



# SPEC<sup>®</sup> CFP2006 Result

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ASUSTeK Computer Inc.  
(Test Sponsor: Intel Corporation)

SPECfp<sup>®</sup>2006 = 86.8

ASUS Q170M-C motherboard (Intel Core i3-6320)

SPECfp\_base2006 = 85.4

CPU2006 license: 13

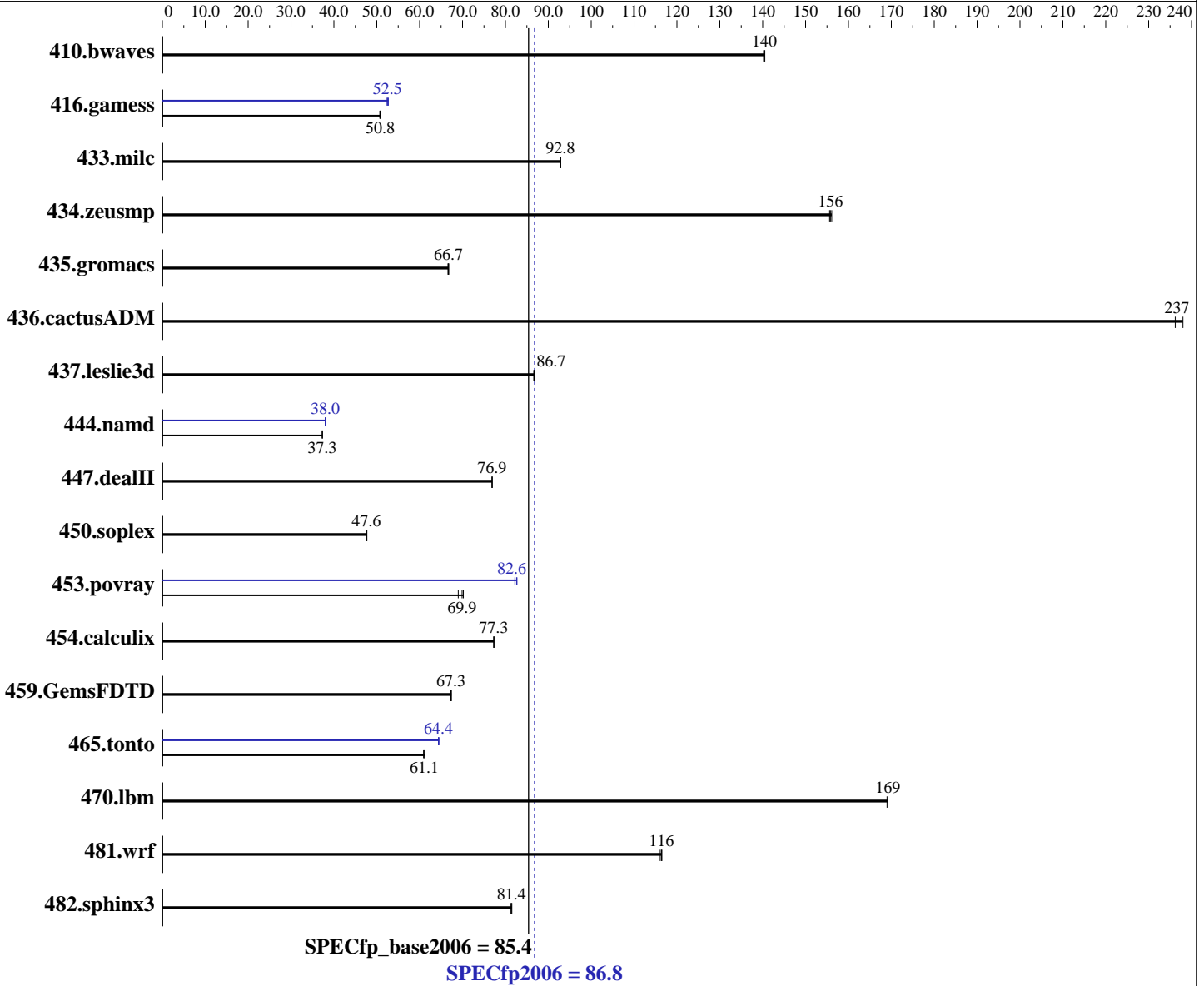
Test date: Mar-2016

Test sponsor: Intel Corporation

Hardware Availability: Sep-2015

Tested by: Intel Corporation

Software Availability: Aug-2015



## Hardware

CPU Name: Intel Core i3-6320  
 CPU Characteristics:  
 CPU MHz: 3900  
 FPU: Integrated  
 CPU(s) enabled: 2 cores, 1 chip, 2 cores/chip, 2 threads/core  
 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 7 Professional 6.1.7601 Service Pack 1 Build 7601  
 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: 4 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 8 GB (2 x 4 GB 2Rx4 PC4-2133P-U)  
 Disk Subsystem: 1 TB Seagate Barracuda HDD, 7200 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	96.9	140	96.7	141	<b><u>96.8</u></b>	<b><u>140</u></b>	96.9	140	96.7	141	<b><u>96.8</u></b>	<b><u>140</u></b>
416.gamess	386	50.8	386	50.7	<b><u>386</u></b>	<b><u>50.8</u></b>	373	52.4	372	52.7	<b><u>373</u></b>	<b><u>52.5</u></b>
433.milc	98.8	92.9	<b><u>98.9</u></b>	<b><u>92.8</u></b>	98.9	92.8	98.8	92.9	<b><u>98.9</u></b>	<b><u>92.8</u></b>	98.9	92.8
434.zeusmp	<b><u>58.4</u></b>	<b><u>156</u></b>	58.5	156	58.3	156	<b><u>58.4</u></b>	<b><u>156</u></b>	58.5	156	58.3	156
435.gromacs	<b><u>107</u></b>	<b><u>66.7</u></b>	107	66.6	107	66.8	<b><u>107</u></b>	<b><u>66.7</u></b>	107	66.6	107	66.8
436.cactusADM	50.6	236	<b><u>50.5</u></b>	<b><u>237</u></b>	50.2	238	50.6	236	<b><u>50.5</u></b>	<b><u>237</u></b>	50.2	238
437.leslie3d	108	86.8	109	86.6	<b><u>108</u></b>	<b><u>86.7</u></b>	108	86.8	109	86.6	<b><u>108</u></b>	<b><u>86.7</u></b>
444.namd	<b><u>215</u></b>	<b><u>37.3</u></b>	215	37.3	215	37.3	211	38.0	211	38.0	<b><u>211</u></b>	<b><u>38.0</u></b>
447.dealII	149	76.9	<b><u>149</u></b>	<b><u>76.9</u></b>	149	76.9	149	76.9	<b><u>149</u></b>	<b><u>76.9</u></b>	149	76.9
450.soplex	175	47.7	<b><u>175</u></b>	<b><u>47.6</u></b>	175	47.6	175	47.7	<b><u>175</u></b>	<b><u>47.6</u></b>	175	47.6
453.povray	<b><u>76.1</u></b>	<b><u>69.9</u></b>	77.1	69.0	75.8	70.2	64.7	82.2	<b><u>64.4</u></b>	<b><u>82.6</u></b>	64.3	82.7
454.calculix	107	77.3	<b><u>107</u></b>	<b><u>77.3</u></b>	107	77.3	107	77.3	<b><u>107</u></b>	<b><u>77.3</u></b>	107	77.3
459.GemsFDTD	158	67.3	158	67.4	<b><u>158</u></b>	<b><u>67.3</u></b>	158	67.3	158	67.4	<b><u>158</u></b>	<b><u>67.3</u></b>
465.tonto	161	61.2	162	60.9	<b><u>161</u></b>	<b><u>61.1</u></b>	<b><u>153</u></b>	<b><u>64.4</u></b>	153	64.5	153	64.4
470.lbm	81.3	169	81.2	169	<b><u>81.2</u></b>	<b><u>169</u></b>	81.3	169	81.2	169	<b><u>81.2</u></b>	<b><u>169</u></b>
481.wrf	96.2	116	<b><u>96.0</u></b>	<b><u>116</u></b>	95.9	117	96.2	116	<b><u>96.0</u></b>	<b><u>116</u></b>	95.9	117
482.sphinx3	240	81.3	<b><u>239</u></b>	<b><u>81.4</u></b>	239	81.5	240	81.3	<b><u>239</u></b>	<b><u>81.4</u></b>	239	81.5

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 CltF832E48856E2 Tue Mar 15 18:15:59 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:** Aug-2015

## Platform Notes (Continued)

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

Trying 'systeminfo'

```
OS Name       : Microsoft Windows 7 Professional
OS Version    : 6.1.7601 Service Pack 1 Build 7601
System Manufacturer: System manufacturer
System Model   : System Product Name
Processor(s)  : 1 Processor(s) Installed.
               [01]: Intel64 Family 6 Model 94 Stepping 3 GenuineIntel ~3900 Mhz
BIOS Version  : American Megatrends Inc. 0704, 1/12/2016
Total Physical Memory: 8,069 MB
```

Trying 'wmic cpu get /value'

```
DeviceID      : CPU0
L2CacheSize   : 512
L3CacheSize   : 4096
MaxClockSpeed : 3900
Name          : Intel(R) Core(TM) i3-6320 CPU @ 3.90GHz
NumberOfCores : 2
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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## 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.dealII: 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-alloc
/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 questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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