



Dell's Chemical Use Policy

In 2002, Dell formalized a chemicals management process to minimize or eliminate the use of certain environmentally sensitive materials in our products. The process began by publishing a list of substances that our customers, regulators and NGOs considered most important to manage, restrict or ban. The resulting publicly available [Dell's Materials Restricted for Use](#) Specification serves as the cornerstone of the Dell chemicals management process. This document has been incorporated into Dell engineering specifications and supplier contractual agreements. In addition, Dell has implemented process controls and corrective actions throughout its organization and supply chain to ensure that its chemicals management objectives are met — that the targeted restricted materials are replaced and alternative materials are developed for future product generations. Process controls that Dell implemented include supplier declarations and Dell factory and supplier material testing audits.

Through this integrated management process, Dell has established a working model that can be used to make more informed decisions when new scientific findings call for alternative material selections.

Dell published an updated Chemical Use Policy in December 2005 to share our long term vision of our precautionary approach to chemical management. Dell's vision is to avoid the use of substances in its products that could seriously harm the environment or human health and to ensure that we act responsibly and with caution. We affirm this commitment in this new Chemical Use Policy.

Act Responsibly

To act responsibly, Dell believes that if reasonable scientific grounds indicate that a substance (or group of substances) could pose significant environmental or human health risks, then Dell should avoid using the substances. Precautionary measures should be taken — even if the full extent of harm has not yet been definitively established — unless there is convincing evidence that the risks are small and the benefits outweigh the risks. Dell considers these to be “substances of concern.” When identifying substances of concern, Dell considers legal requirements, international treaties and conventions, and specific market demands. Dell's list of “substances of concern” all have hazardous properties that:

- are a known threat to human health or the environment
- show strong indications of significant risks to human health or the environment
- are known to biopersist or bioaccumulate in humans or the environment

Enforce the Company's Precautionary Measures

To enforce the company's precautionary measures, Dell strives to eliminate substances of concern in its products by:

- maintaining a Banned and Restricted Substance Program
- choosing designs and materials that avoid the use of substances of concern
- prohibiting supplier use of these substances contractually
- substituting viable alternative substances

If alternatives are not yet viable, Dell works with its industry partners to promote industry standards and the development of reliable, environmentally sound, and economically scalable technical solutions.

Compliance with International Restrictions on Hazardous Substances

Global concerns over human health and environmental risks associated with the use of certain environmentally sensitive materials in electronic products have led numerous countries to restrict the use of certain hazardous



substances in electronic products. To meet these requirements, we've worked with our supply chain to develop substitutions, to modify our specifications, and to verify compliance with these requirements.

European Union RoHS

In 2006, the European Union (EU) Directive on the Restriction of the use of certain Hazardous Substances (RoHS) went into effect. This important Directive is designed to restrict the use of cadmium, hexavalent chromium, lead, mercury and certain halogenated flame retardants (PBBs and PBDEs) in electronic products. All Dell products sold in the E.U. on or after July 1, 2006, comply with the E.U. RoHS requirements. (As permitted by the RoHS Directive, service or upgrade parts that do not meet the restricted levels may continue to be offered to support legacy products that were sold prior to July 1, 2006.) In addition, effective July 1, 2006, Dell met the requirements of the Japan RoHS or JMOSS legislation for applicable products. As of the beginning of 2007, all Dell branded products were compliant to the E.U. RoHS requirements worldwide.

Dell understands the environmental risks associated with the substances covered by the RoHS Directive and has committed to eliminating or reducing the use of these, as well as other, environmentally sensitive substances in our products. We restrict the use of cadmium, hexavalent chromium, lead, mercury, PBBs and PBDEs in Dell branded products (in accordance with regulatory requirements).

Dell continues to comply with the latest changes from the EU RoHS Recast Directive (2011/65/EU).

European Union REACH

REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals, EC 1907/2007) is the European Union's chemical regulation that came into force on 1 June 2007 and will be phased in over an 11 year period (until 2018). Dell supports the basic objective of REACH to further improve the European Union's chemicals regulatory system, including the aim to advance public health and safety and the protection of the environment.

Dell satisfies all requirements coming from the implementation of REACH and is committed to provide our customers with information about substances in our products according to future REACH requirements. Dell's Chemical Use Policy restricts the use of environmentally-sensitive substances and Substances of Very High Concern (SVHC) in products and works to minimize our impact on the environment through every stage of the product lifecycle. For more details on REACH, please refer to:

<http://i.dell.com/sites/content/corporate/environment/en/Documents/earth-materials-REACH-statement-2010.pdf>

<http://www.dell.com/reach>

China RoHS

On February 28, 2006, China released a regulation called "Management Methods for Controlling Pollution by Electronic Information Products," which is commonly referred to as "China RoHS." Although this regulation restricts use of the same six hazardous substances as the E.U. version of RoHS, the China RoHS regulation adopts a different approach for compliance verification. That is, producers should properly label and disclose RoHS information for all applicable electronic and information products (EIPs) and parts sold in China on and after March 1, 2007. Dell complies with the China RoHS labeling and disclosure requirements and continues to monitor new developments related to China RoHS, including the development of China RoHS Phase II and China RoHS Voluntary Certification Program.

Other RoHS Type Regulations



Dell is compliant to all implemented RoHS type regulations worldwide, including but not limited to, Korea, Japan, US States (e.g. California), Ukraine, Serbia and Turkey. Dell continues to monitor, influence and develop our processes to comply with upcoming proposed RoHS type regulations, including but not limited to, Brazil, Argentina, India and Vietnam.

Voluntary Activities on Substances of Concern

Elimination of Mercury

Dell transitioned all of its new laptop displays to light-emitting diode (LED) by 2010. In addition to the energy savings when compared to cold cathode fluorescent lamp (CCFL), LED displays technology eliminates the use of mercury commonly found in CCFL. This technology has already been incorporated in all Dell notebooks and Dell is committed to expand the list of mercury free, LED-based flat panel monitor displays.

Elimination of Arsenic in Glass

Arsenic is commonly used during the manufacturing of glass to reduce the effects of iron impurities in glass. By 2010, Dell adopted Arsenic-free display glass in newly designed Dell notebooks. Dell will continue to expand its portfolio of arsenic-free glass in future products.

Elimination of BFR & PVC¹

Brominated Flame Retardants (BFR) and Polyvinyl Chloride (PVC) are used in various components, wires and cables in electronic products. Although studies of their environmental and human health effects are still ongoing, Dell has adopted precautionary measures to eliminate these substances. Dell continues to make progress towards our commitment to eliminate BFR & PVC from PC products, as acceptable alternatives are identified. These efforts aim to lower possible product health and environmental impacts without compromising product performance. Examples include:

- By 2004, all BFRs and PVC were restricted from the external case plastics in Dell branded products.
- Dell has already transitioned to BFR- and PVC-free removable media storage devices, memory, notebook LCDs, and hard disk drives
- Dell introduced BFR/PVC-free products such as the Latitude E6420, Optiplex 990 SFF and XPS 13.
- In 2012, all XPS and Latitude Notebooks plan to be BFR/PVC-free with some exceptions due to regulatory restrictions and supply limitations

However, challenges remain. For some specific applications technical issues still exist:

- o Electrical performance issues above 1 GHz in Halogen-free printed circuit boards
- o Dielectric loss
- o Unpredictability of technical performance
- o Potential safety concerns in high temperatures areas
- Availability issues for environmentally-preferable alternatives
- Transition to new substances for high performance products with long life-cycles
- Ability to maintain high recycled content as substances are restricted.
- Non-safety standards for BFR/PVC-free materials such as power cables

¹ Meeting the definition of BFR-/PVC-free as set forth in the iNEMI Position Statement on the 'Definition of Low-Halogen Electronics (BFR-/CFR-/PVC-free)'. Plastic parts contain less than 1,000 ppm (0.1%) of bromine (if the Br source is from BFRs) and less than 1,000 ppm (0.1%) of chlorine (if the Cl source is from CFRs or PVC or PVC copolymers). All printed circuit board (PCB) and substrate laminates contain bromine/chlorine total less than 1,500 ppm (0.15%) with a maximum chlorine of 900 ppm (0.09%) and maximum bromine being 900 ppm (0.09%).



Dell believes that legislation, such as the EU RoHS Directive, plays an important role in promoting industry-wide transition to restrict substances of concern. Dell continues to support the inclusion of BFRs and PVC in future EU RoHS Recasts, provided that some critical issues can be overcome or addressed by specific exemptions.

Elimination of Lead in Enterprise Servers

With the launch of Dell's 11th Generation servers in 2010, Dell eliminated the use of lead solder (lead is currently allowed under EU RoHS exemption 7b) ahead of regulation. All subsequent server generations will use non-lead based solders.

Elimination of a number of Phthalates

Phthalates are mainly used as a plasticizer for wires and cables in the electronic industry. A number of studies have identified the need to control these substances, with the emphasis on the 3 phthalates listed below. Regulations to restrict these phthalates are now being proposed.

- Bis (2-ethylhexyl) phthalate (DEHP)
- Butyl benzyl phthalate (BBP)
- Dibutylphthalate (DBP)

Based on our precautionary approach, Dell has implemented the restriction of the above phthalates in all newly designed products since 2010 and is committed to a complete ban on all shipping products by July 2012, well ahead of possible regulatory restrictions.


Chemical Hazards Alternative Assessment

Chemical hazards alternative assessment is a method for evaluating and comparing the inherent properties of a substance and identifying environmentally preferable alternatives. The purpose of an assessment is to guide decision making toward the use of the least hazardous/safest substance options available. This assessment can lead to the use of less hazardous chemical and non-chemical technologies in products and/or their manufacturing processes. Another benefit is to minimize the opportunity for unintended consequences.

Dell is participating in a number of Chemical Hazards Alternative Assessment projects including the Phthalates Alternative Assessment Project chaired by Green Chemistry & Commerce Council ([GC3](#)).

Engagement in Environmental Preferable Materials Initiatives

Where viable alternatives do not yet exist, Dell is working with its industry partners to promote the development of standards and reliable, environmentally sound and economically scalable technical solutions.

EPA Project: Dell is actively engaged in the EPA Design for the Environment (DfE) Flame Retardants in Printed Circuit Boards project. This project is focused on identification of the flame retardants used by laminate and resin manufacturers to better understand the environmental and human health impacts of new and current materials that can be used to meet the fire safety requirements for circuit boards. EPA homepage: <http://www.epa.gov/dfepubs/projects/pcb/index.htm> 

HDPUG Halogen-free Projects:

Since 2001, the High-Density Packaging User Group ([HDPUG](#)) has been at the forefront of evaluating halogen-free materials within the electronics industry. In 2008, Dell led the Halogen-Free Properties project in HDPUG, which



published a comprehensive Halogen-Free Guideline. Increased access to this information will enhance supply chain adoption of halogen-free components. Dell finalized its latest project called BFR/PVC-free Cables Project with the aim to overcome the technical and supply chain challenges faced with the adoption of BFR/PVC-free cables and wires.

iNEMI:

Dell chairs the Environmentally-Conscious Electronics Technology Implementation Group (ECE TIG), which establishes the roadmap for environmental projects within [iNEMI \(International Electronics Manufacturing Initiative\)](#). In addition, Dell has completed the PVC Alternatives project within iNEMI, conducting a comparison on cradle-to-grave life cycle assessments (LCA) between a conventional PVC and non-PVC alternatives for flexible cable applications.

Verifying Compliance

Dell requires suppliers to sign a Supplier Declaration of Conformity (SDoC) to ensure that all product materials comply with Dell's environmental policy. This documentation is required to release a part to production. To sign the SDoC, the supplier must ensure that the product meets the Dell Materials Restricted for Use specification and record any applicable exemptions. At Dell's request, the supplier must also be able to provide technical documentation in the form of internal design controls, supplier declarations, or analytical test data. Dell's goal is to collect supplier declarations on each part in a product's bill of materials. This will ensure that each product meets the legislated materials requirements.

A second tier in Dell's compliance verification strategy is our supplier RoHS audit program. This program can be divided into two parts: a traditional audit and an in-depth supplier survey.

A traditional audit, in which Dell parts are selected at random and submitted for third-party analytical testing, is conducted on a quarterly basis. Samples are tested for the presence of restricted materials, including those prohibited by the RoHS Directive. The audit is used to further validate SDoCs and to ensure that Dell's entire supply chain complies with the directive. Dell also actively screens samples in-house by using X-Ray Fluorescence (XRF) equipment.