



## HP ZBook Firefly 14 G11 Mobile Workstation PC: Improve productivity, battery life, and power efficiency

### vs. an HP ZBook Firefly 14 G10 Mobile Workstation PC

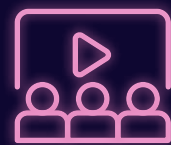
For business, creative, and technical professionals with an eye to the future, investing in an HP ZBook Firefly 14 G11 Mobile Workstation PC can bring many advantages. In our hands-on performance and battery life tests, we found upgrading from a previous-gen G10 to a G11 could lead to shorter render times, stronger performance for critical artificial intelligence (AI) workloads, and longer battery life with better power efficiency. That's in part because the ZBook Firefly 14 G11 is powered by an Intel® Core™ Ultra processor, which integrates central processing unit (CPU), graphic processing unit (GPU), and neural processing unit (NPU) cores into a single package.<sup>1</sup>

At PT, we used industry-standard benchmarks to compare the next-gen HP ZBook Firefly 14 G11 Mobile Workstation PC powered by an Intel® vPro® with Intel Core Ultra 7 processor 165H to its G10 predecessor powered by an Intel Core i7-1355U processor. We found that by teaming up with the new Intel Core Ultra processor-powered HP ZBook Firefly 14 G11 Mobile Workstation PC, you can better prepare to meet your current needs and exceed your future goals.



#### Identify people and objects faster

34.1% more ResNet-50  
samples per second



#### Tackle bigger content creation projects

28.4% higher Cinebench  
2024 CPU multi-core score



#### Balance performance and battery efficiency

59.2% higher MobileMark 30  
Index score

## How we tested

To measure the benefits of upgrading to the newest 14-inch HP ZBook Firefly Mobile Workstation PC, we equipped both Windows 11 Pro systems with 32 GB of memory and 1 TB of storage and otherwise configured the systems as closely as possible.



### HP ZBook Firefly 14 G11

Mobile Workstation PC

- Intel vPro® with Intel Core Ultra 7 processor 165H
- Integrated Intel Arc™ graphics
- Integrated Intel AI Boost
- NVIDIA RTX™ A500 discrete graphics
- 56-Whr battery



### HP ZBook Firefly 14 G10

Mobile Workstation PC

- Intel Core i7-1355U processor
- Integrated Intel Iris® Xe graphics
- No NPU component
- NVIDIA RTX A500 discrete graphics
- 51-Whr battery

To evaluate system performance from many angles, we used these industry-standard benchmarks and AI tools:

- 3DMark® Fire Strike Extreme
- 3DMark Time Spy Extreme
- Cinebench 2024
- Geekbench AI
- ResNet-50
- SPECapc® for Creo 9
- SPECworkstation® 3.1
- Stable Diffusion

To determine battery life and battery efficiency advantages, we ran the MobileMark 30 benchmark in the Windows 11 Best power efficiency power mode.

The results we report reflect the specific configurations we tested. Any difference in the configurations—as well as screen brightness, network traffic, and software additions—can affect these results. For a deeper dive into our testing parameters and procedures, see the [\*science behind the report\*](#).



## About the HP ZBook Firefly 14 G11 Mobile Workstation PC

The 14-inch Firefly is the most compact offering on the HP ZBook mobile workstation roster. Designed to help professionals stay productive wherever they're working, the HP ZBook Firefly 14 G11 Mobile Workstation PC is powered by Intel Core Ultra processors with new architecture that is "purpose-built for the next era of AI software" and "delivers power-efficient performance for complex business workloads."<sup>2</sup> The system comes with up to an Intel Core Ultra 9 CPU (with integrated Intel Arc graphics and Intel AI Boost), optional Intel vPro, a discrete NVIDIA RTX A500 GPU, up to 64 GB of memory, and up to 2 TB of storage.<sup>3</sup>

## About the Intel Core Ultra 7 processor 165H

The Intel Core Ultra 7 processor 165H employs an architecture that integrates CPU, GPU, and NPU components. The CPU offers six performance-cores, eight efficient-cores, and two low-power efficient-cores, while the GPU (Intel Arc graphics) offers eight Xe-cores and ray-tracing capabilities. The NPU (Intel AI Boost) supports OpenVINO™, WindowsML, DirectML, and ONNX RT AI software.<sup>4</sup>

Learn more at: <https://www.intel.com/content/www/us/en/products/sku/236851/intel-core-ultra-7-processor-165h-24m-cache-up-to-5-00-ghz/specifications.html>.

## Improve day-to-day experiences

Whether your to-do list is filled with problem-solving tasks, modeling and manipulating 3D designs, or taking on complex AI or machine learning (ML) projects, strong performance from your workstation is key to your success.

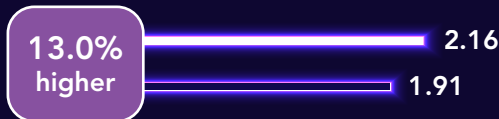
The SPECworkstation 3.1 benchmark measures CPU, graphics, I/O, and memory bandwidth for diverse professional applications.<sup>5</sup> Each SPECworkstation 3.1 workload uses different tools to measure performance of industry-specific workflows. The Media and Entertainment workload uses Blender, Handbrake, LuxReader, Maya, and 3ds Max. The Product Development workload uses Rodinia, WPCcfd, CalcuilX, CATIA, Creo, NX, Solidworks, and Showcase. The Financial Services workload uses a Monte Carlo simulation algorithm as well as Black-Scholes and Binomial options pricing model algorithms. Finally, the Energy (oil and gas) workload uses FFTW, Convolution, SRMP, Kirchhoff Migration, Poisson, and SPECviewperf<sup>®</sup> 13 Energy.<sup>6</sup>

### Better handle productivity workflows

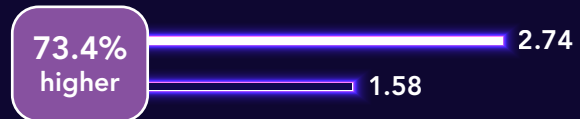
Higher is better

■ HP ZBook Firefly 14 G11    □ HP ZBook Firefly 14 G10

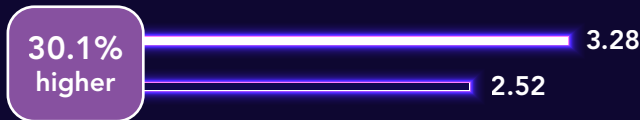
Media and Entertainment overall score



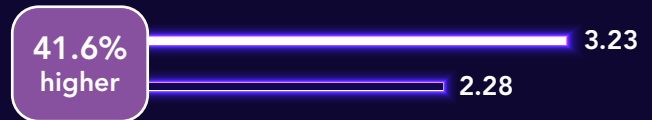
Financial Services overall score



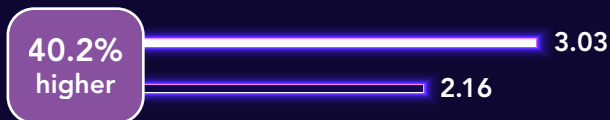
Product Development overall score



Energy overall score



Graphics overall score



GPU Compute overall score

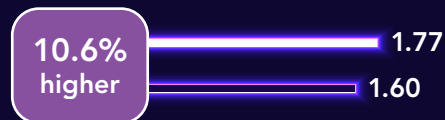


Figure 1: SPECworkstation 3.1 overall scores. Higher is better. Source: Principled Technologies.



## Boost product design and content creation

The level of system performance that business, creative, and technical professionals require depends on their specific workflows. We tested the mobile workstations using four industry-standard benchmarks to reflect multiple different workflows.

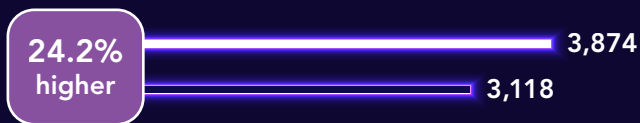
The 3DMark Fire Strike Extreme benchmark is a DirectX 11 test that stresses both CPU and GPU.<sup>7</sup> The 3DMark Time Spy Extreme benchmark is a DirectX 12 test that stresses graphics cards and multi-core processors.<sup>8</sup> Better real-time graphics performance can translate to faster 3D graphics rendering and smoother viewing experiences.

### Better handle multimedia tasks

Higher is better

■ HP ZBook Firefly 14 G11   ■ HP ZBook Firefly 14 G10

3DMark Fire Strike Extreme score



3DMark Time Spy Extreme score

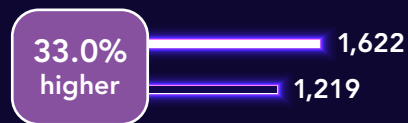


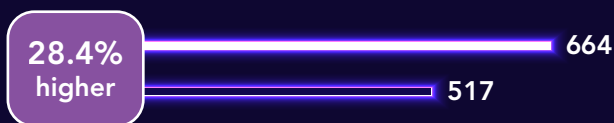
Figure 2: 3DMark results. Higher is better. Source: Principled Technologies.

The Cinebench 2024 benchmark uses the Redshift rendering engine to evaluate CPU and GPU capabilities while running a Cinema 4D scene.<sup>9</sup> The SPECapc for Creo 9 benchmark uses eight application workflows to measure CPU and GPU performance while using the popular Creo 9 computer-aided design program.<sup>10</sup>

### Tackle bigger content creation projects

Higher is better

Cinebench 2024 CPU multi-core score



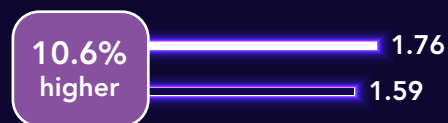
■ HP ZBook Firefly 14 G11   ■ HP ZBook Firefly 14 G10

Figure 3: Cinebench 2024 CPU multi-core scores. Higher is better. Source: Principled Technologies.

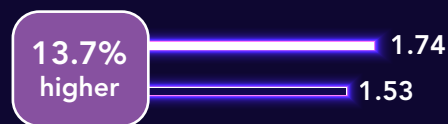
### Speed product design and validation

Higher is better

CPU Composite score



GPU Composite score



■ HP ZBook Firefly 14 G11   ■ HP ZBook Firefly 14 G10

Figure 4: SPECapc for Creo 9 results. Higher is better. Source: Principled Technologies.

## Embrace AI and ML technologies

AI and ML technologies are changing how we approach business, creative, and technical challenges. But these advances come at a price. AI and ML workloads are data- and processor-intensive activities that can bog down lesser machines.

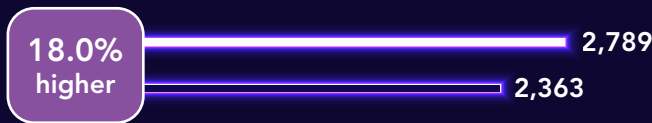
The Geekbench AI benchmark measures CPU, GPU, and NPU capabilities for machine learning applications.<sup>11</sup> The Single Precision score reports float32 precision, the Half Precision score reports float16 precision, and the Quantized score reports int8 precision.<sup>12</sup> In our testing, we used the OpenVINO AI framework and CPU AI backend for machine learning on Windows.

### Get important insights faster

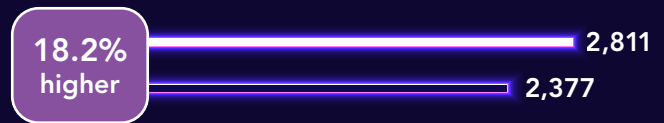
Higher is better

■ HP ZBook Firefly 14 G11 ■ HP ZBook Firefly 14 G10

Geekbench AI Single Precision score



Geekbench AI Half Precision score



Geekbench AI Quantized score

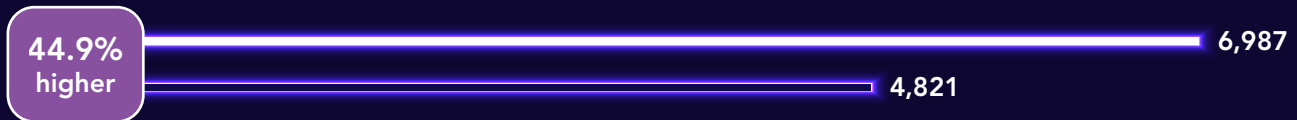


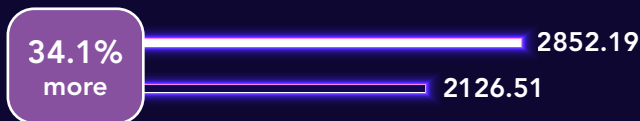
Figure 5: Geekbench AI OpenVINO CPU results. Higher is better. Source: Principled Technologies.

The MLPerf ResNet-50 benchmark measures how many samples per second a system can process.<sup>13</sup> ResNet models are trained on over a million images to help business, creative, and technical professionals organize and categorize objects, people, and places in images. Stable Diffusion is a generative AI model that produces photorealistic images from text prompts.<sup>14</sup> For our tests, we measured how long it took for each mobile workstation to generate an image based on identical Stable Diffusion text prompts.

### Identify people and objects faster

Higher is better

ResNet-50 samples per second



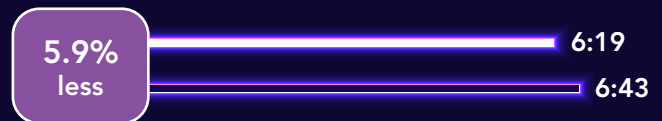
■ HP ZBook Firefly 14 G11 ■ HP ZBook Firefly 14 G10

Figure 6: MLPerf ResNet-50 benchmark results. Higher is better. Source: Principled Technologies.

### Contribute ideas faster

ss:ms | Lower is better

Time to generate a Stable Diffusion image from a text prompt



■ HP ZBook Firefly 14 G11 ■ HP ZBook Firefly 14 G10

Figure 7: Stable Diffusion text-prompt to image-generation results. Time in minutes and seconds. Less time is better. Source: Principled Technologies.

## The difference between float32, float16, and int8 precision

Each of these is a measure of the precision, with Int8 being the lowest and float32 being the highest. Higher precision always costs more resources. The Geekbench AI Single Precision score reports float32 precision, which is essential for medical professionals and data engineers who want hyper-accurate image analysis and object classification. The Geekbench AI Quantized score reports int8 precision, which is accurate enough for security professionals to determine whether the thing that tripped a vision-sensor is an animal or a human being. The Geekbench AI Half Precision score reports float16 precision, which is less precise than Single Precision but more precise than Quantized.

## Improve battery life and power efficiency

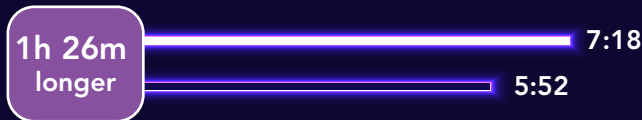
Before we started testing, we set the Windows 11 power mode in both mobile workstations to Best power efficiency. The MobileMark 30 battery life benchmark uses real-world applications to gauge battery life in office productivity situations, and its MobileMark 30 Index score factors in DC performance and battery life results.<sup>15</sup> Higher Index scores reveal a better balance between performance and battery life. Lower Index scores indicate that performance suffered in the pursuit of longer battery life. For reference, power efficiency is the ratio of the useful output energy to the total input energy consumed.

### Balance performance and battery efficiency

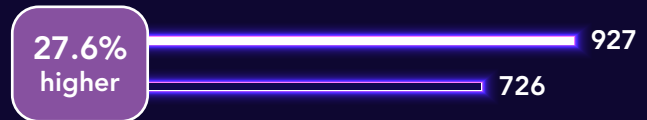
Higher is better

■ HP ZBook Firefly 14 G11    □ HP ZBook Firefly 14 G10

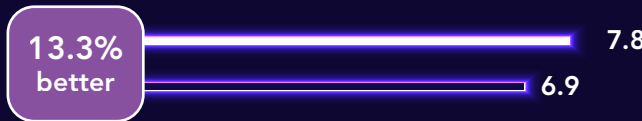
Battery life (h:mm)



DC performance score



Power efficiency



MobileMark 30 Index score

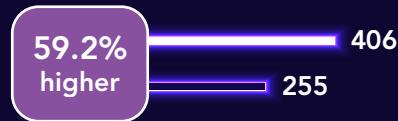
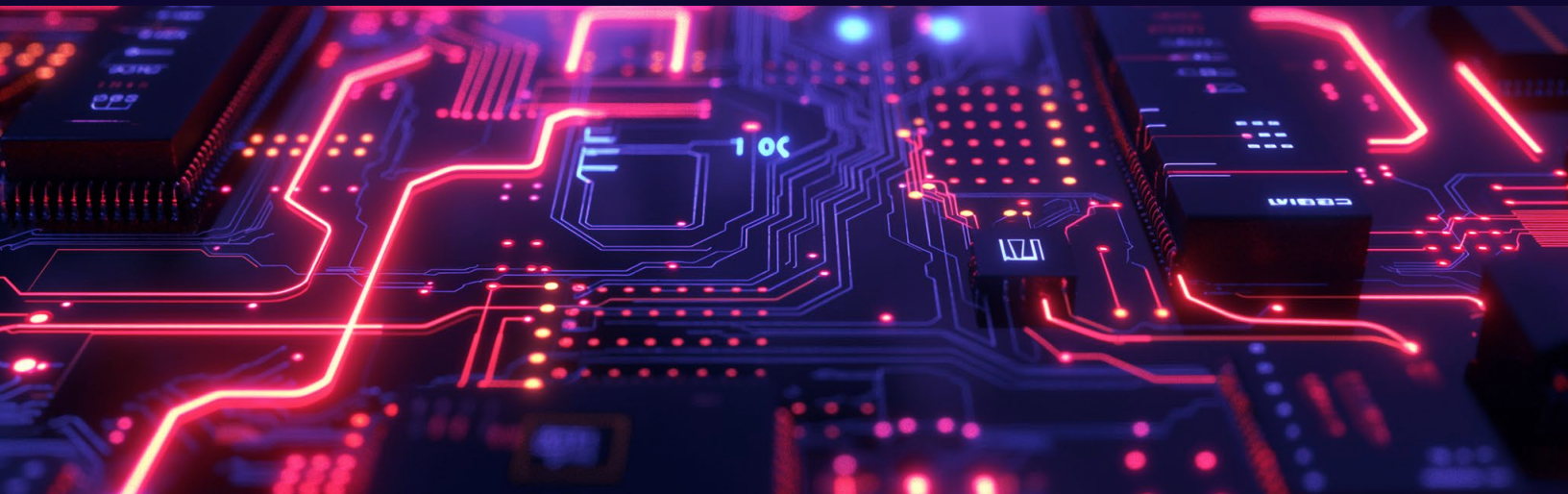


Figure 8: MobileMark 30 battery life results. Higher scores and more time are better. Source: Principled Technologies.



## Conclusion

We found upgrading to an Intel Core Ultra 7 processor 165H-powered HP ZBook Firefly 14 G11 Mobile Workstation PC from a previous-gen G10 model powered by an Intel Core i7-1355U processor could benefit business, creative, and technical professionals in multiple ways—from longer battery life and stronger benchmark results in areas of day-to-day productivity, content creation, and AI and ML capabilities.

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This project was commissioned by HP.