Autodesk Inventor Performance Excels Against Primary Competitors.

A series of benchmark tests proves that the performance of Inventor for typical day to day work excels against its competitors. This is particularly true for the so-called “high end” systems—CATIA, Pro/E, and NX.

- Against CATIA, Inventor uses half the memory resources and is 2-4 times faster. In pattern feature creation, assembly editing, and drawing view creation Inventor runs almost 5 times faster.
- Compared to Pro/ENGINEER Wildfire Inventor uses half the memory resources and is 1.5 times faster. Part model operations are comparable.
- Compared to UG NX, Inventor is 2-4 times faster and in some case 20 times faster.
- Compared to SolidWorks, Inventor is 3.6 times faster for large assembly handling and uses less memory.

The benchmark tests measured the performance of Autodesk® Inventor™ against its strongest competitors, including CATIA, Pro/ENGINEER, SolidWorks and NX. The measurements focused on the resources used by each application, the performance on loading and editing assemblies, drawing preview, view creation, part model rebuild, and feature pattern creation.

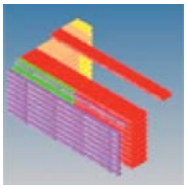
These functions are those most commonly performed by end users in their day to day work and thus user experiences can be expected to closely mirror these test results.

The parts used

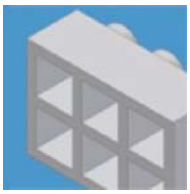
For each application, an identical set of typical CAD workflows covering Assembly, Part and Drawing operations are carried out against an equivalent set of test models with varying sizes. Each system’s performance behavior, defined by the execution time in actual end user time and the systems memory consumption, were measured and analyzed for all the workflows contained in this investigation. When comparing each application versus Inventor, each application was installed on the same test computer with similar hardware and software configurations. Performance data was measured with a stopwatch to record actual end user time for a particular action. CPU times and memory usage data were also recorded.

Four sets of test models are used in this investigation:

- A set of assembly models ranging in size from 234 unique parts and 1593 instances to 270 unique parts and 4879 instances. Shown right is a sample assembly.



- A set of part models consisting of primarily extruded pattern features (Matrix Parts) ranging in size from 500 features to 4000 features. Shown right is a sample of the 1000 feature part.



- A set of low style part files (Low style Parts) ranging in size from 100 features to 500 features as shown below.

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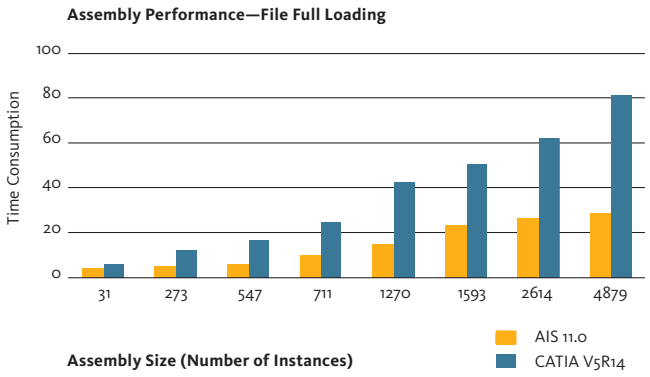
Inventor Performance Comparison

Key Performance Highlights

The following graphs are selected results that support the above conclusions.

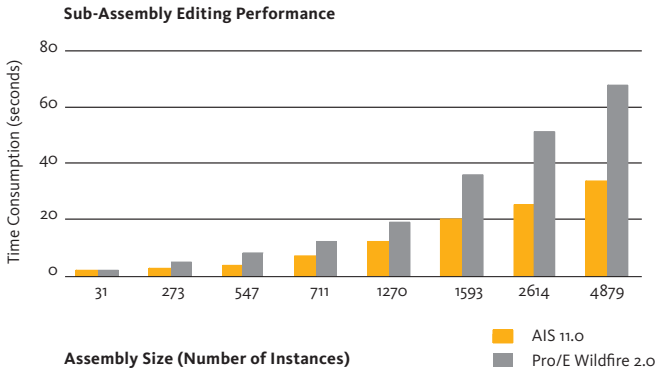
CATIA

In our conclusions in the introduction we noted that "Against CATIA, Inventor uses half the memory resources and is 2-4 times faster. In pattern feature creation, assembly editing, and drawing view creation Inventor runs almost 5 times faster." Below clearly shows this advantage in assembly loading.



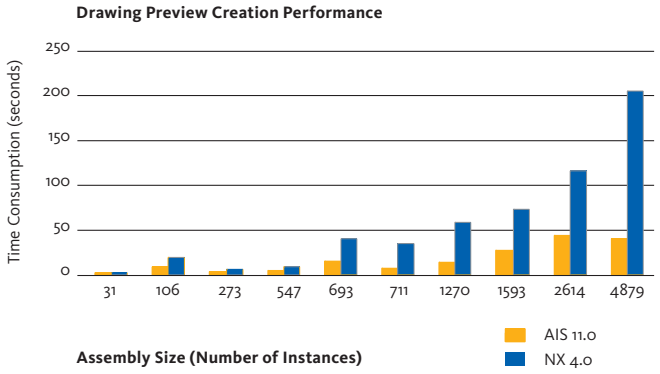
Pro/ENGINEER

Shown below is the result of sub-assembly editing performance. Note the increasing advantage Inventor has over Pro/ENGINEER for larger assemblies.



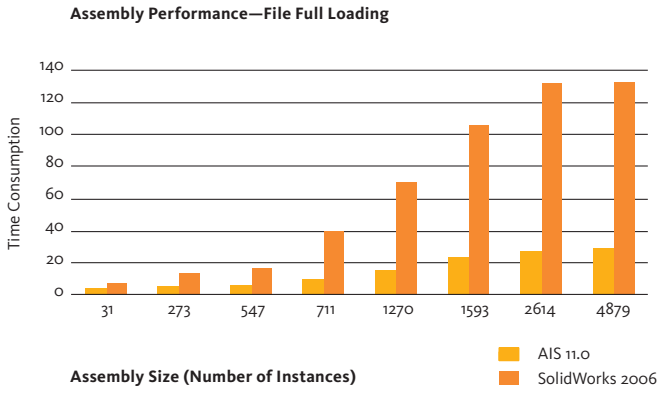
NX

One example of the Inventor performance advantage over NX is in drawing preview creation. The figure below it shows the results. For large assemblies, Inventor is more than 4 times faster. Users will be waiting less than a minute for Inventor to complete with the largest assembly size, compared to 3.5 minutes for NX.



SolidWorks

For part model rebuild performance (matrix part) Inventor is consistently faster than SolidWorks in loading and editing large assemblies.



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Test details

Table 1 – Summary of the results.

	Inventor vs. UG-NX	Inventor vs. CATIA	Inventor vs. PRO/E	Inventor vs. SolidWorks
Application Startup	27%-31% faster	2X faster	22% faster	Comparable
Assembly loading	3.4X faster assembly loading 4.3X faster subassembly editing	2.4X faster loading 5.4X faster editing	Comparable loading 1.7X faster editing	3.6X faster loading 2.7X faster editing
Drawing preview creation	2.6X faster	3.2X faster	1.4X faster	2X faster
Drawing view creation	3X faster up to 700 parts >700 parts-10 to 30X faster	2 to 5X faster	N/A	Comparable for 1200 instances and larger
Part model rebuild	500 features, 10-20X faster	3 to 4X faster for complex parts (>500 features)	N/A	N/A
Pattern feature creation	N/A	4-5X faster	2-8X faster	N/A

The measurements used

Application Startup establishes a startup behavior baseline for each system.

Assembly Loading evaluates the general, full assembly loading behavior and the systems scalability as the number of unique parts and occurrences increases.

Sub Assembly Editing follows these specific steps of operation:

1. For each test assembly model, start a new CAD session.
2. Open the assembly using "All Components Suppressed" LOD.
3. Start stopwatch.
4. Edit the top subassembly, which forces the subassembly to load.
5. Report time and memory consumption.

Drawing Preview Creation evaluates the performance and capacity behavior with drawing preview creation.

1. For each assembly model, start a new CAD session.
2. Create a new drawing document.
3. Start stopwatch.
4. Loading an assembly (the preview will be floating), with Hidden Lines Removed option and scale 1:20.
5. Measure time and memory usage.

Drawing View Creation evaluates the actual drawing view creation performance and capacity behavior.

1. For each assembly model to test, start a new CAD session.
2. Create a new drawing document.
3. Loading an assembly (the preview will be floating), with Hidden Lines Removed option and scale 1:20.
4. Start stopwatch.
5. Create a drawing view.
6. Measure time and memory usage.

Pattern Feature Creation in a part evaluates the performance and capacity behavior with pattern feature creation in a part.

1. Open the template part.
2. Edit the parameter the pattern feature.
3. Start stopwatch.
4. Generating the pattern feature as the specified parameter by clicking Update button
5. Measure time and memory usage.

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