

## Case Studies: Leak testing

### Medical Device Leak Test Drawer Fixture

**Client:** Leading Medical Diagnostic Device Company

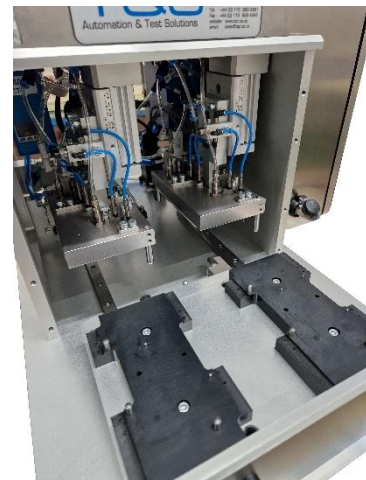
**Part:** Laboratory on a cassette device (Lab-on-a-chip)

**Machine supplied:** Leak test fixture for very low-pressure decay leakage rate

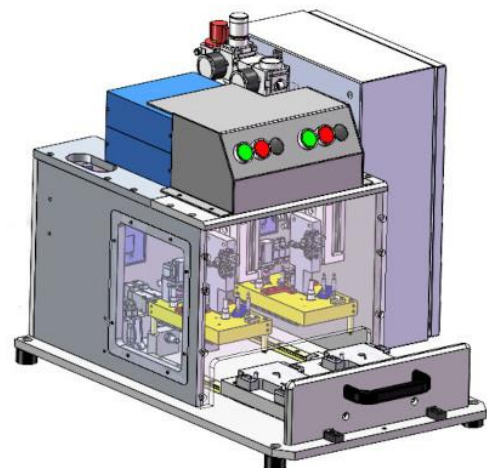
**Overview:** This system was designed and manufactured in order to give the customer the ability to automatically produce 100% checked parts. The leak test was to ensure no liquid leakage through a series of diagnostic channels and had 6 sequential tests on each of the 2 fixtures.

This leak test fixture is a standard Series 20 drawer fixture, modified to test 2 parts simultaneously. This type of solution is suitable for automatic leak testing of small to medium-sized parts.

Two OEM MALT LT201 valve modules and controllers are used as the leak testing instruments, with the valve module mounted close to the fixture tooling to keep the test volume as small as possible. A button box is included for operator controls, this was on a flying lead to be positioned either to the right or left of the drawer for right or lefthanded operators.



The Series 20 drawer fixture is a standard TQC design with bottom tooling in the drawer fixture and top seal tooling positioned on compact cylinders behind the Perspex guard. TQC designed and manufactured custom tooling for the specific part that is leak tested based on an existing proven design.



This system allows the operator to load the tooling nest located in the drawer, the drawer is pushed forwards to the closed position to allow automatic leak testing. There are switches and interlocks in the drawer fixture that are connected directly into the available inputs and outputs (I/O) in the MALT controller. In this system, a series of valves are switched between 0.9 bar, 0.5 bar and 0.5 bar vacuum automatically by the MALT controllers additional I/O capability.

The system uses the graphical capabilities of the MALT user interface when connected to a laptop computer. The sequence of tests on each side was locked within the software to ensure that each side was synchronised when both sides were testing. It was possible to view the 2 fixtures on a single laptop screen during the test. The unit could also be run on just one side through the laptop interface.

The leak test was initiated by pressing the start button. The leak test is performed by sealing multiple zones on the part and monitoring the pressure changes in the test volume. At the end of the test, a pass is indicated to the operator through the lights at the front of the machine. The drawer can be opened for unloading after a pass result on all 6 tests, the MALT controller is configured to lock the drawer on a Fail result. The integration of a pass stamp or output to a label printer on a pass result can also be added if needed.

#### Key features:

- System operating at the extremities of air decay leak testing capabilities
- Benchtop leak test fixture
- 2 off MALT leak test units with a single button box
- Drawer fixture with load/unload position and test position
- Custom designed seals
- Complex 16 multi-point sealing on the top of the cassette.
- Eject cylinders included to ensure the release of the part from the seals
- Drawer locked closed on part fail

TQC has in the past also integrated a 20 bar high pressure test into similar systems. The MALT has a 3 bar maximum test pressure but by careful arrangement of the test volume, a pressure rise technique from vacuum can be used whilst still pressurising the part to high pressure.

If you have an application that could benefit from TQC's expertise in leak testing, please contact us by email or phone via the contact details

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