

Facts about the Safety of Xerox® Products



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General Information

Xerox[®] Environment, Health, Safety & Sustainability Policy

Xerox Corporation is committed to the protection of the environment and the health and safety of its employees, customers and neighbors. This commitment is applied worldwide. The following principles shall govern all business practices in the design, manufacture, procurement, marketing, distribution, maintenance, reuse/recycling and disposal of products and related services:

- Protection of the environment and the health and safety of our employees, customers and neighbors from unacceptable risks takes priority and will not be compromised.
- Xerox operations must be conducted in a manner that safeguards health, protects the environment, conserves valuable materials and resources, and minimizes risk of asset losses.
- Xerox is committed to designing, manufacturing, distributing and marketing products and processes to optimize resource utilization and minimize environmental impact.
- All Xerox operations and products are, at a minimum, in full compliance with applicable governmental requirements and Xerox standards.
- Xerox is dedicated to continuous improvement of its performance in environment, health and safety.

Overview

To ensure full compliance with the above policy, health, safety and environmental considerations are an essential element of the product and materials design and review process, involving internal and external world-class experts.

Extensive system testing is conducted under a variety of simulated field and stress conditions to verify that all the health and safety requirements have been met. Our internal test groups conduct some of these tests while others are performed by external testing organizations.

Xerox has a long history of proactively assessing the health and safety of the materials used in its products. We use a wide variety of methods and tests in these assessments, including sophisticated methodologies such as structural activity relationship analysis and in vitro and in vivo testing. These measures drive elimination of the use of persistent, bioaccumulative and toxic materials throughout the supply chain.

Whenever new information raises a concern about the safety of a product, we investigate and, when warranted, take prompt action with health and safety considerations being our highest priority.

Safety Data Sheets

Xerox prepares two types of data sheets that summarize safety and health information for its equipment and supplies products:

- *Product Safety Data Sheets* (PSDSs) contain information about the mechanical, electrical and environmental attributes of our equipment as well as product emission data.
- *Material Safety Data Sheets* (MSDSs) provide information on potential hazards and the safe use of products that may be classified as chemicals. They also contain storage, shipping and disposal information.

General Safety Practices

To ensure the safety of those who use and care for our equipment, it is important to observe these fundamental rules:

- Site the equipment according to published Xerox installation requirements. Installation requirements should be reviewed whenever equipment is moved to a new location.
- Equipment must be connected to a properly grounded electrical service outlet.
- Comply with all caution and warning labels in order to avoid potentially hazardous conditions.
- Do not bypass or defeat interlocked covers. These covers prevent creation of hazardous conditions, which could occur if they were opened.
- Only trained service personnel may remove covers or guards held in place by fasteners that cannot be detached without using tools.
- **Only** Xerox-approved maintenance procedures and materials are to be used.
- Equipment should be stopped immediately, disconnected from its power supply and serviced before next use if unusual noises, odors or smoke are noticed.
- Dispose of spent materials and products according to information provided on *Material Safety Data Sheets* on www.xerox.com/environment.
- Do not stare at equipment light sources, which can produce temporary nuisance effects or discomfort.

Equipment Design and Exposure Limits

Xerox policy requires that products meet safety standards at least as strict as those generally accepted by approval agencies and government regulations. For each product it brings to market, Xerox has a comprehensive Product Safety Plan that details the specific safety requirements. Assessments are made for all possible hazards: electrical, mechanical, chemical, biological, radiation, heat, emissions and noise. Possible interactions between hazards are also considered. Results of assessments must be satisfactory in all areas before any equipment can be shipped to the customer. In addition to these assessments, service procedures, service materials, special tools and the operator's manual must all be approved prior to customer shipments. Standards also define minimum product space requirements to ensure proper equipment performance and to provide adequate access for service.

Xerox® products are typically submitted to a nationally recognized testing laboratory such as Underwriters Laboratories® (UL), Canadian Standards Association (CSA) or TÜV Rheinland®, resulting in product certification to the latest country-specific version of internationally accepted product safety standards, such as IEC 60950 (Safety of Information Technology Equipment). Products are also CB Scheme Certified and CE marked for sales in European Union markets.

Xerox takes a conservative position on potential health risks to its employees and customers. Accordingly, it may establish Xerox Exposure Limits (XEL), which are internal company exposure limits for specific chemical or physical agents. Xerox Exposure Limits are more stringent than external consensus or regulatory limits.

Xerox[®] Products

Electromagnetic Compatibility

Xerox[®] products are designed to function properly in the intended electromagnetic environment without causing harmful interference to nearby equipment or radio communication services. In this regard, Xerox[®] products comply with all governmental regulations covering Electromagnetic Compatibility (EMC). Compliance is verified by appropriate product testing.

Ergonomics/Human Factors

Human factors are an integral part of our design process. Our multidisciplinary team of professionals evaluates Xerox[®] products to ensure usability by our customers, serviceability by our technicians and ease of assembly by our manufacturing personnel.

Document Illumination

Staring at lamps can sometimes produce an afterimage, but this is of short duration and has no permanent effects. Due to the intensity of some light sources, some lamp systems are interlocked with the platen cover to prevent this. We recommend that all platens be covered while making copies to minimize exposure and facilitate good copy quality.

Lasers

Xerox[®] products containing lasers do not represent a hazard to equipment operators or bystanders and are designed and built to comply with the strict safety requirements of governmental and international standards. Product designs ensure that potentially harmful laser beams are contained within the equipment. Covers and shields need not, and should not, be removed for customer maintenance. Covers that may be removed by Xerox service personnel are labeled to indicate potential laser hazards. No service mode requires direct viewing of the laser beam or permits the beam to exit the confines of the equipment. Service personnel following established adjustment procedures are not exposed to potentially harmful laser beams.

Xerox® Supplies

Materials Safety Evaluation

Materials used in our products comply with applicable external regulatory requirements as well as Xerox's more stringent internal safety requirements. During the assessment of any material or product, both its inherent properties (potential hazards) and the potential exposures to customers and service personnel are considered.

The various materials used in imaging processes are evaluated for their toxic potential by reviewing published technical data or by responsible testing. The safety evaluation process considers possible acute and chronic effects as well as the potential for eye and skin irritation. Various bacterial and mammalian cell type tests are used as predictors of potential genotoxic effects.

All tests are performed to the Organization for Economic Cooperation and Development (OECD) methods by independent laboratories that operate in accordance with the rules of good laboratory practice, and the results are documented and placed into the health and safety archives. Further, all laboratories used in safety testing are accredited by, or meet the standards of, the American Association for Accreditation of Laboratory Animal Care. Responsible use and humane treatment of animals are basic requirements of sound scientific research and the generation of valid test data. Whenever feasible, we utilize alternatives to animal testing; however, viable alternatives do not always exist. In all instances, we ensure that our safety testing activities are in full compliance with worldwide regulatory standards and requirements.

Summaries of the test results are published in the *Material Safety Data Sheets*—under the Toxicology heading. Xerox makes the actual detailed test reports available to appropriate health and safety regulatory agencies.

Toners and Developers

Xerox® toners are fine powders composed of plastics, colorants and small quantities of functional additives. They are not considered to be hazardous preparations according to any regulatory classification criteria. Toner constituents must not only produce images having high xerographic quality but also pass our health and safety reviews.

The toners are typically designed using styrene-acrylic, styrene-butadiene or polyester polymers. In black toners, several different specialty grade carbon blacks or iron oxide are used as colorant, while for color images, various dyes or pigments are employed. During the toner manufacturing process, the carbon black (or other colorant) and polymer are combined in such a way that the colorant becomes encapsulated by the polymer.

Under normal operating conditions, the toners are entirely stable and no significant decomposition occurs. When exposed to the proper combination of heat and pressure, the toner simply flows and adheres to the paper.

Developers are composed of a carrier material and toner. Xerox® carriers are based on special grades of sand, glass, steel or ferrite types of materials. They are generally coated with a small amount of special polymer to achieve the desired functional behavior in the xerographic equipment.

Toner Inhalation Study

More than 30 years ago, Xerox initiated a comprehensive investigation of the toxicology of inhaled xerographic toner. We did this because there was no scientific data about the biological effects of long-term inhalation of toners and other closely related materials such as polymer dusts.

There are two key elements of this work:

The initial investigation focused on rodents that were exposed to low, medium or high levels of a test toner for the majority of their life span. The inhalation studies did not show any dose-related effect of exposure on survival and/or causes of death. The results of the study have been communicated to the appropriate regulatory authorities and continue to be recognized as extremely important investigations into the properties of inhaled particles. As a part of Xerox's ongoing Hazard Communication Program, a summary of these studies is found on the *Material Safety Data Sheets* for all toners and developers.

Xerox also initiated a complex series of studies of manufacturing and service employees to investigate possible adverse health consequences associated with occupational exposure to toner. The studies have been ongoing. The results of the occupational health studies continue to indicate that there is no significant health effects associated with the exposure to toner at the levels found in manufacturing or service.

These on-going studies include the health of current employees and an assessment of the causes of death for people who worked for the company between 1960 and 1982. The analysis to date indicates that the health and mortality patterns of Xerox employees are consistent with a healthy working population.

Photoreceptors

A xerographic photoreceptor is a multilayer device in which photoconducting layers are very tightly bonded to a substrate. The substrate may be a rigid aluminum drum or a flexible metal belt or polyester film. Most current photoreceptors use a proprietary organic photoconductor. Like all imaging materials, photoreceptor constituents are subject to rigorous safety evaluation.

Liquid and Solid Inks

Xerox uses liquid and solid inks in some imaging applications such as plotters and printers. The liquid inks are generally based on a solvent and contain various colorants and dispersing agents. Black inks contain specialty grade carbon blacks while colored inks contain dyes or pigments. The various solid inks contain polyethylene, waxes, resins, dyes and pigments. All these materials are subject to the same rigorous safety evaluation as other imaging materials.

Fuser Lubricants

Some xerographic processes use lubricants as release agents during the fusing process. These lubricants are inert silicone oils and greases, which have high thermal stability. The lubricants are not mineral oils and are not subject to the regulatory controls for such materials.

Indoor Air Quality and Emissions

Xerox® products are designed to ensure that they can be safely located in typical office areas near employee work spaces. Under normal operating conditions and with proper maintenance, machines meet or exceed legal requirements and current standards for emissions and are in conformance with select internationally recognized voluntary guidelines. Additional information on the emission characteristics of Xerox® equipment is summarized on the *Product Safety Data Sheets*.

Xerox supports its customers' responsibility for maintaining excellent indoor air quality in the workplace. The quality of indoor air is affected by many factors including ventilation, office furnishings and building materials in addition to the type of office equipment and use patterns. Xerox® equipment is tested in conformance with rigorous emission testing protocols to ensure that we meet or exceed current standards and acceptable best practices. For example, we set and adhere to strict limits on the amount of ozone, volatile organic compounds, and particulate substances emitted from xerographic products.

Ozone

In xerographic devices, small quantities of ozone are produced as a byproduct of the printing process. Ozone is generated only when the machine is copying or printing. Xerox Ozone Management Guidelines require that equipment situated in locations that do not meet either space or temperature and humidity requirements be equipped with a filter to reduce ozone to an acceptable level. Some equipment is equipped with ozone filters at the factory while others may be retrofitted at the placement site. With production printing equipment the emission of ozone is controlled by ducting. Xerox emission levels of ozone are substantially below internationally recognized exposure limits. The *Facts about Ozone* publication is available upon request or at www.xerox.com/environment.

Volatile Organic Compounds (VOCs)

In some conditions, volatile organic compounds may be emitted during and immediately after copying or printing. The concentrations are low, typically less than 1/100th of the occupational exposure limits for such compounds. Volatile compounds have to be measured in special inert chambers because their levels are less than those found in typical room interiors due to building materials, floor coverings and furniture. Measured levels, as included on the Xerox *Product Safety Data Sheets*, also meet many global ecolabel requirements.

Particulates and Dust

Dust associated with copying and printing consists primarily of paper particles and fibers. Less than 10 percent is toner particles. The levels are significantly below the standard limits for respirable dust.

During a product's operation, very small amounts of paper dust and toner may become airborne. Most dust created inside the machine is drawn through the heat exhausts and trapped by filters. Paper fragments are also generated when paper is handled outside the equipment. Ultimately, levels of paper dust depend on the composition and quality of paper used.

Odors

Xerox makes every effort to ensure that its equipment does not emit objectionable odors into the workplace. However, since some chemicals have very low odor thresholds, some people with a sensitive sense of smell may sometimes detect faint odors, even though the concentration of the chemical is significantly below any that would present a potential health concern.

Additional Topics

Audible Noise

Xerox uses state-of-the-art instrumentation and noise test facilities to optimize product designs for low noise and enhanced comfort. Xerox® products do not produce noise levels expected to damage human hearing. Noise emission levels meet various ecolabel and ergonomic guidelines, and are well below legally mandated exposure limits established around the world.

Product Service and Maintenance

Xerox's environmental health and safety personnel review and approve all service procedures and materials prior to field usage. They assess and control any potential mechanical, electrical, chemical or physical hazards such as lasers, noise, etc. to minimize exposures of Xerox employees and customers. Field usage of these procedures and materials is monitored, and product retrofits, warning labels or special bulletins are made when appropriate.

Xerox has created ways for customers to service their own equipment using web-based service procedures, within a customer training course such as eXcellerate, or described to the customer over the telephone. Each of these service procedures has been reviewed and approved by qualified health and safety personnel to ensure that customers are not significantly exposed to physical hazards, chemical or physical agents, ergonomic stressors, or hazardous electrical energy.

Disposal of Spent Supplies and Equipment

Proper disposal of waste materials minimizes environmental impact and promotes public health and welfare. Xerox's environmental management program identifies hazardous waste materials for proper disposal and encourages recycling or reclaiming of waste products. All materials that are used in the various imaging processes are evaluated against the following criteria: environmental toxicity and biodegradability, ignitability, corrosivity, and reactivity.

The *Material Safety Data Sheets* contain sections on Spillage and Disposal that outline the procedures to follow. For any questions concerning disposal of Xerox® materials, review *Material Safety Data Sheets* and observe all applicable governmental regulations.

Xerox offers a comprehensive end-of-life management program for our imaging supplies: Supplies used in our products are designed for safe local disposal or recycling. Xerox® dry ink toner is non-toxic and does not generate hazardous waste. Land filling of the material with normal office refuse is acceptable if necessary; however, Xerox also offers return programs through our Green World Alliance® program at www.xerox.com/gwa.

Exceptions or special considerations may apply in the following circumstances:

Photoreceptors

The photoreceptors used in our modern equipment have met all the criteria to be classified nonhazardous. Used or damaged Xerox[®] photoreceptors containing arsenic and selenium should be returned to Xerox Corporation or the supplier for disposition. If they are not returned to Xerox, state and local laws regarding disposal of this material must be followed, and we recommend disposal in a chemical waste landfill.

Incineration of toner or toner cartridges

Xerox recommends that caution be taken in the incineration of toners, as dust clouds may be explosive.

Developer

Developer also meets all criteria for classification as nonhazardous and therefore may be disposed of with normal office refuse. However, state and local requirements may be more restrictive. Consulting the appropriate state and local waste disposal authorities is advised.

Service Materials

Material Safety Data Sheets have been made available for each of the service materials sold by Xerox. These materials have also been evaluated against hazardous waste criteria to determine proper disposal. If the waste materials are classified hazardous and small quantity generator exemptions do not apply, applicable governmental regulations must be observed for proper disposition.

For any further questions concerning disposal of Xerox[®] materials, please review MSDSs and observe all applicable governmental regulations.

Equipment

Xerox operates a worldwide equipment takeback and reuse/recycle program as described at www.xerox.com/environment.

Additional Information

It is a fundamental principle of Xerox Corporation to ensure that its products are safe and do not in any way represent a concern to its customers or employees. If you have questions that have not been answered here or would like additional information on any aspect of environment, health and safety of Xerox® products, please visit the Xerox Environment, Health, Safety & Sustainability website at www.xerox.com/environment or contact:

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