SPEC CPU®2026 Floating Point Rate Result

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Apple

(Test Sponsor: SPEC CPU Supporting Contributor jhenning)

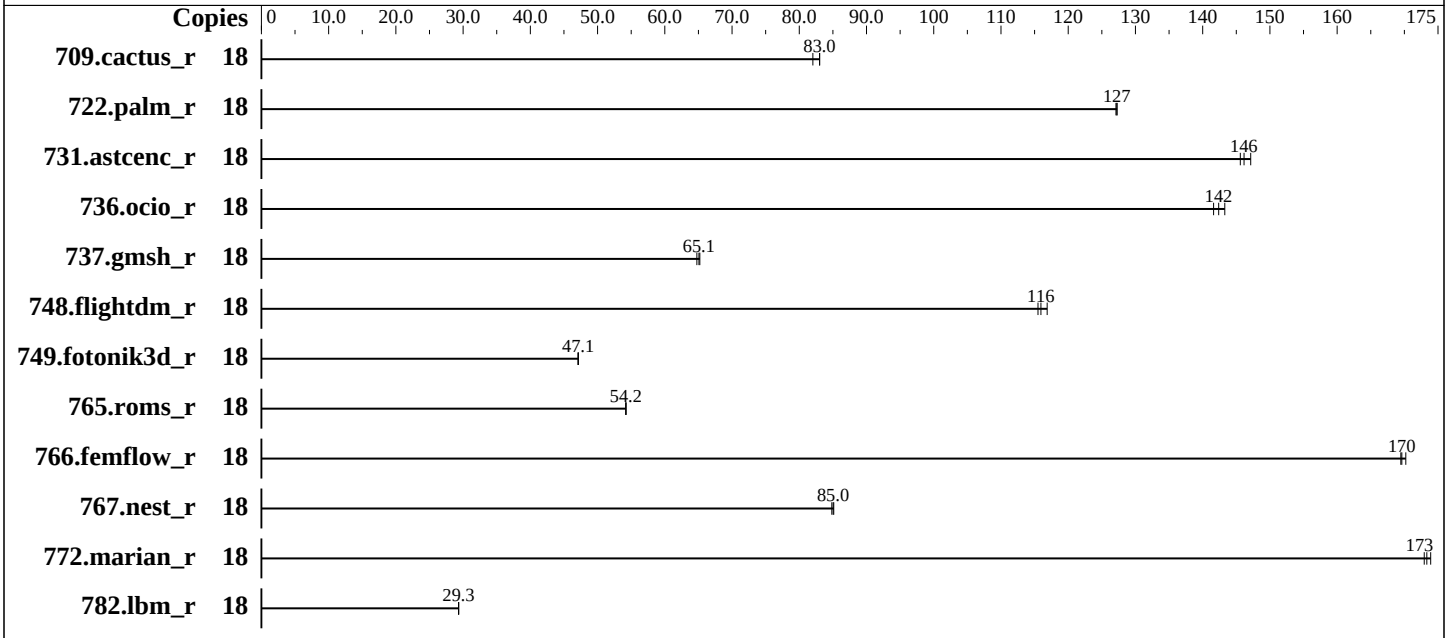
MacBook Pro (16-inch, M5 Pro) 18-copy SPECrate

SPECrate®2026_fp_base = 90.7

SPECrate®2026_fp_peak = Not Run

CPU2026 License: 7
Test Sponsor: SPEC CPU Supporting Contributor jhenning
Tested by: SPEC CPU Supporting Contributor jhenning

Test Date: Apr-2026
Hardware Availability: Mar-2026
Software Availability: Apr-2026



Hardware

CPU Name:	Apple M5 Pro
Max MHz:	4600 (approximate; see notes)
Nominal:	4600 (approximate; see notes)
Enabled:	18 (6 Super and 12 Performance) cores, 1 chip
Orderable:	1 chip
Cache L1:	192 KB I + 128 KB D on chip per core (Super); 128 KB I + 64 KB D on chip per core (Performance)
L2:	32 MB I+D on chip per chip, (16 MB per 6 Super cores, 8 MB per 6 Performance cores)
L3:	None disclosed
Other:	None disclosed
Memory:	64.0 GB
Storage:	4 TB APPLE SSD AP4096Z
Cooling:	Air
Other:	None

Software

OS:	macOS 26.4.1 (25E253)
Compiler:	C/C++: Version 22.1.3 of LLVM; Fortran: Version 22.1.3 of Homebrew flang
Compiler Category:	Community
Firmware:	Version 18000.101.7 released Apr-2026
File System:	apfs
System State:	Default
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	Xcode 26.4.1.0.1775747724
Power Management:	Default

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
709.cactus_r	18	188	82.0	**186**	**83.0**	186	83.0							
722.palm_r	18	**187**	**127**	187	127	187	127							
731.astcenc_r	18	103	147	104	146	**103**	**146**							
736.ocio_r	18	110	143	111	142	**111**	**142**							
737.gmsh_r	18	128	64.8	127	65.2	**127**	**65.1**							
748.flightdm_r	18	110	117	**111**	**116**	112	116							
749.fotonik3d_r	18	442	47.1	441	47.1	**442**	**47.1**							
765.roms_r	18	523	54.2	523	54.2	**523**	**54.2**							
766.femflow_r	18	155	170	156	169	**156**	**170**							
767.nest_r	18	168	85.1	168	84.8	**168**	**85.0**							
772.marian_r	18	163	174	164	173	**164**	**173**							
782.lbm_r	18	**352**	**29.3**	352	29.3	352	29.3							

SPECrate®2026_fp_base = 90.7

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

Compiler Notes

NOTE - MODERATE COMPILER TUNING

The results on this page intentionally use only moderate compiler tuning. This page differs from many other SPEC CPU results which are published to demonstrate the best performance that can be achieved by a system. Such tests often use compilers that are optimized for specific chip vendors and use advanced tuning options.

Moderate optimization may be of interest to users who prefer a simple build process, or who do not know whether their application works correctly with advanced tuning options. Specifically, these tests:

- Use an open source, community-supported compiler, rather than a vendor-specific compiler.
- Specify only one optimization option, namely -O3.
- Avoid options that disregard strict standards compliance, such as -Ofast, -ffinite-math-only, or -funsafe-math-optimizations.
- Avoid options such as -march=native or -mcpu=native. Without those, the code generator cannot assume that the program will run only on systems that use the same chip as the current system.

There are many other kinds of testing can be done with SPEC CPU, such as:
- Performance modeling prior to CPU chip development.
- Hardware validation.
- Compiler regression testing (both correctness and performance).
- Academic and industrial research into new optimizations for CPUs, memory systems, and compilers.

General Notes

```
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.
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-2017-5754
     (Meltdown) is mitigated in the system as tested and documented.
The above 3 statements are based on https://support.apple.com/en-us/101886
```

Platform Notes

```
Sysinfo program /Volumes/ScratchVolume/spec/cpu2026/1.0.0/bin/sysinfo
Rev: 779ab21020787073335a329f3a45e2cd
running on i4gots-MacBook-Pro Tue Apr 21 23:53:39 2026

SUT (System Under Test) info as seen by some common utilities.

uname -srvm
  Darwin 25.4.0 Darwin Kernel Version 25.4.0: Thu Mar 19 19:33:50 PDT 2026;
  root:xnu-12377.101.15~1/RELEASE_ARM64_T6050 arm64

w
  23:53  up  4:43, 3 users, load averages: 1.30 4.82 7.91
  USER       TTY      FROM    LOGIN@  IDLE WHAT
  i4got      console  -      19:10    4:43 -
  i4got      s000     -      19:12       - -bash
  i4got      s001     -      19:20       2 tail -f reportable.fprate.1-copies.try-1.out

Username
  From environment variable $USER:  i4got

ulimit -a
  core file size          (blocks, -c) 0
  data seg size           (kbytes, -d) unlimited
  file size               (blocks, -f) unlimited
  max locked memory       (kbytes, -l) unlimited
  max memory size         (kbytes, -m) unlimited
  open files                      (-n) 256
  pipe size            (512 bytes, -p) 1
  stack size              (kbytes, -s) 65000
  cpu time               (seconds, -t) unlimited
  max user processes              (-u) 10666
  virtual memory          (kbytes, -v) unlimited
```

(Continued on next page)

Platform Notes (Continued)

```
sysinfo process ancestry
 /sbin/launchd
 /System/Applications/Utilities/Terminal.app/Contents/MacOS/Terminal
 login -pf i4got
 -bash
 /bin/bash ./run.5.sh
 runcpu -c clang5 -n 3 --reportable --nobuild --copies=18 fprate
 specperl $SPEC/bin/sysinfo
$SPEC = /Volumes/ScratchVolume/spec/cpu2026/1.0.0

Hardware:

    Hardware Overview:

      Model Name: MacBook Pro
      Model Identifier: Mac17,8
      Model Number: Z1N0001A3LL/A
      Chip: Apple M5 Pro
      Total Number of Cores: 18 (6 Super and 12 Performance)
      Memory: 64 GB
      System Firmware Version: 18000.101.7
      OS Loader Version: 18000.101.7

Software:

    System Software Overview:

      System Version: macOS 26.4.1 (25E253)
      Kernel Version: Darwin 25.4.0
      Boot Volume: Macintosh HD
      Boot Mode: Normal
      Computer Name: i4got's MacBook Pro
      User Name: i4got (i4got)
      Secure Virtual Memory: Enabled
      System Integrity Protection: Enabled
      Time since boot: 4 hours, 43 minutes

Memory:

      Memory: 64 GB
      Type: LPDDR5
      Manufacturer: Micron

Developer:

    Developer Tools:
```

(Continued on next page)

Platform Notes (Continued)

```
        Version: 26.4.1 (17E202)
        Location: /Applications/Xcode.app
        Applications:
            Xcode: 26.4.1 (24909.0.3)
            Instruments: 26.4.1 (64575.156)
        SDKs:
            DriverKit:
                25.4:
            iOS:
                26.4: (23E252)
            iOS Simulator:
                26.4: (23E252)
            macOS:
                26.4: (25E251)
            tvOS:
                26.4: (23L236)
            tvOS Simulator:
                26.4: (23L236)
            visionOS:
                26.4: (23O248)
            visionOS Simulator:
                26.4: (23O248)
            watchOS:
                26.4: (23T238)
            watchOS Simulator:
                26.4: (23T238)


 From sysctl:
    machdep.cpu.core_count: 18
    machdep.cpu.thread_count: 18
    machdep.cpu.brand_string: Apple M5 Pro
    hw.memsize: 68719476736
    hw.activecpu: 18
    hw.perflevel0.l1icachesize: 196608
    hw.perflevel0.l1dcachesize: 131072
    hw.perflevel0.l2cachesize: 16777216
    hw.perflevel1.l1icachesize: 131072
    hw.perflevel1.l1dcachesize: 65536
    hw.perflevel1.l2cachesize: 8388608
    hw.physicalcpu: 18
    hw.physicalcpu_max: 18
    hw.logicalcpu: 18
    hw.logicalcpu_max: 18
    hw.cacheconfig: 18 1 6 0 0 0 0 0 0 0
    hw.cachesize: 2995912704 65536 8388608 0 0 0 0 0 0 0
    hw.pagesize: 16384
```

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Platform Notes (Continued)

```
    hw.pagesize32: 16384
    hw.cachelinesize: 128
    hw.l1icachesize: 131072
    hw.l1dcachesize: 65536
    hw.l2cachesize: 8388608
    hw.memsize_usable: 67420422144

SPEC is set to: /Volumes/ScratchVolume/spec/cpu2026/1.0.0
    Filesystem      Size    Used   Avail Capacity iused ifree %iused  Mounted on
    /dev/disk3s1   1998G    569G   1429G    29%    1.3M   14G    0%   /Volumes/ScratchVolume

(End of data from sysinfo program)


ADDITIONAL INFORMATION FROM SYSCTL

 $ sysctl hw | grep  perflevel0
 hw.perflevel0.physicalcpu: 6
 hw.perflevel0.physicalcpu_max: 6
 hw.perflevel0.logicalcpu: 6
 hw.perflevel0.logicalcpu_max: 6
 hw.perflevel0.l1icachesize: 196608
 hw.perflevel0.l1dcachesize: 131072
 hw.perflevel0.l2cachesize: 16777216
 hw.perflevel0.cpusperl2: 6
 hw.perflevel0.name: Super
 $ sysctl hw | grep  perflevel1
 hw.perflevel1.physicalcpu: 12
 hw.perflevel1.physicalcpu_max: 12
 hw.perflevel1.logicalcpu: 12
 hw.perflevel1.logicalcpu_max: 12
 hw.perflevel1.l1icachesize: 131072
 hw.perflevel1.l1dcachesize: 65536
 hw.perflevel1.l2cachesize: 8388608
 hw.perflevel1.cpusperl2: 6
 hw.perflevel1.name: Performance
 $

The above shows cache sizes for both core types, and "cpusperl2" indicates sharing among cores. See
https://developer.apple.com/documentation/kernel/1387446-sysctlbyname/determining_system_capabilities
Note: it is possible that the sysctl cache information may be incomplete.  There might be other cache
types or other cache characteristics that are not disclosed by the above 'sysctl' command.


ADDITIONAL INFORMATION FROM POWERMETRICS

Regarding the CPU MHz fields above, note that:
```

(Continued on next page)

Platform Notes (Continued)

- The vendor does not state CPU frequencies in their marketing materials.
- Frequency levels are printed by the vendor-provided 'powermetrics' utility; these might or might not correspond to traditional "nominal" or "maximum" MHz. Therefore, the values on this page for Nominal and Maximum MHz must be considered approximate.
- The table below lists all of the MHz values mentioned in the dvfm_states section of powermetrics.
- On the tested system, the maximum frequencies mentioned are 4608 for the S-cluster and 4380 for the P-Clusters

```
------------------------------------------------------------------------------------------------------------
CPU Dynamic Frequencies                                                  From 'powermetrics --format=plist'
------------------------------------------------------------------------------------------------------------
processor
clusters    dvfm_states
name        freq
----------  -----------------------------------------------------------------------------------------------
P0-Cluster  1344 1644 1992 2304 2652 2964 3240 3504 3696 3876 4044 4176 4284 4308 4380
P1-Cluster  1344 1644 1992 2304 2652 2964 3240 3504 3696 3876 4044 4176 4284 4308 4380
S-Cluster   1308 1620 1980 2292 2580 2880 3180 3432 3648 3828 3984 4104 4188 4236 4284 4308 4332 4428 4512 4608
```

The table above was extracted from powermetrics via Perl code:

```
open P, "powermetrics --sample-count=0  --show-initial-usage --samplers=cpu_power --format=plist|"
   or die "cannot run powermetrics";
while (<P>) {
   if (m{<key>name</key><string>(\S+Cluster)</string>}) {
      printf "%-10s  ", $1;
      $printing = 1;
      @freqs    = ();
   }
   next if ! $printing;
   if (m{^</array>}) {
      print join(" ", @freqs), "\n";
      $printing = 0;
   }
   if (m{<key>freq</key><integer>(\d+)</integer>}) {
      push @freqs, $1;
   }
}
```

Compiler Version Notes

```
==============================================================================
C       | 782.lbm_r(base)
------------------------------------------------------------------------------
Homebrew clang version 22.1.3
```

(Continued on next page)

Compiler Version Notes (Continued)

```
Target: arm64-apple-darwin25.4.0
Thread model: posix
InstalledDir: /opt/homebrew/Cellar/llvm/22.1.3/bin
Configuration file:
  /opt/homebrew/Cellar/llvm/22.1.3/etc/clang/arm64-apple-darwin25.cfg
------------------------------------------------------------------------------

==============================================================================
C++     | 731.astcenc_r(base) 736.ocio_r(base) 748.flightdm_r(base)
        | 766.femflow_r(base) 767.nest_r(base) 772.marian_r(base)
------------------------------------------------------------------------------
Homebrew clang version 22.1.3
Target: arm64-apple-darwin25.4.0
Thread model: posix
InstalledDir: /opt/homebrew/Cellar/llvm/22.1.3/bin
Configuration file:
  /opt/homebrew/Cellar/llvm/22.1.3/etc/clang/arm64-apple-darwin25.cfg
------------------------------------------------------------------------------

==============================================================================
C++, C  | 709.cactus_r(base) 737.gmsh_r(base)
------------------------------------------------------------------------------
Homebrew clang version 22.1.3
Target: arm64-apple-darwin25.4.0
Thread model: posix
InstalledDir: /opt/homebrew/Cellar/llvm/22.1.3/bin
Configuration file:
  /opt/homebrew/Cellar/llvm/22.1.3/etc/clang/arm64-apple-darwin25.cfg
------------------------------------------------------------------------------

==============================================================================
Fortran | 722.palm_r(base) 749.fotonik3d_r(base) 765.roms_r(base)
------------------------------------------------------------------------------
Homebrew flang version 22.1.3
Target: arm64-apple-darwin25.4.0
Thread model: posix
InstalledDir: /opt/homebrew/Cellar/flang/22.1.3/libexec
Configuration file: /opt/homebrew/Cellar/flang/22.1.3/libexec/flang.cfg
Configuration file:
  /opt/homebrew/Cellar/flang/22.1.3/etc/clang/arm64-apple-darwin25.cfg
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
clang

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Base Compiler Invocation (Continued)

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Benchmarks using both C and C++:
clang++ clang

Base Portability Flags

766.femflow_r: -DSPEC_NO_CXX17_SPECIAL_MATH_FUNCTIONS

Base Optimization Flags

C benchmarks:
-std=c18 -g -O3 -Wno-implicit-function-declaration

C++ benchmarks:
-std=c++17 -g -O3 -Wno-implicit-function-declaration

Fortran benchmarks:
-std=f2018 -g -O3

Benchmarks using both C and C++:
-std=c++17 -std=c18 -g -O3 -Wno-implicit-function-declaration

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2026/results/flags/llvm-rev-A3.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2026/results/flags/llvm-rev-A3.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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