



Software Review

VX Overdrive™ V5 Improves Mold Design

by Don LaCourse

VX Overdrive™ V5 is the latest offering by [VX Corporation](#) (Palm Bay, FL) of its flagship hybrid surface/solid modeling application. V5 builds upon a young and robust application with a revamped graphical user interface (GUI) and new solid features like rods, lips and asymmetric chamfers. The most impressive features of V5 can be found in the product's Mold Edition application that targets the mold and tooling design sector. First, let's take a look at the VX kernel, the underlying core of VX Overdrive™.

The VX Kernel

VX Overdrive™ is powered by a second generation proprietary geometric modeling kernel (referred to as VX Kernel) that allows the integration of wireframe, surface and solid modeling feature-based functions within the same B-rep (boundary representation) database structure. This hybrid approach offers an advantage over "solids-only" MCAD applications by allowing surface and solid models to co-exist. In the VX Kernel, open volumes are supported and become key intermediate steps to building more complex solid models. In this environment, solid features like cuts, bosses, holes, etc. can be applied to surface models and traditional surface modeling features like point clouds and surface tweaking can be applied to solids.

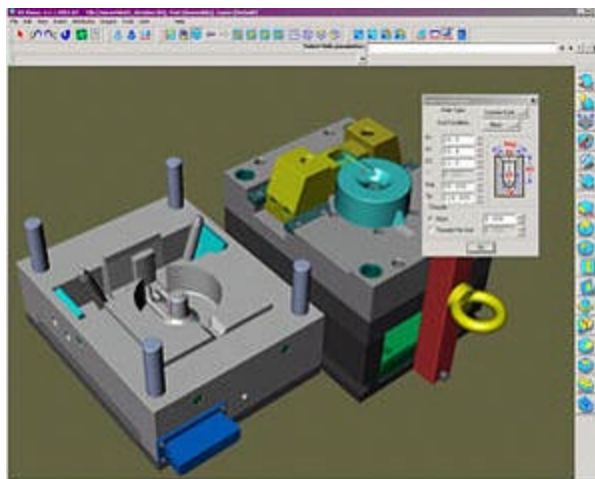


Figure 1 - The VX Kernel allows intelligent feature attributes to be preserved from design through manufacturing.

New Windows Compliance

VX Overdrive™ V5 goes further toward upgrading the GUI to be more Windows compliant, an effort undertaken by many MCAD vendors today. The tool bars have been redesigned using standard Windows icons. The control key combinations have been remapped to Windows standard functions such as "Ctrl+X" for cut, "Ctrl+C" for copy, "Ctrl+P" for past, etc. The key combos are also shown on the pull down menus. Recently opened files are now listed on the File menu for quick retrieval and files can now be dragged and dropped into VX Overdrive™ graphics window.

New Mold Base Library

VX Overdrive™ V5 Mold Edition contains a parametric standard mold base supplier-parts catalogue system by PARTsolutions (www.part-solutions.com). Mold bases and standard mold components as well as common nuts, bolts, springs, etc. can be selected from catalogues of industry standard suppliers and then regenerated with VX Overdrive™ (refer to figures 2 and 3).

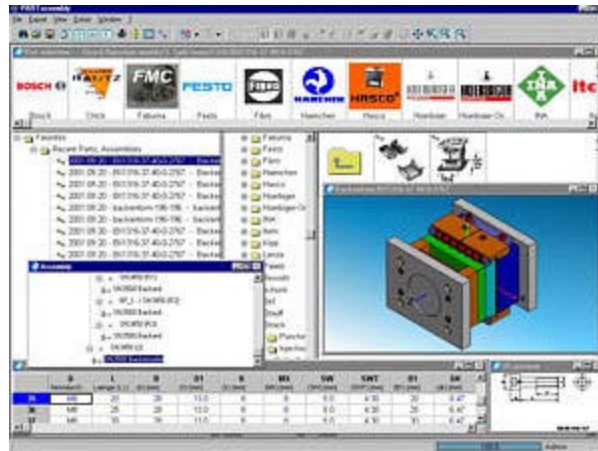


Figure 2 - Mold Edition accesses the PARTsolutions supplier-parts catalogue system where mold base assemblies and components are selected from tables. Each component can be previewed and rotated within PARTsolutions prior to sending them to VX Overdrive™.

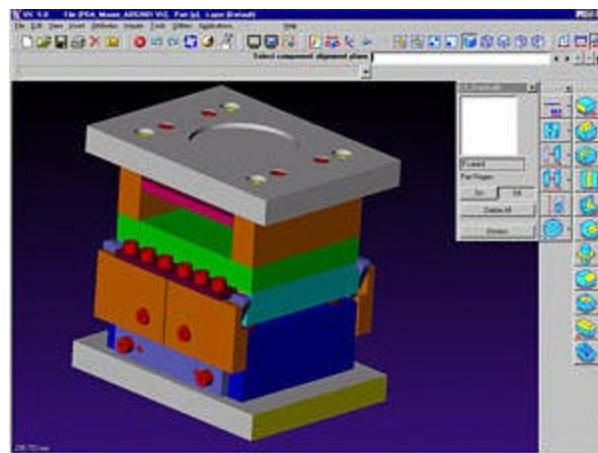


Figure 3 - The selected standard mold base assembly and components are regenerated within VX Overdrive™ where custom modifications can be made. The complete mold design including the core/cavity blocks can be completed in Mold Edition and complete detail drawing packages can be generated with VX Drafting.

PARTsolutions commands are added to the VX Overdrive™ Applications menus and include the following functions:

Table 1 - VX Overdrive™ V5 / PARTsolutions Functions

PARTviewer	You can select an individual part or static assembly and insert it as a component in the active VX Overdrive™ assembly. A static assembly refers to one that cannot be altered within PARTsolutions.
PARTassembly	You can select a dynamic assembly and insert it as a component in the active VX Overdrive™ assembly. A dynamic assembly refers to one that can be altered within PARTsolutions prior to inserting it.
PARTconnection	You can insert a range of 3D fastener assemblies based on two plate thicknesses (i.e., the plates being fastened). You can specify the fastener components (e.g., bolt, nut, washer, etc.) within PARTconnection and then insert the assembly as a component in the active VX Overdrive™ assembly.

- PARTshaft** You can insert a range of 3D shafts and assemblies that are parametrically designed within PARTshaft. You can specify the shaft dimensions and select additional components such as bearings, o-rings, seals, etc. and then insert the assembly as a component in the active VX Overdrive™ assembly.
- PARTreplace** You can replace a component in the active VX assembly with a PARTsolutions component but it will not force adjustments to the assembly due to dimensional changes.
- PARTshell Check In** You can "check in" a native VX part into PARTsolutions. Once the part is checked in, you can create new records in the variable table within PARTsolutions for deriving a family of parts based on your original VX Overdrive™ component.
- PARTshell Check Out** You can "check out" a component that was previously "checked in" using the PARTshell Check In function.

New Cooling Channel Feature

VX Overdrive™ V5 Mold Edition includes a new cooling channel feature that automatically generates cooling channel routing based on a supplied diameter selected centerlines (see figure 4). Drill tip angles can be included or omitted.

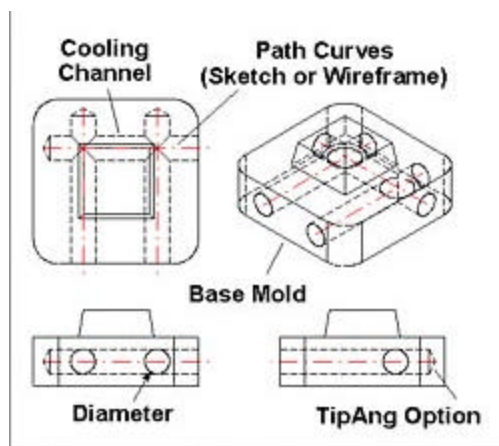


Figure 4 - VX Overdrive™ V5 Mold Edition automates the design of cooling channels in core and cavity blocks.

Other Mold Design Functions

VX Overdrive™ V5 Mold Edition also comes equipped with a suite of tools to assist in the mold design process. Parting lines can be created in a variety of automated and manual methods. Parting line connections can be analyzed to locate gaps and overlaps. Draft features can be applied to the entire part or individual faces. Draft analysis locates potential undercuts that may hinder core/cavity separation. Automatic separation of part geometry into core and cavity regions is supported as is automatic trimming of core/cavity blocks.

Slide and insert design from profiles is made easier by automating much of the process. Many different methods of creating parting surfaces are also supported, including the following: creating parting surfaces from parting lines, at an angle to a face, normal to a plane or swept along a curve. Much of the work required to create parting line transitions and reliefs is also automated.

New Import Repair Menus

Critical to the mold design process is the ability to successfully import CAD data from a variety of MCAD systems and industry standard formats (see Table 2). Very often, imported data contains mismatched edges and abnormal surfaces. VX Overdrive™ V5 includes a new import repair tool bar that contains the

most common tools for analyzing and healing part topology. Gaps are identified for visual inspection or automatic healing. Other healing functions include curve and surface fairing (control point redeployment), refitting, and control point reduction - all aimed toward the reduction or removal of curve and surface abnormalities.

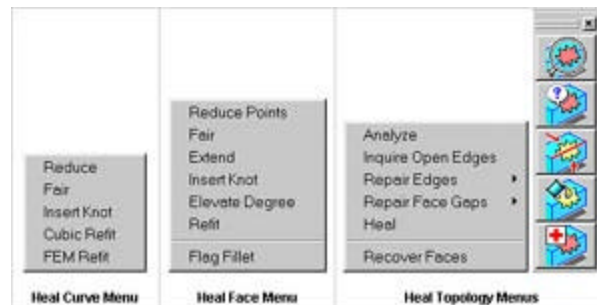


Figure 5 - VX Overdrive™ V5 provides interactive and automatic healing functionality for curves, surfaces and solid topology as indicated by the menus shown above.

Table 2 – VX Overdrive™ V5 Supported Import/Export Formats

Format	Import	Export	2D Drawings	3D Parts
IGES	•	•	•	•
STEP	•	•	•	•
VDA	•	•	•	•
DWG	•	•	•	•
DXF	•	•	•	•
DXF(B)	•	•	•	•
VXN	•	•	•	•
CATIA	•		•	•
STL		•		•
VRML		•		•
HTML		•		•
PS2	•		•	
PS3	•			•
Parasolid	•	•		•

Other VX Overdrive™ Features

Although this review simply cannot cover all of the new VX Overdrive™ functionality, I believe it is worth mentioning that the sheet metal module FabDesign is now included in the base product and supports many sheet metal specific features (see Figure 6), and supports full and partial flanges with automatic reliefs, dimples, louvers, and closed corners. Sheet metal parts can be designed in the folded and unfolded state. Sheet metal attributes, such as thickness and K-factor, can be defined once and then applied to new parts.

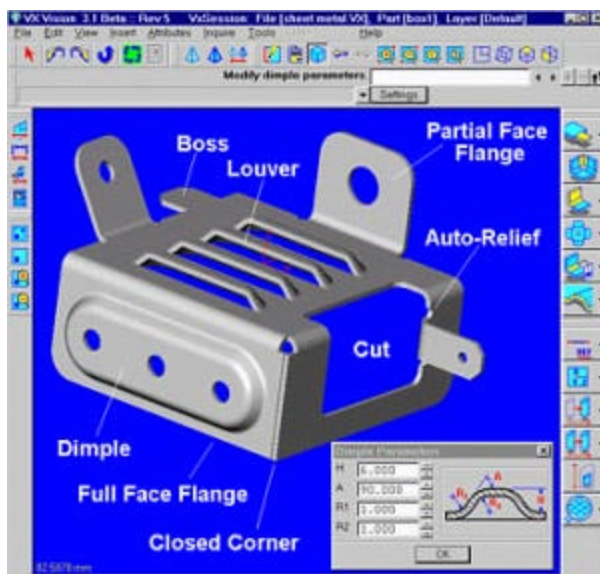


Figure 6 - The FabDesign module of VX Overdrive™ is a direct extension of part and assembly modeling. It supports cuts across bends, dimples, louvers, reliefs, full and partial flanges as well as open and closed corners.

VX Overdrive™ V5 also supports advanced rendering including scene positioning, light sources, texture mapping, ray tracing and surface transparency to name a few. A full-featured drafting package can be used to create associative details of 3D parts or as a stand-alone drafting tool. VX Corporation has carved a niche for itself in the mold design and tooling industry due to an optional integrated 3-5 axis CAM package.

Conclusions

VX Overdrive™ made its debut in 1999 and already contains features that contend with even high-end MCAD systems. However, there are things about this product that still need improving. For example, the history list is not in a graphical tree structure similar to all other MCAD systems. This structure would make it easier to understand the parametric history, especially for designers that are new to the part. The customization tools also need revamped. You can't customize the contents of the tool bars, and the user menu feature is cryptic and undocumented. Having mentioned these shortcomings, VX Overdrive™ is still a full-featured product that can handle the most complex design tasks. It is well worth taking a look at for your next MCAD application.

Comments? Feedback? [Click here](#) to tell us what you think about this topic or if you have additional information you'd like to share on this subject!

Don LaCourse writes about MCAD applications and is president of The Solid Modeling ExChange, a design, applications support, and online help documentation firm in Cookeville Tennessee. He can be reached at dlacourse@charter.net

VX Overdrive™ V5

Minimum System Requirements: Windows 2000, NT

Price: \$3,995

Includes: Solids, Advanced Surfacing, Assembly, Drafting, Translators, Healing, Rendering, Sheet Metal and Mold Design (V5 only)

Availability: Now

Contact: VX Corporation, www.vx.com