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Brief 67-10377

NASA TECH BRIEF

Stabilizing Stainless Steel Components for Cryogenic Service

The problem:

Stainless steel valve components commonly experience warpage or creep after being placed in service in cryogenic systems. The resultant dimensional changes can cause leakage of the cryogenic fluid.

The solution:

The valve components are machined to a semifinish and then immersed (cold soaked) in a bath of the cryogenic liquid in which the components are to operate for approximately two hours. After this cold-soak treatment, the components are returned to ambient temperature and machine finished to the final drawing dimensions. By this procedure, the residual stresses and strains that would otherwise be produced in the metal during service are set up before the final machining step.

Notes:

1. This procedure has been used by the Rocketdyne Division of North American Aviation, Inc., in the fabrication of stainless steel valve components for cryogenic systems for several years.
2. Inquiries concerning this procedure may be directed to:
   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama 35812
   Reference: B67-10377

Patent status:

No patent action is contemplated by NASA.

Source: C. F. Holden
of North American Aviation, Inc.
under contract to
Marshall Space Flight Center
(MFS-13127)

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