

Creative Cloud on Apple Silicon: Key Speed Measures

Adobe Photoshop

About this Benchmark Project

This report presents the findings of a market-specific benchmarking project conducted by Pfeiffer Consulting for Adobe. The main aim of the research was **to measure the performance of Creative Cloud flagship apps on the newly introduced Apple M1 MacBook Pro**, compared to the performance of these apps running on an otherwise identical, similarly priced Intel MacBook Pro.

Benchmarks were executed using *Pfeiffer Consulting's Methodology for Productivity Benchmarking*, which has been fine-tuned over more than a decade, and measures the time experienced operators take to execute specific tasks. Please refer to the Methodology section on the last page of this document for more information.

About the Apple M1 Platform

In November 2020, Apple started **transitioning the main processor architecture** used in its desktop and laptop computers from the previously used Intel architecture to Apple Silicon to enable **better performance and lower power-consumption** through the use of a more efficient processor architecture.

This benchmark project analyzes in detail how the first generation of Apple Silicon hardware, the **M1 MacBook Pro**, **performs in the context of creative workflows**. Benchmarks covered seven essential Creative Cloud applications: **Photoshop, Illustrator, InDesign, XD, Premiere Pro, Lightroom and Lightroom Classic**. Operations benchmarked covered **a wide range of time-consuming tasks** specific to each individual workflow.

Creative Cloud Apps Performance on Apple M1 MacBook Pro

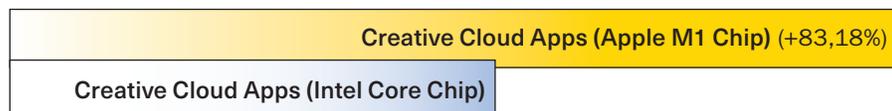


Chart based on the average of all benchmarks of seven essential Creative Cloud apps. A total of **774 individual benchmark measures** were taken. **Longer is better.**

Executive Summary

- ▶ This document presents key results from a benchmark project **comparing performance of Creative Cloud apps** on the recently released Apple M1 hardware platform.
- ▶ On average, based on 19 workflow benchmarks conducted for this research, Photoshop was **almost 90% faster** using the Apple M1 system.
- ▶ Individual, segment-specific benchmarks were conducted with **seven essential Creative Cloud apps**.
- ▶ Benchmarks showed that, based on all benchmarks conducted, Creative Cloud is **on average over 80% faster using the Apple M1 system** when compared to an identically configured Intel system.
- ▶ **Adobe Sensei-powered features** that have been optimized for the Apple M1 machine learning architecture can result in **up to 4x - 6x performance gains**.

How fast is it really?

Creative Cloud Application Speed on Apple's M1 platform

The Hardware Conundrum

Reliable, fast hardware is absolutely essential for creative professionals to get their work done. It's not surprising, therefore, that Apple's announcement in 2019 that the company would start transitioning away from the tried and tested Intel architecture used in Macs for almost fifteen years was met with intense interest from professionals around the world.

How smooth could such an important transition be? How long would it be before essential applications such as Photoshop and Illustrator would run natively on the new platform? And, crucially, **how well would these native apps perform**, given the innovative approach Apple was taking?

The Question of Performance

Just seven months after the introduction of the first generation Apple Silicon Macs, **all key Creative Cloud apps are now available** in 'universal binary' versions, meaning that the same program can run on both Intel and Apple Silicon platforms.

But what about performance? **How well do these apps take advantage of hardware features unique to Apple's processor design**, in particular aspects such as unified memory? How does the presence of the **Neural Engine in Apple's chips impact Adobe Sensei-driven features** in Photoshop, Premiere Pro and other apps?

To answer these questions we conducted **comprehensive real-world benchmarks** with seven essential Creative Cloud apps, covering aspects as diverse as application launch, opening and processing complex data-sets, and more. For each individual app—Photoshop, Illustrator, InDesign, XD, Premiere Pro, Lightroom and Lightroom Classic—the **most time-consuming features were measured**.

The results were surprising: There was not a single benchmark where the M1 hardware was slower than the Intel version. There is one caveat, however: to ensure a coherent comparison, **we used identical hardware configurations for both Intel and M1** (See sidebar.) For features that rely heavily on GPU acceleration, however, an Intel Mac with a discreet, powerful GPU can still outperform the current generation of M1 Macs in some areas. There is little doubt, however that Apple will address this in the future as new generations of M1 Macs close any remaining gaps with new Apple Silicon-based Macs.

Benchmark Configurations

▶ **Apple M1:**

13 inch **M1 MacBook Pro**
16GB RAM, 2TB of SSD

▶ **Intel:**

13 inch **Intel Core i5 MacBook Pro**
16GB RAM, 2TB of SSD

Both systems were connected to an **Apple Pro Display XDR** for benchmarks (See last page for complete Methodology.)

How Creative Cloud Applications Perform on M1

	Intel	Apple M1	M1 Productivity gains over Intel
Photoshop – Average of all benchmarks	22,57	11,97	+89%
Top Results Photoshop			
Content Aware Fill 1	37,88	12,62	+200%
Select Subject 1	4,91	1,92	+156%
Illustrator – Average of all benchmarks	25,96	15,73	+65%
Top Results Illustrator			
Scrolling performance (complex vector drawing)	28,15	5,74	+390%
Open file with 31 complex artboards	20,76	9,50	+119%
InDesign – Average of all benchmarks	22,21	13,94	+59%
Top Results InDesign			
Open graphics-heavy file – CPU	6,50	2,28	+185%
Scrolling 100 page book project – GPU	25,23	14,14	+78%
XD – Average of all benchmarks	10,06	5,60	+80%
Top Results XD			
Open complex app prototype	43,11	16,07	+168%
Insert graphic from CC Libraries (copy)	4,48	2,18	+105%
Premiere Pro – Average of all benchmarks	291,31	164,05	+78%
Top Results Premiere Pro			
Scene Edit Detection – 4K	25,51	3,70	+430%
Import XAVC S 4K 100p	19,02	6,63	+187%
Lightroom – Average of all benchmarks	77,00	45,54	+69%
Top Results Lightroom			
Super Resolution	29,87	5,75	+420%
Full-Screen Image Review (Twenty 61MP Images)	71,50	31,74	+125%
Lightroom Classic – Average of all benchmarks	139,60	64,54	+116%
Top Results Lightroom Classic			
Apply Settings (1000 images)	65,23	14,59	+347%
Super Resolution	36,39	9,60	+279%
Average of all benchmarks (774 individual benchmarks measures)	84,10	45,91	+83%

Photoshop Speed on Apple M1

What We Benchmarked

Photoshop performance benchmarks focussed on areas where a user is the most likely having to wait for the program to complete an operation: **opening** or **saving and closing** large files, **resampling** documents of varying size and complexity, and **applying time consuming affects** or processes, such as *Content-Aware Fill* or processing a panorama from several high-resolution files.

Assets used for the benchmarks ranged from **large flat images files**, to **documents with complex pixel-layer structures** and/or **multiple effects layers**.

Analysis of Benchmark Results

On average, **Photoshop was almost 89% faster on M1** than on Intel. Performance gains ranged from just 17% faster for saving and closing a 60MB file **to two to three times faster performance for Adobe Sensei powered features** such as *Content-Aware Fill* or *Select Subject*.

In any case, benchmarks showed that **performance gains scale with the complexity of an operation**: Thus, resampling a relatively small image composition with dozens of layers shows more performance gains than resampling a flat image file.

To sum things up, it seems clear that **Photoshop strongly benefits from, among other aspects, the unified memory architecture of the M1 chip**, as well as **from the acceleration provided for Adobe Sensei-powered features by the Neural Engine** of the chip, as can also be seen in benchmarks of other Creative Cloud apps.

Major Points

- ▶ On average, based on 19 workflow benchmarks conducted for this research, Photoshop was **almost 90% faster** using the Apple M1 system.
- ▶ Benchmarks of Photoshop on the Apple M1 system seem to indicate **that performance gains increase with the complexity of the assets**, underlining the fact that Photoshop benefits from the advances in the Apple M1 hardware architecture.
- ▶ Adobe Sensei-powered features, such as *Select Subject* and *Content-Aware Fill* showed **particularly strong performance gains** over the Intel platform.

Photoshop: Average of all Benchmarks

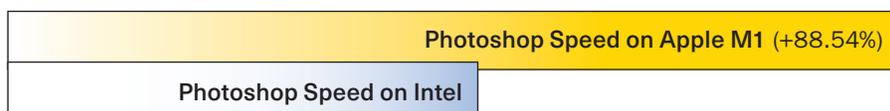


Chart based on the average of 19 workflow benchmarks conducted with Photoshop. A total of **114 individual benchmark measures** were taken. **Longer is better.**

Photoshop on Apple M1: Key Benchmark Results

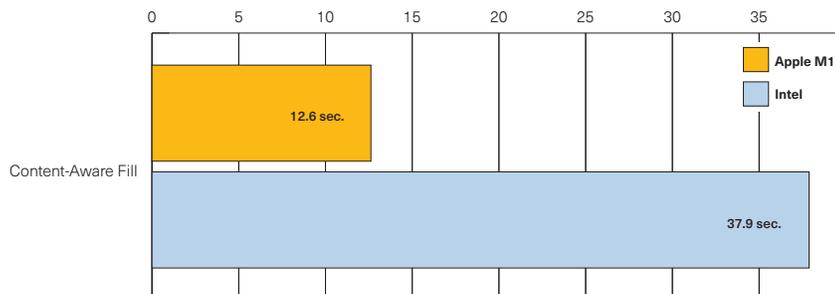
Content-Aware Fill: To assess the performance of *Content-Aware Fill*, we used a 61MP 16-bit photograph and selected a specific portion of the image, corresponding roughly to 20% of the overall surface. We timed execution from the moment the operation was triggered in the *Content-Aware Fill* dialog.

Photoshop on M1 was **over three times faster** completing the operation.

Photoshop Apple M1 Benchmarks: Content-Aware Fill (61MP Image)

Time-scale in seconds. All data are the average of 3 individual benchmarks

Shorter is better.



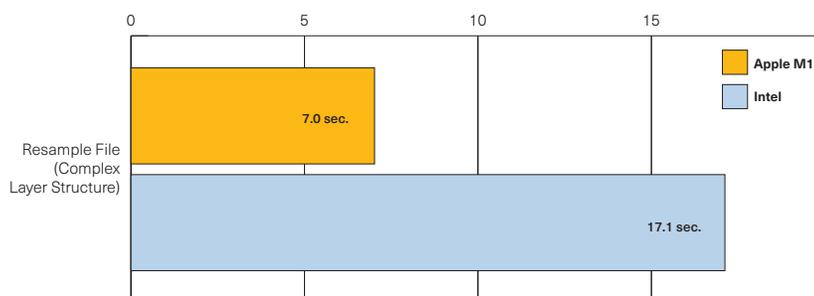
Resample File with Complex Layer Structure: The Photoshop composition used for this benchmark was a 45MB professional Illustration with dozens of pixel layers, which was resampled to 200%, using default settings.

Running on the M1 platform, **Photoshop was almost 1.5 times faster** than running on the Intel system.

Photoshop Apple M1 Benchmarks: Resample File (Complex Layer Structure)

Time-scale in seconds. All data are the average of 3 individual benchmarks

Shorter is better.



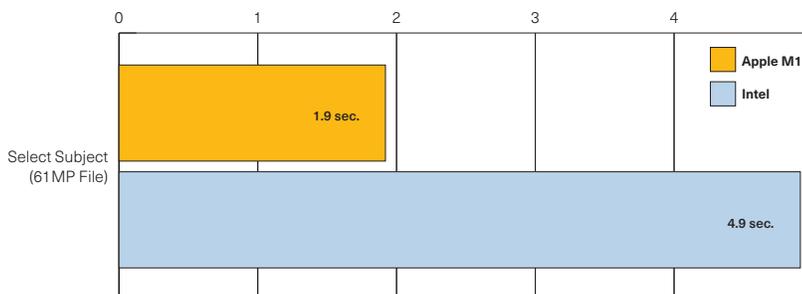
Select Subject: *Select Subject* relies on Adobe Sensei technology to automatically select the subject in a picture. To benchmark the feature, we used a 61MP 16-bit photograph. Timing was triggered when clicking on the *Select Subject* button, and ended when the selection was processed.

The operation was **three times faster with Photoshop on M1.**

Photoshop Apple M1 Benchmarks: Select Subject (61MP File)

Time-scale in seconds. All data are the average of 3 individual benchmarks

Shorter is better.



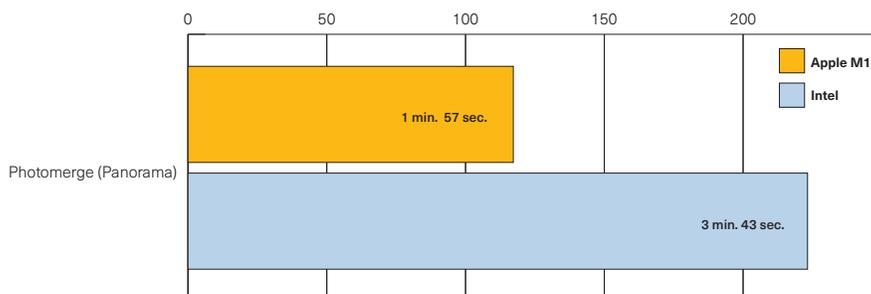
Photomerge (Panorama): This benchmark was conducted using three 61MP 16-bit architectural photographs, using the 'Auto' setting with the option to apply content-aware fill to transparent areas in the resulting panorama.

Photoshop was **almost twice as fast** completing the operation on the M1 system

Photoshop Apple M1 Benchmarks: Photomerge (Panorama)

Time-scale in seconds. All data are the average of 3 individual benchmarks

Shorter is better.



Methodology

This benchmark project was commissioned by Adobe and independently executed by Pfeiffer Consulting.

All the productivity measures presented in this document are based on real-world workflow examples, designed and executed by professionals with many years of experience with these applications and workflows.

How we measure productivity

The basic approach is simple: in order to assess productivity gains that a program or solution may (or may not) bring, we start by analyzing the minimum number of steps necessary to achieve a given result in each of the applications or workflows that have to be compared.

Once this list of actions has been clearly established, we start to execute the operation or workflow in each solution, with the help of seasoned professionals who have long-standing experience in the field and with the solutions that are tested.

Every set of steps is **executed three times**, the average of the three measures is used as final result.

Benchmark Configurations

Apple M1:

13 inch **M1 MacBook Pro**
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13 inch **Intel Core i5 MacBook Pro**
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Both systems were connected to a
Apple Pro Display XDR for all benchmarks

Hardware Preparation for Performance Benchmarks

Before performance benchmarks, systems are completely re-initialized. Only apps necessary for the benchmarks are installed.

Only the internal SSD was used for storage and access of benchmark assets.

About Pfeiffer Consulting

Pfeiffer Consulting is an independent technology research and benchmarking operation focused on the needs of publishing, digital content production, and new media professionals.

For more information, please contact
research@pfeifferreport.com

Pfeiffer Report

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