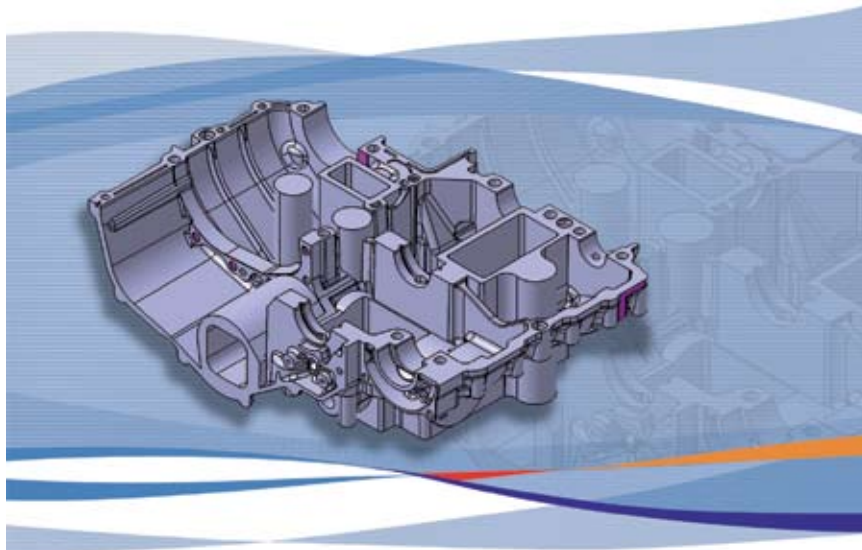


Union Precision molds its future with CATIA V5



“Younger engineers find it easier to grasp 3D renderings on a computer screen than reading 2D drawings and building 3D images in their heads. In fact, they can get their work done much faster that way.”

– Chiaki Ikemoto, Manager, Engineering Section, Union Precision Die Co. Ltd.

Overview

■ The Challenge

To enable inexperienced engineers to create complex shapes for die molds more quickly, Union Precision needed 3D visualisation and design tools

■ The Solution

Adopting CATIA V5 allowed young engineers to become productive quickly, without the years of experience required to effectively visualise 3D shapes in 2D

■ The Benefit

Union Precision has significantly cut design times for new die molds, and anticipates 50 percent gains when the project is fully implemented.

CATIA V5 provides fast start for die design

For more than 30 years, Union Precision Die Co. Ltd. has used time-tested 2D methods to design the dies and molds for casting aluminium parts for Kawasaki brand motorcycles, watercraft and general-purpose engines.

Learning how to conceptualise increasingly complex 3D shapes from 2D drawings is an art that takes years to master. Consequently, as the company’s experienced engineers have retired, Union Precision has been challenged by the long learning times required to train their replacements.

“Younger engineers find it easier to grasp 3D renderings on a computer screen than reading 2D drawings and building 3D images in their heads,” says Chiaki Ikemoto, Manager of the Engineering Section in the company’s production department.

So when its parent company, Kawasaki Heavy Industries, adopted CATIA V5 in 2000, Union Precision decided to take advantage of the change to adopt 3D tools that could shorten the learning curve for young engineers while reducing the company’s overall design cycles.

Leading the engine industry with 3D

In making the change, Union Precision is ahead of many of its competitors. “The engine manufacturing segment has not yet fully converted to 3D product design,” says Hisashi Fujii, the company’s Corporate Advisor and former President. “In the very near future, dies and molds will be fully designed in 3D, and we don’t want to lag behind when that time comes so we decided to take pre-emptive action.”



Union Precision has taken a highly methodical approach to its CATIA V5 rollout, dividing its processes into distinct phases and addressing each in sequence. Aided by IBM Business Partner Daizo Corporation, the company embarked on fully-fledged 3D design in 2005, including specialised training in generative design and knowledge management.

First, the company revised its design specifications and standardised parts based on established rules. Existing part data is reused whenever possible, and only unique parts are designed anew. BOMs are automatically generated from each model, and catalogues of structural parts were created. Union Precision also built movable core models and catalogued structural assemblies, simplifying the layout process.

CATIA V5 cuts design cycle in half

To date, about 80 percent of the die prototype parts for a 1,250-ton casting machine have been modelled and catalogued. A single hydraulic cylinder component consists of about 100 parts, while a typical die generally requires many hundreds of standard and custom-designed parts.

Thanks to Knowledgeware and generative design in CATIA V5, the company can now render the 3D structure of the die, check for interferences in assemblies and automatically generate BOMs from assembly models. Selecting an ejector pin from the catalogue and placing it on the plate automatically creates a hole of corresponding size on the plate, for example. Any changes in pin size are automatically reflected in the hole geometry.

“Now we can pretty much design at will,” says Haruo Sakurai, Assistant Manager, CAD Group. “2D drawings are also necessary in manufacturing structural die parts. Luckily, our solution can easily generate those from a 3D model.”

Ultimately, the company expects to reduce its design cycles by 50 percent. A prototype die such as the one for its 1,250-ton casting machine, for example, typically took 40 days to design in 2D after receiving product drawings from a client. With CATIA V5, Union Precision expects to reduce the cycle to 20 days.

“Judging from the internal demonstrations I’ve seen so far, our 3D design capability has made quite a lot of progress,” Fujii says. “We are now about to move from functional prototypes to production prototypes with plans to convert the 3D die design directly into CNC machining data.”



IBM Eurocoordination

Product Lifecycle Management
Tour Descartes
La Defense 5
2, avenue Gambetta
92066 Paris La Defense Cedex
France

The IBM home page can be found at **ibm.com**

IBM, the IBM logo, ibm.com and the On Demand Business Logo are trademarks of International Business Machines Corporation in the United States, other countries, or both.

CATIA® is a registered trademarks of Dassault Systèmes.

Other company, product and service names may be trademarks, or service marks of others.

Any reference to an IBM product, program or service is not intended to imply that only IBM products, programs or services may be used. Any functionally equivalent product, program or service may be used instead.

This publication is for general guidance only. Information is subject to change without notice. Please contact your local IBM sales office or reseller for latest information on IBM products and services.

Photographs may show design models.

© Copyright IBM Corporation 2006
All Rights Reserved.