

# Unigraphics NX 2—Hard to beat

EDS delivers flexible and scalable tools in its flagship CAD application. By Mark Huxley

At one end of the CAD spectrum is code that seems like it was written in someone's garage, then turned loose on the masses, who in turn act as beta testers as long as they can endure it. At the other end are companies that have led the industry for decades. EDS PLM Solutions, the maker of Unigraphics NX 2, is one of those leaders (figure 1). Not only does it develop several highly compatible CAD applications (Unigraphics, I-deas, Solid Edge), it also



offers a range of PLM (product lifecycle management) solutions. For those unfamiliar with this relatively new acronym, CIMdata defines PLM as "collaborative creation, management, dissemination, and use of product definition information across the extended enterprise from concept to end of life."

Unigraphics NX 2, which is slated for release in the third quarter of 2003, represents both the continued development of Unigraphics and the next step in the integration of EDS' Unigraphics and I-deas CAD/CAE/CAM suites. NX 3, due out in just over a year, will complete the transition with the merging of the two products. The process began when EDS acquired both UGS (developer of Unigraphics) and I-deas developer SDRC (Structural Dynamics Research Corp.) in 2001.

EDS is one of the few companies whose software offerings address the needs of everyone involved in production (figures 2–4). The single Unigraphics application is scalable enough to assist you throughout your career,

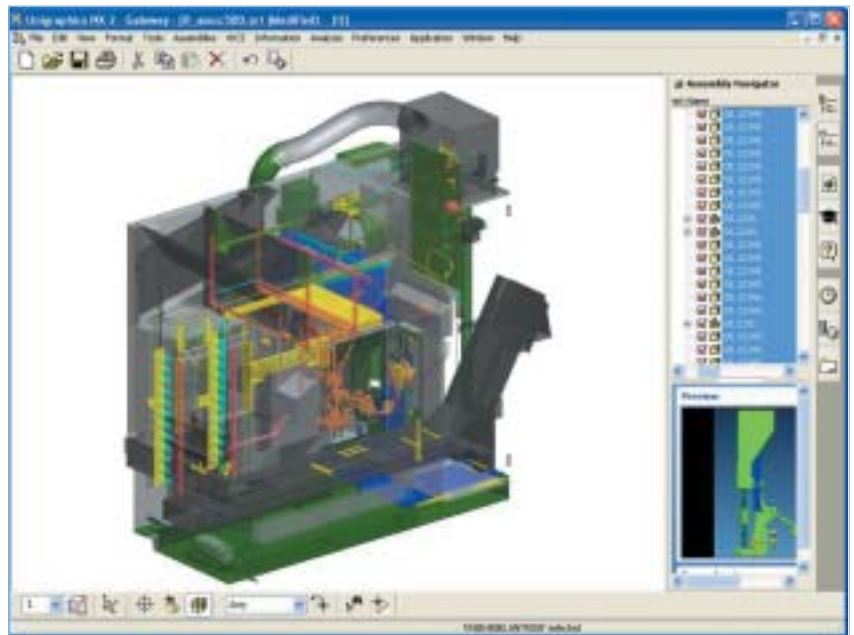


Figure 1. This Hermle CNC assembly comprises 1,300 unique parts—4,000 components total—yet takes up only about 600MB on disk. Unigraphics has historically performed well with larger assemblies. If you do push the envelope (say 100,000 components), several tools are available to speed your workflow. You can choose to load faceted representations instead of B-reps and use simplified geometry or shrink-wrapped versions of components and subassemblies.

## UNIGRAPHICS NX 2

Mechanical design software

star rating: 5 stars out of 5

pros: Part of a complete PLM/CAD/CAM/CAE offering from a long-time, industry-leading vendor.

cons: Entire package requires significant investment.

price: Bundles from \$7,995–\$25,000

EDS PLM Solutions

800.498.5351 [www.eds.com/nx](http://www.eds.com/nx)

## UNIGRAPHICS NX 2 IN A NUTSHELL

Whether you are a designer, engineer, analyst, or machinist, Unigraphics NX 2 offers an extensive line of tools to help you quickly and reliably perform your duties. The five upper-level differentiators listed in the review put Unigraphics in a class with few competitors. Combine them with Unigraphics' dependable, flexible code, and it's hard to beat. NX 2 is an integral part of a true PLM solution that works equally well with other EDS components or hetero-

geneous piecemeal solutions from other vendors. As we went to press, EDS announced that a version of Unigraphics NX for the 64-bit Windows platform is forthcoming.

NX stands for next generation, and last year's release of Unigraphics NX was a dramatic debut of much new technology. NX 2 represents equally substantial progress. We can't wait to see the culmination of decades of development in NX 3.

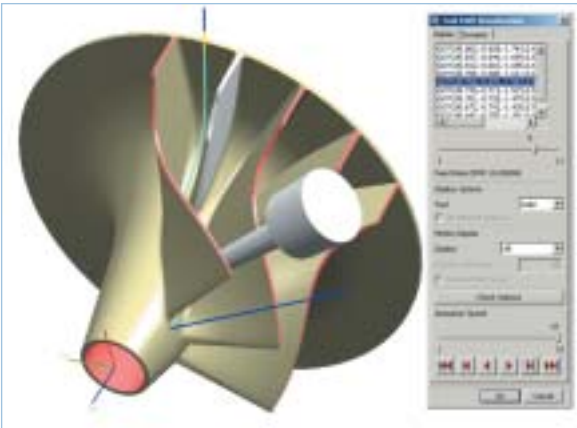


Figure 2. NX CAM machines high-tolerance surfaces with complicated twists. Best-in-class solutions are available for milling, turning, wire EDM, mold, and sheet metal. Here a tool path is visualized to check for possible crashes.



Figure 3. Analysis tasks that choke other systems can be performed with relative ease in Unigraphics NX 2. Stress analysis of this automotive suspension uses both shell and solid elements.

whether you're a newbie designer or a seasoned finite-element analyst with a doctorate. Users currently design everything from plastic widgets to the most advanced composite and hydro-formed metal products on the planet.

NX 2 will specifically appeal to:

- Designers or engineers who need to go beyond simple part design to perform tasks such as stress analysis and design optimization.
- Organizations that need to integrate different parts of their development process, such as design and manufacturing, concept design and detailed component design, simulation and design, and so forth.
- Organizations that need to communicate and exchange information across geographic locations, organizational barriers, suppliers, and partners.
- Organizations that want to capture design knowledge and benefit from its reuse.

### STRENGTHS

A perennial strength of Unigraphics is its vast flexibility. Unfortunately, this has traditionally been accompanied by increased training time. Unigraphics NX 2 addresses this obstacle in a unique way—by streamlining the user interface, EDS manages to offer more functions in a less obtrusive manner. The previous release (NX) focused mostly on revamping the user interface. NX 2's improvements build on

this trend with more intuitive, easier-to-use tools. The coordinate system is a good, simple example of the work in this area. To translate or rotate the UCS in the past, you were forced to find a menu command, use hot keys, or hunt down an icon and type in the exact numbers you wanted to use. These old methods still perform the task, but now you can simply click on the coordinate system and drag appropriate handles.

Some essentials and current improvements include:

- The Undo list is "unlimited." Unlimited is in quotes because saving a file resets the list.
- You can review images of files in Windows Explorer and drag and drop said files.
- Double-clicking or right-clicking on objects provides direct interaction with feature properties.
- The fly-out part navigator is great—it's there when you need it, unobtrusive when you don't. It displays a lot of information with minimal icons (pink parents and blue children, for example).



Figure 4. Once you set up a scene, materials, and lights, an optional module performs photorealistic rendering of concepts or finished models.

- You can directly open and edit JT, CATIA, Solid Edge, I-deas, and other file types.

I was able to install both NX and NX 2 with no problems. The installation process was straightforward and Windows compliant.

The resource bar contains, among other useful tools, a built-in browser that should prove useful for tasks such as browsing standard part libraries and running training software. Tight integration like this, combined with the use of a fly-out window, is probably the best solution short of having two monitors.

As Mike Rebrukh, director of Unigraphics product management, explains, EDS is "investing heavily in both increased functionality and flexibility, as well as in improved usability and streamlined workflows. Our focus on customer-driven workflows means

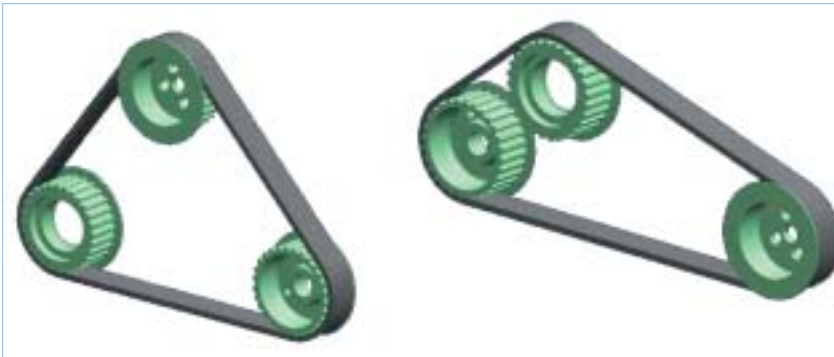


Figure 5. Flexible components and management of varied assembly arrangements are now possible. The same belt, spring, or hose file can vary its geometry to conform to its proper assembled state.

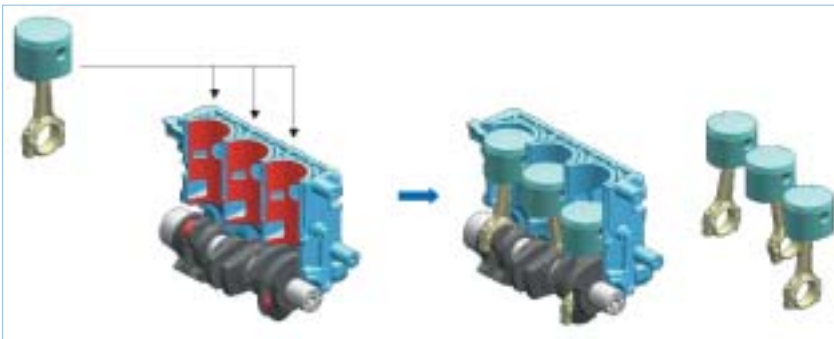
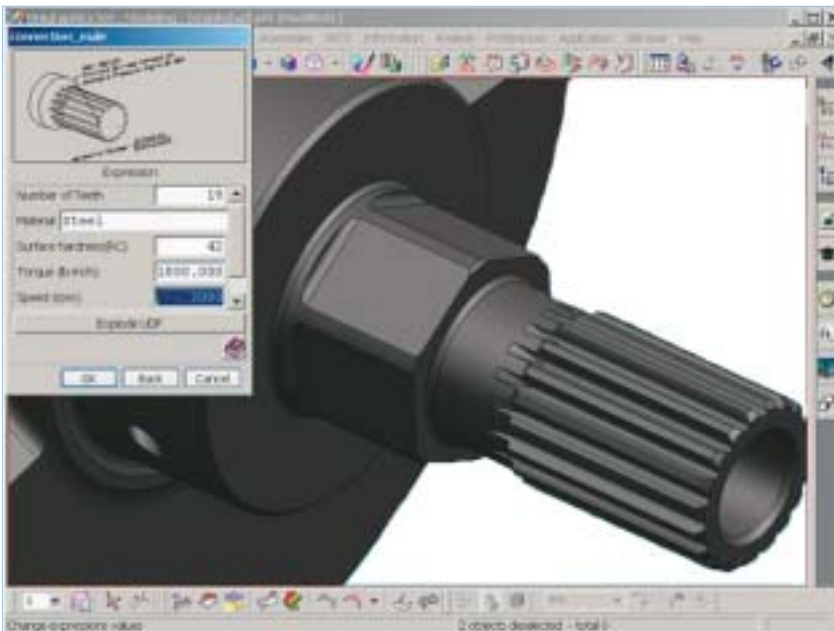


Figure 6. The same subassembly, using the same part number in bills of materials, can exist in different shapes and ranges of motion.



As Evan Yares noted in *Engineering Automation Report* (July 2002), products and parts "are always designed based on functional requirements, but CAD products have historically been oriented toward designing based upon geometric requirements. Knowledge-driven automation tools provide a way for engineers to translate functional requirements into a geometric model. At least in theory. The problem is that if the tools are too hard to learn or too limited in their capabilities, the people sitting in front of the CAD system just won't use them."

With the Unigraphics DMX (Direct Modeling Extension), you can recognize features and add parameters to imported geometry (figure 8). By selecting faces or regions, you can easily modify "dumb solids" imported into Unigraphics via IGES, STEP, and other popular formats. NX 2 offers a blend/fillet algorithm that

ance. Unigraphics knowledge tools can automate the sizing and rating of these junctions. By setting up simple rules, checks, and a table of values, you can account for a range of interfaces. This is a simplified example, but think about how much time you can save by setting up the variables for the geometry of a variable-pitch helical feed screw in an injection molding press or by varying the wingspan of an aircraft. This technique makes it possible to create new designs, based partially on legacy data, in a fraction of the time it took to make the original (figure 7).

In addition to these benefits, knowledge fusion offers more elusive gains.