

SCOPE:

Vacuum Leak Test, Internal Evacuation of Long Tubular Shapes.

TEST EQUIPMENT:

Mass Spectrometer Leak Detector calibrated to American Vacuum Society⁽¹⁾ (A.V.S.) Std. 2.1. Calibration shall be done daily during an active period of the day shift with the aim of establishing the Minimum Detectable Signal (M.D.S.). The Leak Detector shall have a Minimum Detectable Leak Rate of better than 2×10^{-9} Atm. cc/sec. of helium, and shall be equipped with a strip chart recorder per A.V.S. Std. 2.1. A Calibrated Leak. Helium gas, high purity grade or better. Leak Test Vacuum System with provisions for attaching a calibrated leak to the test item at the furthest point from the M.S.L.D. Sealing caps and plugs. Internal Vacuum Supports. Leak test label #MA-103015.

TEST PROCEDURE:

1. Insert vacuum supports. Evacuate the inside volume of the test item.
2. Open M.S.L.D. and hold at steady state (constant scale reading) for 60 seconds. Machine shall have been "warmed up" per manufacturer's instructions, and test shall be run only when the gauge reads less than 85% of the most sensitive scale.
3. Probe the test item with helium gas at all seams, welds, and joints.
4. Enclose the test item and completely surround it with helium gas for two (2) minutes.
5. Open Calibrated Leak at the furthest end of the system from the M.S.L.D. and wait for M.S.L.D. to reach steady state response.
6. Completely remove any vacuum grease using the specified cleaning and handling procedure for the test item.

TEST REPORTS:

1. Record the following data on the Q.C. Traveler Label:
 - a. Part Number.
 - b. Date and Time.
 - c. Operator's Last Name.
 - d. Scale Units before helium probing.
 - e. Scale Units while enclosure is helium flooded.
 - f. The Minimum Detectable Signal (M.D.S.) obtained from the latest calibration. (Scale Units)

REV.	DESCRIPTION	DRAWN	DATE
		APPD.	DATE

UNLESS OTHERWISE SPECIFIED			ORIGINATOR	G. Btattas/POWER
FRACTIONS	DECIMALS	ANGLES	DRAWN	E-KNEIP 4-27-78
±	±	±	CHECKED	
1. BREAK ALL SHARP EDGES 1/64 MAX.			APPROVED	APB 4-27-78
2. DO NOT SCALE DWG.			USED ON	
3. DIMENSIONING IN ACCORD WITH ANSI Y14.5 STD'1.			MATERIAL	
<input checked="" type="checkbox"/> MAX. ALL MACHINED SURFACES				
 FERMI NATIONAL ACCELERATOR LABORATORY ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION				
ENERGY DOUBLER VACUUM LEAK TEST SPECIFICATION INTERNAL EVACUATION-LARGE SYSTEM				
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				REV.

(1) American Vacuum Society, 335 East 45 Street, New York, New York 10017; Phone No. (212) 695-1940

TEST REPORTS(CONT):

REV.	DESCRIPTION	DRAWN	DATE
		APPO.	DATE

- g. The background before Test Procedure, Item 3 above. (Scale Units)
- h. The steady state gauge reading response to the Calibrated Leak. (Scale Units)
- i. The temperature corrected value of the Calibrated Leak (Std. cc/sec. helium).

2. Calculate the Minimum Detectable Leak (M.D.L.) using data recorded above and enter on Q.C. Traveler label.

TEST RESULTS:

- 1. A leak, as evidenced by an increase in the scale reading during test procedures 3 and 4 above shall be cause for rejection.
- 2. A calculated Minimum Detectable Leak greater than 2×10^{-8} Atm. cc/sec. of helium shall be cause for rejection.
- 3. Strip chart records from the M.S.L.D. calibrations shall be retained by vendor for inspection by cognizant Fermilab personnel.
- 4. Insert the label (do not peel off backing) into the part's packaging bag if applicable.

UNLESS OTHERWISE SPECIFIED			ORIGINATOR	
FRACTIONS	DECIMALS	ANGLES	DRAWN	
±	±	±	CHECKED	
1. BREAK ALL SHARP EDGES 1/64 MAX.			APPROVED	
2. DO NOT SCALE DWG.			USED ON	
3. DIMENSIONING IN ACCORD WITH ANSI Y14.5 STD'S.			MATERIAL-	
<input checked="" type="checkbox"/> MAX. ALL MACHINED SURFACES				

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ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

ENERGY DOUBLER
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