

VAP PRESSURE TEST

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Objective:

To determine pressure rating of new design of graphite gasket and 0.025" seal boss on VAP Insertion port. This data can then be used to determine if the graphite gasket and seal boss is sufficient for future use in the VAP assembly.

Summary:

The graphite gasket seal did not leak at any of the pressures tested and has been determined an effective means of sealing the VAP mount plate with the 0.025" seal boss on the port.

Procedure:

In order to test the pressure rating, an apparatus complete with a regulator and pressure gauge was assembled and the mount plate with gasket was attached **(A-2) Figures 1 and 2**. This was done using a 6" insertion port (6.25" mount-flat) and welding a cap on the end opposite the 6.25" mount. This insertion port also incorporated a 0.025" boss on the port **(A-1) Insertion Port and Gasket Reference**. This capped end was tapped with a 1/2" pipe which attached directly to a regulating valve **(A-2) Figure 3**. This regulating valve allowed for a gauge, which was added to confirm pressure in the system **(A-3) Figure 4**. On the incoming side of the regulating valve a standard hose connection was added and water was hooked up.

Next the graphite gasket was positioned between the insertion port and VAP mounting plate. Standard hardware (1/4-20 bolts, washers, nuts) was added and the mounts were tightened together. A 1/4" NPT pipe nipple was added to one of the two hex couplings on the mount which allows for attachment of a ball valve. This ball valve is necessary to adjust pressure in the system and help release any air pockets present when first adding water. It is only necessary to use one of the two hex couplings; therefore the other is plugged tightly. Upon turning the water on it is best to leave the ball valve open for several minutes, and then slowly close it when all the air is out of the chamber. Desired pressures can then be achieved through adjustment of the regulator valve.

This setup allowed for water to be introduced and adjusted to desired pressures. The chamber was tested at 3 chosen pressures for 30 minutes each. The unit was monitored for leaks throughout the process.

Discussion:

After 30 minutes at each of three pressures, there were no signs of leaks around the gasket. Following is a chart outlining pressures used and observed results.

PRESSURE MAINTAINED (PSI)	TIME AT PSI (MIN)	OBSERVATION
15	30	NO LEAKS
30	30	NO LEAKS
55	30	NO LEAKS

This test approves the addition of the 0.025” seal boss to all Insertion Ports. Also, the design for the gasket is approved and all probes should be shipped with the gasket design.

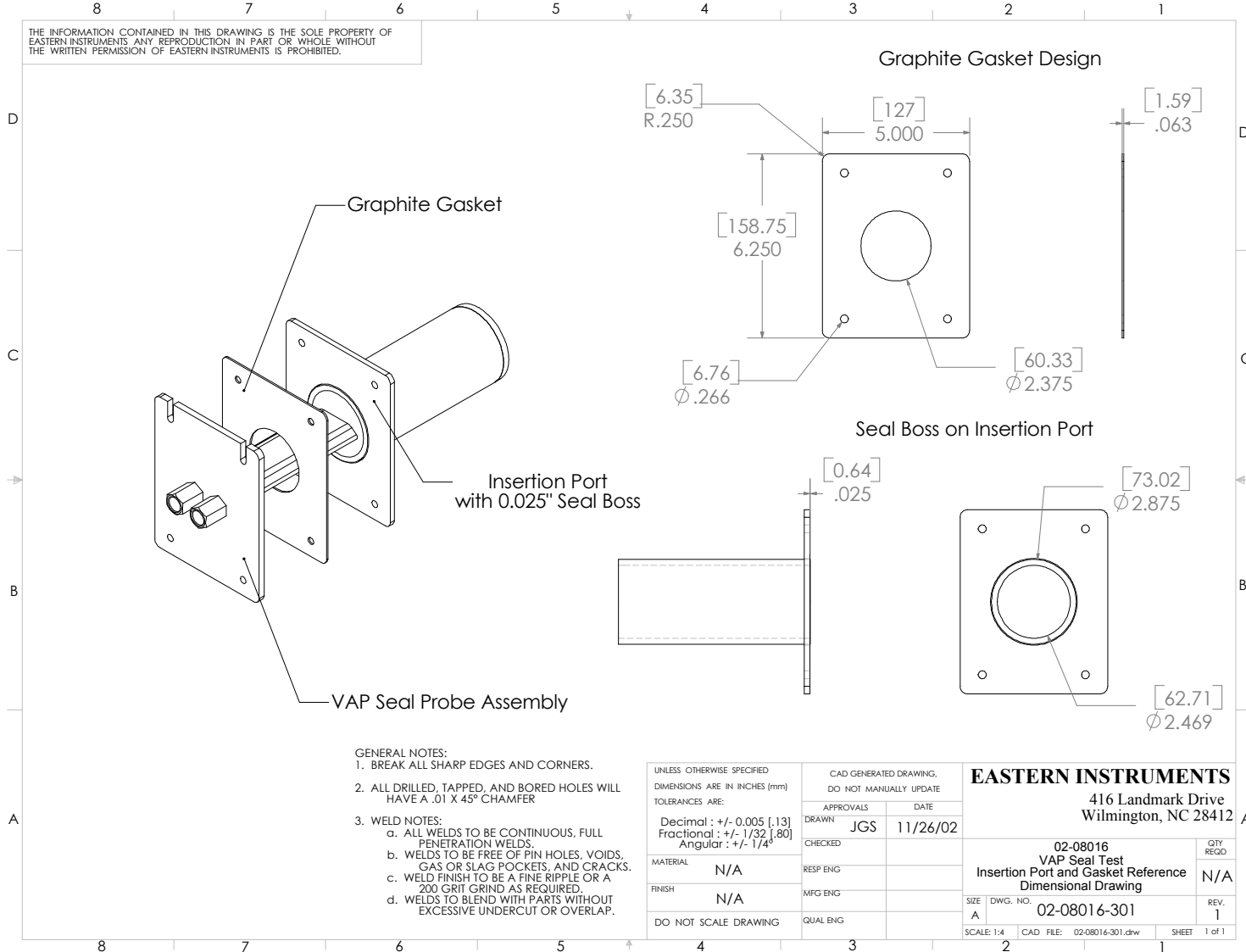
Further flatness and tolerance specifications need to be developed for the 0.025” seal boss drawings for all Insertion Ports.

Appendix:

(A-1) Insertion Port and Gasket Reference Drawing

(A-2) Apparatus Photographs

(A-1) Insertion Port and Gasket Reference Drawing



(A-2) Apparatus Photographs

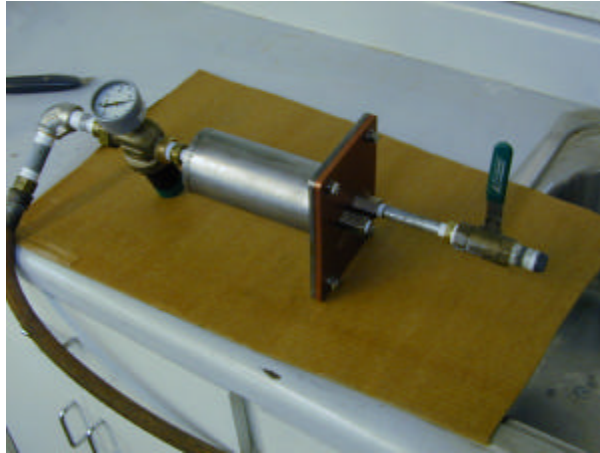


Figure 1 Test Apparatus View 1

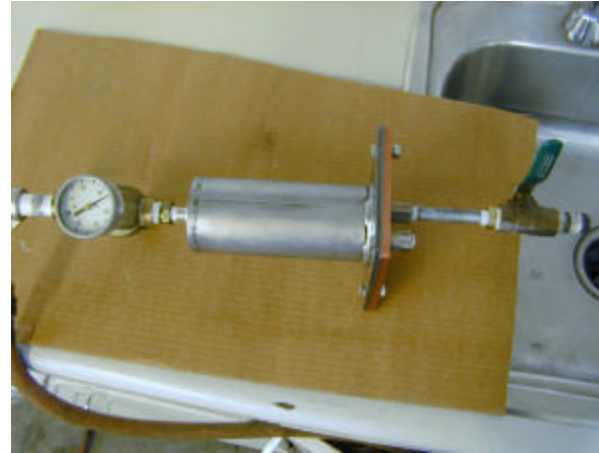


Figure 2 Test Apparatus View 2

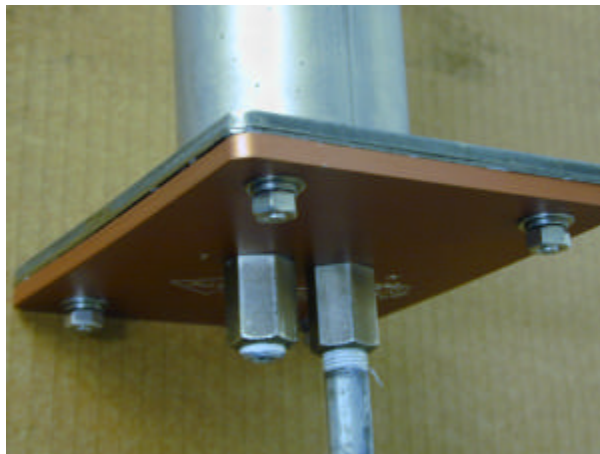


Figure 3 Fitting Overview



Figure 4 Pressure Gauge Overview