

Specifications:

Test article to provide validation of a sealing approach for high conductance vacuum swing adsorption process:

Introduction:

To attain high efficiency in vacuum swing adsorption processes, high vacuum conductance is required. NASA Marshall Space Flight Center is in the process of designing a new class of compact adsorption canisters that incorporate the valve functions within the canister, have large vacuum ports for efficient desorption, provide high vacuum conductance, and have low torque requirements for cycle transitions. In order to achieve these goals, a sealing approach similar to that used on the Skylab 2-Bed Molecular Sieve 5-way valve has been chosen. This valve used an arrangement of narrow cross-section seals injected molded in place on an inner cylinder. Cycle transitions were achieved by rotation of the inner cylinder to a second position.

Specifications:

This procurement is to obtain a test article that will be used to validate the sealing approach for the intended application. The test article is shown in the attached drawing. Specific requirements are:

1. Full Vacuum Across 1.25" And 2.25" Diameter Ports
2. Allow for Reverse Rotation of Drum
3. Number Of Cycles Expected: 4-180 Degree Turns/Hour/Year Example: +180 Deg., -180 Deg., +180 Deg., -180 Deg, each hour for a total of 35,000 Cycles
4. Static Temperature: 400 F
5. Dynamic Temperature: Ambient/Room Temperature

Certain design parameters are expected to be determined by the vendor as follows. All determined design parameters are to be discussed with NASA MSFC prior to actual fabrication of the testing article.

1. Seal Compression
2. Seal Groove Width and Depth
3. Clearance to Outer Drum to Insure No Scraping Occurs
4. Seal Material