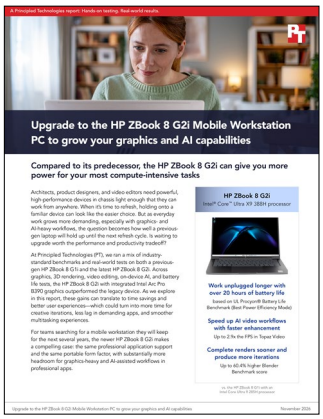

The science behind the report:

Upgrade to the HP ZBook 8 G2i Mobile Workstation PC to grow your graphics and AI capabilities

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 Upgrade to the HP ZBook 8 G2i Mobile Workstation PC to grow your graphics and AI capabilities.

We concluded our hands-on testing on October 5, 2026. 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 19, 2026 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 https://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 testing.

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
PassMark PerformanceTest v11.1 Build 1010		
Overall PassMark Rating	**9,896.9**	**8,680.6**
CPU Mark score	**38,288.9**	**37,356.4**
Integer Math (million operations/s)	94,460.8	97,421.4
Floating Point Math (million operations/s)	116,984.9	118,858.6
Prime Numbers (million primes/s)	361.5	418.3
Extended Instructions (SSE) (million matrices/s)	30,616.6	27,080.2
Compression (KB/s)	377,630.5	354,060.4
Encryption (MB/s)	30,343.3	27,954.4
Physics (Frames/s)	3,215.4	3,096.7
Sorting (thousand strings/s)	46,986.2	45,517.9
CPU single thread (million operations/s)	4,256.1	4,509.8

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
2D Graphics Mark score	**993.7**	**1,035.2**
Simple Vectors (thousand vectors/s)	11.7	17.5
Fonts and Text -(operations/s)	359.3	391.1
Windows Interface (operations/s)	51.5	94.6
Image Filters (filters/s)	2,542.6	1,790.5
Image Rendering (thousand images/s)	195.7	145.7
Direct 2D (frames/s)	68.5	70.4
PDF Rendering (operations/s)	57.2	57.5
Direct 2D SVG (frames/s)	133.1	126.7
3D Graphics Mark score	**9,844.1**	**7,296.3**
DirectX 9 (frames/s)	114.0	100.7
DirectX 10 (frames/s)	42.3	38.1
DirectX 11 (frames/s)	76.3	50.3
DirectX 12 (frames/s)	59.1	33.9
GPU compute (operations/s)	4,062.8	2,779.5
Memory Mark score	**3,758.2**	**3,532.2**
Database Operations (thousand operations/s)	13,043.6	12,621.8
Memory Read Cached (MB/s)	33,550.3	36,695.0
Memory Read Uncached (MB/s)	20,283.9	21,446.8
Memory Write (MB/s)	15,551.2	16,516.1
Available RAM (MB)	50,761.8	54,114.8
Memory latency in nanoseconds	39.3	47.2
Memory Threaded (MB/s)	100,769.5	81,752.2
Disk Mark score	**42,107.7**	**50,057.2**
Disk Sequential Read (MB/s)	5,955.9	6,571.5
Disk Sequential Write (MB/s)	5,456.0	6,488.1
IOPS 32KQD20 (MB/s)	2,521.9	3,526.3
IOPS 4KQD1 (MB/s)	102.1	99.8
Geekbench 7 Pro v7.0.0		
GPU OpenCL score	**53,608**	**33,752**
Background Blur	65,501	40,592
Face Tracking	52,438	30,609
Super Resolution	114,727	51,450
Horizon Detection	40,711	34,535
Photo Filter	59,813	38,083
Video Filter	56,764	34,551
RAW	33,362	33,500

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
Feature Matching	50,777	34,783
Path Tracer	38,875	29,411
Particle Physics	63,293	50,370
Fluid Simulation	46,287	12,916
3DMark® Benchmark v2.32.8874		
Steel Nomad overall score	**1578**	**798**
FPS	15.78	7.98
Wild Life overall score	**44,058**	**26,257**
FPS	263.82	157.23
Night Raid overall score	**46,999**	**35,743**
Graphics	75,283	44,183
Graphics test 1 (FPS)	329.20	189.92
Graphics test 2 (FPS)	400.51	240.11
CPU	15021	17165
CPU test (ms)	38.30	33.50
Port Royal overall score	**4,069**	**2,033**
FPS	18.84	9.42
UL® Procyon AI Computer Vision 2.0 Benchmark - NPU (Procyon - v2.12.2641, Procyon AI Computer Vision 2.0 - v1.0.567)	Windows ML - Intel AI Boost NPU, INT8	Windows ML - Intel AI Boost NPU, INT8
Overall score	**1,578**	**400**
ConvNeXt throughput (images/s)	962.110	153.650
BLIP - Decoder Inference speed (it/s)	208.056	86.489
BLIP - Encoder Inference speed (it/s)	67.240	17.871
SAM 2.1 - Decoder Inference speed (it/s)	183.285	50.533
SAM 2.1 - Encoder Inference speed (it/s)	10.993	2.769
DETR - Inference speed (it/s)	107.757	33.736
ESRGAN - Inference speed (it/s)	14.207	4.042
Procyon AI Computer Vision 2.0 Benchmark - GPU (Procyon - v2.12.2641, Procyon AI Computer Vision 2.0 - v1.0.567)	Windows ML - Intel Arc Pro B390 GPU, float16	Windows ML - Intel Arc Pro 140T GPU, float16
Overall score	**1,444**	**846**
ConvNeXt throughput (images/s)	590.300	392.180
BLIP - Decoder Inference speed (it/s)	195.215	122.151
BLIP - Encoder Inference speed (it/s)	169.255	85.255
SAM 2.1 - Decoder Inference speed (it/s)	351.690	188.322
SAM 2.1 - Encoder Inference speed (it/s)	18.803	10.414
DETR - Inference speed (it/s)	92.264	53.403
ESRGAN - Inference speed (it/s)	5.648	3.315

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
Procyon AI Image Generation Benchmark - Stable Diffusion 1.5 (FP16) Benchmark v1.1.265	Intel® OpenVINO™	Intel OpenVINO
Overall score	**633**	**339**
Overall duration (sec)	157.768	294.712
Overall image generation speed (s/image)	9.861	18.420
Procyon AI Image Generation Benchmark - Stable Diffusion 1.5 (INT8) Benchmark v1.1.265	Intel OpenVINO	Intel OpenVINO
Overall score	**7,811**	**3,810**
Overall duration (sec)	32.005	65.603
Overall image generation speed (s/image)	4.001	8.200
Average UNET Speed (it/s)	12.8	6.2
Procyon AI Image Generation Benchmark - Stable Diffusion XL (FP16) Benchmark v1.1.265	Intel OpenVINO	Intel OpenVINO
Overall score	**695**	**370**
Overall duration (sec)	862.677	1619.149
Overall image generation speed (s/image)	53.917	101.197
Geekbench AI GPU v1.7.0 OpenVINO	GPU - Intel Arc Pro B390	GPU - Intel Arc Pro 140T
Single Precision score	**18,578**	**11,118**
Half Precision score	**46,524**	**27,424**
Quantized score	**58,489**	**34,656**
Image Classification (SP)	9,833	7,365
Image Classification (HP)	19,933	13,821
Image Classification (Q)	29,067	18,074
Image Segmentation (SP)	19,064	8,349
Image Segmentation (HP)	51,849	23,639
Image Segmentation (Q)	55,376	26,809
Pose Estimation (SP)	44,180	25,955
Pose Estimation (HP)	229,528	109,959
Pose Estimation (Q)	502,613	208,352
Object Detection (SP)	10,871	7,118
Object Detection (HP)	25,711	16,561
Object Detection (Q)	34,107	21,348
Face Detection (SP)	20,580	11,779
Face Detection (HP)	56,148	29,046
Face Detection (Q)	76,287	43,394
Depth Estimation (SP)	39,341	23,183
Depth Estimation (HP)	85,130	56,009

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
Depth Estimation (Q)	110,387	71,814
Style Transfer (SP)	108,428	64,257
Style Transfer (HP)	424,228	185,691
Style Transfer (Q)	603,644	321,913
Image Super-Resolution (SP)	17,304	10,556
Image Super-Resolution (HP)	58,995	37,517
Image Super-Resolution (Q)	84,809	48,940
Text Classification (SP)	6,491	3,540
Text Classification (HP)	7,259	5,183
Text Classification (Q)	4,242	3,419
Machine Translation (SP)	5,514	3,891
Machine Translation (HP)	9,417	6,891
Machine Translation (Q)	9,544	7,020
Geekbench AI NPU v1.7.0 OpenVINO	NPU (Intel AI Boost)	NPU (Intel AI Boost)
Single Precision score	**4,616**	**5,493**
Half Precision score	**36,475**	**10,022**
Quantized score	**53,180**	**15,515**
Image Classification (SP)	2,984	4,202
Image Classification (HP)	21,475	6,900
Image Classification (Q)	26,433	9,636
Image Segmentation (SP)	3,568	4,775
Image Segmentation (HP)	14,525	2,803
Image Segmentation (Q)	21,586	3,396
Pose Estimation (SP)	5,634	7,142
Pose Estimation (HP)	117,848	33,770
Pose Estimation (Q)	266,230	74,753
Object Detection (SP)	2,482	2,722
Object Detection (HP)	22,691	6,110
Object Detection (Q)	33,178	10,330
Face Detection (SP)	8,212	8,873
Face Detection (HP)	56,391	18,203
Face Detection (Q)	78,258	33,892
Depth Estimation (SP)	6,739	7,931
Depth Estimation (HP)	91,199	18,100
Depth Estimation (Q)	170,277	33,094
Style Transfer (SP)	15,492	19,281
Style Transfer (HP)	236,744	54,072

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
Style Transfer (Q)	380,967	98,417
Image Super-Resolution (SP)	3,055	3,452
Image Super-Resolution (HP)	63,314	16,015
Image Super-Resolution (Q)	110,343	30,922
Text Classification (SP)	3,127	3,513
Text Classification (HP)	4,120	2,077
Text Classification (Q)	4,275	2,116
Machine Translation (SP)	3,620	3,952
Machine Translation (HP)	15,416	4,427
Machine Translation (Q)	14,740	4,478
Amuse Benchmark v3.7.3		
Time to generate image (sec) (Lower is better)	**1,619.45**	**3,087.88**
Topaz Video v1.7.0		
3,840 x 2,160 (4K) Artemis 1X (FPS)	1.91	N/A*
3,840 x 2,160 (4K) Artemis 2X (FPS)	1.17	N/A*
3,840 x 2,160 (4K) Artemis 4X (FPS)	0.40	N/A*
3,840 x 2,160 (4K) Iris 1X (FPS)	1.27	0.76
3,840 x 2,160 (4K) Iris 2X (FPS)	0.71	0.47
3,840 x 2,160 (4K) Iris 4X (FPS)	0.22	0.15
3,840 x 2,160 (4K) Proteus 1X (FPS)	2.00	1.03
3,840 x 2,160 (4K) Proteus 2X (FPS)	1.35	0.76
3,840 x 2,160 (4K) Proteus 4X (FPS)	0.52	0.31
3,840 x 2,160 (4K) Proteus Natural 2X (FPS)	0.19	0.11
3,840 x 2,160 (4K) Gaia 1X (FPS)	0.76	0.43
3,840 x 2,160 (4K) Gaia 2X (FPS)	0.49	0.29
3,840 x 2,160 (4K) Gaia 4X (FPS)	0.32	0.19
3,840 x 2,160 (4K) Gaia Animation 2X (FPS)	1.48	0.50
3,840 x 2,160 (4K) Nyx 1X (FPS)	0.31	0.20
3,840 x 2,160 (4K) Nyx 2X (FPS)	0.42	0.26
3,840 x 2,160 (4K) Nyx Fast 1X (FPS)	0.82	0.49
3,840 x 2,160 (4K) Nyx XL 1X (FPS)	0.06	0.04
3,840 x 2,160 (4K) Rhea 4X (FPS)	0.17	0.09
3,840 x 2,160 (4K) RXL 4X (FPS)	0.16	0.09
3,840 x 2,160 (4K) Hyperion HDR 1X (FPS)	2.82	1.59
3,840 x 2,160 (4K) 4X Slowmo Apollo (FPS)	3.17	1.74

* Test failed to run.

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
3,840 x 2,160 (4K) 4X Slowmo APFast (FPS)	10.89	5.74
3,840 x 2,160 (4K) 4X Slowmo Chronos (FPS)	1.02	0.64
3,840 x 2,160 (4K) 4X Slowmo CHFast (FPS)	1.75	1.05
3,840 x 2,160 (4K) 16X Slowmo Aion (FPS)	2.94	1.76
Blender Benchmark using GPU (Blender Benchmark Launcher v3.3.0, Blender v5.2.0)		
Blender Open Data - Monster	527.13	380.36
Blender Open Data - Junkshop	435.43	285.92
Blender Open Data - Classroom	395.49	246.44
Puget Bench for Creators: Adobe® Premiere® Pro Extended (Puget Bench benchmark version 2.0.1, Adobe Premiere Pro v26.0)		
Overall score (Standard)	**34,600**	**24,140**
Overall score (Extended)	**32,039**	**N/A***
LongGOP score (Standard)	37	25
Intraframe score (Standard)	82	53
RAW score (Standard)	24	21
GPU Effects score (Standard)	19	12
LongGOP score (Extended)	29	N/A*
Intraframe score (Extended)	37	N/A*
RAW score (Extended)	39.60	N/A*
GPU Effects score (Extended)	25.00	N/A*
Encoding - H.264 50Mbps 8-bit UHD (FPS)	52.38	40.71
Encoding - H.264 10Mbps 8-bit HD (FPS)	153.48	126.55
Encoding - DNxHR LB UHD (FPS)	50.33	37.05
Encoding - DNxHR SQ UHD (FPS)	50.45	38.34
Encoding - DNxHR HQX UHD (FPS)	32.25	N/A*
Encoding - ProRes 422 Proxy UHD (FPS)	114.70	71.03
Encoding - ProRes 422HQ UHD (FPS)	109.94	66.11
Encoding - ProRes 4444 UHD (FPS)	72.25	N/A*
Processing - 4K H.264 150Mbps 4:2:0 8-bit (FPS)	128.65	94.65
Processing - 4K H.264 150Mbps 4:2:0 8-bit 4x MultiStream (FPS)	18.00	14.35
Processing - 4K HEVC 100Mbps 4:2:2 10-bit (FPS)	77.78	N/A*
Processing - 4K HEVC 100Mbps 4:2:2 10-bit 4x MultiStream (FPS)	11.39	N/A*
Processing - 8K HEVC 100Mbps 4:2:0 8-bit (FPS)	23.29	N/A*
Processing - 4K ProRes 422 Proxy (FPS)	125.25	81.54
Processing - 4K ProRes 422 (FPS)	102.56	78.43
Processing - 4K ProRes 422 4x MultiStream (FPS)	17.56	12.06

* Unable to complete Extended workload of benchmark, but was able to complete Standard workload

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
Processing - 4K DNxHR LB (FPS)	220.90	119.74
Processing - 4K DNxHR SQ (FPS)	208.19	117.98
Processing - Canon Cinema RAW Light (FPS)	5.21	5.55
Processing - ARRIRAW (FPS)	62.06	N/A*
Processing - 4K Nikon N-RAW (FPS)	31.50	N/A*
Processing - Sony X-OCN ST (FPS)	16.45	N/A*
Processing - RED R3D (FPS)	25.05	18.09
Processing - RED R3D 4x MultiStream (FPS)	5.69	N/A*
Real World - YouTube Gamer (FPS)	23.55	13.92
Real World - Behind the Scenes (FPS)	9.82	N/A*
Real World - Behind the Scenes (ProRes) (FPS)	10.73	N/A*
Processing - 8K RED (FPS)	17.50	N/A*
GPU Effects - VR Digital Glitch x20 (FPS)	6.82	N/A*
GPU Effects - VR De-Noise x4 (FPS)	3.20	N/A*
GPU Effects - Echo Glow x3 (FPS)	3.10	1.97
GPU Effects - Bokeh Blur x2 (FPS)	1.63	0.92
GPU Effects - Edge Glow x3 (FPS)	3.27	2.05
GPU Effects - Wonder Glow x3 (FPS)	3.55	N/A*
Puget Bench for Creators: DaVinci Resolve Studio Extended (Puget Bench benchmark version 2.1.0, Blackmagic Design DaVinci Resolve Studio v21.0.4)		
Overall score (Basic)	**57,704**	**41,939**
Overall score (Standard)	**33,048**	**23,395**
Overall score (Extended)	**N/A***	**16,642**
LongGOP score (Standard)	37	19
Intraframe score (Standard)	37.00	24.70
RAW score (Standard)	27.00	21.20
GPU Effects score (Standard)	23	16
Fusion score (Standard)	62.10	56.90
LongGOP score (Extended)	N/A*	16.80
Intraframe score (Extended)	N/A*	10.60
RAW score (Extended)	N/A*	18.40
GPU Effects score (Extended)	N/A*	12
Fusion score (Extended)	N/A*	38.90
AI score (Standard)	25.10	17.60

* Unable to complete Extended workload of benchmark, but was able to complete Standard workload

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
AI score (Extended)	N/A*	13.70
Encoding - H.264 50Mbps 8-bit UHD (FPS)	84.27	46.14
Encoding - HEVC 50Mbps 8-bit UHD (FPS)	104.35	47.46
Encoding - HEVC 60Mbps 10-bit UHD (FPS)	N/A*	43.87
Encoding - DNxHR LB UHD (FPS)	84.21	56.75
Encoding - DNxHR SQ UHD (FPS)	84.25	56.72
Encoding - ProRes 422 Proxy UHD (FPS)	93.27	62.96
Encoding - ProRes 422 HQ UHD (FPS)	93.24	62.92
Encoding - ProRes 4444 UHD (FPS)	N/A*	62.95
Encoding - DNxHR HQX UHD (FPS)	N/A*	56.79
Processing - 4K H.264 150Mbps 420 8-bit (FPS)	162.95	88.50
Processing - 4K H.264 150Mbps 420 8-bit 4x MultiStream (FPS)	27.39	14.30
Processing - 4K HEVC 100Mbps 422 10-bit (FPS)	N/A*	54.96
Processing - 4K HEVC 100Mbps 422 10-bit 4x MultiStream (FPS)	N/A*	11.72
Processing - 8K HEVC 100Mbps 420 8-bit (FPS)	N/A*	33.08
Processing - 4K ProRes 422 Proxy (FPS)	149.74	105.53
Processing - 4K ProRes 422 (FPS)	135.17	98.36
Processing - 4K ProRes 422 4x MultiStream (FPS)	24.27	14.22
Processing - 4K DNxHR LB (FPS)	149.71	98.39
Processing - 4K DNxHR SQ (FPS)	149.18	98.36
Processing - Canon Cinema RAW Light (FPS)	30.86	23.34
Processing - 4K ARRIRAW (FPS)	N/A*	37.37
Processing - 4K Nikon N-RAW (FPS)	N/A*	20.92
Processing - 5K Sony X-OCN (FPS)	N/A*	16.71
Processing - 4.6K BRAW (FPS)	47.06	32.77
Processing - RED R3D (FPS)	17.45	16.08
Processing - RED R3D 4x MultiStream (FPS)	N/A*	3.66
Real World - YouTube Gamer (FPS)	11.07	6.49
Real World - Behind the Scenes (FPS)	N/A*	5.36
Real World - Behind the Scenes (ProRes) (FPS)	N/A*	5.39
Processing - 8K RED (FPS)	N/A*	4.49
GPU Effects - Temporal NR (2 Frames Better) x3 (FPS)	N/A*	1.30
GPU Effects - Temporal NR (2 Frames Better) (FPS)	7.01	4.57
GPU Effects - Film Grain (FPS)	13.39	11.95
GPU Effects - Spatial NR (Better) (FPS)	N/A*	6.45

* Unable to complete Extended workload of benchmark, but was able to complete Standard workload

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
GPU Effects - Lens Blur x5 (FPS)	N/A*	4.39
GPU Effects - Lens Flare (FPS)	16.45	11.21
GPU Effects - Optical Flow (50% Enhanced Better) (FPS)	N/A*	5.15
GPU Effects - Sharpen x3 (FPS)	3.55	2.43
GPU Effects - Color Node x30 (FPS)	16.64	11.03
Fusion - 3D Backlit Text (FPS)	7.21	6.86
Fusion - 3D Lower 3rd (FPS)	69.28	63.34
Fusion - 3D Title (FPS)	12.64	14.61
Fusion - Digital Glitch (FPS)	N/A*	4.97
Fusion - Phone Composite UHD (FPS)	15.66	10.98
Fusion - Turbulent Particles (FPS)	N/A*	5.44
AI - Super Scale (2x) (FPS)	8.61	5.68
AI - Super Scale (2x Enhanced) (FPS)	N/A*	0.51
AI - Face Refinement (FPS)	N/A*	12.46
AI - Person Mask (Faster) (FPS)	N/A*	N/A*
AI - Person Mask (Better) (FPS)	N/A*	N/A*
AI - Depth Map v2 (FPS)	10.79	8.21
AI - Depth Map (Better) (FPS)	N/A*	5.03
AI - Relight (FPS)	N/A*	3.18
AI - Optical Flow (50% Speed Warp) (FPS)	N/A*	1.94
AI RunTime - Audio Transcription - x-realtime	N/A*	4.24
AI RunTime - Video Stabilization (FPS)	203.96	151.70
AI RunTime - Smart Reframe (FPS)	N/A*	380.56
AI RunTime - Magic Mask v2 (FPS)	4.11	2.70
AI RunTime - Magic Mask Tracking (Better) (FPS)	N/A*	2.50
AI RunTime - Create Subtitles from Audio - x-realtime	N/A*	5.90
AI RunTime - Scene Cut Detection (FPS)	N/A*	309.58
Autodesk® Arnold Renderer version 7.5.0.0		
CPU render time - hr:min:sec	0:42:45	0:56:28
SPECviewperf® 15.0.1 - 1920x1080 (FHD)		
3ds Max composite score	21.25	16.12
Blender composite score	22.55	14.33
Catia composite score	25.64	15.59
Creo composite score	66.25	36.14
Energy composite score	37.27	20.03

* Unable to complete Extended workload of benchmark, but was able to complete Standard workload

Performance & productivity tests	HP ZBook 8 G2i	HP ZBook 8 G1i
Enscape composite score	14.52	9.69
Maya composite score	82.89	64.17
Medical composite score	72.15	41.13
SNX composite score	76.89	44.46
Solidworks composite score	34.06	18.49
Unreal_engine composite score	40.47	25.46

Table 2: Results of our battery life testing.

Battery life tests	HP ZBook 8 G2i	HP ZBook 8 G1i
Procyon Battery Life Benchmark (Office Productivity) - Best Power Efficiency Mode (Office v16.0.20326.20144, Procyon UI - v2.12.2586, Benchmark - v1.3)	200 nits	202 nits
Total duration (hours:min)	**20:23**	**14:57**
Normalized battery life (minutes per Wh)	17.99	11.65
Maximum performance score	124,000	109,000
Minimum performance score	111,000	98,000
Median performance score	121,500	105,000
Procyon Battery Life Benchmark (Office Productivity) - Balanced Mode	200 nits	202 nits
Total duration (hours:min)	**18:46**	**13:42**
Normalized battery life (minutes per Wh)	16.56	10.68
Maximum performance score	166,000	180,000
Minimum performance score	108,000	95,000
Median performance score	163,000	173,000
Procyon Battery Life Benchmark (Office Productivity) - Best Performance Mode	200 nits	202 nits
Total duration (hours:min)	**15:49**	**11:48**
Normalized battery life (minutes per Wh)	13.96	9.19
Maximum performance score	248,000	221,000
Minimum performance score	111,000	95,000
Median performance score	236,000	213,000

System configuration information

Table 3: Detailed information on the systems we tested.

System	HP ZBook 8 G1i 14"	HP ZBook 8 G2i 14"
Processor		
Vendor	Intel®	Intel
Model number	Core™ Ultra 9 285H	Core Ultra X9 388H
Core frequency (GHz)	1.0 – 5.4	1.6 – 5.1
Number of cores	(16) 6 x Performance Cores 8 x Efficient Cores 2 x Low Power Efficient Cores	(16) 4 x Performance Cores 8 x Efficient Cores 4 x Low Power Efficient Cores
Number of threads	16	16
L3 cache (MB)	24	18
AI engine capabilities NPU TOPS	13	50
NPU driver	Intel 32.0.100.4724	Intel 32.0.100.4403
Memory		
Amount (GB)	64	64
Type	DDR5	LPDDR5x
Speed (MT/s)	5,600	7,467
Graphics		
Vendor	Intel	Intel
Model number	Arc Pro 140T	Arc Pro B390
Driver	Intel 32.0.101.8831	Intel 32.0.101.8724
Storage		
Model	Micron® MTFDKBA1T0TGD-1BK1AABHA	Phison® PSENN001TA87QC0
Amount (TB)	1	1
Type	PCIe Gen4 NVMe® M.2 SSD	PCIe Gen5 NVMe M.2 SSD
Connectivity/expansion		
WLAN	Intel Wi-Fi 7 BE201	Intel Wi-Fi 7 BE211
Bluetooth	5.4	6.0
USB	2 x Thunderbolt 4 with USB Type-C 40Gbps 1 x USB Type-A 5Gbps 1 x USB Type-C 20Gbps	2 x Thunderbolt 4 with USB Type-C 40Gbps 1 x USB Type-A 5Gbps 1 x USB Type-C 10Gbps
Video	HDMI 2.1	HDMI 2.1
Battery/AC adapter		
Type	Lithium-ion	Lithium-ion
Rated capacity (Wh)	77	68

System	HP ZBook 8 G1i 14”	HP ZBook 8 G2i 14”
Display		
OEM description	WUXGA 400 nits	WUXGA 400 nits
Size (inches)	14	14
Resolution	1,920 x 1,200	1,920 x 1,200
Touchscreen	No	No
Operating system		
Vendor	Microsoft	Microsoft
Name	Windows 11 Pro	Windows 11 Pro
Build number or version	25H2 Build 26200.9278	25H2 Build 26200.9168
BIOS		
BIOS name and version	HP X70 Ver.01.05.01 (07/13/2026)	HP Y70 Ver.01.02.06 (07/31/2026)
Dimensions		
Height (inches)	0.74	0.75
Width (inches)	12.43	12.43
Depth (inches)	8.74	8.74
Weight (pounds)	3.66	3.41

How we tested

Setting up the systems

Setting up and updating the OEM image

1. Boot the system.
2. Follow the on-screen instructions to complete installation, 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 & 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 the Enter key.
    b. Move the slider control to Never notify, and click OK.
6. Run Windows Update, and install all available updates.
7. Run the Support Assistant utilities, and install all recommended BIOS and driver updates available.
8. Verify the date and time are correct, and synchronize the system clock with the time server.
9. Pause Automatic Windows Updates:
    a. Click the Windows Start button.
    b. Type Windows Update settings and press Enter.
    c. From the Pause updates drop-down menu, select Pause for 5 weeks.

Capturing an image

1. Connect an external HDD to the system.
2. Click Windows Menu button, and type Control Panel in the search bar. Click Control Panel → System and Security → Backup and Restore (Windows 7) → Create a system image.
3. Verify that the external HDD is selected as the save drive, and click Next.
4. Verify that all drives are selected to back up, and click Next.
5. Click Start backup.
6. When you see the prompt to create a system repair disc, select No, and close the dialogs.

Restoring an image

1. Connect an external HDD to the system.
2. Press and hold the Shift key while restarting the system.
3. Select Troubleshoot.
4. Select Advanced options.
5. Select See more recovery options.
6. Select System image recovery.
7. Select the User account.
8. Enter the system password, and click Continue.
9. At the Restore system files and settings screen, select Next.
10. Verify that the external HDD is selected, and click Next.
11. Once the recovery has completed, click Finish.

Testing with 3DMark

Setting up the test

1. Purchase and download 3DMark from https://benchmarks.ul.com/3dmark.
2. To install 3DMark with the default options, double-click the 3DMark installer.exe file.
3. To launch 3DMark, double-click the 3DMark desktop icon.
4. Enter the registration code, and click Register.
5. Exit 3DMark.

Running the test

1. To launch the benchmark, double-click the 3DMark desktop icon.
2. At the 3DMark Home screen, click More Tests.
3. Select the benchmark you want to run.
4. Move the slider button to turn off the "Include Demo" feature.
5. Click Run.
6. When the benchmark run completes, record the results.
7. Perform steps 1 through 6 two more times for each benchmark, and report the median of the three runs.

Testing with Amuse Generate AI

Setting up the test

1. Download the Amuse application from https://github.com/saddam213/AmuseAI/releases/tag/v3.7.3.
2. Using all the defaults, run the installer, and install the application.
3. Launch the Amuse application.
4. Under the Image tab, click Load, and download the Anima model.

Running the test

1. Launch Amuse.
2. Click Load to load the downloaded Anima model.
3. Once the model has downloaded, select the Image tab, and click Load to load the downloaded model.
4. In the prompt type A cute raccoon playing guitar on the beach.
5. Under the Options tab verify the following settings:
   - Resolution = 768 x 768 Square.
   - Seed= 8.
   - Scheduler= Euler.
   - Steps= 30.
   - Guidance= 7.5.
6. Under the Automation tab, verify the following settings:
   - Automation= Seed Batch
   - Image Count= 4.
7. Click Automate to generate Images.
8. After the image generation has completed, record the elapsed time.
9. Wait 5 minutes and repeat step 7 two more times and capture the median of 3 runs.

Testing with Arnold Renderer

Setting up the test

1. Purchase and download Arnold from https://www.autodesk.com/.
2. Download and install 7-zip from https://www.7-zip.org/.
3. Go to https://dpel.aswf.io/alab/ and download the two test scenes to the Downloads directory:
    a. Asset Structure - v.2.3.0 (aka Alab-2.3.0.zip)
    b. Techvar Assets - v.2.2.0 (aka alab-techvars.v2.2.0.zip)
4. Launch PowerShell in Administrator mode, and enable long path support by typing:
5. New-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Control\FileSystem" -Name "LongPathsEnabled" -Value 1 -PropertyType DWORD -Force
6. Reboot the system.
7. Using 7-zip, extract the two test scenes using the following PowerShell script:

```
$ErrorActionPreference = 'Stop'
$7z    = "C:\Program Files\7-Zip\7z.exe"
$root  = "C:\alab"          # repo root
$usd   = "C:\alab\ALab"     # actual USD root
cd "$HOME\Downloads"

# Guard: Move-Item nests instead of renaming if the target already exists
if (Test-Path $root) { throw "$root already exists. Delete or rename it first." }

# 1. Asset Structure -> C:\alab
& $7z x ALab-2.3.0.zip -oC:\stage_alab
if ($LASTEXITCODE -gt 1) { throw "7-Zip failed on Asset Structure (exit $LASTEXITCODE)" }
Move-Item C:\stage_alab\ALab-2.3.0 $root
if (-not (Test-Path "$usd\entry.usda")) { throw "entry.usda not found at $usd" }
Remove-Item C:\stage_alab -Recurse -Force

# 2. Techvars -> staging folder (zip has a 'techvar_assets' wrapper)
& $7z x alab-techvars.v2.2.0.zip -oC:\stage_tv
if ($LASTEXITCODE -gt 1) { throw "7-Zip failed on Techvars (exit $LASTEXITCODE)" }
if (-not (Test-Path C:\stage_tv\techvar_assets\fragment)) { throw "techvar_assets\
fragment not found" }

# 3. Merge techvar fragment onto the structure fragment, overwriting
robocopy C:\stage_tv\techvar_assets\fragment "$usd\fragment" /E /IS /IT /MOVE /R:1 /W:1 /NFL /NDL
if ($LASTEXITCODE -ge 8) { throw "robocopy failed (exit $LASTEXITCODE)" }
Remove-Item C:\stage_tv -Recurse -Force

# 4. Verify
Test-Path "$usd\entry.usda"
"{0:N2} GB" -f ((Get-ChildItem "$usd\fragment" -Recurse -File | Measure-Object Length
-Sum).Sum / 1GB)
```

8. Install Arnold.
9. Extract the Arnold zip file.
10. Inside the Bin directory, click the ArnoldLicenseManager.exe.
11. Install a single-user license.
12. Install Autodesk Licensing software when prompted.
13. Log in with your Autodesk account.
14. Click the Windows Start button, and type Edit the system environment variables.
15. Under the Advanced tab, click Environment Variables.
16. Under the System variables section, scroll down and select Path, and click Edit.
17. Click New, browse to where the Arnold\bin directory is located, and click OK.

Running the CPU render test

1. Open PowerShell in Administrator mode, browse to the Arnold\bin path, and type:

```
kick C:\alab\ALab\entry.usda -frame 1010 -dw -dp -device cpu -set options.camera /root/camera01/
GEO/renderCam_hrc/renderCam_buffer/renderCam_srt/renderCam -set options.xres 1920 -set options.yres
1080 -set options.AA_samples 6 -set options.GI_diffuse_depth 2 -set options.GI_specular_depth 2 -set
options.GI_transmission_depth 2 -set options.GI_total_depth 10 -ii -o C:\alab\out\cpu_warmup.exr -v
5 -logfile C:\alab\out\cpu_warmup.txt
```

2. Record the rendered time reported in the log file.
3. Repeat steps 1 and 2 two more times.
4. Record the median result.

Testing with the Blender Benchmark

Setting up the test

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

Running the test

1. Launch the Blender Benchmark.
2. At the Welcome screen, click Next.
3. Select Blender version 5.2.0, and click Next.
4. At the Benchmark Scenes screen, click Next.
5. At the Benchmark Device screen, select the GPU option, and click Start Benchmark.
6. Record the results.
7. Wait 15 minutes before performing the next run.
8. Repeat steps 1 through 7 two more times, and record the median result.

Testing with Geekbench 7 Pro GPU OpenCL

Setting up the test

1. Purchase a Pro license and download and install Geekbench 7 Pro from https://www.geekbench.com/download/.

Running the test

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

Testing with the Geekbench AI benchmark

Setting up the test

1. Purchase and download a Geekbench AI Pro license from https://www.geekbench.com/ai/download/.
2. Using all the defaults, run the installer, and install the benchmark.

Running the test

1. Launch Geekbench AI.
2. Enter the license key.
3. For NPU testing, select:
   - AI Framework: OpenVINO™
   - AI Backend: NPU
   - AI Device: processor
4. For GPU testing, select:
   - AI Framework: OpenVINO
   - AI Backend: GPU
   - AI Device: graphics card
5. Click Run AI Benchmark.
6. Wait 5 minutes and repeat steps 3 through 5 two more times and capture the median of 3 runs.

Testing with PassMark PerformanceTest

Setting up the test

1. Download PassMark PerformanceTest from https://www.passmark.com/products/performancetest/download.php.
2. To begin the installation, press Install.
3. Select Accept to accept the license agreement, and press Next.
4. After the installation is complete, deselect Launch Performance Test, and press Finish.

Running the test

1. To launch PassMark PerformanceTest, click the PassMark PerformanceTest icon.
2. To start the benchmark, click Run Benchmark.
3. When the test completes, record the results.
4. Repeat steps 1 through 3 two more times.
5. Report the median of the three runs.

Testing with Procyon AI Computer Vision 2.0 Benchmark

Setting up the test

1. Purchase and download the Procyon AI Computer Vision 2.0 benchmark from https://benchmarks.ul.com/procyon.

Install the benchmark.

1. Double-click the installer.
2. Click Next.
3. To agree to the EULA, click Agree, and click Next.
4. Click Next.
5. Launch Procyon.
6. Select Settings, and input the license key.
7. Close Procyon.

*Note: It is necessary to have Windows Update enabled for the first run so that the benchmark can check online for the latest Windows ML version.

Running the test

1. Launch Procyon.
2. Select the Computer Vision 2.0 Benchmark test:
   - For NPU testing, select the NPU for Inference device type, and leave the default Inference Engine set to Windows ML.
   - For GPU testing, select the GPU for Inference device type, and leave the default Inference Engine set to Windows ML.
3. To begin the test, click Run.
4. When the test completes, record the results.
5. Wait 15 minutes before rerunning.
6. Repeat steps 1 through 7 two more times, and report the median result.

Testing with Puget Bench for Creators: DaVinci Resolve

We used the following applications:

- DaVinci Resolve Studio
- PugetBench for Creators

Setting up the test

1. Purchase, download, and install DaVinci Resolve Studio from https://www.blackmagicdesign.com/products/davinciresolve.
2. Launch DaVinci Resolve Studio.
3. When prompted, enter the DaVinci Resolve Studio registration key.
4. Accept default configuration options and firewall permissions.
5. To confirm the Resolve configuration options, click DaVinci Resolve → Preferences.
6. In the Memory and GPU tab, ensure the GPU processing mode is set to Auto.
7. Close DaVinci Resolve Studio.
8. Purchase a PugetBench for Creators license from https://www.pugetsystems.com/pugetbench/creators/.
9. Click the Download PugetBench for Creators for Windows or Mac.
10. After the download completes, double-click the installation file to install PugetBench.
11. Enter the license key in the license field. Click Activate.
12. Click Download Assets.

Running the test

1. Boot the system.
2. Open PugetBench for Creators.
3. Select the DaVinci Resolve test on the left side of the app.
4. Under the Benchmark Preset drop-down menu, select Extended.
5. Click Start Test.
6. When the benchmark finishes, record the overall score.
7. Close PugetBench for Creators, and restart the system under test.
8. Wait 30 minutes before performing the next run.
9. Repeat steps 1 through 8 two more times, and record the median results.

Testing with Puget Bench for Creators: Premiere Pro

We used the following applications:

- Adobe Premiere Pro
- PugetBench for Creators

Setting up the test

1. Launch Adobe Premiere Pro.
2. Click through the Tutorial pop-up tips.
3. Close Adobe Premiere Pro.
4. Purchase a PugetBench for Creators license from https://www.pugetsystems.com/pugetbench/creators/.
5. Click the Download PugetBench for Creators for Windows or Mac.
6. After the download completes, double-click the installation file to install PugetBench.
7. Enter the license key in the license field. Click Activate.
8. Click Download Assets.

Running the test

1. Boot the system.
2. Open PugetBench for Creators.
3. Select the Premiere Pro test on the left side of the app.
4. Under the Benchmark Preset drop-down menu, select Extended.
5. Click Start Test.
6. When the benchmark finishes, record the overall score.
7. Close PugetBench for Creators, and restart the system under test.
8. Wait 30 minutes before performing the next run.
9. Repeat steps 1 through 8 two more times, and record the median results.

Testing with SPECviewperf 15.0.1

Setting up the test

1. Navigate to https://gwpg.spec.org/benchmarks/benchmark/specviewperf-15_0_1/, and purchase and download the vendor license of the benchmark.
2. Download and unzip SPECviewperf® 15.0.1.
3. Navigate to the extracted SPECviewperf® 15.0.1 directory, and click the .exe file to install.

Running the test

1. Launch SPECviewperf.
2. Click Run.
3. When the test is complete, record the results.
4. Repeat steps 1 through 3 two more times.

Testing with Topaz Video

Setting up the test

1. Purchase, download and install Topaz Labs Video from https://www.topazlabs.com/downloads.

Running the test in 3,840x2,160 (4K)

1. Launch Topaz Labs Video.
2. Enter license information, and click OK.
3. Select Process → Benchmark.
4. From the Input Resolution drop-down menu, select 3,840x2,160 (4K).
5. Click Benchmark.
6. When the test completes, record the results.
7. Wait 15 minutes before retesting.
8. Repeat steps 3 through 7 two more times.

Measuring battery life with the Procyon Office Productivity Battery Life Benchmark

Setting up the test

1. Boot the system.
2. Verify the following display and power settings:
    a. Right-click the desktop, and select Display settings.
    b. Uncheck the box next to Change brightness automatically when lighting changes, if available.
    c. Uncheck the box next to Change brightness based on content, if available.
    d. In the Scale drop-down menu, select 100%.
    e. From the pane on the left, select System.
    f. Click Power & Battery.
    g. For all power options listed under Screen and Sleep, select Never.
    h. Set Power mode while unplugged to the appropriate setting (Best Performance, Balanced, or Best Power Efficiency).
    i. Under Energy Saver disable Lower screen brightness when using energy saver.
3. Download and install Procyon.
4. Open Procyon.
5. Click Battery Life Office Productivity Benchmark.
6. Click Register.
7. Enter the license key, and click Register.
8. Click Calibrate.
9. Click Start.
10. Using a nit meter, adjust the screen brightness to as close to 200 nits as possible and click Next.
11. Fill out the information and click Save calibration.
12. Close Procyon.
13. Before running the benchmark, make sure to install a licensed version of Microsoft 365; open Word, Excel, PowerPoint, and Outlook applications; and disable tips when possible.

Running the test

1. Boot the system.
2. Ensure the system is fully charged.
3. Launch Procyon.
4. Select the Procyon Battery Life option.
5. Under the Office Productivity tab, click Run.
6. When prompted, unplug the system.
7. When the benchmark completes, plug in and power up the system.
8. Record the results.
9. Repeat steps 2 through 8 twice more.

Testing with the Procyon AI Image Generation Benchmark

Setting up the test

1. Purchase and download the Procyon AI Image Generation benchmark from https://benchmarks.ul.com/procyon.
2. Install the Procyon benchmark.
3. Double-click the installer.
4. Click Next.
5. Click to agree to the EULA, and click Next.
6. Click Next.
7. Launch Procyon.
8. Select Settings, and input the license key.
9. Close Procyon.

Running the test

1. Launch Procyon.
2. Select the Image Generation Benchmark test.
3. Under the Stable Diffusion 1.5 (FP16) test option, select the appropriate AI Inference Engine and select the graphics device name to be used.
4. To begin the test, click Run.
5. Complete and record 3 runs.
6. Under the Stable Diffusion 1.5 (INT8) test option, select the appropriate AI Inference Engine and select the graphics device name to be used.
7. To begin the test, Click Run.
8. Complete and record 3 runs.
9. Under the Stable Diffusion XL (FP16) test option, select the appropriate AI inference Engine and select the graphics device name to be used.
10. To begin the test, click Run.
11. Complete and record 3 runs.

This project was commissioned by HP

Read the report ▶

Primary contributors

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How we created this report

A PT team, which includes the contributors we've listed and others, created this report and performed the technical work behind it. We used AI to help outline, draft, and proofread this report, as well as to aid in chart creation, image editing, and content layout.

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