

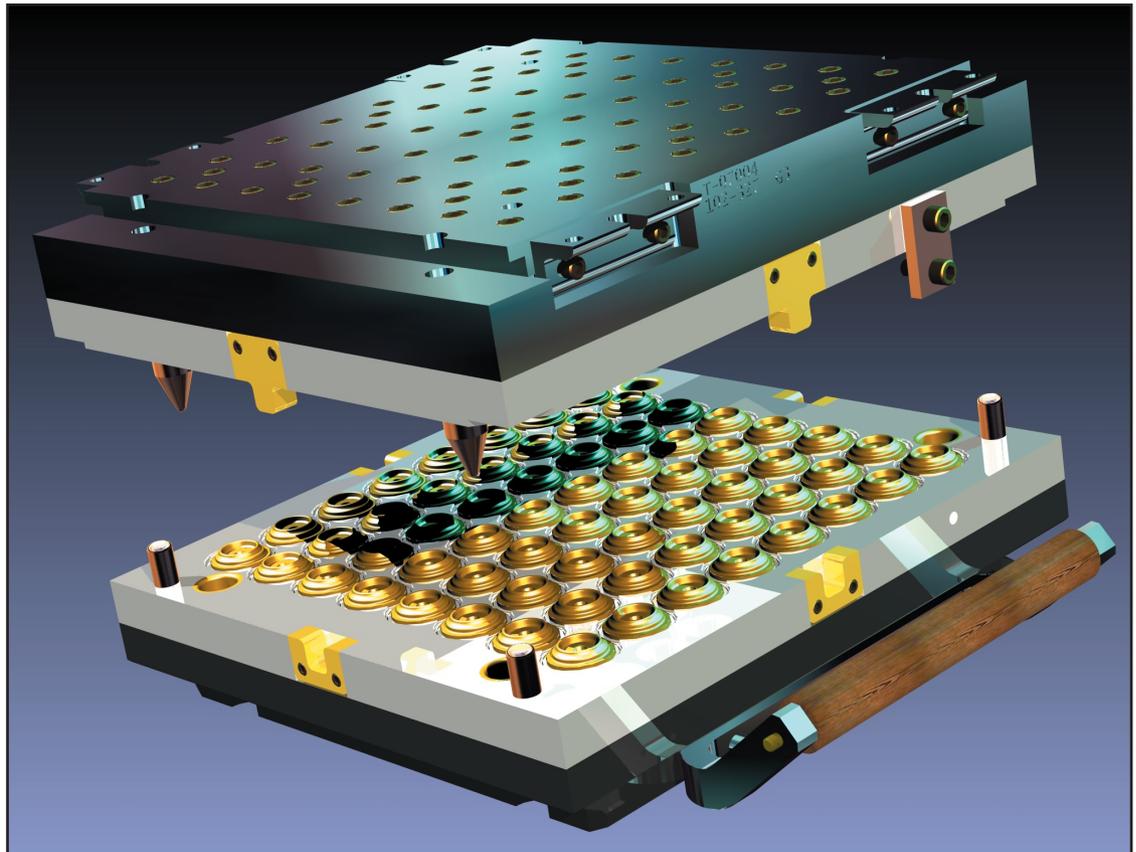
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# Solid Edge Version 8

Hot new features and hundreds of improvements enable users to improve design productivity considerably.



Keeping up with Unigraphics Solutions' new Solid Edge releases over the last year and a half has been a virtual whirlwind. Last year, I reviewed for *Computer-Aided ENGINEERING* Version 6 in the January issue and Version 7 in the August issue. Version 8 was just unveiled in March at the National Design Engineering

**mechanical** Show, so here I am again. During 1999, this mid-range mechanical design software program also received awards from a variety of publications including the *CADENCE* Show Stopper award in March; *New Equipment Digest's* Excellence in Innovation award in July; and *Desktop Engineering's* Reader's Choice Product of the Month award in August.

The obvious question is: Can

**A place for parts.** Solid Edge Version 8 allows users to place parts in assemblies faster, using a teach-and-repeat technique. This functionality addresses assemblies in which a part is placed in multiple locations, such as on this mold designed by Vernay Laboratories.

there possibly be anything momentous to write about when new versions are released every six months? I have been working with Solid Edge Version 8 for several months (in beta and final release) and am here to tell you the answer is yes. Some truly hot new features and literally hundreds of improvements in this release provide the potential to improve design productivity considerably. I think the hottest feature is Cognitive Assembly Design, a new technology designed to improve and simplify how assemblies are created.

## Assembly Design, Management

In general, assembly design and management are two of

Solid Edge's major strengths. Its ability to handle massive assemblies is unique in the mid-range software category. In fact, some Solid Edge users have assemblies with tens of thousands of parts in production today. Solid Edge is already the undisputed leader in this area in this price range. In my opinion, Solid Edge also has the best quality design documentation and drawing production tools to finish the job. A lot has been done in Version 8 to significantly increase drawing performance to support large assemblies. For example, drawing views created with a display configuration only load the necessary parts, and a new proprietary

By Robert Martin

## At A Glance:

**Solid Edge Version 8.** Midrange mechanical design and solid modeling software that provides advanced 3D part modeling, large assembly design and drafting, and process-specific features for sheet metal, plastics, and tubing design. **Pros:** Superior assembly features such as the drag and drop functionality; ease-of-use; and the comprehensive mechanical CAD strategy of a strong parent company. Distributed in eight languages. **OS Requirements:** Windows 98 and NT. **Minimum Hardware Requirements:** Intel Pentium processor-based computer with 64 MB RAM, 100 MB of disk space, SVGA (1,024 X 768, 256 colors), and CD-ROM (local or network) for installation. **Price:** \$4,995 for Solid Edge Classic. **Unigraphics Solutions, 800-807-2200; www.ugsolutions.com**

routine for drawing views reduces memory consumption.

### Cognitive Assembly Design

Cognitive Assembly Design is a set of tools that simplify and accelerate mechanical assembly design by letting users embed assembly placement intelligence within part models. This dramatically reduces the amount of input needed to position parts in the assembly model. Solid Edge captures information about part alignment and mating conditions as parts are placed, using a "teach-and-repeat" technique. This assembly intelligence is used in subsequent part placements. Bottom line? Users can place parts and establish assembly relationships faster, with significantly fewer commands and mouse clicks. According to Chris Oesterle, CAD system administrator at Liebert Corp., a Solid Edge customer in Columbus, OH, "This reduces the number of human inputs by a factor of four, dramatically increasing the speed and ease of placing parts in these new, intelligent assemblies."

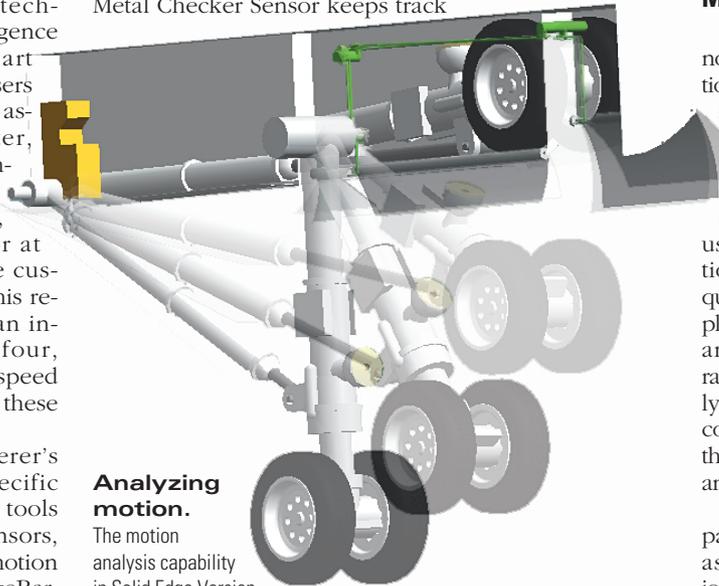
So, how does this "sorcerer's apprentice" work? The specific Cognitive Assembly Design tools include DesignAssistant Sensors, which are new, integrated motion analysis capabilities and EdgeBar, a simplified user interface.

### DesignAssistant Sensors

The DesignAssistant Sensors provide continuing feedback on key rules and variables as a design develops. Much like physical sensing devices, the Solid Edge Design-Assistant provides intuitive, readily interpreted feedback with gauge-like displays. To create sensors, users simply specify design variables or dimensions to be monitored, such as the distance between assembly components, critical thresholds, and the range

of values to be gauged. The sensors provide persistent monitoring as the design is developed, and if the level is unacceptable based on some user-defined criteria, a warning is given.

Any quantity that can be measured is potential input for the software's sensors. The Minimum Distance Sensor keeps track of the distance between two objects. It can monitor both distance between parts in an assembly (part to part) and within a part (face to face or edge to edge). The Sheet Metal Checker Sensor keeps track



### Analyzing motion.

The motion analysis capability in Solid Edge Version 8 is integrated into the assembly modeling environment. Simply Motion, a kinematics analysis and motion simulation package from Mechanical Dynamics Inc., automatically builds accurate motion analysis models from Solid Edge assemblies.

of the distance between sheet metal features and edges of a part. It's actually an advanced minimum distance sensor that allows users to define global criteria, as well as criteria on a particular face. For example, it can be set to check minimum distance of deformation features from the edge of a part. The General Variable Sensor allows users to monitor

any variable stored in the variable table.

The new EdgeBar feature collects many of the dialog boxes and tools available in previous versions of Solid Edge into one central location. This reduces the amount of screen real estate required for input boxes. The three separate EdgeBars for Part, Assembly, and Drafting modes allow for more efficient working because the information users need is available in one place. The Part EdgeBar incorporates Feature PathFinder, Feature Library, DesignAssistant, and Family of Parts. The assembly environment EdgeBar incorporates PathFinder, Part Library, and DesignAssistant (sensors). In drafting mode, EdgeBar incorporates Symbol Library, Group Path Finder, and Layers.

### Motion Analysis Capabilities

Solid Edge Version 8 includes, at no extra cost by the way, Simply Motion, a motion analysis package that is seamlessly integrated into the assembly modeling environment.

Simply Motion automatically builds detailed motion analysis models from the assembly, and users can perform motion simulations almost on the fly. Users can quickly and accurately simulate complex movement, detect interferences, and create animations of the full range of assembly motion. This analytical feedback helps identify and correct problems at the front end of the process and improves the quality and performance of moving parts.

Simply Motion creates moving parts and motion joints directly from assembly constraints. Additional joints, springs, and motion generators can be added through an easy-to-use wizard-style interface. Simply Motion's 3D dynamic motion engine allows users to simulate problems far beyond simple linkages or kinematic-type problems. The simulation results can be used to generate animations of a moving assembly, or to check for interference as the assembly moves through its full range of simulated motion.

### Inter-Part Associativity

The software now supports inter-part associativity. In the Part and Sheet Metal environments, the

Inter-part Copy command is available for associatively copying faces from peer parts into an in-place-activated part. Inter-part copy adds peer-to-peer associativity to the established Solid Edge top-down modeling approach. The Inter-part Manager command lets users review and modify these Inter-part relationships.

A related enhancement is that the Include command now supports the selection of more element types to better support associative and include operations. For example, users can include a face, possibly from another part, and update it even if the number of edges in the face changes.

### Other Improvements

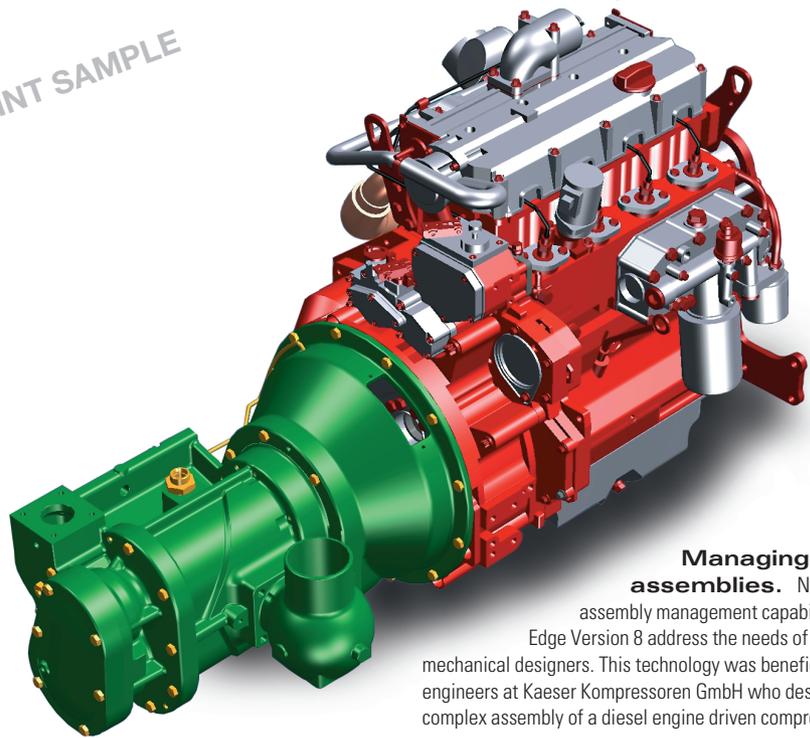
In addition to the Cognitive Assembly Design innovations, Solid Edge Version 8 contains more than 350 customer-driven enhancements. Obviously I can't list or describe them all, but here are a few I am partial to.

The Hole command now supports keypoint selection when defining the extent. The Hole Settings dialog box makes it easier to define parameters when creating holes.

The Place Part command user interface now provides reduced input options. A Part Library displayed by EdgeBar supports live preview and a "Common Parts" list. Place Part can be initiated through drag and drop from the Parts Library. This means, for example, that users can drag and drop a bolt into a hole in one operation. In addition, Place Part now can infer relationships from faces on the placement part and show the part dynamically attached to the cursor. Users can have parts with embedded assembly intelligence that allow single click placement in assemblies (Flashfit) and Parts can be "taught" for re-use (Capturefit).

### Drafting Mode

I feel like a broken record in all my reviews, but the 3D modeling process is only part of the picture for most users. Most of us still need to produce drawings—accurately and easily. Solid Edge continues to improve in this department as well. Drawing performance enhancements include a



**Managing large assemblies.** New large assembly management capabilities in Solid Edge Version 8 address the needs of many mechanical designers. This technology was beneficial to the engineers at Kaeser Kompressoren GmbH who designed this complex assembly of a diesel engine driven compressor.

Copy to Symbol Library command to store selected geometry as a symbol in a library; a Symbol Library interface in the Draft EdgeBar; SmartSelect, which lets users select by color, width, line type, layer, etc; and Stretch, which lets users stretch geometry defined by a fence. Other enhancements include the ability to hide all occurrences of a part in drawing view, and hidden line support for interfering bodies. In Sheet Metal Drawings, the bend lines for the flat pattern are now shown in the drawing view of the flat pattern.

### From AutoCAD to Solid Edge

Many 2D AutoCAD users (and those who use other 2D programs) really want to move to 3D, but often the obstacles seem daunting. Solid Edge Version 8 works hard to ease this process. It provides excellent AutoCAD compatibility, and several new features are specifically designed to ease the transition. Solid Edge not only provides AutoCAD drafting capabilities (e.g., symbol libraries, improved text handling), but an AutoCAD Translation wizard incorporates the AutoCAD Import and Export Options dialog boxes. It also helps users map entities such as line types, fonts, and colors when importing from and exporting to the AutoCAD format.

Solid Edge claims to have thousands of customers who have moved on to Solid Edge and have recorded impressive productivity

improvements. A white paper is available from Solid Edge that addresses the issues faced when moving from 2D to 3D.

### The Bottom Line

I am impressed with the progress that Solid Edge makes with every new release, and I'm not the only one. It is becoming a regular occurrence for major CAD Value Added Retailers, manufacturing companies, and universities (e.g., Yale) to select Solid Edge. Frankly, the momentum of the aggressive product development, the ease-of-use, and the strength of its industry-leading modeling functionality make it an easy choice.

Solid Edge Version 8 provides advanced 3D part modeling, large assembly design and powerful 2D drafting tools, and process-specific features for sheet metal, plastics and tubing design. The Solid Edge Voyager Program includes more than 150 engineering software applications in such disciplines as finite-element analysis, manufacturing, kinematics and dynamics, electro-mechanical, rapid prototyping, standard parts, product data management, translation, view/redline/animation, and hardware solutions.

**Bob Martin** is a Mechanical Engineer who has been writing about CAD/CAM for more than 11 years; contact him at 520-663-5860 or bob@veainc.com. He was assisted by **Claudia Craven**, a freelance writer specializing in CAD/CAM. Contact her at ccraven@ior.com.

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## **Unigraphics Solutions International Headquarters**

### **Americas**

13736 Riverport Drive  
Maryland Heights, MO  
63043  
USA  
(800) 498-5351

### **Europe**

Centrum House  
101-103 Fleet Road  
GU13 8NZ  
UK  
+31 (0) 79363 5515

### **Asia Pacific**

Suite 1701  
Cheung Kong Center  
2 Queens Road Central  
HONG KONG  
(852) 2230-3333

### **Other Areas**

(256) 705-2600

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