

Understanding Gases

Nitrogen Dioxide



Nitrogen dioxide, also known as NO₂, is a one of the oxides of nitrogen or nitrogen oxides (NOx) group of gases. These gases are highly reactive and are created at high temperatures.



Composed of nitrogen and oxygen, NO₂ is a strong-smelling gas.



NO₂ is well known due to its capacity to create a smoggy haze of pollution in the air, specifically in highly populated locations. That brown haze that hangs over a polluted city is caused by the presence of NO₂.



Although it is a greenhouse gas, the reason it is listed by the World Health Organisation (WHO) is as a significant contributor to outdoor air pollution, and consequent outdoor-air pollution related health issues.

What are the dangers of Nitrogen Dioxide?

As noted above, the ingestion and consumption of NO₂ comes with considerable health impacts. Breathing air that has high levels of nitrogen dioxide causes aggravation to the respiratory system. Short term exposure or low concentrations can worsen diseases such as asthma and cause coughing, wheezing or difficulty breathing. The EH40 limits for health are very low at 0.5ppm for an 8 hour exposure and 1ppm for a 15 minute exposure.

Over longer time periods, exposure to NO₂ can cause individuals to develop asthma and places the vulnerable at greater risk of respiratory issues. Studies have also shown that the more serious health impacts from this gas include premature death, cardiopulmonary effects, reduced lung function in children, and increased allergic responses.

In terms of the environmental hazards from NO₂, the interaction with water, oxygen and other chemicals in the atmosphere forms acid rain, which damages natural habitats and ecosystems. As mentioned, the particles created along with this gas can also make the air hazy, worsen visibility and cause health problems.

How do you detect Nitrogen Dioxide?

For most people, Nitrogen dioxide is noticeable at low concentrations for its bitter smell, which is reminiscent of chlorine, though some people are unable to smell it at all. Although pungent in its smell for most, detecting it by smell alone is not a fool proof method of detection. Utilising a measuring instrument, or nitrogen gas detector, is a much safer way to remain aware of the risks from this hazardous substance outside or within any working environment.

What should you do if you are exposed?

If an individual is exposed to nitrogen dioxide usually they will require treatment immediately, including the administering of oxygen and medications to make breathing easier.

Also in the after-moments of exposure to high concentrations, the cleansing and washing of exposed or irritated eyes should begin with plain water or saline solution. This should be undertaken for at least 20 minutes. It is also important, where applicable, to remove contact lenses if it is easy to do so without causing harm.

If nitrogen dioxide has been ingested, inducing vomiting should not be undertaken and charcoal should not be given. Instead, it is recommended, for those who are conscious, to drink four to eight ounces of water or milk.



Highly reactive and created through the burning of fuel, usually from vehicle emissions



WHO listed as a corrosive, oxidising, toxic, gaseous, health hazard



Exposure will require treatment immediately, often including the administering of oxygen and medications to aid breathing