

2.4 Ex, Ox, Tox – gas hazards!

Gases and vapors are almost always dangerous. If gases are not present in the atmospheric composition to which we are accustomed and which we can breathe, then safe breathing is threatened. Furthermore, all gases are potentially dangerous in their liquid, compressed, or normal state – the decisive factor is their concentration.

There are basically three categories of risk:

- **Risk of explosion (ex)** caused by flammable gases
- **Oxygen (ox)**
 - Risk of suffocation through oxygen deficiency
 - Risk of increased flammability due to oxygen enrichment
- **Risk of poisoning (tox)** by toxic gases

Without equipment to assist, mankind is not in a position to detect these risks early enough to enable preventative steps from being taken. And, with a few exceptions, our nose has proven an extremely unreliable warning instrument.

For example, hydrogen sulfide can be detected in low concentrations because it smells of rotten eggs. However, the nose can no longer perceive the lethal, high concentrations of hydrogen sulfide. Many fatal accidents have occurred because people have fled into what they thought was the safe, odour-free area.

Even harmless gases such as argon, helium or nitrogen can also become dangerous if they are suddenly released, displacing the oxygen that is essential to life. Then there is risk of suffocation. An oxygen concentration of less than six Vol.-% is deadly. An excess of oxygen increases the risk of fire, and can even cause flammable materials to self-ignite. By igniting, flammable gases and vapors can not only cause considerable damage to industrial plants and equipment, they can also threaten people's lives.

Therefore, it is essential to be able to detect Ex, Ox and Tox risks reliably, and to protect human life, industrial plants and equipment, as well as the environment by taking the appropriate measures. Whether Dräger-Tubes® or portable gas detectors, Dräger offers you individual solutions that meet your needs and enable you to counter gas risks professionally.