

# Leading the way through a responsible materials strategy



Customers and stakeholders increasingly expect companies to understand what materials are used in their products, the sources of those materials, and the corresponding environmental and human health impacts.

HP is reinventing how products are designed, manufactured, used, and recovered as we shift our business model and operations toward a materials- and energy-efficient circular economy. In manufacturing HP products, we work to do more with less, getting maximum value from the materials we use. A key concept in the circular economy is a materials cycle where plastics, metals, and other durable materials are used over and over without being “downcycled” into lower-grade uses, eventually becoming waste. To achieve a healthy materials cycle, and reduce our product-related environmental impact, HP works to find alternatives to substances of concern, offers robust product recycling systems, and uses recycled content in new products. Together, these approaches drive our sustainability-driven materials management strategy. For instance, through our closed loop recycling process, we recycle old ink and toner cartridges into new products and reduce landfill impacts.

## Assuring materials compliance

HP proactively evaluates materials in our products and supply chain, taking into account published lists of substances of concern, new and upcoming legal requirements, and customer preferences, as well as scientific analysis that reveals a potential impact to human health or the environment. We implement our materials restrictions through a three-part compliance process:

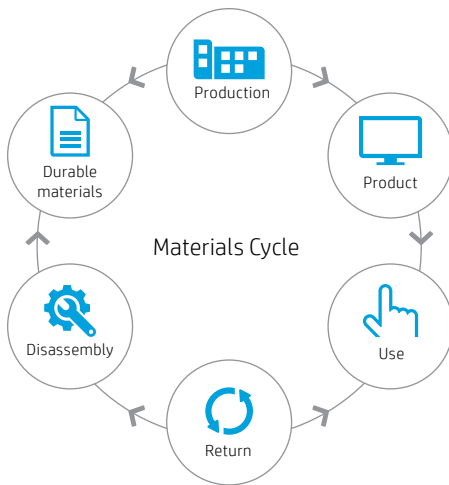
- The [HP Supplier Safe and Legal Standard](#) provides a management system for the design, manufacture, and delivery of products.
- The [HP General Specification for the Environment \(GSE\)](#) includes substance and materials requirements for parts and components used in HP products, packaging, and manufacturing.
- The [HP Active Verification Materials Testing Specification](#) defines our requirements for testing materials for specific substances restricted under the GSE.

## Finding safer alternatives

When replacing substances of concern, we provide guidance to suppliers on commercially viable alternatives with lower potential impact.

In assessing viable alternatives we look for materials that meet performance and cost standards while reducing the risk of human health and environmental impacts. HP's alternatives assessment process is aligned with the National Academies of Science publication [A Framework to Guide Selection of Chemical Alternatives](#) and incorporates the [GreenScreen® For Safer Chemicals](#). Through 2015, HP completed more than 160 material assessments accounting for more than 80% of the weight of products sold. We also advocate for use of the GreenScreen® methodology when regulators or eco-label organizations restrict substances of concern.

HP began proactively eliminating substances of concern in the early 1990s. Phasing out phthalates, BFRs, and PVC remain key focus areas. All HP Elite and Pro Desktop, All-in-One, and Business Notebook products, and 60% of other personal systems product groups introduced in 2015, are classified as low halogen.<sup>1</sup> All disk drives, application-specific integrated circuits (ASICs)<sup>2</sup> and memory modules are also low halogen. The company also started transitioning to low-halogen printed circuit boards for certain HP LaserJet printers in 2015.<sup>3</sup> HP Inc. will further advance these product improvements for our personal systems and printers moving forward.



## Using recycled materials

We are committed to supporting the development of recovered materials markets through the use of recycled content in new HP products. HP's earliest closed loop recycling activities began with creating HP toner cartridges with plastic recycled from the HP Planet Partners program in 2000. Leadership with closed loop plastics recycling expanded in 2005 when the company started using recovered polyethylene terephthalate (PET) from our ink cartridges as a material source for new cartridges. Over time, this program has expanded to include additional cartridges and polypropylene plastic. Through 2015, HP manufactured more than 3 billion HP ink and toner cartridges using more than 177 million pounds of recycled content material. Through this process, the company kept 682 million cartridges, 50 million apparel hangers, and 3.3 billion postconsumer plastic bottles out of landfills, upcycling these materials for continued use. More than 80% of our ink cartridges now contain 45–70% recycled content, and 100% of HP toner cartridges now contain 10–33% recycled content.<sup>4</sup>

Wherever practical and cost-effective, we also incorporate recycled materials into HP personal systems. In 2015, 71% of HP commercial displays introduced during the year contained more than 10% postconsumer recycled plastics, while 27% contained more than 40% postconsumer recycled plastics. In total, HP used nearly 6,200 tons of postconsumer recycled plastics in shipped PCs and displays—representing nearly 9.1% of total plastics used in personal systems.

## Sourcing materials responsibly

It is not only important what materials are used in a product but also how those materials are produced. Two important areas for responsible sourcing for HP are conflict minerals and paper.

### Conflict minerals

The exploitation of natural resources in the Democratic Republic of Congo (DRC) to fund groups engaged in extreme violence and human rights atrocities has generated global outrage and action. Of greatest concern are mineral precursors of the metals tantalum, tin, tungsten, and gold (3TG)—known as “conflict minerals.” Any possibility that the manufacture of our products might be connected to armed conflict is unacceptable. HP conducts rigorous due diligence on conflict minerals across its diverse supply chain and works to catalyze responsible mineral sourcing across our industry.

### Paper

Paper use by customers represents 13–61% of the GHG emissions of an HP printer across its life cycle, depending on the printer’s level of use. To help our customers print sustainably, we source the paper we sell responsibly, facilitate efficient paper use, and press the paper industry to adopt best practices as standard. We also apply these approaches in our own operations. Our company-wide Environmentally Preferable Paper Policy governs paper use at HP. It defines our principles for buying, selling, and using paper and paper-based packaging, and describes our commitment to sourcing from suppliers that demonstrate responsible forestry and manufacturing practices. HP achieved its goal of 50% FSC-certified fiber in HP brand paper in 2014—a year ahead of schedule. We apply the same passion for innovation to our packaging as we do to our products. By finding ways to use less material, optimize shipping densities, and utilize recycled and recyclable materials, we lessen the GHG emissions and raw materials use associated with packaging and product transportation. Our packaging innovations advance our customers’ sustainability objectives, help reduce the environmental footprint of HP products, and support progress toward a circular economy.

In 2016, we set a goal to meet our objective of zero deforestation in HP’s supply chain. All HP paper-based products and packaging<sup>5</sup> will be derived from certified or recycled sources by 2020. To support its achievement, HP will only purchase recycled fiber or responsibly sourced virgin fiber that can be traced to the source forest. We will work with the WWF’s Global Forest & Trade Network (GFTN) and our suppliers to ensure full traceability of virgin fiber and to increase the amount of certified fiber where possible. HP will maintain its preference for Forest Stewardship Council® (FSC®)-certified fiber. PEFC certification or relevant national certification schemes that comply with our paper policy can be used in regions where they are recognized, are endorsed by competent independent stakeholders, and ensure a reliable guarantee of responsible sources.

## Driving innovation with 3D printing

HP’s 3D printing solution, Jet Fusion, is an important enabler of the circular economy. This disruptive technology facilitates more efficient materials use by streamlining the prototyping process, improving the economics of short-run manufacturing, and avoiding waste associated with mass production. It also enables superior designs for the customer.

HP’s innovations in commercial 3D printing will enable our customers to fundamentally reinvent manufacturing, transforming industries in ways that drive down cost-per-part, waste, and GHG emissions. This groundbreaking technology enables shorter production runs and manufacture of one-of-a-kind products and parts locally, rapidly, and inexpensively. By removing the barriers to adoption associated with current 3D printing technology, HP 3D printing will help make the technology ubiquitous and bring it to scale. Key sustainability benefits include:

- Streamlined prototyping processes will enable more rapid iteration in product design and development, including for features that enhance environmental performance.
- Perfect matching of supply and demand will dramatically reduce waste and cost associated with manufacturing products and spare parts that are never used (analogous to improvements HP has achieved by digitizing commercial print production and enabling the analog-to-digital shift). Localized manufacturing will eliminate the environmental impacts and expense associated with transportation to and from large regional or global factories and warehouse operations, and decrease the need for packaging.
- Product lifespans will extend due to the ability of companies to manufacture spare parts on demand that would otherwise not be available or affordable, or would require advanced warehouse and logistics systems.



HP thin client computing devices can require up to

# 65%

less material to produce and ship than our smallest desktop PC

- Additive manufacturing will dramatically reduce the amount of material needed to make finished parts by realizing complex shapes or redesigning complex assemblies into a single part and reducing waste compared to traditional manufacturing methods.
- Fewer material types used in production may increase the recyclability and value of product materials at end of service.



## Progress through partnerships

We work closely with industry, governments, and nongovernmental organizations to achieve consistent standards and forward-looking approaches to materials use in the IT sector. We continue to advocate for consistent and stronger legislation in this area, which will help move the industry toward eliminating substances of concern.

In early 2016, HP joined Green America's [Clean Electronics Production Initiative](#), a new multi-stakeholder initiative aimed at moving the electronics industry toward zero exposure to hazardous substances in the manufacturing process. This will help protect workers and the environment while supporting more effective monitoring and control systems.

As an active member of the [Business-NGO Working Group \(BizNGO\)](#), HP collaborates with industry partners and environmental groups to advance sustainable materials use. Working with BizNGO, HP has contributed to the development of GreenScreen® and the Chemical Footprint Project, as well as several other initiatives. We also endorse the BizNGO [Principles for Safer Chemicals](#) and have integrated these into our materials strategy.

Through the [International Electronics Manufacturing Initiative \(iNEMI\)](#), we collaborate with industry partners to develop alternative materials, such as those used for low-halogen printed circuit boards, and to improve alternative materials assessment standards.

HP recognizes the importance of measuring substances of concern in our products and setting goals for improvement, so in 2016 we will formally participate in the [Chemical Footprint Project \(CFP\)](#). In 2013 and 2014, HP helped develop and pilot the CFP, a third-party benchmark tool launched by Clean Production Action, the Lowell Center for Sustainable Production, and Pure Strategies, that provides companies with a standard way to evaluate progress toward reducing chemicals of high concern and to identify opportunities in this area.

## Advancing the way people live and work

Sustainability is fundamental to HP's corporate strategy and informs our decisions throughout the value chain. It advances our current and future lines of business and helps us meet our customers' needs.

HP is reinventing the way that products are designed, manufactured, used, and recovered as we shift our business model and operations toward a materials- and energy-efficient circular economy. Working with our supply chain partners, we are reducing the environmental impact of our products at every stage of the value chain.

For more information on our materials strategy and to see our closed-loop recycling process in action—including helpful resources for your purchasing decisions—take a look at these additional resources:

- Materials section of the [HP 2015 Sustainability Report](#)
- [A Sustainable IT purchasing guide](#) including a checklist to help you evaluate technology products on a variety of environmental criteria, including materials used in manufacturing
- [Life of an HP cartridge video](#)
- To request more information, contact [sustainability@hp.com](mailto:sustainability@hp.com)

<sup>1</sup> The low-halogen standard = <900 ppm chlorine, <900 ppm bromine, <1,500 ppm chlorine+bromine in any homogeneous material in the products.

<sup>2</sup> HP designed ASICs.

<sup>3</sup> The following HP LaserJet printers meet the EPEAT criteria 4.1.6.2 to eliminate or reduce BFR/CFR content of printed circuit board laminates, so all circuit boards are low halogen: HP LaserJet Enterprise M506dn (U.S. SKU only), HP LaserJet Pro M402dn (U.S. SKU only), HP LaserJet Enterprise Flow MFP M527c, HP LaserJet Managed Flow MFP M527cm, HP LaserJet Enterprise Flow MFP M527z (U.S. SKU only).

<sup>4</sup> Includes recycled plastic as well as recycled metal content.

<sup>5</sup> Packaging is the box that comes with the product and all paper (including packaging and materials) inside the box.

