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Brief 66-10319

NASA TECH BRIEF

Fiber Length and Orientation Prevent Migration in Fluid Filters

The problem:

In the filtering of fluids, migration of particles of the filtering media introduces new contamination of the fluids.

The solution:

An improved stainless steel fiber web that resists fiber migration due to construction techniques employed.

How it's done:

A filter medium is made from relatively long 4- and 8-micron diameter stainless steel fibers. The fibers are randomly oriented in a matlike structure that is sandwiched between two stainless steel screens of 80 by 80 mesh. This screen–mat–screen assembly is then pleated on a conventional commercial pleating device. The pleated assembly is clamped around a perforated center tube and sintered in a dry hydrogen atmosphere at 2,050° F for 30 minutes, then cooled rapidly in the same atmosphere. End flanges are attached and sealed with a filled epoxy resin and the resin is cured for one hour at 250° F.

Notes:

1. This device exhibits excellent filter medium retention in the presence of fuel flow at high rates. Comparative tests with other media indicate that this is a result of the length and random orientation of the fibers plus the sintering step in manufacture.
2. Laboratory tests indicate that this filter element should be capable of holding up to five times as much particulate matter as conventional filters before reaching an arbitrary cutoff pressure drop.
3. Inquiries concerning this invention may be made to:

   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama 35812
   Reference: B66-10319

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Peter A. Reiman
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