

TIPS & TRICKS FOR LEAK TESTING

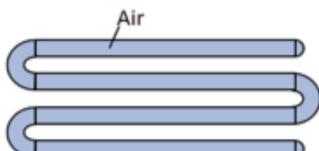


Fig. 1: Part before filling with tracer gas

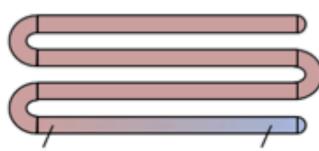


Fig. 2: Gas distribution without previous evacuation



Fig. 3: Gas distribution with previous evacuation

1. EVACUATE BEFORE TRACER GAS FILLING

For proper leak testing it is absolutely mandatory to evacuate the test part before filling with tracer gas. This is particularly important for long and narrow geometries. If you do not evacuate before filling, the air in the test part will simply be pushed to the end of the geometry and no tracer gas will get to this area, hence potential leaks will only release air and cannot be detected by your tracer gas leak detector (Figs. 1 to 3).

Evacuation is also especially important if you fill the part to be tested with low pressures of tracer gas only as the left-in air will dilute the tracer gas filled in. Example: If the part is filled with air at atmospheric pressure and you add one atmosphere of tracer gas, the tracer gas concentration in the part is only 50%. If you add two atmospheres of tracer gas, the concentration of tracer gas will be 66%.

2. DO NOT USE WATER BATH BEFORE TRACER GAS TESTING

Leaks that are tested for with tracer gas usually have the form of a small, long capillary. If you test for leaks in a water bath before leak testing with tracer gas, these capillary will fill with water and clog. Due to the surface tension of water, this water will also not drip out of these small holes, but can only be removed by a long, time-consuming drying process.

3. DO NOT VENT OR SPILL TRACER GAS TO LEAK TESTING AREA

The smallest detectable leak rate in leak testing strongly depends on the background concentration of tracer gas. Although the leak detectors only detect changes of tracer gas concentration, higher background concentration also tend to show higher absolute fluctuations. If you release the tracer gas filling to your leak testing area after leak testing, you steadily increase your background concentration during the day. Also make sure you do not spill gas during filling or release. Periodically check the connectors for leakage as well.

4. CHECK FOR LARGE LEAKS BEFORE TRACER GAS FILLING

Before tracer gas filling you should implement a quick test for large leaks, otherwise the tracer gas spilling from large leaks will contaminate your leak testing area. An easy test for large leaks is to evacuate the part and hold the evacuation pressure for a short time. If the part can hold the evacuation pressure, it will not contain any large leaks and it can be filled with tracer gas.

5. PROVIDE SUFFICIENT VENTILATION TO YOUR LEAK TESTING AREA

Helium / hydrogen do not fly to the ceiling of your leak testing area like a filled balloon would do. Tracer gas forms clouds which move around. Even if your connectors are perfectly tight when connected, almost any connector releases some amount of tracer gas during connecting and disconnecting. It is, therefore, important to have some good ventilation of your testing area. As both tracer gases have the tendency to move up, it is recommended to supply fresh air from the bottom and put the exhaust at the top.

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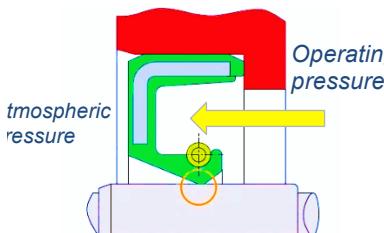


Fig. 4: Radial shaft seal

6. TEST IN THE SAME DIRECTION AS PRESSURE OCCURS IN USE

Many seals have a preferred mounting direction and will only seal properly in that direction (Fig. 4). A perfect example of this is a radial shaft sealing ring. A radial seal will only seal in one direction, but will leak in the opposite direction. Other seals may show similar behavior. If you leak test in the same direction as the pressure occurs in use, you will only find real leaks and not get distracted by false alarms.

7. TEST AT THE SAME PRESSURE AS MAX PRESSURE OCCURRING DURING OPERATION

Many seals and also some defects have a certain pressure threshold at which they open up. If you do test at lower pressures than the maximum pressure occurring during operation, some leaks may not be open yet. If you test at higher pressures, you may detect leaks which do not show under real operation.

8. AVOID CROSS WINDS IN YOUR LEAK TESTING AREA WHEN SNIFFING

Normally in a manufacturing environment, a lot of air movement occurs due to differences in temperature between areas and/or because fans or other sources force air movement. Any air movement will negatively affect the leak detection capabilities as the gas to be detected will be blown away from the sniffer tip opening (Fig. 5). For good results, the leak testing area should be shielded from these winds.

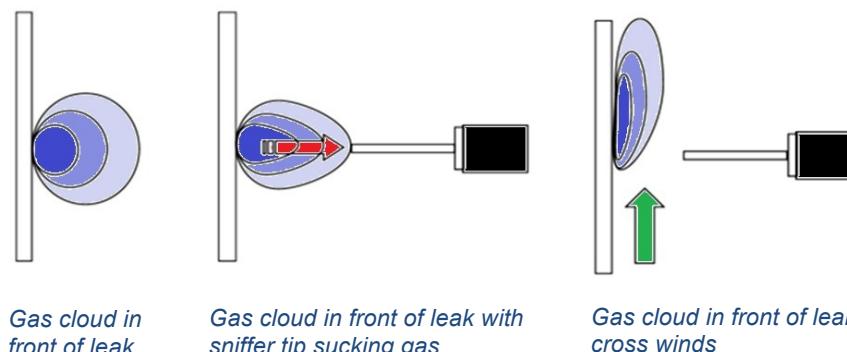


Fig. 5: Gas cloud in front of leak