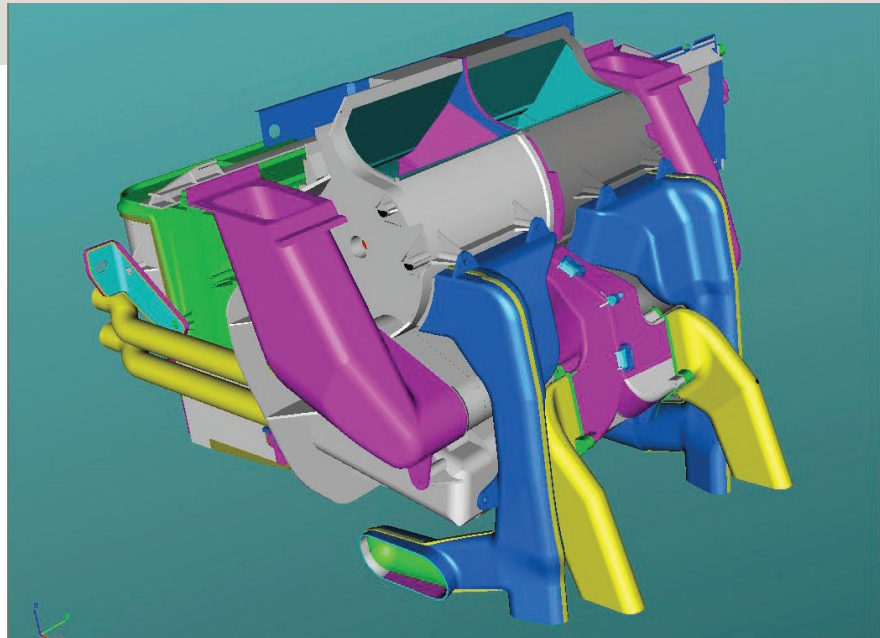
NX
www.siemens.com/nx
Teamcenter
www.siemens.com/teamcenter

Customer's primary business

DENSO Thermal Systems is among the world's leading manufacturers of air conditioning systems, engine cooling systems, heat exchangers, radiators and compressors.
www.denso-ts.com

Customer location

Poirino (TO)
Italy



time compared to our previous practices. We are also able to exchange and share product and project information with suppliers and clients virtually, from style and ergonomics data to the product structure. We manage important data such as technical changes and bills of material in Teamcenter as well. This solution makes it possible to re-use engineering knowledge and promotes collaboration."

To create virtual prototypes, which consist of thousands of components, DENSO Thermal Systems' designers use Teamcenter visualization and digital mockup functionality. Digital prototypes have many advantages compared to physical ones. "Cost savings are huge,"

says Peluso. "The simulation functionality (dynamics analyses, interference checking and on-screen assembly) as well as the lightweight JT™ format (which allows the distribution of the 3D models via the web and to users who do not have a CAD system) have allowed us to increase productivity and decrease the product development cycle."

Encouraged by the results with these Siemens PLM Software solutions, DENSO Thermal Systems plans to pursue innovation in additional areas, such as workflow management and production process simulation.

"Cost savings [attributed to digital mockups] are huge."

Angelo Peluso
Engineering Services Manager
DENSO Thermal Systems

Siemens PLM Software

Americas +1 314 264 8499
Europe +44 (0) 1276 413200
Asia-Pacific +852 2230 3308

www.siemens.com/plm

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