

EMC VNX SERIES UNIFIED STORAGE PRODUCT STEWARDSHIP

The EMC® VNX® Series unified storage systems deliver unmatched performance, efficiency, protection and ease of use for virtualized applications while providing market-leading functionality to accelerate your transformation to the hybrid cloud. In addition, the VNX Series has been designed with product stewardship and environmental sustainability in mind to allow customers to reduce their operational costs and environmental footprint.



VNX Series configurations support 2.5-inch drives, consuming 33 percent less space, 35 percent less weight, and 27 percent less power compared with 3.5-inch drives.



ENERGY EFFICIENCY

The VNX Series is designed not only for performance, protection and simplicity, but is designed to provide superior service using less energy than previous models. Several technologies have been integrated in the VNX Series to address energy efficiency, and multiple VNX models have earned Energy-Star certification. VNX energy efficiency features include the following:

- ENERGY-STAR certification on select models
- SSD and High-capacity HDDs
- High-efficiency Power Supplies
- Adaptive Cooling
- Fully Automated Storage Tiering (FAST)
- Virtual Provisioning
- Compression and deduplication
- Snapshots

ENERGY-STAR CERTIFICATION

To qualify for the ENERGY STAR rating, vendors must meet a stringent set of requirements for power efficiency and must be able to provide information on the performance/watt and capacity/watt of system configurations. This rating assures EMC customers that they are investing in the most energy efficient storage solutions and protecting the environment through superior energy efficiency. To see what VNX models are ENERGY-STAR certified, consult the VNX spec sheet under the power heading.

SSD/FLASH TECHNOLOGY

SSDs (Solid State Drives) provide much higher I/O performance levels than HDD (Hard Disk Drives) devices; in fact on a per watt basis, SSDs provide 20x higher performance than HDDs. As a result, your desired performance is achieved using fewer drives, significantly reducing system power consumption.

HIGH-CAPACITY HDDS

For inactive data that must be available, the use of very high density, low RPM HDDs can also have a significant impact on storage-system power. These drives have very low watt/TB characteristics, and significant power savings are realized by using system intelligence to place less-frequently accessed data on those drives.

REDEFINE

SPECIFICATION SHEET



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HIGH-EFFICIENCY POWER SUPPLIES

The VNX Series high efficiency power supplies reduce total equipment power while simultaneously minimizing waste heat. Reductions in energy consumed by the IT equipment can yield significant savings in the facility cooling and power distribution infrastructure. VNX Series power supplies are designed and qualified to meet or exceed 80 Plus Gold level requirements.

ADAPTIVE COOLING

EMC's long standing adaptive cooling technology achieves significant power savings by monitoring the external environment as well as several internal factors including configuration, workload, and fault status. It adjusts the operation of fans to minimize the power consumed by the system while maintaining reliability.

FULLY AUTOMATED STORAGE TIERING (FAST)

FAST for Virtual Pools (VP) is an EMC industry-first method whereby stored file and block data is kept in pools while being intelligently and transparently moved to the most appropriate storage medium (tier) based on access needs and real-time analysis. Frequently accessed data is placed on devices such as SSDs, providing better performance and energy characteristics. Data that is accessed less frequently is placed on lower-power, higher-capacity HDDs, providing the best energy to storage ratio. A relatively low number of very high IOPs/watt SSDs can be combined with an appropriate number of higher capacity, lower watt/TB HDDs to realize the same or better performance and capacity, while using less power and having a smaller footprint.

VIRTUAL PROVISIONING

Virtual Provisioning is EMC's version of thin provisioning. With this technique, block and file storage space is allocated on an as-needed or on-demand basis rather than in set amounts. As such, only the right amount of storage is used, allowing for consolidation and reduced power usage.

COMPRESSION AND DEDUPLICATION

By compressing and removing repeated patterns of data, the VNX Series reduce the capacity and thus the power and footprint requirements significantly -- up to 50%.

SNAPSHOTS

VNX Snapshots create logical point-in-time copies of data for various uses including fast back-ups and application test areas. EMC's snapshot technology uses added space only as needed for modified data, and hence uses less capacity and less power.

POWER CALCULATOR

VNX customers have access to the EMC Power Calculator. The EMC Power Calculator is an online utility that calculates power consumption, cooling requirements, and greenhouse gas emissions estimates for customizable configurations of the VNX Series and other EMC products. Use of the EMC Power Calculator aids in data center planning, optimization, and in use operating cost estimation.

<http://powercalculator.emc.com/Main.aspx>

TAKE BACK AND END OF LIFE

EMC aims to meet the highest standards of environmental stewardship and effectively manage risks with product end-of-life. Our global eWaste program offers product take back on all EMC branded products to all of our customers worldwide to help ensure

those products are recycled or disposed of responsibly and in compliance with the law.

DESIGN FOR DISASSEMBLY

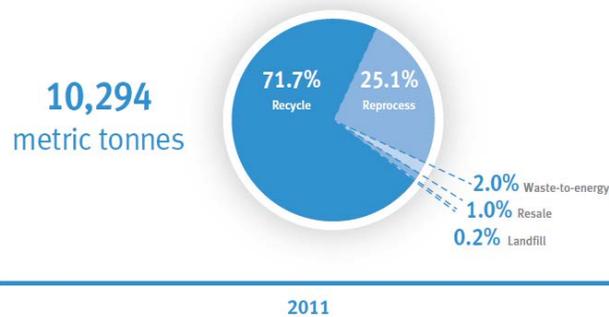
EMC engineers work closely with IT asset disposal (ITAD) vendors to better understand how EMC's products are taken apart at end of life. Ease of separation of components can increase the efficiency of reclaiming and recycling raw materials.

RESPONSIBLE HANDLING OF CUSTOMER RETURNS

After end of life processing, less than three percent of the total material goes to waste-to-energy facilities and landfill. To protect information that customers may have inadvertently left on drives, disk drives are degaussed (magnetically erased) and physically shredded prior to recycling.

DESTINATION OF RETURNED PRODUCTS BY WEIGHT

GLOBAL—METRIC TONNES



Goal: Continue to send less than 1% of eWaste to landfills

For more information on our end of life policies and practices, please visit our product end of life webpage

<http://www.emc.com/corporate/sustainability/environment/material-use-waste/product-end-of-life.htm>

ELIMINATING TOXIC SUBSTANCES

PRODUCT MATERIAL CONTENT

To protect people and the environment, EMC takes a proactive approach to minimizing the use of potentially hazardous substances in our products through a design for the environment (DfE) program that actively researches and identifies alternative materials, and applies them to our products, such as the VNX Series, where such alternatives meet criteria for performance and reliability.

IDENTIFYING ALTERNATIVES

To eliminate potentially hazardous substances in our products, viable alternatives must be found. When we believe that a material may be of concern, we take the precautionary approach by exploring alternatives that are safer for ecological and human health.

EMC's Material Sciences lab collaborates across industry and academia to identify and qualify alternatives that meet the same or higher standards of reliability, cost-

effectiveness, performance, and availability as the materials we currently use. When a suitable alternative for a material is found, we eliminate or reduce use of the material of concern whenever technically and economically feasible—even if use of that material is permitted by law.

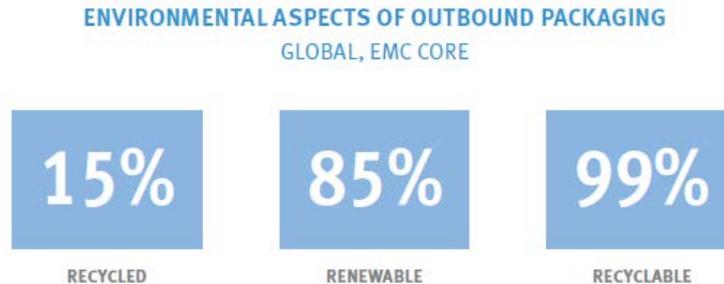
Materials that have been reduced or removed from the VNX Series include:

- Lead solder
- Brominated Flame Retardants
- Halogens

In addition, we are currently developing alternatives for PVCs and phthalates.

PACKAGING

EMC's Sustainable Packaging working group strives to maximize environmental benefits across the package lifespan. The size and weight of EMC's packaging impacts material consumption and greenhouse gas emissions related to transport. Environmental impact is an important design decision for VNX packaging, yet it is crucial that we maintain product protection as the overriding purpose of packaging.



We incorporate up to 15% recycled content, 85% renewable content, and 99% recyclable content in our packaging.

We also partner with waste management and packaging suppliers to recycle our cardboard for re-use in new EMC packaging. Our packaging is free of polyvinyl chlorides (PVCs) and polystyrenes. Our shipping pallet suppliers purchase the majority of their wood from sources certified by the Forest Stewardship Council or the Sustainable Forestry Initiative.

EMC has a returnable packaging program for the VNX, and works with customers to recapture and reuse as much as possible. In 2011, VNX systems and drives in some regions were shipped to customers in reusable packaging or cabinets, eliminating two million pounds of waste. See the EMC Packaging Return Program brochure for more information.

<http://www.emc.com/corporate/sustainability/environment/material-use-waste/packaging.htm>

EMC AND THE PRODUCT LIFECYCLE

The VNX Series has been designed with the full environmental lifecycle in mind. From energy efficient product design, to alternative materials selection, to improving supplier transportation routes, and identifying means of increasing recyclability, EMC has instilled a culture of forethought and planning that encourages the best in environmental efficiency.

Read more about EMC and Sustainability at our sustainability website
<http://www.emc.com/corporate/sustainability/index.htm>

CONTACT US

To learn more about how EMC products, services, and solutions can help solve your business and IT challenges, [contact](#) your local representative or authorized reseller—or visit us at [the EMC Store](#).

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REDEFINE
SPECIFICATION SHEET

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