

Standard Operating Procedure Leak Checking - Helium	SOP No. 6.007
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1 Purpose

1.1 To establish a standard format for helium leak checking of high purity gas lines.

1.1.1 INBOARD TEST: Helium is sprayed on all joints – mechanical and welded – while the line is kept under a deep vacuum (less than 5 torr).

1.1.2 OUTBOARD TEST – The line is filled with helium and a tracer probe (sniffer) is used to detect any possible leaks at mechanical or welded joints.

2 Scope

2.1 This procedure applies to testing high purity gas lines using helium leak detectors capable of sensing leak rate of $[1 \times 10^{-9}]$ cc/sec or smaller (inboard test).

Note: Outboard tests are performed with a sensitivity of $[1 \times 10^{-6}]$.

3 Reference

3.1 Operating manual for helium leak detector.

4 Definition

4.1 Torr: Unit of pressure equal to 1/760 of a standard atmosphere (14.7 psi)

4.2 cc/sec: Cubic centimeters per second (leak rate measurement)

5 Responsibility

5.1 Project Manager (PM) shall notify quality control inspector (QCI) when line needs to be tested.

5.2 QCI shall perform the following procedures and notify PM of the results.

5.3 PM shall notify the customer of findings.

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- 5.4 Ensure that standard calibration leak is traceable NIST (National Institute of Standards and Technology).
- 6 Materials Requirement
 - 6.1 Test port adapters.
 - 6.2 Helium cylinder, spray gun, and helium tracer probe (sniffer).
- 7 Test Equipment
 - 7.1 Helium leak detector capable of sensing leak rates of $[1 \times 10^{-9}]$
- 8 General Procedures
 - 8.1 Verify with the PM when it is safe to test.
 - 8.2 Record the customer's specifications for helium leakage on Form FN 7.027.1 (Analytical Test Report).
 - 8.3 Isolate the tube/line to be tested.
 - 8.4 Start-up and calibrate the helium leak detector.
 - 8.5 Connect the tube/line to be tested to the helium leak detector's test port.
 - 8.6 Follow proper operation steps as per operating manual for each helium leak detector.
 - 8.7 When performing an inboard test (most high purity tests are inboard) QCI shall start spraying helium on the nearest joint to the detector to avoid upstream contamination in case one or more joints are found to be leaking. Test shall be performed in the $[1 \times 10^{-9}]$ sensitivity range or as specified.
 - 8.8 If no leak is found proceed to step 8.14. Any detected leaks shall be recorded on form FN 7.027.1.
 - 8.9 Back fill tested line(s) with high purity Argon.
 - 8.10 Form (Analytical Test Report).
 - 8.11 Backfill the line with Argon welding purge.

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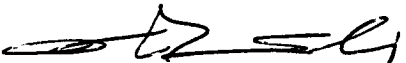
- 8.12 Notify the PM to repair all the leaks.
- 8.13 After all repairs are made and line pressure checked again, repeat steps 8.1 through 8.8.
- 8.14 If no leaks are detected or the leak rates detected are within the customer's specifications, proceed to the following step. Conversely, if detected leak rates exceed the customer's specifications the QCI shall immediately notify the PM.
- 8.15 After the test is completed, the line shall be filled with high purity Argon.
- 8.16 Tested lines shall be tagged appropriately: passed or failed.
- 8.17 If the line passes, hang the passed tag. Otherwise, hang the failed tag.

9 Review and Approval

- 9.1 QCI shall submit the passed Helium Leak Testing Report to the PM.


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Document Approval




 Quality Control Manager

3-17-99
 Date



 Field Operations Manager

3-19-99
 Date



 Quality Assurance Manager

3-24-99
 Date

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