About Dassault Systèmes

As a world leader in 3D and Product Lifecycle Management (PLM) solutions, Dassault Systèmes brings value to more than 115,000 customers in 80 countries. A pioneer in the 3D software market since 1981, Dassault Systèmes applications provide a 3D vision of the entire lifecycle of products from conception to maintenance to recycling.

The Dassault Systèmes portfolio consists of CATIA for designing the virtual product, SolidWorks for 3D mechanical design, DELMIA for virtual production, SIMULIA for virtual testing, ENOVIA for global collaborative lifecycle management, and 3DVIA for online 3D lifelike experiences.

For more information, visit http://www.3ds.com.

www.3ds.com/catia
Driving the design revolution

The product design process is changing. The product development cycle is shortening, product performance requirements are increasing, and design precision is paramount. Manufacturers now demand even more than in the automotive industry. Models are being released increasingly quickly and in ever-changing form. New vehicle models are being developed even within a shortened product lifecycle. Platforms sharing within and between companies are the norm. At the same time, automotive design has become significantly more complex. The industry has experienced revolutionary advances in technology and radical changes in customer expectations in terms of both form and quality, which have created new opportunities and challenges.

These pressures are prompting the design process to evolve and change. Designers need to understand how alterations impact the rest of the design as quickly as possible. Engineers must incorporate changes from early in the design process. Reality-based analysis is becoming more important as the development of the actual vehicle dictates the creation of new models and physical prototypes is being pushed back to the late stages of the development process to save time and costs.

All of which significantly increases the complexity of the actual software-based design environment, especially when it comes to surface design.

The Best Class A surface design tools act as a key interface between the design department and the engineering team that will actually “build” the car. Developed in close collaboration with Class A surfacing professionals to take into account increasingly higher expectations from their own customers, CATIA ICEM comprehensive suite of software solutions is used by large numbers of leading car manufacturers and suppliers in the modeling of Class A surfaces, making it a clear leader in this field.

Leading products must be responsive to customer needs, market developments, and other agents of change. The best products can even shape the direction of that change. CATIA ICEM therefore continues to drive and support the increasing virtualization of the design process by delivering advanced new evolutions on a regular basis.

CATIA ICEM enables mechanical designers, shape designers, and stylists to create, validate, and refine surfaces of any type, particularly those which are visible and tangible such as exterior and interior trims. The trend to style surfaces that customers cannot see directly is also increasing. Car manufacturers that use and build advanced technology solutions solely apply Class A modeling to partially hidden surfaces such as door shut faces or engine covers.

Key Benefits
- The only highest quality Class A surfacing/ modeling solution fully integrated within CATIA
- Unique “Parallel Commands” – simultaneous surface creation and modification
- Optimized workflow, for optimized efficiency

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The CATIA ICEM solution is unique in the market. No other surface design solution allows design professionals to create stunning surfaces of all types and accurately measure and see the impact of individual changes to other parts of the design. No other surface design solution fits better within the all-embracing product development environment.

Because Class A surfaces cannot be developed properly in isolation, the integration with the virtual design environment is crucial to maximize the efficiency and effectiveness of the entire product development process. The greater the emphasis manufacturers put on the development of Class A surfaces, the closer design and engineering teams have to work together, making that integration still more important. Without it, the resultant gaps in the development process chain lead to engineering headaches and expensive redesigns.

CATIA ICEM was the first Class A surface modeling tool to be fully integrated into CATIA virtual design environment, setting a new standard for Class A modeling. Users can now work towards the surface quality required for two end products throughout the entire development process within a single system, and without converting or losing data.

Using a single common data format for designs, from end to end – as opposed to different formats from stand-alone interoperable systems – results in improved surface efficiency, as well as significant time and cost savings. In addition, data model created in CATIA can be converted to other CAD systems, thus ensuring freedom and flexibility for design partners and a faster more efficient, and more cost-effective complete development process. This integration covers the entire development process, allowing software-based development to more than the surface on clay models, draw sheets, and detailed workstations in the early development phases. Data can be shared with other applications for everything from crash analysis and testing to product data management.

The progressive replacement of physical models, prototypes and materials with virtual model equivalents offering the same level of accuracy and much faster, less expensive, more flexible design environment is one of the most powerful in CATIA ICEM. Using capabilities like its real-time diagnosis feature of the progression of surface changes while working with CATIA ICEM, the status of the change is directly visible on enhanced diagram capabilities. The surface modeler receives more accurate simulation data and the visual appearance of the surface while building to ensure a realistic representation of the structure in terms of surface quality and aesthetics.

Key Benefits
- One single solution for the whole product development process, from design to manufacturing
- Integrated associative product development environment
- Real-time diagnosis, ensuring surfaces high-quality end
- Hybrid modeling environment with both explicit and feature-based approaches
- Efficient easy-to-use tools and commands
The ultimate surface-modeling platform

CATIA ICEM Shape Design Center
ICEM Shape Design Center is the foundation of the ICEM Shape Design product portfolio. It offers advanced surface and curve functionality to create, modify, and analyze surfaces that are both aesthetic and ergonomic, to the highest quality. Based on traditional explicit surface-modelling techniques, it introduces a strong associative and feature-based modeling methodology to dramatically improve the productivity within the Class A process. It also delivers new levels of integration in the overall product development environment.

CATIA ICEM Shape Design Expert
ICEM Shape Design Expert offers an extended tool set that complements ICEM Shape Design Center. This add-on module enables the creation and modeling of aesthetic and ergonomic shapes using advanced global surface-modelling and shape-modelling capabilities. It also provides specialized tools and dedicated industry-specific functionalities such as advanced filleting, tri-tangent filleting, gap creation, and accelerated surfaces.

CATIA Freestyle Sketch Tracer
CATIA Freestyle Sketch Tracer is an add-on module that enables the integration of designers’ work into a 3D format for creating 3D virtual mock-ups. An intuitive toolbox helps the user to create 3D data from 2D sketches.

CATIA Digitized Shape Editor
CATIA Digitized Shape Editor is an add-on module that addresses the import, filtering, trimming, tessellation, and character line definition of digitized data from 3D scanners and coordinate-measuring machines.

CATIA Quick Surface Reconstruction
CATIA Quick Surface Reconstruction is an add-on module that simply and rapidly reconstructs surfaces from digitized data and offers several approaches to generating these surfaces, depending on the type of shape required.

CATIA Digital Shape Sculptor
CATIA Digital Shape Sculptor is an add-on module that provides modeling tools to quickly create, edit, or enhance a shape from a concept or an existing physical model. This approach to creating aesthetic forms allows non-CAD specialists to use CATIA to create and edit physical models. CATIA Digital Shape Sculptor supports the entire digital design and engineering process through efficient creation of final design specifications.

CATIA Real Time Rendering
CATIA Real Time Rendering is an add-on module that enables designers to create realistic and dynamic visualizations in real time, taking advantage of all available hardware features. By providing the designer with an intuitive interface of 3D rulers, CATIA Real Time Rendering allows them to create photorealistic visualizations and validate any design.

CATIA Photo Studio
CATIA Photo Studio is an add-on module that generates high-quality photo-realistic images and movies of digital mock-ups, by using a powerful ray-tracing engine. CATIA Photo Studio manages reusable scene settings and delivers powerful animation capabilities. By giving a photorealistic, virtual simulation of the model appearance, it can be used for final design validation.

The geometry has also been made even more associative. For example, whereas surfaces may previously have had to be parameterized after construction, feature-modeling enables surfaces to be defined as features. This allows changes to be made to the surface while maintaining the integrity of its features.

The suite of ICEM Surf also allows the seamless integration of ICEM Surf product designs to the integrated associative product development environment of CATIA ICEM. ICEM Surf consists of multiple modules, each addressing a different aspect of the product development process. The suite of ICEM Surf can also take advantage of the new bidirectional interface with CATIA ICEM for a complete integration of ICEM Surf product designs to the integrated associative product development environment of CATIA ICEM. ICEM Surf consists of multiple modules, each addressing a different aspect of the product development process.

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