

# Mecaplex

Aerospace & Defense Case Study



## Challenge

To outdistance its competition, aerospace transparencies manufacturer Mecaplex needed to improve the reliability of its development processes and capitalize product knowledge for present and future use throughout the company.

## Solution

Mecaplex chose Dassault Systèmes' 3DEXPERIENCE Platform for design, analysis and data management.

## Benefits

Engineers can design transparencies of any shape and complexity, store intellectual property throughout the product lifecycle, and analyze product integrity against external conditions such as high winds, turbulence, and extreme differences in temperature.

## Clear advantages with 3DEXPERIENCE Platform

When the inspector from the Swiss Federal Office of Civil Aviation was scheduled to pay Mecaplex a visit, Daniel Reutimann, responsible for digital design and development, would have trouble sleeping the night before the meeting. One reason was he was concerned he could not easily respond to some questions, such as the type of materials used for the transparencies of a Boeing aircraft. Reutimann knew it was difficult to find the required information right away because it was stored in multiple computer files. He felt it was going to be a long day.

But those days are over. Now, when the inspector schedules a visit, Reutimann sleeps well. This is because he now uses ENOVIA, part of the 3DEXPERIENCE Platform from Dassault Systèmes, to manage his data. "Product and process-related information is only a keystroke away," Reutimann said. "It is a radical improvement. Safety plays a predominant role in the aerospace industry, which means that we are often audited," he explained. "Accurately recorded, up-to-date processes are absolutely essential for product development to run smoothly. Using the 3DS applications means that I no longer have to search for everything in individual files; I have all the latest product and project-related data at my fingertips."

## Sustainable IP

With the 3DS Platform, the Swiss firm also capitalizes on and retains important company knowledge. The ability to capture and reuse program data is essential to ensure that when people with specialized know-how one day leave Mecaplex, important data and process information remains available. "We have employees who

have been with the company 30 years and are often the only ones who can still answer queries about past aircraft designs," Reutimann said. "All staff members now have access to the wealth of program data and other intellectual property stored in the 3DEXPERIENCE Platform, which simplifies work because everyone has real-time access to all of our best practices."

## Extreme conditions

On airplanes and helicopters, transparencies play a key role in keeping passengers and crew safe from a variety of adverse conditions outside the aircraft. For example, cockpits are exposed to strong wind speeds and turbulence. They must withstand collisions with birds as well as extreme differences in temperature, which can fluctuate between -60°C outside and +20°C inside. Transparencies must protect passengers from the sun's UV radiation. So in addition to being sturdy they must be protected with a UV radiation-resistant coating. A transparency's shape plays an important role in its ability to withstand these extreme conditions. Correctly designing it is therefore important. "The analysis and production methods we use today, such as our bird strike computer simulation, which did not even exist a few years ago, are essential to designing structurally sound transparencies," according to Reutimann. "The 3DS applications we use help us develop and manufacture better products."

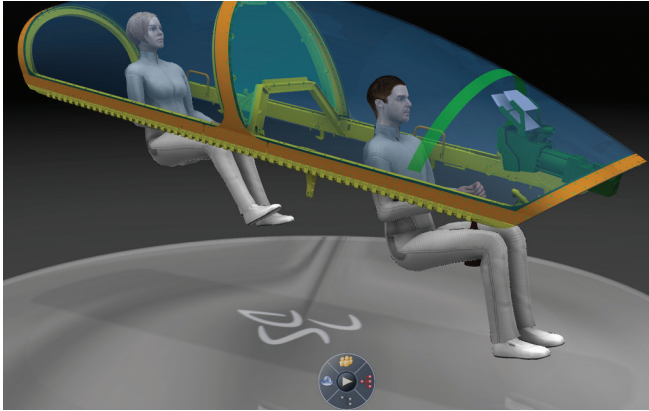
## Venture where others dare not go

The 3DEXPERIENCE technologies help Mecaplex innovate and push boundaries. Competitors are often bigger and more competitive price-wise than this family business founded in 1948. This is why Mecaplex simply has to offer its customers more. Reutimann summed it up succinctly: "We approach assignments with fewer inhibitions than others and venture where they dare not go," he said. "You will never hear us say that something is impossible. We always look for creative solutions that meet our customers' requirements." As a result, companies throughout the world appreciate the flexibility



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**Daniel Reutimann, responsible for digital design and development, Mecaplex.**



Virtual design of the basic trainer canopy of Hürküş TAI



Training aircraft Hürküş TAI

and creativity of the 35-strong Mecaplex staff. Companies that include Dassault Aviation, EADS, Eurocopter, Korean Aerospace Industries, Northrop Grumman and Pilatus Aircraft.

### Virtual product development

Since transparencies are not part of an aircraft manufacturer's principle skill set, a typical request from a Mecaplex customer could be: "We are building a helicopter that is designed to fly at a speed of X and at an altitude of Y and we need to equip it with safe windshields," Reutimann said. "This is where our creative consultancy really starts. In our proposals we cover various aspects of a transparency - the thickness and composition of the shield, whether it should be heated or not and its installation in the aircraft. Reutimann and his team use CATIA and DELMIA, both part of the 3DEXPERIENCE Platform. Based on this Platform all Mecaplex proposals are validated including characteristics such as openings, screwed and bonded joints, as well as the tools and NC programs needed for production. The milling of the transparencies is a delicate process starting with the programming and extending through the clamping stage all the way to the actual machining. To ensure this Mecaplex programs and controls their modern three-axis and five-axis milling machines for mold design and construction. "I have always been an advocate of virtual product design," Reutimann admitted. "When I was a student, one of my college professors showed us the many possibilities CATIA offers for putting ideas into practice. At that time, we literally spent entire nights designing and to this day, I still enjoy working with this application." Now, Reutimann cannot even imagine doing his job without CATIA. "We are free to design any shape, even for the most complex parts such as indicator lamps or wing tips, which are subjected to extreme stress. We then complete the design by running analyses and manufacturing the parts. All in a day's work," he added.

### Enormous Potential

Mecaplex will use 3DVIA, also part of the 3DEXPERIENCE Platform, to generate clear and realistic proposals for its customers. Reutimann is convinced, "There is so much potential with 3D," he said. "A product is not just shown virtually; 3D enables customers to experience the product as if it were real." Furthermore, he believes that the possible uses for glass have by no means been exhausted. "By combining glass with other materials, such as plastics for example, whose thermal expansion behavior is similar to that of acrylic glass, there is enormous potential for innovation. We are only at the start of the learning curve. The great leap forward lies just ahead."

### Focus on Mecaplex

Part of the Glas Trösch group and located in the Swiss canton of Solothurn, Mecaplex develops and produces innovative transparency solutions made of acrylic or polycarbonate with scratch-resistant coating.

**Products:** Transparencies for aircraft and helicopters  
Aerostructures assemblies

**Employees:** 35

**Headquarters:** Grenchen, Switzerland

**For more information**  
[www.mecaplex.ch](http://www.mecaplex.ch)



## Delivering Best-in-Class Products



Virtual Product



Information Intelligence



3D Design



Virtual Planet



Realistic Simulation



Dashboard Intelligence



Digital Manufacturing



Social Innovation



Collaborative Innovation



3D Communication

Dassault Systèmes, the 3DEXPERIENCE Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 150,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit [www.3ds.com](http://www.3ds.com).

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