

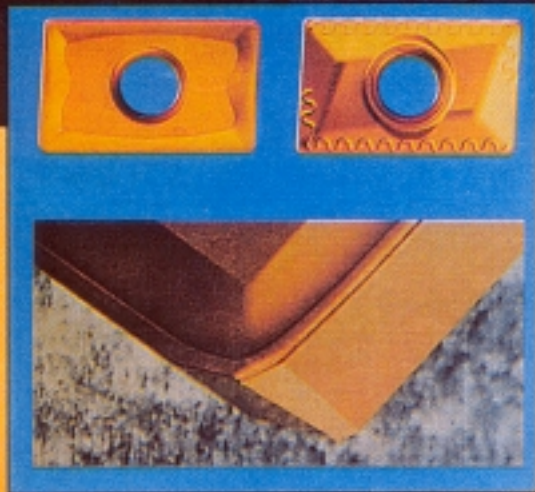
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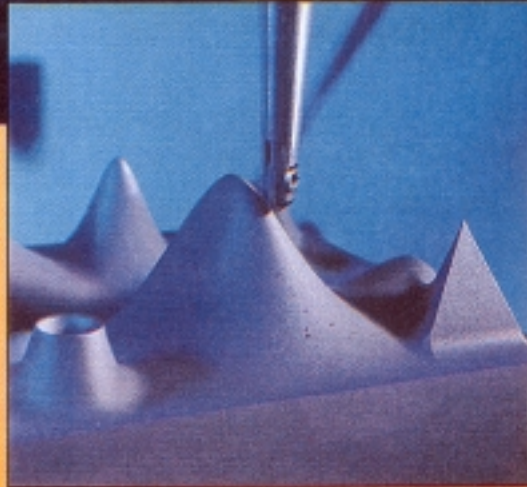
# AMERICAN MACHINIST

THE INTERNATIONAL MAGAZINE OF MANUFACTURING TECHNOLOGY

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## Aircraft

### Workholding system uses suction-cup power

**A** unique workholding system that uses highly accurate actuators with a "suction cup" device has helped an aircraft manufacturer slash setup times and costs by 50%.

The company, Northrop Grumman of Hawthorne, Calif., uses the Pogo flexible tooling system to hold parts such as aircraft skins, spars, bulkheads, and stringers in preparation for machining. The Pogo system, manufactured by CNA Flexi-

ble Tooling Systems of Redmond, Wash., and marketed by Cincinnati Milacron, Cincinnati, uses a 10×10-in. on-center grid pattern of Pogo actuators that automatically configure to hold parts. Imbedded motion controllers regulate a programmed 30-in. stroke to within ±0.003 in. Actuators are easily replaced or relocated because there is no external wiring or plumbing.

The end of each actuator has a

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## TECHNOLOGY TRENDS



## Aircraft

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free-floating, vacuum end-effector or suction cup. They tilt 40° while maintaining a 360° range of motion, and sensors signal if the 50-lb vacuum-pull is not reached. Reversing the air flow creates an air-bearing capable of resisting over 800 lb.

Milacron claims the system can not only lower tooling costs by 50% over dedicated workholding, it can also raise machine tool in-cut time 90%. Applications include aviation, space, and defense industries with integrated, turnkey systems for high-throughput, CNC machining of large, non-prismatic parts. ■

The Pogo flexible workholding system uses a grid of actuators to adjust to part shapes to provide automated flexible workholding for machining of large, variable geometry parts, like this section of aircraft skin.

