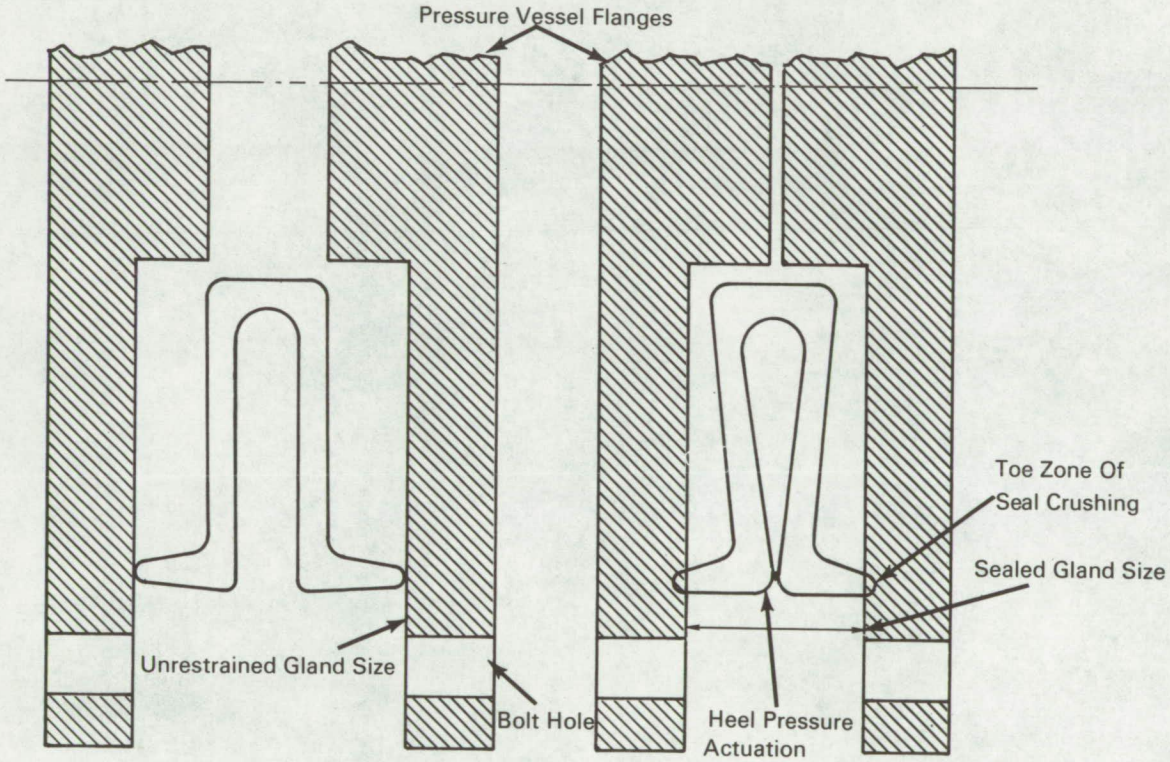
December 1967

Brief 67-10539

AEC-NASA TECH BRIEF

Lead Plated Aluminum Ring Provides Static High Pressure Seal for Large Diameter Pressure Vessel



The problem:

To provide a static seal for a large diameter pressure vessel for use in a hazardous environment at cryogenic temperatures with high pressure fluid flow. Commercially available metal and O-ring type seals would not satisfy the requirements.

The solution:

A ring-type seal of special cross-section design utilizing an aluminum body with a lead plating.

How it's done:

The small cross-section configuration of the seal design is shown. The aluminum seal's unrestrained gland size was slightly less than 1/2 inch, and the soft lead was electroplated to a thickness of 0.003 to 0.005 inch. When the bolt flanges are drawn together, the contacting toes are crushed and pressure actuation takes place at the heel providing a positive static seal.

(continued overleaf)

Notes:

1. This design was successfully used in a hazardous environment at cryogenic temperatures under working fluid pressures of 750 psig. The seal was installed in an aluminum alloy pressure vessel flange joint whose diameter was in excess of 50 inches.
2. This design can be used in high and low pressure lines of any diameter for any fluid, with appropriate material modification.
3. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   AEC–NASA Space Nuclear
   Propulsion Office
   U.S. Atomic Energy Commission
   Washington, D.C. 20545
   Reference: B67-10539

Patent status:

No patent action is contemplated by AEC or NASA.

Source: J. N. Locke
of Aerojet-General Corp.
under contract to
AEC–NASA Space Nuclear Propulsion Office
(NUC-10008)