

NASA TECH BRIEF

Manned Spacecraft Center



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An Improved Gas Extraction Furnace

As part of the analysis of rocks, gas that is trapped within a rock is extracted by placing the specimen in a specially designed glass furnace where it is vacuum heated to melting by rf induction. Because of its ability to penetrate through most substances, helium presents special problems in this extraction. At these high temperatures, the helium will leak through the walls of the glass furnace unless a special glass of low helium permeability is used. But, because the impermeable glass will melt at the temperatures used in the extraction, the glass furnace must be jacketed and water cooled. Figure 1 is a drawing of a conventional gas extraction furnace. This impermeable glass is very difficult to work, and therefore, sealing the water jacket to the vacuum jacket is a costly procedure that can be done by only a few specially skilled glass blowers.

To avoid this expense, the water jacket may be sealed to the impermeable glass with a reusable Teflon O-ring. This is a much simpler operation. Also, since the two glass jackets are not directly fused, the water jacket does not need to be made out of the expensive impermeable glass. Figure 2 is a drawing of the improved furnace. This improved seal will last longer than a glass blown seal which often breaks from the strain of rapid heating and cooling.

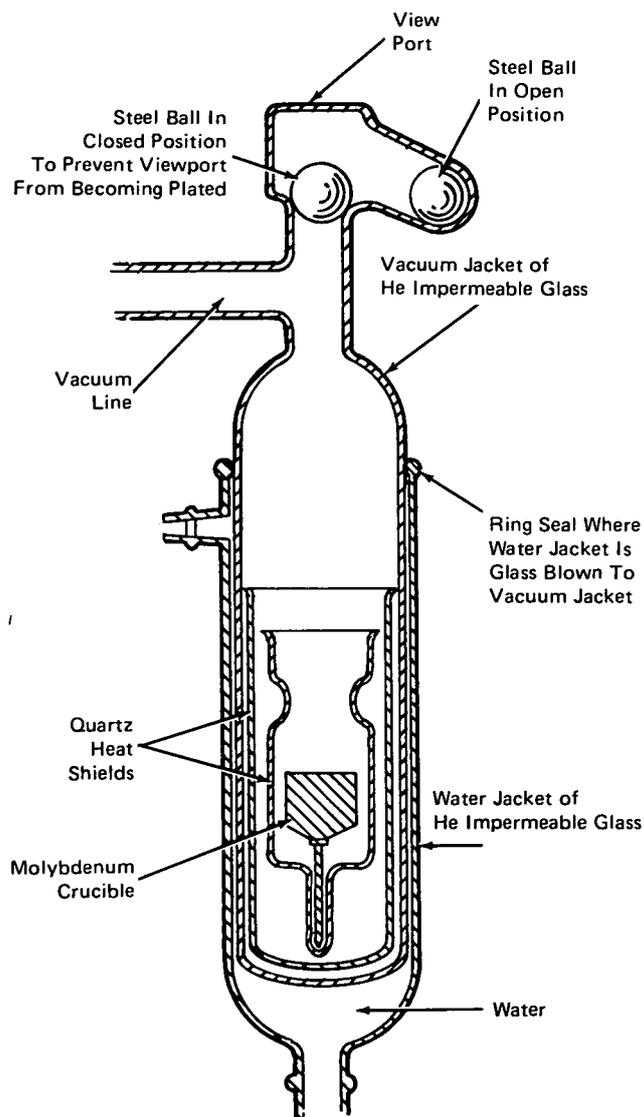


Figure 1. Conventional Gas Extraction Furnace

(continued overleaf)

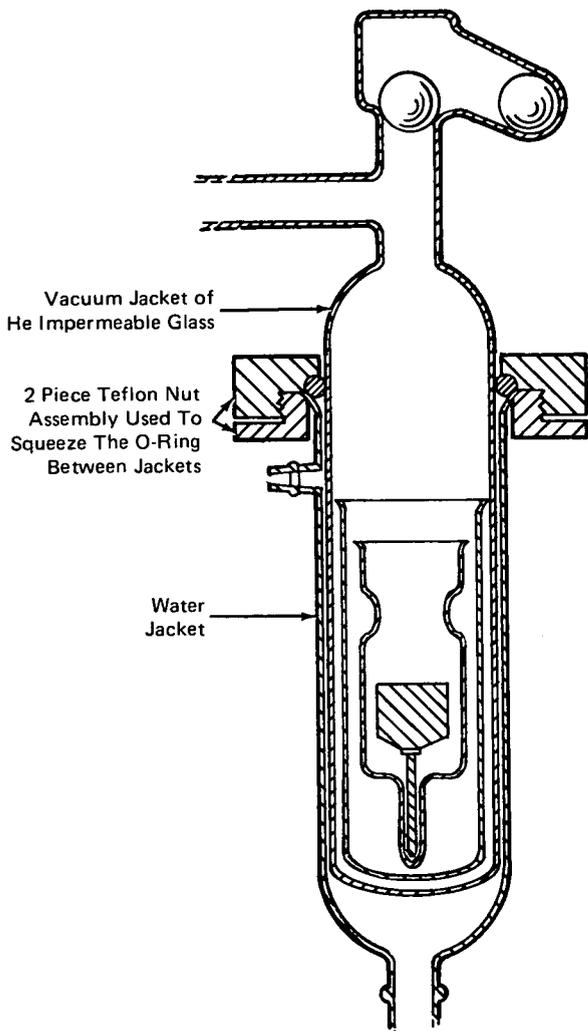


Figure 2. Improved Gas Extraction Furnace

Note:

Requests for further information may be directed to:
 Technology Utilization Officer
 Manned Spacecraft Center
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 Houston, Texas 77058
 Reference: TSP72-10544

Patent status:

NASA has decided not to apply for a patent.

Source: Randolph B. Wilkin of
 Brown & Root-Northrop
 under contract to
 Manned Spacecraft Center
 (MSC-14138)