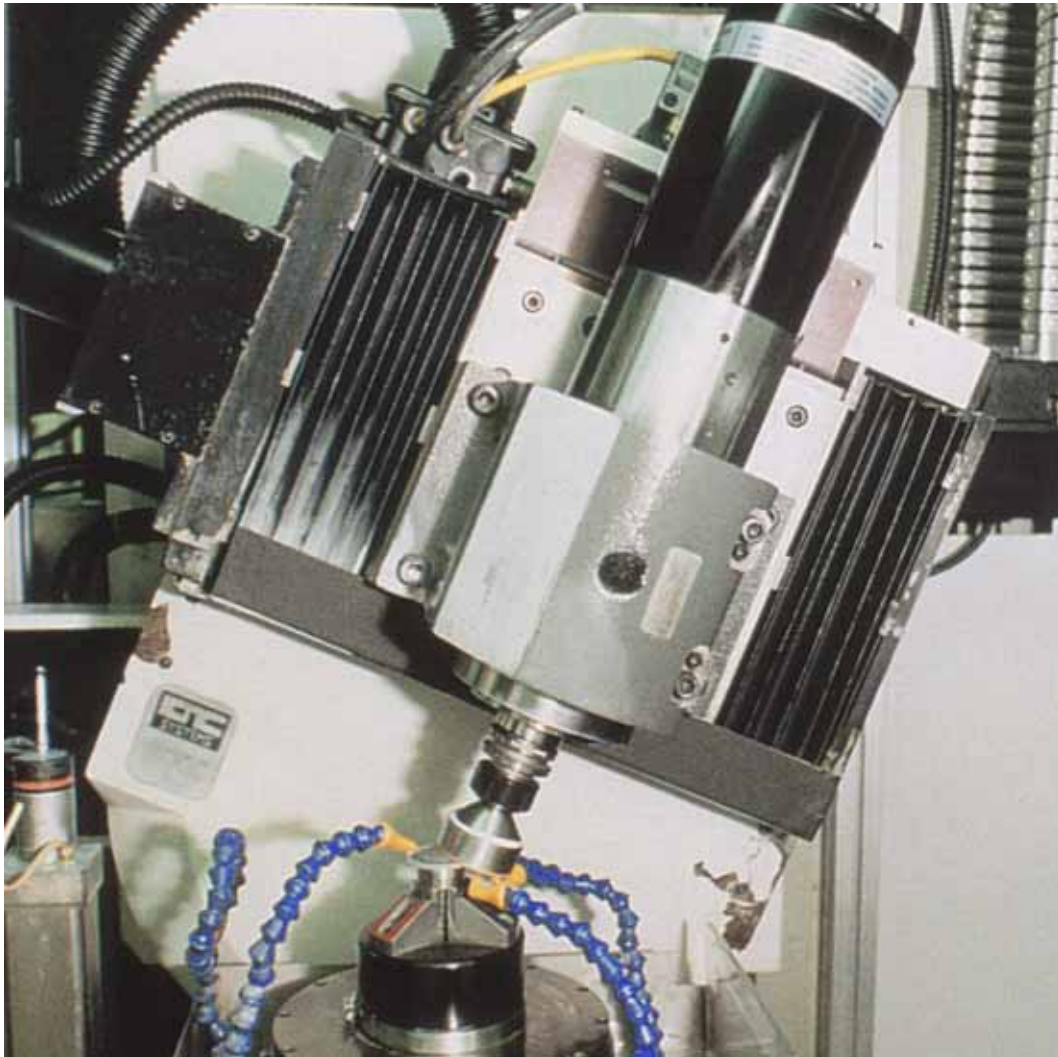


OPTIPRO AND PRECISE HIGH SPEED SPINDLE SYSTEM TEAM UP TO AUTOMATE SPHERICAL OPTICS GRINDING



PROBLEM SOLVED

Combining computer numerically controlled (CNC) technology from the machine tool industry with a 13 kW (17 hp) **precise** spindle that delivers speeds up to 30,000 rpm has created an automated system that can produce lenses in minutes instead of hours or days. It provides a complete, affordable package of capabilities that helps the U.S. optics industry compete in the world market in a normally labor-intensive field.

CUSTOMER BENEFITS

- Spindle provides the speed, power, rigidity and accuracy needed for precision optics manufacturing.
- Liquid cooling maintains a stable operating temperature.
- Spindle's pneumatically-actuated drawbar increases productivity through automatic tool change.
- Infinitely variable speeds from 5,000 to 30,000 rpm are ideal for typical 50mm diamond wheel diameter.

PRECISE SPINDLE SYSTEM EMPLOYED

- [Type SC 60122](#) High Speed Spindle System

APPLICATION DETAILS



Opticam™ machining centers, developed under the sponsorship of the American Precision Optics Manufacturers Association (APOMA) and the U.S. Army Material Command, eliminate the specialized tooling, long cycle times, and special craft skills that were required with conventional lens grinding equipment. The Optical SX™ machining center was developed at the University of Rochester's Center for Optics Manufacturing (COM), in conjunction with Optipro, an Ontario, New York-based builder of CNC machinery.

Donald Golini, who heads the cooperative manufacturing science program at COM, explains, "There were no CNC automated spherical generators that also did other functions such as edging, centering, beveling, truncating and shaping. Using a multiple tool sequential grinding operation, we get very good finish and alignment. We also get excellent shape accuracy and the ability to finish the lens in one setup."

The Rochester-based team borrowed software, hardware, and CNC technology from the metalworking industry and adapted them to optics. Their computer-controlled machining centers now produce lenses with levels of surface roughness and subsurface damage so low they do not require final polishing in some applications.

The Opticam SX™, a six-axis vertical spindle CNC precision optics machining center, incorporates affordable, precision head positioning as well as a **precise** Type SC 60122 High Speed Spindle System that provides infinitely variable speeds from 5,000 to 30,000 rpm. The 13 kW (17 hp) spindle is powered by a variable frequency converter and is liquid-cooled to maintain a stable operating temperature. The spindle provides the rigidity and accuracy needed for precision optics manufacturing. It is equipped with a pneumatically-actuated drawbar for automatic tool changing by the machine's eight-position robotic changer.

SX capabilities include rough generating, fine grinding, plano-contouring, edging, beveling and final microgrinding of lenses 10 to 100 mm in diameter. The lenses are used in a wide variety of precision optics applications, such as photo lithography, astronomical telescopes, military targeting systems, virtual reality headgear, and infrared imaging.

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