New H3C Technologies Co., Ltd.  
H3C UniServer R5300 G5 (Intel Xeon Silver 4314)

### SPEC CPU®2017 Integer Speed Result

**SPECspeed®2017_int_base = 11.3**  
**SPECspeed®2017_int_peak = 11.5**

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (11.3)</th>
<th>SPECspeed®2017_int_peak (11.5)</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
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<tr>
<td>602.gcc_s</td>
<td>10.5</td>
<td></td>
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<tr>
<td>605.mcf_s</td>
<td>10.9</td>
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<tr>
<td>620.omnetpp_s</td>
<td>9.61</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>13.2</td>
<td></td>
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<tr>
<td>625.x264_s</td>
<td>16.4</td>
<td></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>5.77</td>
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<tr>
<td>641.leela_s</td>
<td>4.72</td>
<td></td>
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<tr>
<td>648.exchange2_s</td>
<td>18.8</td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>21.7</td>
<td></td>
</tr>
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</table>

#### Hardware

- **CPU Name:** Intel Xeon Silver 4314  
- **Max MHz:** 3400  
- **Nominal:** 2400  
- **Enabled:** 32 cores, 2 chips  
- **Orderable:** 1.2 Chips  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 1.25 MB I+D on chip per core  
- **L3:** 24 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 2666)  
- **Storage:** 1.6 TB SSD NVME  
- **Other:** None

#### Software

- **OS:** Red Hat Enterprise Linux release 8.3 (Ootpa)  
- **4.18.0-240.el8.x86_64**  
- **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux;  
  Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;  
  C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux
- **Parallel:** Yes  
- **Firmware:** Version 5.27 released Jun-2021 BIOS  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc memory allocator V5.0.1  
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
New H3C Technologies Co., Ltd.  
H3C UniServer R5300 G5 (Intel Xeon Silver 4314)  

SPECspeed®2017_int_base = 11.3  
SPECspeed®2017_int_peak = 11.5  

Results Table

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<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>109</td>
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<tr>
<td>648.exchange2_s</td>
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<td>156</td>
<td>18.8</td>
<td>156</td>
<td>18.8</td>
</tr>
</tbody>
</table>

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
- KMP_AFFINITY = "granularity=fine,scatter"
- LD_LIBRARY_PATH = "/home/speccpu/lib/intel64:/home/speccpu/je5.0.1-64"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
- sync; echo 3> /proc/sys/vm/drop_caches

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

jemalloc, a general purpose malloc implementation built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

(Continued on next page)
SPEC CPU®2017 Integer Speed Result

New H3C Technologies Co., Ltd.  
H3C UniServer R5300 G5 (Intel Xeon Silver 4314)

SPECspeed®2017_int_base = 11.3  
SPECspeed®2017_int_peak = 11.5

CPU2017 License: 9066  
Test Date: Aug-2021
Test Sponsor: New H3C Technologies Co., Ltd.  
Hardware Availability: Jun-2021
Tested by: New H3C Technologies Co., Ltd.  
Software Availability: Dec-2020

General Notes (Continued)


Platform Notes

BIOS Settings:
Set Hyper-Threading to disabled
Set Patrol Scrub to disabled

Sysinfo program /home/speccpu/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost.localdomain Tue Aug 24 19:11:45 2021

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) Silver 4314 CPU @ 2.40GHz
  2 "physical id"s (chips)
  32 "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 : 16
    siblings : 16
    physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu from util-linux 2.32.1:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 32
  On-line CPU(s) list: 0-31
  Thread(s) per core: 1
  Core(s) per socket: 16
  Socket(s): 2
  NUMA node(s): 2
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 106
  Model name: Intel(R) Xeon(R) Silver 4314 CPU @ 2.40GHz
  Stepping: 6
  CPU MHz: 800.362
  CPU max MHz: 3400.0000
  CPU min MHz: 800.0000
  BogoMIPS: 4800.00

(Continued on next page)


## SPEC CPU®2017 Integer Speed Result

### New H3C Technologies Co., Ltd.

**H3C UniServer R5300 G5 (Intel Xeon Silver 4314)**

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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</thead>
<tbody>
<tr>
<td>11.3</td>
<td>11.5</td>
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</table>

### Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Virtualization:</th>
<th>VT-x</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d cache:</td>
<td>48K</td>
</tr>
<tr>
<td>L1i cache:</td>
<td>32K</td>
</tr>
<tr>
<td>L2 cache:</td>
<td>1280K</td>
</tr>
<tr>
<td>L3 cache:</td>
<td>24576K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-15</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>16-31</td>
</tr>
<tr>
<td>Flags:</td>
<td>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 rdtsscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l3 invpcid_single intel_pinn ssbd mba ibrs ibpb stibp ibrs_enabled tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmon hle avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsavec cqm_llc cqm_occmap_llc cqm_mbm_total cqm_mbm_local split_lock_detect wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vibi umip pku ospke avx512_vmbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconf flush_lld arch_capabilities</td>
</tr>
</tbody>
</table>

From /proc/cpuinfo cache data

| cache size | 24576 KB |

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.

<table>
<thead>
<tr>
<th>available: 2 nodes (0-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15</td>
</tr>
<tr>
<td>node 0 size: 251786 MB</td>
</tr>
<tr>
<td>node 0 free: 256591 MB</td>
</tr>
<tr>
<td>node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</td>
</tr>
<tr>
<td>node 1 size: 252219 MB</td>
</tr>
<tr>
<td>node 1 free: 257214 MB</td>
</tr>
</tbody>
</table>

From /proc/meminfo

<table>
<thead>
<tr>
<th>MemTotal:</th>
<th>528014032 kB</th>
</tr>
</thead>
<tbody>
<tr>
<td>HugePages_Total:</td>
<td>0</td>
</tr>
<tr>
<td>Hugepagesize:</td>
<td>2048 kB</td>
</tr>
</tbody>
</table>

/sbin/tuned-adm active

Current active profile: throughput-performance

(Continued on next page)
SPEC CPU®2017 Integer Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

New H3C Technologies Co., Ltd.
H3C UniServer R5300 G5 (Intel Xeon Silver 4314)

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

SPECspeed®2017_int_base = 11.3
SPECspeed®2017_int_peak = 11.5

Test Date: Aug-2021
Hardware Availability: Jun-2021
Software Availability: Dec-2020

Platform Notes (Continued)

/platforms/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.3 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.3"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

SPEC is set to: /home/speccpu
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 1.4T 59G 1.4T 5% /home

From /sys/devices/virtual/dmi/id
Vendor: New H3C Technologies Co., Ltd.
Product: H3C UniServer R5300 G5
Product Family: Rack

(Continued on next page)
Platform Notes (Continued)

Serial: 210235A3WGH213000011

Additional information from dmidecode 3.2 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.

Memory:
16x Hynix HMA84GR7DJR4N-XN 32 GB 2 rank 3200, configured at 2666
16x NO DIMM NO DIMM

BIOS:
  BIOS Vendor: American Megatrends International, LLC.
  BIOS Version: 5.27
  BIOS Date: 06/07/2021
  BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

C  | 600.perlbench_s(peak)
-----------------------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C  | 600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak)
-----------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C  | 600.perlbench_s(peak)
-----------------------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
**NEW H3C TECHNOLOGIES CO., LTD.**

**H3C UNI SERVER R5300 G5 (INTEL XEON SILVER 4314)**

**CPU2017 License:** 9066  
**Test Date:** Aug-2021  
**Test Sponsor:** New H3C Technologies Co., Ltd.  
**Hardware Availability:** Jun-2021  
**Tested by:** New H3C Technologies Co., Ltd.  
**Software Availability:** Dec-2020

---

### Compiler Version Notes (Continued)

<table>
<thead>
<tr>
<th>C</th>
<th>600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak)</th>
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<tr>
<td></td>
<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113</td>
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<tr>
<th>C++</th>
<th>620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)</th>
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<table>
<thead>
<tr>
<th>Fortran</th>
<th>648.exchange2_s(base, peak)</th>
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<tbody>
<tr>
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</tr>
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<td></td>
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</tbody>
</table>

---

### Base Compiler Invocation

**C benchmarks:**
- icx

**C++ benchmarks:**
- icpx

**Fortran benchmarks:**
- ifort

---

### Base Portability Flags

- 600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
- 602.gcc_s: -DSPEC_LP64
- 605.mcf_s: -DSPEC_LP64
- 620.omnetpp_s: -DSPEC_LP64
- 623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX

(Continued on next page)
## SPEC CPU®2017 Integer Speed Result

New H3C Technologies Co., Ltd.
H3C UniServer R5300 G5 (Intel Xeon Silver 4314)

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<tr>
<td>Tested by: New H3C Technologies Co., Ltd.</td>
<td>Software Availability: Dec-2020</td>
</tr>
</tbody>
</table>

### Base Portability Flags (Continued)

- 625.x264_s: \(-DSPEC_LP64\)
- 631.deepsjeng_s: \(-DSPEC_LP64\)
- 641.leela_s: \(-DSPEC_LP64\)
- 648.exchange2_s: \(-DSPEC_LP64\)
- 657.xz_s: \(-DSPEC_LP64\)

### Base Optimization Flags

**C benchmarks:**
- \(-DSPEC.OPENMP\)
- \(-std=c11\)
- \(-m64\)
- \(-fiopenmp\)
- \(-Wl,-z\)
- \(-muldefs\)
- \(-xCORE-AVX512\)
- \(-O3\)
- \(-ffast-math\)
- \(-flto\)
- \(-mfpmath=sse\)
- \(-funroll-loops\)
- \(-qopt-mem-layout-trans=4\)
- \(-mbranches-within-32B-boundaries\)
- \(-L/usr/local/jemalloc64-5.0.1/lib\)
- \(-ljemalloc\)

**C++ benchmarks:**
- \(-DSPEC.OPENMP\)
- \(-m64\)
- \(-Wl,-z\)
- \(-muldefs\)
- \(-xCORE-AVX512\)
- \(-O3\)
- \(-ffast-math\)
- \(-flto\)
- \(-mfpmath=sse\)
- \(-funroll-loops\)
- \(-qopt-mem-layout-trans=4\)
- \(-mbranches-within-32B-boundaries\)
- \(-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/\)
- \(-lqkmalloc\)

**Fortran benchmarks:**
- \(-m64\)
- \(-xCORE-AVX512\)
- \(-O3\)
- \(-ipo\)
- \(-no-prec-div\)
- \(-qopt-mem-layout-trans=4\)
- \(-nostandard-realloc-lhs\)
- \(-align array32byte\)
- \(-auto\)
- \(-mbranches-within-32B-boundaries\)

### Peak Compiler Invocation

**C benchmarks (except as noted below):**
- `icx`
- `600.perlbench_s: icc`

**C++ benchmarks:**
- `icpx`

**Fortran benchmarks:**
- `ifort`
# SPEC CPU®2017 Integer Speed Result

## New H3C Technologies Co., Ltd.

### H3C UniServer R5300 G5 (Intel Xeon Silver 4314)

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**CPU2017 License:** 9066  
**Test Sponsor:** New H3C Technologies Co., Ltd.  
**Tested by:** New H3C Technologies Co., Ltd.  
**Test Date:** Aug-2021  
**Hardware Availability:** Jun-2021  
**Software Availability:** Dec-2020

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

### C benchmarks:

- `600.perlbench_s`: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4 -fno-strict-overflow -mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

- `602.gcc_s`: `-m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1) -fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto -Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

- `605.mcf_s`: `basepeak = yes`

- `625.x264_s`: `-DSPEC_OPENMP -fiopenmp -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math -qopt-mem-layout-trans=4 -fno-alias -mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

- `657.xz_s`: `basepeak = yes`

### C++ benchmarks:

- `620.omnetpp_s`: `basepeak = yes`

- `623.xalancbmk_s`: `basepeak = yes`

- `631.deepsjeng_s`: `basepeak = yes`

- `641.leela_s`: `basepeak = yes`

### Fortran benchmarks:

- `648.exchange2_s`: `basepeak = yes`
SPEC CPU®2017 Integer Speed Result

New H3C Technologies Co., Ltd.  
H3C UniServer R5300 G5 (Intel Xeon Silver 4314)  

SPECspeed®2017_int_base = 11.3  
SPECspeed®2017_int_peak = 11.5

CPU2017 License: 9066  
Test Date: Aug-2021

Test Sponsor: New H3C Technologies Co., Ltd.  
Hardware Availability: Jun-2021

Tested by: New H3C Technologies Co., Ltd.  
Software Availability: Dec-2020

The flags files that were used to format this result can be browsed at:

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.0-CPX-RevD.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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