

May 1971

Brief 71-10116

# NASA TECH BRIEF

*NASA Pasadena Office*



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

## Metal-to-Ceramic Seals: A Literature Survey

A survey of the unclassified literature on the technology of metal-to-ceramic seals was conducted in order to obtain information that would further the design and development of such seals for nuclear thermionic converters. Previous surveys, though extensive, did not cover recent progress in this technology.

The more recent data available covers such topics as radiation damage to ceramics, alkali metal corrosion, active-metal brazing techniques, and graded cermet seal characteristics, all of which are particularly relevant to the field of thermionics. These data are reviewed, and a discussion of that review is presented, along with a summary of the earlier work in the field.

The report covers the topics mentioned, as well as diffusion bonding, techniques currently used in thermionic diodes, various types of brazing techniques, corrosion testing of seals and components, and certain types of seals now being used.

### Reference:

State-of-the-Art Review of Ceramic-to-Metal Joining, AFML-TR-65-143, Air Force Materials Laboratory, Wright-Patterson AFB, Ohio. May 1965.

### Note:

The following documentation may be obtained from:

National Technical Information Service  
Springfield, Virginia 22151  
Single document price \$3.00  
(microfiche \$0.95)

### Reference:

JPL Technical Report 34-1420 (N70-19773),  
Metal-to-Ceramic Seals for Thermionic Con-  
verters: A Literature Survey

### Patent status:

No patent action is contemplated by NASA.

Source: W. M. Phillips of  
Caltech/JPL under  
under contract to  
NASA Pasadena Office  
(NPO-11430)

Category 03,08