ATLAS project document no.	Date last modified.	Approval status
ATL-IT-QP-0046	28 May, 2001	Full Production

1 Scope

1.1 Scope

This procedure establishes requirements to ensure there are no leaks in the completed assembly module.

1.2 Applicability

1.2.1 Applicability

This procedure applies to the process of verifying that all leaks have been eliminated by the Indiana and Duke University Production Facilities.

1.2.2 Relation to Other ATLAS Project Requirements

The quality assurance procedure described by this specification is in addition to other tests and inspections required for module assembly. Module assemblies may be shipped only after acceptable results from this inspection.

2 Applicable Documents

2.1 Document List

The following documents of the issue in effect on the effective date of this specification form a part of this specification to the extent specified herein.

2.1.1 AT-IT-EY-0004, ATLAS U.S. Environmental, Health, and Safety Plan

2.2 Amendments and Revisions

Whenever this procedure is amended or revised subsequent to its effective date, the Revised Version will be placed in the Engineering Data Management System, the Production Database displays, and released to the technicians. The QA Engineer and the affected Production Engineers will coordinate release to the technicians.

3 Requirements

3.1 ATLAS U.S. Responsibilities

The active gas volume of the module must be leak tight to reduce leakage of expensive active gas and to maintain the parity. This procedure uses rate of pressure drop of a known volume to measure the leak rate.

Appendix A provides a checklist to be used by Technicians performing this procedure.

3.2 Software Interface

Instructions for using VirtualBench-Data Logging Program

1. Select “Programs”, VirtualBench 2.1.1”. Select “Virtual Bench –Logger”.
2. On the menu bar, select “Load Settings”.
3. Enter name of Log file: Logger2.set.
4. On the menu bar, select “ Edit”, and then select “Settings”. Enter a unique data file name.
5. Select, “Enable Logging”, and Begin Logging on Start”.
6. Set “Start new file after N lines to 10000. Set “time Intervals in (Sec)” to 20
7. Select “Timing Configuration”.
8. Insure start manually & begin logging on start are selected.
9. Click “OK” twice.

Running Virtual-Logger

1. Ensure that "Logging On" button is selected.
2. Left click on "Start" button.
   - This program may be stopped at any time by selecting either " Stop" or "Pause". Data is then saved to the log file.
   - Before restarting the program, check the "file configuration settings" to ensure that "Append", "Logging Enabled", and "Start" are selected.
   - Data will now be appended to the log file upon restart.
3. Ensure Differential Pressure (Torr), Test Pressure, and Temperature all appear on the time scale. If either Red-Volts, White-Torr, or Yellow-Temp do not register, stop the program and notify Supervisor.
4. Upon completion of test, select "Print Screen". On screen data will be printed to the default printer.
5. Close Virtual-Logger.
6. Verify results by opening file: C:\Program files\National Instruments\VirtualBench\"File Name".

4 Preparation for Delivery

4.1.1 Storage, Packing , and Shipping Requirements

There are no storage, packing, and shipping requirements applicable to this procedure.

5 Environment, Health, and Safety (EH&S)

5.1.1 EH&S Invoked

Oxygen deprivation EH&S hazards may be associated with the conduct of this test. Technicians performing this test must follow instructions and guidance provided by the ATLAS U.S. EH&S plan (see paragraph 2.1.1 above).

6 References

6.1 ATLITB1_0001, Type 1 Isometric Assembly Diagram (Exploded)

6.2 ATLITB2_0001, Type 2 Isometric Assembly Diagram (Exploded)

6.3 ATLITB3_0002, Type 3 Isometric Assembly Diagram (Exploded)

Appendix A

Table Name: tblChecklistVerifyFinalGasTightness

Step Check List Steps

1 Scan the "Quality Assurance Procedure for Verifying Gas Tightness of Completed Module" Product ID barcode.

2 Connect one end of the module at the tension plate gas connectors to the supply connector of the leak test panel using PEEK tubing and a special stainless steel threaded adapter. Plug the unused gas connections. Enter "Done."

3 Set the Load/Test valve to Load and the exhaust valve to closed. Enter "Done."

4 If this is a Type 1 Module Assembly, display next step. Otherwise go to step 6.

5 Open supply valve to flush the active gas volume through the leak test panel and the tension plates with argon for 30 minutes at a rate of 200 cc/min (Steel ball on 60). Enter "Done."

6 If this is a Type 2 Module Assembly, display next step. Otherwise go to step 8.

7 Open supply valve to flush the active gas volume through the leak test panel and the tension plates with argon for 30 min at a rate of 300 cc/min (Steelball on 80). Enter "Done."

8 If this is a Type 3 Module Assembly, display next step, otherwise go to step 10.

9 Open supply valve to flush the active gas volume through the leak test panel and the tension plates with argon for 30 min at a rate of 400 cc/min (Steel ball on 110). Enter "Done."

10 Stop the flow and connect the opposite end of the module at the tension plate gas connectors to the sense connector on the leak test panel. Plug the unused gas connectors. Enter "Done."

11 Carefully open the supply valve and pressurize to 1/3 psig (40% of meter full scale). Turn off supply valve. Ensure that the metering valve in the gas supply line restricts the gas flow rate to a convenient value. Enter "Done."

12 If the module loses pressure at a rate obvious on the supply meter, enter "Reject", save this checklist, and send the module back for rework. If the pressure drop is negligible on the supply meter enter "Accept" and continue.

13 Flush the radiator volume with argon through the flushing gas holes in the shell at the same rate and for the same time as the active gas. When flushing is complete, reduce the flow to 100 cc/min (Black ball on 70). Enter "Done."

14 Readjust the pressure in the active gas volume to 1/3 psig (40% of full scale) by opening the supply valve with the supply-metering valve set to a convenient flow rate. Close the supply valve. Enter "Done."

15 Turn Load/Test valve to Test. If the differential pressure rises more slowly than 1 Torr/min, start the data-logging program for the leak test. Enter "Done."

16 Observe the rise in differential pressure over a period of at least 16 hours. If the pressure rises more than 1 Torr times the number of hours (16 Torr in 16 hours), contact an expert. Enter "Done."

17 Return the Load/Test valve to the Load position and disconnect both ends

of the module from the leak test panel. Enter "Done."

18 If the module assembly passes the inspection as described above, enter "Accept". Otherwise, enter "Reject", save the checklist, and contact the Supervisor.

19 Enter "Save" to save the data and exit the form. Enter "Cancel" to exit the form without saving.

Quality Assurance Procedure for Verifying Gas Tightness of Completed Module
Product ID Barcode

20ITIND0000887

Procedure Part Number

ATL-0000005759-0

Approvals

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