

SUNY POLYTECHNIC INSTITUTE

# Vacuum Components: Fastener and Seals, Assembly and Test Procedures Laboratory

A NEATEC Workforce Development Training Course

## Exercise #4 – System Integrity Check

### Task 1: Base pressure and helium leak check

- Install the vacuum pump or helium leak detector using the arrangement in Graphic 5.
- Using the table below to record your data, prepare as a team to record the readings from the KJLC 275i vacuum gauge at 30 second intervals upon opening the ball valve (**do not open yet**) to pump down the complete vacuum system.
- Close the vent valve.
- Inform your instructor your team is ready for pumpdown.
- The instructor will inform all groups to open their ball valves to begin pumping down the system.
- After opening the ball valve, record the pressure readings from the pressure gauge at 30-second intervals for 10 minutes. Record the readings from the KJLC 275i vacuum gauge at 30-second intervals and record in the table below until the pressure drops to less than 100 mTorr using the table below to record your readings.
- If your system has reached 100mTorr after 10 minutes, continue the pumpdown until the pressure does not drop lower. This may take 20 minutes or more.
- This final pressure value establishes the **Base or Ultimate pressure** of the system. Note the value in the data table below and then close the ball valve and vent the system. The pumpdown curve developed for this system indicates a system correctly assembled and tested.

Time (Seconds)	Pressure (Torr)
0	
30	
60	
90	
120	
150	
180	
210	
240	
270	
300	
330	
360	
390	
420	
450	
480	
510	
540	
570	
600	

Base Pressure \_\_\_\_\_ Torr @ \_\_\_\_\_ minutes

### Review Questions

- 1) What types of connecting flanges are used in this system?
- 2) A section of vacuum tubing has a KF-50 designation. What is its internal diameter?
- 3) What is the lowest pressure a given vacuum system can be pumped down to known as?
- 4) Given that a 5/16 hex head bolt has a flats 1/2 inch wide, an appropriate tool to install this bolt would be:
  - a) 12 inch crescent wrench
  - b) 3/4 inch socket set
  - c) 1/2 combination wrench
  - d) 13 mm wrench
- 5) What is the maximum temperature limit for a silicone O-ring?
- 6) What is the maximum bakeout temperature for this system?
  - a) 200C
  - b) 450C
  - c) 600C
  - d) 450C w/software removed