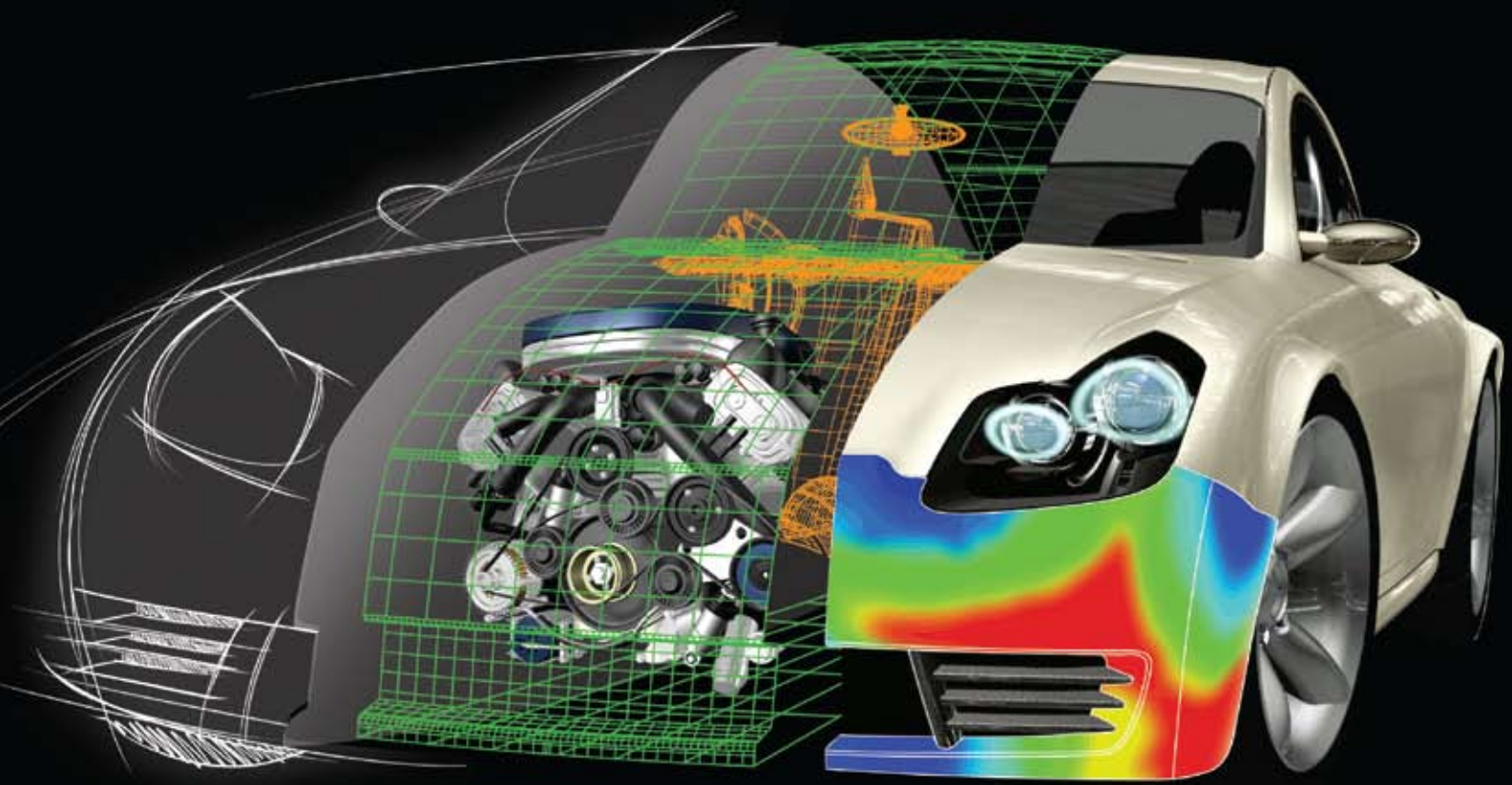
Autodesk®
for Automotive Suppliers

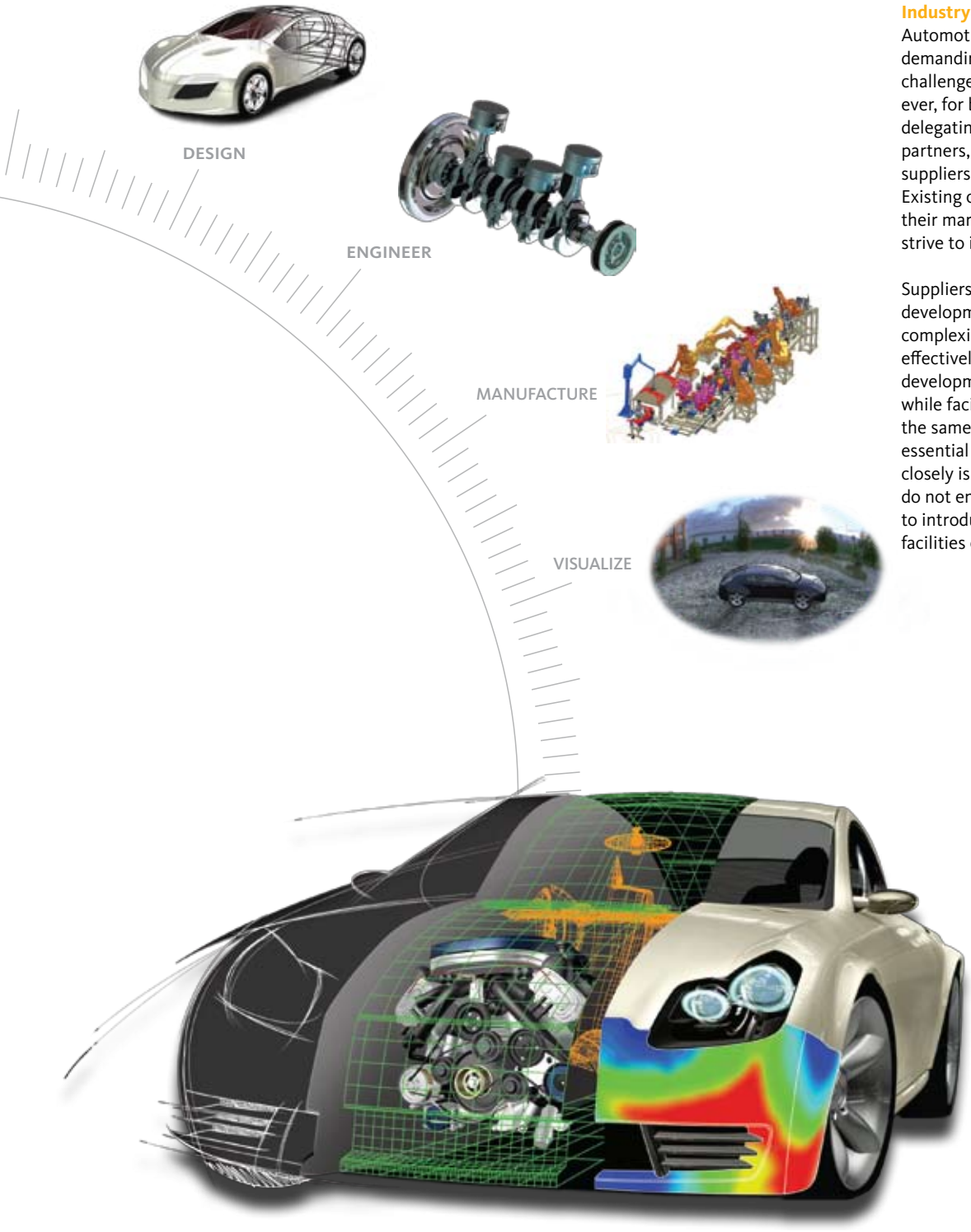
Experience It Before It's Real



Autodesk®

Get Your Designs from Sketch to Street Easier and Faster

Improve collaboration and productivity with the Autodesk solution for Digital Prototyping.



Industry Challenges

Automotive suppliers operate in a complex and demanding environment and face unprecedented challenges today. Customers expect more than ever, for both less time and less money. OEMs are delegating more responsibility to their supplier partners, and engaging in risk-sharing where suppliers are liable for warranty and other costs. Existing competitors are defending and expanding their market positions while emerging competitors strive to introduce higher value products.

Suppliers need to meet expectations for shorter development times at the same time that product complexity is increasing. Companies must effectively collaborate among globalized product development teams and supply chain partners while facing increasingly intense competition. At the same time, the need to accelerate innovation is essential for market success, while managing costs closely is critical to the bottom line. The challenges do not end with product development - the ability to introduce products into flexible manufacturing facilities can make or break the success of a project.

Strategies for Success

Succeeding in this market requires an intense focus on eliminating inefficiencies throughout the development process from concept to market launch. Development teams need the ability to explore a design early in the design process and to communicate that design with stakeholders. The ability to visualize, optimize, and manage a design from the earliest concept phase is a prerequisite to avoiding design errors that do not appear until the physical prototyping stage. Just as important is the ability for multiple disciplines to communicate and collaborate throughout the development process, without recreating data to meet their needs.

The Autodesk Solution for Digital Prototyping

The Autodesk solution for Digital Prototyping enables workgroups to create a single digital model that can be used in every stage of production, bridging the gaps that usually exist between conceptual design, engineering, and manufacturing teams. This single digital model enables the simulation of the complete product and gives designers and engineers the ability to better visualize, optimize, and manage their designs before producing a physical prototype, helping projects get to market faster and reducing errors and the cost and waste associated with physical prototypes.

The Autodesk approach to Digital Prototyping is unique in that it is attainable, scalable, and cost-effective, allowing suppliers to realize benefits with minimal disruption to existing workflows. Digital Prototyping provides a straightforward path to creating and maintaining a single digital model in a multidisciplinary engineering environment.

Common challenges faced by automotive suppliers:

- Pressure from OEMs to reduce costs
- Integration of mechanical and electrical design data
- Data from customers and suppliers exists in various CAD formats
- Late design changes increase development and manufacturing costs
- Product data is out of date and difficult to reuse in manufacturing
- Product performance issues are not identified until physical prototyping
- Communication with suppliers and non-technical teams is inefficient
- Disconnected processes for conceptual design, engineering, and manufacturing

Industrial Design

Autodesk tools help to maintain a single digital model from early sketches through design modeling (including hybrid processes), visualization and decision-making and final technical surfacing.

With market-leading industrial design tools from Autodesk you can:

- Work digitally from project start
- Incorporate industrial design data into the Digital Prototype (share design data with engineering using a common file format)
- Create highly realistic representations of your product to make informed product decisions

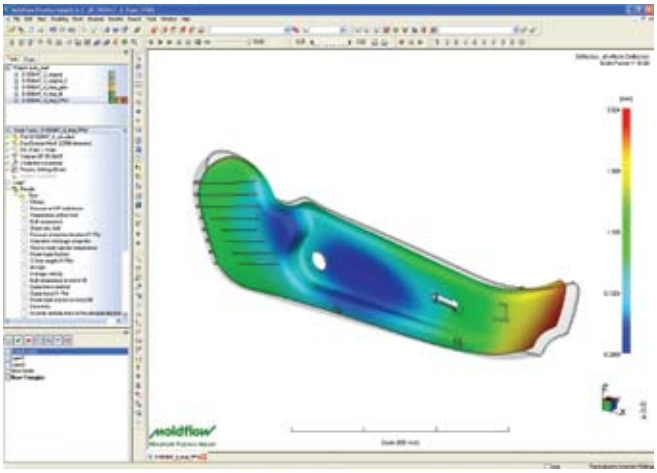
Autodesk offers a comprehensive set of industrial design products which cover all aspects of the conceptual design, Class A surfacing, visualization, and collaboration process.

- Autodesk® Sketchbook® Pro provides best-in-class digital sketching capabilities for up front design.
- Autodesk® Alias Surface® offers a full set of dynamic 3D modeling capabilities that enable virtual modelers to evolve concept models and scan data into Class-A surfaces
- Autodesk® Alias® Automotive provides a comprehensive set of visualization and analysis tools for the entire shape-definition process, from concept sketches through Class-A surfacing

Autodesk industrial design products provide a wide range of data exchange and engineering collaboration workflows with product development tools, including Autodesk® Inventor® and many other 3D CAD tools.

Autodesk® Showcase™ provides a solution for design visualization and communication to enable effective design reviews and decision-making. By providing a means to communicate conceptual designs across multiple sites with photorealistic quality, Showcase helps teams make informed decisions faster.

Images courtesy of Technicon Design, RCD Except



Engineering

With Autodesk software, you can visualize, simulate, and analyze designs early in the design process and collaborate with customers and suppliers to reduce errors, optimize designs, and minimize physical prototyping.

With Autodesk Inventor, the foundation of the Autodesk solution for Digital Prototyping, you can easily and quickly create digital prototypes using Inventor's functional design capabilities:

- Design with a focus on functional requirements, rather than geometry.
- Have your software automatically create complex 3D geometry.
- And as a result, quickly and easily create accurate digital prototypes.

You can use the tightly integrated calculations, stress analysis and motion simulation tools in Autodesk Inventor to validate and optimize your designs digitally:

- Understand how your product will perform under real-world conditions without building a physical prototype.
- Easily iterate, optimize, and validate your design, digitally.

The smooth, bidirectional interoperability between Autodesk 2D and 3D mechanical and electrical applications allows you to easily incorporate your electrical controls designs into 2D or 3D mechanical designs, so electrical and mechanical teams can work collaboratively.

Autodesk Inventor provides capabilities ranging from complete parametric 3D modeling to dynamic simulation and powerful analysis tools. Modeling capabilities extend to multi-disciplinary needs such as 3D routing of cable harnesses, hoses, pipes, and tubes. Dynamic simulation capabilities represent the entire model and are tightly coupled to analysis tools to provide a powerful desktop solution.

Autodesk Inventor also includes a wide range of native translators to incorporate and share data in a variety of CAD formats, which is essential for a supplier dealing with multi-CAD data. Inventor also shares data, including geometry and materials, with AliasStudio and Showcase to provide an effective way to leverage the single digital model from conceptual design through engineering.

Autodesk® Moldflow® software provides the designer with simulation tools to predict the manufacturability of injection molded components during the design process, before the design is frozen and tools are fabricated.

Autodesk Inventor provides the only associative sharing of data with AutoCAD® and AutoCAD Mechanical®, and includes the ability to generate DWF™ data from the original model. These capabilities provide effective ways of communicating updated data to partners throughout the world.

Autodesk enhances internal and external collaboration by better sharing and managing design data with products like Autodesk® Vault (formerly known as Autodesk® Productstream®), Autodesk® Design Review, and Autodesk® Streamline®. Autodesk Design Review software is the most widely used design review and markup software in the world with over 20 million downloads to date. Autodesk Vault enables the effective reuse of product design data and the ability to leverage prior design analyses, freeing design teams to focus on true product innovation.

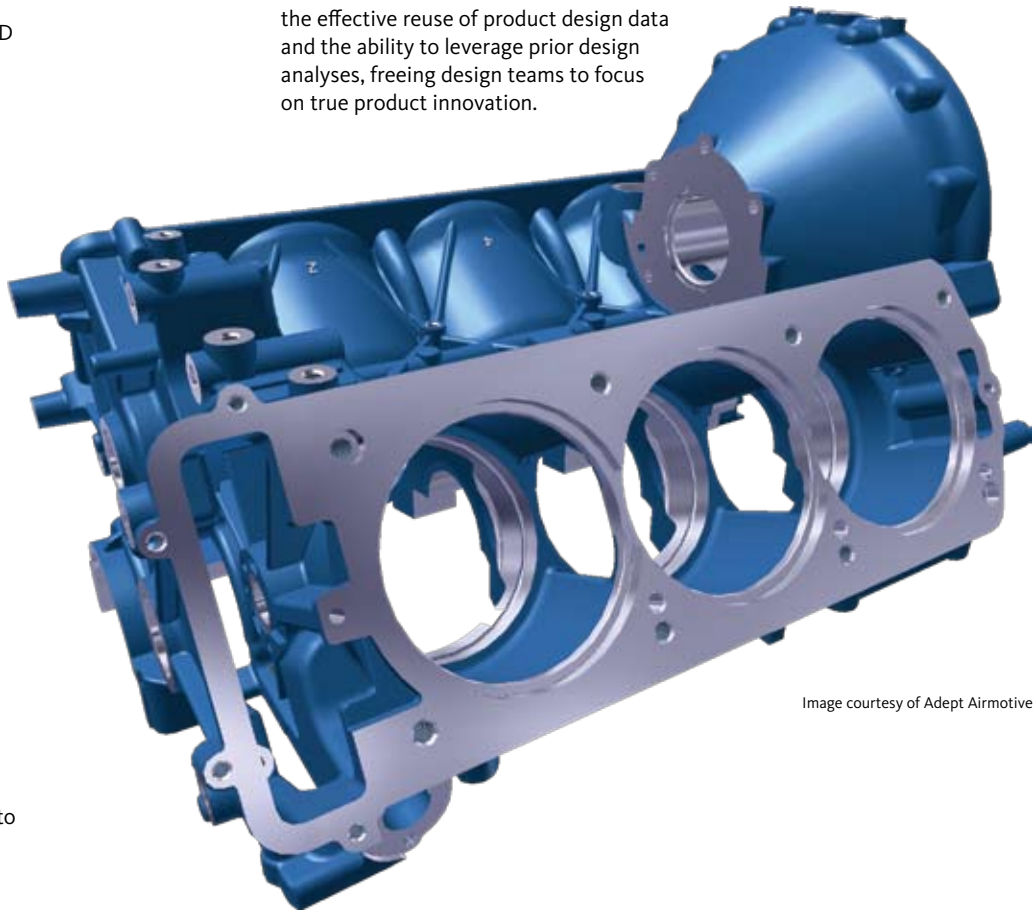


Image courtesy of Adept Airmotive

Steer Your Design from Concept to Production

Manufacturing

Autodesk tools facilitate the integration of product design with tooling, equipment, and manufacturing plant layout capabilities.

Digital Prototyping in the manufacturing workflow enables:

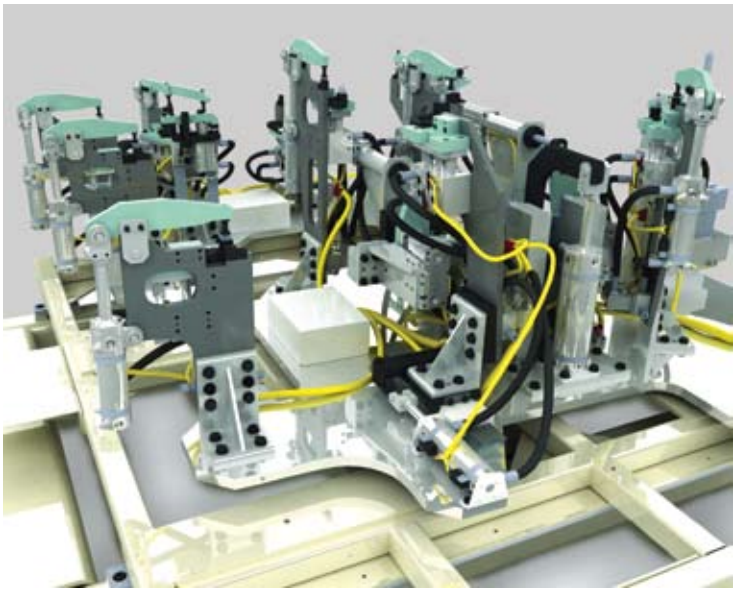
- Early, digital communication with manufacturing teams, so manufacturing input is received up-front, which results in better product quality.
- This digital communication is a much faster and more reliable way to communicate between manufacturing and design departments

Resulting in:

- Reduced reliance on 2D and costly physical prototypes to get to a working product.
- Improved design for assembly using 3D visualization to avoid the confusion of ambiguous paper drawings.

Autodesk® Inventor® and AutoCAD® Mechanical provide the ability to associatively work with 3D tool, jig, and fixture designs and 2D equipment layouts while incorporating 3D product design data from Inventor or other CAD solutions. Autodesk Inventor provides the ability to simulate and visualize the motion of equipment and tooling to more effectively develop and optimize manufacturing processes before committing to a manufacturing concept.

AutoCAD® Electrical provides a complete set of tools for controls design, and works in concert with Autodesk Inventor to integrate electrical controls into mechanical equipment and tooling designs. In addition, the cable harness routing capability of Inventor automates the process of integrating electrical controls.

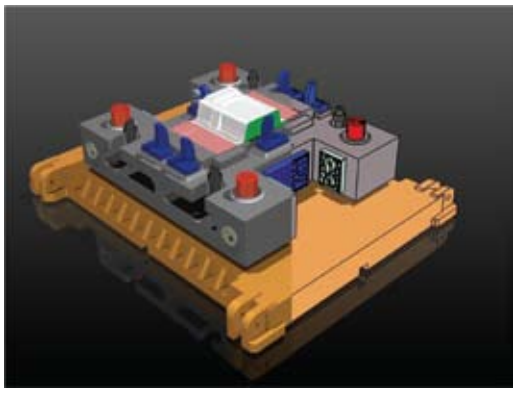


Images courtesy of Aska Corporation and J.S. McNamara

Autodesk® Moldflow® software provides powerful simulation capabilities to simulate the complete process for injection molded components, enabling the optimization of tooling designs and manufacturing processes before the first part is ever molded.

Autodesk® Navisworks® enables the integration of building, product, equipment, and other data to create a complete digital model of the factory. Navisworks provides facility and manufacturing engineers a whole-project view for improving design decision-making, construction implementation, and performance prediction and planning, straight through to management and operation of the facility.

Autodesk® Vault supports workgroup productivity by enabling multiple workgroups to manage documents, changes, and release of information. In addition, bills of material and other rich information can be extended from the workgroup into wider Enterprise Resource Planning applications.



Visualization

Autodesk provides solutions for virtual photography and cinematography that enable creative agencies to market products without the need for costly physical prototypes and photography shoots. These tools effectively repurpose the digital prototype and allow the development of marketing materials in parallel with product development.

Autodesk® Showcase® provides advanced visualization of the digital prototype combined with ease of use. Finished products can be visualized in a custom environment or incorporated into a larger vehicle model to communicate design intent to the customer with photorealistic quality.

For additional visualization, Autodesk® 3ds Max® Design software leverages Autodesk Inventor engineering data to create advanced visualizations of digital prototypes which can incorporate additional modeling, effects, and animations.

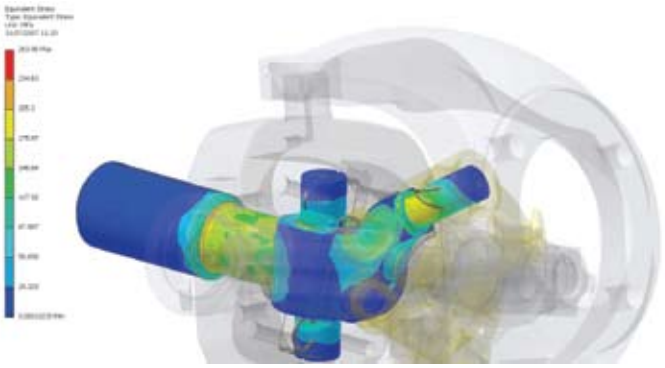
Images courtesy of Paulin Motor Company and Mackevision

Take Digital Prototyping Out for a Spin

Customer References

"Autodesk Inventor is really the first 3D CAD system you can learn and be productive with immediately. You can work with huge machine assemblies, and the software can take you through the whole engineering process to author design data for use everywhere in the company."
-Jason McNamara
CAD Application Engineer
J.S. McNamara

"The true benefit of Autodesk Inventor for a small business such as ours is the affordable cost combined with the ease of operation."
- David Farrell
Technical Director
Thompson Couplings Limited

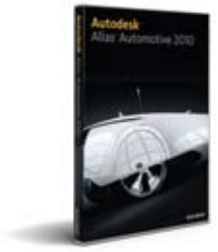


"With Alias software we're able to carry a high percentage of our early surfacing work through the final Class-A stages. It saves us—and our clients—a lot of time in the end."
- Werner Strathaus
Director
Technicon Design

"By investing in Autodesk software, we were able to improve the quality of our services, and therefore, secure the loyalty of our customers."
- Jean-Jacques Thamié
Cofounder and Design Manager
RCD Except

Autodesk® SketchBook® Pro software is designed specifically for use with a stylus, letting automotive designers capture ideas without switching from pen to keyboard and back again.

Autodesk® Alias® Automotive software is an industry-leading application for automotive design and styling.

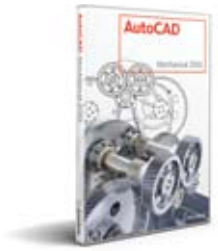


Autodesk® Alias® Surface software offers a full set of dynamic 3D modeling capabilities that enable virtual modelers to evolve automotive concept models and scan data into high-quality production surfaces for Class A surfaces for auto design and styling.

Autodesk® Showcase® software helps designers transform 3D design data into visually realistic images, accelerating decision making for automotive suppliers.

Autodesk® Inventor® software is the foundation for Digital Prototyping, providing a comprehensive and integrated set of design tools to simulate how the design will work under real conditions before the product is ever built.

AutoCAD® Mechanical is the AutoCAD® software for manufacturing, purpose-built to accelerate the mechanical design process, while preserving the AutoCAD user experience.



AutoCAD® Electrical is AutoCAD® software for controls designers, purpose-built to create and modify electrical control systems.

Autodesk® Moldflow® is the leading provider of plastics simulation software used to optimize the design of plastic parts and allow mold designers to predict how a mold design will perform during the manufacturing process.

Autodesk® Navisworks products enable a real-time, whole-project view for effective 3D coordination, 4D planning, photorealistic visualization, dynamic simulation, and accurate analysis.

Autodesk® Vault software (formerly known as Autodesk® Productstream®) securely stores and manages engineering information, design data, and documents-shortening the design-to-manufacturing process.

Autodesk® Design Review software is a free*, all-digital way to share, review, mark up, and track changes to digital prototypes, all without the original creation software.

Autodesk® 3ds Max® Design software helps advertising and marketing agencies create compelling visuals of vehicles from digital prototypes.

Digital Prototyping for Automotive Suppliers

Autodesk is a world-leading supplier of engineering software, providing companies with tools to experience their ideas before they are real. By putting powerful Digital Prototyping technology within the reach of mainstream manufacturers, Autodesk is changing the way manufacturers think about their design processes and is helping them create more productive workflows. The Autodesk approach to Digital Prototyping is unique in that it is scalable, attainable, and cost-effective, which allows a broader group of manufacturers to realize the benefits with minimal disruption to existing workflows, and provides the most straightforward path to creating and maintaining a single digital model in a multidisciplinary engineering environment.

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