Frequently Asked Questions
RoHS, WEEE & EcoDesign

What are hazardous materials?
Hazardous materials are those chemicals and substances that are legislatively, market and/or customer banned, restricted or controlled for use in products and/or manufacturing processes.

What is RoHS?
RoHS is an acronym used to refer to the European Union (EU) Directive 2002/95/EC on the **R**estriction **o**f the use of certain **H**azardous **S**ubstances.

What are the Directive 2002/95/EC RoHS Substances?
The six RoHS substances with Maximum Concentration Value (MCV) are; lead (Pb) 1000ppm, cadmium (Cd) 100ppm, mercury (Hg) 1000ppm, hexavalent chromium (Cr+6) 1000ppm, polybrominated biphenyls (PBB) 1000ppm and polybrominated diphenylethers (PBDE) 1000ppm.

Is China RoHS different from EU RoHS? The scope was developed entirely independently of EU RoHS and has little to do with it. There is substantial overlap but many product types that are not within the scope of EU RoHS are within the scope of China RoHS. Likewise certain categories of EU RoHS are not within the scope of China RoHS.

What is REACH?
REACH is an acronym used to refer to the EU Directive 2006/121/EC **R**egistration, **E**valuation, **A**uthorization and **R**estriction of **Ch**emical substances. Juniper supports the overall REACH objective of improving the protection of human health and the environment.

Is the EU RoHS Directive only applicable to products sold in the European Union?
Yes, however other countries have drafted their RoHS type legislation and Juniper Networks, Inc. has implemented these regulations per the specific legislation.

Do any Juniper products contain RoHS substances?
Yes, Juniper products will continue to use lead-based solders under the exemption allowed for network infrastructure equipment.

The substance Decabromodiphenyl ether (DecaBDE) exemption per the Directive 2002/95/EC has been amended and the MCV level set to 1000ppm effective June 30th 2008.

When is Juniper's EU RoHS compliance implementation date for its products?
Juniper's EU RoHS compliance implementation came into effect on July 1st 2006.

What is Juniper's contact for more information about its environmental programs?
If you require further information regarding the company and our environmental initiatives please login to http://www.juniper.net/company/profile/environmental_relations/ , or send e-mail to environmental-relations@juniper.net with your request including area of environmental interest.

Can Juniper provide companies with product EU RoHS declarations?
EU RoHS declaration for Juniper products is available online at; http://www.juniper.net/rohs If you require specific product information regarding EU RoHS declaration please send e-mail to environmental-relations@juniper.net with your request.

What is Juniper's position regarding the use of lead in our products?Juniper conforms to the relevant clauses of the EU RoHS Directive, including the limitations on concentrations of the RoHS Substances (subject to the lead exemption under RoHS 2002/95/EC Annex Section).

Some lead-free components have been integrated into our products but high reliability alternatives to lead based solders have been a challenge. Juniper will continue to utilize the network infrastructure exemption until lead-free alternatives meet the performance and reliability requirements of our products.

Juniper continues to work with our suppliers, supply-chain and industry consortium to develop reliable lead-free alternatives. Juniper will transition products to lead-free as reliable lead-free technologies are developed and proven as an alternative.

What is WEEE?
WEEE is an acronym used to refer to the European Union (EU) Directive 2002/95/EC on **W**aste **E**lectrical and **E**lectronic **E**quipment. The objective of WEEE is to reduce waste associated with end-of-life equipment especially materials going into landfill.

How are RoHS and WEEE related?
WEEE compliance aims to encourage the design of electronic products with environmentally-safe recycling and recovery in mind. RoHS compliance dovetails into WEEE by reducing the amount of hazardous chemicals used in electronic manufacture.

What is Juniper's contact for more information about its EU WEEE program?

For recycling our products that meet the requirements of the EU WEEE Directive please login to http://www.juniper.net/weee and fill out the requested information.

For more information regarding our overall recycling policies, please contact us at environmental-relations@juniper.net.

What WEEE category applies to Juniper's products?
Juniper's products are classified as "Category 3" as defined in Annex 1A of the WEEE Directive 2002/95/EC.

How is a Juniper product identified as meeting the WEEE Directive?
Juniper products placed on the market after 13 August 2005 are labeled with the crossed-out wheelie bin symbol and/or documented in the product documentation per the marking standard.

What is Product End of Life Management (PELM) at Juniper?
PELM refers to the last life cycle of a product when the WEEE Directive and EcoDesign objectives come into play. The objective is to minimize the amount of a product going to landfill through the use of environmentally friendly processes including reuse, refurbishment, recycling and waste management.

What is REACH - Registration, Evaluation, Authorization and Restriction of Chemicals?
Juniper has taken steps to comply with the REACH regulation of December 2006, which places greater responsibility on industry to communicate and manage substance-related risks. The regulation introduces a plan for assessing the safety of new chemicals while providing data for existing chemicals. REACH also offers a mechanism for identifying substances of very high concern (SVHC) and for eventual substitution of these substances as suitable alternatives are identified.

Juniper supports the overall REACH objective of improving the protection of human health and the environment. Juniper believes it will help customers be more informed about the substances

found in products. Juniper will meet all REACH requirements and is committed to providing our customers with required information about the chemicals in our products.

These actions benefit Juniper, our customers and our employees. Using less material saves energy during manufacturing and distribution while reducing costs, including the disposal cost of products at the end of their lives. Avoiding substances of concern can remove risks to workers manufacturing our products and to recyclers who manage the proper disposal of products at end of life. We are working with industry and government to achieve a workable system that fulfills the goals of REACH and with our suppliers to ensure that Juniper products comply.

EcoDesign

Design-for-Environment (DfE) is an engineering perspective in which the environmentally related characteristics of a product or process are optimized. Juniper's product designers and suppliers will identify, prioritize and recommend environmental improvements through a company-wide DfE program. The DfE guidelines are derived from evolving customer expectations and regulatory requirements, but they are also influenced by the personal commitment of our employees and suppliers.

The Juniper Networks Design for the Environment initiative has these major objectives;

A) Materials Innovation is the reduction of the amount of materials used in our products and development of materials that have less environmental impact and/or more value at End-of-Life.
B) Design for Recyclability is the design of products that are easier to upgrade, reuse and/or recycle
C) Energy Efficiency is the reduction in energy needed to manufacture and/or use our products.

Life-Cycle Assessment quantifies the environmental impact of a product;

A) Identify raw materials and energy sources used;
B) Identify outputs and waste streams;
C) Continue for product's entire life cycle (design, production, transportation, use, recycling and disposal);
D) Quantify impacts of materials, energy and waste.

A part of this challenge is the need to design products with materials that will have value and be easily recycled into new products. Predicting the future is difficult and many materials used today are not economically feasible to recycle. We incorporate basic design rules that make product disassembly and recycling easier, such as reducing the variety of materials used in products if feasible to achieve our reliability objectives. We have engaged with recyclers to support the WEEE Directive and understand or potentially influence how recycling technologies will evolve over time for improved customer and environmental benefit.

Our choices of materials in designing products represent opportunities to improve Juniper's environmental performance. Juniper is working to improve the use of materials in our products and enhance their environmental and safety performance during production, manufacturing, distribution and finally disposal.

Juniper is committed to reduce the impact of our waste materials on the solid waste stream. We emphasize source reduction and recycling programs prior to investigating alternatives for disposal of our products and packaging. Material recycling strategies will focus on the use of:

1) Recycled material(s) in our packaging and product,
2) Other materials which provide a resource for secondary applications (i.e. recyclable materials).

Environmental impacts can occur at every stage of the product development;

A) Documentation shipping with the product has impact on the overall Co2 footprint.
B) Improving the energy efficiency of power supplies and convertors will assist in reducing the Co2 footprint at the system level.
C) The principals of energy efficiencies in the design of ASIC packages and the selection of standard component parts.
D) The principals of energy efficient system design through following objectives set by the principals of industry consortiums to reduce the overall Co2 footprint of our products in the IT datacenter environment.

We take a proactive approach to evaluating materials and eliminating those that pose an environmental, health or safety risk. We may replace or eliminate substances because of customer or legal requirements or because we believe it is appropriate based on a cautionary approach. We strive to replace even legally permitted materials when scientific data has established a potential health or environmental risk and when less risky, commercially viable alternatives are available.

We've developed control processes for product design and manufacturing at our Contract Manufacturers (CM's) to ensure that our products use compliant materials and meet Juniper's specifications. We communicate materials restrictions to our design teams and to our manufacturing suppliers through our Environmental Design Guidelines (SPEC-9200), which prohibits or restricts the use of certain substances in our products, the third-party products that Juniper may sell as part of an integrated solution, and in manufacturing processes. The specification is integrated into our product development process and into supplier contracts as part of our standard contractual terms and conditions.

We use a proactive verification methodology to manage the restriction of materials in our products. This includes risk-based data sampling and chemical analysis as needed. The supplier corrective action processes is used as needed to resolve any issues that arise.

Our suppliers are accountable for shipping materials, components, parts and products to our CM's that comply with the SPEC-9200 as specified in our contracts, hardware drawings, and specifications. Juniper relies on proactive verification to ensure that our materials restrictions are met in our products. The process to ensure product environmental compliance is built into the design and manufacturing process. Suppliers and their sub-suppliers must ensure that non-compliant material cannot enter the manufacturing process and that compliant processes are used.

Any specific questions regarding product environmental compliance or design can be sent via e-mail to environmental-relations@juniper.net indicating your area of environmental interest.