Apple iMac Pro review – this superbly designed workstation is most powerful Mac ever

- **Price When Reviewed:** Base price £4,899 inc VAT. Model reviewed £9,188
- **Pros:** Incredible performance and engineering. Super-detailed and colour-accurate screen. We love the aesthetics too.
- **Cons:** At this price, a traditional desktop and screen may be more effective in the long-term. Mouse needs redesigning.

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Apple's iMac Pro is finally here and I must say I'm impressed. It's the most powerful Mac we've ever seen and – on a day-to-day basis – possibly the most powerful computer we've seen. But, like many of the best things in life (such as Specialized's S-Works Epic XX1 Eagle), it's not for everyone. Also like them, Apple's 'pro workstation' is a specialised tool that delivers everything you could want for a certain type of user, and while many creatives won't see the benefits of what it offers over a standard iMac, those that will really will.

From the outside, the iMac Pro is distinguishable from the standard 27-inch 5K model only by its Space Gray colour scheme (and a couple of extra ports at the back – but more on those

later). This palette extends to the iMac Pro's mouse, trackpad and keyboard – which is full-size with a numeric keypad (there's no gray version of the smaller keyboard). There are also black power and Lightning cables, which weirdly received by far the most interest on Twitter when I tweeted pictures of the different parts of the iMac Pro when it first turned up.

It's a minor thing, but I prefer the Space Gray colour scheme to the traditional iMac silver. It feels a bit more, well, 'pro' – and a better match for the dark interfaces of Premiere Pro and After Effects, Cinema 4D and Maya, and Final Cut Pro X.

I say it's a minor thing – and in real terms it is – but we know that aesthetics can make a definite difference when buying a computer, a bigger difference than most of us would readily admit. And the colour scheme is part of Apple's way of saying that it's committed to the pro market after being accused of caring more about selling iPhones to Instagrammers and MacBook Pros to business people who want to feel creative and hip.

What that 'pro market' is though is a little nebulous. Is an illustrator creating artwork on an iPad Pro not a 'creative pro'? Or a designer using a 27-inch iMac?

The real answer is that the line between the iMac and iMac Pro is (space) grey and fuzzy. They're essentially part of the same range. If you need a certain level of performance or have a set budget, the iMac will work perfectly for you. If you need more, and can pay more – or just have to have the biggest, baddest Mac to satisfy your ego or show off to clients – then you move onto the iMac Pro. (And if you need even more, Apple's working on a new Mac Pro for 2018, though we have no details on it).

So who requires a iMac Pro? From our tests, it's not most designers and artists who use Photoshop, Illustrator, Sketch,

InDesign or Corel Painter. While your apps will feel a bit faster in day-to-day use, especially if you're working with projects with hundreds of layers in Photoshop or huge paintings with very complex brushes in Painter, it's small compared to the jump in cost.

The same is true for video editors with moderate performance needs, editing HD or compressed 4K footage with grading and uncomplicated graphics – as we noted in our Final Cut Pro 10.4 review.

Instead, the iMac Pro is for more complex projects. Yes that means 8K and stereoscopic 360 footage for VR and other futuristic formats that only a few are actually working with – but it also means VFX and animation and video projects with a lot of motion graphics and effects. It's tools like After Effects and Nuke, Cinema 4D and Maya that will gain the most from an iMac Pro.

So what's the difference between an iMac Pro from a standard iMac? Well, it's all about getting Intel's latest set of Xeon processors into the iMac shell. Even the new airflow system that Apple has created pretty GIFs of (below) exists only to get a chip that powerful into a case that slim and keep it near silent (unless we're running our benchmarks – but we've yet to meet a PC that can battle through those without whirring up its fans to maximum).

The power of Xeon

The Xeon W processors has a few key advantages over the iMac's Core i5 and i7 chips. The first is the number of cores. The iMac tops out at four cores, while the iMac Pro has a choice of eight, 10, 14 or 18. iMac Pros with the first two are

available for near-instant delivery, while 14- or 18-core iMacs will arrive in about four to eight weeks.

Additional cores deliver greater performance in multi-threaded applications, though more cores doesn’t necessarily mean more power. Clock speed also matters.

The eight-core Xeon used in the iMac Pro runs at 3.2GHz and tops out at 4.2GHz (ie the speed a core can achieve if other cores are tuned down), while the 10-core runs at 3GHz and has a Turbo Boost of 4.5GHz.

As has been the way with Xeon chips over the years, as you move up to more cores, the top speed slows down. So the 14-core model has speeds of 2.5GHz/4.3GHz, while the 18-core is 2.3GHz/4.3GHz.

The 10-core chip is the one most creatives will go for. It has lower base speed than the 8-core chip but can ramp up to a higher top speed when fewer cores are needed – so you’ll see higher performance in your apps whether what you’re doing in them can take advantage of all of the cores (such as rendering) or not (during the creative process, in most apps).

This has been the case with Xeons for a while now, with Intel in the past putting a W at the end of the name of 10-core Xeons to mark out that these were best for workstations. It’s now dropped this, likely because the line of chips is called W, and having a W at the beginning and end of an otherwise numeric product name would look a bit silly.

The inclusion of the new Xeon W-at-the-front processors also separates the iMac Pro from PC all-in-one workstations such as Dell’s Precision 5720 AIO, which currently support only the previous generation of Xeon chips (and the E3 chips at that, which are mainly aimed at laptops). It puts the iMac Pro again single-chip workstations such as Dell’s Precision T5820 –

though these are traditional desktops

The Xeon W platform is about more than the processors though. It supports the AVX-512 instruction set. This allows the system to process twice as much data in same clock cycle – essentially doubling the throughput.

From this you may seem some performance boost in existing apps might see benefits, while others will need developer updates.

AVX-512 isn't only found on Xeon chips, it's also found on Intel's Core i9 chips – which have similarly high core counts to the Xeon W chips but are aimed at gamers and PCs competing with the likes of the standard iMac. These aren't available in the iMac yet, but if they were, then the iMac Pro may not seem that much more powerful.

One component of the iMac Pro that you wouldn't see in the iMac, even if it was available with an i9 chip, is ECC RAM. This is – an has been – Xeon-only, and is more reliable than standard RAM (a definite boon if you do longer renders, and it's less likely to crash).

Also unlike the iMac, you can't upgrade this RAM yourself – you'll need to go to a service provider.

Graphics performance

There are two graphics options, both from AMD. The Radeon Pro Vega 56 has 8GB of memory, while the Vega 64 has 16GB. It's HBM memory rather than traditional VRAM, which sits on the same package as the GPU for much faster throughput and overall performance with large textures and complex models.

The Vega platform has a memory bandwidth of up to 400GBps – almost as high as Nvidia's highest end workstation-class graphics card, the Quadro P6000. Vega's performance is rated at 11 TFlops – which isn't much lower than the 12 TFlops offered by the P6000.

If you want even more graphics power than that, you can connect an external graphics card over Thunderbolt 3. Before receiving our review unit, I went to an Apple briefing and saw an iMac Pro running Cinema 4D connected to two Sonnet eGFX Breakout Boxes, each with an AMD W9100 inside. This allowed it to work with a hugely complex model of a motorbike – imported from a complete CAD model – in a way that the iMac Pro alone wouldn't be capable of.

This requires a version of Cinema 4D (below) that will ship later this month and Apple to add full support for eGPUs to macOS High Sierra. This is currently in beta, and is expected to be finally released in the next few months.



Storage

The key difference in storage between the iMac and iMac Pro is that the latter has a T2 chip, which encrypts data onto the storage. It's not that relevant to Digital Arts readers unless you work for clients who would like that extra level of security around what you're creating for them – but the main point here, according to Apple, is that it does this without affecting the drive's performance.

While Apple lists storage options of 1TB, 2TB and 4TB, these are actually comprised of two 512GB, 1TB or 2TB flash drives respectively. These appear as a single drive in a way that's kinda RAID-but-not-RAID, but with the faster I/O of having two connectors.

The final differences between the iMac Pro and the iMac is that the Pro model has four Thunderbolt 3 slots to the iMac's two, and the Ethernet port supports 10Gb Ethernet rather than just gigabit Ethernet. This .is especially useful for teams and larger houses who want to work with complex media stored on a SAN (storage area network) rather than on the Mac's hard

drive or a Thunderbolt RAID storage device.



iMac Pro pricing

A base iMac Pro will cost you £4,899 including VAT/US$4,999 plus tax. This has a 3.2GHz, 8-core chip, 32GB of ECC RAM, 1TB of SSD storage, a Radeon Pro Vega 56 with 8GB of HBM2 memory.

Digital Arts readers who would buy an iMac Pro over the standard iMac would probably upgrade this to the 3.0GHz, 10-core chip, 64GB of RAM, 2TB of storage and a Radeon Pro 64 with 64GB of memory. This raises the price to £7,599/$7,999.

Max this out fully with 128GB of RAM and 4GB storage at you're at a little over £9,000/$9,500. Though realistically, unless you're working in non-creative areas like machine learning or scientific work, the £7,599/$7,999 model will be enough for your needs.

These configurations come with the iMac Pro, keyboard and mouse. Adding a trackpad will cost you an extra £149. And for £79 you can get VESA kit to mount it on the wall. This is different from the standard iMac VESA set-up, for which you have to buy what's essentially a standless iMac ready for mounting. The iMac Pro's VESA kit lets you swap an iMac Pro from mounted to being on your desk on its usual stand as you wish.

iMac Pro benchmarking

Our review unit of the iMac Pro has the 3GHz, 10-core, 128GB RAM, the Radeon Pro Vega 64 graphics chip, 2TB of storage and both the mouse and trackpad – which comes in at an whopping £9,188/$9,748 (wince). However, 64GB of RAM is more than enough for most creative applications, and most designers and artists will only want the mouse (often alongside a graphics

tablet, which likely you already own) – so that gets the price down to £7,599/$7,999.

UK-based readers can likely also take off VAT, as the kind of companies that can afford an iMac Pro are likely to be VAT registered. So that's down to a more manageable £6,079.

For this iMac Pro review, we've given our benchmarking test suite a complete overhaul to create more stressful tests that show the capabilities of more powerful workstations like this – and to use current versions of the applications you use, many of which have been updated since we last looked at our test suites. Some of our testing tools remain the same, including Cinebench and SpecWPC v2.1 – though this last tool, which is an industry standard for workstation and includes tests across the likes of Maya, Blender, Handbrake and more, isn't available for Mac, so we can't use it here.

Others, including our core After Effects test that gives the best overall guide to a workstation's performance, have been upgraded to the latest version (2018). AE CC 2018 introduces a new Cinema 4D-based rendering engine that, when combining footage and effects with OpenGL-based output from the Cineware plugin that connects AE and C4D Lite, can give a measurement of real-time performance when taking into consideration all of a workstation's components from chip and RAM to graphics and storage. We consider this to be our core 'Creative Benchmark' that gives you the best idea of how a workstation will run day-to-day in any major modern video, motion graphics, VFX, CG or animation application.

In our benchmarking, we've also had to take into consideration the impact of OS, driver and software updates caused by patches to the recently disclosed Meltdown and Spectre processor bugs that affect devices from Macs and PCs to tablets and phone. You can read more about them here but, in

short. the patches fix the problems but Intel and Microsoft say could slow down computers, especially older ones and more strenuous tasks (like most creative ones). This doesn't affect our the iMac Pro results as it arrived with macOS 11.3.2 installed, which included patches – but in light of this we've re-run benchmarks where possible across a range of Macs and PCs.

Apple's patch doesn't seem to adversely affect our tests on any of the Macs we've tested before-and-after the Meltdown/Spectre patch – whether a new i7 iMac or 15-inch MacBook Pro, or on older 2015 iMac. We've also yet to see much difference on PCs, whether laptops or desktops. However, to ensure accuracy we've only included results in the below benchmarks where we've tested the computer post-Meltdown/Spectre patches.

iMac Pro benchmarks

Cinebench R15

Cinebench is based an older version on Maxon's Cinema 4D 3D suite (which is now on R19). It has two main tests, a rendering test and playing back a 3D scene in real-time to measure graphics performance.

The rendering test is entirely CPU-based, so it doesn't really give you an indication of how fast scenes will render on a workstation if you're using a renderer that can also tap your graphics card, such as AMD's ProRender. However, it's a good indicator a how powerful the chips are – and it shows that the Xeon chip inside an iMac Pro is almost 2.25x faster than a top-spec iMac, and 2.65x that of a new MacBook Pro (or a new HP ZBook Studio G4 laptop).

The iMac Pro's performance is also impressive against an older Lenovo ThinkStation P900. This was only 40 percent faster than the iMac Pro, despite having two 10-core Xeon chips (albeit a

generation older) to the iMac's single chip.

Cinebench's real-time 3D test tells us that raw 3D graphics performance only matter if what you're working with large models and textures. Cinebench's test scene is relatively simple, so you don't see much difference between the iMac Pro and an iMac (or even a powerful laptop like the ZBook Studio). The same is true for games and simple 3D elements in scenes in the likes of Photoshop or Illustrator.

Results are in Cinebench's units – longer bars are better
The iMac Pro has a 3GHz 10-core Xeon processor, 128GB RAM, a Radeon Pro Vega 64 graphics chip with 16GB HBM RAM and 2TB flash storage. Price: £9,188/$9,748
The 2017 i7 5K iMac has a 3.8GHz 4-core chip, 16GB RAM, a Radeon Pro 580 with 4GB RAM and a 512GB SSD. Price: £2,789/$2,899
The 2017 i5 5K iMac has a 3.4GHz 4-core chip, 8GB RAM, a Radeon 570 graphics with 4GB RAM and a 1TB Fusion Drive. Price: £1,749/$1,799
The 2017 iMacBook Pro has a 2.9GHz 4-core Core i7 processor, 16GB RAM, Radeon Pro 560 graphics with 4GB and 512GB SSD storage. Price: £2,699/$2,799
The HP ZBook Studio G4 has a 3.1GHz 4-core Xeon processor, 32GB RAM, Nvidia Quadro M51200 graphics with 4GB RAM, and 256GB flash storage. Price: £4,192/(US price not available)
The Lenovo ThinkStation P900 has two 3.1GHz 10-core Xeon processors, 128GB RAM, a Quadro K5200 graphics card with 8GB RAM and a 512GB SSD. Pricing unavailable at present.

Creative Performance

As mentioned previously, our key Creative Performance test uses After Effects CC 2018 – though the it's a good guide to overall performance in a very complex graphics and processing tasks, and how any major creative tool will perform.

There are four key tests here. The first two measure overall performance when you're using the AE with a standard HD project and a more extreme 4K one (using an OpenGL representation of 3D elements from Cinema 4D). The second two

render those scenes using the Draft Renderer (as the Final renderer would take way too long).

Here we really see what the iMac Pro is capable of. In our standard test it’s 60% faster in than the iMac, and in the extreme one it’s 97% faster. For rendering, its 103% faster, or 133.99% with the extreme file. It’s enormously faster than either the fastest Mac or PC laptops around too.

Results are in minutes – shorter bars are better.

Screen

The iMac Pro’s 5K screen is identical to that found on the standard 27-inch iMac. It’s huge, super-detailed and gorgeous to look at. Apple’s choice of aligning it to the P3 colour space – as used in digital cinema – rather than the Adobe RGB colour space makes more sense considering it’s more for those creating motion content. So while it can only output 91% of Adobe RGB – about the same as the MacBook Pro – you probably won’t mind unless you’re a graphic designer whose bought the iMac Pro just because you can.

Putting the iMac Pro next to the 27-inch iMac reminds me of one of the flaws of the whole all-in-one concept. Unlike with a traditional desktop, upgrading an iMac means upgrading the whole thing – you can’t just get a new workstation and keep the display to keep costs down. And unlike with iMacs from 2009-2014, if you already own an iMac 5K can’t just use your current model as a second display.

If this puts you off buying an iMac Pro, Apple will be launching an new Mac Pro (and separate display) later this year. And unless Apple keeps to the premise of the current ’trashcan’ design, this may also include dual processors and additional storage options.

Accessories

The iMac Pro's keyboard is just a Space Gray version of the keyboard with a numeric keypad that you can order as an option with the iMac. Personally, I prefer the extended keyboard for the extra keyboard shortcuts – but the lack of a smaller Space Gray version may nark creatives short on space on their desks due to using a Cintiq or graphics tablet.



That's a minor quibble, but Apple should have used the launch iMac Pro as a chance to redesign its Magic Mouse – aka the unusable dead cockroach when you need to charge it. We've also noticed that fingerprints are a lot more obvious on the Space Gray mouse.



The trackpad is, um, nice. Most creatives will use a full graphics tablet instead. I've used it twice so far, both times when the mouse was flat on its back charging.



Verdict

The iMac Pro truly is a marvel: beautifully designed both from an engineering perspective and aesthetically – something that's perhaps easy to forget when you have a standard 5K iMac on your desk every day, until you put the the iMac Pro next to a PC workstation. It's the ultimate all-in-one and something I can't see the likes of Dell or HP besting when/if they update their Precision 5720 AIO or Z1 models to the latest Xeon chip (though I'm willing to be surprised).

However, I wonder how many creatives will buy an iMac Pro. The kind of creatives who would spend 6-9k on a workstation are

largely using traditional desktops on Windows and Linux – the latter being what many large VFX firms, for example, have standardised on outside of the art department. Pulling them an all-in-one design, no matter how incredible it looks and is, could be a hard sell.

The natural audience for the iMac Pro perhaps is the kind of creative who is wedded to the Mac platform, and wishes they could have higher performance than they currently get from their i7 iMac or older Mac Pro (and has the budget to this). But they may wish to wait to see what the new Mac Pro has to offer later this year.

https://www.digitalartsonline.co.uk/reviews/creative-hardware/apple-imac-pro-review-this-superbly-designed-workstation-is-most-powerful-mac-ever/