## Apple Product Environmental Specification

#### Product: 15.4-inch MacBook Pro Model Numbers: MA895, MA896

This list of environmental attributes can be used as a guide to determine product compliance with various regional, country, and industry sector product environmental criteria. The environmental criteria listed is based on programs such as ECMA, IT ECO (formerly SITO), Blue Angel, ENERGY STAR®, and TCO.

Each criteria listed includes a reference to the section of the Eco-label specification where it is described. Note: Not all environmental criteria apply to all products.

This environmental specification is provided for informational purposes only. Nothing contained within shall be construed as a warranty, expressed or implied, with respect to the product.

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#### 1.0 Environmental policy & environmental management

An environmental policy and environmental management system (EMS) demonstrates the commitment, purpose, objective and mission of a company. Apple has established an internal EMS, and has certified its facilities in Sacramento, CA, Ireland, and Singapore to ISO 14001.

#### 2.0 Environmentally conscious design

Environmentally conscious design is the systematic approach of identifying and incorporating product features and functions with respect to environmental, health and safety objectives throughout all stages of a product's life. Apple has established a process where we address these issues in the design, development, manufacture, use, and end-of-life of our products.

#### 3.0 Banned/restricted materials

Some materials that have traditionally been used in electronic products have been determined to be environmental or health hazards. The use of these materials has been banned or restricted by legislation or eco-labels.

#### 4.0 Batteries

Apple uses rechargeable batteries to provide power for notebooks, develops power management software and energy saving features to obtain maximum efficiency, and avoids batteries that contain lead, cadmium and/or mercury.

# 5.0 Energy consumption The use of energy-efficient products results in savings in energy costs and the reduction of pollution resulting from the generation of electricity. Apple promotes energy conservation in its product design and performance including our participation in the ENERGY STAR® program and no-load power consumption programs such as the EU Code of Conduct for external power supplies, and the U.S. Federal Energy Management Program. The energy data listed reflects standard configurations only. Other configurations may yield different energy values. 6.0 Emissions

Apple products are tested and certified to international standards to assure the safe use of our products. *Electrical Safety, EMC, and connection to telephone network* 

# The safe use of Apple products is of foremost concern. Therefore, Apple tests and certifies our products to international standards to assure their safe use.

#### 8.0 Ergonomics

Visual ergonomics is an important concern to computer users. It affects user comfort and performance. Apple designs, tests and certifies our displays to meet stringent visual ergonomics (front of screen) criteria. In addition, our displays have the capability of tilting and swiveling to adjust to user needs.

#### 9.0 Packaging and documentation

Apple evaluates the environmental attributes of our packaging for hazardous materials as well as the minimization of the quantity and weight of the packaging materials. These considerations enable and promote recycling of packaging materials for our customers.

#### 10.0 Recycling

Apple designs its products with specific features and functions that promote the ease of recyclables. In addition, in specific countries, Apple has established takeback/recycling programs to assist customers.

#### 11.0 Additional Attributes

### 12.0 Noise characteristics

Acoustical noise is becoming an increasingly important concern to computer users. It affects user comfort and performance, and it may become disruptive and annoying to the user or others in the work environment. For these reasons, Apple is concerned and designs our products to generate acoustical noise levels as low as possible.

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Apple	Product Environmental Specification	Requirement met			IT ECO	Blue Angel	TCO '99	ECMA
		Yes	No	N/A	('02)	Desktop CPUs	Desktop Display	(6/99)
1	Environmental policy & environmental management							
1.1	The manufacturer has a documented environmental policy approved by the management	х			C3.1		1.1.1	5.1
1.2	The manufacturer has an environmental management system according to: ISO 14001 _X_, EMAS or internal system	х			C3.2		1.1.3	5.1
1.3	The manufacturer regularly publishes an environmental report		Х		C3.3			
1.4	The manufacturer and the manufacturer's representative market its products in accordance with environmental rules in applicable marketing legislation	х					1.1.4	
2	Environmentally conscious design							
2.1	Large mechanical plastic parts consist of one material or of materials that are easy to separate	х			P6.3			5.9
2.2	All plastic components that weigh >100g shall be made from no more than 2 types of plastics	х			P6.3		1.4.2	
2.3	The variety of materials forming components of comparable functions are limited to one material	х				B.1		
2.4	The proportional use of recyclate is permitted		Х			B.5		
2.5	Mechanical plastic parts, heavier than 25 g are marked with plastic identification code according to ISO 11469 and ISO 1043, parts 1-4 Plastics - Symbols and abbreviated terms	x			P6.4, 6.5, P6.15	3.1.3	1.4.1	5.9
2.6	The coating of plastic components is limited to a minimum	Х				B.3		
2.7	Paints, lacquers or varnishes do not increase the weight of any plastic component weighing >25 g by more than 1%. In-mold decoration is not allowed in any plastic components weighing >25 g. Metallic paint (particles > 10 microns) is not allowed	x					1.4.3	
2.8	No internal or external metallization or molded in metal parts or glued parts in plastic housing for CRT or LCD			х			1.4.4(a)	
2.9	Plastic parts are free from metal inlays that cannot be removed by one person alone with a standard tool	х			P6.6			
2.10	Labels should be inherent and separable for recycling	Х			P6.7			
2.11	Components made of incompatible materials can be removed separately or via separation aids	Х				A.1		
2.12	Connections to be separated during disassembly are easily traceable	Х				A.3		
2.13	The product is designed for easy dismantling during recycling; gluing/welding of different materials has been avoided	х			P6.1	3.1.1		
2.14	Disassembly can be done exclusively with all-purpose tools	Х				A.4		
2.15	Disassembly can be done by a single person	Х				A.9		
2.16	All screwed connections between modules can be separated with no more than three tools	Х				A.7		
2.17	Large-size plastic case parts are so designed as to ensure the reutilization of the plastics on the basis of existing technologies for the production of high-quality and long-lived plastic products	х				3.1		
2.18	Materials and material compounds can be recycled on an industrial scale (technologically and economically useful)	х				B.4		
2.19	Future recycling and material utilization processes are taken into account	х				3.1		
2.20	Electronic modules containing harmful substances are easily traceable and removable for recycling	х				A.2		
2.21	The case parts are free from electronic modules	Х				A.11		
2.22	The product has a modular design and no special tools are needed to upgrade the product	х			P6.8	4.4, C.1		
2.23	Processor, memory and cards of various types can be changed/upgraded	х			P6.9	4.4, C.2		5.2
2.24	Information on the ability to change/upgrade components is included in the product documentation	х				4.5		5.2
2.25	Design allows for installation, expansion exchange, upgrade, or attachment of a mass storage unit	х			P6.10	4.4, C.3		5.2

Apple Product Environmental Specification		Requirement		IT	Blue	TCO '99	ECMA		
				met		ECO	Angel	Deakton	
			Yes	No	N/A	('02)	CPUs	Display	(6/99)
3	Banned/restricted materials	;		•					
	Compliant with EU Directive 2002 the use of certain hazardous sub- electronic equipment (RoHS)	2/95/EC on the restriction of stances in electrical and							
3.1	<ul> <li>Exempted applications to Directive 2002/95/EC in use:</li> <li>Lead in electronic ceramic parts</li> <li>Lead in glass of cathode ray tubes, electronic components and fluorescent tubes</li> <li>Lead as an alloying element in steel containing up to 0.35% lead by weight, aluminum containing up to 0.4% lead by weight, and copper containing up to 4% lead by weight</li> </ul>								
3.2	No CFCs or HCFCs present in th	e product	Х			P1.1			
3.3	No substances included in annex A, B or C of the Montreal Protocol on Substances that Deplete the Ozone Layer are used in the manufacture of the printed wiring boards, assembly of the PWBs and final assembly of the product		х					1.2.1	5.8
3.4	No asbestos, PCB (polychlorinate (polychlorinated terphenyls) prese	ed biphenyls) or PCT ent in the product	Х						5.8
3.5	No mercury present in the produc	xt	X			P1.2			5.8
3.6	Mercury (Hg) content in flat pane	l display: 0 mg	← S Val	see ue		P6.17		1.3.2	
3.7	No brominated or chlorinated flame retardants, PBB or PBDEs present in mechanical plastic parts heavier than 25 g		Х			P6.12		1.3.5(a)	5.8
3.8	The base material of PWB must not contain any PBB (polybrominated biphenyls), PBDE (polybrominated diphenyl ethers) or chlorinated paraffins		х				3.1.2.2		
3.9	Plastic components that weigh >25 g shall not contain flame retardants that contain organically bound chlorine or bromine. PVC is inherently flame retardant with organically bound chlorine and, therefore, not allowed (exception: PVC cables)		х					1.3.5	
3.10	No Antimony Trioxide (Sb <sub>2</sub> O <sub>3</sub> ) flame retardants in plastic enclosures		х						
3.11	No polyvinyl chloride (PVC) is used in plastic enclosures (exception: cable enclosures)		Х					1.4.2	
3.12	No cadmium (Cd), cadmium compounds, lead (Pb), or lead compounds are intentionally added to cable enclosures		х						5.8
3.13	No cadmium (Cd) or lead (Pb) present in mechanical plastic narts beavier than 25 g		Х						5.8
3.14	No cadmium (Cd) in the CRT (Ca	thode Ray Tube)			Х			1.3.1	5.8
3.15	No mercury (Hg) or cadmium (Co	I) in electronic components	Х					1.3.4	5.8
3.16	No cadmium (Cd) or lead (Pb) in product	paints and inks used in the	Х			P1.4			5.8
3.17	No chloroparaffins with chain length 10-13 carbon atoms and chlorinated greater than 50% are present in mechanical plastic parts heavier than 25 g		х						5.8
	-								
4	Batteries			1					
4.1	Batteries defined as hazardous in the EU Directive 91/157/EEC and amendments 98/101/EC are not used in the product		Х				3.1.4		5.10
4.2	Battery handling information is provided in the product documentation		Х				3.1.4		5.10
4.3	No mercury (Hg) or cadmium (Co	l) in batteries	Х			P2.2	3.1.4	1.3.3(a)	5.8
	Remote battery chemical composition:	Lithium manganese dioxide							
4.4	Backup battery chemical composition:	Lithium manganese dioxide	← See Values						
	Power battery chemical composition:	Lithium-ion polymer							

Apple Product Environmental Specification			Requirement met		IT ECO	Blue Angel	TCO '99	ECMA			
				Yes	No	N/A	('02)	Desktop CPUs	Desktop Display	(6/99)	
5	Energy consump	tion									
	Power supply maximum continuous power rating 85 W										
	Mode	100V	115V	230V							5.3
51	Off	0.84 W	0.84 W	0.85 W	← 5	See		P8 1	4116	4 5	
0.1	Sleep – WOL off	1.21 W	1.17 W	1.16 W	Valu	ues		1 0.1		1.0	
	Sleep – WOL on	1.98 W	1.97 W	1.90 W							
	Idle – Display off	17.2 W	17.4 W	17.7 W							
	Idle – Display on	21.4 W	21.8 W	22.3 W							
	External power supply (AC adaptor) no-load power consumption										
5.2	Mode		115V	230V	← See Values						
	No-Load		0.22 W	0.26 W							
	Average Efficiency		88%	87%		-		56.4			
5.3	Product meets ENER	RGY STAR® V4	.0 criteria		Х			P8.4	4.1.1.1	4.5	5.3
5.4	External power supply (AC adapter) meets ENERGY STAR® criteria			YSTAR®	х						
5.5	External power suppl Conduct (2003) criter	ly (AC adapter) ria	meets Europea	n Code of	х						
5.6	Product meets US FI Program) criteria	Product meets US FEMP (Federal Energy Management Program) criteria			х						
5.7	Information about the energy save function is given in the user manual			х			P8.3			5.3	
5.8	Sleep mode is activated automatically			Х			P8.1	4.1.1.2			
5.9	Product shall not be damaged if separated from power source for at least 4 weeks			х				4.1.1.4			
5.10	The computer supports an operating system allowing the implementation of power-saving functions. Unit must offer at least one power-saving rest mode which activates automatically after a factory pre-set interval			x				4.1.1.2			

#### Definitions of energy consumption modes in section 5.1:

In each mode, the system is connected to AC power and the battery is fully charged.

Idle - Display on: State in which the system has completed loading Mac OS X with its default settings, with the display at its full brightness.

The following modes correspond to the requirements of the Energy Star Program Requirements for Computers Version 4.0 specification. Refer to the specification for the complete test conditions. The system is connected to a gigabit Ethernet network for each mode.

Idle - Display off: State in which the system has completed loading Mac OS X and the display is off after a period of inactivity.

**Sleep - WOL on:** Low power state that is entered automatically after a period of inactivity or by selecting sleep from the Apple menu. Wake-on-LAN, a Mac OS X default feature that allows the system to wake from sleep when directed by a network request, is enabled for this test.

Sleep - WOL off: Low power state that is entered automatically after a period of inactivity or by selecting sleep from the Apple menu. Wake-on-LAN functionality, which allows the system to wake from sleep when directed by a network request, is disabled through the Energy Saver System Preference panel.

Off: Lowest power mode of the system, also referred to as standby-mode or shutdown.

#### Definitions of energy consumption modes in section 5.2:

The following modes correspond to the requirements of the Energy Star Program Requirements for Single Voltage External AC-DC and AC-AC Power Supplies.

No-Load: Condition in which the power adapter is connected to AC power, but not connected to the system.

Average Efficiency: Average of the power adapter's measured efficiency when tested at 100%, 75%, 50%, and 25% of the power adapter's rated power output.

6	Emissions					
6.1	Alternating Electric Field: Band I: 5 Hz to 2 kHz, < 10 V/m, measured 30 cm & 50 cm in front of display; Band II: 2 kHz to 400 kHz, < 1 V/m, measured at 50 cm around display & at 30 cm in front (Products with CRTs and Flat Panels)		х		4.3	
6.2	Alternating Magnetic Fields: Band I: 5 Hz to 2 kHz, $\leq$ 200 nT, measured at 50 cm around & at 30 cm in front; Band II: 2 kHz to 400 kHz, $\leq$ 25 nT measured at 50 cm around display (Products with CRTs and Flat Panels)		х		4.4	

Apple Product Environmental Specification		Requirement met		IT ECO	Blue Angel	TCO '99	ECMA			
			Yes	No	N/A	('02)	Desktop CPUs	Desktop Displav	(6/99)	
7	Electrical safety, EMC and connection to the telephone network									
7.1	The product is CE-marked and a CE certificate of conformity is					P3.4			5.4	
7.2	The product meets applicable EMC Dire	ctives	Х			P3.2				
7.3	The product is to be connected to the P the EU telecommunications Directive	TT network and meets	х			P3.3				
7.4	Product meets the Low Voltage Directive electrical safety (73/23/EEC and 93/68/E	e (LVD) regarding EEC)	х			P3.1				
7.5	The product meets the requirements of safety	EN 60950 for electrical	х					5.1		
8	Ergonomics		1	1	1					
8.1	The personal computer system meets the requirements of ISO 9241-3, -7, -8 for C for flat panel displays	e ergonomic RT and ISO 13406-2			х	12.1				
8.2	The product keyboard meets the require EN ISO 9241-4	ments of ISO 9995 and			х	12.2				
8.3	The computer input device meets the re 9241-9	quirements of ISO			х	12.3				
8.4	The LCD panel meets the ergonomic re-	quirements of TCO'99			Х			B.1,B.2		
9	Packaging and documentation									
9.1	The product package material does not	contain heavy metals	Х			P5.1				
9.2	The product package material does not	contain CFC/HCFC	Х			P13.1			5.8	
9.3 9.4 9.5	Material type:         Corrugated cardboard and         paperboard         EPS (expanded polystyrene)         HDPE/LDPE         Plastic packaging material is marked ac         DIN 6120ISO 11469 / ISO 1043         The company participates in or has its o         collection and recycling of packaging material	Retail       Retail and         Box       Outer Box         Weight       Weight         525g       1085g         155g       195g         45g       75g         cording to:	← Se Value X X	e s		P13.2 13.3 C1.1	3.1.8		5.11 5.11 5.11	
9.6	No polyvinyl chloride (PVC) used in packaging X P13.5									
9.7	Packaging is in conformance with national guidelines, regulations and/or standards such as those implementing the EU Directive 94/62/EEC and/or the Ordinance on Packaging, as amended								5.11	
10	Recycling		1			-				
10.1	and/or consumables (refer to item 13)	cycling of the product	Х			C2.1	3.1.7	1.4.5	5.12	
10.2	Information about the system for reuse/recycling can be found in the user manual or specified elsewhere (refer to item 13)					C4.1	3.1.7		5.12	
11	Additional Attributes									
11.1	The supply of spare parts for repair of the product is guaranteed for at least 5 years from termination of production		х			P6.11	3.1.6		5.2	
11.2	Information on modularity of design, exp guarantee is included in product docume	ansion capacity and entation	х				3.1.7		5.2	
12	Noise Characteristics									
	Declared Noise Emissions in accordanc	e with ISO 9296								
12.1	Condition Sound Pow L <sub>Wad</sub> 1B = 1			ver Level (B) 0dB			Sound Pressure Level, Operator Position, Unit on Table L <sub>pAm</sub> (dB)			
	Hard drive accessing	3.0					2	20		
	Optical drive accessing 3.8					34				

13	Additional Information/Notes						
13.1	Product recycling/take-back systems are local and regionalized. They may not exist, in the same manner, in all municipalities/countries.						
13.2	Apple has established regional systems for packaging take-back/recycling in those countries with packaging legislation.						
13.3	Definitions:         CAS       Chemical Abstract Service         CFC       chlorofluorocarbon         CRT       cathode ray tube         EMAS       Eco Management and Audit Scheme         EMC       electromagnetic compatibility         EPS       expanded polystyrene         HCFC       hydro chlorofluorocarbon         ISO       International Organization of Standardization         IT ECO       Association of the Swedish IT and Telecom Industry         LCD       liquid crystal display         LDPE       low density polyethylene         MSDS       material safety data sheet         PBB       polybrominated biphenyls         PBDE       polybrominated biphenyls         PCT       polychlorinated terphenyl         PVC       polychlorinated terphenyl         PVC       polychlorinated terphenyl         PVC       polychlorinated terphenyl         PWB       printed wiring board         SPI       Society of Plastics Industry         TBBA       tetrabrominated bisphenol A         VDT       visual display terminal						