



17-inch MacBook Pro

Environmental Report



Model MB604

Date introduced

January 6, 2009

Environmental Status Report



17-inch MacBook Pro is designed with the following features to reduce environmental impact:

- Mercury-free LED-backlit display
- Arsenic-free display glass
- Brominated flame retardant-free
- PVC-free internal cables
- Highly recyclable aluminum and glass enclosure

Meets ENERGY STAR® Version 5.0 requirements.



MacBook Pro (17-inch) achieved a Gold rating from EPEAT.



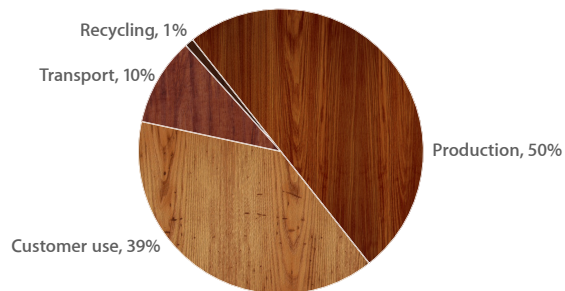
Apple and the Environment

Apple believes that improving the environmental performance of our business starts with our products. The careful environmental management of our products throughout their life cycles includes controlling the quantity and type of materials used in their manufacture, improving their energy efficiency, and designing them for better recyclability. The information below details the environmental performance of the 17-inch MacBook Pro as it relates to climate change, energy efficiency, restricted substances, and material efficiency.

Climate Change

Greenhouse gas emissions have an impact on the planet's balance of land, ocean, and air temperature. Most of Apple's corporate greenhouse gas emissions come from the production, transport, use, and recycling of its products. Apple seeks to minimize greenhouse gas emissions by setting stringent design-related goals for material and energy efficiency. The chart below provides the estimated greenhouse gas emissions for the 17-inch MacBook Pro over its life cycle.

Greenhouse Gas Emissions for 17-inch MacBook Pro



Total greenhouse gas emissions: 680 kg CO₂e

Energy Efficiency

One of the largest contributors of a product's greenhouse gas emissions comes from its use, so energy efficiency is key in product design. Apple products use power efficient components and software that intelligently powers them down during periods of inactivity. The result is that the MacBook Pro is energy efficient right out of the box.

The 17-inch MacBook Pro outperforms the stringent requirements of the ENERGY STAR Program Requirements for Computers Version 5.0. The following table details the power consumed in different use modes:

Power Consumption for 17-inch MacBook Pro

Mode	100V	115V	230V
Power adapter, no-load	0.21W	0.23W	0.29W
Off	0.69W	0.70W	0.75W
Sleep	1.37W	1.39W	1.43W
Idle—Display off / on	15.6W / 25.0W	15.5W / 24.9W	15.7W / 25.2W
Power adapter efficiency	87.7%	88.4%	88.6%

Battery Chemistry

System battery: lithium-ion polymer, 95 Wh

Free of lead, cadmium, and mercury in compliance with EU directive 98/101/EC

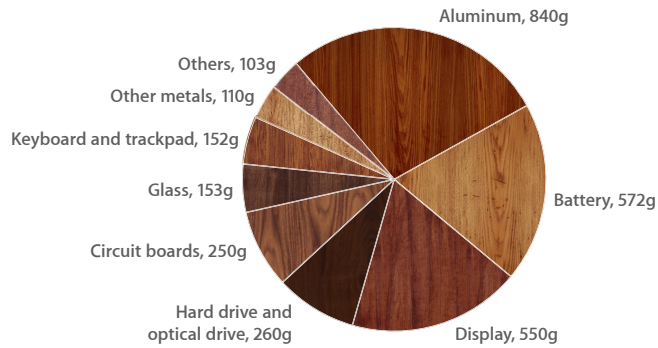
Battery Design

The 17-inch MacBook Pro features a breakthrough battery design that dramatically improves its lifespan—up to five years. So it uses just one battery in the same time a typical notebook uses three.

Material Efficiency

Apple’s ultra-compact product and packaging designs lead the industry in material efficiency. Reducing the material footprint of a product helps maximize shipping efficiency. It also helps reduce energy consumed during production and material waste generated at the end of the product’s life. Waste is further minimized through the use of batteries that last up to three times longer than typical notebook batteries. The 17-inch MacBook Pro enclosure is made of aluminum and glass, materials highly desired by recyclers. The chart below details the materials used in this model.

Material Use for 17-inch MacBook Pro



The new 17-inch MacBook Pro retail packaging consumes 35 percent less volume than the previous-generation 17-inch MacBook Pro and is free of expanded polystyrene.

Packaging

The new packaging design of 17-inch MacBook Pro uses corrugated cardboard made from a minimum of 25 percent post-consumer recycled content, and is free of expanded polystyrene (EPS). In addition, the packaging is extremely material efficient. The following table details the materials used in its packaging.

Packaging Breakdown for 17-inch MacBook Pro (U.S. Configurations)

Material	Retail box	Retail and shipping box
Paper (corrugate, paperboard)	520g	1074g
Molded fiber	—	220g
High-impact polystyrene	234g	234g
Other plastics	52g	72g

Restricted Substances

Apple has long taken the lead in restricting harmful substances from its products and packaging. As part of this strategy, all Apple products comply with the strict European Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, also known as the RoHS Directive. Examples of materials restricted by RoHS include lead, mercury, cadmium, hexavalent chromium, and PBB and PBDE brominated flame retardants (BFRs). The 17-inch MacBook Pro goes even further than the requirements of the RoHS Directive by incorporating the following more aggressive restrictions:

- Mercury-free display
- Arsenic-free display glass
- Brominated flame retardant (BFR)-free
- All internal cables free of polyvinyl chloride (PVC)



Recycling

Through ultra-efficient design and use of highly recyclable materials, Apple has minimized material waste at the product's end of life. In addition, Apple offers and participates in various product take-back and recycling programs in 95 percent of the regions where Apple products are sold. All products are processed in the country or region in which they are collected. For more information on how to take advantage of these programs, visit www.apple.com/environment/recycling/.

Definitions

Electronic Product Environmental Assessment Tool (EPEAT): A program that ranks computers and displays based on environmental attributes in accordance with IEEE 1680. For more information visit www.epeat.net.

Greenhouse gas emissions: Estimated emissions are calculated in accordance with guidelines and requirements as specified by ISO 14040 and ISO 14044. Calculation includes emissions from the following life cycle phases contributing to Global Warming Potential (GWP 100 years) in CO₂ equivalency factors (CO₂e):

- **Production:** Includes the extraction, production, and transport of raw materials and the manufacture of the product, as well as product packaging.
- **Transport:** Includes air and sea transportation of the finished product and its associated packaging from the manufacturing site to continental distribution hubs. Transport of products from distribution hubs to the end customer is not included.
- **Use:** User power consumption assumes a four-year period. Consumption patterns are modeled according to European Commission and U.S. Environmental Protection Agency computer eco-design studies. Geographic differences in the power grid mix have been accounted for at a continental level.
- **Recycling:** Includes transportation from collection hubs to recycling centers and the energy used in mechanical separation and shredding of parts.

Energy efficiency terms: The energy values in this report are based on the ENERGY STAR Program Requirements for Computers Version 5.0 and/or ENERGY STAR Program Requirements for Single Voltage External AC-DC and AC-AC Power Supplies Version 2.0. For more information visit www.energystar.gov.

- **Off:** Lowest power mode of the system when the battery is fully charged and the system is shut down. Also referred to as Standby.
- **Idle—Display on:** System is on and has completed loading Mac OS X; the display is set to its full brightness.
- **Idle—Display off:** System is on and has completed loading Mac OS X; the display is set to sleep.
- **Sleep:** Low power state that is entered automatically after 10 minutes of inactivity (default), or by selecting Sleep from the Apple menu. Wake-on-LAN is enabled.
- **Power adapter, no-load:** Condition in which the power adapter is connected to AC power, but not connected to the system.
- **Power adapter efficiency:** Average of the power adapter's measured efficiency when tested at 100 percent, 75 percent, 50 percent, and 25 percent of the power adapter's rated current.

Restricted substances: Apple defines a material as BFR-free and PVC-free if it contains less than 900 parts per million (ppm) of bromine and chlorine.