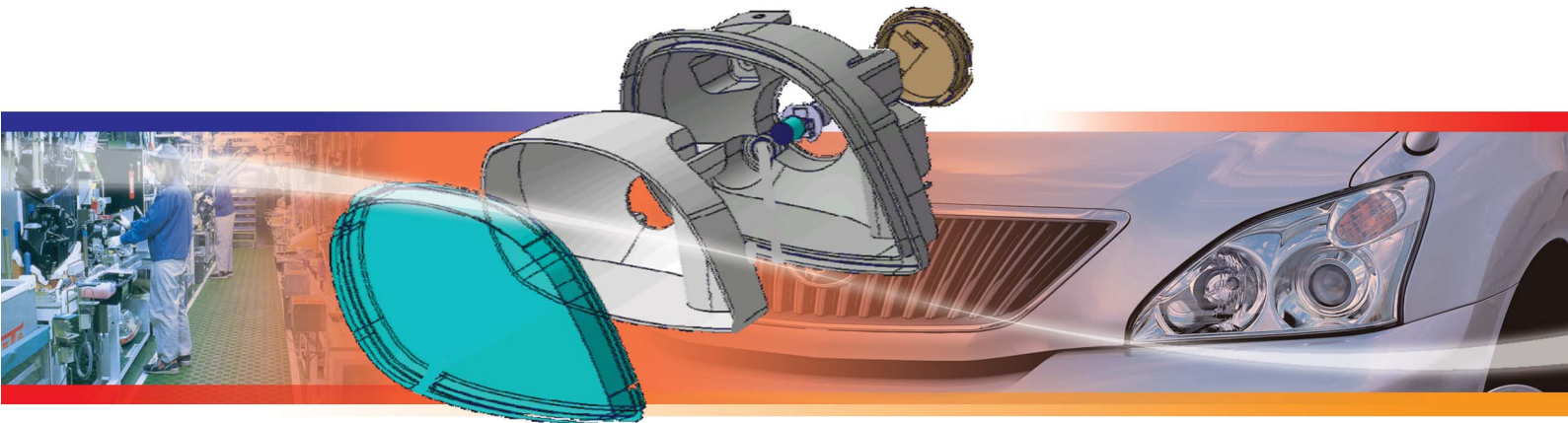


# Koito Manufacturing Co., Ltd.

Driving success with V5 PLM



## Overview

### ■ Challenge

*Koito needed to offer automotive OEMs flexible, rapid, low-cost solutions*

### ■ Solution

*Koito chose CATIA V5, DELMIA, and ENOVIA SmarTeam to gain a larger share of the world automotive lighting market, and create a global development and manufacturing network*

### ■ Benefit

*With a consistent development process from product to manufacturing design based on PLM, Koito is creating high-quality, high-performance products faster than before*

## Koito

### Japanese vehicle lighting leader

Since its inception in 1915, Koito Manufacturing Co., Ltd. has been a leading Japanese supplier of vehicle lighting systems for the automotive industry. In order to maintain its substantial global share and anticipate future customer needs, Koito has developed a strategic global network throughout, North America, Europe and Asia with 12 production bases in nine countries.

Under the slogan "Entrusting Safety to Light", the Koito Group, continues to develop technologically-advanced lighting systems primarily for the automotive and other high-tech industries.

### New challenges from OEM customers

Global automotive manufactures 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 OEMs.

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 increasing pressure on automotive suppliers to implement turnkey production systems capable of developing more products in a shorter period of time, while entering mass production faster.

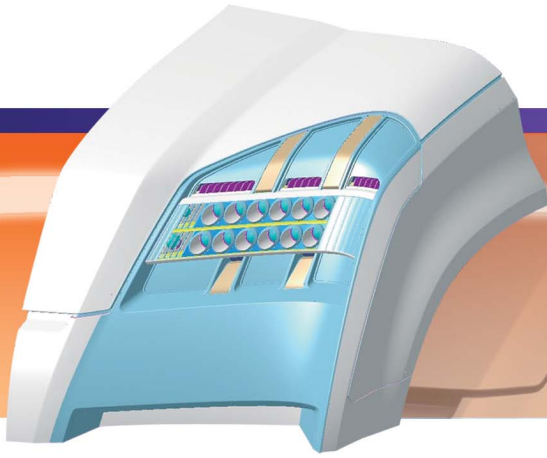
"At Koito, we strive to improve client satisfaction by meeting and even exceeding their needs in the areas that are most important to them: quality, cost and delivery. Safety and environmental factors are built into the very essence of our product development process. We work hard to boost our growth, competitive advantage and earning power." said Masahito Ishikawa, Manager, CAE Competency Center, Engineering Department, Koito Manufacturing Co., Ltd.



"In order to keep abreast of automakers' market strategies, we develop innovative products by leveraging CATIA V5, DELMIA, and ENOVIA SmarTeam while continuing to develop and assess the highest-quality prototypes."

Masahito Ishikawa, Manager,  
CAE Competency Center,  
Engineering Department,  
Koito Manufacturing Co., Ltd.





"With V5 PLM solutions, we can improve product quality and reduce defects through inter-departmental information sharing."

Misunori Urushibara, Assistant Manager,  
Fujikawa Tool Department,  
Koito Manufacturing Co., Ltd.

### **Outperforming in the highly competitive automotive industry with V5 PLM**

In 2000, to optimize product development, Koito deployed Dassault Systèmes' V5 PLM Solutions including CATIA V5, DELMIA and ENOVIA SmarTeam. With V5 PLM and the review of its development processes, the company is increasing collaboration between its design and tooling departments to further streamline operations and attain high efficiency and high product quality.

### **CATIA V5 for optimized product design**

Innovative design is key to making more efficient and attractive headlights. Koito uses CATIA V5 morphing capabilities to apply specification changes in the design definitions with 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 Masahiko Ishikawa.

Koito employs a three-stage process using CATIA V5 to create data quickly and more efficiently:

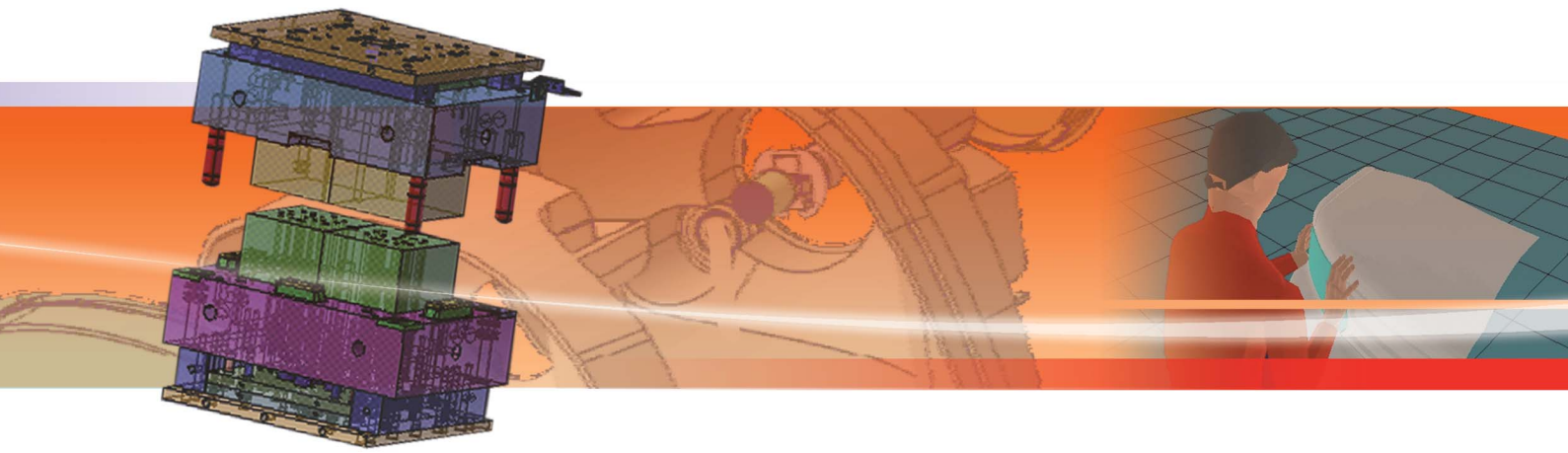
- CATIA V5's PowerCopy uses templates for creating cross-sectional shapes, and makes cross-sectional and exterior-shape drawings of the lamp body.

- CATIA V5's automation (Macro) feature stores standard components such as bulbs, reflectors, screws, screw nuts, and motor units for AFS, in the library for future re-use
- Component Application Architecture Version 5 (CAA V5) is used for evaluation and automatic design features that are needed for tracing light from bulbs and creating a line as a trajectory, and for making specific lamp shapes.

CATIA V5's highly reliable product data is utilized for die manufacturing. With CATIA V5, Koito can create high-quality data efficiently and centralize all the data, from product design to die manufacturing.

### **ENOVIA SmarTeam for collaborative data management**

Koito uses ENOVIA SmarTeam to manage and share CATIA V5 designs and associated engineering data. Product definitions designed in CATIA V5 are controlled by ENOVIA SmarTeam and shared throughout the company. Design modifications are also managed through ENOVIA SmarTeam. Koito also shares and manages engineering data with suppliers connected through its collaborative environment.



### **DELMIA for shop floor simulations**

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 simulations enabling Koito to ensure, in advance, that jigs hold products correctly and that there is no part interference.

### **Optical simulation with SPEOS**

Koito uses SPEOS from OPTIS, a Dassault Systèmes CAA V5 software partner, to conduct lighting simulations of rear marker lights, study the look of the lamp itself while lit, and ensure compatibility with legally stipulated security standards.

"SPEOS CAA V5 Based makes simulations that are extremely close to the actual product. For example, with LED marker lights, the central portion becomes extremely bright in a circular fashion when lit due to the strong directivity of the light rays, a special feature of LEDs. By accurately modeling these unique features, SPEOS CAA V5 Based lighting simulations allow us to study how the lights appear, and at the same time calculate their level of compatibility with legal security standards. These realistic images also help boost our ability to

make proposals to automobile manufacturers." said Sawako Onaka, Computer Aided Engineering Promoting Room, Engineering Dept. Koito Manufacturing Co., Ltd.

### **Improved product design**

The use of V5 DMU (digital mockup) solutions has helped Koito perform pre-manufacturing product evaluations such as simulations and Performance Capability Scalability (PCS) assessments, improve product development efficiency among cross-functional teams for sharing information, and help designers intuitively understand product shape and form. It is now possible to launch products that meet client demands ahead of the competition.

### **Fewer production errors**

Koito avoids problems by using interference checking or knowledgeware embedded in the CATIA V5 mold & die model thanks to its template capability. Compared with conventional methods, this innovative approach to die manufacturing has drastically reduced iterations and improved the quality of manufacturing.



"Molding requirements have had to become more sophisticated to keep up with the growing complexity of automotive parts. To cope with these demands, we believed it was important to shift to a system where the design department produces a unified 3D form that also takes molding requirements into consideration."

Seiji Igarashi, manager,  
Fujikawa Tooling Department,  
Production Head-Quarters,  
Koito Manufacturing Co., Ltd.

## Reduced product design time

Koito's modeling process has been successfully automated thanks to a newly developed support tool. Consequently, the company was able to shorten its mold design period compared to the time required using the conventional 2D design method.

"We were able to automate the process of creating special die component data. This helped reduce die manufacturing time." said Mitsunori Urushibata, Assistant Manager, Fujikawa Tool Department, Koito Manufacturing Co., Ltd.

## Optimized manufacturing processes

DELMIA's assembly planning and robot simulations enable us to ensure in advance that jigs hold the product correctly and that there is no interference. This helps prevent errors and accidents.

"We needed to reengineer the process between the design and manufacturing departments. Tooling requirement definition is now handled by the engineering department. The tooling department must step up efforts to develop a process that emphasizes "moldability" verification and enhanced precision when creating products from data." said Seiji Igarashi, manager, Fujikawa Tooling Department, Production Head-Quarters, Koito

Manufacturing Co., Ltd.  
By automating the entire CAM (Computer Aided Manufacturing) process from design to manufacturing, Koito is confident they will not only streamline the entire production system, but also continue to provide unbeatable solutions to the market in a timely manner.

"V5 PLM solutions from Dassault Systèmes are enhancing our product development efficiency while improving overall product quality through improved departmental collaboration, concluded Masahito Ishikawa.

## Optical simulation product: SPEOS CAA V5 Based

SPEOS, developed by OPTIS of France, is optical simulation software specializing in the design and optimization of lighting and optical device products. SPEOS CAA V5 Based is fully integrated into CATIA V5 making it easy to use. Designers can perform simulations while designing and developing products. The result is an optimal balance between design and cost, performance and quality, as well as ease of manufacture.



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