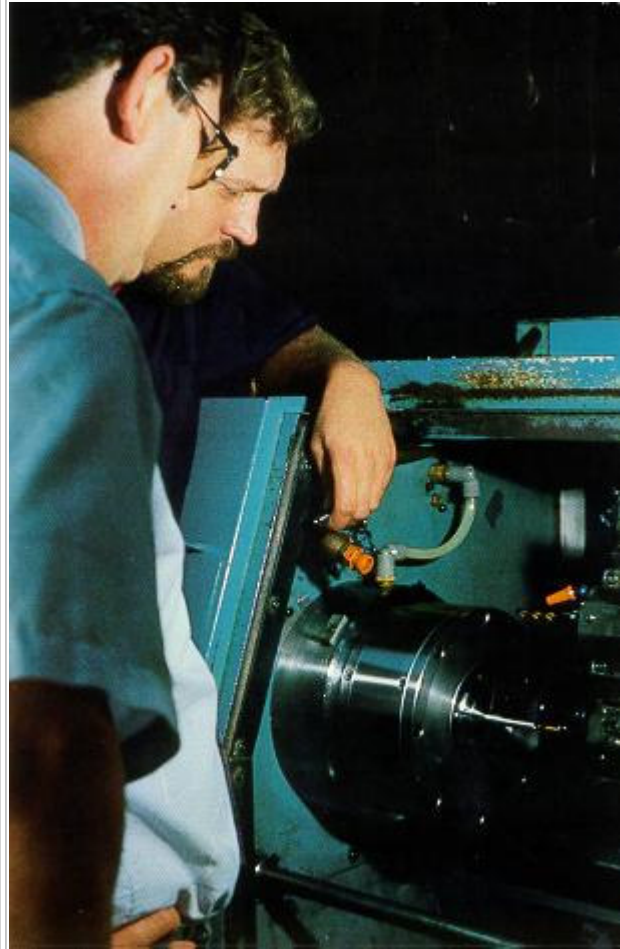


American Machinist Casebook

Air-release chuck solves workholding problems

Roseland Metal Products (Dolton, IL) is a parts supplier to the appliance, plumbing and automotive industries. In addition to several Brown & Sharpe and New Britain screw machines, the company also has a Mazak Quick Turn 10 lathe. After several years of poor workholding performance from the three-jaw chuck used on the lathe (A2-6 spindle with a 2.20" through hole), Roseland purchased an air-operated collet chuck which eliminated the grip-force issues. However, maximum productivity was now limited due to the chuck's narrow gripping range which limited stock variation to +/- 0.005". This limited gripping range required the purchase of numerous collets at a cost of approximately \$200.00 each. The chuck also restricted the workpiece size to 2" in diameter as well. Machine operators now found themselves switching between the three-jaw chuck and the collet chuck on a regular basis to accommodate the particular job's requirements. This procedure increased setup time for short production runs to an unacceptable level.

In February 1991, the company purchased an FB27 Full Bore® Chuck from Production Dynamics of Valparaiso, IN (now Lexair, Inc). This unit is an eight inch diameter, mechanical grip, air released chuck. The self-contained, front mounted unit permits full use of the spindle capacity as the drawtube is no longer necessary and the chuck features true fixed-length positioning. Grip force remains constant regardless of rotational speed and is adjustable so less force can be applied when turning softer materials. Clamping force is easily changed by tightening or loosening the collet using the spanner wrench holes in the front of the collet. The chuck does not require an external actuator as the air release is built into the chuck itself. (**Air is used only to open the chuck**) Several sets of die springs mounted in the axial, not the radial position provide the mechanical force that holds the workpiece while it is being machined.



***BEFORE:** Three-jaw chuck and air-operated collet chuck had gripping related problems that affected production.*

***AFTER:** The Full Bore® Chuck from Production Dynamics (now Lexair, Inc.) provides constant grip force regardless of spindle speed allowing for increases in production of up to 40%.*

productivity. For example, a 40% increase has been experienced in the machining of a precision spacer with a 1-5/8" OD and 1" ID. This stress-proof steel part was formerly produced one at a time due to grip-force limitations during the initial boring operation. The Full Bore® Chuck allows bar stock to be advanced to a suitable length for the manufacturing of ten parts at a time with no pushback during the boring process. **Ease of setup is another benefit.** By using Warner & Swazey or Hardinge pads with master

Therefore, the part remains safely clamped in place even if air pressure to the machine is lost.

Since the incorporation of the Full Bore® Chuck into the lathe, the chucks that were previously used have not been required and there have been substantial increases in

collets, the pads or collets themselves can be changed in less than five minutes. Since the installation of the Full Bore® Chuck by Roseland, fifty different parts have been produced.