SPEC® CPU2017 Floating Point Rate Result

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Fujitsu

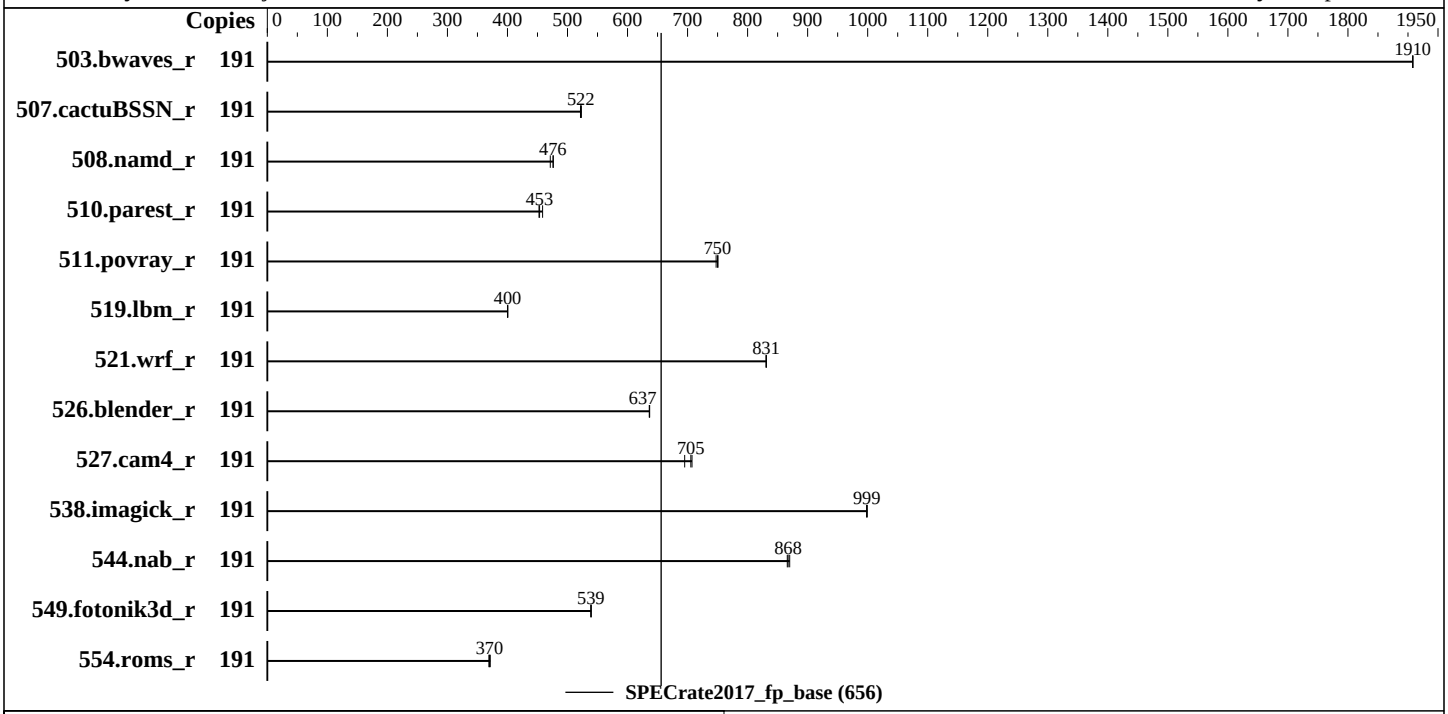
PRIMEQUEST 3800B, Intel Xeon Platinum 8158, 3.00GHz

SPECrate2017_fp_base = 656

SPECrate2017_fp_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Oct-2017
Hardware Availability: Jul-2017
Software Availability: Sep-2017



Hardware

CPU Name:	Intel Xeon Platinum 8158
Max MHz.:	3700
Nominal:	3000
Enabled:	96 cores, 8 chips, 2 threads/core
Orderable:	2,4,6,8 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	24.75 MB I+D on chip per chip
Other:	None
Memory:	1536 GB (96 x 16 GB 2Rx4 PC4-2666V-R)
Storage:	768 GB tmpfs
Other:	1 x SAS HDD, 600 GB, 10.5K RPM, used for swap

Software

OS:	SUSE Linux Enterprise Server 12 SP2 4.4.21-69-default
Compiler:	C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
Parallel:	No
Firmware:	Fujitsu BIOS Version V1.0.0.0 R1.21.0 for D3858-A1x. Released Dec-2017
File System:	tmpfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	None

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	191	1004	1910	**1004**	**1910**	1004	1910							
507.cactuBSSN_r	191	464	522	**463**	**522**	462	523							
508.namd_r	191	381	476	**381**	**476**	385	471							
510.parest_r	191	1090	459	**1102**	**453**	1104	453							
511.povray_r	191	597	748	594	751	**595**	**750**							
519.lbm_r	191	**503**	**400**	503	400	502	401							
521.wrf_r	191	515	831	**515**	**831**	515	831							
526.blender_r	191	457	636	457	637	**457**	**637**							
527.cam4_r	191	**474**	**705**	481	695	472	707							
538.imagick_r	191	476	998	475	999	**476**	**999**							
544.nab_r	191	**371**	**868**	369	870	371	866							
549.fotonik3d_r	191	1380	539	1381	539	**1380**	**539**							
554.roms_r	191	817	371	822	369	**820**	**370**							

SPECrate2017_fp_base = 656

SPECrate2017_fp_peak = Not Run

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

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
Set Kernel Boot Parameter:  nohz_full=1-191 isolcpus=1-191
Set tmpfs filesystem with:
mkdir /home/memory
mount -t tmpfs -o size=768g,rw tmpfs /home/memory
Process tuning setting:
echo 0 > /proc/sys/kernel/numa_balancing
echo never > /sys/kernel/mm/transparent_hugepage/enabled
cpu idle state set with:
cpupower idle-set -d 1
cpupower idle-set -d 2
Set affinity of rcu threads to the cpu0:
for i in 'pgrep rcu' ; do taskset -pc 0 $i ; done
```

General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/memory/speccpu/lib/ia32:/home/memory/speccpu/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/memory/speccpu/je5.0.1-32:/home/memory/speccpu/je5.0.1-64"

 Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.4
 Prior to runcpu invocation
 Filesystem page cache synced and cleared with:
 sync; echo 3 > /proc/sys/vm/drop_caches
 runcpu command invoked through numactl i.e.:
 numactl --interleave=all runcpu <etc>
```

Platform Notes

```
 BIOS configuration:
 DCU Streamer Prefetcher = Disabled
 Sub NUMA Clustering = Enabled
 Stale AtoS = Enabled
 LLC Dead Line Alloc = Disabled
 Fan Control = Full
 Sysinfo program /home/memory/speccpu/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on linux-k55j Fri Oct 20 23:34:52 2017

 SUT (System Under Test) info as seen by some common utilities.
 For more information on this section, see
    https://www.spec.org/cpu2017/Docs/config.html#sysinfo

 From /proc/cpuinfo
    model name : Intel(R) Xeon(R) Platinum 8158 CPU @ 3.00GHz
       8  "physical id"s (chips)
       192 "processors"
    cores, siblings (Caution: counting these is hw and system dependent. The following
    excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
       cpu cores : 12
       siblings  : 24
       physical 0: cores 0 1 2 3 4 9 10 16 18 19 25 26
       physical 1: cores 0 1 2 3 9 10 11 17 19 25 26 27
       physical 2: cores 1 2 3 4 8 9 10 11 19 24 25 27
       physical 3: cores 0 1 2 3 4 8 9 11 17 18 19 20
       physical 4: cores 0 1 2 3 4 9 10 16 18 19 25 26
       physical 5: cores 0 1 2 3 4 9 10 16 18 19 25 26
       physical 6: cores 0 1 2 3 4 8 10 11 18 24 25 27
       physical 7: cores 0 3 4 5 6 7 16 18 19 20 21 22

 From lscpu:
```

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Platform Notes (Continued)

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                192
On-line CPU(s) list:   0-191
Thread(s) per core:    2
Core(s) per socket:    12
Socket(s):             8
NUMA node(s):          16
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Platinum 8158 CPU @ 3.00GHz
Stepping:              4
CPU MHz:               3684.339
CPU max MHz:           3700.0000
CPU min MHz:           1200.0000
BogoMIPS:              6000.34
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              25344K
NUMA node0 CPU(s):     0-2,5,7,10,96-98,101,103,106
NUMA node1 CPU(s):     3,4,6,8,9,11,99,100,102,104,105,107
NUMA node2 CPU(s):     12-14,16,19,21,108-110,112,115,117
NUMA node3 CPU(s):     15,17,18,20,22,23,111,113,114,116,118,119
NUMA node4 CPU(s):     24,25,28,29,33,34,120,121,124,125,129,130
NUMA node5 CPU(s):     26,27,30-32,35,122,123,126-128,131
NUMA node6 CPU(s):     36-38,41,42,44,132-134,137,138,140
NUMA node7 CPU(s):     39,40,43,45-47,135,136,139,141-143
NUMA node8 CPU(s):     48-50,53,55,58,144-146,149,151,154
NUMA node9 CPU(s):     51,52,54,56,57,59,147,148,150,152,153,155
NUMA node10 CPU(s):    60-62,65,67,70,156-158,161,163,166
NUMA node11 CPU(s):    63,64,66,68,69,71,159,160,162,164,165,167
NUMA node12 CPU(s):    72-74,77,81,82,168-170,173,177,178
NUMA node13 CPU(s):    75,76,78-80,83,171,172,174-176,179
NUMA node14 CPU(s):    84-86,90-92,180-182,186-188
NUMA node15 CPU(s):    87-89,93-95,183-185,189-191
Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pln pts dtherm hwp
hwp_act_window hwp_epp hwp_pkg_req intel_pt tpr_shadow vnmi flexpriority ept vpid
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx avx512f
```

(Continued on next page)

Platform Notes (Continued)

```
      avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec
      xgetbv1 cqm_llc cqm_occup_llc

 /proc/cpuinfo cache data
    cache size : 25344 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
   available: 16 nodes (0-15)
   node 0 cpus: 0 1 2 5 7 10 96 97 98 101 103 106
   node 0 size: 95377 MB
   node 0 free: 85726 MB
   node 1 cpus: 3 4 6 8 9 11 99 100 102 104 105 107
   node 1 size: 96763 MB
   node 1 free: 96488 MB
   node 2 cpus: 12 13 14 16 19 21 108 109 110 112 115 117
   node 2 size: 96763 MB
   node 2 free: 96489 MB
   node 3 cpus: 15 17 18 20 22 23 111 113 114 116 118 119
   node 3 size: 96763 MB
   node 3 free: 96489 MB
   node 4 cpus: 24 25 28 29 33 34 120 121 124 125 129 130
   node 4 size: 96763 MB
   node 4 free: 96488 MB
   node 5 cpus: 26 27 30 31 32 35 122 123 126 127 128 131
   node 5 size: 96763 MB
   node 5 free: 96484 MB
   node 6 cpus: 36 37 38 41 42 44 132 133 134 137 138 140
   node 6 size: 96763 MB
   node 6 free: 96490 MB
   node 7 cpus: 39 40 43 45 46 47 135 136 139 141 142 143
   node 7 size: 96763 MB
   node 7 free: 96497 MB
   node 8 cpus: 48 49 50 53 55 58 144 145 146 149 151 154
   node 8 size: 96763 MB
   node 8 free: 96488 MB
   node 9 cpus: 51 52 54 56 57 59 147 148 150 152 153 155
   node 9 size: 96763 MB
   node 9 free: 96492 MB
   node 10 cpus: 60 61 62 65 67 70 156 157 158 161 163 166
   node 10 size: 96763 MB
   node 10 free: 96481 MB
   node 11 cpus: 63 64 66 68 69 71 159 160 162 164 165 167
   node 11 size: 96763 MB
   node 11 free: 96484 MB
   node 12 cpus: 72 73 74 77 81 82 168 169 170 173 177 178
   node 12 size: 96763 MB
```

(Continued on next page)

Platform Notes (Continued)

```
   node 12 free: 96486 MB
   node 13 cpus: 75 76 78 79 80 83 171 172 174 175 176 179
   node 13 size: 96763 MB
   node 13 free: 96486 MB
   node 14 cpus: 84 85 86 90 91 92 180 181 182 186 187 188
   node 14 size: 96763 MB
   node 14 free: 96478 MB
   node 15 cpus: 87 88 89 93 94 95 183 184 185 189 190 191
   node 15 size: 96613 MB
   node 15 free: 96340 MB
   node distances:
   node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
     0:  10  11  35  35  35  35  40  40  40  40  40  40  35  35  40  40
     1:  11  10  35  35  35  35  40  40  40  40  40  40  35  35  40  40
     2:  35  35  10  11  40  40  35  35  40  40  35  35  40  40  40  40
     3:  35  35  11  10  40  40  35  35  40  40  35  35  40  40  40  40
     4:  35  35  40  40  10  11  35  35  35  35  40  40  40  40  40  40
     5:  35  35  40  40  11  10  35  35  35  35  40  40  40  40  40  40
     6:  40  40  35  35  35  35  10  11  40  40  40  40  40  40  35  35
     7:  40  40  35  35  35  35  11  10  40  40  40  40  40  40  35  35
     8:  40  40  40  40  35  35  40  40  10  11  35  35  35  35  40  40
     9:  40  40  40  40  35  35  40  40  11  10  35  35  35  35  40  40
    10:  40  40  35  35  40  40  40  40  35  35  10  11  40  40  35  35
    11:  40  40  35  35  40  40  40  40  35  35  11  10  40  40  35  35
    12:  35  35  40  40  40  40  40  40  35  35  40  40  10  11  35  35
    13:  35  35  40  40  40  40  40  40  35  35  40  40  11  10  35  35
    14:  40  40  40  40  40  40  35  35  40  40  35  35  35  35  10  11
    15:  40  40  40  40  40  40  35  35  40  40  35  35  35  35  11  10

 From /proc/meminfo
    MemTotal:       1583801256 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 From /etc/*release* /etc/*version*
    SuSE-release:
       SUSE Linux Enterprise Server 12 (x86_64)
       VERSION = 12
       PATCHLEVEL = 2
       # This file is deprecated and will be removed in a future service pack or release.
       # Please check /etc/os-release for details about this release.
    os-release:
       NAME="SLES"
       VERSION="12-SP2"
       VERSION_ID="12.2"
       PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
       ID="sles"
```


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Platform Notes (Continued)

```
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/o:suse:sles:12:sp2"

 uname -a:
    Linux linux-k55j 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Oct 20 00:46

 SPEC is set to: /home/memory/speccpu
    Filesystem     Type   Size  Used Avail Use% Mounted on
    tmpfs          tmpfs  768G  8.8G  760G   2% /home/memory

 Additional information from dmidecode follows.  WARNING: Use caution when you interpret
 this section. The 'dmidecode' program reads system data which is "intended to allow
 hardware to be accurately determined", but the intent may not be met, as there are
 frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
   BIOS FUJITSU V1.0.0.0 R1.21.0 for D3858-A1x            09/15/2017
   Memory:
    48x Hynix HMA42GR7BJR4N-VK 16 GB 2 rank 2666
    48x Samsung M393A2G40EB2-CTD 16 GB 2 rank 2666

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CXXC 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CC  511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
```

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Compiler Version Notes (Continued)

```
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 FC  507.cactuBSSN_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CC  521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

(Continued on next page)

Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
`-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`

Base Other Flags

C benchmarks:
`-m64 -std=c11`

C++ benchmarks:
`-m64`

Fortran benchmarks:
`-m64`

Benchmarks using both Fortran and C:
`-m64 -std=c11`

Benchmarks using both C and C++:
`-m64 -std=c11`

Benchmarks using Fortran, C, and C++:
`-m64 -std=c11`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.html`
`http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevC.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.xml`
`http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevC.xml`

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

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