The science behind the report:

Escalate productivity and output with the newest HP ZBook Firefly 14 Mobile Workstation

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report Escalate productivity and output with the newest HP ZBook Firefly 14 Mobile Workstation.

We concluded our hands-on testing on October 4, 2023. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on July 31, 2023 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

To learn more about how we have calculated the wins in this report, go to http://facts.pt/calculating-and-highlighting-wins.
Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 1: Results of our benchmark and hand-timed design workflow comparisons. Higher benchmark scores are better. Lower hand-timed test times are better.

	HP ZBook Firefly 14 G10	HP ZBook Firefly 14 G9
Geekbench 6 Pro scores (higher is better)		
CPU multi-core	8,887	8,082
GPU Compute OpenCL	42,689	38,645
GFXBench scores (higher is better)		
4K Aztec Ruins OpenGL (high tier) offscreen	1,640.8	1,313.3
1,440p Aztec Ruins OpenGL (high tier) offscreen	3,698.3	2,894.0
1,080p Aztec Ruins OpenGL (normal tier) offscreen	9,991.3	7,804.4
1,080p Car Chase offscreen	8,577.9	7,439.8
1,440p Manhattan 3.1.1 offscreen	7,345.7	6,152.0
1,080p Manhattan offscreen	17,322.1	14,866.7
1,080p Texturing offscreen (MTexel/s)	46,045	31,867

	HP ZBook Firefly 14 G10	HP ZBook Firefly 14 G9
Blender 3.6.0 benchmark scores (higher is better)		
Monster	57.14.	50.66
Junkshop	33.47	24.55
Classroom	24.31	19.42
Basemark GPU score (higher is better)		
DirectX 12	2,664	2,409
Procyon® AI Inference Benchmark for Windows score (higher is better)		
Intel OpenVINO™ CPU Integer	104	49
Hand-timed design workflow comparisons, in seconds (lower is better)		
Render a scene from an Autodesk Maya® 2024 video into an image with Arnold	45	50
Import 50 Photos using Adobe® Lightroom® Classic	12	17
Export 50 Photos using Adobe Lightroom Classic	36	62
Upscale image resolution 4x using Gigapixel AI	39	73
HandBrake hardware 1080p H.264 video encoding	243	304

System configuration information

Table 2: Detailed information on the systems we tested.

System configuration information	HP ZBook Firefly 14 G10	HP ZBook Firefly 14 G9
Processor		
Vendor	Intel®	Intel
Model number	Core™ i7-1365U	Core i7-1265U
Core frequency (GHz)	3.9 – 5.2	3.6 – 4.8
Number of cores	2 P-cores, 8 E-cores	2 P-cores, 8 E-cores
Cache (MB)	12	12
Memory		
Amount (GB)	32	32
Type	DDR5	DDR5
Speed (MHz)	5,200	4,800
Integrated graphics		
Vendor	Intel	Intel
Model number	Iris® Xe Graphics	Iris Xe Graphics
Discrete graphics		
Vendor	NVIDIA®	NVIDIA
Model number	RTX™ A500	T550
VRAM (GB)	4	4
Storage		
Amount (GB)	1,000	512
Type	PCIe®-based flash	PCIe-based flash
Connectivity/expansion		
Wireless internet	Intel AX211 Wi-Fi 6E	Intel AX211 Wi-Fi 6E
Bluetooth	5.3	5.2
USB	2x 3.2, 2x 4 Type-C	2x 3.2, 2x 4 Type-C
Thunderbolt	2	2
Video	1x HDMI	1x HDMI
Battery		
Type	Lithium-polymer	Lithium-polymer
Size	Integrated	Integrated
Rated capacity (WHr)	51	51

System configuration information	HP ZBook Firefly 14 G10	HP ZBook Firefly 14 G9
Display		
Size (in.)	14.0	14.0
Type	IPS	IPS
Resolution	1920 x 1200	1920 x 1200
Touchscreen	No	No
Operating system		
Vendor	Windows	Windows
Name	Windows 11 Pro	Windows 11 Pro
Build number or version	22H2	22H2
BIOS		
BIOS name and version	HP 8b41 51.2B.00	HP 896D 02.63.00
Dimensions		
Height (in.)	0.75	0.75
Width (in.)	12.43	12.43
Depth (in.)	8.83	8.83
Weight (lb.)	3.2	3.2

How we tested

Setting up the HP ZBook Firefly 14 mobile workstations

Creating and updating the OEM Windows 11 home image

1. Boot the system.
2. To complete installation, follow the on-screen instructions, using the default selections when appropriate.
3. Set the Windows (plugged in) Power Mode to Best Performance.
4. Set Screen and Sleep options to Never:
   a. Right-click the desktop, and select Display settings.
   b. From the left column, select System.
   c. Click Power and Battery.
   d. For all power options listed under Screen and Sleep, select Never.
5. Disable User Account Control notifications:
   a. Select Windows Start, type UAC, and press Enter.
   b. Move the slider control to Never notify, and click OK.
6. Run Windows Update, and install all updates available.
7. Verify the date and time are correct, and synchronize the system clock with the time server.
8. Pause Automatic Windows Updates:
   a. Right-click Windows Start.
   b. Type Windows Update settings, and press Enter.
   c. From the Pause updates drop-down menu, select Pause for 5 weeks.

Measuring system performance with benchmarks

Using the Basemark GPU benchmark

Setting up the test

1. Download the Basemark GPU benchmark from https://www.basemark.com/benchmarks/basemark-gpu/.
2. To install Basemark GPU with the default options, double-click the Basemark GPU installer file.
3. Follow the installation instructions and install any necessary Microsoft Visual Redistributable components.

Running the Basemark GPU test

1. To launch the benchmark, double-click the Basemark GPU desktop icon.
2. Select the Graphics API, Graphics Device, Texture Compression, and Content Quality.
3. Click Run Official Test.
4. When the benchmark run completes, record the results.
5. Repeat steps 1 through 4 two more times.

Using the GFXBench 5.0 benchmark

Setting up the test

1. Download and install the GFXBench 5.0 installer from https://gfxbench.com/windows-download/gfxbench/.

Running the GFXBench 5.0 test

1. Launch GFXBench.
2. Ensure the default API (OpenGL) and correct device are selected for testing.
3. Click Select.
4. Click Start all.
5. Record the results.
6. Wait 5 minutes before rerunning.
7. Repeat steps 1 through 6 two more times.

Using the Blender benchmark

Setting up the test

1. Download and install the Blender Benchmark from https://opendata.blender.org/.

Running the Blender test

1. Launch the Blender benchmark Launcher.
2. To accept the agreement, click Next.
3. Leave the default 3.6.0 Blender Version selected, and click Next.
4. Confirm the scenes the benchmark will render, and click Next.
5. Ensure the correct Benchmark Device is selected, and click Start Benchmark.
6. Record the results.
7. Wait 5 minutes before rerunning.
8. Repeat steps 1 through 7 two more times.

Using the Geekbench 6 Pro benchmark

Setting up the test

1. Purchase a Pro license, and download and install Geekbench 6 Pro from https://www.geekbench.com/download/.

Running the Geekbench 6 Pro test

1. Launch Geekbench.
2. Click Run CPU Benchmark.
3. Record the result.
4. Wait 5 minutes before rerunning.
5. Repeat steps 1 through 4 two more times.

Running the Geekbench 6 Pro GPU OpenCL test

1. Launch Geekbench.
2. Click Run Compute Benchmark.
3. Record the result.
4. Wait 5 minutes before rerunning.
5. Repeat steps 1 through 4 two more times.

Using the UL Procyon AI Inference Benchmark

Setting up the test

1. Download and install Procyon.
2. Open Procyon.
3. Click AI Inference Benchmark.
4. Click Register.
5. Enter the license key for the AI Inference Benchmark, and click Register.

Running the Procyon AI Inference test

1. Boot the system.
2. Launch Procyon.
3. Click AI Inference Benchmark.
4. Select the version of the AI Inference Benchmark to run.
5. Click Run.
6. When the benchmark is complete, record the results.
7. Wait 15 minutes before rerunning the benchmark.
8. Repeat steps 1 through 7 twice more.

Running hand-timed tests

Rendering a scene from an Autodesk Maya 2024 video into an image

Setting up the Autodesk Maya 2024 with Arnold Renderer test

1. Download and install the Maya 2024 7-day trial from https://www.autodesk.com/products/maya/free-trial.
2. During installation, verify that Arnold is checked to be installed as an additional component.
3. Launch Maya 2024, and point the Project Window to the correct directory:

    • Go to File→Project Window.

    • Click New, and enter the name `Dinner_scene`.

    • Set the Location to Documents\maya\projects.

    • Click Accept.

4. Create a Maya 2024 test workload scene named Dinner_scene. We used the YouTube tutorial created by Creative Tap.
5. Copy the Dinner_scene test workload to the Documents\maya\projects directory onto the other test system. When prompted to overwrite the Dinner_scene directory, select Yes.
6. Close Maya 2024.

Running the test

1. Launch Maya 2024, browse to Documents\maya\projects\Dinner_scene\Dinner_scene_v1.mb, and select the workload scene.
2. From the top menu bar, select the Display render settings icon.
3. Next to the Render Using field, select Arnold Renderer.
4. Under the System tab, select GPU as the Render Device.
5. To choose a folder under the Dinner_scene project, click the folder icon, and click Select.
6. Close the Render Settings dialog.
7. From the top menu, select Open Render View.
8. To begin rendering the scene, simultaneously start the timer and click the green arrow.
9. Stop the timer when the render completes, and record the time.
10. Repeat steps 1 through 9 two more times.

Changing video formats

Setting up the HandBrake hardware 1080p H.264 video encoding test

1. Download HandBrake from https://handbrake.fr/downloads.php.
2. Install HandBrake with default options.
3. Copy the 4K file to transcode to the test system.
4. Launch HandBrake.
5. Browse to the 1080p source file, click Open.

Running the test

1. Click the Chapters tab, and uncheck the Create chapter markers box.
2. Click Start Encode.
3. To view the encoding statistics, when complete, click the Show Queue menu item.
4. Record results.
5. Repeat steps 1 through 4 two more times.

Upscaling image resolution 4x

Setting up the Gigapixel AI test

1. Register, download, and install the Topaz Labs Gigapixel AI free trial from https://www.topazlabs.com/gigapixel-ai
2. Launch Gigapixel AI, and enter the username and password.
3. Close Gigapixel AI.

Running the test

1. Launch DeNoise AI.
2. Open File → Preferences, select the appropriate AI Processor, and set Allowed Memory Consumption to High.
3. Click Browse, and select the test image. Leave the default Scale and AI Model resize options selected.
4. To start the upscale process, click Save.
5. Once the save process completes, record the time it took. This appears in the box located at the bottom of the screen.
6. Wait 5 minutes before performing the next run.
7. Repeat steps 1 through 6 two more times.

Using Adobe Lightroom Classic to share images

Importing 50 photos

1. Launch Lightroom.
2. Click the Import button.
3. Select the test file directory.
4. Start the timer, and click Import.
5. When the import task completes, stop the timer, and record the time.
6. Remove all images from the test library.
7. Repeat steps 1 through 6 two more times.

Exporting 50 photos

1. Launch Lightroom.
2. Click the Import button.
3. Select the test file directory.
4. Click Import.
5. Select all images in the test library.
6. Click File → Export.
7. Leave the default JPEG settings.
8. Start the timer, and click Export.
9. When the export task completes, stop the timer, and record the time.
10. Repeat steps 1 through 9 two more times.

Read the report at https://facts.pt/A8So76i ▶

This project was commissioned by HP.