



# SPEC<sup>®</sup> CFP2006 Result

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ASUSTeK Computer Inc.  
(Test Sponsor: Intel Corporation)

SPECfp<sup>®</sup>\_rate2006 = 138

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

SPECfp\_rate\_base2006 = 136

CPU2006 license: 13

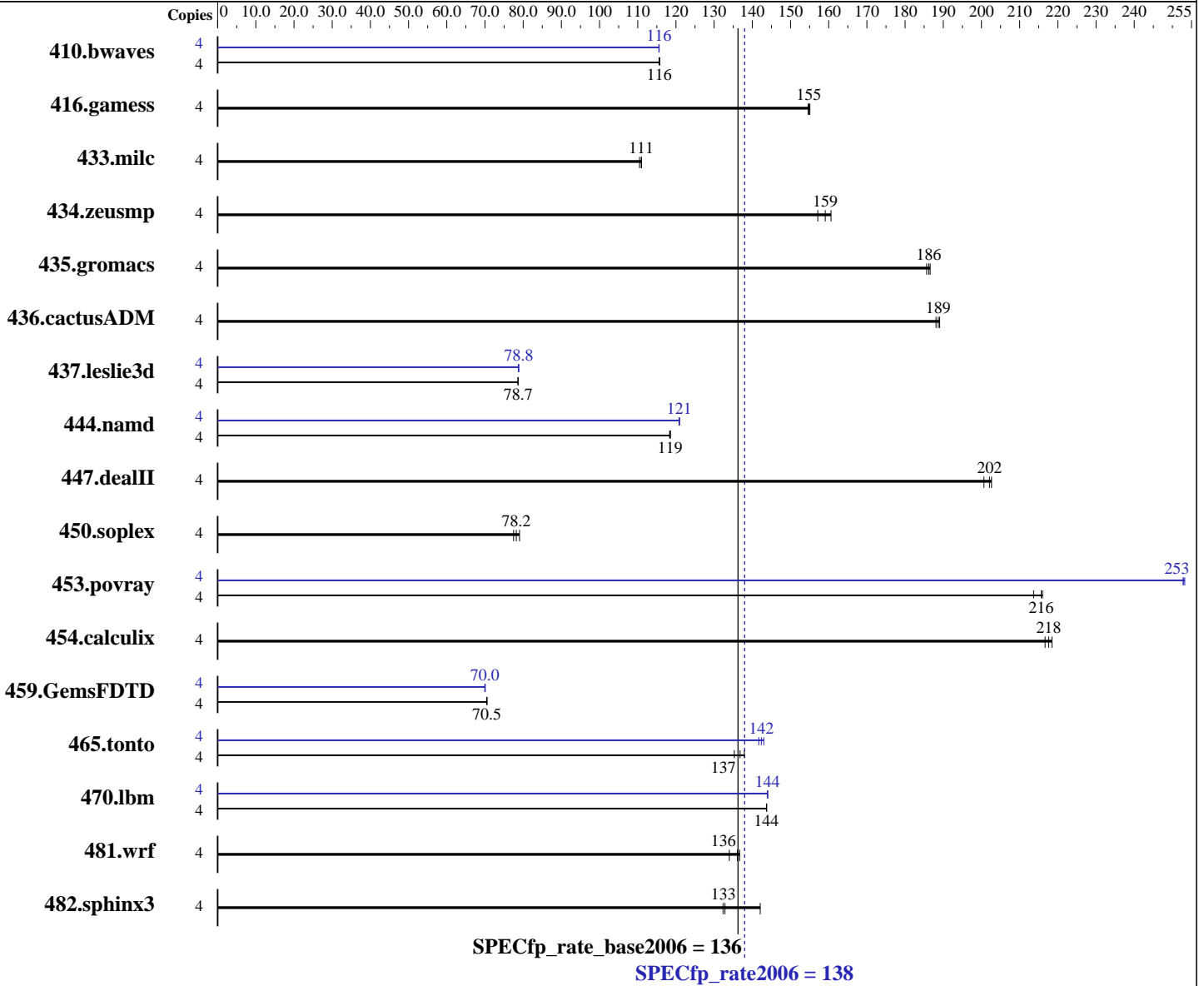
Test sponsor: Intel Corporation

Tested by: Intel Corporation

Test date: Jan-2016

Hardware Availability: May-2014

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: No

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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						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	470	116	<b><u>470</u></b>	<b><u>116</u></b>	470	116	4	470	116	470	116	<b><u>470</u></b>	<b><u>116</u></b>
416.gamess	4	505	155	506	155	<b><u>506</u></b>	<b><u>155</u></b>	4	505	155	506	155	<b><u>506</u></b>	<b><u>155</u></b>
433.milc	4	<b><u>331</u></b>	<b><u>111</u></b>	331	111	332	110	4	<b><u>331</u></b>	<b><u>111</u></b>	331	111	332	110
434.zeusmp	4	<b><u>229</u></b>	<b><u>159</u></b>	232	157	227	161	4	<b><u>229</u></b>	<b><u>159</u></b>	232	157	227	161
435.gromacs	4	<b><u>153</u></b>	<b><u>186</u></b>	154	186	153	187	4	<b><u>153</u></b>	<b><u>186</u></b>	154	186	153	187
436.cactusADM	4	253	189	<b><u>253</u></b>	<b><u>189</u></b>	254	188	4	253	189	<b><u>253</u></b>	<b><u>189</u></b>	254	188
437.leslie3d	4	478	78.7	<b><u>478</u></b>	<b><u>78.7</u></b>	478	78.7	4	477	78.8	478	78.7	<b><u>477</u></b>	<b><u>78.8</u></b>
444.namd	4	271	118	<b><u>271</u></b>	<b><u>119</u></b>	271	119	4	265	121	<b><u>265</u></b>	<b><u>121</u></b>	265	121
447.dealII	4	228	201	<b><u>226</u></b>	<b><u>202</u></b>	226	203	4	228	201	<b><u>226</u></b>	<b><u>202</u></b>	226	203
450.soplex	4	430	77.5	422	79.0	<b><u>427</u></b>	<b><u>78.2</u></b>	4	430	77.5	422	79.0	<b><u>427</u></b>	<b><u>78.2</u></b>
453.povray	4	98.5	216	<b><u>98.7</u></b>	<b><u>216</u></b>	99.6	214	4	84.2	253	<b><u>84.2</u></b>	<b><u>253</u></b>	84.0	253
454.calculix	4	151	218	<b><u>152</u></b>	<b><u>218</u></b>	152	217	4	151	218	<b><u>152</u></b>	<b><u>218</u></b>	152	217
459.GemsFDTD	4	602	70.5	<b><u>602</u></b>	<b><u>70.5</u></b>	602	70.5	4	<b><u>606</u></b>	<b><u>70.0</u></b>	606	70.1	607	70.0
465.tonto	4	285	138	<b><u>288</u></b>	<b><u>137</u></b>	291	135	4	275	143	<b><u>276</u></b>	<b><u>142</u></b>	278	142
470.lbm	4	382	144	382	144	<b><u>382</u></b>	<b><u>144</u></b>	4	382	144	<b><u>382</u></b>	<b><u>144</u></b>	382	144
481.wrf	4	<b><u>328</u></b>	<b><u>136</u></b>	333	134	327	137	4	<b><u>328</u></b>	<b><u>136</u></b>	333	134	327	137
482.sphinx3	4	549	142	<b><u>587</u></b>	<b><u>133</u></b>	589	132	4	549	142	<b><u>587</u></b>	<b><u>133</u></b>	589	132

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 Sat Jan 9 09:02:57 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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**Test date:** Jan-2016  
**Hardware Availability:** May-2014  
**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.
```

Binaries compiled on a system with 1x Intel Xeon E5-2699 v3 CPU  
+ 64GB memory using Windows 8.1 Enterprise 64-bit

## Base Compiler Invocation

C benchmarks:  
icl -Qvc12 -Qstd=c99

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## Base Compiler Invocation (Continued)

C++ benchmarks:

ic1 -Qvc12

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

ic1 -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- -Qansi-alias -Qopt-prefetch  
-Qauto-ilp32 /F1000000000 shlw64M.lib -link /FORCE:MULTIPLE

C++ benchmarks:

-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qansi-alias -Qopt-prefetch  
-Qcxx-features -Qauto-ilp32 /F1000000000 shlw64M.lib  
-link /FORCE:MULTIPLE

Fortran benchmarks:

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

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qansi-alias -Qopt-prefetch  
-Qauto-ilp32 /F1000000000 sh1W64M.lib -link /FORCE:MULTIPLE

## 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: -QxCORE-AVX2 -Qprof\_gen(pass 1) -Qprof\_use(pass 2) -Qipo  
-O3 -Qprec-div- -Qansi-alias -Qopt-prefetch -Qauto-ilp32  
/F1000000000 sh1W64M.lib -link /FORCE:MULTIPLE

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 -Qauto-ilp32 /F1000000000  
sh1W64M.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- -Qopt-prefetch -Qauto-ilp32
/F1000000000 sh1W64M.lib -link /FORCE:MULTIPLE
```

Fortran benchmarks:

```
410.bwaves: -QxCORE-AVX2 -Qprof_gen(pass 1) -Qprof_use(pass 2) -Qipo
-O3 -Qprec-div- -Qansi-alias -Qopt-prefetch /F1000000000
sh1W64M.lib -link /FORCE:MULTIPLE
```

416.gamess: basepeak = yes

434.zeusmp: basepeak = yes

437.leslie3d: Same as 410.bwaves

459.GemsFDTD: Same as 410.bwaves

```
465.tonto: -QxCORE-AVX2(pass 2) -Qprof_gen(pass 1) -Qprof_use(pass 2)
-Qipo -O3 -Qprec-div- -Qunroll4 -Qauto /F1000000000
sh1W64M.lib -link /FORCE:MULTIPLE
```

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 questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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