SPEC® CFP2006 Result
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Intel Corporation

ASUS Z97-A motherboard (Intel Core i7-4770K)

$SPECfp^{®}2006 =$ 73.7

$SPECfp\_base2006 =$ 71.9
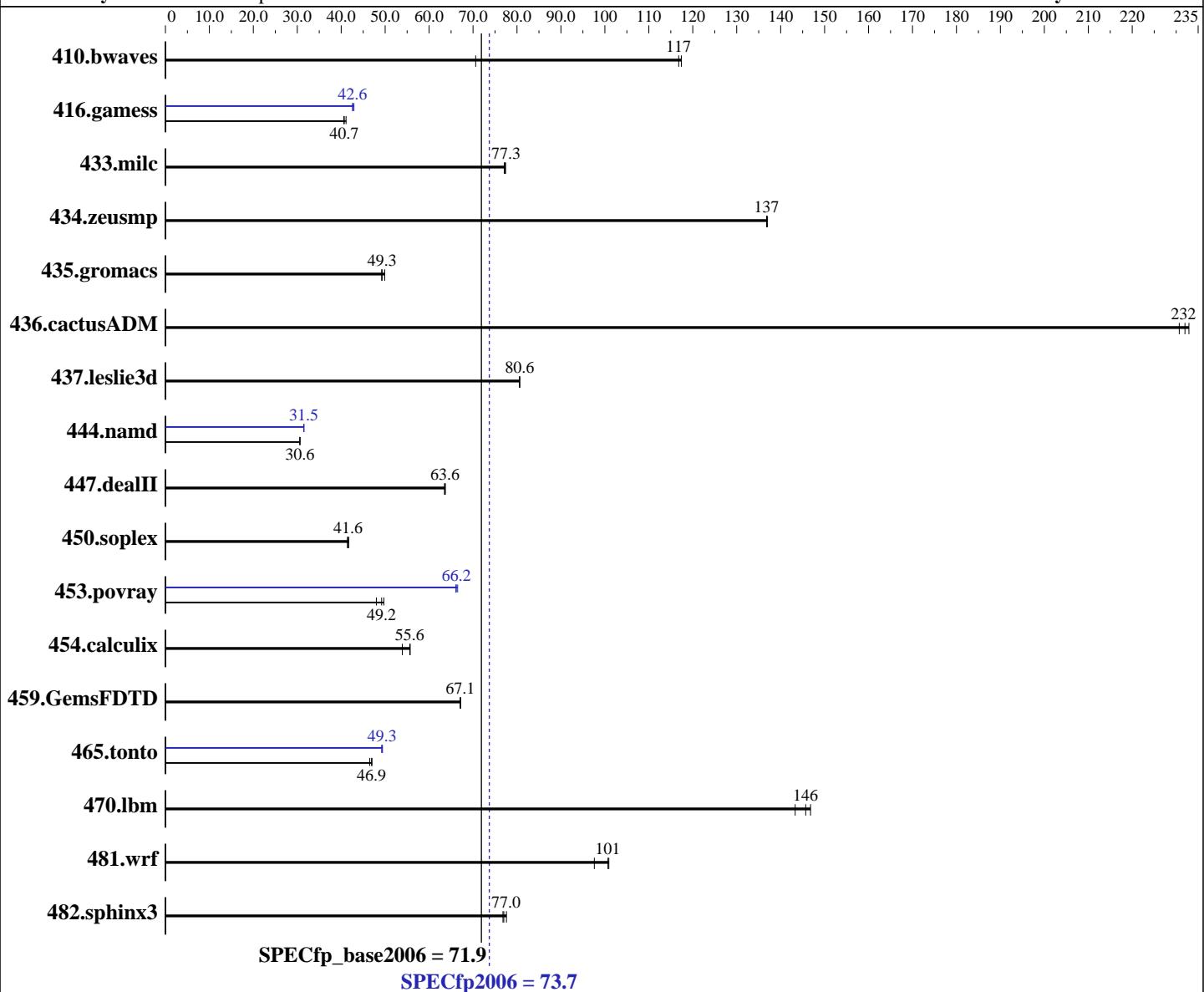
CPU2006 license: 13
Test sponsor: Intel Corporation
Tested by: Intel Corporation

Test date: May-2014
Hardware Availability: Apr-2014
Software Availability: Oct-2013

Benchmark	Value
410.bwaves	117
416.gamess	42.6 / 40.7
433.milc	77.3
434.zeusmp	137
435.gromacs	49.3
436.cactusADM	232
437.leslie3d	80.6
444.namd	31.5 / 30.6
447.dealII	63.6
450.soplex	41.6
453.povray	66.2 / 49.2
454.calculix	55.6
459.GemsFDTD	67.1
465.tonto	49.3 / 46.9
470.lbm	146
481.wrf	101
482.sphinx3	77.0

SPECfp_base2006 = 71.9
SPECfp2006 = 73.7

Hardware

CPU Name:	Intel Core i7-4770K
CPU Characteristics:	Intel Turbo Boost Technology up to 3.90 GHz
CPU MHz:	3500
FPU:	Integrated
CPU(s) enabled:	4 cores, 1 chip, 4 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

Continued on next page

Software

Operating System:	Microsoft Windows 8.1 Pro 6.3.9600 N/A Build 9600
Compiler:	C/C++: Version 14.0.1.139 of Intel C++ Studio XE for Windows; Fortran: Version 14.0.1.139 of Intel Fortran Studio XE for Windows; Libraries: Version 16.00.30319.01 of Microsoft Visual Studio 2010 Professional SP1
Auto Parallel:	Yes

Continued on next page

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L3 Cache:	8 MB I+D on chip per chip	File System:	NTFS
Other Cache:	None	System State:	Default
Memory:	8 GB (2 x 4 GB 2Rx4 PC3-12800U-11)	Base Pointers:	32/64-bit
Disk Subsystem:	180 GB Intel SSD 530	Peak Pointers:	32/64-bit
Other Hardware:	None	Other Software:	SmartHeap Library Version 10.0 from http://www.microquill.com/

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	193	70.6	**116**	**117**	116	117	193	70.6	**116**	**117**	116	117
416.gamess	477	41.1	482	40.6	**481**	**40.7**	456	42.9	**459**	**42.6**	460	42.6
433.milc	**119**	**77.3**	119	77.1	119	77.4	**119**	**77.3**	119	77.1	119	77.4
434.zeusmp	66.4	137	**66.5**	**137**	66.5	137	66.4	137	**66.5**	**137**	66.5	137
435.gromacs	**145**	**49.3**	145	49.2	143	49.9	**145**	**49.3**	145	49.2	143	49.9
436.cactusADM	51.8	231	51.3	233	**51.5**	**232**	51.8	231	51.3	233	**51.5**	**232**
437.leslie3d	117	80.6	**117**	**80.6**	117	80.6	117	80.6	**117**	**80.6**	117	80.6
444.namd	262	30.6	**262**	**30.6**	262	30.6	255	31.5	**255**	**31.5**	255	31.5
447.dealII	**180**	**63.6**	180	63.5	180	63.7	**180**	**63.6**	180	63.5	180	63.7
450.soplex	200	41.7	201	41.4	**200**	**41.6**	200	41.7	201	41.4	**200**	**41.6**
453.povray	**108**	**49.2**	111	48.0	107	49.7	80.0	66.5	80.5	66.1	**80.4**	**66.2**
454.calculix	153	53.9	**148**	**55.6**	148	55.7	153	53.9	**148**	**55.6**	148	55.7
459.GemsFDTD	158	67.2	**158**	**67.1**	158	67.1	158	67.2	**158**	**67.1**	158	67.1
465.tonto	212	46.5	**210**	**46.9**	209	47.0	**199**	**49.3**	200	49.2	199	49.4
470.lbm	95.9	143	93.6	147	**94.3**	**146**	95.9	143	93.6	147	**94.3**	**146**
481.wrf	111	101	**111**	**101**	114	97.6	111	101	**111**	**101**	114	97.6
482.sphinx3	**253**	**77.0**	254	76.8	251	77.6	**253**	**77.0**	254	76.8	251	77.6

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 14.0 was set up to
generate 64-bit binaries with the command:
"ipsxe-comp-vars.bat intel64 vs2010" (shortcut provided in the Intel(r)
Parallel Studio XE 2013 program folder)
```

Platform Notes

```
Sysinfo program C:\SPEC14.0/Docs/sysinfo
$Rev: 6775 $ $Date:: 2011-08-16 #$ \8787f7622badcf24e01c368b1db4377c
running on Z97A Sun Mar 15 04:12:40 2015

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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Platform Notes (Continued)

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

  Trying 'systeminfo'
  OS Name        : Microsoft Windows 8.1 Pro
  OS Version     : 6.3.9600 N/A Build 9600
  System Manufacturer: ASUS
  System Model   : All Series
  Processor(s)   : 1 Processor(s) Installed.
       [01]: Intel64 Family 6 Model 60 Stepping 3 GenuineIntel ~3501 Mhz
  BIOS Version   : American Megatrends Inc. 0702, 4/23/2014
  Total Physical Memory: 8,069 MB

  Trying 'wmic cpu get /value'
  DeviceID       : CPU0
  L2CacheSize    : 1024
  L3CacheSize    : 8192
  MaxClockSpeed  : 3501
  Name           : Intel(R) Core(TM) i7-4770K CPU @ 3.50GHz
  NumberOfCores  : 4
  NumberOfLogicalProcessors: 8

  (End of data from sysinfo program)
  BIOS: SATA mode set to RAID
  Windows Disk Driver: Intel Rapid Storage Technology 12.9.0.1001
```

Component Notes

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

General Notes

```
  OMP_NUM_THREADS set to number of processors cores
  KMP_AFFINITY set to granularity=fine,scatter
  Binaries compiled on a system with 1x Intel Core i7-860 CPU
  + 8GB memory using Windows 7 Enterprise 64-bit
```

Base Compiler Invocation

C benchmarks:
```
     icl -Qvc10 -Qstd=c99
```

C++ benchmarks:
```
     icl -Qvc10
```

Fortran benchmarks:
```
     ifort
```

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Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
```
icl -Qvc10 -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
              -Qoption,cpp,--ms_incompat_treatment_of_commas_in_macros
    450.soplex: -DSPEC_CPU_P64
   453.povray: -DSPEC_CPU_P64 -DSPEC_CPU_NEED_INVHYP -DNEED_INVHYP
  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 -Qauto-ilp32 /F1000000000
```

C++ benchmarks:
```
-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias
-Qopt-prefetch -Qcxx-features -Qauto-ilp32 /F1000000000 shlW64M.lib
          -link /FORCE:MULTIPLE
```

Fortran benchmarks:
```
-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias
-Qopt-prefetch /F1000000000
```

Benchmarks using both Fortran and C:
```
-QxCORE-AVX2 -Qipo -O3 -Qprec-div- -Qparallel -Qansi-alias
-Qopt-prefetch -Qauto-ilp32 /F1000000000
```

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Peak Compiler Invocation

C benchmarks:
```
icl -Qvc10 -Qstd=c99
```

C++ benchmarks:
```
icl -Qvc10
```

Fortran benchmarks:
```
ifort
```

Benchmarks using both Fortran and C:
```
icl -Qvc10 -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 -Qauto-ilp32 /F1000000000
              shlW64M.lib              -link /FORCE:MULTIPLE

   447.dealII: basepeak = yes

   450.soplex: basepeak = yes

   453.povray: -QxCORE-AVX2(pass 2) -Qprof_gen(pass 1) -Qprof_use(pass 2)
              -Qipo -O3 -Qprec-div- -Qunroll4 -Qansi-alias -Qauto-ilp32
              /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
```

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Peak Optimization Flags (Continued)

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-ic14.0-official-windows.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-windows.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
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