

# Autodesk® Inventor®

Professional



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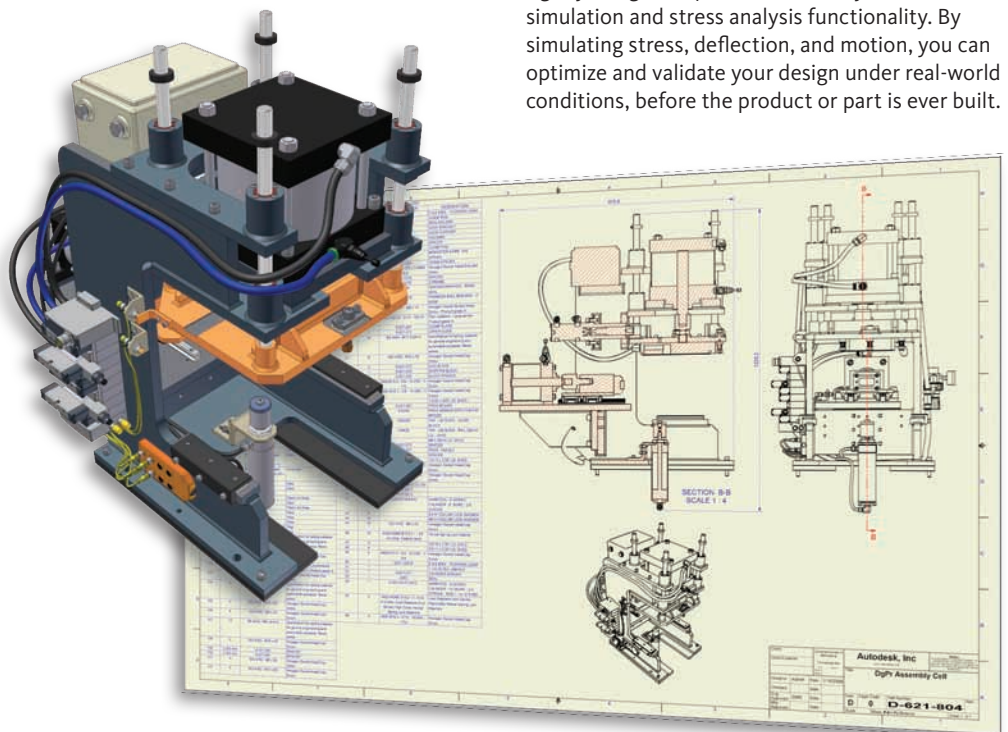
Learn how Autodesk Inventor can help you use a digital prototype to bring better products to market faster and at less cost.

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

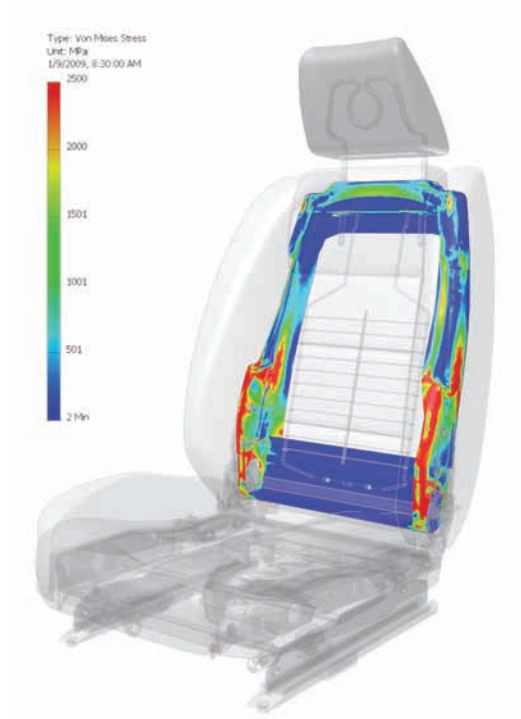
The Autodesk Inventor product line includes automated mold design tools that work directly from Inventor 3D models of plastic parts. Powered by Autodesk® Moldflow® plastic flow analysis tools, Inventor can help to optimize your design for moldability and minimize the number of mold iterations.

### 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.



# Simulation

Easy-to-use and tightly integrated motion simulation and stress analysis in the Autodesk® Inventor® Professional software help you predict how the design will work under real-world conditions before building it.

A comprehensive simulation environment provides support for motion simulation and static and modal finite element analysis (FEA) at both the part and assembly level. Results from dynamic simulation allow engineers to use FEA more effectively by leveraging the reaction forces to set up the conditions for finite element stress analysis.

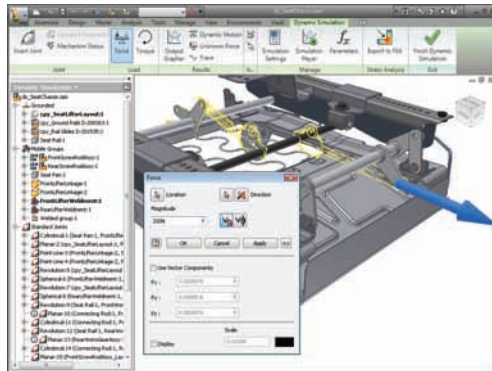
## Integrated Motion Simulation

Use motion simulation—not intuition—to enhance your design decisions. The motion simulation feature in Autodesk Inventor software uses the assembly constraints in your 3D model to identify relevant rigid bodies, generate correct motion joints, and compute dynamic behavior. This helps you to quickly understand the design's behaviors, including the position, velocity, and accelerations of the moving parts.



## Load Definition

Apply different driving loads and torques as well as time-based force functions using the Load Profile editor. Use this tool to investigate the design's performance under a range of different load conditions.



## Integrated FEA

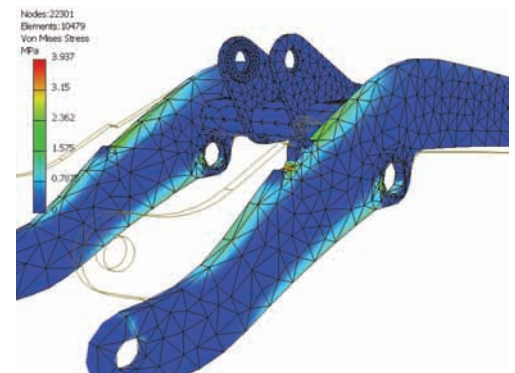
Increase the accuracy and reliability of your design stress analysis. Use integrated FEA to predict stress and deflection with accurate peak loads by transferring reaction forces from simulation time steps to AIP stress analysis.

## Adaptive Solver

Conduct finite element studies faster and apply the results sooner. Adaptive solver technology and localized tuning algorithms within Inventor give you accurate results more quickly.

## Static Analysis

Make sure your designs are strong enough while avoiding over-designing. Examine the deformation of parts and assemblies under static loads to determine maximum and minimum stresses and deflections. At the same time, you can help assure designs meet the necessary safety standards.



# Simulation

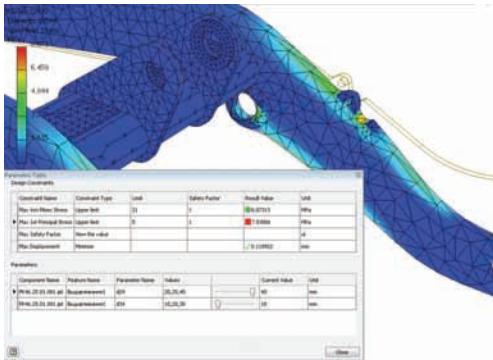
Optimize and validate product performance before the product is built. Because these tools are part of the 3D design software, it's practical and cost-effective to employ simulation throughout the design process.

## Modal Analysis

Prevent annoying and potentially hazardous vibrations without having to build and test physical prototypes. Use studies of oscillating modes to explore the vibrations and natural frequencies of the parts or assemblies within your design. Then make changes that reduce the amplitude of oscillations.

## Parametric Studies

Improve the structural performance of your designs. Use the Parameter Table tool to create parametric studies of design constraints and understand the effect of different parameter values. You'll be able to explore the impact of changes, such as wall thickness, fillet radius, and hole diameter, to your design.



## Optimization Studies

Find the best design solution without having to investigate an excessive number of options. When you conduct optimization studies, Inventor automatically seeks parameter values that meet your design criteria.

## Design Update

Quickly apply the results of simulation studies to your 3D model. You can select new parameter values from parametric and optimization studies. The Promote tool automatically modifies the assemblies and parts within your model.

## Point Trace

Easily calculate motion paths and save time by simplifying the design of cams, grooved paths, and other motion-dependent components. Select any point in the model and use the Trace tool to display the point's location at each step in the motion simulation. Using Inventor, you can also save simulation outputs, including path traces and assembly positions, for use in part and assembly design.



## FEA Environment Definition

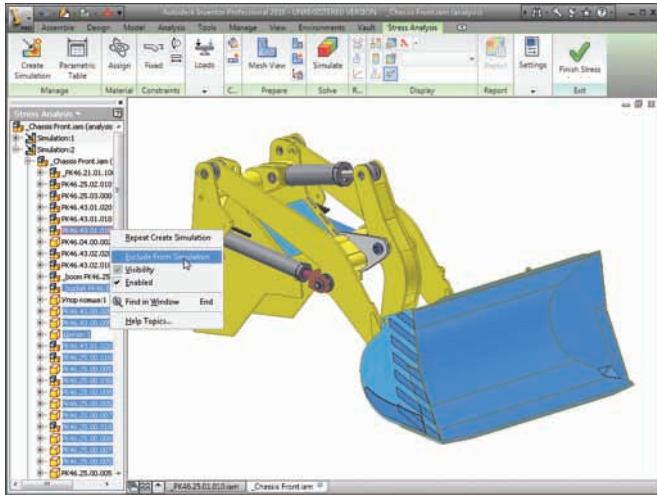
Spend more time analyzing performance and less time preparing the analysis. Inventor gives you full control over materials, loads, constraints, contacts, mesh, solution quality, representations, and component visibility. Automatic and manual contact definition and support for multiple simulations also provide you with definition control.

# Simulation

Autodesk Inventor Professional gives you the tools to record your engineering decisions and share the results of simulation with team members - allowing you to derive maximum benefit from your digital prototypes.

## Model Simplification

Reduce the time required to generate results from stress analysis by simplifying part geometry to suppress features during FEA.

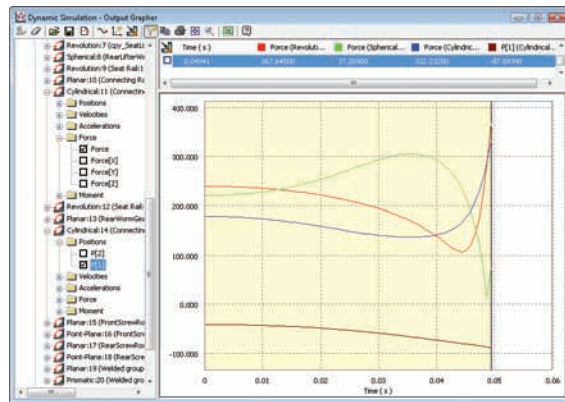


## Visualization

Interpret the behavior and performance of your design more fully. Watch as Inventor software provides animated visualizations of your 3D model. These accurate visualizations are based on the underlying physics models and load conditions applied to the design.

## Graphing

Use the comprehensive graphing capability in Inventor to quickly investigate how the dynamic characteristics of your design vary through its operating cycle. Plot physical parameters—such as position, force, and acceleration—versus time. Compare different properties at each point in the simulation cycle, using multiple plots on the same graph.



## Analysis Output

Select different ways to view analysis results to make it easier to understand and visualize complex problems. Your analysis visualization options include smooth and contour color plots, mesh plots, animation, and interactive probes. You can focus on specific components of the design by selecting other components and hiding them from view.

## Report Generation

Easily share and record the results of your analysis. Inventor includes a custom report generator with embedded graphics.

## Microsoft Excel Output

Export XY plot data to Microsoft® Excel® worksheets to analyze simulations and incorporate results in presentations and reports.

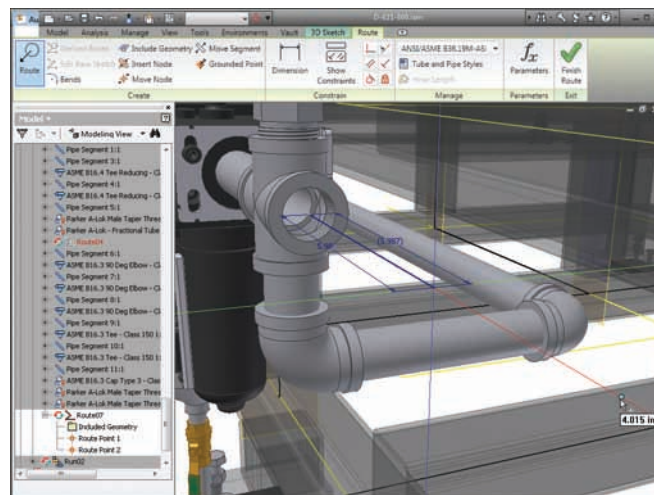
Use Autodesk Inventor Professional to accelerate the design for routed elements, including tubing, piping, and flexible hose.

Changing to different styles of fittings is quick and easy. Simply select a different pipe style and Autodesk Inventor repopulates the pipe run with the new fittings while adhering to any new design rules.

Simplify the design of pipe runs—or spools—to fit in complex assemblies or tight spaces. Automatically routed segments respect predefined routing styles to present you with alternative pipe routes that comply with routing rules, such as minimum or maximum length criteria and bend radius. You can also define pipe runs manually by creating 3D sketch geometry or build them up interactively using the route edit tools. For maximum control, combine automatically routed segments with user-defined segments.

Improve quality, easily organize parts, and eliminate tedious searching with automatic placement of the correct part from an extensive library of piping components. The library contains commonly used, industry-standard tubing, piping, hose, and fittings, including ANSI, DIN, ISO, and JIS. Add or modify properties, including part numbers, to existing parts and control file names used to instance fittings, pipes, tubes, and other content.

Make sure flexible hose and fittings fit properly using a 3D digital prototype that drives accurate manufacturing documentation. The system inserts appropriate hose fittings from the Content Center and checks for minimum bend radius based on the hose style you select. Hose lengths are updated automatically for use in Length Roll-Up commands.



# Tube and Pipe Design

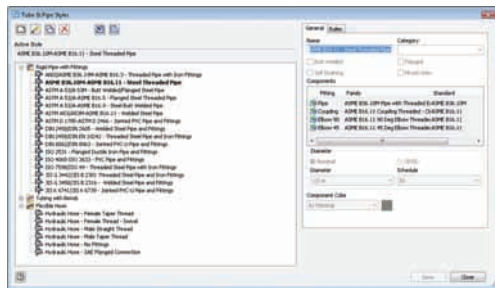
Autodesk Inventor Professional provides rules-based routing tools that select the correct fittings and helps the pipe run to comply with your standards for segment length, round-off increments, and bend radius.

## Rigid Tube Routing

Quickly create rigid tubes with superior control over the shape, bend angles, and radii. Create rigid tubes with an arbitrary number of bends and variable custom bend angles and radii. The radius and rotation handles offer greater control over the shape of rigid tubes.

## Tube and Pipe Styles

Increase the quality and manufacturability of designs by helping to ensure that tube and pipe runs automatically adhere to preset design standards. Create tube and pipe styles to support the use of threaded, welded, and flanged connections. Styles define the fittings to be used for both automatic and manual routing, and enforce design rules, including minimum segment lengths and minimum bend radii, as well as the maximum length between couplings.

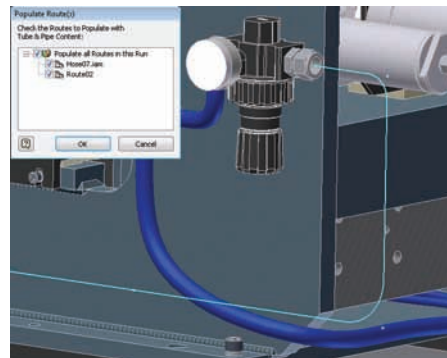


## Hygienic Pipe Runs

Design process lines that comply with sterility and hygiene standards required for process equipment in the pharmaceutical, food, and personal care industries. Incorporate the correct slope into the pipe route, including use of drainable angle fittings that comply with the American Society of Mechanical Engineers (ASME) bioprocessing equipment where needed.

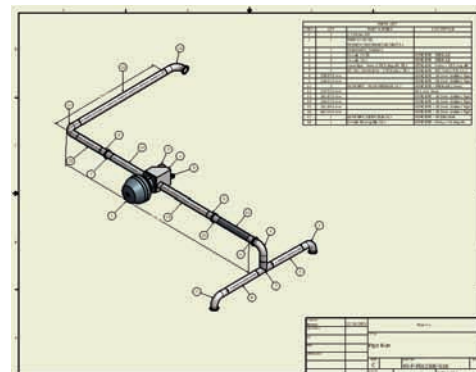
## Creating Runs

Automatically populate piping routes with real parts that adhere to manufacturing standards. The Populate Route tool turns tube, pipe, and hose routes into physical pipe runs, automatically placing fittings, pipe segments, rigid tubes, and hoses as needed. Standard Inventor parts are created during this process to make it easy to perform mass property calculations and interference checks. In addition, couplings are automatically placed when pipes reach their maximum length, and users can specify length cutoff increments.



## Tube and Pipe Documentation

Create manufacturing deliverables without redrawing—reducing errors and associated costs. Fully associative documentation for tube and pipe runs provides assembly drawings that update whenever a change is made to the 3D design. ISOGEN PCF file output creates isometric piping drawings in third-party ISOGEN software such as Alias ISOGEN, and tubing bend tables in ASCII format provide the information required by tube bending machines.





# Cable and Harness Design

Autodesk Inventor Professional streamlines cable and harness design by leveraging wire list information imported from schematic design packages such as AutoCAD® Electrical.

Incorporating cable and harness runs into your digital prototypes saves time and money by allowing you to calculate accurate path lengths, avoid small radius bends, and help electrical components fit into the mechanical assembly before manufacturing.

## Functional Harness Design

Design cable and harness components in 3D to reduce manufacturing problems, facilitate output of manufacturing drawings, and avoid late-stage engineering change orders. In Inventor software, wire list and connector information drives harness design with built-in cross-checking of electrical and mechanical data. This allows you to make sure that all wires and connectors in the wire list are represented in the 3D cable design.

## Wire List Input

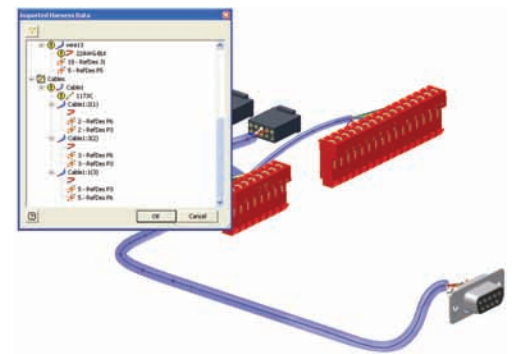
Maintain electrical design intent and reduce errors when importing wire lists into the assembly. Quickly import large wire lists from AutoCAD® Electrical or third-party schematic design applications, with detection and correction of missing connectors, pins, and wire definitions.

## Wire Routing

Quickly route thousands of wires while exerting control over the paths of critical wires. Inventor supports manual, interactive, and automatic routing with accurate wire length calculation. Manual routing requires the explicit selection of the wire's path. Interactive routing requires selection of the start/end points, after which the system algorithm chooses the shortest path. In automatic routing, the system finds the shortest possible path based on all available paths.

## Harness Path Definition

Optimize the design of cable and harness assemblies to help proper spacing for manufacturing and to reduce errors in manufacturing caused by incomplete product definition. Define harness and cable paths using a point-and-click methodology that creates 3D virtual conduits (segments) in the model. Create associative relationships that will update the harness whenever you change a design component. Add points or move existing points to refine the overall shape of the harness.

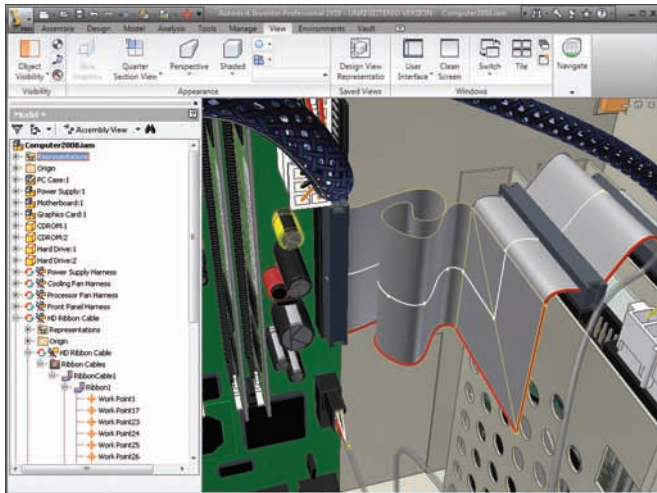


# Cable and Harness Design

Full integration with the bill of materials (BOM) tools in Autodesk Inventor helps you make sure that your BOM accurately represents the electrical components in your design.

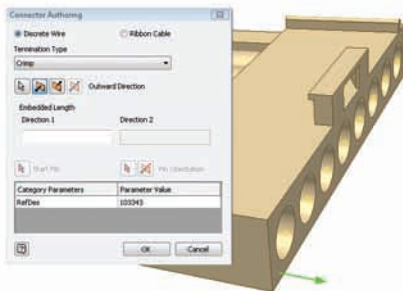
## Ribbon Cables

Reduce errors in the design of electronic equipment by incorporating ribbon cables in your 3D digital prototype. Add ribbon cables between connectors with full control over the locations of twists and folds.



## Connector Authoring

Set up company-specific connector libraries to encourage the use of preferred connectors in the design of electrical products. Inventor software includes an extensive library of connectors to simplify selection and placement. The Content Center provides an easy-to-use editor to add user-defined connectors, and add or modify properties, such as part numbers and default file names, used when instancing connectors.



## Harness Validation

Improve cable quality and manufacturability and prevent costly recalls and product failures by adhering to design standards. Inventor software automatically calculates quality parameters, including bundle diameter, bend radius, and wire lengths whenever you make changes to the harness. This allows you to eliminate the time-consuming, error-prone process of manually measuring a hardware prototype.

## Harness Documentation

Quickly and easily create manufacturing documentation before you build the first article. Since cable and harness geometry is native to Inventor, you can create assembly documentation showing accurate cable and harness placement details. You'll be able to:

- Automatic create and update 3D nailboard diagrams for 3D wire harnesses, cables, and ribbon cables
- Run reports such as wire run lists, termination charts, cut tables, and other documentation needed for the design and manufacture of harnesses
- Output XML files to transfer the final wire connectivity information and streamline the creation of schematics and wiring diagrams, using AutoCAD Electrical or other schematic design software

# Tooling And Mold Design

Autodesk Inventor Professional helps automate key aspects of the design of injection molds for plastic parts. This allows you to quickly create and validate complete mold designs, reducing errors and improving mold performance.

With its intuitive mold design workflow, Inventor software guides you through the mold design process in a way that is natural for the experienced user, while at the same time supportive for the novice.

## Streamline the design of plastic injection molds

Autodesk Inventor software includes easy-to-use mold design features that work directly from Inventor 3D models of plastic parts. Full associativity to the Inventor digital model helps make sure that any changes to the model are automatically reflected in the mold design. Inventor guides you through the mold design process and automates a number of complex operations, such as capping openings and runoff/shutoff surface generation. The result is higher quality products and faster time to market.

## Part Preparation

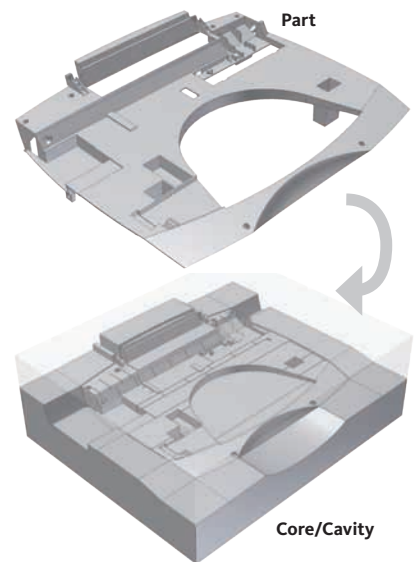
Gain access to extensive material property information by selecting part material from the Autodesk® Moldflow® material database, the world's largest material database for injection plastic molding. Interactively define the parting direction. A default work piece size is recommended by the system based on the part dimensions. You can also easily edit the settings, if necessary. Any information added to the part model is reused in the mold design process.

## Patch and Parting Surface Creation

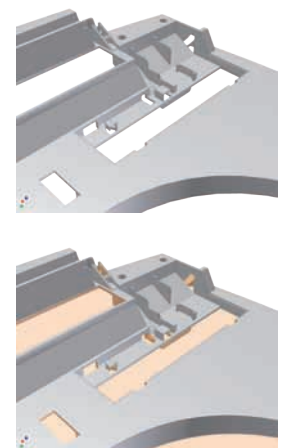
Accelerate mold design by creating surfaces automatically. Close multiple openings in your part model using automated patch surface creation. And generate parting surfaces automatically based on the defined parting direction.

## Automated Core and Cavity Design

Core and cavity design is time consuming with traditional CAD tools, but the mold design knowledge in Inventor software saves you time and reduces rework. With Inventor, you can split the work piece to generate the core and cavity halves based on the parting surface definition. Create side core designs to match the mold assembly, and incorporate old side core designs into existing mold assemblies. For multicavity mold designs, easily define the mold configuration layout as circular, rectangular, or variable. And use automated core and cavity design tools to create family molds.



## Intelligent Patching



# Tooling And Mold Design

Autodesk Inventor Professional includes Moldflow plastic flow analysis tools. Use them to determine material flow rates, ideal gate locations, shrinkage, and process parameters.

## Runner and Gate Design

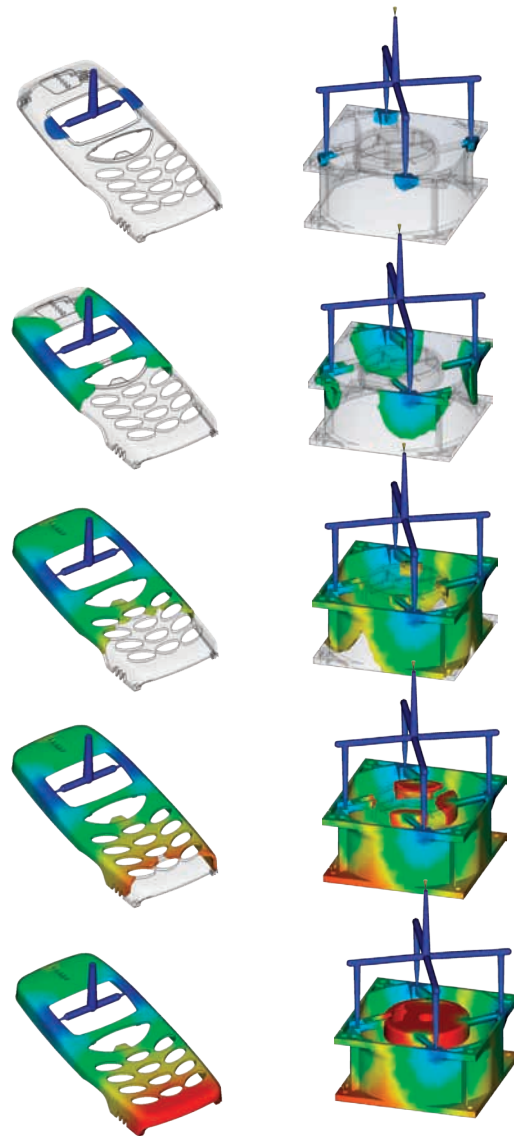
Reduce mold design lead time with automated runner and gate design tools. Facilitate the efficient distribution of molten plastic from the machine nozzle to the mold cavities by designing the complete runner system, including the sprue, runners, and gates. Gate location analysis tools help you determine gate locations accurately and efficiently. Preconfigured shapes allow you to quickly create gate points, gates, runners, sprues, and cold wells.

## Cooling Channel Design

Reduce the time it takes to add cooling channels to the mold base while avoiding errors and inconsistencies. With Inventor Mold Design, you can quickly design cooling channels for the mold base through an intuitive user interface. Enforce consistency and reduce mistakes by selecting cooling components, such as connectors and pipe plugs, sealing plugs, and O-rings, from a standard catalog.

## Moldability Analysis

Avoid costly mistakes by detecting moldability issues early in the design cycle. With Inventor software, you can analyze the part model before starting the mold design process. You quickly enhance your understanding of the plastic filling, sink marks, cooling efficiency, gate location, and optimum molding window.





# Tooling And Mold Design

Autodesk Inventor Professional provides an extensive collection of vendor catalogs of standard mold bases and components so you won't have to spend time modeling them.

## Mold Base Libraries

Reuse standard mold base components across the organization, allowing you to avoid duplicate work while taking advantage of proven design knowledge. Inventor software supports a wide range of mold base catalogs, including DME, Futaba, HASCO, LKM, Pedrotti, Polimold, Rabourdin, and Strack. A single database stores and delivers easy access to standard components. When required, you can efficiently customize standard mold bases to suit your needs.

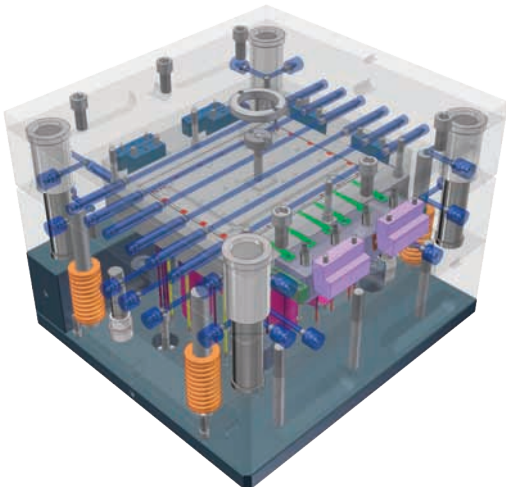


## Standard Mold Base Parts

Improve productivity and avoid errors by reusing existing mold design knowledge as you create the detailed mold design in 3D. Begin by selecting mold base components from standard catalogs, including Meusburger, Misumi, National, Progressive, Punch, and Sideco. Design or modify standard components, such as sliders, lifters, ejectors, sprue bushings, and locating rings. When you have standard mold base components that meet your needs, you can export them as templates for future use.

## Documentation

Reduce mold design lead time by generating drawings and BOMs automatically. Inventor allows you to automatically create 2D drawings of mold designs and related BOMs for use in documentation or manufacturing. When you make changes to the 3D design model, Inventor automatically updates the drawings and BOMs.



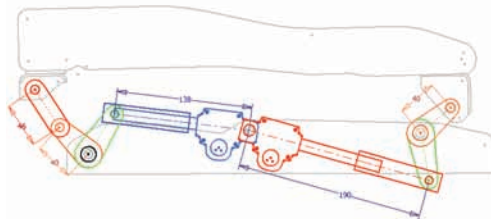
# 3D Layout and System Design

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.

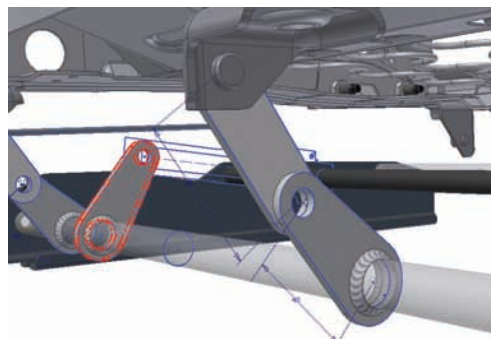
## Sketching

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.



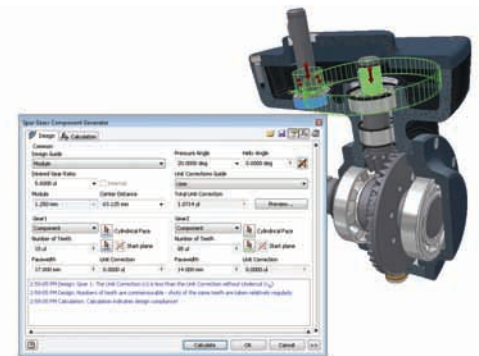
## Layout Design

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

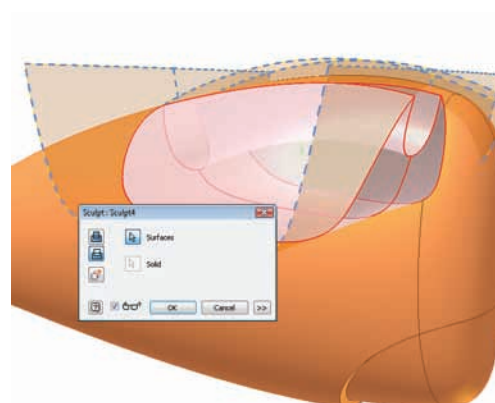
Reduce time to market by working directly with exterior surface data. Easily import Autodesk Alias surface data created by industrial designers. Associative links allow you to review and incorporate changes from the Alias family of products into the Inventor model.

## 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.

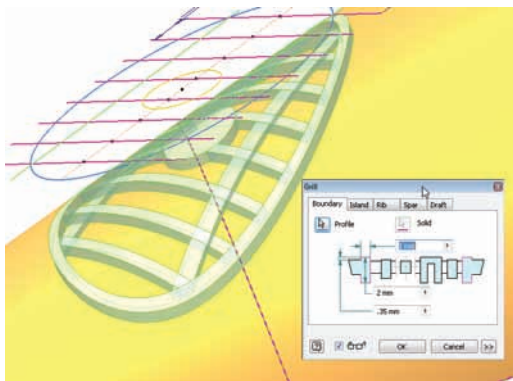
## Molded Part Definition

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.



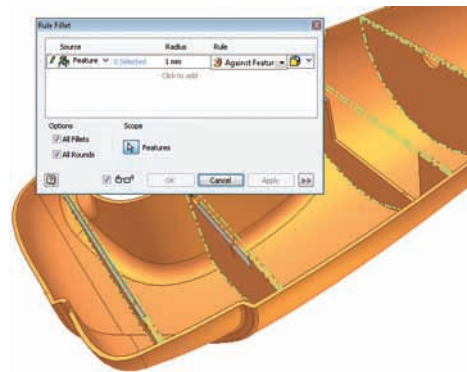
## Technical Plastic Features

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.

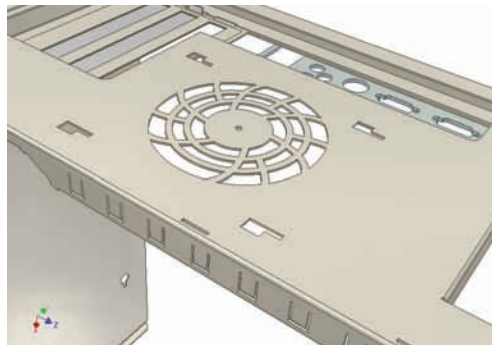
Autodesk Inventor software improves your productivity when you design sheet metal parts by providing a digital prototype that combines manufacturing information – such as punch tool parameters and custom bend tables – with an accurate, 3D model of sheet metal folding and a flat-pattern editing environment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

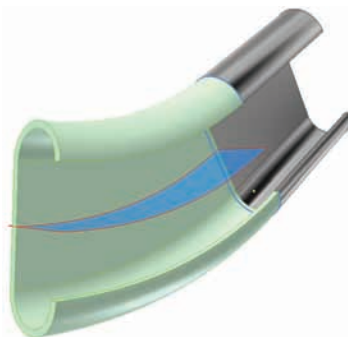
## Sheet Metal Flanges

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.



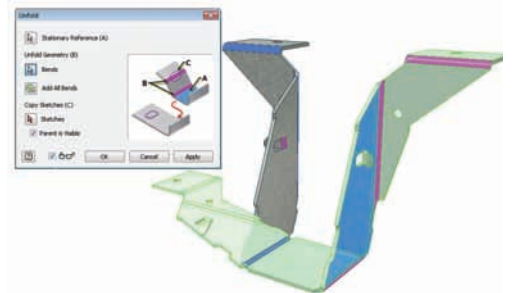
## Transitional Shapes

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

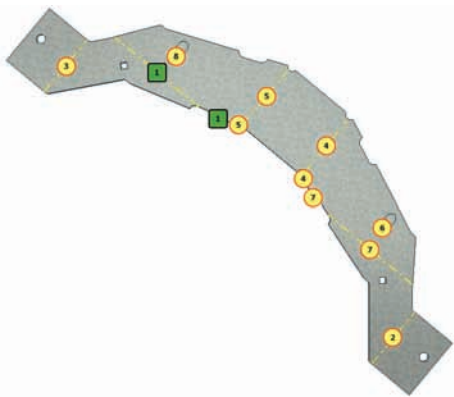
Simplify the inclusion of punches, cuts, fillets, chamfers, and extrusions that span sheet metal bend plates. Use the unfold and refold commands to create features using an unfolded representation of the part. Automatically propagate the resulting features to both the folded model and the flat pattern.



# Sheet Metal Design

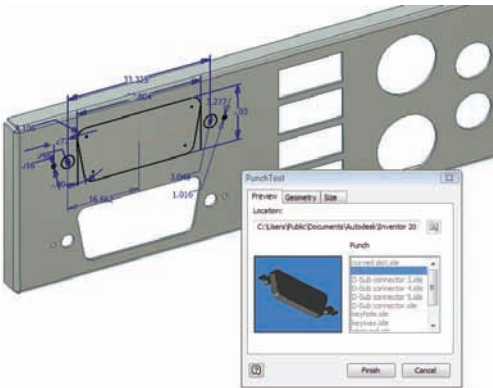
## Flat-Pattern Modification

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.



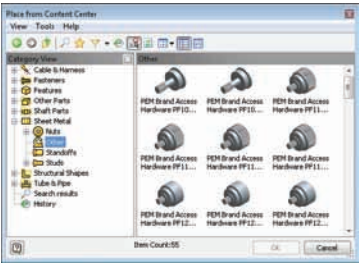
## Punch Libraries

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.

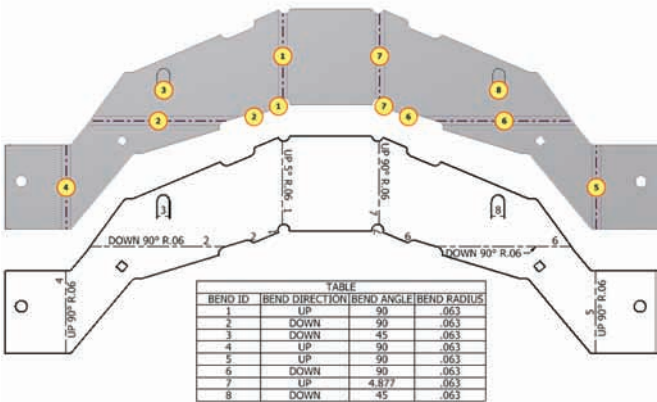


## DXF Output

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

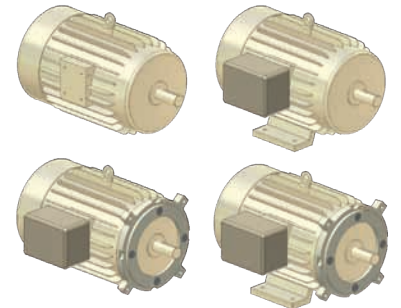
Reduce costly errors and improve manufacturability by testing assembly function within Inventor. Check for static interference among parts with graphic highlighting of overlapping material, and then test for potential collisions between moving parts by driving assembly constraints or dragging components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

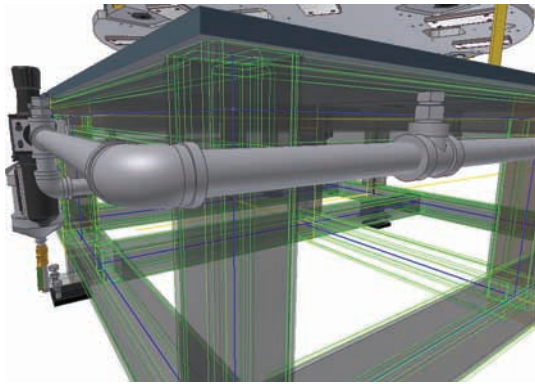


# Assembly Design

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

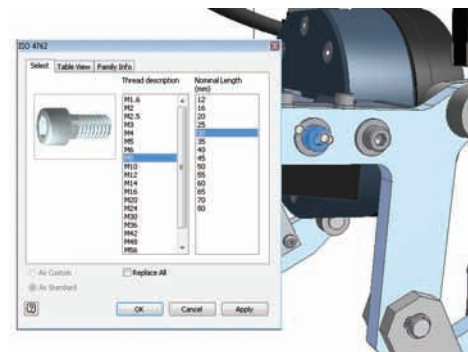
Reduce errors and engineering changes through automatic monitoring of critical design parameters. AutoLimits can be used to monitor length, distance, angle, diameter, loop length, area, volume, and mass. AutoLimits icons change color when the monitored parameters exceed the prescribed parameter range.

## 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.



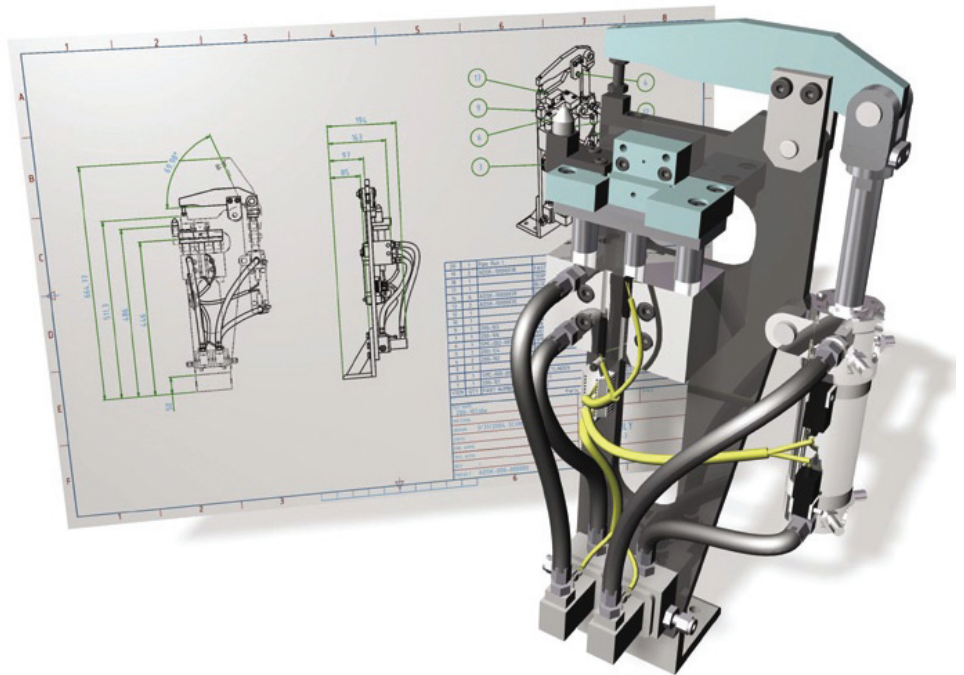
# AutoCAD Integration and DWG™ Interoperability

Inventor software makes it easy for AutoCAD users to experience the benefits of Digital Prototyping by leveraging investments in AutoCAD expertise and DWG design data.

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

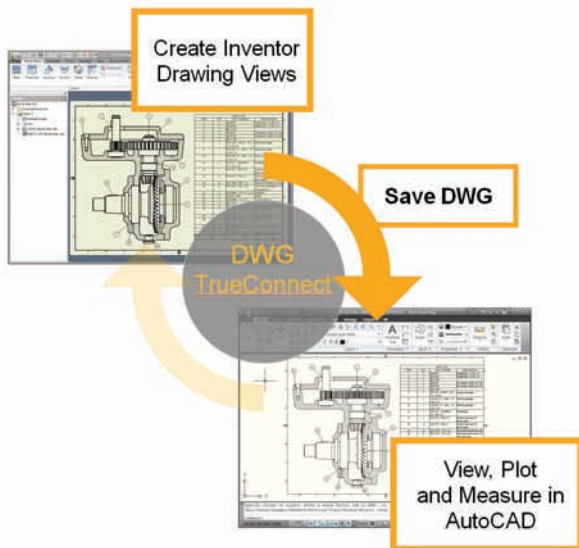
All Autodesk Inventor software products bundles also include the latest version of AutoCAD Mechanical.

## 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.

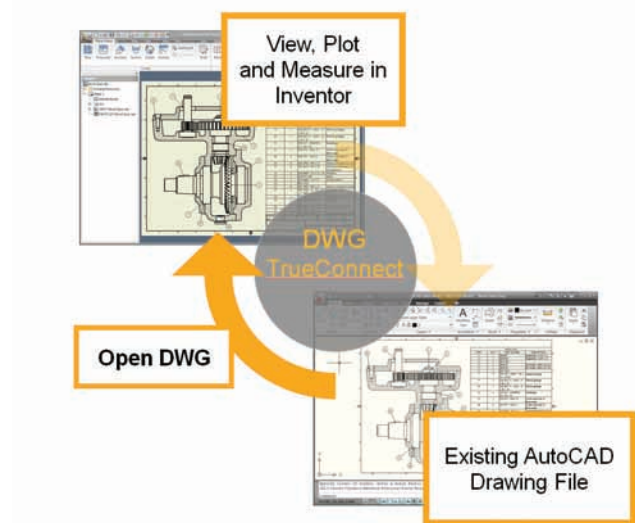


## AutoCAD Blocks from Inventor Views

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.

# Native Translators

Accept projects that use different applications. Autodesk Inventor offers a comprehensive suite of translators, including native translators that read and write files from other CAD tools and translators for industry standard formats such as IGES and STEP.

In today's world of integrated supply chains, you may need to work with 3rd-party CAD data from customers and suppliers. Using the translators in Inventor, you can accept and supply data in the customer's preferred format.

## Native Translators

Streamline projects that require opening files from vendors or customers in native formats. And deliver 3D design data to customers or vendors who prefer native file formats. You can easily exchange data between Inventor and CATIA V5™, UGS®, SolidWorks®, and Pro/ENGINEER®. Inventor supports direct import and export of CATIA V5, JT™ 6, JT™ 7, Parasolid®, and GRANITE files. It also supports direct import of UG-NX™, SolidWorks, Pro/E, and SAT files.

## STEP/IGES

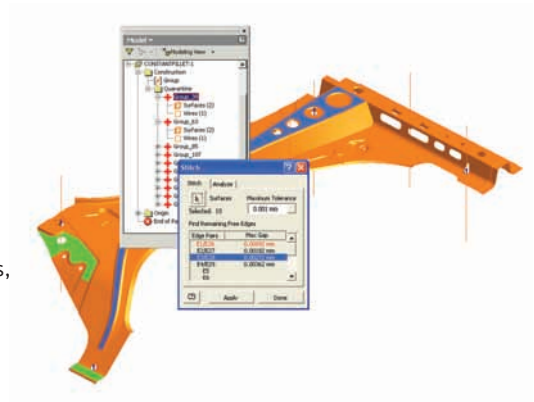
Enable accurate collaboration with suppliers and customers by sharing and reusing design data between 3D CAD/CAM systems. Read and write design and drawing data using industry-standard formats.

## Construction Environment

Reduce the time you need to inspect and repair customer data files. The Inventor construction environment provides fault-tolerant import of large STEP and IGES data sets. It can quarantine entities containing geometric problems, such as surface slivers and mismatched boundary curves. Then use the comprehensive toolkit for inspecting, editing, and correcting quarantined entities, including solids, surfaces, wireframes, and points. Data sets can be corrected and promoted into 3D part models, surfaces, or 3D wireframes.

## AEC Exchange

The architecture, engineering, and construction (AEC) exchange tool creates and publishes simplified 3D representations, intelligent connection points, and additional information using the Autodesk Package Files format (.adsk) to facilitate exchange of data with Autodesk® REVIT® MEP and Autodesk® REVIT® Architecture.



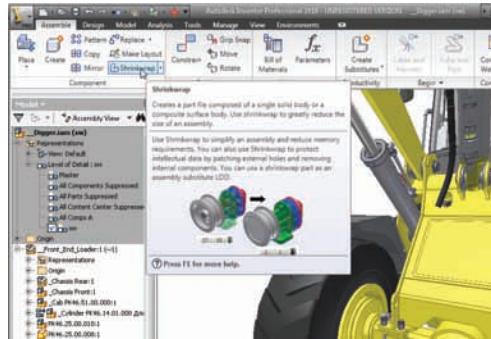
# Learning Resources

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.



## 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.

## 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.



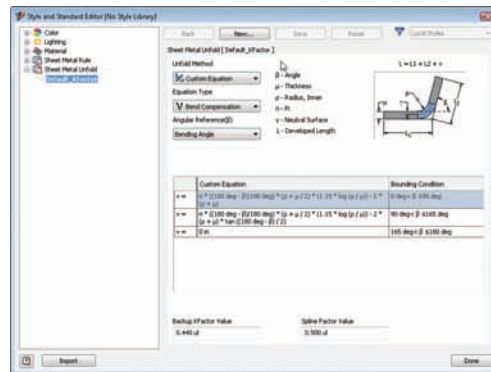
# Customization and Automation

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.

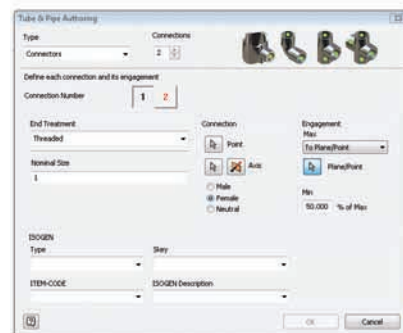
## Content Center Publishing Tools

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

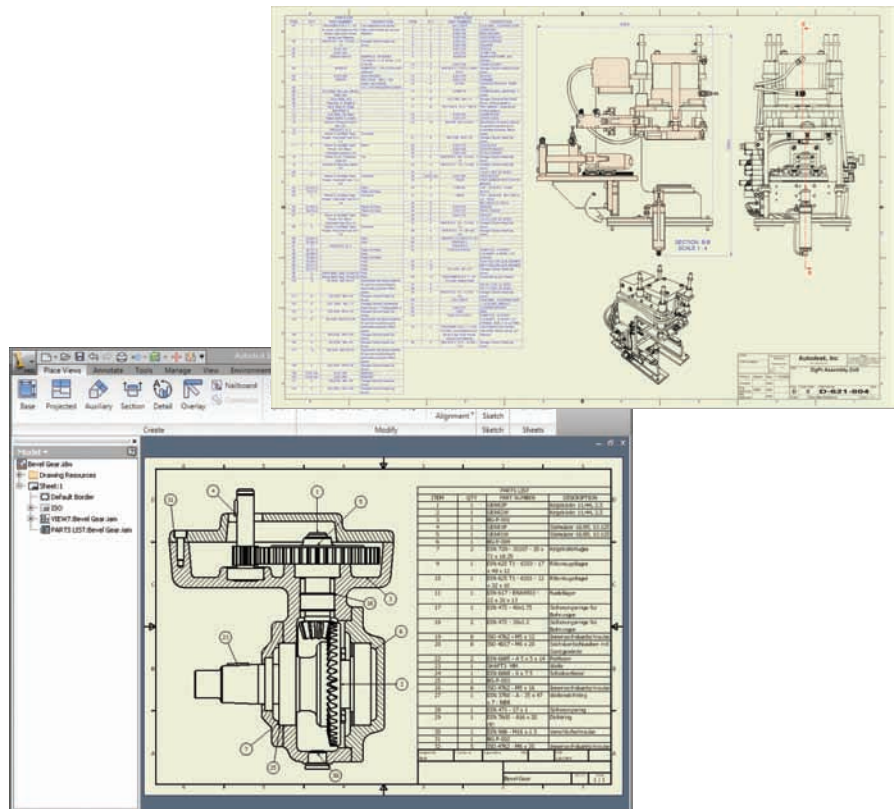
Easily generate and share production-ready drawings with manufacturing teams and outside suppliers. Autodesk Inventor software allows you to generate engineering and manufacturing documentation from a validated digital prototype to reduce errors and deliver designs in less time.

Extending the advantages of AutoCAD® software, Autodesk Inventor software takes the production of manufacturing documentation to the next level of productivity through automatic generation of drawing views and comprehensive tools for finishing drawings.

## Automatic Drawing Views

Create drawings dramatically faster than with 2D methods. You simply call out drawing views, including front, side, ISO, detail, section, and auxiliary views, and Autodesk Inventor projects the geometry. Inventor software also delivers comprehensive options for controlling hidden line display and support for technical drawing standards such as GB, JIS, BSI, ISO, DIN, ANSI, and ESKD. Timesaving options include:

- Automatic retrieval of dimension data from the 3D model, allowing you to place the dimensions, including isometric view dimensions, with automatically updated dimension values.
- The Arrange Dimensions command, which lets you align and clean up retrieved dimensions to produce quality production drawings in minutes.
- A robust palette of dimension, annotation, and 2D symbols for fast, flexible completion of the drawing set.



# 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.

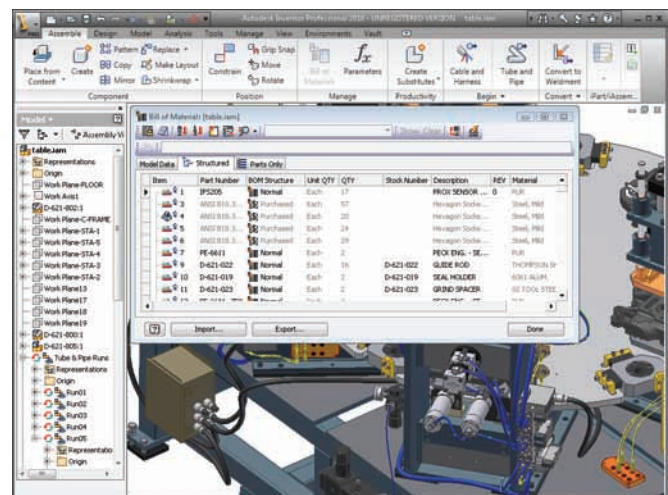
## Associative Parts List

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.



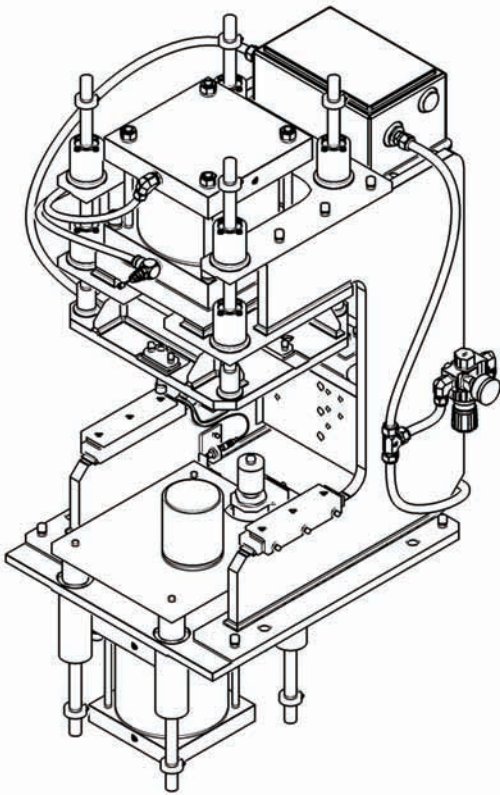


# 3D Visualization and Design Communication

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.

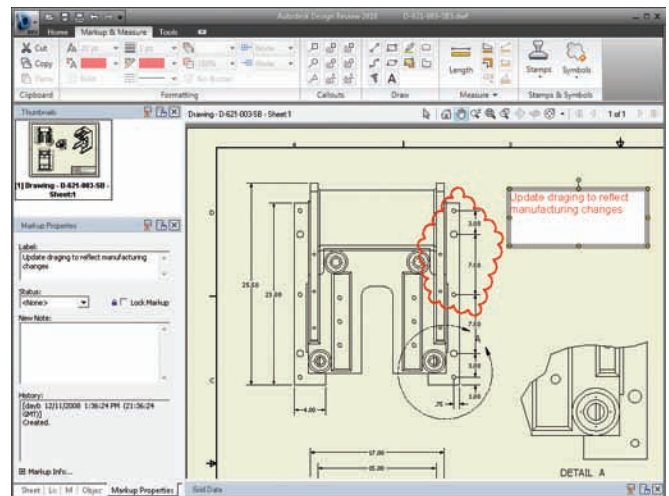


## DWF Publishing

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.

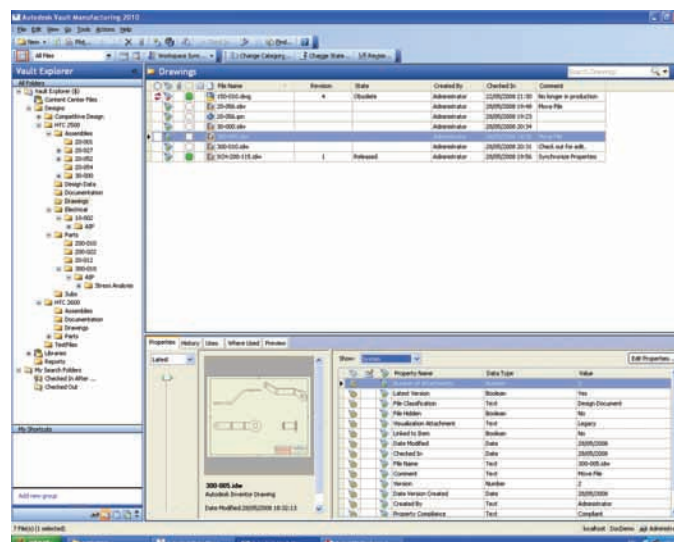
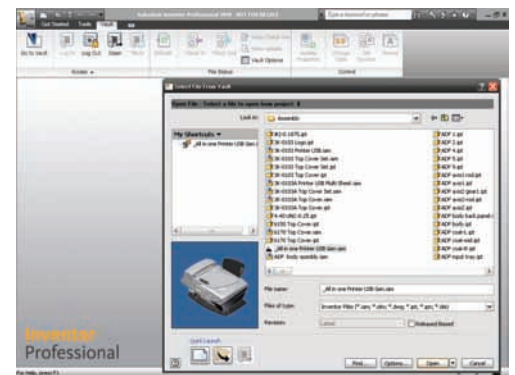
Autodesk Data Management solutions allows design workgroups to manage and track all the design components of a digital prototype, helping them to better reuse critical design data, manage BOMs, and promote earlier collaboration with manufacturing teams and clients.

## 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 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)**.

	AutoCAD Inventor Suite 2010	AutoCAD Inventor Routed Systems Suite 2010	AutoCAD Inventor Simulation Suite 2010	AutoCAD Inventor Tooling Suite 2010	AutoCAD Inventor Professional Suite 2010
Autodesk Inventor	•	•	•	•	•
AutoCAD Mechanical	•	•	•	•	•
Autodesk Vault	•	•	•	•	•
Cable and Harness Design		•			•
Tube, Pipe, and Flexible Hose Design		•			•
Stress Analysis (FEA)			•		•
Dynamic Simulation			•		•
Tooling and Mold Design				•	•

