



# SOLIDWORKS DESIGN-TO-MANUFACTURING SOLUTION



# DESIGN, VISUALIZE, COMMUNICATE, VALIDATE, COST, MANUFACTURE, INSPECT, COMPOSE, MANAGE, AND SELL—ALL IN ONE ENVIRONMENT

For years, companies have survived with a separation between their design and manufacturing departments, both by organization and by the tools they used. Now with more competition and a resulting need to produce products faster, with higher, more predictable quality and at lower costs, companies are looking to streamline their design-to-manufacturing workflows.

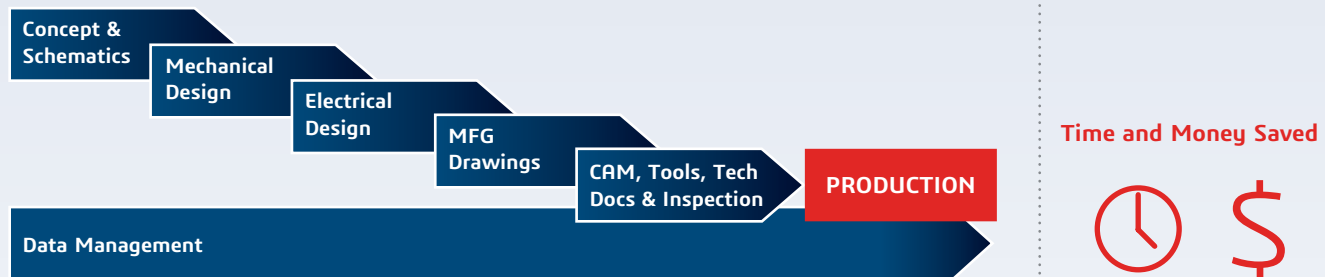
The SOLIDWORKS® Design-to-Manufacturing solution offers an integrated system enabling design and manufacturing teams to work together concurrently. Providing all the tools in a single environment eliminates the time-consuming need for data to be translated between departments, which often results in errors and intelligence gaps. Designers and engineers can spend more time optimizing their designs, confident that their changes won't threaten delivery targets. As a result, companies can go from conceptual design to manufactured parts faster and more easily than ever before.

## CONCURRENT VS. SERIAL PRODUCT DEVELOPMENT PROCESS

### Typical serial design-to-manufacturing process



### Concurrent and integrated design-to-manufacturing process



At the center of this solution is a shared 3D CAD model, enabling design or manufacturing changes to be effectively managed and allowed to propagate automatically to all related drawings, downstream manufacturing systems, and technical documentation that are affected by the change.

Benefits of having the 3D CAD model at the center of your Design-to-Manufacturing process:

- **Automatically propagate changes:** Design changes propagate automatically to downstream functional areas.
- **Eliminate the need to freeze designs for manufacturing:** You can incorporate changes late in the product development cycle without the need to push out delivery dates.
- **Design and manufacture concurrently:** All departments can start their tasks earlier.
- **Control master representation of the design:** The 3D CAD model is the master representation of the product.

Thousands of companies have taken advantage of these tools, and many have become leaders in their markets.



# INTEGRATED DESIGN-TO-MANUFACTURING PROCESS

The SOLIDWORKS Design-to-Manufacturing solution lets designers, engineers, manufacturing teams, and even outside vendors work concurrently in one seamlessly integrated and managed system. All phases of the design and manufacturing process benefit from these solutions.

## DESIGN

Great products begin with great design. Start with SOLIDWORKS tools to get from concept to parts and assemblies. Used by more than 5.6 million designers, engineers, managers, and manufacturers around the world, SOLIDWORKS drives smarter, faster, and easier product development.

The industry-leading capabilities in SOLIDWORKS include the following:

- **Conceptual Design:** Purpose-built tools for industrial design and mechanism design.
- **Surfacing:** Advanced tools that ensure you can create any shape quickly.
- **Direct Editing:** Direct manipulation of 3D CAD geometry.
- **Production-Quality 2D Drawings:** Illustration of how designs should be manufactured.
- **Large Assemblies:** Power to handle extremely large designs, even hundreds of thousands of parts.
- **Reverse Engineering:** Tools for point-cloud and mesh-data surfacing and manipulation.
- **Specialized Design Functions:** Mold design, sheet metal, weldments, and pipe and electrical routing.
- **Automation:** Product and drawing configurability, free Application Programming Interfaces (APIs), batch processing.
- **Generative Design:** Automated part shape development based on functional and manufacturing requirements.
- **CAD Libraries:** Over 1 million hardware, electrical items, and symbols to add to your designs.
- **Direct Interoperability:** SOLIDWORKS 3D Interconnect for use of non-native CAD files.

## VALIDATE

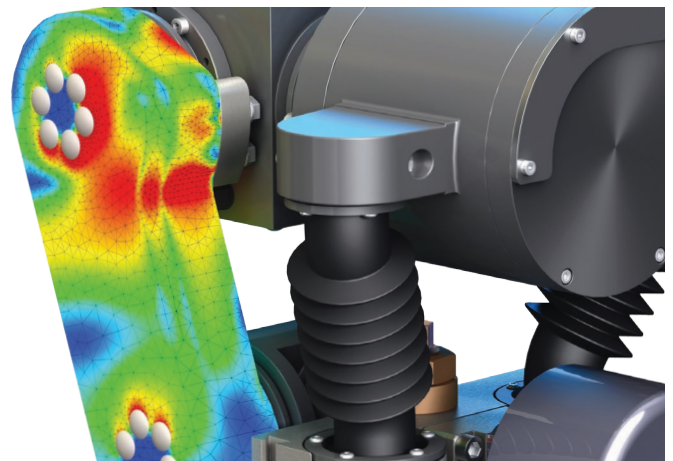
3D virtual simulation has become an irreplaceable tool for manufacturing companies across all industries. More than ever before, the process enables product and manufacturing engineers to validate their technical decisions with the help of simulation results, giving engineers the edge they need to innovate and to truly understand product manufacturability.

- **Product Validation:** With powerful and intuitive SOLIDWORKS Simulation solutions, product engineers can virtually test new ideas, quickly and efficiently evaluate performance, and improve quality to get ahead of the product innovation curve. SOLIDWORKS Simulation helps you solve complex engineering issues throughout the design process.
- **Manufacturing Validation:** Both designers and manufacturers can take advantage of the many tools in SOLIDWORKS to verify the manufacturability of their designs. From checks for proper draft, undercuts, and machinability, to more complex tools for simulating injection-molding, SOLIDWORKS has tools to help you get the design right, before it goes to manufacturing.

**“With SOLIDWORKS Simulation, I can identify and resolve potential issues during design, so that when we mold those initial pieces, they are right the first time. It’s an incredible tool that has let us save 30 to 60 percent in capital costs in the development of new products.”**

— Todd Turner, Senior Product Development Engineer, Macro Plastics

Model courtesy of OMAX Corporation



**“SOLIDWORKS helps me with the entire process from idea to actual product ... it’s not just a CAD program; it’s not just a CAM program; it’s all in one ... without SOLIDWORKS CAM’s rules-based machining, bringing a thousand parts in-house would have been almost impossible.”**

**– Matt Moseman, Product Engineer, RINGBROTHERS**



Model courtesy of Russell Mineral Equipment

## COMMUNICATE

SOLIDWORKS MBD (model-based definition) lets users communicate their detailed design intent to manufacturing directly in the 3D CAD model, without the need for creating separate 2D drawings. It helps define, organize, and publish product manufacturing information (PMI), including 3D model data using industry-standard file formats.

If a PDF or eDrawings<sup>®</sup> file is needed for archiving, it can be created automatically from the 3D model just like with a 2D drawing, significantly reducing design time.

SOLIDWORKS MBD helps streamline production, cut cycle time, reduce errors, and support industry standards with these capabilities:

- **Detail Views in 3D Model:** Capture, save, and detail views directly in the 3D model.
- **Customize 3D output templates for multiple deliverables:** Generate engineering drawings and requests for quotes (RFQs) for departments, such as operations, manufacturing, QA, and Procurement.
- **Share and archive 3D data directly:** No need to rebuild a 3D model from a drawing for downstream manufacturing applications that require 3D models—just send the 3D model with PMI.
- **Read and interpret 3D PMI programmatically:** Automate CAM programming and the creation of inspection documentation, and eliminate errors due to manual data entry.

## COST

SOLIDWORKS Costing tools provide cost estimates in just seconds for items including sheet metal, machining, weldments, castings, plastic parts, and 3D printing. With this information, designers and engineers can continuously check their designs against cost targets, and manufacturers can automate their quoting process. Capabilities include the following:

- **Automatic, real-time manufacturing cost estimation:** Cost parts and assemblies instantly.
- **Assembly cost roll-up:** Roll up the costs of all manufactured and purchased components in an assembly.
- **Output cost quotes and reports:** Output customizable quotes and reports in both Word and Excel formats.

## MANUFACTURE

The seamless integration of design and manufacturing applications into one system is key to your success in delivering innovative products to market faster.

- SOLIDWORKS CAM, powered by CAMWorks<sup>™</sup>, is a fully integrated, rules-based technology that allows users to integrate design and manufacturing processes in one application. Manufacturing engineers can program tool paths directly on the SOLIDWORKS model. Product engineers can evaluate designs earlier in the process to avoid unexpected costs and delays.
- SOLIDWORKS Print3D streamlines the workflow from design to 3D print for prototyping, tools and fixtures, customization, or production parts. Reducing the time it takes to prepare models for printing and eliminating failed builds means fewer design iterations and ultimately better products.

## INSPECT

SOLIDWORKS Inspection software automates the creation of ballooned inspection drawings and inspection sheets for first article inspection (FAI) and in-process inspections. Manufacturers can save time and virtually eliminate errors by speeding up this repetitive, tedious, and manual process. SOLIDWORKS Inspection helps you streamline the creation of inspection documents by leveraging your existing 2D and 3D data.

## COMPOSE

SOLIDWORKS Composer™ enables users to directly repurpose design and manufacturing 3D models to create technical documentation like assembly instructions for the shop floor, service manuals for customers, and parts lists and interactive content for customer service manuals. This ability saves time and money, and ensures that documentation will be ready to go before product delivery.

SOLIDWORKS Composer enables teams to rapidly create and update high-quality graphical assets, while producing the following technical documentation types:

- Manufacturing assembly and installation instructions
- User manuals, maintenance and repair guides
- Training systems and interactive, configurable product demos
- Product web pages and sales bidding kits
- Interactive bills of materials (BOMs) and parts lists

## MANAGE

With the explosion of electronic data created today, companies are faced with the daunting task of finding, organizing, and controlling access to this important information. SOLIDWORKS data management solutions can help you take control of a company's data to enhance collaboration and innovation. When design data is under control, managing projects and design changes is substantially improved, along with the way teams manage and collaborate on product development.

## SELL

Online configuration of your products is now just a few clicks away. Your design doesn't need to stop when your data gets archived. It can be used by your sales teams and even your customers, online. SOLIDWORKS Sell opens your design and all its possible configurations to the rest of the world—while protecting your intellectual property.

- Cloud-based: device-independent and mobile-ready
- From a few users to millions of users—you choose
- Millions of configurations created on-the-fly with dynamic BOM
- High-resolution rendering created as needed

## VISUALIZE

SOLIDWORKS Visualize is “the camera” of SOLIDWORKS that enables users to create professional, photo-quality images and animations and immersive 3D content quickly and easily. It helps companies make better decisions about product design and aesthetics earlier in the cycle. Other capabilities:

- **Rendering:** Perfect for photo-realistic images, animations, and interactive 360-VR content for web and mobile
- **Ease of Use:** Designed for anyone, even nontechnical users
- **Versatility:** Usable with any CAD tool

## AUGMENTED AND VIRTUAL REALITY

SOLIDWORKS Extended Reality (XR) provides a way to bring your CAD data to life, virtually. Simply export your content from SOLIDWORKS to power-rich AR, VR, and web viewing experiences:

- Improve collaborative internal and external design reviews.
- Sell your designs more effectively with immersive experiences.
- Train users to assemble and interact with your products immersively.

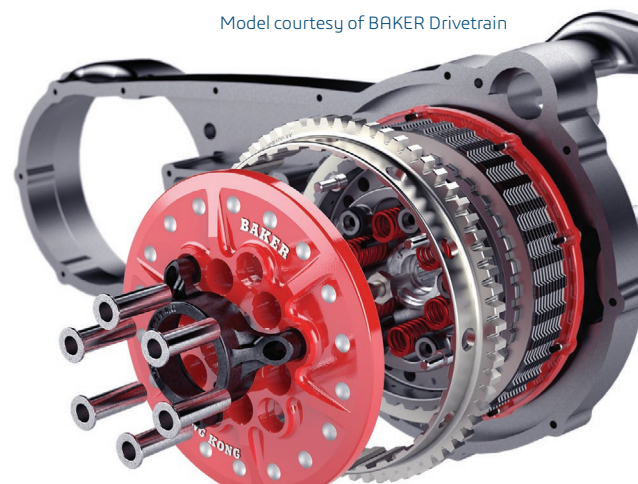
## CONNECTED DESIGN-TO-MANUFACTURING ECOSYSTEM

With access to the 3DEXPERIENCE® cloud-based platform, you can easily share your CAD data, collaborate with others, and use a growing suite of connected tools to design, manufacture, and manage your products.

**“The perfect photo quality of SOLIDWORKS Visualize helps us accelerate the approval process and deliver our products to the market six months faster than before. With how quick and easy it is to change materials and lighting, it’s a no-brainer for us to choose SOLIDWORKS Visualize over the competition.”**

– Jenny DeMarco Staab, Senior Industrial Designer, Mary Kay Inc.

Model courtesy of BAKER Drivetrain



# SOLIDWORKS DESIGN-TO-MANUFACTURING SOLUTIONS

To quote a SOLIDWORKS customer, "I cannot speak all the languages of the world, but I can talk to my customers and suppliers around the world with SOLIDWORKS."

SOLIDWORKS software provides you with an intuitive 3D development environment that helps maximize the productivity of your design and manufacturing resources to create better products faster and more cost-effectively.

**See the full range of SOLIDWORKS software for collaboration, design, simulation, technical communication, data management, and product lifecycle management—visit [www.solidworks.com](http://www.solidworks.com).**



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