DISCLAIMER

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or the Regents of the University of California.
DOUBLET III NbIS  

VACUUM VESSEL  

FINAL LEAK TESTING PROCEDURE

After modifications to the NbIS vacuum vessel, the vessel will be leak tested once more time. The assembly shop will perform most of the work under Don Coyle's supervision. Additional effort will be provided by Jack Harvey of Mechanical Technology.

This leak testing will improve over the previous test (see M5241). The response time of the leak detection system to helium in-leakage is shortened. This is done by adding a 6" diffusion pump with the helium mass spectrometer is connected to the forepressure side of the diffusion pump. A Varian Smart Gage for monitoring the percent of nitrogen gas is also added.

Procedure

1. The assembly shop will clean and assemble the vessel in Building 6.
2. Jack Harvey and the assembly shop will work together in setting up the pumping and test equipments as in Figure 1.
3. Rough the vessel down to the 10-50 micron range with the Kinney KC 110.
4. Start up diffusion pump.
5. Open 6" gate valve to the diffusion pump slowly.
6. Value off the KC110 roughing pump and shut it down.

7. Start up leak detector pumping system.

8. After the system has attained base pressure, the leak detector is opened slowly to the fore-pressure of the diffusion pump.

9. Value off the diffusion pump's fore pump when the leak detector is pumping satisfactorily on the diffusion pump.

10. Calibrate the leak detector per manufacturer's operation manual.

11. Leak detector response time
    a. Note helium background value.
    b. Open sensitivity calibrator at spool #3.
    c. Note time it takes the leak detector to respond to the helium input.
    d. Note the value for the sensitivity calibrator.
    e. Close the sensitivity calibrator at spool #3.
    f. Value on fore pump to pump out the helium.

12. Leak testing the vessel
    a. Valve off the fore pump.
    b. Note helium background value.
    c. Spray helium over each weld joint. If there is no large leak, note the highest steady value.
(1) Hood the vacuum vessel by sections and fill with helium. Wait at least ten times the response time in (11) and note the steady value on the leak detector.

(2) Value on the fore pump.

(3) Shut down the leak detector.

13. Close the 6" gate valve

14. Shut down the 6" diffusion pump.

15. Spoil vacuum by admitting dry nitrogen gas into vessel slowly. (Set regulator at 15-20 psig)

16. Disassemble vessel and protect with plastic sheets and wood strips.
DOUBLET III NBIS VACUUM TANK

LEAK DETECTION SET-UP

VARIAN ION GAGE

SPool #3

2" VALUE

SPool #2

6" GATE VALUE & ELBOW

LN TRAP

SPool #1

6" DIFF. PUMP WITH COLD CAP

TC GAGE

VEECO MS-9 LEAK DETECTOR

VARIAN SMART GAGE

KINNEY KC-118 PUMP

2" LINE

MOL. SIEVE

15-0-15 PSIG COMPOUND GAGE

RELIANCE VALUE SET AT 2 PSIG

TC GAGE
This report was done with support from the Department of Energy. Any conclusions or opinions expressed in this report represent solely those of the author(s) and not necessarily those of The Regents of the University of California, the Lawrence Berkeley Laboratory or the Department of Energy.

Reference to a company or product name does not imply approval or recommendation of the product by the University of California or the U.S. Department of Energy to the exclusion of others that may be suitable.