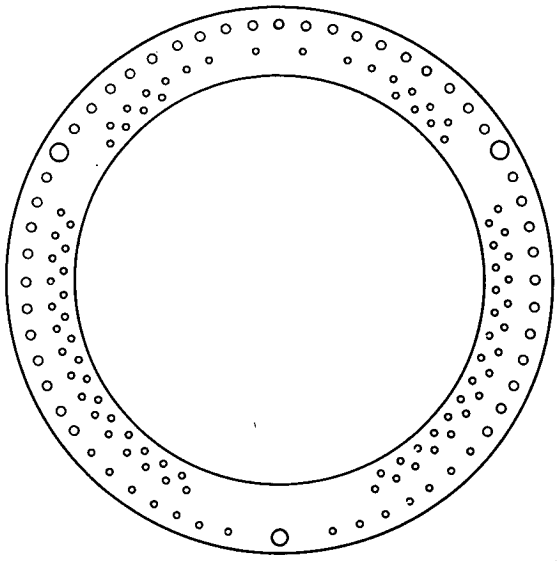
NASA TECH BRIEF

Manned Spacecraft Center

Dispersion Ring Reduces Injector Orifice-To-Orifice Flow Variation



Dispersion Ring Showing Hole Pattern

A new technique permits a significant reduction of the orifice-to-orifice flow variation in an injector. A dispersion ring in each manifold ring groove, upstream of the injector orifice rings, adjusts orifice-to-orifice flow.

Current methods of flow adjustment involve reconfiguration of the manifold canals. Utilization of the dispersion ring technique substantially reduces machining complexity. In addition, the ring is successful in reducing the systematic and random orifice-to-orifice flow variations from values of 10 to 15 per cent of mean orifice flowrate to less than 5 per cent.

The tapered ring grooves of the injector are deepened at a constant additional depth and the dispersion ring is installed resting on, and welded to, the lands protruding from the groove walls. A pattern of holes is drilled in each dispersion ring with relative low open area (hole area/ring area) in locations under the injector inlet (region of high static pressure) and at the 180-degree stagnation point, with more open area in regions between these two points. Varying the spacing of equal-diameter holes, rather than varying hole diameter at constant spacing, accomplishes the desired programming of open area around the groove.

This technique improves injector performance and may be useful for products mixed or homogenized by an injector process. It is applicable to the pharmaceutical, food, dairy and petrochemical industries.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Manned Spacecraft Center, Code JM7
Houston, Texas 77058
Reference: TSP72-10117

Patent status:

No patent action is contemplated by NASA.

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