

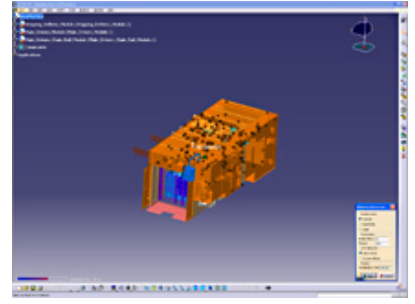
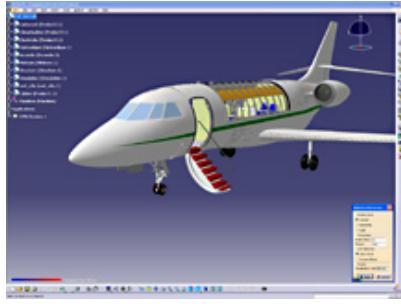


Vertex Buffer Objects Frequently Asked Questions

Whether you're using CATIA® for automotive design, aerospace engineering, plant design or consumer product prototyping, ATI FireGL™ desktop and mobile workstation graphics accelerators deliver ground-breaking features and performance for the most demanding workstation users. Accelerated by ATI FireGL graphics, CATIA's innovative capabilities deliver an exceptional level of realism for aesthetic, visual designs and the ability to experiment with design options in real-time which can help increase creativity and innovation to streamline the manufacturing process. A recent technology addition to CATIA called VBO is now adding further performance capabilities to your design process.

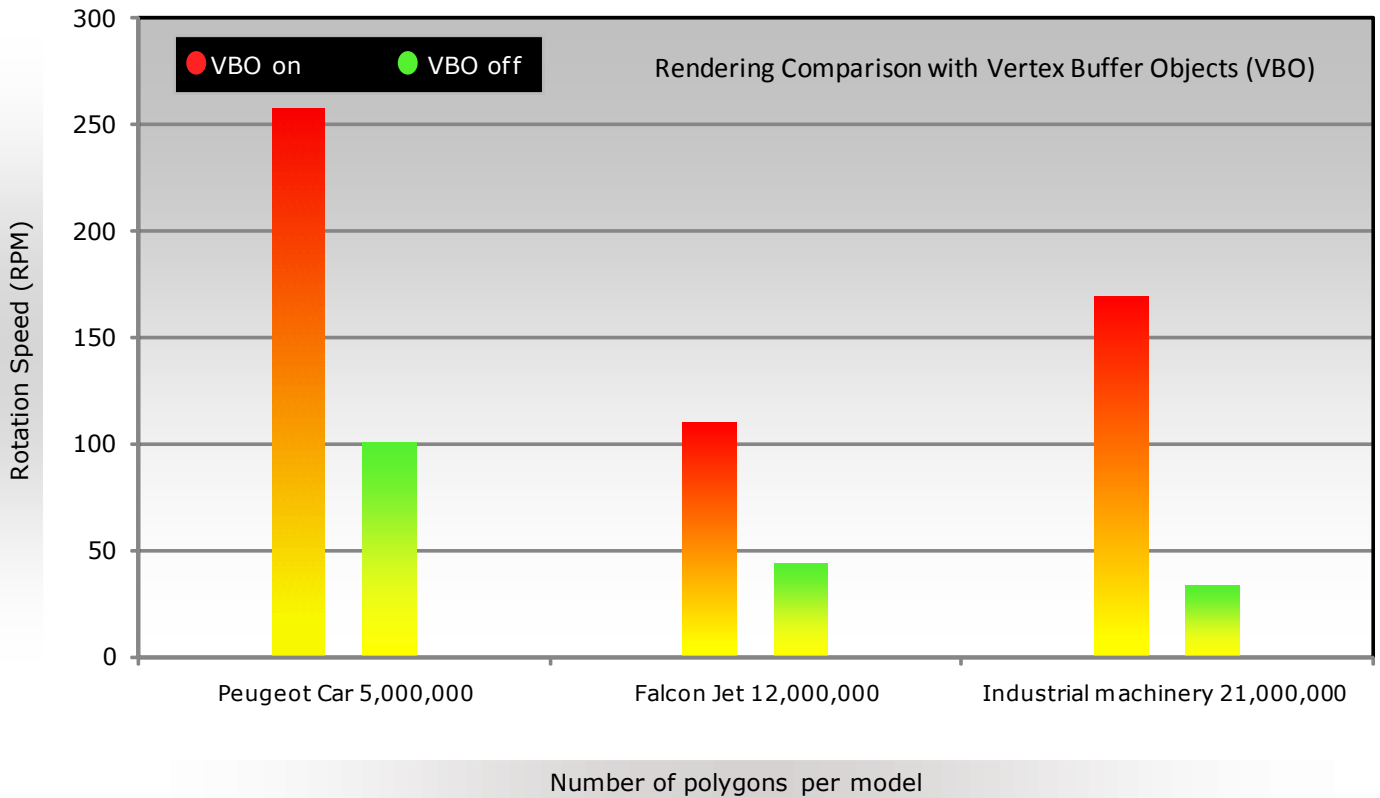
1. **What is VBO and how does it work?**
Vertex Buffer Objects (VBO) is part of CATIA V5R18 or higher versions. It is a buffer which is stored on the GPU memory and when activated, the application stores vertex data for triangles and lines in this location.
2. **Why is VBO important?**
VBO is a modern and innovative way for an application to render data without repeatedly accessing the computer's sub systems such as the hard drive and therefore help achieve higher operational performance. The data is stored on the GPU memory allowing direct and immediate access.
3. **Where and when is it available? How would someone access it?**
As noted above, VBO is a new feature of CATIA V5R18 and higher versions that can be used by all current models of the ATI FireGL graphics accelerator available for shipping as of June, 2008. The amount of memory that can be used is based on the graphic memory available on the card. The more data (geometry, textures, Framebuffer resolution) you need to visualize, the more memory is utilized in the process. In order to use VBO, the application needs to use some specific OpenGL APIs.
4. **Is VBO proprietary technology and unique to AMD/ATI FireGL?**
It is not proprietary however, Dassault Systèmes worked on CATIA (V5 R18 and higher) with ATI to develop the implementation of VBO to meet their specific requirements for performance and efficiency.
Some key requirements for VBO implementation are:
 - A clear status of the amount of memory available at anytime in order to stop allocating the buffer as appropriate and therefore avoiding any impact on application process memory.
 - Fast creation/destruction and transfer of these buffers to maintain a good level of performance and interactivity at any time.
 - The implementation of the Vertex Buffer Objects technology in CATIA boosts AMD's competitive edge with respect to graphics acceleration performance.
5. **Will VBO be available in other CAD applications?**
Yes currently it is also available in SolidWorks.
6. **Which ATI FireGL SKUs takes advantage of VBO?**
All current models of the ATI FireGL graphics accelerator available for shipping as of June, 2008
7. **Do other GPU makers have access to VBO?**
Yes, however as noted, AMD's current VBO implementation boosts its competitive edge with respect to graphics acceleration performance.
8. **How does AMD intend to maintain its performance lead in this area?**
AMD is in a unique position to offer solutions to customer challenges because of the fact that it offers a platform wide solution (both CPU and GPU). For example, in future implementations, multi core CPUs are being designed to thread tasks such as creation/destruction/transfer and rendering of the data further enhancing performance and increasing productivity.

The following chart illustrates the performance advantage of VBO. Three models with various number of polygons and objects were used to produce this chart. Each model was opened in two identical instances of CATIA (V5R18) on an Intel® Core™ 2 Extreme



QX6800 Asus P5W64-WS Pro with 4 GB of system RAM running Windows™ XP32 using an ATI FireGL™ V86500 Workstation Graphics Accelerator.

Using CATIA's capabilities, each model was set to rotate 400 turns for both instances. One instance on each test had VBO turned on. CATIA reports both duration for the action as well as overall performance. These results were plotted and are shown in the chart below.



For further details on ATI FireGL™ 3D Graphics Accelerators please visit:

<http://ati.amd.com/products/workstation.html>

<http://ati.amd.com/products/workstation/catia.html>