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# METAL SEALS FOR THE 1/2 SUPERPERIOD PUMPING MOCK-UP

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Upton, L.I., N.Y.

Addendum No. 1

to

AGS DIVISION TECHNICAL NOTE

No. 26

J. C. Schuchman  
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METAL SEALS FOR THE 1/2 SUPERPERIOD PUMPING MOCK-UP

The following metal seals will be used in this system:

<u>Quantity</u>	<u>Metal Seal Part No.</u>	<u>Replaces</u>
6	C-D05-578-3A	265056-4 Con-o-ring
12	C-D05-579-3A	265056-4 "
5	C-D05-585-3 A	265056-6 "
8	P/N 1035X-0041	265056-2 "
12	P/N 4.150/187/020/p/180	2-346 O-ring
4	continue to use Viton	2-220 "

Continue to use Viton O-rings on thermocouple connection and Vactronic valves.

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AGS DIVISION TECHNICAL NOTE

No. 26

J.C. Schuchman

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METAL SEALS FOR THE 1/2 SUPERPERIOD PUMPING MOCK-UP

The mock-up vacuum system for the conversion program will eventually be converted to an all-metal sealed system. Pump down tests, ultimate pressure and a direct comparison with the rubber-sealed system will then be studied.

The purpose of this note is to describe the metal seals which will be used in the mock-up.

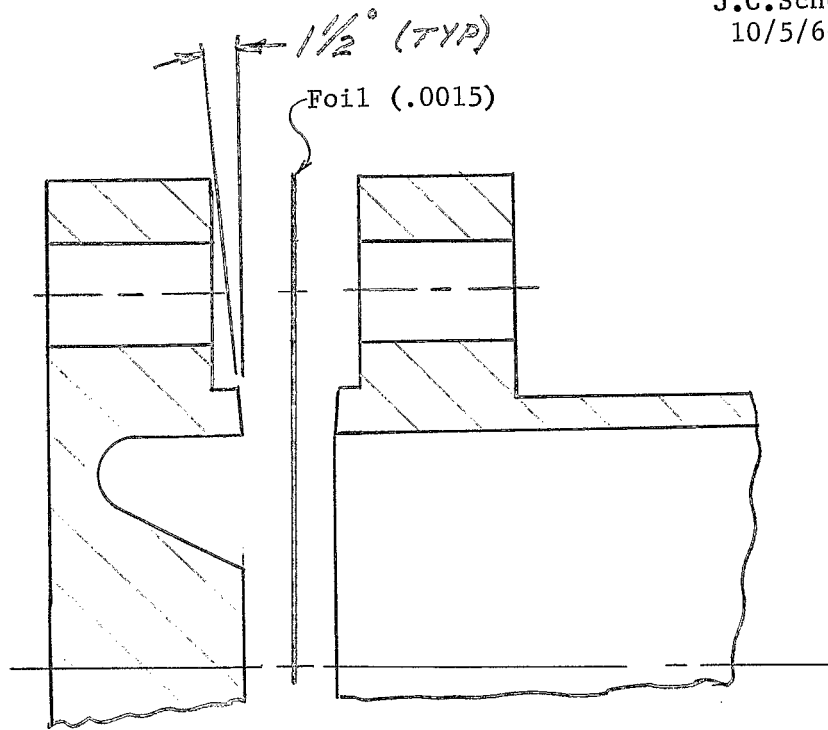
The system is presently designed for con-o-rings, (a retained O-ring used between plain flat flanges), and O-rings in standard groove configurations. We plan to use a modified aluminum foil seal (Fig. 1) in place of the con-o-rings, and either "C" rings (Pressure Science Corp.), metal O-rings (DSD Co.) or "Lo-load" seals (Advanced Products Corp.) to replace the rubber O-ring.

A test was made using a modified aluminum foil seal on mating components of the actual mock-up. A joint was made-up using standard cleaning and assembly techniques. The clamping bolts were torqued to increasing values and the joint leak checked at each torque level. The joint was successfully sealed at 375 in.lbs using (8) 1/2-13 bolts. This is roughly equivalent to 1660 lbs/lin. in. The standard aluminum foil design recommends 2000 to 3000 lb/lin. in., but this is for a bakeable joint.

It should be noted that the standard foil design stores energy by having the flanges rotate about the seal area. This feature maintains sealing pressure during thermal cycling. In the modified design the flanges are more rigid and rotate less, but for room temperature applications it appears to be adequate. One mil aluminum foil was used, and there was no observable deformation of the aluminum flanges.

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\*Standard Aluminum  
Foil Seal



Modified Aluminum  
Foil Seal

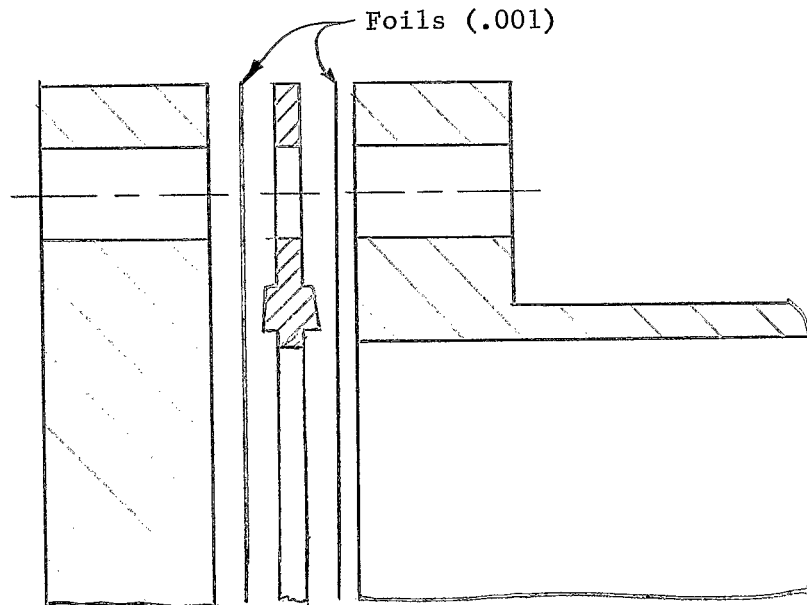


Fig. 1

\*Reference: TH Batzer, Flange design using aluminum foil for UHV applications,  
UCRL-7393, ENA-129, Nov. 1963