



# SPEC<sup>®</sup> CFP2006 Result

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ASUSTeK Computer Inc.  
(Test Sponsor: Intel Corporation)

SPECfp<sup>®</sup>2006 = 72.0

ASUS H97M-PLUS Motherboard (Intel Core i5-4590)

SPECfp\_base2006 = 70.3

CPU2006 license: 13

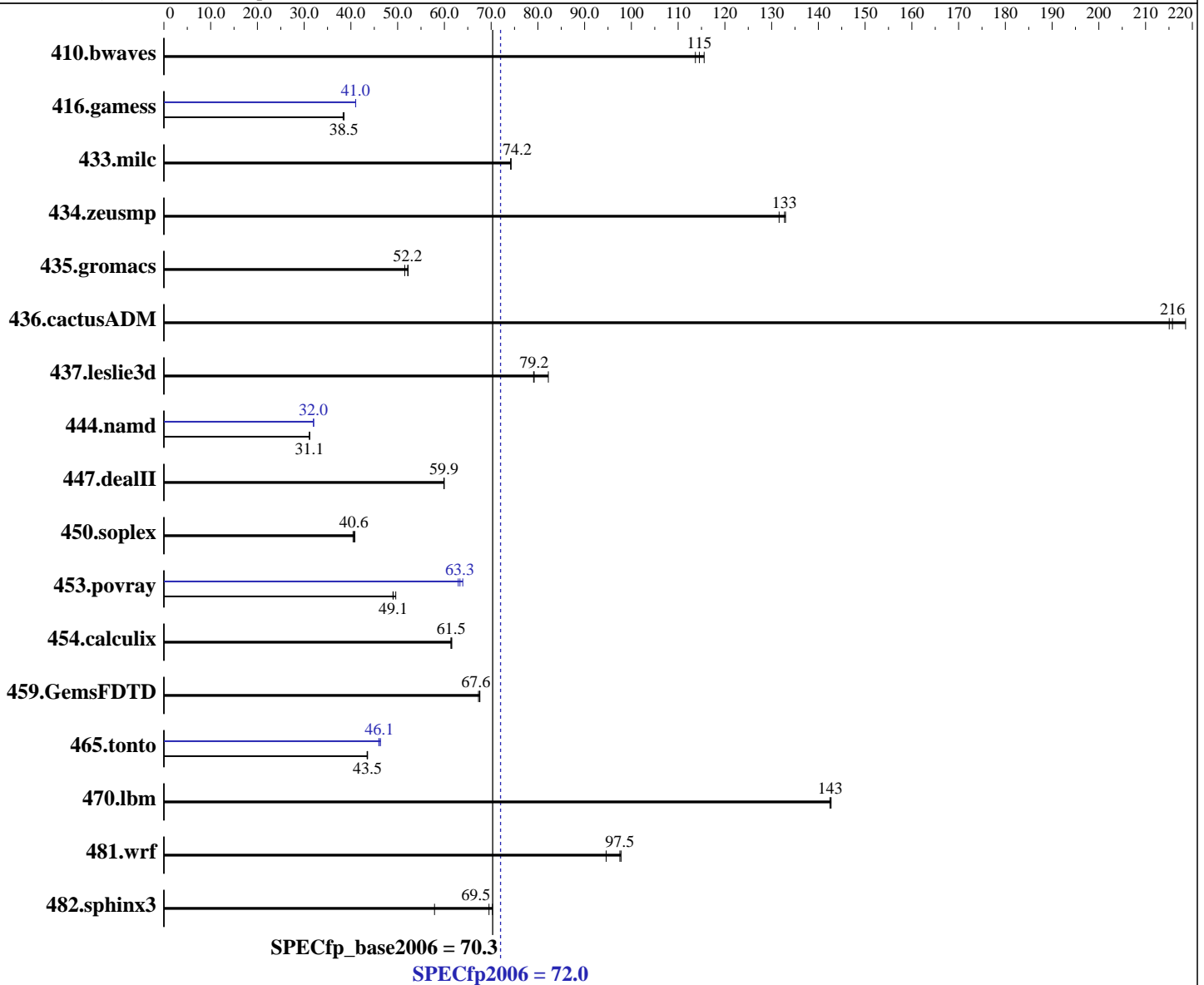
Test date: Jan-2016

Test sponsor: Intel Corporation

Hardware Availability: May-2014

Tested by: Intel Corporation

Software Availability: Nov-2015



### Hardware

CPU Name: Intel Core i5-4590  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 3300  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip  
 CPU(s) orderable: 1 chip  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

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### Software

Operating System: Microsoft Windows 10 Pro  
 10.0.10586 N/A Build 10586  
 Compiler: C/C++: Version 16.0.0.110 of Intel C++ Studio XE for Windows;  
 Fortran: Version 16.0.0.110 of Intel Fortran Studio XE for Windows;  
 Libraries: Version 18.00.30723 of Microsoft Visual Studio 2013  
 Auto Parallel: Yes

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L3 Cache: 6 MB I+D on chip per chip  
Other Cache: None  
Memory: 8 GB (2 x 4 GB 2Rx8 PC3-12800U-11)  
Disk Subsystem: 1 TB SATA, 72000 RPM  
Other Hardware: None

File System: NTFS  
System State: Default  
Base Pointers: 32/64-bit  
Peak Pointers: 32/64-bit  
Other Software: SmartHeap Library Version 11.0 from <http://www.microquill.com/>

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	<b>119</b>	<b>115</b>	118	116	120	114	<b>119</b>	<b>115</b>	118	116	120	114
416.gamess	511	38.3	508	38.5	<b>508</b>	<b>38.5</b>	477	41.0	477	41.0	<b>477</b>	<b>41.0</b>
433.milc	124	74.2	<b>124</b>	<b>74.2</b>	124	74.2	124	74.2	<b>124</b>	<b>74.2</b>	124	74.2
434.zeusmp	<b>68.5</b>	<b>133</b>	68.4	133	69.1	132	<b>68.5</b>	<b>133</b>	68.4	133	69.1	132
435.gromacs	<b>137</b>	<b>52.2</b>	139	51.5	137	52.2	<b>137</b>	<b>52.2</b>	139	51.5	137	52.2
436.cactusADM	54.7	219	55.6	215	<b>55.4</b>	<b>216</b>	54.7	219	55.6	215	<b>55.4</b>	<b>216</b>
437.leslie3d	114	82.2	119	79.1	<b>119</b>	<b>79.2</b>	114	82.2	119	79.1	<b>119</b>	<b>79.2</b>
444.namd	257	31.2	258	31.1	<b>258</b>	<b>31.1</b>	251	32.0	<b>251</b>	<b>32.0</b>	251	32.0
447.dealII	<b>191</b>	<b>59.9</b>	191	59.9	191	59.9	<b>191</b>	<b>59.9</b>	191	59.9	191	59.9
450.soplex	<b>205</b>	<b>40.6</b>	204	40.9	206	40.5	<b>205</b>	<b>40.6</b>	204	40.9	206	40.5
453.povray	<b>108</b>	<b>49.1</b>	107	49.6	109	49.0	83.2	63.9	<b>84.0</b>	<b>63.3</b>	84.5	63.0
454.calculix	134	61.4	134	61.6	<b>134</b>	<b>61.5</b>	134	61.4	134	61.6	<b>134</b>	<b>61.5</b>
459.GemsFDTD	<b>157</b>	<b>67.6</b>	157	67.6	158	67.3	<b>157</b>	<b>67.6</b>	157	67.6	158	67.3
465.tonto	<b>226</b>	<b>43.5</b>	226	43.5	226	43.6	212	46.3	214	46.0	<b>214</b>	<b>46.1</b>
470.lbm	<b>96.4</b>	<b>143</b>	96.4	143	96.3	143	<b>96.4</b>	<b>143</b>	96.4	143	96.3	143
481.wrf	114	97.8	<b>115</b>	<b>97.5</b>	118	94.6	114	97.8	<b>115</b>	<b>97.5</b>	118	94.6
482.sphinx3	<b>280</b>	<b>69.5</b>	337	57.9	277	70.3	<b>280</b>	<b>69.5</b>	337	57.9	277	70.3

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Compiler Invocation Notes

To compile these binaries, the Intel Compiler 16.0 was set up to generate 64-bit binaries with the command:  
"psxevars.bat intel64" (shortcut provided in the Intel(r) Parallel Studio XE 2016 program folder)

## Platform Notes

Sysinfo program C:\SPEC16.0\Docs\sysinfo  
\$Rev: 6775 \$ \$Date:: 2011-08-16 #\$ \8787f7622badcf24e01c368b1db4377c  
running on Clt10C37B4DEDF8 Fri Jan 8 22:01:44 2016

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

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**Software Availability:** Nov-2015

## Platform Notes (Continued)

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

Trying 'systeminfo'

```
OS Name       : Microsoft Windows 10 Pro
OS Version    : 10.0.10586 N/A Build 10586
System Manufacturer: ASUS
System Model  : All Series
Processor(s)  : 1 Processor(s) Installed.
               [01]: Intel64 Family 6 Model 60 Stepping 3 GenuineIntel ~3301 Mhz
BIOS Version  : American Megatrends Inc. 2602, 12/4/2015
Total Physical Memory: 8,070 MB
```

Trying 'wmic cpu get /value'

```
DeviceID      : CPU0
L2CacheSize   : 1024
L3CacheSize   : 6144
MaxClockSpeed : 3301
Name          : Intel(R) Core(TM) i5-4590 CPU @ 3.30GHz
NumberOfCores : 4
NumberOfLogicalProcessors: 4
```

(End of data from sysinfo program)

## Component Notes

Tested systems can be used with Shin-G ATX case,  
PC Power and Cooling 1200W power supply

## General Notes

```
450.soplex (base): "getline_test" src.alt was used.
447.dealII (base): "max_prototype" src.alt was used.
447.dealII (base): "cxx11_make_pair" src.alt was used.
450.soplex (base): "getline_test" src.alt was used.
447.dealII (base): "max_prototype" src.alt was used.
447.dealII (base): "cxx11_make_pair" src.alt was used.
```

OMP\_NUM\_THREADS set to number of processors cores  
KMP\_AFFINITY set to granularity=fine,scatter  
Binaries compiled on a system with 1x Intel Xeon E5-2699 v3 CPU  
+ 64GB memory using Windows 8.1 Enterprise 64-bit



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## Base Compiler Invocation

C benchmarks:

icl -Qvc12 -Qstd=c99

C++ benchmarks:

icl -Qvc12

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

icl -Qvc12 -Qstd=c99 ifort

## Base Portability Flags

410.bwaves: -DSPEC\_CPU\_P64  
 416.gamess: -DSPEC\_CPU\_P64  
 433.milc: -DSPEC\_CPU\_P64  
 434.zeusmp: -DSPEC\_CPU\_P64  
 435.gromacs: -DSPEC\_CPU\_P64  
 436.cactusADM: -DSPEC\_CPU\_P64 -names:lowercase /assume:underscore  
 437.leslie3d: -DSPEC\_CPU\_P64  
 444.namd: -DSPEC\_CPU\_P64 /TP  
 447.dealII: -DSPEC\_CPU\_P64 -DDEAL\_II\_MEMBER\_VAR\_SPECIALIZATION\_BUG  
 -DSPEC\_CPU\_BOOST\_CONFIG\_MSC\_VER -DSPEC\_NEED\_ALGORITHM  
 450.soplex: -DSPEC\_CPU\_P64 -DSPEC\_GETLINE\_TEST  
 453.povray: -DSPEC\_CPU\_P64  
 454.calculix: -DSPEC\_CPU\_P64 -DSPEC\_CPU\_NOZMODIFIER -names:lowercase  
 459.GemsFDTD: -DSPEC\_CPU\_P64  
 465.tonto: -DSPEC\_CPU\_P64  
 470.lbm: -DSPEC\_CPU\_P64  
 481.wrf: -DSPEC\_CPU\_P64 -DSPEC\_CPU\_WINDOWS\_ICL  
 482.sphinx3: -DSPEC\_CPU\_P64

## Base Optimization Flags

C benchmarks:

-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias  
-Qopt-prefetch /F1000000000

C++ benchmarks:

-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias  
-Qopt-prefetch -Qcxx-features /F1000000000 shlw64M.lib  
-link /FORCE:MULTIPLE

Fortran benchmarks:

-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias  
-Qopt-prefetch /F1000000000

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Software Availability: Nov-2015

## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias  
-Qopt-prefetch /F1000000000

## Peak Compiler Invocation

C benchmarks:

icl -Qvc12 -Qstd=c99

C++ benchmarks:

icl -Qvc12

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

icl -Qvc12 -Qstd=c99 ifort

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -QxCORE-AVX2(pass 2) -Qprof\_gen(pass 1) -Qprof\_use(pass 2)  
-Qipo -O3 -Qprec-div- -Oa /F1000000000 shlw64M.lib  
-link /FORCE:MULTIPLE

447.dealIII: basepeak = yes

450.soplex: basepeak = yes

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## Peak Optimization Flags (Continued)

```
453.povray: -QxCORE-AVX2(pass 2) -Qprof_gen(pass 1) -Qprof_use(pass 2)
           -Qipo -O3 -Qprec-div- -Qunroll4 -Qansi-alias /F1000000000
           shlW64M.lib -link /FORCE:MULTIPLE
```

Fortran benchmarks:

410.bwaves: basepeak = yes

```
416.gamess: -QxCORE-AVX2(pass 2) -Qprof_gen(pass 1) -Qprof_use(pass 2)
           -Qipo -O3 -Qprec-div- -Qunroll2 -Ob0 -Qansi-alias
           -Qscalar-rep- /F1000000000
```

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

```
465.tonto: -QxCORE-AVX2(pass 2) -Qprof_gen(pass 1) -Qprof_use(pass 2)
           -Qipo -O3 -Qprec-div- -Qunroll4 -Qauto -Qinline-calloc
           /F1000000000
```

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

The flags file that was used to format this result can be browsed at  
<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-windows.html>

You can also download the XML flags source by saving the following link:  
<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-windows.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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