Reference gas versus reference leak

The normal way of calibrating leak detectors is to use a reference leak which gives a specified leak flow in e.g. std cc/s or mbarl/s.

In actual fact, an active sniffer measures concentration (ppm) and convert it to ml/s, assuming that all gas from the reference leaks is collected and diluted with a defined flow of air. Therefore, one can equally well use a reference gas with a known concentration.

In order to do so, one must establish (theoretically, or by experiment) what the concentration in the active sniffer will be when sniffing a certain leak specified in ml/s. This conversion assumes that the sniffer is near enough to the leak. It is therefore not an absolutely accurate conversion.

The difference between the two methods is that:
1) Reference leak needs no conversion from ppm to ml/s.
2) Reference leak must be sent for calibration, reference gas is purchased with a certificate.
3) Reference leaks can easily be damaged or contaminated in an industrial environment, and may therefore not be reliable enough.
4) The reference gas gives an absolute concentration of gas, while a reference leak gives an additional concentration to the background concentration. Zeroing in a high concentration background before calibrating with reference gas can therefore give a too small change whereby the sensitivity is adjusted higher than necessary. This constitutes no risk for quality because even smaller leaks will then be rejected.

In conclusion, a reference leak should be used when setting up a system, but daily, or hourly, calibrations can be performed with a reference gas.

If people find it difficult to understand the use of a reference gas, simply recommend them to use the traditional method with a reference leak.

Point out that the idea of using a reference gas has nothing to do with hydrogen or helium. Any gas detector primarily measures concentration, and can therefore be calibrated with a reference gas. This is also the case for all gas detectors that are used for other applications than leak detection.