

Ultimate CAD-CAM Performance

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Recommendations



MYTH#1

**Any i7,i9, Xeon CPU,
should be enough for
Manufacturing Workflows**



CAD/CAM Performance

Age matters!

- ❑ With each generation of technology performance improves. Ask; -
 - How old is your PC
 - How much time do you spend waiting for tasks to complete?
- ❑ Maximum CPU Speed in GHz is a good indicator. but do not expect the same performance from a 5 GHz CPU from 3 years ago vs today.
- ❑ We recommend a replacement cycle of 3-5 years as optimal for CAD/CAM performance.



CAD/CAM Performance Tests

Single Core Test - CAM

2020- Dell Precision 7750	2023- Dell Precision 7780
10 th Gen i7-10850H up to 5.1GHz	13 th Gen i9-13950HX up to 5.5GHz

If we just took the difference in maximum speed the Precision 7780 should be approx. 8% faster.... Lets see

Tests performed using SOLIDWORKS 2023 and SOLIDCAM 2023, Windows 10 Pro
Average of Minimum 3 test runs. Both clips shown a 5x real speed

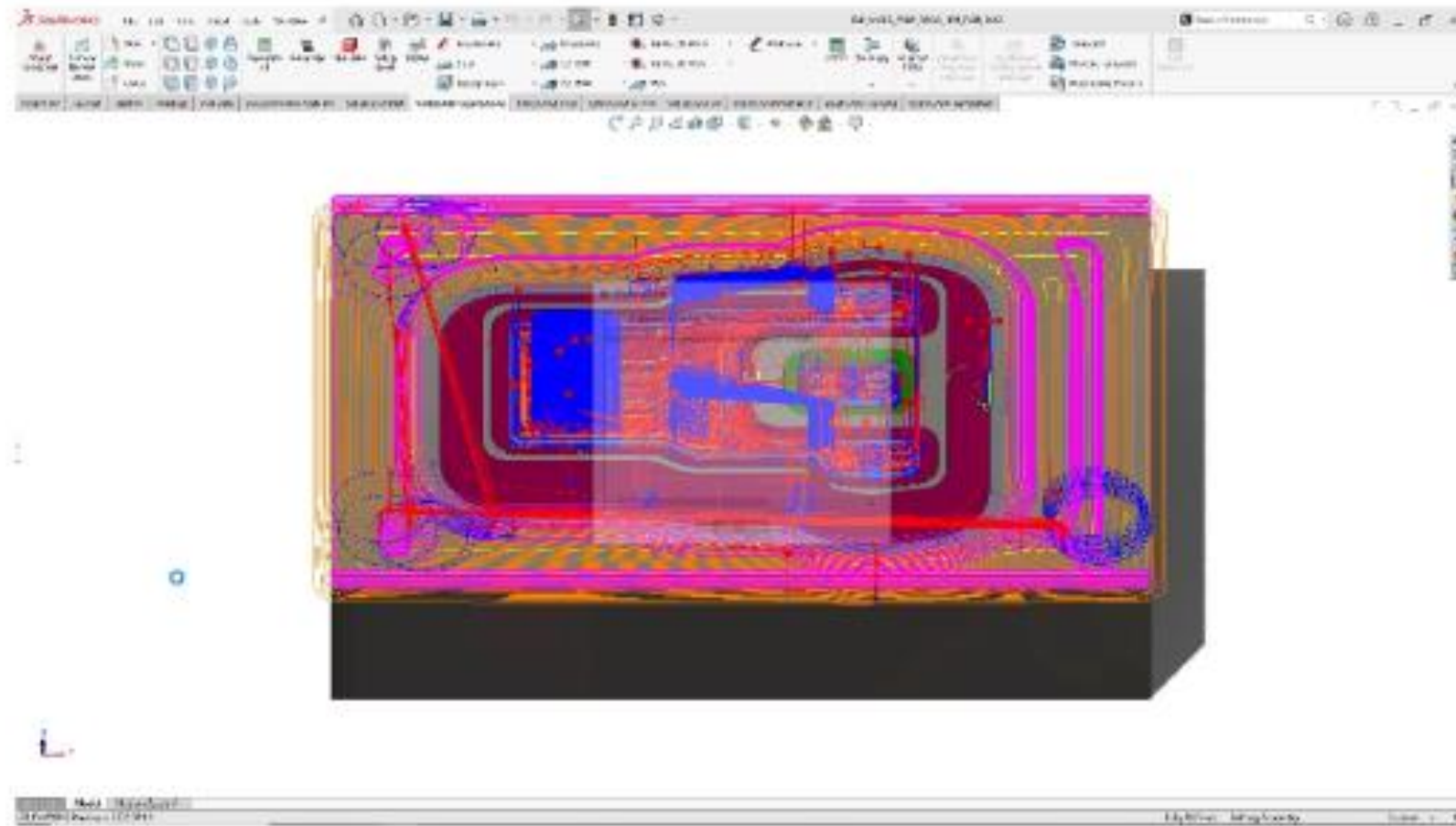


CAD/CAM Performance Tests

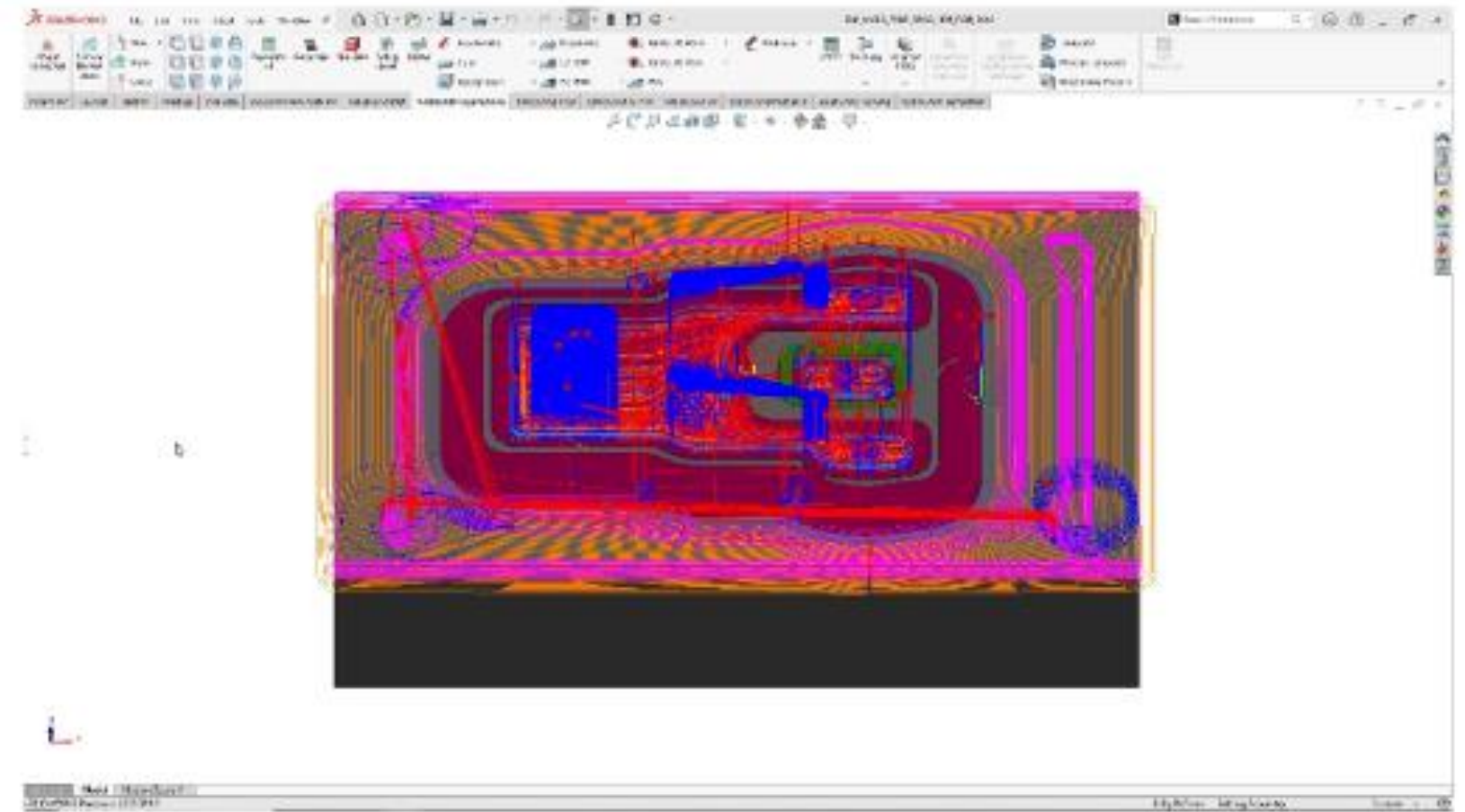
Single Core Test- **38% Quicker**

2020- Dell Precision 7750

2023- Dell Precision 7780



1 Min 48 Sec



1 Min 6 Sec



CAD/CAM Performance Tests

What about CAD?

- ❑ If you are using an integrated manufacturing product Part/Assembly open and rebuild time also matters.
- ❑ Lets look at a CAD model rebuild which will mostly use 1-2 cores
- ❑ Again speed in GHz + the generation of CPU is important.

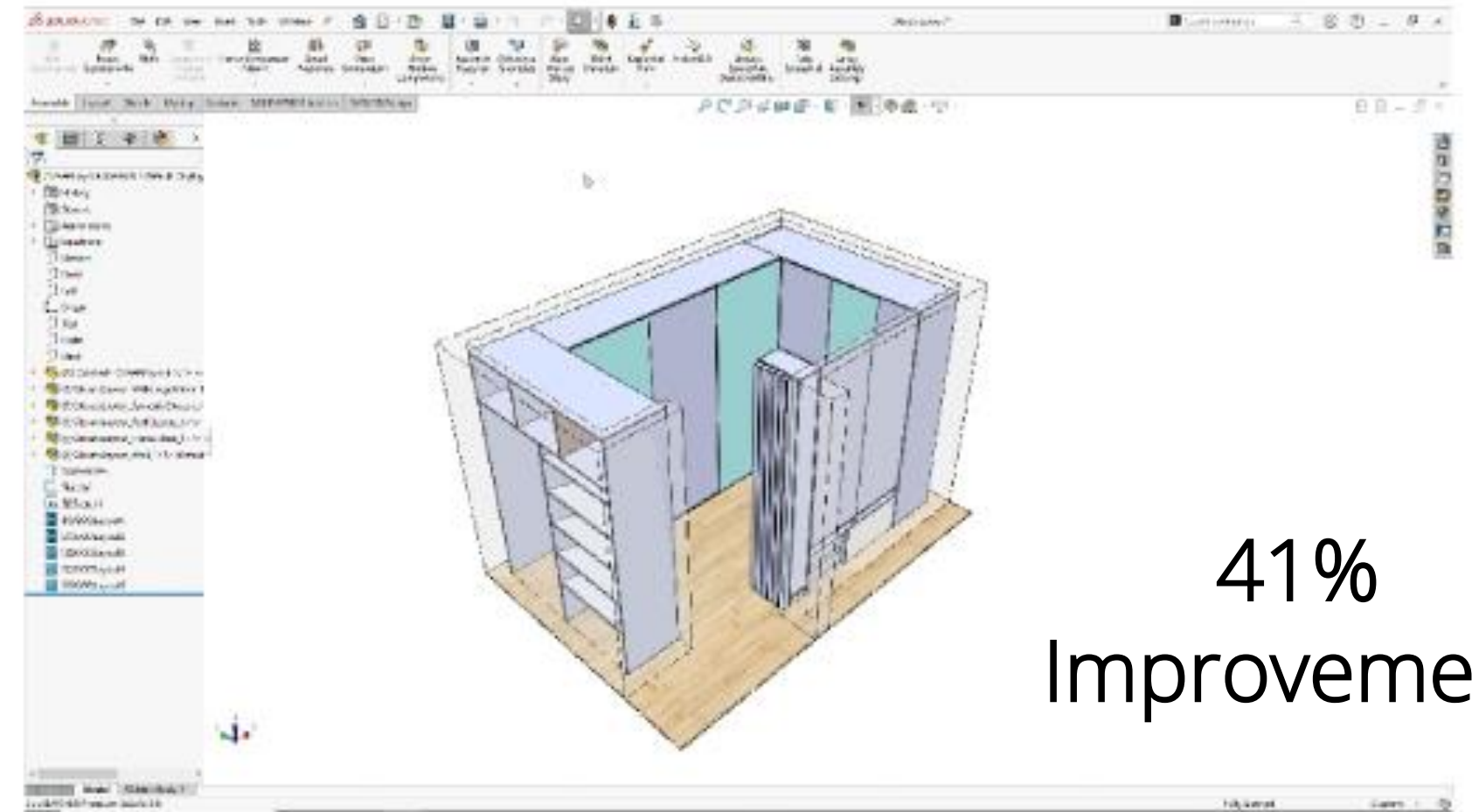
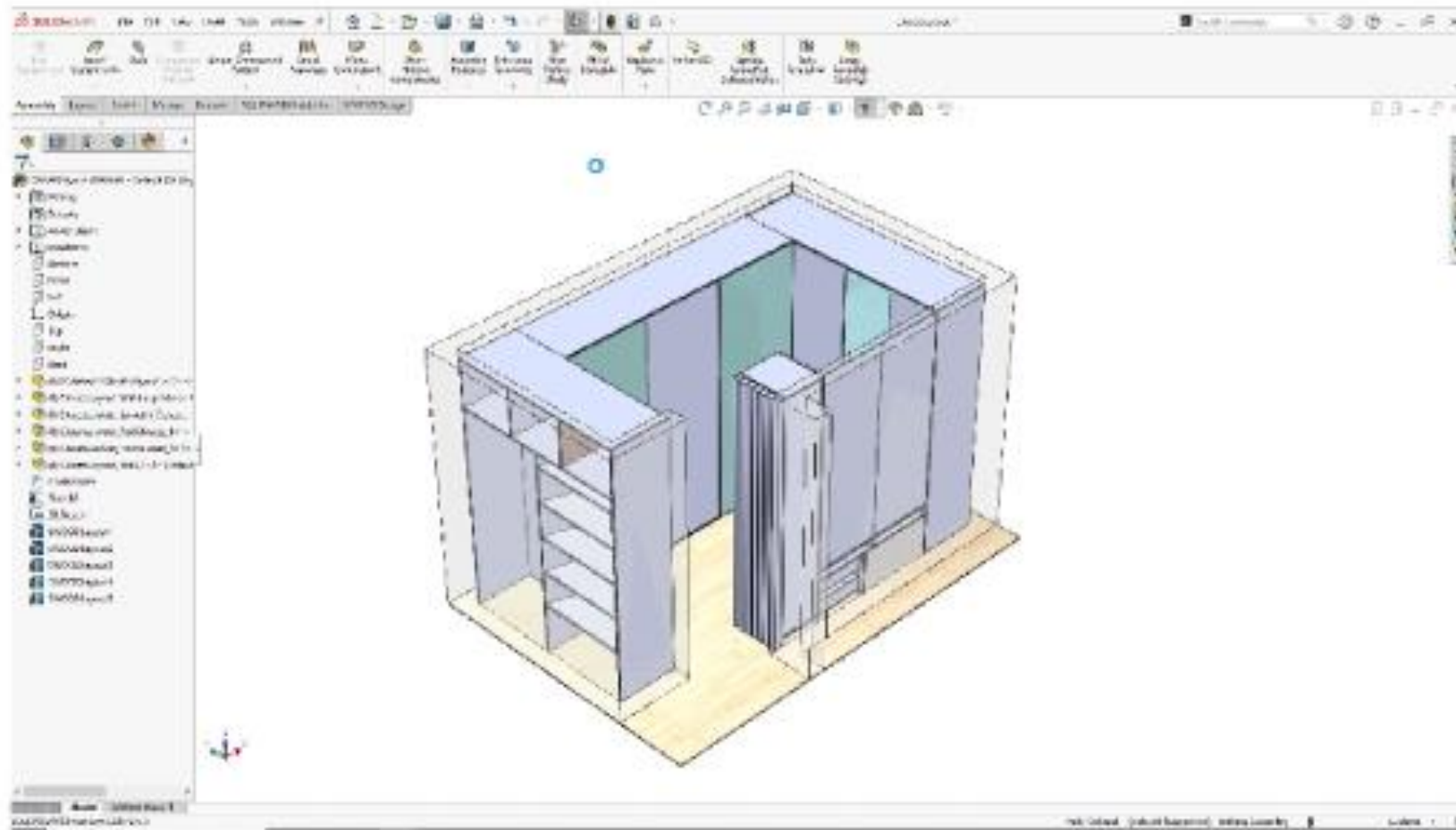


CAD/CAM Performance Tests

What about CAD? SWOOD rebuild multiple component sizes

2020- Dell Precision 7750

2023- Dell Precision 7780



41%
Improvement

41 Seconds

24 Seconds



MYTH#2

**CAD/CAM isn't
multithreaded**



CAD/CAM using Multiple cores

What can use multiple cores?

- ❑ It is true SOLIDWORKS will use 1-2 cores for most operations due to the way all CAD programs need to rebuild 1 feature/ step at a time in order.
- ❑ Some tasks such as drawings with multiple views, assembly graphics calculations have been multi-threaded, along with FEA, CFD etc.
- ❑ For 3d Scanning an 8 core i7 or above is recommended.
- ❑ In SOLIDCAM Turbo HSR and HSM Toolpath calculations can multi-threaded delivering even bigger performance improvements.



CAD/CAM Performance Tests

SOLIDCAM Multi Core

2020- Dell Precision 7750	2023- Dell Precision 7780
10 th Gen i7-10850H up to 5.5GHz	13 th Gen i9-13950HX up to 5.5GHz
6 Cores	24 Cores

Using Turbo HSR/HSM to leverage many cores.

Tests performed using SOLIDWORKS 2023 and SOLIDCAM 2023, Windows 10 Pro
Average of Minimum 3 test runs. Both clips shown a 5x real speed

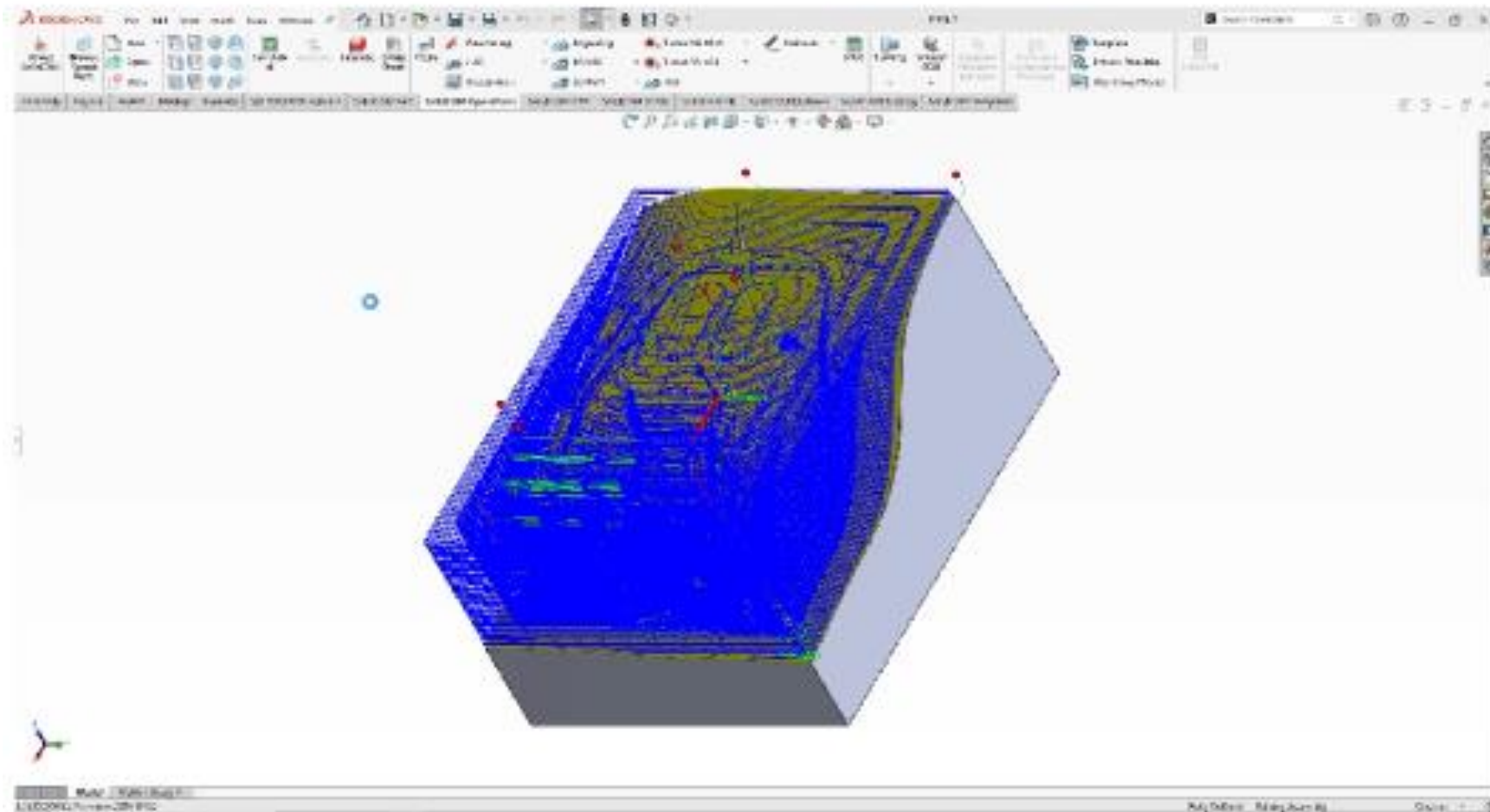


CAD/CAM Performance Tests

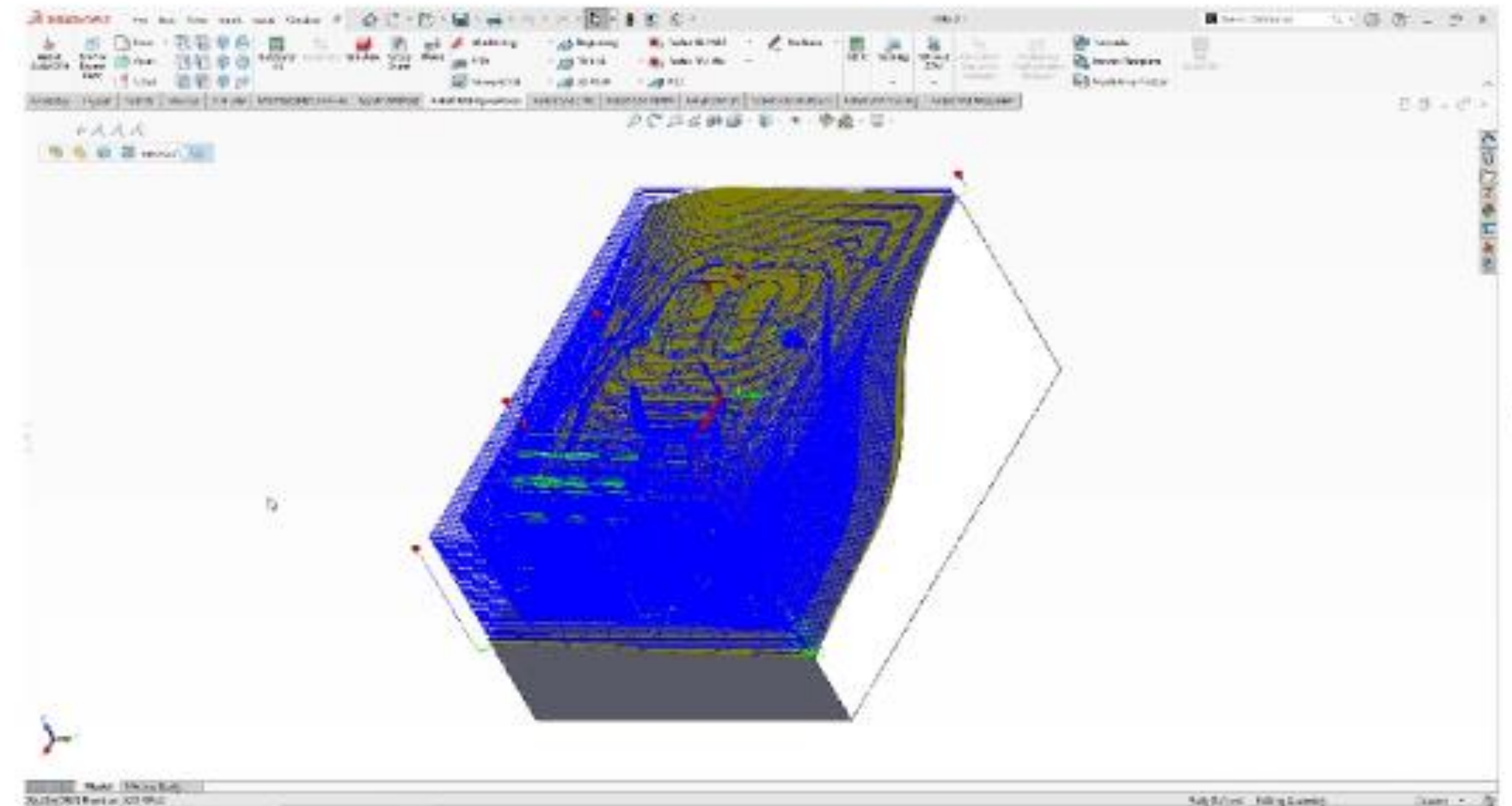
SOLIDCAM Multi Core- 55% Improvement

2020- Dell Precision 7750

2023- Dell Precision 7780



2Min 25 Sec



1 Min 4 Sec



MYTH#3

**CAD Workflows can't
take advantage of high
end Graphics Cards**



CAD & Manufacturing

What uses the Graphics Card?

- ❑ CAD programs rely on certified professional graphics cards for stability and performance.
- ❑ SOLIDWORKS changed the underlying graphics engine in 2019 to make use of high-end graphics particularly for complex datasets, display of edges etc.
- ❑ While toolpath calculation is mainly CPU based the result is then overlaid on your CAD model, In testing we noted increased load on the graphics card with tool paths displayed in addition to the SOLIDWORKS Model



CAD/ Manufacturing

What uses the Graphics Card?

- ❑ 3D Scanning relies heavily on your graphics card, 8GB Graphics memory or more is recommended. The size and resolution of the scan you can achieve relates to the amount of memory onboard
- ❑ SOLIDWORKS Visualize can also utilise graphics card to accelerate render times. Again 8GB+ is recommended as the scene must fit in the graphics memory.



CAD/ Manufacturing

Visualize Rendering

2020- Dell Precision 7750

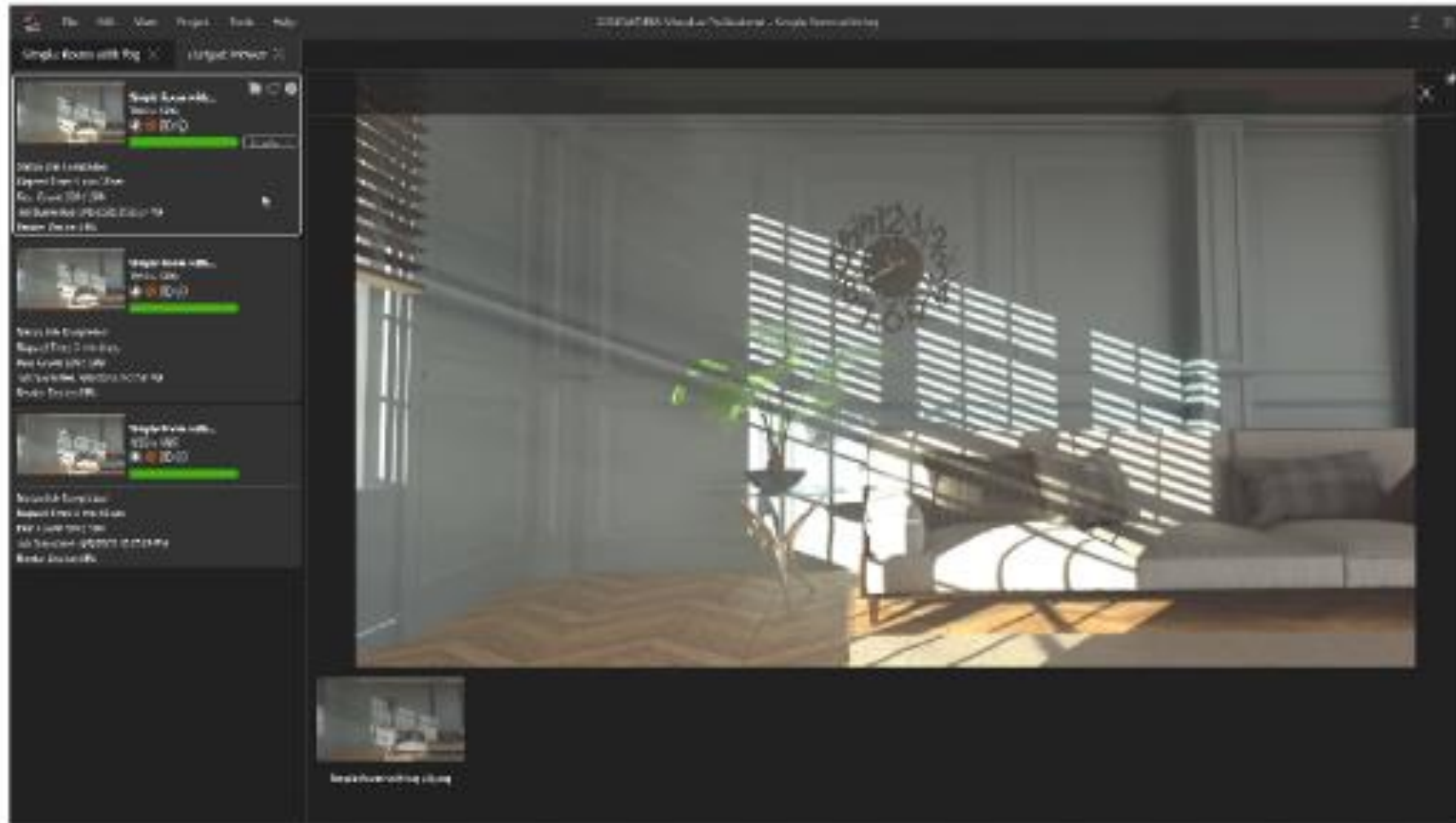
NVIDIA Quadro RTX 3000 6GB

2023- Dell Precision 7780

12GB NVIDIA RTX 4000 Ada Gen

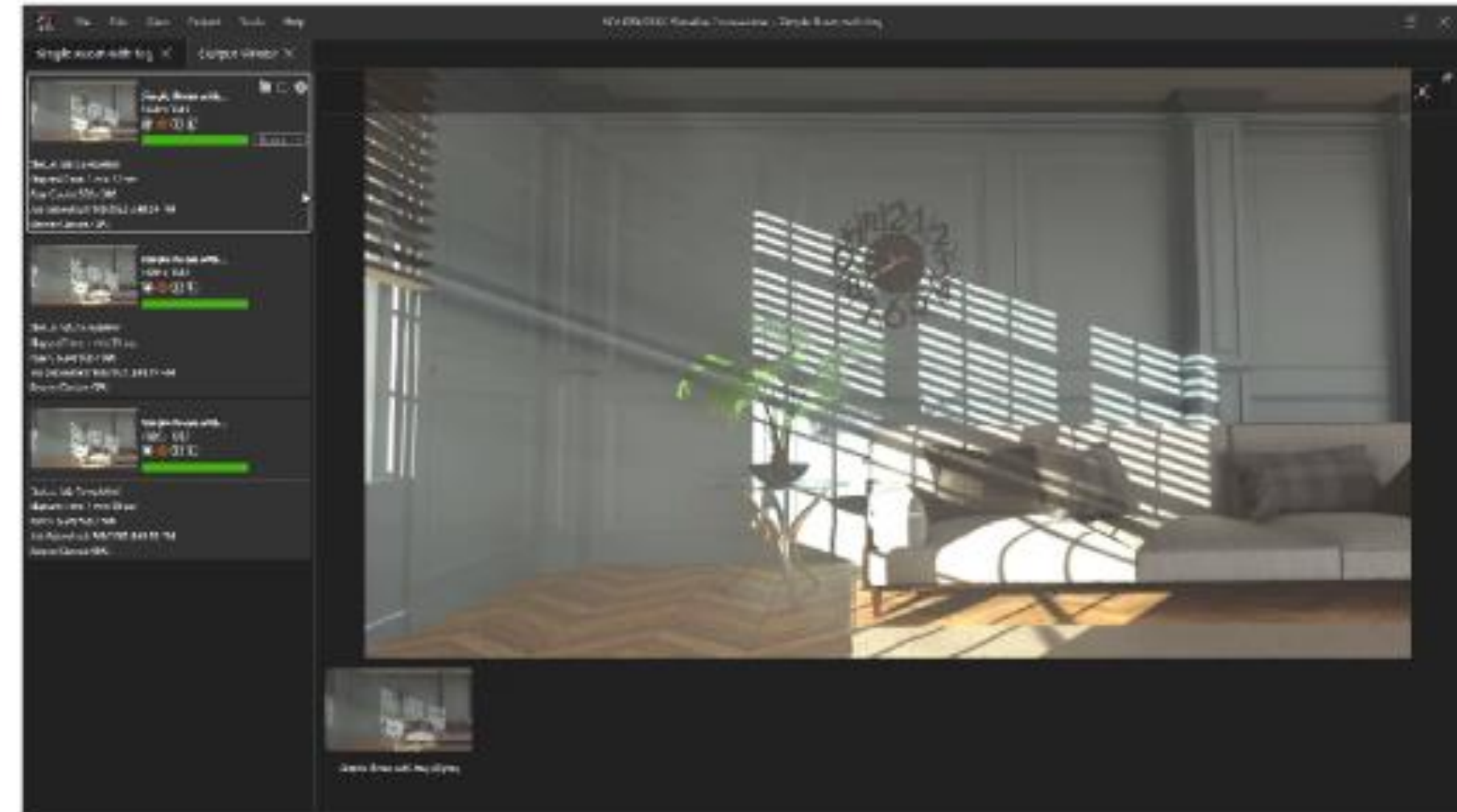


2020- Dell Precision 7750



5 Min 2 Sec

2023- Dell Precision 7780



1 Min 38 Sec



Recommended Workstations

Dell Precision 2023



Selecting the best Workstation

What is right for your Workflow

We have shown that CAD-CAM requires a mix of;

- High speed single threaded performance from latest generation CPUs
- . 8+ cores for multithreaded workloads
- NVIDIA Professional Graphics – mid-high end.
- Fast SSD storage

Desktops vs Laptops

- Desktops still typically retain a 5-10% performance advantage for most workloads.



Sustainability on Dell Precision Workstations

Design

Precision workstations lead the industry in sustainable design and materials. Precision were the first workstations to use reclaimed carbon fiber and renewable bioplastic.

Sustainable Materials

Precision mobile workstations contain up to 17% recycled plastic, and the fixed workstations contain up to 46%. Precision also uses reclaimed carbon fiber from the aerospace industry.

In the lids, of the 3000 Series we blend our new bioplastic with carbon fiber and other recycled materials for a total of 71% sustainable materials.

Packaging Innovation

We use 100% recycled paper pulp throughout the portfolio and 100% recycled plastic (75% PCR and 25% ocean-bound) material for the system tray for Precision 5000 Series.

PRECISION HAS

19

EPEAT registered products

16







TCO 8 certified configurations

8.0

ENERGY STAR® throughout the portfolio



Precision Fixed Workstation Portfolio

	Precision 3260 Compact	Precision 3460 SFF	Precision 3660 Tower	Precision 5860 Tower	Precision 7865 Tower	Precision 7960 Tower
						
Desc.	Most affordable	Best price/performance	Best price/performance in Towers	Scalable frequency and cores	Scalable cores and frequency	Ultimate performance and scalability
Processors	Up to Intel Core i9, 24 (8P+16E) cores, 65W	Up to Intel Core i9, 24 (8P+16E) cores, 65W	Up to Intel Core i9, 24 (8P+16E) cores, 125W	Up to Intel Xeon W, 24 cores, 350W	AMD Ryzen Threadripper™ Pro up to 56 cores	Intel Xeon W, 56 cores per CPU
Graphics	Up to NVIDIA T1000 8GB	Up to 75W NVIDIA RTX A2000 (12GB)	Up to 350W NVIDIA RTX A6000 (48GB)	Up to dual NVIDIA RTX A6000 (48GB)	Up to dual NVIDIA RTX A6000 (48GB)	Up to four double-wide 300W, up to NVIDIA RTX A8000 (48GB)
Memory	Up to 64GB DDR5 4800MHz, ECC options	Up to 128GB DDR5 4800MHz, ECC options	Up to 128GB DDR5 4800MHz, ECC options	Up to 2TB DDR5 4800MHz, ECC options	Up to 1TB DDR4 3200MHz	Up to 4TB 4800MHz, ECC options
Storage	Up to 9TB (HDD, SDD), RAID options	Up to 20TB (HDD, SDD), RAID options	Up to 28TB (HDD, SDD), RAID options	Up to 56TB, RAID options	Up to 56TB, RAID options	Up to 152TB, RAID options
Design	Ultra Small Form Factor	Small Form Factor	Mini-Tower	Mid-Tower	Mid-Tower	Full Tower

Precision Mobile Workstation Portfolio

	3480	3580	3581	5480	5680	7680	7780
							
Desc.	Entry-level 14"	Low price 15"	Best performance 15"	Powerful, thin, light 14"	Powerful, thin, light 16"	Most powerful 16"	Most Scalable 17"
CPU	Up to i7, 14 cores (6P+8E), P-series, 28W	Up to i7, 14 cores (6P+8E), U- or P-series, 20-28W	Up to i9, 14 cores (6P+8E), H-series, 45W	Up to i9, 14cores (6P+8E), H-series, 45W	Up to i9, 14 cores (6P+8E), H-series, 45W	Up to i9, 24 cores (8P+16E), HX-series, 55W	Up to i9, 24 cores (8P+16E), HX-series, 55W
Graphics	Up to NVIDIA A500 (4GB)	Up to NVIDIA RTX A500 (4GB)	Up to NVIDIA RTX 2000 Ada (8GB)	Up to NVIDIA RTX 1000 Ada (8GB)	Up to NVIDIA RTX 3000 Ada (12GB)	Up to NVIDIA RTX 5000 Ada (16GB)	Up to NVIDIA RTX 5000 Ada (16GB)
Storage	Up to 2TB	Up to 3TB	Up to 4TB	4TB, RAID options	8TB, RAID options	Thin: 8TB, Performance: 12TB, RAID options	16TB, RAID options
Memory	Up to 64GB DDR5 4800MT/s non-ECC	Up to 64GB DDR5 4800MT/s non-ECC	Up to 64GB DDR5 4800MT/s non-ECC	Up to 64GB DDR5 6000MT/s Non-ECC	Up to 64GB DDR5 6000MT/s Non-ECC	128GB (CAMM), 64GB (SODIMM), 5600MT/s, optional ECC, non-ECC	128GB (CAMM), 64GB (SODIMM), 5600MT/s, optional ECC, non-ECC
Display	14", up to FHD, PremierColor, Touch and ComfortView Plus options	15.6", up to FHD, PremierColor, Touch and ComfortView Plus options	15.6", up to FHD, PremierColor, Touch and ComfortView Plus options	14", InfinityEdge 16:10 display, up to QHD+ PremierColor with Touch, Pen and ComfortView Plus options	16", 3-sided InfinityEdge 16:10 display, up to QHD+ PremierColor with Touch, ComfortView Plus options	16", 16:10 OLED display, up to HDR500, PremierColor, Touch and ComfortView Plus options	17.3", 16:9 display, up to HDR500, PremierColor, ComfortView Plus options
Weight	3.06 lbs./1.39 kg	3.56 lbs./1.63 kg	3.96 lbs./1.79 kg	3.26 lbs./1.48 kg	4.49 lbs./1.99 kg	Thin: 5.75 lbs./2.6 kg Perf: 5.90 lbs./2.67 kg	6.73 lbs./3.05 kg

Recommended Desktops

<https://www.solidsolutions.co.uk/solidworks/hardware/desktop-workstations.aspx>



OUR PRICE: £2,500

Includes Delivery, Excludes VAT

NEW Dell Precision™ 3660 Desktop – Design Plus 2023

Full size tower workstation with 13th Generation Intel i7 16 Core CPU and NVIDIA A2000 12GB professional graphics best suited to datasets with low thousands of components, occasional visualisation tasks.

Hardware Specification

- Intel i7-13700k 16Core (8P +8E) Turbo Boost up to 5.4GHz
- Windows 10 Professional 64bit (Windows 11 license included)
- 32GB (2x16GB) DDR5 Ram
- NVIDIA RTX A2000 12GB Graphics Card
- 1TB PCIe NVMe Solid State Drive
- 500W Chassis
- Dell Wired Keyboard & Mouse
- *No Optical Drive or WiFi*
- *No Display Included*
- 3Yr Dell ProSupport and Next Business Day On-Site Service



OUR PRICE: £3,250

Includes Delivery, Excludes VAT

NEW Dell Precision™ 3660 Desktop - High End 2023

Full size tower workstation with fastest available 13th Generation Intel i9 24 Core CPU, 64GB DDR5 RAM and high end NVIDIA A4000 16GB professional graphics card. Well suited to datasets with many thousands of components, simulation and GPU visualisation tasks.

Hardware Specification

- Intel i9-13900k 24 Core (8P +16E) Turbo Boost up to 5.8GHz
- Windows 10 Professional 64bit (Windows 11 license included)
- 64GB (2x32GB) DDR5 ECC Ram
- NVIDIA RTX A4000 16GB Graphics Card
- 1TB PCIe NVMe Solid State Drive
- 500W Chassis
- Intel Wi-Fi 6E AX211 & Bluetooth 5.2 Wireless Card
- Dell Wired Keyboard & Mouse
- *No optical drive or display included*
- 3Yr Dell ProSupport and Next Business Day On-Site Service

Performance Guideline



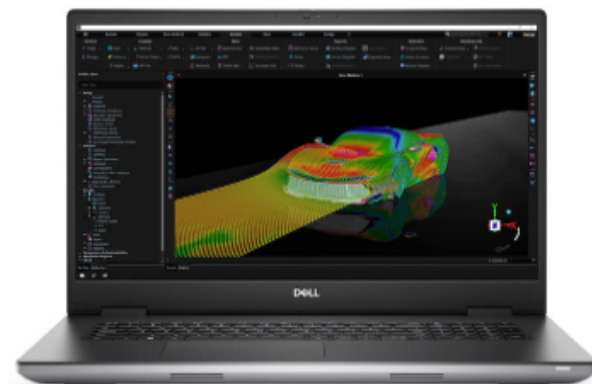
Recommended Laptops

<https://www.solidsolutions.co.uk/solidworks/Hardware/Laptop-Workstations.aspx>



OUR PRICE: £3,975

Includes Delivery, Excludes VAT



OUR PRICE: £5,050

Includes Delivery, Excludes VAT

NEW Dell Precision 7680 16" Laptop - High End 2023

High 16 Inch Laptop, performance chassis version featuring Intels latest 13th Generation Intel i7 HX CPU, delivering faster CAD and multiheaded performance with 20 cores, and High end 12GB graphics card from NVIDIAS new Ada Generation professional graphics. also featuring 64GB of DDR5 RAM all of which makes it a great balance for those working with the most challenging data sets with many thousands of components or CAE workloads such as visualisation, Simulation, 3D Scanning.

Hardware Specification

- Intel Core i7-13850HX 20Core (8P+12E) Turbo Boost upto 5.3GHz
- 16.0 Inch FHD, 1920x1200,with Cam and Mic
- Windows 10 Professional 64bit (Windows 11 License included)
- 64GB DDR5 RAM
- 12GB NVIDIA RTX 3500 Ada Generation Graphics Card
- 1TB M.2 PCIe NVMe Solid State Drive
- 3Yr ProSupport and Next Business Day On-Site Service

NEW Dell Precision 7780 17" Laptop - Ultimate 2023

Now the only major OEM 17.3 Inch laptop workstation, ever popular for it's extra screen real estate and scope for cooling the most powerful components. This spec features top of the range 13th generation Intel i9 CPU, offering fast CAD and multiheaded performance with 24 cores and ultra high end NVIDIA RTX 4000 Ada Generation graphics. With 2TB of SSD storage, 64GB of DDR5 RAM all of which makes it a great balance for those working with the most challenging data sets with many thousands of components or CAE workloads such as visualisation, simulation, 3D scanning.

Hardware Specification

- Intel Core i9-13950HX 24 Core (8P + 16E) Turbo Boost up to 5.5GHz
- 17.3 Inch FHD, 1920x1080,with Cam and Mic
- Windows 10 Professional 64bit (Windows 11 License included)
- 64GB DDR5 RAM
- 12GB NVIDIA RTX 4000 Ada Generation Graphics Card
- 2TB M.2 PCIe NVMe Solid State Drive
- 3Yr ProSupport and Next Business Day On-Site Service

Performance Guideline





ANY QUESTIONS?

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