

# Leak Testing Procedure (Standard)

Belle Technology UK Ltd.

Before proceeding with tests, please check for the following items :-

1. Ensure Gloves (if fitted) are in good condition and are secured inside glove box with the supplied glove stop flexible arms or similar.
2. If the box is anaerobic, please ensure the Oxygen Meter is switched off ,to prolong life of sensor seeing excessive O<sub>2</sub>.
3. Ensure the recirculator module is switched **OFF** for all tests.
4. Ensure that the box Lute is filled with Mineral Oil to the correct level, as indicated by the pointer located on the Lute body.
5. Check that all doors and bungs are sealed, all access panels are secured correctly and any services taken into the box are tight.
6. Control box gas and electrical supplies connected. Gas pressure 2 Bar, and Electric 24V D.C. (Footswitch should not be in operation). Ensure "Box Purge" valve on control box is closed down. (Fully clockwise position)
7. That the four cartridges fitted on the gas recirculator module, have their Quick Release Couplings (QRC's) connected correctly top and bottom. To ensure this, disconnect and re-connect each QRC in turn.

## Brief description of test criteria

The testing of the glove box system box is done by isolating the two basic modules from each other (Glove box and gas recirculation module). This is done by closing both large blue valves located on the gas recirculator module. Once these two valves are closed, the two units are then independent of each other, and may be individually tested for leaks. The first test will be to establish the integrity of the main box and transfer ports, then if no leak is detected in the box module, the testing will move to the gas recirculator module. If the gas recirculator module is gas tight, then further testing will concentrate on the individual cartridges and their gas connections.

**Note** That when testing, Mineral oil levels can vary with a change in temperature. Ideally a thermometer should be used whilst tests are under way, if you think the temperature is going to vary significantly.

## **Box Module testing :-**

1. Close the two large blue valves on the gas recirculator and ensure the eight smaller valves located on the top and bottom manifolds are also in the "Off" closed (Handle horizontal) position.
2. On the control box, press on the red power switch located on the front panel. Gas will flow into the glove box until a pressure of approximately 2 inches WG is reached. (Box automatically "Tops Up").
3. Switch off the red power switch on the front of the control box and observe the box Lute oil level, specifically in the inner small lower tube, for a period of typically 30 minutes. If the mineral oil level remains static, the glove box is gas tight.
4. If the oil level changes, repeat instructions 2 & 3, then observe the transfer port Lutes for any signs of bubbling. Also check for leaks using a propriety leak detector solution or similar, on all box joints and box intrusions (Breakthru's).

## **Gas Recirculator Module testing :-**

1. Close the two large blue valves on the gas recirculator and ensure the eight smaller valves located on the top and bottom manifolds are also in the "Off" closed (Handle horizontal) position.
2. On the control box, press on the red power switch located on the front panel. Gas will flow into the glove box until a pressure of approximately 2 inches WG is reached. (Box automatically "Tops Up").
3. Switch off the red power switch on the front of the control box and observe the box Lute oil level, specifically in the inner small lower tube, Open just the large blue valve on the top of the gas recirculator module. Observe oil level for 30 minutes. (You do not need to stay with the box, just check it after the 30 minutes).
4. If OK, open the large bottom blue valve and again observe oil level for a change for a period of typically 30 minutes. If the mineral oil level remains static, the gas recirculator pump itself and associated connections are secure and gas tight.
5. On Cartridge #1 (R/H side with Cal port connection) open just the small top valve (In Line handle) position) observe oil level for a change for a period of typically 30 minutes. If the mineral oil level remains static, then cartridge #1 itself is gas tight. Repeat for each of the other 3 cartridges or until a change of oil level is noted. This would indicate the source of the leak is in this cartridge or possibly the QRC connector. If no Mineral oil level change is seen, return to cartridge #1 and open the lower small valve. Observe oil level for a change for a period of typically 30 minutes. If the Mineral oil level remains static, the cartridge #1 valve and lower manifold are gas tight. Repeat test for each of the other 3 cartridges or until a change of oil level is noted.