

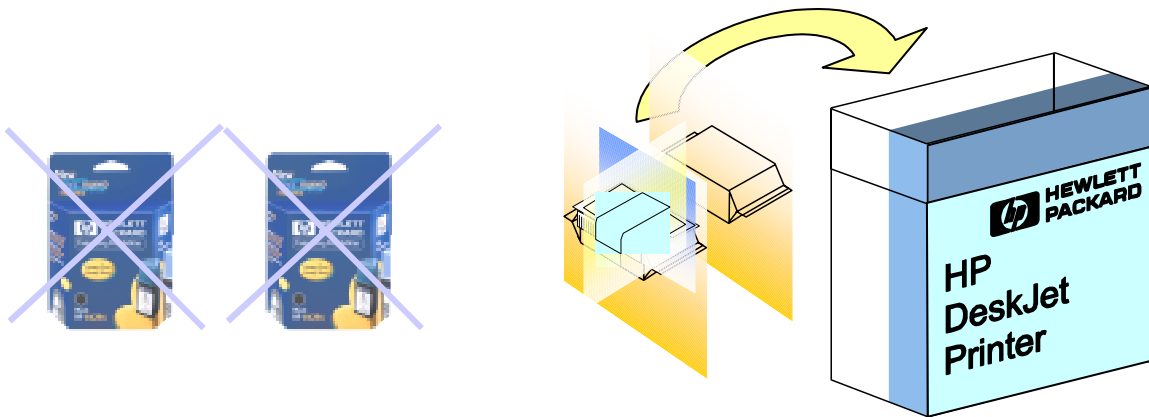
Hewlett-Packard has always taken a proactive position on designing its product packaging to be as environmentally responsible as possible. In 1992, HP successfully led an electronic industry-wide effort to develop guidelines based on best practices which are still in use at HP today. During the year 2001, HP made great strides in many packaging areas with a positive environmental impact. The efforts concentrated on reducing the amount of packaging and improving packaging recyclability. The following examples highlight these efforts.

Inkjet Cartridge Retail Packaging

Many resellers of HP's inkjet cartridges require that the product to be packaged in thermoformed-plastic enclosures called "clamshells" to reduce theft in the store environment. The "clamshelling" was originally done by the resellers but was then taken over by HP. In doing so, HP took the opportunity to reduce the overall size of the packaging by roughly 20 percent, and the plastic thickness was reduced from 18 mil to 15 mil. The redesign optimized space on the backer card which allowed the elimination of one label, eliminated the varnish finish on the outside, and reduced the number of colors used, both making recyclability difficult. The changes not only reduced the amount of resources wasted, the cost savings for the company was about \$800,000 per year. The packaging engineers think that the next step is to eliminate the use of the PVC plastic currently specified for the "clamshells" and to transition to more environmentally-responsible designs and materials.



HP has also reinvented the packaging for the inkjet cartridges included with new printers. Printer cartridges now come in pouches eliminating the need for the cardboard boxes used for retail merchandising of the cartridges. The new solution saved HP roughly \$.15 per printer sold. From an environmental standpoint, about 2.1 million pounds of cardboard were eliminated. On a yearly basis, water consumption was reduced by roughly 15 thousand gallons, the use of 109 thousand gallons of hazardous materials was eliminated, and total energy consumption was reduced by roughly 126 thousand BTUs. The second effort involving inkjet cartridges within the printer boxes was the combining of two inserts that provided legal information regarding the pens. Previously, host pens used two separate inserts, one each for the color pen and for the black pen. This effort alone saved the company \$600,000 per year and eliminated the use of over 170,000 pounds of paper each year.



HP has found that a simple change in packaging can make a substantial difference in resource and cost savings. In one case, going from #3 grade paper to #2 grade paper for printed inserts used in inkjet cartridge packaging reduced the amount of paper used by 8%. At the same time, the engineers were able to maintain the brightness and opacity of the sheet as well as the overall print fidelity. For products shipped in North and Latin America, the change resulted in a company savings of \$325,000 annually.

HP Scanner Assembly Process

HP scanners are made of many components which are manufactured throughout the world and come together in one location for final assembly. The packaging engineers are involved in coordinating and designing the most effective use of materials to reduce assembly cycle time, storage of components and disposal of packaging waste at the distribution centers. One example of successful re-engineering involved the large plastic hinges used to attach the document cover to the base of a scanner. Traditionally these have been attached to the cover by the supplier and then shipped to the final assembly location. The hinges protruded outside of the flat rectangle of the cover making it an awkward shape to package. By shipping the hinges separately to the distribution centers for them to attach the hinges during final assembly, the document covers by

themselves could be more densely bulk-packed reducing the expanded the use of polystyrene foam (EPS) packaging. The net financial savings including the increased labor costs needed to attach the hinges later in the process were \$107,000 annually. It also reduced the amount of difficult-to-recycle EPS required by over 2000 cubic meters per year.

HP Media Products

In another paper-weight reduction project, engineers reduced the weight of the instructions for HP media products from 80 pounds to 60 pounds. In addition, the change called for the use of non-coated paper rather than coated paper. The current specified paper is also free of elemental chlorine and includes 20% post-consumer recycled content paper. At the same time, the instructions were simplified to fit on one page rather than two. These changes resulted in an annual savings of roughly \$200,000.



Engineers checking for opacity

HP NT Servers

The packaging engineer for NT servers re-examined the product protection requirements and distribution environment allowing them to reduce the use of certain materials. The effort eliminated the use of over 150,000 wood pallets, corrugated trays, and plastic clips annually. The resulting material reductions saved HP over \$3 million per year and facilitated easier disposal for the customer.

HP's Home PC Bundle

HP's Home PC packaging team developed a new way to provide a customer-oriented solution through packaging. Retailers and customer wanted a complete solution (PC, monitor, and a printer) when shopping for a home personal computer system. HP first met this demand by placing all three individually-boxed components into one big box which duplicated cardboard and EPS foam.



First step: placing three boxes into a larger box

Although this met the needs of the retailers and customers and was very successful in the market place, the packaging engineers were not satisfied with this approach in part due to the wasted resources. Working with the supply chain partners, they redesigned the packaging in order that the PC, monitor, and printer could all be packaged in just one box. The material reduction lead to huge cost savings estimated to be around \$10 million per year in materials and transportation because twice as many bundles fit could be shipped in the same amount of space used by the old packaging scheme.



Three boxes (and foam) down to one box



Bundled HP PC

Annualized Results of Packaging Engineering Efforts

Due to the collective efforts of HP packaging engineers in 2001, the company saved more than \$15 million dollars and eliminated the waste of hundreds of thousands of pounds of natural resources.