



# HP Z230 Workstation Generational Performance Improvements

## Introduction

The HP Z230 joins the powerful family of Z workstations as the follow-on generation to the HP Z220. There are two chassis designs available, the compact tower and small form factor. Both deliver substantial improved performance compared to the HP Z220 and are capable of tackling heavy workloads. The HP Z230 features a choice of the latest Intel® Xeon® processors or 4th generation Intel® Core™ processors with the option to use Intel's high-end offering of processor-based graphics for entry-level workstations, namely the Intel® HD Graphics P4600. Support is also offered for powerful dedicated graphics cards, including models from the NVIDIA Kepler family. With either selection, this workstation promises a considerable upgrade in processor and graphics performance over its predecessors without compromising energy efficiency. The HP Z230 offers compelling performance, reliability, compact design and low power consumption.

## Performance

### Processor

The Intel® Xeon® processor E3-1200 v3 and the 4th generation Intel® Core™ processor families deliver superior performance and enhanced graphics capabilities over previous generations of Intel processors. Improvements in Intel's Advanced Vector Extensions 2.0 platform feature boost performance of integer/matrix-based calculations for image processing workloads. Further advancements in the processor microarchitecture provide substantial performance boosts to compute-intensive software. Figure 1 shows up to 21% increase in processor performance for digital content creation and computer-aided design applications. Performance benefits will vary based on factors such as available memory, workload and application.

### CPU Composite Scores

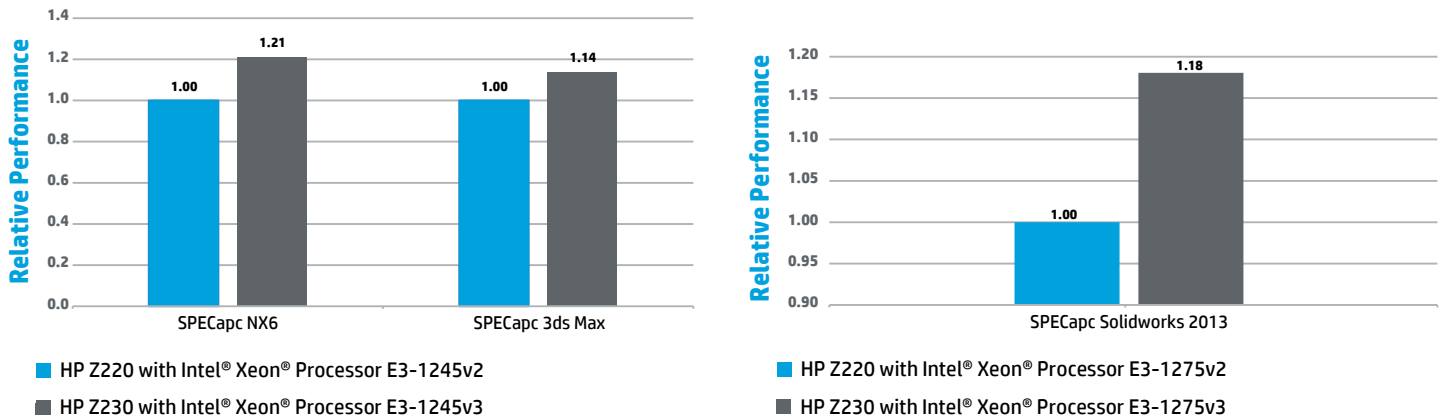


Figure 1: Processor Performance

### Intel® HD Graphics

The Intel® HD Graphics technology available with the Intel® Xeon® processor E3-1200 v3 and the 4th generation Intel® Core™ product families is designed to improve both 2D and 3D graphics performance. Key updates to processor graphics include improved shared local memory for compute shaders, increased number of execution units, and enhanced hardware tessellation. Intel® HD Graphics P4600 delivers performance improvements by as much as 36% for professional applications. Performance gains will vary based on the system configuration including, but not limited to, memory configuration, CPU, and configuration of the storage subsystem.

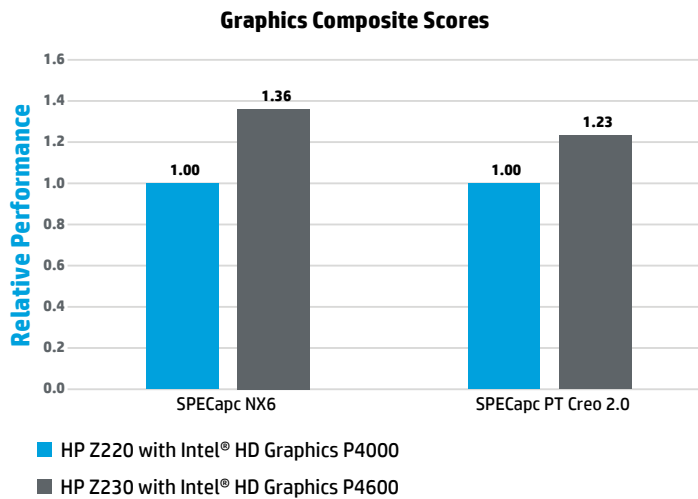


Figure 2: Graphics Performance

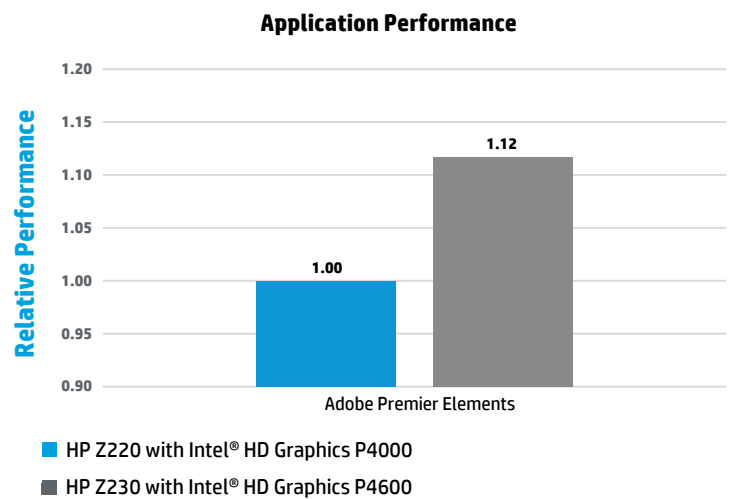


Figure 3: Application Performance

In the example configuration above, Intel’s HD Graphics P4600 proves to increase the SPECcapc NX6 benchmark composite graphics score up to 36% and the SPECcapc PT Creo 2.0 benchmark graphics scores up to 23% (see Figure 2). Professional OpenGL and DirectX applications benefit from application specific tuning and support for next-generation graphics APIs, such as Microsoft DirectX 11.1, OpenGL 4.0, OpenCL 1.2 and DirectCompute 5.0 standards. Figure 3 shows up to 12% additional application performance for Adobe® Premier Elements. OpenCL allows the application to access the graphics processing unit for non-graphical computing. Adobe Premier Elements also takes advantage of OpenGL to speedup display functions and accelerate specific processing tasks.

For users interested in improving graphics or video application performance at a minimal price, the Intel® HD Graphics P4600 offers competitive performance to entry-level discrete graphics cards.

**Energy Efficiency**

The HP Z230 strives to uphold HP’s leadership in environmental sustainability and energy efficiency. The HP Z230 compact tower and small form factor feature more efficient power supplies than their predecessors. Figures 4 and 5 show the power consumption history for HP entry level workstations¹.

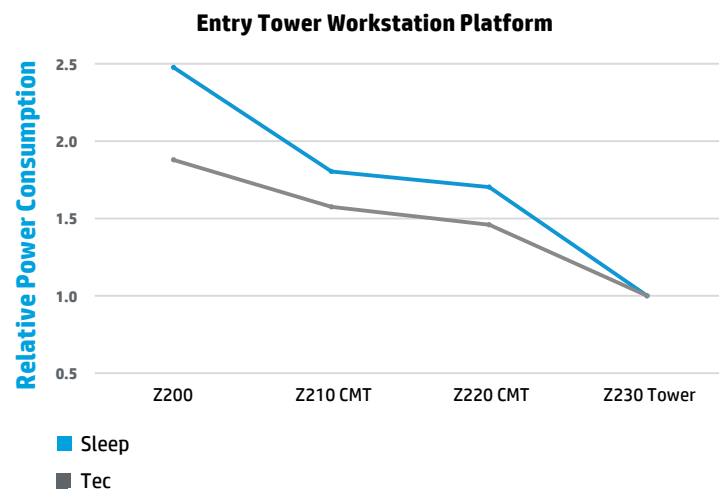


Figure 4: Tower Workstation Power Consumption

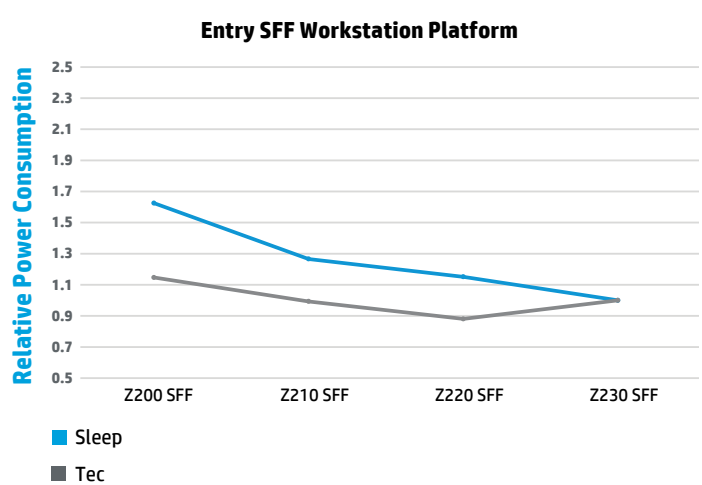


Figure 5: Small Form Factor Workstation Power Consumption

The HP Z230 tower consumes less than 1/3 of the power in sleep state and nearly 1/2 the power in TEC state when compared to its predecessors (see Figure 4). The small form factor design performs equally well with a power reduction of approximately 70% in sleep state (see Figure 5).

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<sup>1</sup>Typical Energy Consumption based on the estimated total amount of energy consumed in one year.

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