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NASA TECH BRIEF

Wire Material Reduces Compressor Blade Vibration

The problem:

Compressor blade vibrations often severely limit the choice of design and operating conditions of "high-aspect-ratio" compressor blading. The use of titanium wires to friction-damp blade vibrations has generally been unsatisfactory due to wire galling and wear.

The solution:

A wire material (Inconel) having high friction and low wear characteristics, which reduces vibratory stress and prevents blade failure.

How it's done:

Two 1/16-inch oxidized Inconel wires were installed on an experimental compressor to damp both bending and torsional vibrations. This damping reduced vibratory stress to about 1/20 of the undamped stress and prevented failure. After nearly 10 hours of operation, no significant wear was observed on the blades and maximum wire wear of 0.0008 inch was noted.

Note:

Inquiries concerning this innovation may be directed to:

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Reference: B66-10666

Patent status:

No patent action is contemplated by NASA.

Source: R. L. Johnson
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Category 03