

HP 8710w



Intel Core2 Duo T9300 Processor

(2.50 GHz, 6 MB L2 cache, 800 MHz FSB)

Mobile™ Intel® 965PM Express chipset (800 MHz FSB)

17.0 WUXGA WVA AG 8710p Display (1920 X 1200)

NVIDIA FX 1600M 512MB 8710w Graphics

4096M 667DDR2 2DM 8710 Module

200G 7200RPM FX 8710 Hard Drive

DVD RW DL LS 8710 Drive

1 integrated Smart Card reader, 1 Secure Digital slot

10/100/1000

ethernet 56K V92 MDC 8710 Modem

Intel 802.11a/b/g 8710p Card

Bluetooth 2.0+ 8710p Module

on board Stereo speakers

Microphone 8

8 Cell 73Whr 8710 Battery

1 type I/II PCMCIA-slot

6 x USB 2.0 ports

IEEE 1394

1x VGA HDMI standard, DVI only when docked

headphone/ microphone connection

audio in/out

touchpad & pointing stick & Sec Finger Print reader 3,3 (front) x 39,3 x 27,5 cm

3,3 (front) x 39,3 x 27,5 cm / from 3,4 kg

3 Year Pick up and return warranty standaard (See options for 3 year next business onsite warranty)

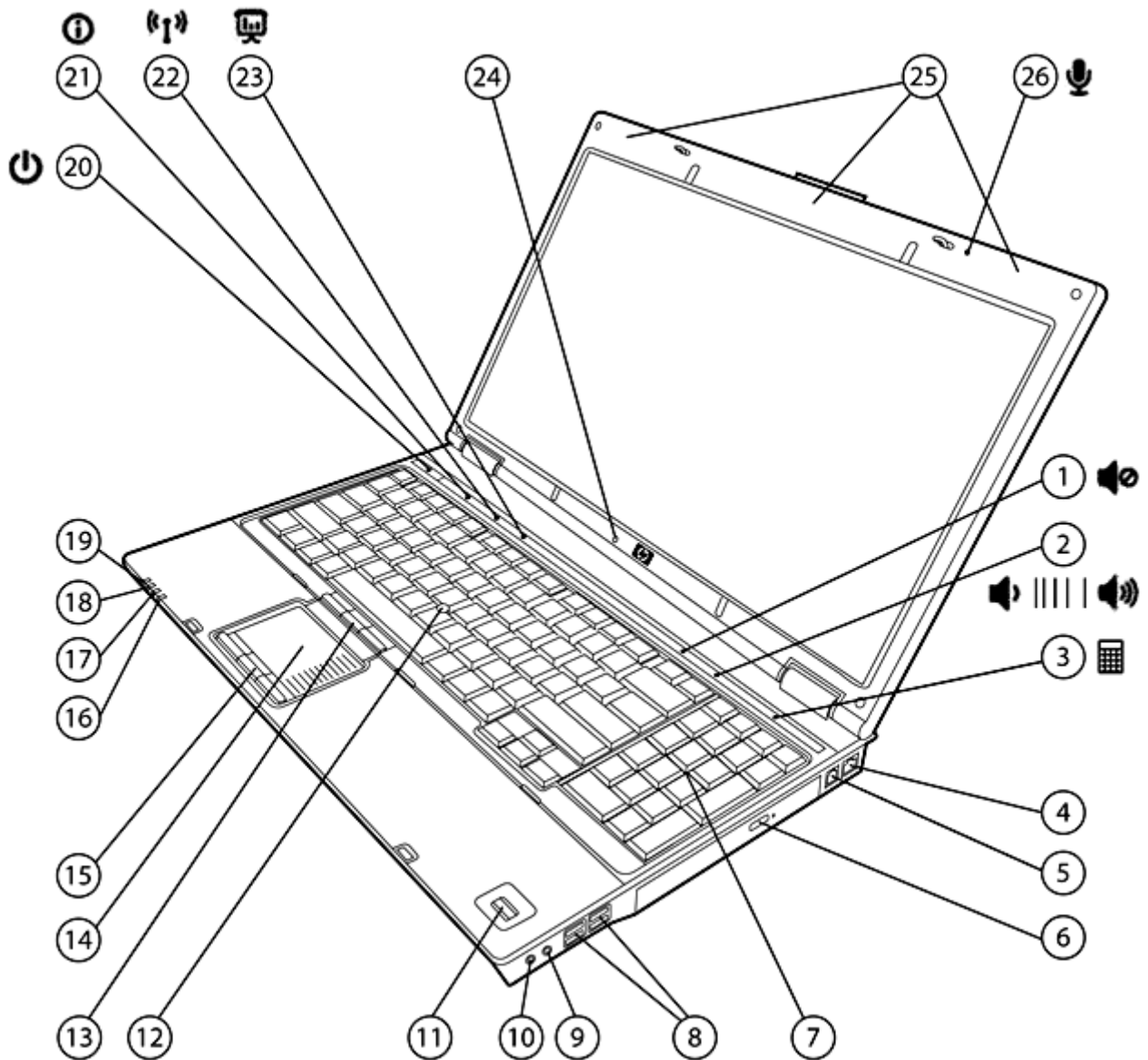
Vista business 32

Inclusief : batterij lader

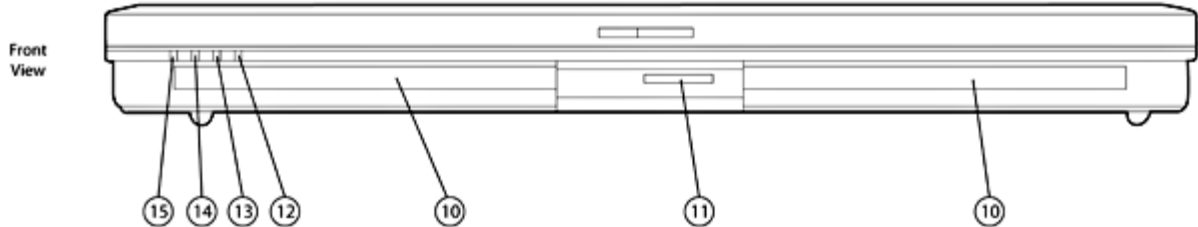
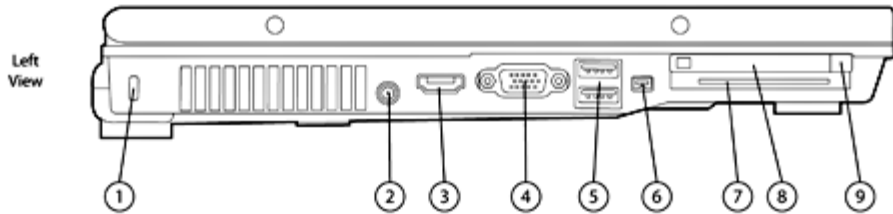
Overview

HP Compaq 8710w Mobile Workstation

HP recommends Windows Vista®
Business



- | | |
|---|--|
| 1. Volume mute button with LED indicator | 14. Touchpad with scroll zone |
| 2. Volume scroll zone with up/down LED indicators | 15. Touchpad buttons, three |
| 3. Calculator button | 16. Hard drive / optical drive activity / HP 3D DriveGuard LED |
| 4. RJ-45/Ethernet port | 17. Battery charging LED |
| 5. RJ-11/modem port | 18. Power/standby LED |
| 6. Optical drive | 19. Wireless on/off LED |
| 7. Full numeric keypad | 20. Power button with LED |
| 8. 4 USB 2.0 ports | 21. HP Info / HP QuickLook button with LED indicator |
| 9. Stereo microphone in | 22. Wireless on/off button with LED indicator |
| 10. Stereo headphone/line out | 23. HP Presentation button with LED indicator |
| 11. HP Fingerprint Sensor | 24. Ambient Light Sensor |
| 12. Pointstick | 25. Three WLAN antennas (with WLAN option) |
| 13. Pointstick buttons, three | 26. Integrated microphone |



- | | |
|-----------------------------------|--|
| 1. Kensington Lock slot | 9. PC Card eject button |
| 2. Power connector | 10. Integrated stereo speakers |
| 3. HDMI port | 11. Media Card Reader |
| 4. VGA/external monitor connector | 12. Hard drive activity / HP 3D DriveGuard LED |
| 5. 2 USB 2.0 ports | 13. Battery charging LED |
| 6. 1394a port | 14. Power/standby LED |
| 7. Integrated Smart Card Reader | 15. Wireless on/off LED |
| 8. Type I/II PC Card slot | |

At A Glance

- NVIDIA Quadro FX 1600M up to 512 MB dedicated memory
- DirectX 10 support and Dual Link DVI (available through optional docking) provides faster rendering capabilities and support for ultra-high resolution monitors
- Intel® Centrino® with vPro™ technology capable, with Intel Core™2 Duo processors
- HDMI high definition video/audio port
- DVD+/-RW SuperMulti DL Drive
- Designed to travel, with weight starting at 7.5 lb/3.4 kg and 1.3-inch/33 mm thin at front
- Widescreen 17.0-inch diagonal display with wide-viewing angle and Ambient Light Sensor
- Integrated Media Card Reader
- Full-sized keyboard with separate numeric keypad
- Enhanced reliability with HP DuraKeys, HP DuraFinish, and magnesium alloy support structures
- Enhanced security features including integrated Smart Card Reader, Drive Encryption for HP ProtectTools, HP Fingerprint Sensor, TPM 1.2**
- HP QuickLook on Windows Vista models for instant access to email, calendar, and contact information
- Flexible wireless connectivity options:
 - Integrated 802.11 a/b/g/draft-n, a/b/g, or b/g wireless LAN module
 - Bluetooth®
- Up to 200-GB 7200 rpm user-removable hard drive with HP 3D DriveGuard protection
- Touch-sensitive controls for HP Info Center, HP QuickLook, wireless on/off, HP Presentation button, volume up, volume down, and mute
- Up to 8GB of 667-MHz DDR2 SDRAM, dual channel memory support
- Integrated Intel Gigabit Network Connection (10/100/1000 NIC)
- Enhanced dual pointing devices (touchpad with scroll zone and pointstick)

* At initial boot, either 32- or 64-bit can be selected. This is a one time selection and the other version will be deleted.

** TPM module disabled where not permitted by law (for example, Russia and China).

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Standard Features

Processors	Intel Core 2 Duo Processor T9300 (2.50 GHz, 6 MB L2 cache, 800 MHz FSB)*	
	* Intel's numbering is not a measurement of higher performance.	
	NOTE: Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.	
Operating System	Preinstalled	Genuine Windows Vista Business [†] *
	Supported	Genuine Windows Vista Enterprise* Genuine Windows 2000
	Certified	SuSE Linux Enterprise Desktop 10
	[†] At initial boot, either 32- or 64-bit can be selected. This is a one time selection and the other version will be deleted.	
	* Certain Windows Vista product features require advanced or additional hardware. See http://www.microsoft.com/windowsvista/getready/hardwareregs.mspx and http://www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit http://www.windowsvista.com/upgradeadvisor .	
Chipset	Mobile Intel PM965 with 800-MHz front side bus	

Intel Centrino with vPro technology capable	<p>Intel Centrino with vPro technology is a selectable feature that is available on units configured with an Intel Wireless WiFi Link 4965AGN or 4965AG. It provides advances in remote manageability, security, energy efficient performance, and wireless connectivity. Intel Active Management Technology (AMT) offers built-in manageability and proactive security for networked notebook PCs, even when they are powered off* or when the operating system is inoperable. It can help identify threats before they reach the operating system, isolate infected systems, and update PCs regardless of their power state.</p> <p>* Requires a Windows operating system, network hardware and software, connection with a power source, and a direct (non-VPN) corporate network connection which is either cable or wireless LAN.</p> <p>NOTE: Some functionality of Intel Centrino Pro and vPro technology, such as Intel Active Management technology and Intel Virtualization technology, requires additional 3rd party software in order to run. Availability of future "virtual appliances" applications for Centrino Pro and vPro technology is dependant on 3rd party software providers. Compatibility with future "virtual appliances" and Microsoft Windows Vista operating system is yet to be determined.</p>
Graphics	<p>NVIDIA Quadro FX 1600M graphics with 512 MB dedicated video memory Microsoft DirectX 10 support</p>
Display	<p>Internal</p> <p>17.0-inch diagonal WUXGA wide-viewing angle anti-glare (1920 x 1200 resolution) Ambient light sensor Integrated lid switch HP Privacy Filter support</p> <p>External</p> <p>Up to 32-bit per pixel color depth VGA port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz HDMI 1.2 port supports direct connection to high-definition displays with up to 1920 x 1080 resolution and 7-channel audio with one convenient cable (not included). DVI port in optional HP Docking Station (sold separately) supports resolutions up to 1920 x 1200 for single-link DVI monitors and up to 2560 x 1600 for dual-link DVI monitors. NOTE: Resolutions are dependent upon monitor capability, and resolution and color depth settings.</p>
Memory	<p>Standard 4096-MB 667-MHz DDR2 SDRAM; two SODIMM slots supporting dual channel memory Maximum Upgradeable to 8-GB with 4096-MB SODIMM in slots 1 and 2 Dual-channel Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.</p> <p>NOTE: Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. Full availability of 8 GB of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.</p>
Communications	<p>Integrated Intel Gigabit Network Connection (10/100/1000 NIC)* 56K V.92 modem**</p> <p>* The term "10/100/1000" or "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.</p> <p>** Designed for downloads from 56K modem compliant sources. Maximum achievable download transmission rates currently do not reach 56 KB/s, and will vary with line conditions. Modem availability is subject to country regulatory approval.</p>
Wireless Devices	<p>Support for a broad range of secure, integrated wireless LAN options featuring support for the latest industry standards. Wireless LAN is factory configurable or available as an option to be added later. Integrated Bluetooth is also available (factory configurable only) and can be combined with any of the supported wireless LAN options.</p> <p>All 802.11a/b/g integrated wireless LAN options Wi-Fi certified Cisco Compatible Extensions support (Version 4.0) with Microsoft Windows XP Wired Equivalent Privacy (WEP) support up to 128-bit keys Wi-Fi Protected Access (WPA) and WPA2 support 802.1x authentication support, including EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, and LEAP Advanced Encryption Standard (AES) support Wi-Fi certified for WPA2, WMM Three antennas integrated in the display enclosure</p> <p>Intel Wireless WiFi Link 4965AGN Integrated support for 802.11a, b, g, and draft-n Up to 300-mbps data rate</p> <p>HP Integrated Module with Bluetooth Wireless Technology Bluetooth Specification v2.0 compliant Works with a wide range of Bluetooth devices</p>
Keyboard	<p>The 101/102-key compatible keyboard features an industry standard, full-pitch key layout with desktop keyboard features, such as the isolated inverted-T cursor control keys, editing keys, both left and right control and alt keys, and 12 function keys. US and International key layouts are available. Other features include a full numeric keypad, holkeys for instant access to power conservation, brightness, and other features, 19.05-mm x 19.05-mm key pitch (center-to-center spacing), 3.0-mm stroke, and comfort-dished keycaps.</p> <p>HP DuraKeys is a clear coating applied over the notebook keyboard that helps protect the finish and the printed characters on the keys.</p> <p>HP DuraFinish helps protect the finish on the keyboard deck, graphics, and icons from normal wear and tear.</p>
Touch-sensitive controls	<p>Touch-sensitive controls provide easy access to the following features: HP Info Center, HP QuickLook, wireless on/off, HP Presentation button, volume up, volume down, mute, and calculator button</p>
Pointing device	<p>Enhanced dual pointing devices (touchpad with scroll zone and pointstick, both with three pick buttons)</p>
Expansion card slots	<p>1 Type I/II PC Card slot Supports 32-bit CardBus and 16-bit PC Cards Integrated Smart Card Reader Compatible with ISO 7816 compliant Smart Cards PC/SC interface support Secure Digital slot Supports SD (Secure Digital), MMC (MultiMedia Card), Memory Stick, Memory Stick Pro, Memory Stick Duo*, xD-Picture card * Memory Stick Duo Adapters are required and sold separately. Inserting a Memory Stick Duo Card directly into your notebook could damage the memory card and/or notebook.</p>
Storage	<p>Internal Storage Device 160/200-GB 7200 rpm SMART SATA Hard Drive NOTE: Hard drives are customer removable and will withstand multiple insertion/removal cycles. Up to 10 GB is reserved for the system recovery software. HP 3D DriveGuard The hard drive is mounted directly to the notebook frame, reducing the transmission of shock away from the hard drive. Uses three-axis digital motion detection with intelligent sensitivity to help protect the hard drive during normal use from shock and vibration. The digital accelerometer temporarily halts all data transfer and parks the hard drive when abrupt motion is detected. Optical drives DVD+/-RW SuperMulti DL LightScribe Drive Blu-Ray Disc DVD+/-RW SuperMulti DL Drive NOTE: Optical drive is user replaceable with HP option. Requires single screw removal.</p>
Interfaces	<p>PC Card slot One Type I/II PC Card slot Smart Card Reader One Media Card Reader One External monitor One - VGA 1394a One - 4-pin connector Stereo microphone in One</p>

Stereo headphone/line out	One
Power connector	One
RJ-11/modem	One
RJ-45/Ethernet	One
HDMI	One – 1.2 compliant
USB 2.0	Six
Docking connector	One
Secondary battery connector	One
LED status indicators	Sixteen

Audio High Definition Audio support w/24-bit DAC
Integrated stereo speakers
Integrated microphone
Touch-sensitive controls for volume up, volume down, and mute
Stereo headphone/line out
Stereo microphone in

Software

Preinstalled software with Windows Vista or Windows XP

- PDF Complete
- HP Backup and Recovery Manager
- HP Help and Support Center
- HP QuickLook (Windows Vista only)
- HP OpenView Radio Management Agent
- HP Performance Tuning Framework
- HP Universal Print Driver
- HP ProtectTools Security Manager:
 - BIOS Configuration for HP ProtectTools
 - Credential Manager for HP ProtectTools
 - Device Access Manager for HP ProtectTools
 - Drive Encryption for HP ProtectTools
 - Embedded Security for HP ProtectTools
- HP Quick Launch Buttons
- HP Wireless Assistant
- Microsoft Office Ready with 60-day Office Professional 2007 Trial Edition (select models)
- Roxio Creator 9 (for optional DVD+/-RW and DVD/CDRW drives)
- Synaptics Touchpad Driver
- Symantec Norton Internet Security with complimentary 60-day live update
- Intervideo WinDVD – DVD/Blu-Ray Disc Player

Software provided on disc

- Roxio Creator 9 (for optional Blu-Ray Disc drives)

Additional software available from the web

- HP Client Manager
- Java Card Security for HP ProtectTools

Workstation ISV Certifications

MCAD
(Mechanical CAD/Architectural Engineering and Construction)

- AutoDesk AutoCAD
- AutoDesk Inventor
- AutoDesk Revit
- Bentley Microstation
- Dassault Catia V5
- UGS I-DEAS NX 10
- UGS I-DEAS NX 11
- UGS/PDM Unigraphics NX, NX2, NX3
- PTC Pro/E 2001: Mechanica
- PTC Pro/E Wildfire Mechanica
- MSC.Patran
- UGS Solidedge
- Solidworks
- ICEM Surf
- CoCreate OneSpace Designer
- SensAble
- PTC DV Mockup

DCC
(Digital Content Creation)

- Discreet 3DS MAX/Combustion
- Alias Maya
- Alias Studio Tools
- Avid SoftImage XSI/3D
- Avid Express Pro
- Adobe Premiere/After Effects

GIS
(Geographic Information Systems)

- ESRI ArcGIS 9

Oil and Gas

- SMT
- Landmark/GeoGrpahix
- EDS
- Roxar
- Schlumberger/Petrel

HP Performance Tuning Framework HP Performance Tuning Framework (PTF) enables optimal configuration of HP Mobile Workstations delivering stability and best performance. HP PTF will guide your system setup allowing a "custom" configuration that best matches the workstation to user requirements.

HP Backup and Recovery Manager Each unit is shipped with HP Backup and Recovery Manager. HP Backup and Recovery Manager can provide data and system file protection for HP business PCs to enable fast recovery if the system becomes corrupted or if important information is accidentally deleted. HP Backup and Recovery Manager can perform scheduled or manual backups of the entire drive or individual files and folders. Up to 10 GB of the hard drive is reserved for the system recovery software. HP Backup and Recovery Manager can also create software recovery CDs or DVDs (requires optional CD-RW or DVD+/-RW hardware).

SMBIOS Version 2.4 System Management BIOS, previously known as DMI BIOS, is used to store system management information.

HP ProtectTools Security Manager HP ProtectTools Security Manager is the security platform for business notebooks and desktops. The HP ProtectTools Security Manager is an extensible client security console that delivers enhanced security capabilities through add-on software modules. Modules currently available are:

- BIOS Configuration for HP ProtectTools
- Credential Manager for HP ProtectTools
- Device Access Manager for HP ProtectTools
- Drive Encryption for HP ProtectTools
- Embedded Security for HP ProtectTools
- Java Card Security for HP ProtectTools

Security **Standard Features** HP ProtectTools Security Manager
HP Fingerprint Sensor

Integrated Smart Card Reader
 Configuration Control Hardware
 Memory Change Alert
 Ownership Tag
 Setup Password
 Power-On Password
 TPM 1.2 Embedded Security Chip*
 TPM Enhanced DriveLock*
 HP Disk Sanitizer
 HP 3D DriveGuard
 Kensington Lock Slot
 Support for Computrace / LoJack for Laptops (must be purchased separately)

Optional Features

HP Privacy Filter
 Narrows viewing area so that screen data is visible only to persons directly in front of the monitor

* TPM module disabled where use is restricted by law; for example, Russia and China.
 For more information on HP security solutions refer to <http://www.hp.com/go/security>.

Power Supply

External 120-watt Smart AC adapter, 6-foot (1.8-meter) power cord included.
 External 135-watt Smart AC adapter, 6-foot (1.8-meter) power cord included (required to support NVIDIA FX 3600M graphics)
 Total length including external AC adapter is 12 feet (3.66 meter).
 HP Fast Charge*

*HP Fast Charge recharges your battery up to 90% within 90 minutes when the system is off. HP Fast Charge does not apply to 12-cell Ultra-Capacity batteries.

Battery

Primary battery 8-cell (73 WHr) Lithium-Ion battery
Optional HP Extended Life Battery 8-cell (52 WHr) high capacity Lithium-Ion battery
Optional HP Ultra-Capacity Battery 12-cell (95 WHr) high capacity Lithium-Ion battery

Battery Life

Primary battery Up to 4 hours
Primary battery and optional HP Extended Life Battery Up to 7 hours
Primary battery and optional HP Ultra-Capacity Battery Up to 9 hours

NOTE: The listed battery life measurements were taken on models running Microsoft Windows XP Professional. Battery life will vary depending on the product configuration, product model, applications loaded on the product, power management settings of the product, and the product features used by the customer. As with all batteries, the maximum capacity of this battery will decrease with time and usage.

System Standby Time

Up to 2 weeks

Power Conservation

NVIDIA PowerMizer 7.0 technology
 Hibernation
 Standby
 ACPI compliance

Docking and Stands

HP Advanced Docking Station
 HP Docking Station
 HP Standard Monitor Stand
 HP Adjustable Notebook Stand
 HP External MultiBay II

HP's shared docking solutions provide simple and convenient port replication and cable management. Features include Gigabit NIC pass through, modem pass through, legacy parallel and serial ports, S-video TV out, composite video, Dual Link DVI-D, USB 2.0 ports, integrated security mechanism*, integrated MultiBay II and ExpressCard** slots. These docking solutions are compatible across multiple Business Notebook platforms enabling a lower total cost of ownership.

* HP/Kensington Cable Lock required (purchased separately)
 ** HP Advanced Docking Station only

Service and Support

HP Services offers limited 3-year, 1-year and 90-day warranty options depending on country;
 1-year limited warranty on primary battery. On-site service and warranty upgrades are also available. For HP Care Pack services see <http://www.hp.com/go/lockuptool>.

For the school PIH the warranty is 3 Year next business onsite included.

NOTE: Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details.
<http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp>.

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Memory

667-MHz DDR2 SDRAM
 Two DIMM slots supporting dual channel memory
 DIMM sizes supported: 512 MB, 1024 MB, 2048, 4096 MB

Standard Memory

- 4096 MB (2048 MB x 2)

Optional Memory Upgrades

Support for up to 4096 MB of memory with the installation of optional DDR2 SDRAM memory kits. Both memory slots are user accessible. Please refer to the Hardware and Software Guide for installation procedures. Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

Up to	Slot 1	Slot 2
1024 MB	1024 MB	Empty
1024 MB	512 MB	512 MB
1536 MB	1024 MB	512 MB
2048 MB	1024 MB	1024 MB

4096 MB	2048 MB	2048 MB
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NOTE: This chart does not represent all possible memory configurations. Due to the non-industry standard nature of some third-party memory modules, we strongly recommend using only HP branded memory modules to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. Full availability of 8 GB of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

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Storage

Optical Drive Support

	Quantity Supported	Drive Bay
DVD+/-RW SuperMulti DL LightScribe Drive	One	Fixed optical drive bay
Blu-Ray Disc DVD+/-RW SuperMulti DL Drive	One	Fixed optical drive bay

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Technical Specifications

System Unit	Dimensions (HxWxD)	1.3 in (at front) x 15.5 in x 10.8 in 33 mm (at front) x 393 mm x 275 mm
	Weight	Starting from 7.5 lb (3.4 kg)
	NOTE: Height varies depending upon where on the notebook the measurement is made. Starting weight includes 8-cell battery, hard drive, 512-MB memory, 802.11 wireless communications module, Bluetooth, and optical drive. Weight varies by configuration and components.	
	Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage 18.5 V Average Operating Power 12.5 W Max Operating Power < 120 W (< 135 when configured with NVIDIA FX3600M)
	Temperature	Operating 32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical) Non-operating -4° to 140° F (-20° to 60° C)
	Relative Humidity	Operating 10% to 90%, non-condensing Non-operating 5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
	Shock	Operating 125 G, 2 ms, half-sine Non-operating 200 G, 2 ms, half-sine
	Random Vibration	Operating 0.75 grms Non-operating 1.50 grms
	Altitude (unpressurized)	Operating -50 to 10,000 ft (-15.24 to 3,048 m) Non-operating -50 to 40,000 ft (-15.24 to 12,192 m)
	Industry Standard Certifications	UL Yes CSA Yes FCC Compliance Yes ICES Yes GS Yes Australia / NZ A-Tick Compliance Yes CCC Yes Japan VCCI Compliance Yes MIC Yes BSMI Yes CE Marking Compliance Yes BNCI or BELLIS Yes CIT Yes GOST Yes Saudi Arabian Compliance (ICCP) Yes SABS Yes UKRSERTCOMPUTER Yes
	For accessibility information on HP products, please visit http://www.hp.com/accessibility .	

HP 120W Smart AC Adapter	Weight	1.52 lb (0.69 kg) (adapter) 0.29 lb (0.13 kg) (power cord)
	Dimensions	6.65 x 2.56 x 1.50 in (16.9 x 6.5 x 3.8 cm)
	Input	Operating Input Voltage 100 to 240 VAC Operating Input Current PFC Version: 2.20 A at 90 VAC 1.10 A at 180 VAC Non-PFC Version: 2.5 A at 110 VAC 1.25 A at 180 VAC Operating Frequency Range 47 to 63 Hz AC Efficiency 83% minimum at 115 VAC

Output	Output power	120 W
	DC Output Voltage	18.5 V
Environmental Design	Operating Temperature	32° to 104° F (0° to 35° C)
	Non-operating (storage) Temperature	-4° to 149° F (-20° to 65° C)
	Altitude	0 to 10,000 ft (0 to 3,048 m)
	Humidity	20% to 80%
	Storage Humidity	10% to 90%
EMI and Safety Certifications	CE Mark: full compliance with IVD and EMC directives	
	Worldwide safety standards: IEC60950, EN60950, UL60950, Class2, SELV	
	Agency approvals: CUL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE, S-Mark, Australian Electric Permit, PSB, eK, BSMI, BNCI, KONCAR, GS, GOST, SASO, SABS, UKRSERT/COMPUTER	
	NOTE: Approvals in italics apply to PFC version only.	
MTBF	Over 200,000 hours at 25°C ambient condition	

Optional HP Ultra-Capacity Battery	Dimensions (H x W x L)	1.3 x 6.0 x 10.6 in (3.33 x 15.25 x 26.88 cm)	
	Weight	1.77 lb (0.803 kg)	
	Cells/Type	12-cell Lithium-Ion	
	Energy	Watt-hour Capacity 95Wh	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (-10° to 60° C)
		Non-operating	-4° to 140° F (-20° to 60° C)
	Battery Re-Charge Time	Smart Adapter	3 to 4 hours
		System ON	4 to 5 hours (depending on system power consumption)
	Fuel Gauge	When pressed, LEDs light indicating level of charge remaining on battery	

Optional HP Extended Life Battery	Dimensions (H x W x L)	1.0 x 3.9 x 8.7 in (2.5 x 10.0 x 22.0 cm)	
	Weight	1.00 lb (0.455 kg)	
	Cells/Type	8-cell Lithium-Ion	
	Energy	Watt-hour Capacity 52Wh	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (-10° to 60° C)
		Non-operating	-4° to 140° F (-20° to 60° C)
	Battery Re-Charge Time	System in OFF mode or Standby	3 hours
		System ON	3 to 5 hours (depending on system power consumption)
		HP Fast Charge	Charges the battery up to 90% within 90 minutes when system is OFF
Fuel Gauge	When pressed, LEDs light indicating level of charge remaining on battery		

8-Cell (73Wh) Lithium-Ion battery	Dimensions (H x W x L)	0.8 x 1.9 x 10.6 in (2.0 x 4.8 x 27.0 cm)	
	Weight	0.980 lb (0.445 kg)	
	Cells/Type	8-cell Lithium-Ion	
	Energy	Watt-hour Capacity 73Wh	
	Temperature	Operating (Charging)	32° to 113° F (0° to 45° C)
		Operating (Discharging)	14° to 140° F (-10° to 60° C)
		Non-operating	-4° to 140° F (-20° to 60° C)
	Battery Re-Charge Time	System in OFF mode or Standby	2.5 hours
		System ON	3 to 5 hours (depending on system power consumption)
		HP Fast Charge	Charges the battery up to 90% within 1.5 hours when system is OFF

17.0-inch WUXGA wide-viewing angle, anti-glare	Active Area (W x H)	14.5 x 9.0 in (36.7 x 22.9 cm)	
	Diagonal Size	17.0 in (43.2 cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	300:1 typical	
	Refresh Rate	60 Hz	
	Brightness	200 nit typical	
	Pixel Resolution	Pitch	0.191 mm
		Format	1920 x 1200
		Configuration	RGB Stripe
	Backlight	CCFL	
	PPI	133	
	Viewing Angle	±60° Horizontal, ±50° Vertical (minimum)	

Hard Drives

160-GB 7200 rpm SATA	Drive Weight	0.25 lb (113 g)	
	Capacity	160 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-7 / SATA 1.0a	
	Transfer Rate	Synchronous (maximum)	100 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1 ms
		Average	10 ms
		Maximum	18 ms
	Rotational Speed	7200 rpm	
	Logical Blocks	312,581,808	
	Operating Temperature	41° to 140° F (5° to 60° C) [case temp]	
	Features	ATA Security	

Optical Drives – Fixed

DVD+/-RW SuperMulti DL LightScribe Drive	Access Times	Random	<175 ms CD <230 ms DVD
	Max Data Transfer Rate	24X CD-ROM	3,600 KB/s
		8X DVD	10,800 KB/s
		24X CD-R	3,600 KB/s
		16X CD-RW	2,400 KB/s
		8X DVD+R	10,800 KB/s
		4X DVD+RW	5,400 KB/s
		8X DVD-R	10,800 KB/s
		4X DVD-RW	5,400 KB/s
		2.4X DVD+R(9)	2,700 KB/s
	5X DVD-RAM	6,750 KB/s	
	Transfer Mode	Multiword DMA Mode	
	Interface	EIDE	

Supported Media (read) CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM

Supported Media (write) CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, LightScribe

Max Media Capacity (read) 8.5 GB

Max Media Capacity (write) 8.5 GB

Transport Tray Loading

DVD+/-RW SuperMulti DL Drive	Access Times	Random	<140 ms CD-ROM <160 ms DVD-ROM <300 ms BD-ROM
	Max Data Transfer Rate	24X CD-ROM	3,600 KB/s
		8X DVD-ROM	10,800 KB/s
		8X CD-R	1,200 KB/s
		8X CD-RW	1,200 KB/s
		8X DVD+R	10,800 KB/s
		4X DVD+RW	5,400 KB/s
		8X DVD-R	10,800 KB/s
		4X DVD-RW	5,400 KB/s
		2.4X DVD+R(9)	2,700 KB/s
	5X DVD-RAM	6,750 KB/s	
	1X BD-ROM	4,500 KB/s	
	1X BD-R	4,500 KB/s	
1X BD-RE	4,500 KB/s		
Transfer Mode	Multiword DMA Mode		
Interface	EIDE		
Supported Media (read)	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM, BD-ROM, BD-R, BD-RE		
Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9), DVD-RW, DVD-RAM, BD-R, BD-RE		
Max Media Capacity (read)	50.0 GB		
Max Media Capacity (write)	50.0 GB		
Transport	Tray Loading		

Security

HP Fingerprint Sensor	Mobile Voltage Operation	3.0V–3.6V Single Supply	
	Operating Temperature	32° – 158°F (0° – 70°C)	
	Current Consumption @ 3.3V	Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management	
	High-Rate Image Capture	Up to 240 image frames /sec	
	ESD Resistance	IEC 61000-4-2 Level 4 (±15KV)	
	Detection Matrix	192 x 16 Pixels 9.7 mm x 0.81 mm 500 ppi High-Resolution Images	

Audio

Hardware	Implementation	ADI1981HD High Definition CODEC	
	Touch-Sensitive Volume Controls	Volume up, volume down, and mute	
	Full Duplex	Yes	
	Sound Blaster Pro compatible	Yes	
	Microphone In	Stereo	
	Headphone/Line Out	Stereo	
Integrated Microphone	Yes		

Audio Output Quality	Frequency Response	20 Hz – 20 kHz	
	Signal to Noise Ratio	>85 dB	
	Total Harmonic Distortion	0.01%	
	Noise Floor	-110 dB	
	Play/Record Sampling Rate(s)	8 kHz – 48kHz	
	DAC	16, 20 or 24-bit	
	ADC	16 or 20-bit	

Integrated Stereo Speakers	Power Rating Impedance	2 Watts 4 Ohms
Communications		
Integrated Intel Gigabit Network Connection (10/100/1000 NIC)	Ethernet Features Power Management Performance Features Manageability Interface NIC Device Driver Name Drivers Available	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3z and 802.3ab; IEEE 802.3 clauses 34-42) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 802.1p QoS (Quality of Service) Support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable) ACPI compliant – multiple power modes Situation-sensitive features reduce power consumption TCP/IP/UDP Checksum Offload (configurable) Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Intel Advanced Management Technology (iAMT) PCI Express x1 Intel 82566MM Gigabit Network Connection Microsoft Windows Vista Microsoft Windows XP
V.92 56K Data/Fax Modem	Form Factor Power Management Support Approvals/ Certifications Data Mode Capabilities Fax Mode Capabilities Command Set	MDC 1.5 Daughtercard APM Revision 1.2, ACPI UL, CSA, NEMKO, CCIB, Industry Canada, FCC Part 68, CTR21, FCC Part 15 Class B, Canadian ICES-003 Class B, C.I.S.P.R.22, Australian ACA, CE Mark, Other Countries V.92 data V.8bis V.80 V44, V.42bis, MNP5 (Compression) V.42 (LAPM, MNP2-4) (Error Correction) Optional symbol rates: 2800, 3429 Asymmetric Symbol rates Synchronous primary channel data signaling rates: 3600, 31200 Automatic rate re-negotiation V.34 V.32bis V.32 V.23 V.22bis V.22 V.21 Bell 212A Bell 103 TIA/EIA-578-B (Class 1) T.30, T.4 (Group 3) V.17 V.29 V.27ter V.21 Channel 2 V.250 (Partial) TIA-602 Identification: +GMI, +GMM, +GMR Port control: +IPR, +ICF, +IFC, +ILRR Modulation: +MS, +MR, +MA Error control: +ES, +ER, +EB, +ESR, +ETBM Data compression: +DS, +DR V.251
Intel Wireless WiFi Link 4965AGN	Wireless LAN Standards Interoperability Frequency Band Data Rates Modulation Security ¹ Sub-channels Media Access Protocol Network Architecture Models Roaming Output Power (for CKK) ² Output Power (for OFDM; power varies by data rate) ² Power Consumption	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n (draft 1.02) Wi-Fi certified (802.11abg only) Cisco Compatible Extensions Program compliant (802.11abg only) with Microsoft Windows 2000 and XP (details at http://www.hp.com/go/notebooks/WLAN) Tested with wireless access points from several major manufacturers (details at http://www.hp.com/go/notebooks/WLAN/draftn) 2.4 GHz and 5 GHz 802.11b: 1, 2, 5.5, 11 Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n (draft): 66 possible data rates, ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n (draft) specification Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES (support for key sizes of 128, 192, and 256 bits), 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows 2000 and XP only. Multinational support with frequency bands and channels compliant to local regulations. CSMA/CA (Collision Avoidance) with ACK Ad-hoc (Peer to Peer) Infrastructure (Access Point Required) IEEE 802.11 compliant roaming between access points 15 dBm 15 dBm Transmit: 2.3 Watts (average, with two spatial streams) Receive: 1.9 Watts (average with three receive chains) Idle mode ³ : 30 mW (average)

	Radio off: 20 mW (max)	
Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity⁴	300 Mbps: -68 dBm, 54 Mbps: -74 dBm, 6 Mbps: -90 dBm	
Antenna Connections	3 U.FL type connectors, 50 ohm nominal impedance	
Range	802.11 a – Typical (@6 Mbps)	600 feet – Outdoor Open Area 150 feet – Indoor, Office environment
	802.11 b – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
	802.11 g – Typical (@1 Mbps)	1200 feet – Outdoor Open Area 300 feet – Indoor, Office environment
Form Factor	PCI Express MiniCard	
Weight	0.013 lb (6 g)	
Dimensions	0.19 x 1.2 x 2.0 in (4.75 x 29.85 x 50.8 mm)	
Operating Voltage	3.3V +/- 9%, 1.5V +/- 5%	
Temperature	Operating	32° to 176° F (0° to 80° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90% (non-condensing)
	Non-operating	5% to 90% (non-condensing)
Altitude	Operating	0 to 10,000 ft (3,048 m)
	Non-operating	0 to 50,000 ft (15,240 m)
Configuration Utility⁵	Microsoft Windows 2000 or XP Choice of Configuration Utility:	

- Microsoft Windows XP Wireless Network Connection Manager
- Intel PROSet for Microsoft Windows 2000 or XP (required for Cisco Compatible Extensions support)

Microsoft Windows Vista

- Microsoft Windows Vista Wireless Network Connection Manager

LED Activity LED Off – Radio OFF; Solid LED On – Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. In Power Save Polling mode and on battery power.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows 2000 or XP. WLAN may also be compatible with certain third-party software suppliers.

Bluetooth Profiles Supported

(with Bluetooth for Windows 4.0 software)

- Serial Port Profile (SPP)*
- Dial-Up Networking (DUN)*
- Generic Object Exchange Profile (GOEP)
- Object Push Profile (OPP)*
- File Transfer Profile (FTP)
- Synchronization Profile (SYNC)
- Hard Copy Cable Replacement (HCRP)*
- Personal Area Networking Profile (PAN)*
- Human Interface Device Profile (HID)*
- FAX Profile (FAX)
- Basic Imaging Profile (BIP)
- Headset Profile (HSP)
- Hands Free Profile (HFP)
- Advanced Audio Distribution Profile (A2DP)

* indicates the profile is also supported by Microsoft Windows XP SP2

Environmental Data

Eco-Label Certifications

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US Federal Energy Management Program (FEMP)
- ECO declaration
- Korean Eco Label
- EPEAT Silver Rating

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data is based on a "Typically Configured Notebook"

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	18.05 W	19.49 W	12.19 W
Sleep (Energy Star low power mode)	1.261 W	1.281 W	1.261 W
Off	1.563 W	1.57 W	1.563 W
Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	61.586 BTU/hr	66.499 BTU/hr	41.592 BTU/hr
Sleep	4.302 BTU/hr	4.37 BTU/hr	4.302 BTU/hr
Off	5.332 BTU/hr	5.356 BTU/hr	5.332 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions

(in accordance with ISO 7779 and ISO 9296)

- Idle
- Operating mode (HDD)

Sound Power
(LWA_d, bels)

- 3.1
- 3.1

Sound Pressure
(LpA_m, decibels)

- 25
- 26

Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000 ppm by weight.

The battery type and chemistry used in the product is:
CR2032 (coin cell), Lithium
8 cell rechargeable Lithium-Ion battery

Additional information:

This product is in compliance with the EU Restrictions of Hazardous Substances (RoHS) Directive – 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.

Keyboard complies with ISO standard: ISO 9995, EN 29241-4, and ISO/IEC 15412

Input devices of this product comply with ISO 9241, part 9.

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

This product contains 0% recycled materials (by wt.)

This product is greater than 92% recyclable when properly disposed of at end of life.

Packaging Materials

- External:
 - Corrugated / Paper – 2.25 lb (1019 g)
- Internal:
 - EPE Foam – 0.15 lb (70 g)
 - LDPE Bag – 0.04 lb (19.44 g)
- The corrugated paper packaging materials contains at least 40% recycled content.

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (for reference of these limits please refer to the HP General Specification of the Environment (http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)

- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

End-of-Life Management and Recycling

HP offers our customers several other options for handling their aging computers while also minimizing the impact on the environment—including product trade-in and leasing services—in addition to recycling services.

Hewlett-Packard Corporate Environmental Information

Please go to: <http://www.hp.com/recycle>

or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

For more information about HP's commitment to the environment:

Global Citizenship Report

<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>

Environment website

<http://www.hp.com/environment>

Eco-label certifications

[http://www.hp.com/hpinfo/globalcitizenship/](http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html)

[environment/productdesign/ecolabels.html](http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html)

ISO 14001 certificates:

<http://www.hp.com/hpinfo/globalcitizenship/>

[environment/operations/envmanagement.html](http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html)

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