DASSAULT SYSTEMES

SOLIDWORKS

3DEXPERIENCE®

SOLIDWORKS DESIGN TO MANUFACTURING PROCESS SOLUTION

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

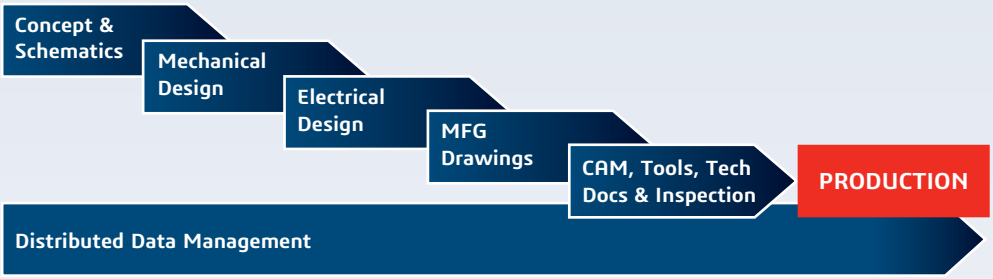
For years, companies have survived with a separation between their design and manufacturing departments, both by organization and by the tools they used. Now with more competition and a resulting need to produce products faster, with higher, more predictable quality and at lower costs, companies are 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 to optimize their designs, confident that their changes won't threaten delivery targets. As a result, companies can go from concept design to manufactured parts faster and easier than ever before.

SOLIDWORKS CONCURRENT AND INTEGRATED PROCESS VS. TYPICAL SERIAL PROCESS

Typical Serial Design to Manufacturing Process

Concurrent and Integrated Design to Manufacturing Process



Time and Money Saved

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.

The benefits of having the 3D CAD model as the center of your Design to Manufacturing Process include:

- **Automatically propagate changes:** Design changes propagate automatically to downstream functional areas.
- **No need to freeze designs for manufacturing:** Incorporate changes late in the product development cycle without the need to push out delivery dates.
- **Concurrent design and manufacturing:** All departments can start their tasks earlier.
- **Control master representation of the design:** 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

SOLIDWORKS Design to Manufacturing Process 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, so SOLIDWORKS offers tools enable you to get from concept to parts and assemblies. Used by more than 4.7 million designers, engineers, managers, and manufacturers around the world, SOLIDWORKS helps drive smarter, faster, and easier product development. SOLIDWORKS helps companies innovate thanks to industry-leading capabilities including:

- **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:** Communicate 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 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.
- **Online catalogs:** Both user-built and certified vendor components.
- **Import/Export:** Production-proven, 2D, and 3D import/export of all major formats.
- **Direct Interoperability.** SOLIDWORKS 3D Interconnect for use of non-native CAD files.
- **Design for Manufacturability (DFM):** Checks for interference, tolerances, drawing standards.

VISUALIZE

SOLIDWORKS Visualize is "the camera" of SOLIDWORKS that enables users to create professional, photo-quality images, 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 include:

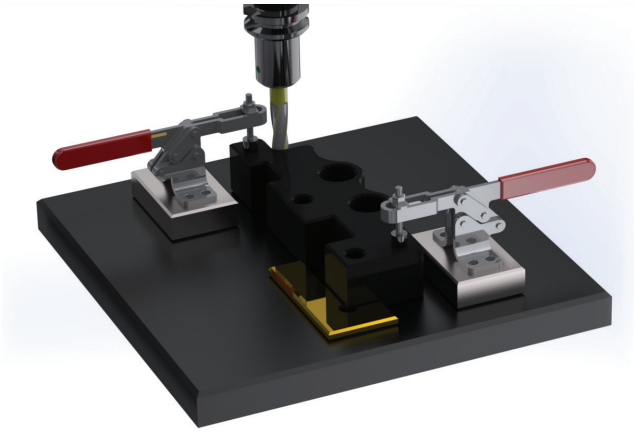
- **Rendering:** Camera-quality photo-realistic rendering and animation capture.
- **Ease-of-Use:** Designed for anyone, even nontechnical users.
- **Versatility:** Can be used with any CAD tool.

"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.

"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



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® file is needed for archiving, this file can be created automatically from the 3D model just like any PDF or eDrawings file made from 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 Request for Quote (RFQ) 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.
- **3D PMI can be read and interpreted programmatically:** Help automate CAM programming and the creation of inspection documentation, and eliminate errors due to manual data entry.

VALIDATE

3D virtual simulation has become an irreplaceable tool for manufacturing companies across all industries. More so than ever before, the process enables product and manufacturing engineers to validate their technical decisions with the help of simulation results. This gives all engineers a needed edge in terms of innovation and a true understanding of a product's manufacturability. There are two areas of validation that benefit most from these SOLIDWORKS advancements.

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

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:

- **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.
- **Customizable manufacturing settings:** Customize costing inputs based on company and regional conditions.
- **Output cost quotes and reports:** Output customizable quotes and reports in both Word and Excel® formats.

"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 Engineering, RINGBROTHERS

MANUFACTURE

The seamless integration of design and manufacturing applications into one system is key to the success of the SOLIDWORKS Design to Manufacturing Solution.

- SOLIDWORKS CAM, powered by CAMWorks™, 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. If the design model is modified, tool paths update accordingly. This connects design and manufacturing teams directly through a common software tool and a common 3D model.
- SOLIDWORKS Print3D streamlines the workflow from design to 3D print for prototyping, tools and fixtures, customization or production parts. Rapid 3D printed prototypes are a key part of product development. 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, manual process. SOLIDWORKS Inspection helps users streamline the creation of inspection documents by leveraging their 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 user 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 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.

SOLIDWORKS DESIGN TO MANUFACTURING PROCESS 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 that provide tools to Design, Visualize, Communicate, Validate, Cost, Manufacture, Inspect, Compose, and Manage—all in one environment—at www.solidworks.com/products2018.

To learn more about SOLIDWORKS SOLUTIONS, visit www.solidworks.com/solutions.

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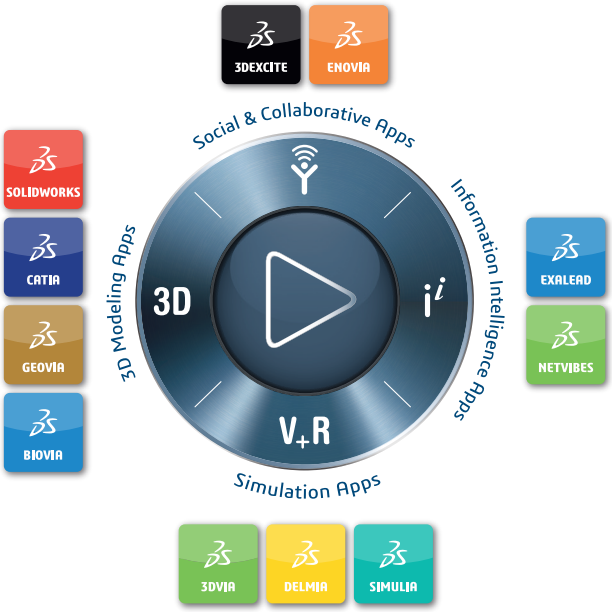

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