The Official CINEMA 4D XL Benchmark-Suite V1.0

Contents

Foreword

Welcome to the CINEMA 4D benchmark suite. This program runs several tests to determine the speed of graphics adapters as well as processor speed.

Requirements

You need a computer with a minimum of 48 MB of physical RAM. Turning on virtual memory is not recommended because this leads to very inaccurate values (e.g. because of initiating disk swapping).

Installation

Extract the files from the archive with the correct folder structure into a new folder on your hard disk. Do not change the location or the name of any of the folders or files that come with this benchmark suite. No further installation procedure is required. Just double click the CINEMA 4D icon inside the benchmark folder and the test will start automatically. After the test has finished a dialog box will appear with the results of the test.

Preparations

Before running this benchmark program you should eliminate any disruptive effects. Therefore quit all other applications and tasks. Turning on virtual memory is not recommended. This leads to very inaccurate results (e.g. because of initiating disk swapping). If you are connected to a network you should disable your access or log off from the network. While testing you shouldn't move the mouse nor hit any keys on the keyboard.

Important Notes On Graphics Accelerators

Some graphics accelerators are known to silently switch OFF acceleration on resolutions higher than 800x600 pixels or higher than 1024x768 pixels. Some of these cards quit acceleration when your screen resolution is higher than the mentioned values others do so when your CINEMA 4D editor and output windows exceed these values. To be on the safe side you should run the benchmark suite with a maximum screen resolution of 800x600 pixels.

Then there are some accelerators (mainly OpenGL graphics adapters) that do not support hardware acceleration with color depths of 24 bpp (bits per pixel) or higher. That is "True Color" under Windows and "Millions of Colors" under MacOS. If that is the case, the operating system usually switches back to software-based support. Time, perhaps, to watch "Gone With The Wind" while the test completes itself. Therefore you should switch back to a 16 bpp colour palette, which is "High Color" under Windows and "Thousands of Colors" under MacOS.

We recommend that you do both, i.e. set the screen resolution to 800x600 pixels and the colour depth to 16 bpp.

Another very interesting statement regarding multi-monitor solutions under Windows 98 can be found on the ELSA support pages http://www.elsa.com/SBASE/C/FAQ/E_CADW98.HTM:

> *"When using more than one board, only software-OpenGL is possible (due to restrictions in Windows 98)"*

Running the Test

The suite will perform six different tests which will take approximately 2 to 6 minutes depending on your hardware.

1. 2D Performance (C4D)

An object is rotated 3 times, thereby increasing the number of polygons in the scene. The test measures how many triangles per second can be drawn line by line with CINEMA 4D's built-in software engine.

2. 3D Performance (C4D)

An object is rotated 3 times, thereby increasing the number of polygons in the scene. The test measures how many triangles per second can be Gouraud shaded with CINEMA 4D's built-in software engine.

3. 2D Performance (GL)

This test performs like the one in step 1. This time an installed OpenGL or QuickDraw 3D RAVE accelerator card will be used for output. If you don't have an accelerator card attached to your system, you can check whether software based OpenGL/RAVE is faster than CINEMA 4D's built-in software engine – provided that you have appropriate software drivers installed in your system.

4. 3D Performance (GL)

This test performs like the one in step 2. This time an installed OpenGL or QuickDraw 3D RAVE accelerator card will be used for output. If you don't have an accelerator card attached to your system, you can check whether software based OpenGL/RAVE is faster than CINEMA 4D's built-in software engine – provided that you have appropriate software drivers installed in your system.

5. SP Performance

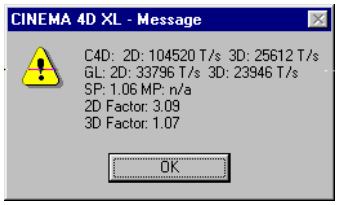
CINEMA 4D's raytracer renders 3 different scenes in different output resolutions with different numbers of textures and different values for refractions, shadows and reflections. Each scene will be pre-rendered first in a very small resolution first to eliminate any hard disk dependencies. (So all textures are loaded into your computer's physical memory.)

6. MP Performance

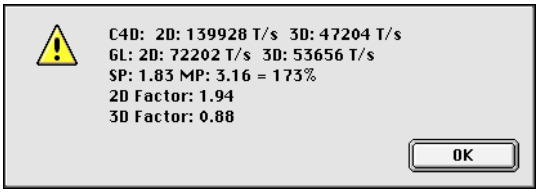
This test performs like the one in step 5. However, this one will only be performed if you have more than one CPU installed in your computer and your operating system supports multiple CPUs. While this test is performed Apple Macintosh users will only see a white window, because the window output would distort the expected results significantly.

The Benchmark Results

After the test has finished you're presented a final dialog box that shows you 5 rows filled with different numbers/values:



Result-box under Windows
Single processor machine



Result-box under MacOS
Dual processor machine

- The first line shows how fast CINEMA 4D's built-in software engine is in 2D and 3D.
  The value displayed represents the number of triangles drawn per second. The higher the values the better.

- The second line shows how fast your graphics accelerator card is in 2D and 3D.
  The value displayed represents the number of triangles drawn per second. The higher the values the better. Please note that CINEMA 4D does not support OpenGL under MacOS though the line in the dialog might lead to a different conclusion. QuickDraw3D RAVE is meant here.

- The third line shows how fast CINEMA 4D's raytracer is with 1 CPU (SP) and multiple CPUs (MP). The second value is displayed only if there is more than one CPU installed in your computer.
  The value displayed is the so called *CINEMA 4D Index*. By default a Pentium processor with 133 MHz has an index of 1. The higher the values the better. A computer with an index of 4 is four times faster than a Pentium 133 MHz for raytracing.
  If you're using a multi-processor machine, you'll find an additional value that compares the results of SP and MP raytracing (right figure). Usually you'll get 180% out of 2 CPUs and 360% out of 4 CPUs.

  If you have multiple CPUs in your computer and you get only a low MP percentage, then something is wrong! Either your operating system does not support multiple CPUs (e.g. Windows 95/98) or you

have general problems with your hardware (loose contacts, etc.). Also a dual Pentium machine offers lower results due to the fact that both processors have to use the same L2 cache.

- The fourth line compares the 2D values of the accelerator card and CINEMA 4D's built-in engine. The factor "CINEMA 4D performance divided by hardware accelerator performance" is shown. You can easily determine which one is faster.
  If the value is greater than 1.00, then CINEMA 4D is faster. For example, a value of 2.00 would indicate that CINEMA 4D is twice as fast as the graphics accelerator.
  If the value is less than 1.00, then the hardware accelerator is faster. For example, a value of 0.50 would indicate that the graphics adapter is twice as fast as CINEMA 4D.

- The fifth line compares the 3D values of the accelerator card and CINEMA 4D's built-in engine. The factor "CINEMA 4D performance divided by hardware accelerator performance" is shown. You can easily determine which one is faster.
  If the value is greater than 1.00, then CINEMA 4D is faster. For example, a value of 2.00 would indicate that CINEMA 4D is twice as fast as the graphics accelerator.
  If the value is less than 1.00, then the hardware accelerator is faster. For example, a value of 0.50 would indicate that the graphics adapter is twice as fast as CINEMA 4D.

Now write down the values for further comparison. Hit the OK button of the dialog box and choose "Quit" from the "File" menu.

Interpreting the Results

Well, let's start with the easy ones, the SP and MP factors. Actually there's nothing you really have to care about. The higher the value, the faster is your computer, the quicker you get any rendering results.

And now for the tricky ones, the speed results of the graphics tests. To get comparable results you have to test every graphics adapter in one and the same machine under the same conditions. If for example you compare a Diamond FireGL 4000 in a Pentium 266 MHz computer with an ELSA GLoria-XL in a Pentium II 400 MHz environment, the best you can get is an upward or downward trend, but nothing really comparable.

You can minimize that trend result by building up relative values, e.g. dividing the card results by the CINEMA 4D results (as CINEMA 4D also profits from a higher CPU speed). However, it is more than likely that the speed increase with CINEMA 4D is not as great as speed increase with the graphics adapter – it's just … trendy.

By the way, this division is already made by the benchmark program (see results, lines 4 and 5).

> Again:
>
> If you want comparable results, you have to test every graphics adapter in the same environment (i.e. on the same computer).

One additional word about these hardware comparison tests. It's well known that – especially under Windows – you almost never get completely rid of any previously installed hardware drivers. And some drivers or any of their entries in any of the inizialization scripts, though they're not needed any more, can cause unpredictable results in your computer system's overall stability. Better computer magazines e.g. always do a clean OS installation before adding new exchange hardware to the system (this starts with formatting your boot drive and beginning from scratch). So, if you really wnat to test different graphics adapters … well, good luck.

Oh, and before you start laughing: the same problems are known for MacOS. However, it's easier to find all older driver components manually here.

Improving System Performance

Now, you're the lucky guy who doesn't care about all that hardware comparison stuff. You have your one computer and that is that. You're asking yourself how you could possibly use the CINEMA 4D benchmark suite for your own benefit.

The first thing could be to share your experiences (the benchmark results) with your friends and neighbours. You then can either boast about your computer equipment or signal retreat. In either case recall our words of caution concerning what is comparable and what isn't!

But there's more to the CINEMA 4D benchmark suite. You can enhance your system performance (no joke). At the beginning I told you how to prepare properly for the benchmark. Run the first test as stated. Then simply run another test in your usual working environment (e.g. resolution 1280x1024, 32 bbp, network attached, etc.). You will then see if your system slows down considerably. If the system does slow down, you may want to go about eliminating the causes one-by-one.

You can also determine the best environment for graphics hardware acceleration by running several tests and thereby constantly reducing the system load (e.g. do test rows by first decreasing only the system's colour depth, then by decreasing only the screen resolution and finally by doing both).

Ranking

Due to German law we are not allowed to provide you with a detailed list of tested hardware but you are free to spread the results you experience. If you do, you should use the following template:

```
CINEMA 4D Benchmark Suite V1.0
==============================
Tester          : <your name here>
CPU Count       : <number of CPUs in your computer>
CPU Type        : <CPU model name>
Clock Speed     : <the MHz number here>
Memory          : <RAM installed on your machine>
Operation System: <with version (and service pack number, if you have one)>
Graphic Card    : <vendor, model, RAM on board, driver version, if
available>

2D (C4D) : <first line, first value>
3D (C4D) : <first line, second value>

2D (GL)  : <second line, first value>
3D (GL)  : <second line, second value>

2D Factor: <value fourth line>
3D Factor: <value fifth line>

SP       : <third line, first value>
MP       : <third line, second value; "n/a" if there's just one processor>
```

Otherwise your results are useless for comparison.

This template shown above comes with the CINEMA 4D Benchmark Suite, ready for you to fill it out. You'll find the files "Template.txt" for the Windows operating system and "Template.mac" for MacOS.

Example 1

```
CINEMA 4D Benchmark Suite V1.0
==============================
Tester          : Christian Losch
CPU Count       : 1
CPU Type        : Pentium
Clock Speed     : 133 Mhz
Memory          : 64 MB
Operation System: Win95b
Graphic Card    : Spea S3 (no OpenGL)

2D (C4D) : 81000
3D (C4D) : 22900

2D (GL)  : 81000
3D (GL)  : 22900

2D Factor: 1
3D Factor: 1

SP       : 1.00
MP       : n/a
```

Example 2

```
CINEMA 4D Benchmark Suite V1.0
==============================
Tester          : Christian Losch
CPU Count       : 2
CPU Type        : Pentium Pro
Clock Speed     : 200 Mhz
Memory          : 128 MB
Operation System: WinNT 4.0 SP3
Graphic Card    : Matrox Millenium 4MB + Software OpenGL

2D (C4D) : 107500
3D (C4D) : 35600

2D (GL)  : 55700
3D (GL)  : 41500

2D Factor: 1.93
3D Factor: 0.86

SP       : 2.01
MP       : 3.73
```

Example 3

```
CINEMA 4D Benchmark Suite V1.0
==============================
Tester          : Michael Giebel
CPU Count       : 2
CPU Type        : PPC 604e
Clock Speed     : 200 Mhz
Memory          : 256 MB
```

```
Operation System: OS 8.1
Graphic Card    : Phase5 GRex 8MB + Rave

2D (C4D) : 85700
3D (C4D) : 37700

2D (GL)  : 117900
3D (GL)  : 73000

2D Factor: 0.73
3D Factor: 0.52

SP       : 1.86
MP       : 3.14
```

New CINEMA 4D Versions

There will be new versions of CINEMA 4D in the future. Now what, you might ask? On the one hand there's the CINEMA 4D version delivered with the benchmark suite, on the other hand there is this new improved version.

Please do NOT use a different version of CINEMA 4D for benchmarking other than the one provided with the benchmark suite.

We will provide you with new versions of the benchmark suite in the future. This might be the case for example when a new CINEMA 4D version is released with new improved features. It is important to know that you cannot compare values you've determined with one benchmark version with values you determine with another. It is the same as with all the other usual benchmark programs. Noone compares the results of a Winbench 97 with the ones received in 1880.

And now have fun with the benchmark ☺

Christian Losch
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Luke Stacy
(HiSoft Systems)
Thank you for correcting my mistakes. – Michael

If you have any questions about the benchmark suite
or if you would like to send us your results, please contact:

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