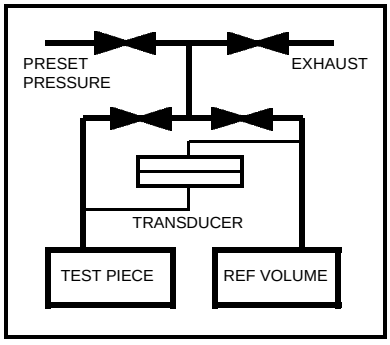
component leak testing

pressure/vacuum/helium methods

TQC has specialised in the automated leak testing of components for many years. This is combined with TQC's experience in production line test equipment and process automation. The result is a service to industry which can offer complete leak test systems which use the correct technique for the particular situation.

- Quantifiable Leak Testing.
- Calibration to BS5750.
- Fast, clean and dry test.
- Easily incorporated into automatic or manual lines.
- Automated pass/fail limits and marking.
- Data outputs for SPC analysis.



Pressure/Vacuum Systems

TQC are the UK agents for the Nolek range of leak test measurement instruments. Test Pressures between vacuum and 10 bar (150psig) are available as standard. Leak measurement may be made down to a resolution of 1 atm.mm^3/sec. All test parameters may be programmed into the instruments

The test piece and the reference volume are simultaneously pressurised (or evacuated) to a preset pressure. The air in the system is then allowed to stabilise, with the supply valves all closed. The Differential Pressure Transducer is automatically zeroed.

After this stabilisation time, the pressure change in the test piece is compared to the pressure change in the reference volume, using the Transducer. If the test piece is leaking, the difference will increase and be measured, an alarm limit may be set for a pass/fail decision.

The sequence is fully automatic, the accuracy and sensitivity of the system is defined by the method of setting the preset pressure together with the quality and type of control valves and Differential Pressure Transducer.

Pressure Decay

Advantages:

- Lowest cost
- Simple to understand
- Direct value results
- Direct Calibration

Disadvantages:

- Temperature dependent
- Component must be stable

TQC
The Application of Technology

nolek

TQC Ltd
Hooton Street,
Nottingham
NG3 2NJ

Tel. 0115 950 3561
Fax. 0115 948 4642

sales@tqc.co.uk

component leak testing

pressure/vacuum/helium methods

Helium Systems

A vacuum pump evacuates the test chamber and test piece simultaneously to a preset vacuum. At this present level, the chamber and the test piece are isolated and the chamber evacuated further to a very low pressure. A positive pressure difference is therefore created between the test piece and the chamber.

Helium gas is then introduced into the test piece, often in a 10% concentration. A mass spectrometer analyses a sample from the chamber as the vacuum continues to be drawn. The mass spectrometer measures the helium leakage and sets the pass/fail decision.

The test piece pressure is often compared to the chamber pressure before dosing with helium, to avoid saturating the Mass Spectrometer in the event of a gross leak.

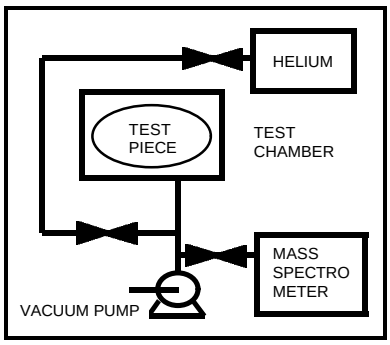
Vacuum Decay

Advantages:

- Limits temperature effects
- Assists sealing loading
- Reduced stabilisation time
- Often a faster throughput

Disadvantages:

- Indirect leak calculation
- Complex fault detection



Helium Detection

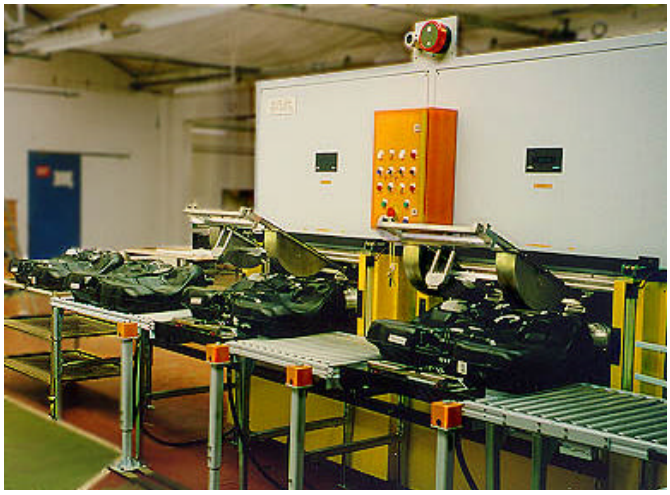
Advantages:

- Most sensitive (x10)
- Independent of temperature
- Independent of volume
- High throughput

Disadvantages:

- Most expensive
- Most complex

TQC provide complete leak test facilities utilising leak test instruments and pumping groups from Varian or Alcatel Vacuum Technology. The leak measurement resolution may be typically 1 x 10-6 atm.mm^3/s



For leaks of air into atmosphere, units are usually expressed as mm3 or cm3 (cc) per second or minute. So 16.6 mm3/ sec = 1cm3/min. A bubble under water is about 30-50 mm3, so 1 bubble per second is about 30mm3/sec or 2cm3/ min. A standard unit of leakage which takes account of air pressure is the mbarl/sec. (millibar-litre per second). A leak into atmosphere of 1 mbarl/sec is equivalent to a volume leak of 1000 mm3/sec.

TQC
The Application of Technology

TQC Ltd
Hooton Street
Nottingham
NG3 2NJ

Tel. 0115 950 3561
Fax. 0115 948 4642

sales@tqc.co.uk
www.tqc.co.uk