



Hydrogen:

Hydrogen is actually the lightest element in the universe and hydrogen gas is the lightest of all gases. Hydrogen molecules move with a much higher velocity than any other molecule and therefore escape through leaks quicker than other gases. Hydrogen gas does also dissipate quicker than other gases thereby minimizing the risk for build-up background interference during leak testing.

If you worry about increased background concentrations, try 5% Hydrogen as tracer gas. This is also the least expensive tracer gas you can buy.



Some leaks are so big that you can see them or hear them. Other leaks are so small that you need a vacuum system to detect them. Most leaks are in the range between these extremes and can be detected with hydrogen tracer gas.

Hydrogen has some unique properties making it a superb tracer gas for leak testing:

- Lightest molecule
- Low background in air (0.5 ppm)
- Environmentally friendly and a renewable natural resource
- Inexpensive
- Non flammable (when purchased ready mixed 5% Hydrogen in Nitrogen)
- Non-toxic and non-corrosive

Never use pure hydrogen for leak testing. We recommend to use a standard industrial gas mixture consisting of 5% hydrogen in nitrogen, available from almost all gas supplier (often called Forming Gas).

Safety:

It is a widespread misconception that the flammability of Hydrogen would make it impossible to benefit from its advantageous properties in leak testing. In fact, Hydrogen is only flammable in the concentration range 4% - 75% in air or oxygen, and can only detonate in the range 18% - 60% in air or oxygen.

By using pre-diluted Hydrogen one can avoid the flammable concentration range altogether. Standard Hydrogen/Nitrogen mixtures are for example commonly used as shielding gases for welding purposes.

Hydrogen can therefore safely be employed for leak testing if used at the right concentration. A suitable concentration to use is the standard 5% Hydrogen / 95% Nitrogen mixture which is available in industrial grade from most gas suppliers. The price is only a fraction for example of the price for helium.

The 5% mixture is classified as non-flammable according to international standard [ISO 10156](#). This standard not only describes how flammability limits of gas mixtures are to be determined, but also states that Hydrogen/Nitrogen mixtures containing less than 5.7% Hydrogen are non-flammable, irrespective of how this mixture, in turn, is mixed with air.

Environment:

Hydrogen is a naturally occurring gas which is totally non-toxic and has no adverse effects on the environment. Hydrogen can be found naturally or produced with very simple methods. In fact we all have some hydrogen being produced in our stomachs! The normal background level of Hydrogen in air is as low as 0.5 ppm.

Other tracer gases either comes from finite sources, are expensive to produce or are potentially toxic. Therefore Hydrogen is the most environmentally friendly choice to make when considering Leak Testing with a tracer gas. A fact important to remember if your company holds an ISO14001 certificate or similar.

(Bron: Sensistor Technologies Sweden)

