December 1971

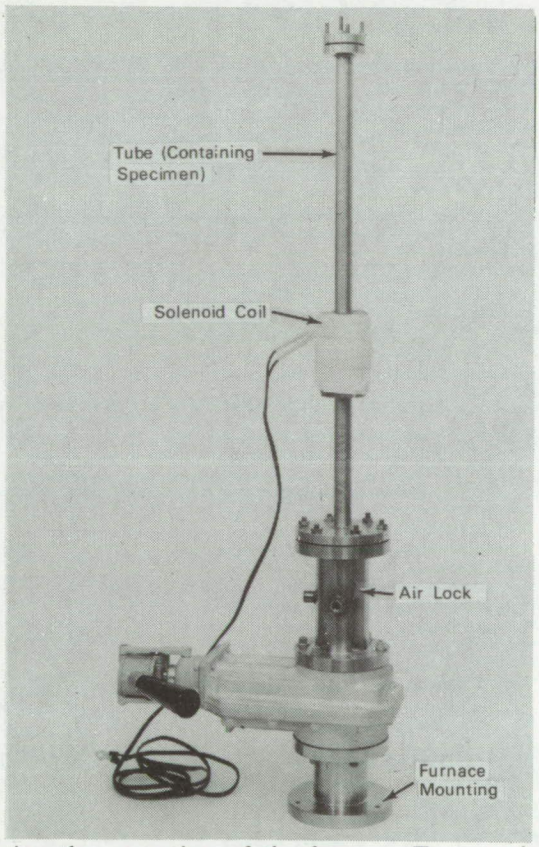
Brief 71-10493

NASA TECH BRIEF

Langley Research Center

Air Lock Mechanism Speeds Specimen Testing in High-Temperature Vacuum Furnaces

A new air lock mechanism (see figure) allows high-temperature test-rod specimens to be inserted into and removed from a vacuum furnace without interrupting the operation of the furnace. Test specimens may be cycled at specified temperatures and pressures in less than twenty minutes, saving several hours over the time required with conventional high-temperature vacuum furnaces not equipped with this mechanism.



The air lock, made of 347 stainless steel, is attached to a furnace port by a bolted flange. The unit incorporates a quick-opening, high-vacuum valve and associated fittings which provide connections to the air lock evacuation and to an inert gas supply for quenching the specimen after it is withdrawn from the furnace into the air lock. During the quenching period, the pressure of the inert gas in the air lock is equalized with that of the atmosphere by means of a relief valve.

A rod specimen is introduced into or extracted from the furnace through a tube welded to a flange mounting on the air lock. One end of the specimen is held in a gripping device which is suspended from a long tantalum rod fastened to an iron slug (solenoid armature), and the entire assembly is inserted into the tube opening at the far end of the air lock. The specimen is inserted into or removed from the continuously operating furnace by moving the external solenoid coil along the length of the tube, with the motion relative to the internal iron slug.

Notes:

1. Related information is contained in NASA Tech Brief 68-10135.
2. No additional documentation is available. Specific questions, however, may be directed to:

   Technology Utilization Officer
   Langley Research Center
   Langley Station
   Hampton, Virginia 23365
   Reference: B71-10493

(continued overleaf)

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to:

Patent Counsel
Mail Code 173
Langley Research Center
Langley Station
Hampton, Virginia 23365

Source: C. Whitehead
Langley Research Center
(LAR-10841)