

What are sticky gases?

Sticky gases are a group of toxic gases that tend to sorb (**absorb** or **adsorb**) with surfaces, such as sampling tubing or the exterior of gas detection devices. Examples of sticky gases include:

- Ammonia (NH₃)
- Nitrogen dioxide (NO₂)
- Hydrogen cyanide (HCN)
- Chlorine (Cl₂)
- Hydrochloric acid (HCl)
- Chlorine dioxide (ClO₂)
- Hydrogen fluoride (HF)
- Hydrogen sulfide (H₂S)
- H₂S component of quad-gas mixture

What is the difference between absorption and adsorption?

Absorption

The process where one material is taken in by another. At a molecular and atomic level, the molecules of one material fill in the empty spaces between the molecules of the other material. An example of absorption is a paper towel picking up water.

Adsorption

The surface interaction between two materials where one material adheres to the surface of another. While the atoms of the materials bond to each other, they do not combine. An example of adsorption is paint on a wall. The paint molecules attach to the wall molecules but remain separate.

How does sampling sticky gases impact gas detection equipment?

A gas detection device's response time will be slower than normal when sampling a sticky gas because the tubing material interacts with the gas flowing along it, slowing down the overall flow of gas to the detector.

This behavior means that the actual gas concentrations might not be accurately measured, and the gas detection device won't alarm at the appropriate gas concentration, putting workers at risk for chronic and acute health effects.

NOTE: Gas adsorption by tubing may impact gas readings more during sampling than continuous monitoring. During continuous monitoring, gas levels at the sensor will eventually reach accurate or representative levels. During sampling, if the sample time is insufficient to compensate for a lower volume of gas at the sensor, gas readings may be inaccurate.

How do I reduce the risks associated with sampling sticky gases?

Blackline recommends using Teflon-lined tubing because sticky gases cannot sorb into or onto Teflon as easily.