

# Autodesk® Inventor®



Autodesk®

# Experience your design before it's built.

The Autodesk® Inventor® product line provides a comprehensive and flexible set of software for 3D mechanical design, simulation, tooling creation, and design communication that help you cost-effectively take advantage of a Digital Prototyping workflow to design and build better products in less time.

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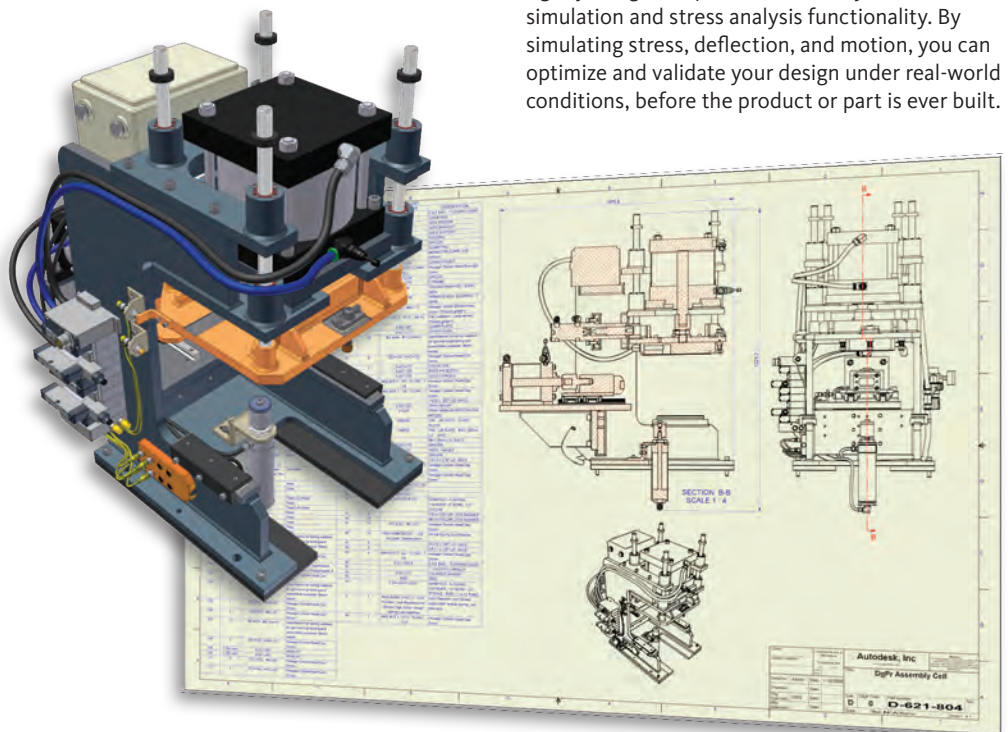
Learn how Autodesk Inventor can help you use a digital prototype to bring better products to market faster and at less cost.

Autodesk® Inventor® software is the foundation of the Autodesk solution for Digital Prototyping. The Inventor model is an accurate 3D digital prototype that enables you to validate the form, fit, and function of a design as you work, minimizing the need to test the design with physical prototypes. By enabling you to use a digital prototype to design, visualize, and simulate your products digitally, Inventor software helps you communicate more effectively, reduce errors, and deliver more innovative product designs faster.

### Design and Validate Your Products Digitally

Autodesk Inventor software products include an intuitive parametric design environment for developing initial concept sketches and kinematic models of parts and assemblies. Inventor software automates the advanced geometry creation of intelligent components, such as plastic parts, steel frames, rotating machinery, tube and pipe runs, and electrical cable and wire harnesses. Inventor software helps reduce the geometry burden so you can rapidly build and refine digital prototypes that validate design functions and help minimize manufacturing costs.

Traditionally, validating the operating characteristics of a design before it was built usually meant hiring expensive specialists. But with Inventor software, you don't need to be a simulation expert to effectively simulate and optimize designs digitally. The Inventor product line includes easy-to-use and tightly integrated part and assembly-level motion simulation and stress analysis functionality. By simulating stress, deflection, and motion, you can optimize and validate your design under real-world conditions, before the product or part is ever built.





### Streamline Mold Design

The Autodesk Inventor product line includes automated mold design tools that work directly from Inventor 3D models of plastic parts. Powered by Autodesk® Moldflow® plastic flow analysis tools, Inventor can help to optimize your design for moldability and minimize the number of mold iterations.

### Improve Design Communication and Collaboration

Reduce errors and associated engineering change orders before manufacturing by generating manufacturing documentation directly from your validated 3D digital prototype. Inventor offers rapid and accurate output of production-ready drawings directly from the 3D model. Inventor product bundles also include AutoCAD® Mechanical software for situations that require a high-productivity 2D mechanical drafting tool.

Inventor is tightly integrated with Autodesk data management applications, enabling the efficient and secure exchange of design data and promoting earlier collaboration between design and manufacturing workgroups. Different workgroups can manage and track all components of a digital prototype with free\* Autodesk® Design Review software—the all-digital way to review, measure, mark up, and track changes to designs—allowing for better reuse of crucial design data, management of bills of materials (BOMs), and collaboration with other teams and partners.

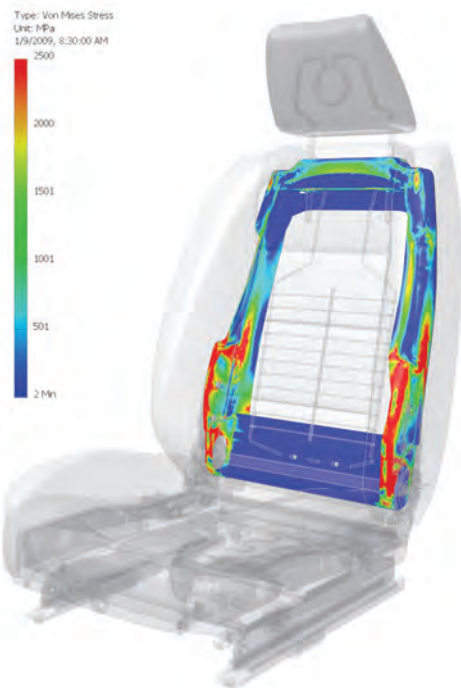
With different product configurations that offer specific levels of functionality to fit your design needs, no company is more focused than Autodesk on helping you create accurate digital prototypes and bring better products to market faster at less cost.

## AutoCAD Users: Move beyond 3D to Digital Prototyping.

With Autodesk Inventor software, you can easily integrate AutoCAD® and 3D data into a single digital model to create a virtual representation of the final product.

Inventor software helps you realize the benefits of Digital Prototyping by providing direct read and write of native DWG™ files, so there's no risk of inaccurate translations.

Leveraging valuable DWG data with Autodesk Inventor software can help you compete more effectively, service your clients better, and do more in-house.



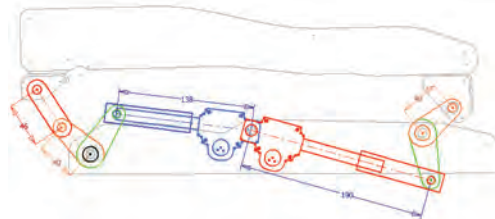
# 3D Layout and System Design

Getting the initial design concept right is the key to a successful project. Move your initial design studies from paper by using the parametric design environment in Inventor to develop initial concept sketches and kinematic models.

With dynamic sketch blocks, you can quickly evaluate different concepts and then convert your sketches into a fully constrained 3D assembly model to form a digital prototype. The Design Accelerators in Inventor software provides the fastest way to add the remaining components, such as drive mechanisms, fasteners, steel frames, and hydraulic systems.

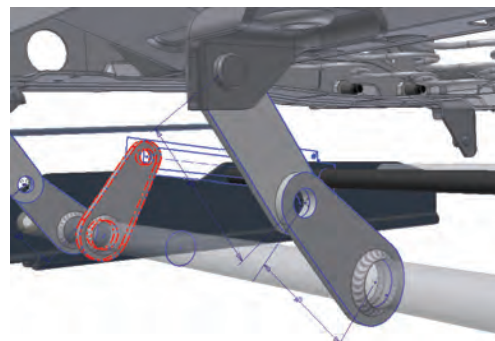
## Sketching

Evaluate different design ideas before creating detailed part and assembly models. Using the Inventor sketch environment, you can quickly capture design ideas as versatile 2D layouts. Combining the power of constraints with easy-to-use tools for modifying sketches lets you try different design concepts and control color and line style, allowing you to find the best way to convey your design ideas.



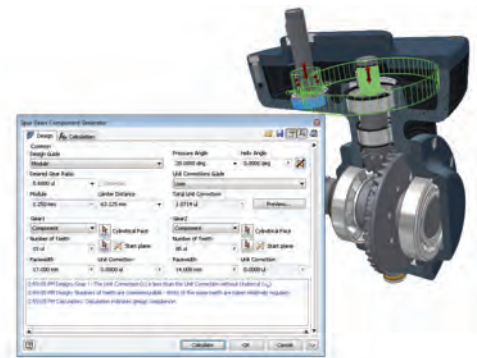
## Layout Design

Perform detailed motion studies using sketches, and find kinematic solutions in the concept phase. Quickly evaluate different mechanisms by combining sketch blocks representing individual rigid and moving bodies to create 2D kinematic models. With a working design, you use the same sketch blocks to populate the assembly with correctly constrained part models.



## Design Accelerators

Rapidly design, analyze, and create commonly used machine components based on functional requirements and specifications. Move beyond 2D drafting and 3D modeling and accelerate design by working with parts that are based on mechanical relationships rather than on geometric descriptions (lines, arcs, and circles) and constraints. Design accelerators create parts and assemblies based on user input of real-world attributes and conditions. Inventor includes component generators for mechanical connections, shafts and hubs, O-rings, gear design, belt and chain drives, power screws, and springs.



# Plastic Part Design

Autodesk® Inventor® software offers plastic parts designers maximum flexibility by combining native Inventor geometry with exterior surface models designed with industrial design applications such as the Autodesk® Alias family of products.

The associative relationship between the Autodesk® Alias family of products and Inventor data reduces time to market by allowing engineers to start detailed designs earlier. As the concept evolves, engineers can easily incorporate changes from the industrial design team.

## Advanced Shape Description

Create a wide range of complex geometries by easily combining solids and surfaces. Inventor software gives you precise control of shape characteristics such as tangency and continuity. Advanced modeling tools include Loft to a Point, N-Sided Patch, Sweep Normal to Surface, Area Loft, Centerline Loft, G2 Continuous Fillets, Full Round Fillets, and Face-to-Face Fillets.

## Import from Alias Family of Products

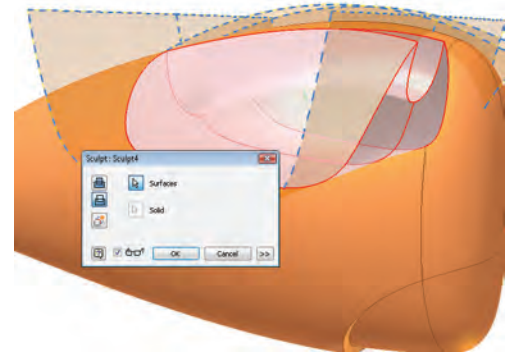
Reduce time to market by working directly with exterior surface data. Easily import Autodesk Alias surface data created by industrial designers. Associative links allow you to review and incorporate changes from the Alias family of products into the Inventor model.

## Sculpt Tool

Quickly and easily modify shape details using surfaces from Inventor software or by incorporating imported surfaces. Construct 3D part geometry from a closed set of surfaces, and incorporate imported surface data into the model using the Sculpt tool to modify existing parts by adding or removing material.

## Surface Quality Analysis

Create models with high-quality surface characteristics, and check design data for manufacturability to avoid costly changes during manufacturing setup. Zebra and Gaussian analysis tools simplify the process of checking for tangency, continuity, and curvature.



# Plastic Part Design

Functional plastic features, rule-based fillets and powerful multi-body workflows simplify the design of high-quality molded part models.

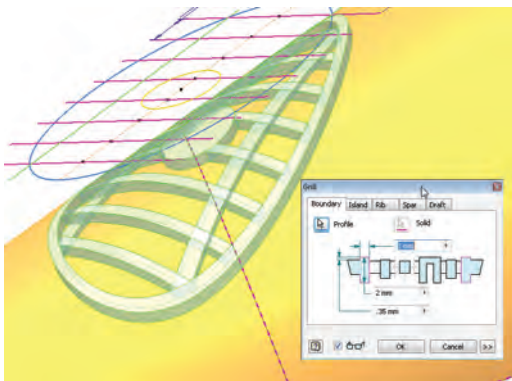
## Molded Part Definition

Make sure molded parts meet aesthetic guidelines for the position of parting lines while supporting cost-effective manufacturing requirements. Divide the 3D component to define the molded parts, using tools to identify silhouette curves for optimum parting plane geometry and multibody operations that make it easy to split the part into separate bodies.



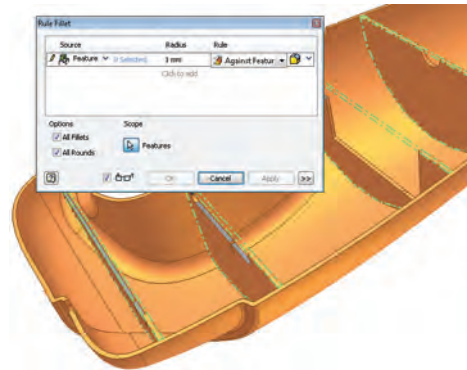
## Technical Plastic Features

Quickly add the technical plastic features that define manufacturing-ready parts. With built-in support for pull direction and draft angle, Inventor plastic features generate multiple-element features for molded plastic parts in a single step. Add grills, bosses, lips, rests, and snap-fit fittings to plastic parts with less modeling than traditional approaches.



## Rule Fillets

Speed up the creation of fillets on machined and molded parts, and make changes to parts without having to recreate the fillets. Rule fillets generate fillet geometry based on functional rules you establish. Support for multiple rules per feature lets you define complex fillet operations with a single feature, greatly reducing the need to select individual edges.



## Draft Angle and Cross-Section Analysis

Cross-section analysis displays wall thickness, color-coded feedback of minimum and maximum thickness violations, and moment of inertia at the end of the cross section. Draft angle analysis displays color-coded draft angle based on a pull direction, which can be defined by an axis, plane, or planar face.

# Sheet Metal Design

Use the Inventor Digital Prototype to simplify the design of complex sheet metal parts.

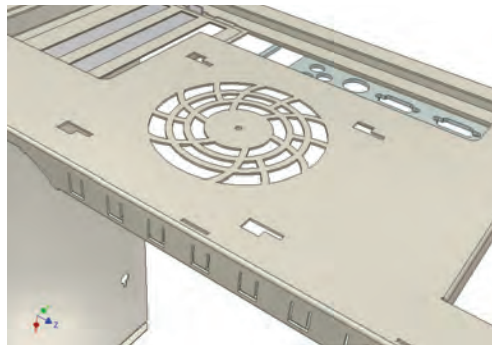
Autodesk Inventor software improves your productivity when you design sheet metal parts by providing a digital prototype that combines manufacturing information – such as punch tool parameters and custom bend tables – with an accurate, 3D model of sheet metal folding and a flat-pattern editing environment where manufacturing engineers can tweak flat patterns to minimize manufacturing costs.

## Sheet Metal Styles

Generate flat patterns that accurately reflect your manufacturing capabilities. Control sheet metal unfolding with styles that define the material thickness, bend rules, and corner reliefs. To control the unfolding geometry, Inventor software supports linear unfolding, custom unfold equations, and custom bend tables.

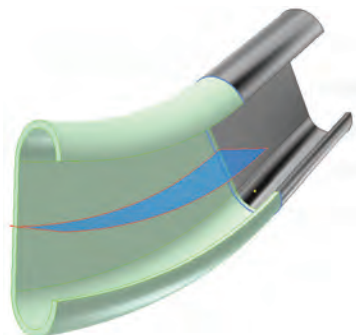
## Sheet Metal Flanges

Speed up the design of sheet metal parts with complex flanges using intelligent 3D models that take your manufacturing processes into account. Intelligent features enable the creation of multiple flanges in a single operation with rich unfold options, automatic mitering, and seam level overrides for precise control of overlap and relief conditions. Supported features include flanges, contour flanges, and lofted flanges.



## Roll-Formed Parts

Create accurate digital prototypes that include roll-formed parts. The contour roll command simplifies the creation of rolled features with full support for supplemental sheet metal features and flat-pattern operations.



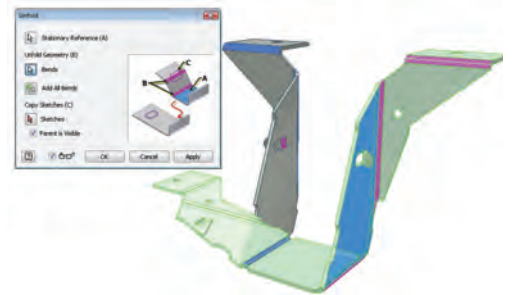
## Transitional Shapes

Efficiently design parts for ducting, material handling hoppers, exhaust hoods, and other uses that require press-brake or die-form techniques. The lofted flange and rip features simplify the design of transitional shapes with options to create geometry for both die-form operations and press brakes.



## Unfold Design Workflows

Simplify the inclusion of punches, cuts, fillets, chamfers, and extrusions that span sheet metal bend plates. Use the unfold and refold commands to create features using an unfolded representation of the part. Automatically propagate the resulting features to both the folded model and the flat pattern.



# Sheet Metal Design

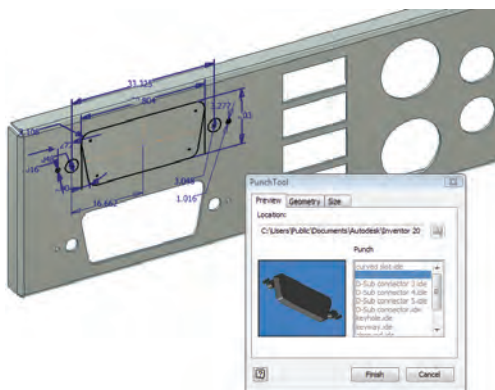
## Flat-Pattern Modification

Optimize flat patterns to eliminate unnecessary manufacturing costs. Generate flat-pattern models automatically from the folded 3D model. Then modify the model to define the optimum bend sequence, add cosmetic centerlines, define postform operations, and modify corner reliefs to match your shop-floor capabilities. Information defined in the flat pattern also simplifies the creation of accurate manufacturing drawings.



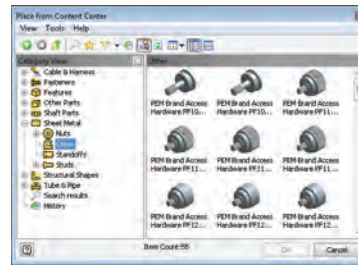
## Punch Libraries

Standardize punch usage and reduce computer numerical control (CNC) tooling costs by defining your own sheet metal punch libraries. Table-driven punches let you define families of punches—typically different sizes of the same punch shape with full representation of manufacturing parameters, including punchID, punch depth, and sketches for alternative punch representations.



## Sheet Metal Fasteners

Quickly insert specialized sheet metal fasteners into sheet metal designs. You'll find a comprehensive range of PEM fasteners in the Content Center.

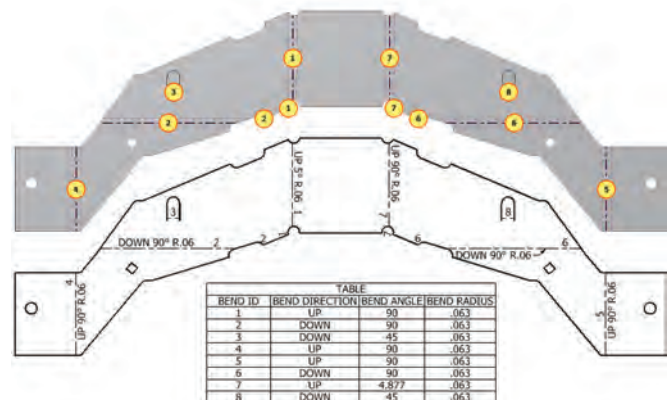


## DXF Output

Reduce programming time by eliminating effort spent cleaning up DXF™ files for CNC machining. DXF/DWG export for sheet metal provides control of preprocessing and postprocessing options such as DXF/DWG file version, layer mapping, user-defined chord length for spline simplification, and customization through external XML files.

## Sheet Metal Manufacturing Drawings

Quickly create accurate manufacturing drawings to support sheet metal manufacturing operations. Document flat-pattern drawings by inserting punch notes, punch tables, and bend tables that display punch and bend data from your 3D model, and select the display of bend directions using drawing styles.



# Assembly Design

Autodesk® Inventor® software combines design accelerators with assembly tools so you can be sure that every part and component in an assembly design fits correctly.

Inventor provides the tools to control and manage the data created by large assembly designs, allowing you to work on just the components required to complete a particular part of the design.

## Assembly Design

Quickly assemble individual parts and subassemblies to define the complete product structure. Verify that your product can be assembled. Insert and position new components in the assembly, using constraints to capture the positional relationships that define fixed and moving components.

## Interference Analysis and Contact Detection

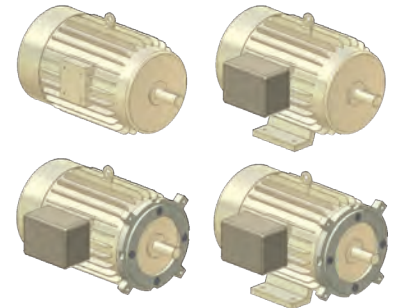
Reduce costly errors and improve manufacturability by testing assembly function within Inventor. Check for static interference among parts with graphic highlighting of overlapping material, and then test for potential collisions between moving parts by driving assembly constraints or dragging components until they collide.

## Assembly Configurations

Easily design and document product families using assembly configurations to define variations from a master assembly. Exclude or substitute individual components and make changes to dimension and constraint values. Document the whole part or assembly configuration using the Table tool, which automatically creates the parameter table in a 2D drawing.

## Large Assembly Performance

Realize the benefits of 3D design when developing very large assemblies. Native shrinkwrap gives you the ability to manage large assemblies by converting sub-assemblies into simplified part models or lightweight surface models. With level of detail (LOD) representations, you can switch between full and lightweight representations to control memory consumption and increase performance. A large assembly “capacity meter” shows you how much memory is available.

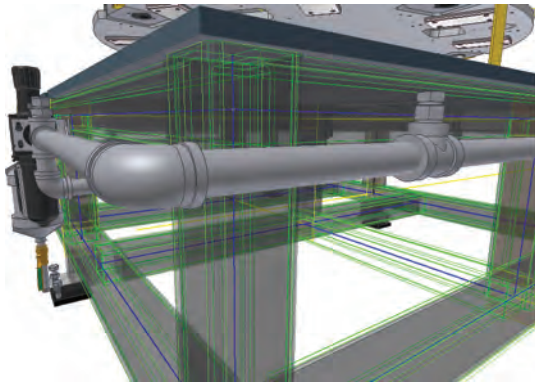


# Assembly Design

Accurately validate interference and mass properties to produce quality products the first time.

## Frame Generator

Quickly design and develop welded frames for industrial machinery applications. Frame Generator builds up structural frames by dropping predefined steel shapes onto wireframe or solid skeletal frames and simplifies creation of end conditions with predefined options for mitered, notched, and straight butt welded joints. It includes profile authoring so you can add custom profiles to the existing library of standard profiles.



## AutoLimits

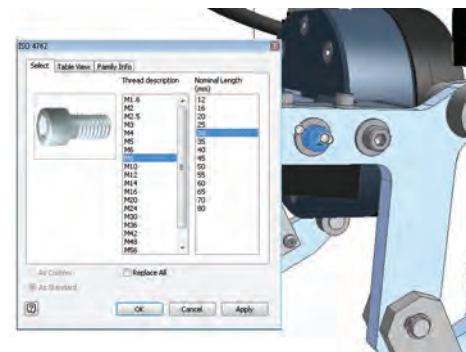
Reduce errors and engineering changes through automatic monitoring of critical design parameters. AutoLimits can be used to monitor length, distance, angle, diameter, loop length, area, volume, and mass. AutoLimits icons change color when the monitored parameters exceed the prescribed parameter range.

## Weldments

Improve quality and documentation of welded assemblies. Define weld preparation, weld creation, and postweld operations with full 3D representation of fillet, gap, or groove welds that provide weldment analysis and bead volume reports. Automatically create 3D annotation based on industry or company standards and generate associative 2D weld symbols for documentation.

## Content Center

The Content Center provides fast and easy access to frequently used content, simplifying creation, reuse, and management of all standard company content. The Content Center is a centralized library for engineering content that provides an easy-to-use content browser with Search and Filter tools to help you quickly find the right parts families. It includes more than 650,000 components—such as nuts, bolts, and screws—and enables companies to add in-house parts and standard features to user-defined libraries.



## Supplier Content Center

Reduce the time and effort to incorporate standard components into designs. The Supplier Content Center provides web-based access to component models from more than 100 leading manufacturers. The simple-to-use browser provides quick and easy access to models in native Inventor format. And it's fully integrated with the Inventor Content Center.

## Design Doctor™

Find and fix errors in a 3D model with a diagnostic tool that identifies potential design issues and recommends corrections.

## Assembly STL Output

Quickly create source stereolithography (STL) files for rapid prototyping of Inventor assemblies. Save files in the STL format directly from the Inventor assembly environment.

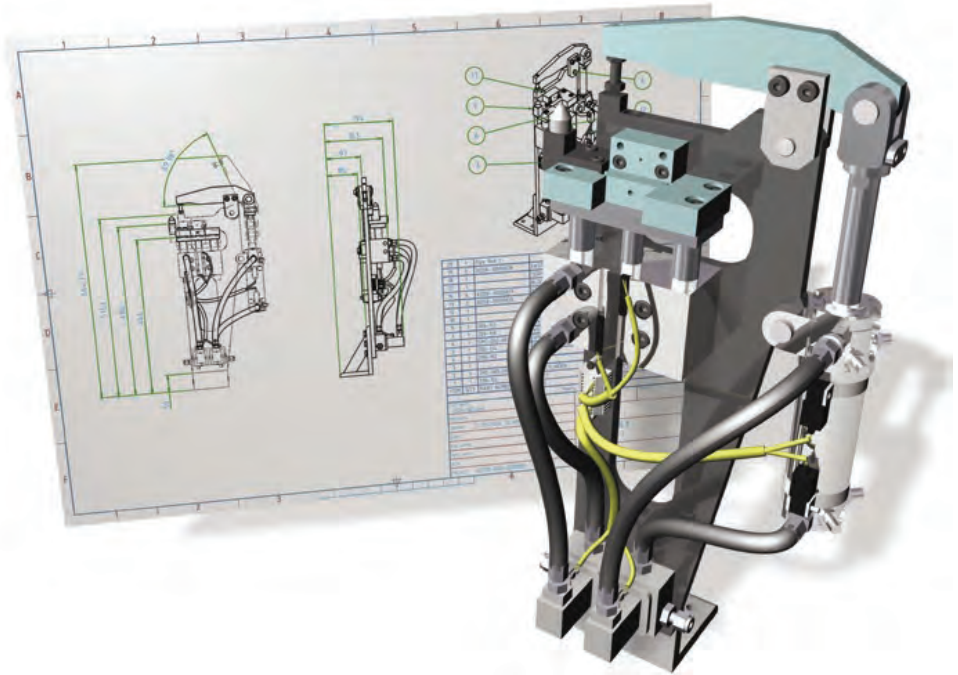
# AutoCAD Integration and DWG™ Interoperability

Inventor software makes it easy for AutoCAD users to experience the benefits of Digital Prototyping with Inventor software. Reduce training time by taking advantage of a familiar design environment, AutoCAD compatible shortcuts, cursor-based prompts, and command redo.

Inventor delivers industry-leading integration of 2D and 3D design data, providing direct read and write of native DWG files –without the need for data-compromising translators.

## Ease of Use

Quickly transition from AutoCAD to Digital Prototyping with Inventor software. Reduce training time by taking advantage of a familiar design environment, AutoCAD compatible shortcuts, cursor-based prompts, and command redo.



# AutoCAD Integration and DWG Interoperability

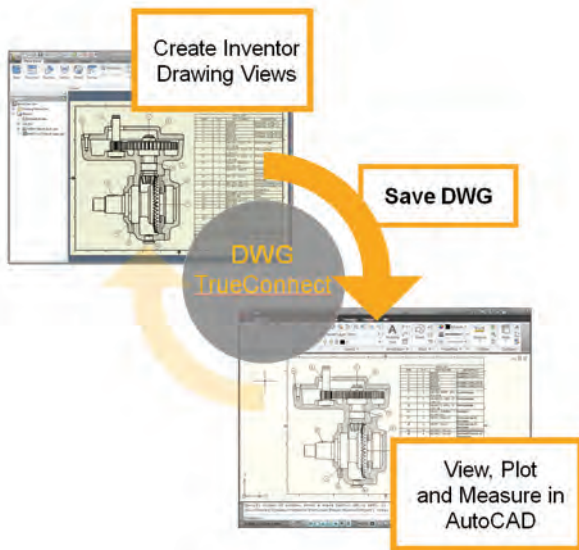
All Autodesk Inventor software products bundles also include the latest version of AutoCAD Mechanical.

## DWG Save

Integrate DWG™ technology into 3D design workflows to:

- Take advantage of existing skills
- Easily combine parts, assembly, and schematic drawings data
- Streamline communication with suppliers and partners who rely on DWG technology

The DWG Save feature stores Inventor drawing views in a DWG file to provide view, plot, and measure in AutoCAD with complete visual fidelity, while preserving fully associative drawing updates.

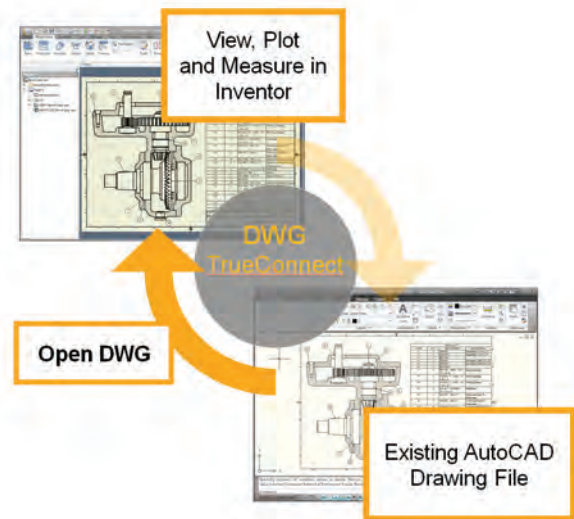


## AutoCAD Blocks from Inventor Views

Reduce the cost of using 3D to upgrade equipment and machinery originally designed in 2D. This feature generates AutoCAD blocks from Inventor drawing views, so you can redesign subassemblies using Inventor and then integrate the new drawing views directly into the original drawings.

## Direct DWG Open

Gain access to existing 2D design data without installing or learning AutoCAD software. Open AutoCAD drawings directly in the Inventor application to view, plot, and measure using familiar Inventor commands. Incorporate existing 2D design data into 3D design workflows using copy and paste tools.



## Template Synchronization

Reduce the time required to create drawings that comply with customer or partner drawing standards. Simply open a DWG file in Inventor and automatically create layers and dimension and text styles based on the AutoCAD styles in the DWG file thus reducing the time required to create drawings that comply with your customers' drawing standards.



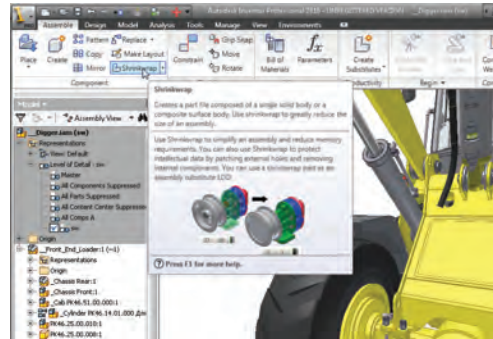
# Learning Resources

Accelerate the adoption of Digital Prototyping. Inventor software offers a range of learning and reference resources to help you build and maintain your skills as well as quickly make the most of the 3D design environment.

Learn new tricks, look up information about a procedure or tool, and get the latest tips you need to stay productive.

## Advanced Help System

Speed the transition to 3D with contextual help. The advanced help system is easier to use, with improved navigation and profiles that present you with information based on your user profile.



## Tutorials and Skill Builders

Use extended learning modules, including tutorials with “show me” animations and skill builders, to enhance your understanding and skills.

## E-Learning

Accelerate learning through flexible access to tutorials and best practices. A valuable component of the Autodesk® Subscription program, e-Learning provides a continually expanding curriculum of short training exercises.

## Engineer's Handbook

Save time researching engineering formulas, tables, and standards. The Engineer's Handbook provides a comprehensive online reference of engineering theory, formulas, and algorithms. This manufacturing knowledge base is easily accessible from anywhere in the Inventor software.

## Deployment Guide

Quickly and easily complete your installation of Inventor software. Whether you are planning a new deployment or upgrading to Autodesk Inventor 2010, this easy-to-read guide provides the information you need to successfully plan your installation and rollout.

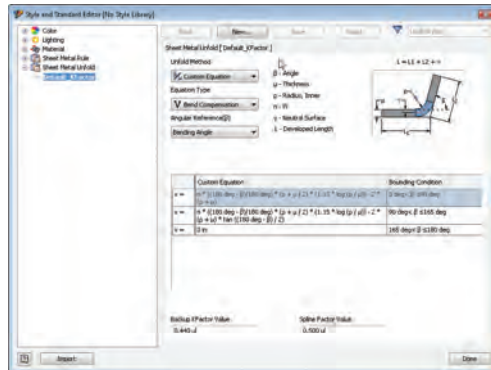
# Customization and Automation

Using the Inventor API (application programming interface), you can streamline frequently used procedures and automate specialized workflows that support design standards and engineering processes.

Increase speed and productivity with configurable styles so drawing conform to standards, and publish custom components in the Content Center to make sure designers use the appropriate components in their designs.

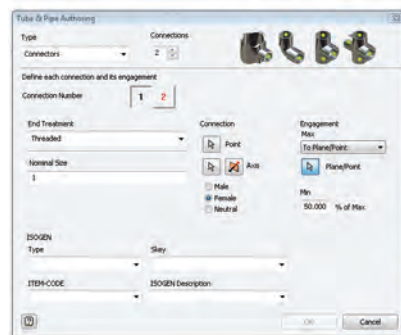
## Content Center Publishing Tools

Quickly prepare and publish intelligent part libraries for internal use and parts catalogs. Publishing tools include a Microsoft® Excel editing environment and batch processing for large data sets.



## Task Scheduler

Increase productivity by automating repetitive and nonproductive tasks. The Inventor Task Scheduler allows you to schedule single or multiple (batch) automated tasks, including DWF™ publishing, printing, file migration, IGES and STEP transfers, and Autodesk® Vault operations. You can also check out and download files from the Vault.



## Open API

Increase productivity by developing tools to automate your company's design and documentation processes. Inventor software includes a well-documented API to create customized programs that automate specialized workflows and extend the Inventor data model with custom attributes.

## Styles

Work faster by quickly changing the formatting of an entire document, without sacrificing alignment to company standards. Styles are combinations of formatting characteristics such as font, font size, color, standards, linetype, and material. Name your preferred styles and store them as templates that can control all aspects of drawing formats. When you apply a style, all the formatting instructions in that style are applied at one time, and you can configure a set of common styles for use by an entire project team.



# Design and Manufacturing Documentation

Autodesk Inventor software provides support for all major drawing standards, automated drawing updates, and output in the DWG™ format.

## Automatic Drawing Updates

Reduce errors and the need for manual update checks with automatic drawing updates. Inventor associates drawing views with the original components, so any change to a part or assembly is automatically reflected in the drawing. Inventor also supports global updates of drawing resources such as title blocks, borders, and sketched symbols.

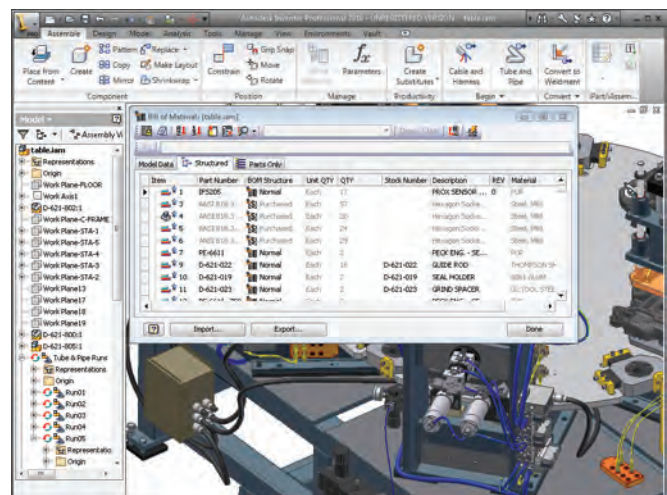
## Associative Parts List

Automatically generate and update accurate parts lists in a fraction of the time required by traditional 2D methods, virtually eliminating the risk of human error. The associative parts list enables you to maintain an accurate parts list, with parts and subassembly quantities that are automatically kept up to date, organized, and populated into a drawing parts list. The associative parts allow you to rapidly add balloons and item numbers to assembly drawings. You also have greater flexibility in customizing parts lists to meet company standards.

## Bill of Materials

Provide earlier visibility into accurate component lists to improve costing and sourcing decisions. Simplify release to manufacturing with accurate engineering bill of materials (BOM) data. The BOM is a single source for managing the assembly and subassembly structure of purchased and nonpurchased parts, including virtual components. Timesaving features include:

- Automatically number items, with support for numeric and alpha characters and item number override.
- Define materials for virtual components such as glue and paint.
- Directly edit materials in the BOM table, which allows material changes to be made to more than one item at the same time.



# 3D Visualization and Design Communication

Improve communication and collaboration with stakeholders and customers using the same digital prototype used to design and validate their designs.

People without engineering experience typically do not understand engineering drawings. They prefer images that help them visualize a design. With the power of modern desktop computers and the advanced rendering features included with Autodesk Inventor software, it's easy to create powerful images and videos that help sell your ideas.

## Autodesk Inventor Studio

Help eliminate the high costs of prototyping and product photography with high-quality, photorealistic renderings and animations. Autodesk® Inventor® Studio provides the state-of-the-art tools that design engineers need to quickly create renderings and animations.

## Publishing Formats

Share product information with partners and customers who need to incorporate your designs into their products. Users can publish Inventor drawings as PDF files, publish 3D part and assembly models in SAT or JT formats, and create stereolithography (STL) files for output to STL and 3D print machines.

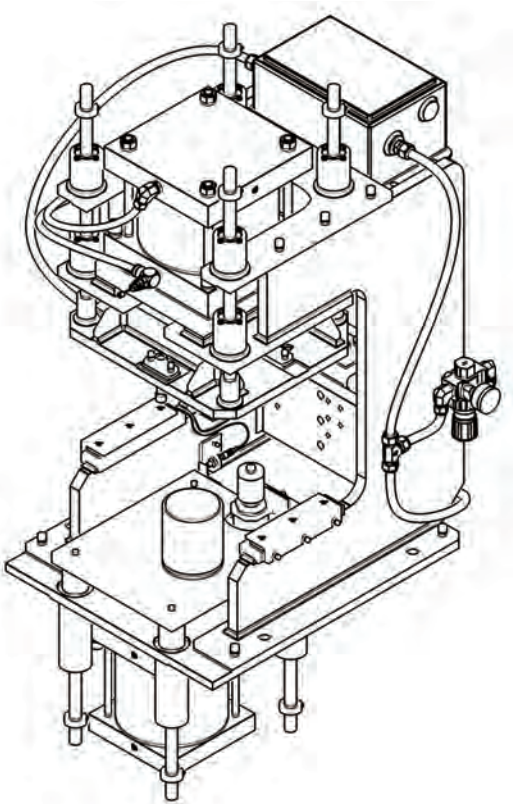


# 3D Visualization and Design Communication

Designers and engineers now have the tools to convey design ideas to managers in a compelling way, explain designs to manufacturing, and convince customers that they have the best solution for their needs.

## Technical Illustrations

Use the Presentation Environment in Inventor software to quickly create technical illustrations, process sheets, training materials, parts manuals, assembly instruction sheets, and videos to train assembly teams on the manufacturing floor.

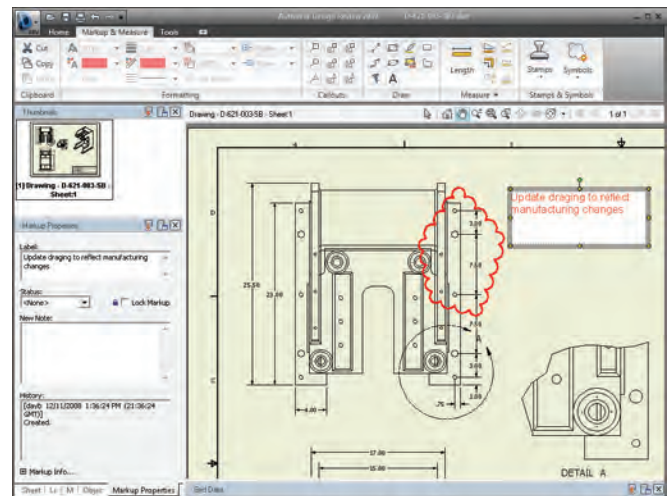


## DWF Publishing

Improve product quality, decrease time to market, and reduce scrap and rework costs by using DWF™ technology to streamline communication with suppliers, purchasing, and other supply chain partners. You can easily publish information required by manufacturing partners, including assembly animations, detailed step-by-step assembly instructions, 2D drawings, and 3D models with BOM information.

## DWF Markup

Easily track, manage, and verify multiple markups and design changes throughout the design review process. Overlay DWF markups directly onto Autodesk Inventor drawings, provide status, and make changes. You can then republish or round-trip those changes back to the design reviewer to complete the process.



# Data Management

Use Autodesk Inventor software to efficiently and securely exchange design data and support collaboration between different engineering contributors, including industrial design, product design, and manufacturing.

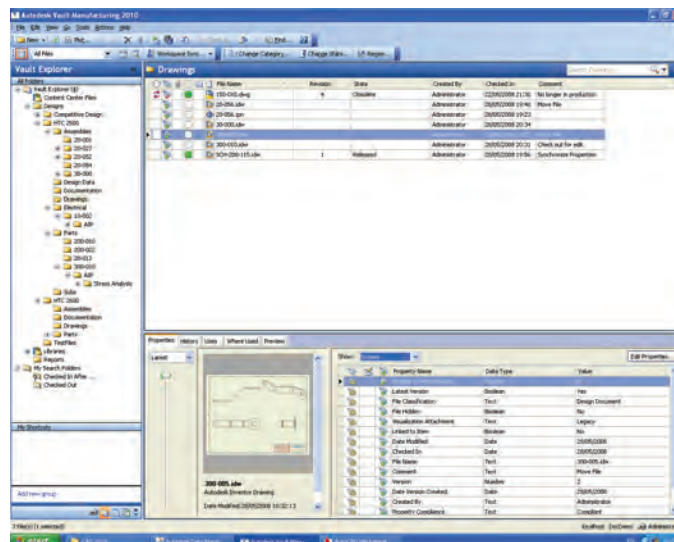
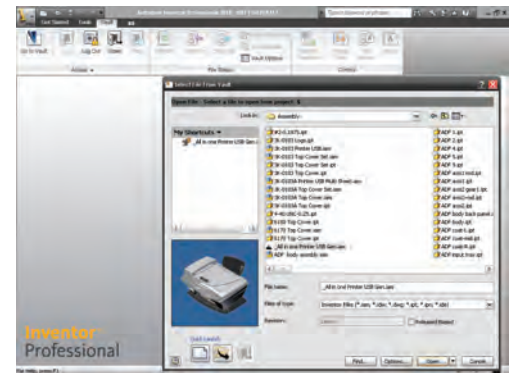
Autodesk Data Management solutions allows design workgroups to manage and track all the design components of a digital prototype, helping them to better reuse critical design data, manage BOMs, and promote earlier collaboration with manufacturing teams and clients.

## Autodesk Vault Software Integration

Maximize returns on your investment in design data by maximizing design reuse with Autodesk® Vault software. A centralized data management application in Inventor, Autodesk Vault allows workgroups to securely store and manage design data and related documents. Vault manages in-progress designs while making it easier to find, reference, and reuse design data

## Autodesk Vault Manufacturing

Autodesk® Vault Manufacturing software (sold separately and previously known as Autodesk® Productstream®) securely stores and manages engineering information, design data, and documents, enabling you to shorten the design-to-manufacturing process. It helps design, engineering, and manufacturing departments across separate locations collaborate and share Digital Prototyping information. It also gives your design departments advanced tools to track engineering change orders, manage BOMs, and promote earlier collaboration through integration with manufacturing business systems. With support for multi-CAD environments, Vault allows you to share and manage designs and engineering data created with third-party software and AutoCAD software throughout the product lifecycle.



Learn More

Learn about the different Autodesk® Inventor® products available to fit your specific design needs, and discover why Inventor products are the best choice for manufacturing companies. For more information, visit **[www.autodesk.com/inventor](http://www.autodesk.com/inventor)**.

