

# Facts about Ozone

## WHAT IS OZONE?

Ozone (O<sub>3</sub>) gas is an unstable form of oxygen (O<sub>2</sub>). It is created by natural processes such as ultraviolet radiation in the upper atmosphere and by lightning. Ozone is also a pollutant generated by automobile exhaust and certain industrial activities. Xerographic copying and printing equipment may generate ozone when high-voltage charging devices produce an electrostatic discharge during a copy run. In standby mode no ozone is produced.

The word ozone is derived from the Greek word for smell. Its odor can be detected when very low concentrations are present, as low as 0.0076 parts-per-million (ppm). At low concentrations ozone has a sweet, clover-like odor often noted outdoors after an electrical storm. At higher concentrations the odor becomes pungent and may irritate the eyes, nose and throat.

Ozone has been classified as an air pollutant by most regulatory bodies around the world. Ozone is different from most pollutants, however, in that it rapidly reverts to oxygen. The rate of decomposition is described by a parameter known as "half-life". The half-life of ozone is the time required for its concentration to be reduced by half. For typical offices the half-life of ozone is five minutes or less.

## IS EXPOSURE TO OZONE HARMFUL?

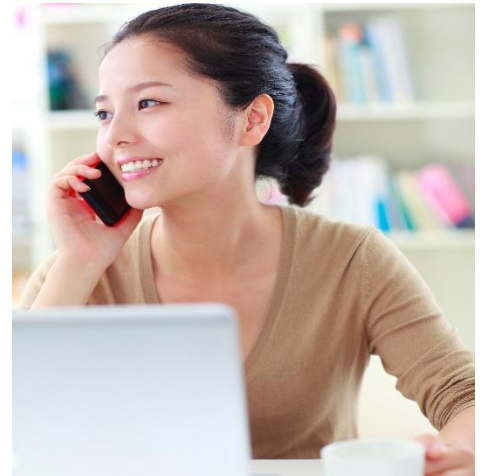
The health effects of ozone have been studied extensively. In recent years, medical experts in environment, health and safety agencies have generally agreed that exposure to a concentration of 0.1 ppm is acceptable for an 8-hour occupational exposure. The United Kingdom Health and Safety Executive established an occupational exposure limit of 0.2 ppm for shorter, 15-minute periods. Above these levels, subtle, pulmonary effects can be measured; these effects are enhanced as exposure levels increase. Concentrations above 0.3 ppm can also produce headaches, eye irritation and breathing difficulty. However, because of the strong, pungent odor, these concentrations are easily recognized and avoided. Ozone, like oxygen, does not accumulate in the human body.

## OZONE EMISSIONS FROM XEROX® MACHINES

Xerox strictly controls emissions of ozone from its machines. However, the concentration of ozone in the air around the machine is affected by the usage rate, the size of the room and the rate of air exchange or ventilation.

If machines are located in unfavorable conditions or operated in excess of expected copy volumes, ozone concentrations may rise above the level that Xerox recommends. Also, since the odor detection level of ozone is very low, a strong odor of ozone may be perceived, even though levels are within acceptable limits. In these instances, measures may need to be taken to ensure that ozone concentration will not cause discomfort to those operating the equipment or located near it.

These measures could include improving ventilation or moving the machine to a more favorable location to dissipate the ozone. However, since ozone is generated by automobile exhaust and other industrial processes, ambient levels can be the highest contributor to indoor ozone levels.



For more information about environment, health and safety programs at Xerox, see our website:

[www.xerox.com/environment](http://www.xerox.com/environment)

Questions  
1.800.ASK.XEROX (1.800.275.9376)  
[askxerox@xerox.com](mailto:askxerox@xerox.com)  
[EHS-Europe@xerox.com](mailto:EHS-Europe@xerox.com)

## **CAN THE OZONE LEVEL BE EASILY MEASURED AT CUSTOMER INSTALLATIONS?**

Yes, using a ChemDisk Personal Sampler for Ozone. These require analysis by an AIHA- accredited laboratory. Xerox does not routinely conduct this testing.

## **DOES XEROX® EQUIPMENT COMPLY WITH OCCUPATIONAL EXPOSURE LIMITS FOR OZONE?**

Yes. The Xerox machine emissions testing process ensures Xerox® products are tested with ozone reducing devices fitted where necessary and characterized by an “intrinsic ozone emission rate.” This rate is used to predict ozone concentrations at customers’ premises.

The results for each Xerox® product can be found in the Emission/Exposure Information section of the relevant Xerox Product Safety Data Sheet (PSDS). All Xerox® equipment, operating in the minimum specified environmental conditions, meets all national and international occupational exposure limits.

## **IS MY MACHINE FITTED WITH AN OZONE FILTER? IF SO, HOW OFTEN SHOULD IT BE REPLACED?**

It depends on the machine. The need for an ozone filter is determined from the ozone emission testing during product development. Most machines that do incorporate an ozone filter have filters that are fitted for product life and do not normally need replacing. However, some products have filters with replacement intervals which is addressed through service or routine maintenance activities.

## **IS THE SMELL COMING FROM MY MACHINES FROM OZONE?**

It is possible that transient, low levels of ozone may be noticed; if so, a slightly sweet odor may be detected. However, ozone is sometimes mistakenly blamed for other odors, in particular the “new smell” (like the odor of a new car) that can be associated with newly commissioned machines. The use of non-Xerox consumables, such as some paper products, has also been observed to result in odor generation.

## **CAN OZONE EMISSIONS FROM OUR MACHINE MAKE ME ILL?**

It is highly unlikely that a correctly sited machine will produce ozone levels that would result in symptoms associated with ozone exposure – e.g. headaches and irritation to the eyes and throat.

Other possible causes should also be considered. The entire working environment should be investigated. Poor temperature control and ventilation can lead to general discomfort, and low humidity has been found to lead to similar symptoms such as sore eyes and dry throat.

## **WHAT EFFECT DOES OZONE HAVE ON THE ENVIRONMENT?**

At high altitudes, ozone produced by solar radiation is essential to filter out harmful ultraviolet rays. At low altitudes outdoors, high levels can contribute to smog. The concentrations generated by Xerox® equipment are extremely small and considered to have no impact on the environment.