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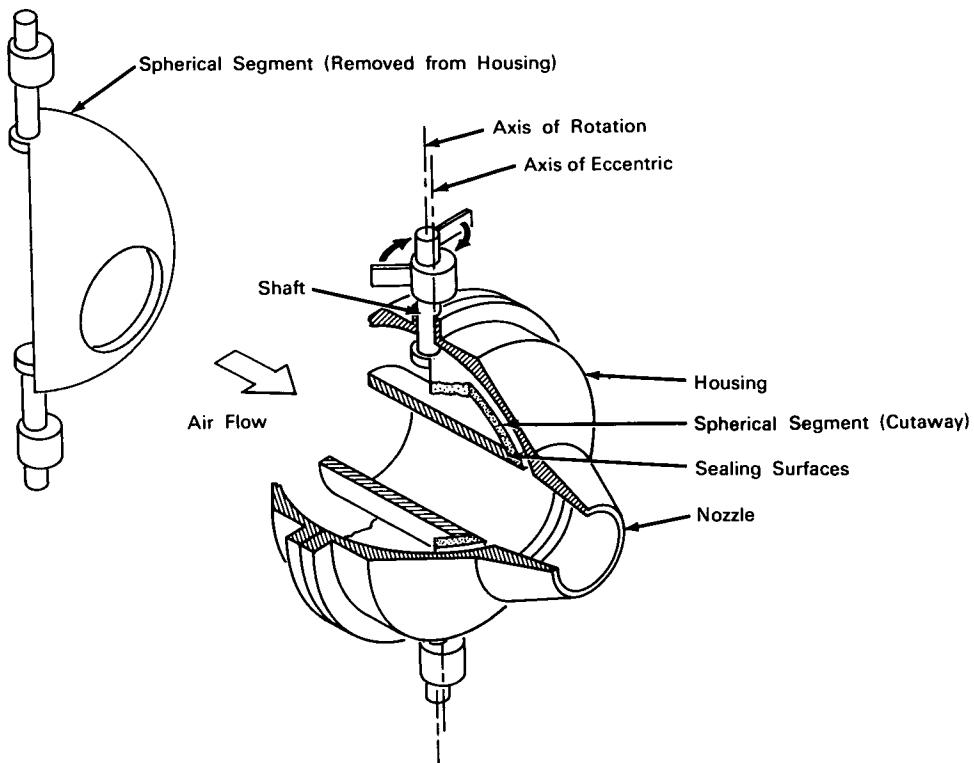
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NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the NASA space program.

High-Temperature, High-Pressure Spherical Segment Valve Provides Quick Opening



The problem: To design a valve for air, or other gas, which would provide quick opening at valve discharge pressures up to 2,000 psig and temperature up to 2,500°F.

The solution: A special hollow spherical segment valve with an eccentric which permits non-rubbing closure and provision of a means for gas-cooling of the seal.

How it's done: The hollow spherical segment is rotated into and out of the air stream by a hydraulic

cylinder (not shown) and an arm attached to the shaft on which the segment is mounted. An eccentric, actuated by a second hydraulic cylinder (also not shown), provides a non-rubbing action by creating a one-eighth-inch free space between the sealing surfaces before the segment is rotated into seating position. The creation of this one-eighth-inch space serves to shift the pressure load from the valve body to the segment shaft bearing, making rapid operation possible. The area around the seal is gas-cooled to permit

(continued overleaf)

operation at high temperature.

Notes:

1. The non-rubbing seals should make this type of high-pressure valve useful in controlling the flow of abrasive slurries and in applications where large-bore, fast-response valves are required.
2. This valve is capable of being operated from closed to open condition at low pressure drops (up to 400 psig).
3. A large valve of this type (throat diameter 22 inches) was specially built for installation at the outlet of a pebble-bed heater ahead of a hypersonic

wind-tunnel test nozzle and incorporates a number of costly features.

Patent status: NASA encourages the immediate commercial use of this invention. It is owned by NASA, and a patent application has been filed. When patented, royalty-free non-exclusive licenses for its commercial use will be available. Inquiries concerning license rights should be made to NASA Headquarters, Washington, D.C. 20546.

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