

## Koito Manufacturing Co., Ltd.

*Outperforming in the highly competitive automotive industry with PLM*



# Company overview

Koito Manufacturing Co., Ltd. is a leading Japanese supplier of vehicle lighting systems with 60% of the local headlight market and 19% of the worldwide market. Founded in 1915, the company has built a global network in Japan, North America, Europe, and Asia, including 12 production facilities in eight countries.

Koito Manufacturing offers an ever-growing range of innovative vehicle lighting systems such as high-brightness discharge headlights, intelligent AFS headlights (adaptive front lighting system), and LED lights. Koito Manufacturing also provides lighting equipment to the aircraft, train, and shipbuilding industries.

## Business challenges

- + Offer automotive OEMs flexible, rapid, low cost solutions
- + Respond quickly to design innovations while respecting legal regulations
- + Optimize manufacturing processes for rapid development of turnkey production systems

## Situation

### Significant Reduction in engineering changes

Global automotive manufacturers are under pressure to deliver new vehicles in less time and at lower costs. This pressure has reached the automotive supplier community which faces increased demand for flexible, fast, and low cost solutions to meet the development needs of automotive Original Equipment Manufacturers (OEMs).

"We need to introduce the information technologies that OEMs demand, and help them develop new cars faster and cheaper with greater flexibility," said Shigeki Okuma, director, Engineering Headquarters, Design Engineering Dept., Koito Manufacturing.

Vehicle lighting systems require sophisticated design technology, quality, and precision. Since they include optical components, headlights have complex shapes and are subject to many legal regulations in areas such as light distribution and visibility.

In addition, headlights are a vital part of a vehicle's style and appearance and therefore must reflect the latest trends in automotive design.

Finally, there is an increasing pressure on suppliers to implement turnkey production systems capable of developing more products in a shorter period of time, and enabling faster entry into mass production.



*"The automotive industry is undergoing considerable change worldwide. The resulting efforts to reduce time-to-market and costs have a big impact on automotive suppliers in particular."*

**Shigeki Okuma, director, Engineering Headquarters, Design Engineering Dept.**

# Solution

As part of its business strategy to capture 25% of the world automotive lighting market, and create a global development and manufacturing network, Koito Manufacturing chose IBM PLM Solutions, including CATIA V5 and SMARTEAM, developed by Dassault Systèmes and DELMIA from Dassault Systèmes.

## CATIA V5 for optimized product design

Innovative design is key to making more efficient and attractive headlights. Koito Manufacturing uses CATIA V5 morphing capabilities to apply specification changes in the design phase in order to optimize its engineering processes.

Product morphing is a set of state-of-the-art business practices which automatically combine existing and validated design definitions with new specifications to generate a new, fully-engineered product definition.

“Since the basic function of the headlight does not change, we use morphing to create more efficient designs,” said Masahito Ishikawa, manager, CAE Competency Center, Engineering Dept., Koito Manufacturing

## SMARTEAM for simplified data management

Koito Manufacturing uses SMARTEAM to manage and share CATIA V5 designs and associated engineering data. Product definitions designed in CATIA V5 are controlled by SMARTEAM and shared companywide. Design modifications are also managed through SMARTEAM.

## 3D digital manufacturing for shop floor simulation

Finally, in response to OEM pressure for turnkey mass production solutions, Koito loads CATIA V5 data into DELMIA to optimize manufacturing processes such as assembly planning and robot simulation. Robot simulations enable Koito Manufacturing to ensure in advance that jigs hold products correctly and that there is no part interference.



*“Leveraging our PLM solutions, we build efficient development processes in order to create high quality, attractive products.”*

Masahito Ishikawa, manager, CAE Competency Center, Engineering Dept.



**Development time: -40%**

# Results

Koito Manufacturing's seamlessly integrated PLM application suite has significantly shortened product development time and improved quality.

## Improved Design Efficiency

CATIA V5 enables Koito Manufacturing to respond to OEMs' styling demands for innovative, imaginative designs with products that respect legal regulations and deliver sophisticated technical features.

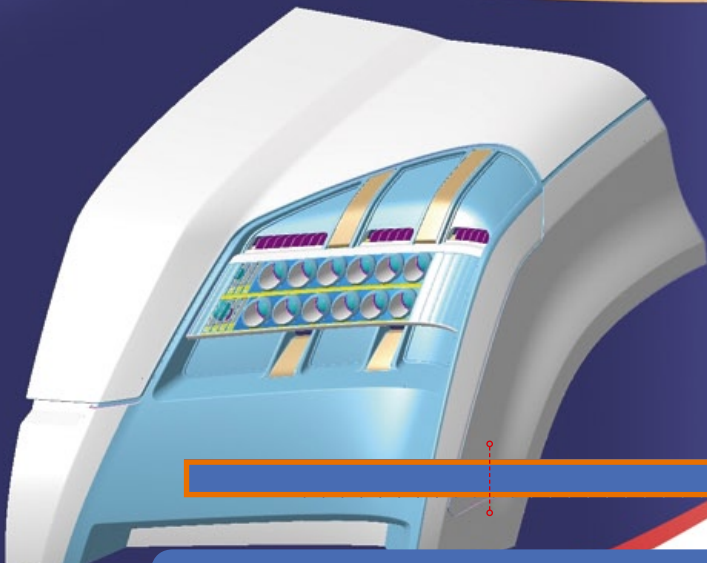
In addition, Koito Manufacturing's use of CATIA V5 morphing capability has enabled the company to implement specification changes at the design phase and optimize the overall process. The result has been a significant reduction in engineering changes and improved design efficiency.

Koito is also building a Knowledge management system to display and manage items during the development stage from a Web browser. This system enables designers to perform checks that in the past were performed by each division using their own checklist. This allows designers to consider related factors outside their area of direct responsibility, such as die or facility requirements, as well as compliance to legal regulations, thereby improving overall design quality.

## Shorter Development Cycles

Using its integrated PLM application suite, Koito Manufacturing produces Bills of Material (BOM) during digital mock-up creation. By creating BOM data earlier in the development process, the company has been able to reduce development time by 40%.

"One of the main reasons we chose IBM PLM solutions, developed by Dassault Systèmes, was our appreciation of the concept of a PPR hub that centrally manages the system while linking products, processes, and resources," said Shigeru Nakamura, general manager, CAE Competency Center, Engineering Dept., Koito Manufacturing.



**Substantial reduction in die modification costs**

### Reduced Costs

With CATIA V5 Knowledgeware, which enables reuse of corporate intellectual property, Koito Manufacturing can avoid errors by using tested design definitions. Using Knowledgeware has allowed the company to significantly reduce product defects and die modification costs

### Enhanced Collaborative Development

SMARTEAM has enabled Koito Manufacturing to share and manage engineering data with each department and with suppliers connected through its collaborative environment.

### Optimized Manufacturing Processes

DELMIA has enabled Koito Manufacturing to significantly optimize its manufacturing processes such as assembly planning and robot simulation.

For example, in a sealer application simulation, interference with nozzles can be checked in the 3D virtual environment. Since simulation results can be downloaded to the facility, work can be accomplished more efficiently than with human operators, particularly in case of complex products.



**Dramatic reduction in manufacturing cycle time**



*"IBM PLM solutions developed by Dassault Systèmes help us develop and produce the best products in the shortest amount of time."*

**Shigeru Nakamura, general manager, CAE Competency Center, Engineering Dept.**

# Future

Koito Manufacturing plans to expand its use of CATIA V5 Knowledgeware capabilities. In addition, since PLM has significantly helped Koito Manufacturing to respond to specification changes, the company will put greater focus on the use of PLM in the early design stage of its products.

“Our objective is to be solutions-oriented and get involved in an OEM’s new vehicle development process at an early stage,” said Shigeki Okuma, director, Engineering Headquarters, Design Engineering Dept.

“We want to actively propose our own cutting-edge technologies created through our independent research and development. In order to accomplish this, we must set up an IT environment that creates even greater opportunities for collaboration with our customers and suppliers, and we are confident that we will derive great benefit from our PLM solutions,” said Ohkuma.

## Significant Reduction in engineering changes

Improved design efficiency with morphing technology

## Development time: -40%

Creation of BOM data earlier in development process





## Substantial reduction in die modification costs

Prevention of product defects with Knowledgeware

## Dramatic reduction in manufacturing cycle time

Optimization of manufacturing processes with DELMIA

# Conclusion

With IBM PLM Solutions developed by Dassault Systèmes, Koito Manufacturing is able to maintain a leading position within the highly competitive automotive supplier segment.

Thanks to PLM, the company has created a manufacturing environment that can respond quickly within a truly global industry, where rapid adaptability has become a prerequisite for survival.



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