CATIA ICEM SHAPE DESIGN

PERFECTION IN VIRTUAL SURFACE DESIGN

3S CATIA

Driving the design revolution

The product design process is changing, it has to. Product replacement cycles are shortening, product platforms have to be designed to satisfy market demand for numerous niche variants, and design precision is paramount.

Nowhere are these trends more evident than in the automotive industry. Models are being replaced increasingly quickly and are often 'face lifted' several times even within a shortened product lifecycle. Platform-sharing within and between manufacturers is 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. All of which means surfaces must be pristine.

These pressures are combining to make the design process even more intensive. Designers need to understand how alterations impact the rest of the design

as quickly as possible. Engineers must incorporate changes more rapidly than ever before. Feasibility analysis has to be incorporated into the development of the initial concept and the creation of clay models and physical prototypes is being pushed back to the later stages of the development process due to time and cost constraints. All of which significantly increases the importance of the 'virtual' 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 a large number of leading car manufacturers and suppliers for 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, in order to remain successful. 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 modify surfaces of any type, particularly those which are visible and tangible such as exterior and interior trim. The trend to style surfaces that customers cannot always see directly is also increasing. Car manufacturers that use and build advanced technology solutions already apply Class A modeling to partially hidden surfaces such as door shut faces or engine covers.

Now you see it

The CATIA ICEM solution suite 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-encompassing 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 their 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 standalone, incompatible systems – results in improved workflow efficiency, as well as significant time and cost savings. In addition, data models created in CATIA ICEM can be used in CATIA. Ultimately, this means greater freedom and flexibility for design professionals and a faster, more efficient, and more cost-effective complete development process. This integration covers the entire development process chain, allowing software-based development to

minimize the reliance on clay models, sheer lathes, and standalone renderers in the early development phases. Data can be shared with other applications for everything from crash analysis and tooling to product documentation.

The progressive replacement of physical models, prototypes and materials with virtual equivalents offering the same level of accuracy allows faster, less expensive product feasibility testing.

One of the most powerful of CATIA ICEM's many capabilities is perhaps its real time diagnosis feature. If the geometry of a surface changes while working with CATIA ICEM, the impact of the change is directly visible via advanced diagnosis capabilities. The surface modeler receives real time notification about the quality and the visual appearance of the surface enabling him to make a judgment on the validity of the outcome 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, securing surfaces high-end quality
- Hybrid modeling environment with both explicit and feature-based approaches
- Efficient easy-to-use tools and commands

The ultimate surface-modeling platform

Every iteration of CATIA ICEM addresses a wide range of enhancements specifically requested by professional developers and designers. Many of these new features improve the integration between concept creation, Class A surface-modeling and CAD modeling.

The geometry has also been made even more associative. For example, whereas surfaces may previously have had to have their parameters changed after construction, feature modeling enables surfaces to be defined as features. This allows changes to be made to the surface while retaining the original properties of other design features.

Class A surface-modeling capabilities have been further improved through the enhancement of the fill function, as well as the arching of surfaces. Meanwhile, commands have also been made more efficient and easy-to-use for the selection, manipulation, and modification of surface elements.

Users of ICEM Surf can also take advantage of the new bidirectional interface with CATIA ICEM for a smooth migration of their ICEM Surf product designs to the integrated associative product development environment of CATIA ICEM.

CATIA ICEM consists of multiple modules, each addressing a different aspect of the product development process.

The suite can be supplied in different configurations according to your own specific requirements.

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 aesthetic and ergonomic shapes to the highest quality.
Based on traditional explicit surface-modeling 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 lifecycle.

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-modeling and shape-modeling capabilities. It also provides specialised Class A 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 coordinatemeasuring 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 manipulate and test 3D virtual polygon models. CATIA Digital Shape Sculptor enhances the collaboration between design and engineering offices through an easy-to-use sculpting technique.

CATIA Real Time Rendering
CATIA Real Time Rendering is an add-on module that enables designers to interactively create realistic and dynamic renderings and animations in real time, taking advantage of all available hardware features. By providing the dynamic display of your mock-up, CATIA Real Time Rendering allows efficient design evaluation and validation at any time

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 physically realistic simulation of the model appearance, it can be used for final design validation.

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.

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