



# Material Safety Data Sheet

## Section 1- Product identification

**Product Name:** Ozone  
**Synonyms:** Triatomic Oxygen, O<sub>3</sub>  
**Chemical Family:** Oxidizer  
**Molecular Formula:** O<sub>3</sub>  
**Molecular Weight:** 48.0

## Section 2 - Hazardous Ingredients

**Components:** Ozone Gas  
**Concentration:** 0-20% by weight  
**Gas Registry Number:** 10028-15-6

## Section 3 - Physical Data

**Boiling Point:** -111.9 C  
**Melting Point:** -192.7 C  
**Solubility in Water by weight at 20 C:** 0.003 g/l (3 ppm)  
**Vapor Density (air =1)**

**Appearance and Odor:** Ozone is colorless at all concentrations experienced in industry. It has a very pungent characteristic odor usually associated with electrical sparks. Ozone odor is generally detectable at concentrations of 0.02-0.05 ppm.

## Section 4 - Fire/Explosion Hazards Data

Ozone is a powerful oxidizing agent and oxidation with ozone evolves more heat and usually starts at a lower temperature than oxidation with oxygen. It reacts with non-saturated organic compounds to produce ozonides, which are unstable and may decompose with explosive violence.

Ozone is an unstable gas which, at normal temperatures, decomposes to biatomic oxygen. At elevated temperatures and in the presence of certain catalysts such as hydrogen, iron, copper and chromium, this decomposition may be explosive.

**FLASH POINT:** Not Applicable  
**AUTOIGNITION :** Not Applicable

FLAMMABILITY: Non Flammable but vigorously supports combustion.  
EXTINGUISHING MEDIA: Depends on source media.

### **Section 5 - Reactivity Data**

**Conditions Contributing to Instability:** Ozone spontaneously decomposes under all ordinary conditions, so that it is not encountered except in the immediate vicinity of where it was formed. The decomposition is speeded by solid surfaces and by many chemical substances.

**Incompatibilities:** Ozone is a powerful oxidizing agent and reacts with all oxidizable materials, both organic and inorganic. Some reactions are highly explosive.

**Hazardous Decomposition Products:** None

**Special Precautions:** None

### **Section 6 - Health Hazard Data**

**Permissible Exposure Limit:** The current standard for ozone is 0.1 part of ozone per million parts of air (ppm) averaged over an eight-hour work shift. This may also be expressed as 0.2 milligrams of ozone per cubic meter of air (mg/m<sup>3</sup>). No criteria is set for the permissible concentration of ozone in water.

**Symptoms of Exposure:** A sharp irritating odor is noticed after exposure to very low concentrations ( =0.04 ppm) of ozone for a very brief period of time. As the concentration of ozone increases, the ability to smell it may decrease. Irritation to the eyes, dryness of the nose and throat, and a cough may be experienced. If the ozone concentrations continue to rise, more severe symptoms may develop. These may include headache, upset stomach, or vomiting, pain or tightness of the chest, shortness of breath or tiredness, which may last for several days or weeks. Finally, with higher levels of exposure, the lungs may be damaged and death may occur.

**Toxicological Properties:** Ozone is extremely irritating to the upper and lower respiratory tract. The characteristic odor is readily detectable at low concentrations ( 0.02 ppm to 0.05 ppm). Ozone produces local irritation of the eyes and mucous membranes and may cause pulmonary edema at high exposure. Systematically, ozone has been reported to mimic the effects of ionizing radiation, and may cause damage to chromosomal structures. A partial tolerance appears to develop with repeated exposures. Although most effects are acute, the possibility of chronic lung impairment should be considered, based upon animal experimentation.

### **Section 7- Preventive Measures**

**Leak Procedures:** Persons not wearing protective equipment and clothing should be restricted from areas of leaks until cleanup has been completed. If ozone is leaked, the following steps should be taken:

1. Ventilate area of leak to disperse gas.
2. Stop flow of gas.

**Waste Disposal Method:** Do not dispose of ozone off gas to atmosphere without properly designed off gas destruct unit.

**Engineering Controls:** Respiratory Protection - Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

**Ventilation:** All potential sources of ozone off gas must be collected with suitable collection system. All ozone off gas must pass through a properly designed ozone off gas destruct unit prior to release to atmosphere.

**Personal Protective Equipment:** Respirators may be used when engineering and work practice controls are not technically feasible, when such controls are in the process of being installed, or when they fail and need to be supplemented. Respirators may also be used for operations which require entry into tanks or closed vessels, and in emergency situations.

Only appropriate respirators shall be provided and used when the use of respirators is the only means of controlling exposure for routine operations, or during an emergency. (Refer to Table 1 of ANSUI/ASTM E591-77 for appropriate respirator selection ).