

LensPro-HP

Precision Two-Axis IOL Lathe

Cost-effective, polish-free lathing capability

1-3 nm Ra surface finish achievable on rotationally symmetric parts

3-5 nm Ra surface finish achievable on toric lenses using the TLG-4000

Lathing of spheric, aspheric, toric, diffractive and custom-lens profiles via DXF or points file input

Intuitive lens profile manager software creates part programs and manages process recipes

Linear-motor-driven air-bearing slides with sub-nm resolution glass encoder scales

High-speed, ultra-precision air-bearing spindle

Optional attachments include a fast tool servo (TLG-4000) for non-rotationally symmetric (toric) lens machining, milling/marking spindles and a parts loader for automated production

Aerotech's LensPro-HP is a cost-effective, 2-axis, ultra-precision lathe capable of producing polish-free lenses on a variety of lens materials and geometries. Optimized for high-quality IOL production, the LensPro-HP provides the ultimate flexibility in lens fabrication without sacrificing lens quality and throughput.

Ultra-Precision Design

The LensPro-HP is built on a granite machine base that provides excellent dimensional and thermal stability. The machine is equipped with air isolation to minimize the effects from external vibration influences on the production floor.

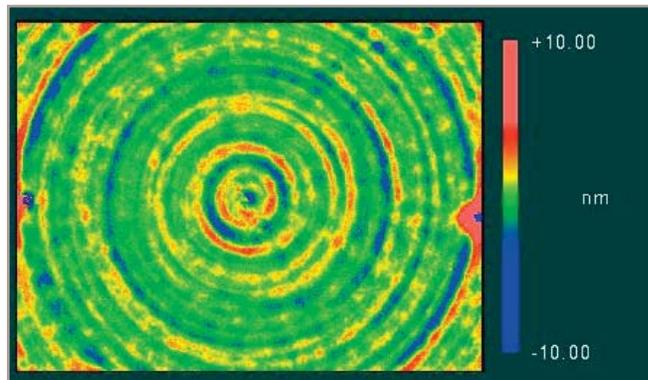
The X and Z air-bearing slides are linear-motor-driven with sub-nanometer resolution glass encoder scales to produce accurate, smooth motion that is critical in the production of polish-free lenses. The proprietary, high-stiffness air-bearing design rivals the performance of competitive oil



Aerotech's LensPro-HP lathe is capable of producing polish-free surfaces on a variety of lens materials.

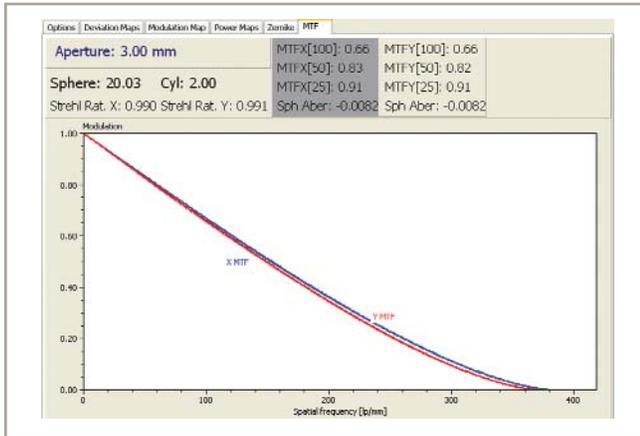
hydrostatic designs without the added complexity of pumps and collection systems.

At the heart of the LensPro-HP machine is an ultra-precise, high speed, air-bearing spindle. The total radial and axial error motions of <math><25\text{ nm}</math> enable production of high-quality surfaces that are not possible with inferior spindle designs. A specially-designed spindle mount minimizes vertical tool height changes due to spindle warm-up, allowing maximum production throughput. The spindle is equipped with a 0.5 inch diameter pneumatic collet chuck and integral dead-stop as standard. Other custom sizes and dead-length designs are also available.



Zygo NewView7200 image (best-fit sphere removed) of a 0.53 x 0.71 mm area in the center of an IOL turned on Aerotech's LensPro-HP lathe. The resulting surface finish is 1 nm Ra when processed according to ISO 4288.

LensPRO-HP DESCRIPTION



An MTF measurement of a plano-convex toric lens (20D of spherical power and 2D of cylinder) machined on a LensPro-HP. The measurement, taken on a Lambda-X NIMO TR0815, shows the near diffraction-limited lens resolution that the machine is capable of producing.

Ultimate Flexibility

Available with a wide variety of tooling and automation options, the LensPro-HP can be configured to fit nearly any application. The tooling platform can accommodate up to seven tools including roughing/finishing/edging tools, an LVDT front surface probe, a fast tool servo (TLG-4000) and marking/milling spindles. The tool holders are designed with a micro-height adjustment feature and a built-in dial indicator to facilitate easy and accurate tool centering.

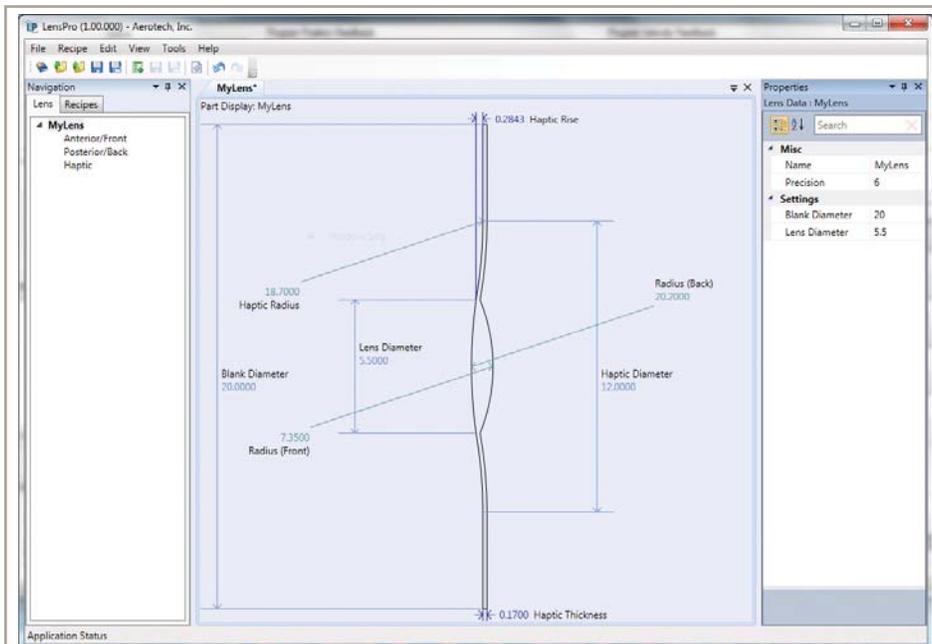
Tool blow-off and vacuum swarf extraction features are standard. Automatic part loading is available to fully automate the production process. The machine's modular design and build approach allows for full customization of features to fit your exact lens production needs.

Modern Machine Control

Controlling the LensPro-HP is Aerotech's award-winning A3200 automation platform that is based on standard commercial PC technology and Windows 7 software. The networked, open-control platform allows for easy expansion and integration into a full-production automation line. The machine is equipped with an intuitive, menu-driven touch-screen interface with fully-customizable process buttons.

Lens Design and Recipe Management

The LensPro-HP comes equipped with an easy-to-use lens design and recipe management software package. This software allows simple design of spheric, aspheric and toric lens profiles as well as inputs DXF files for more complex lens geometries. The part recipe including spindle speeds, cutting feedrates, depths of cut and tools is easily created and stored with the parts file.



Aerotech LensPro lens designer and recipe management software allows for easy creation of a variety of lens profiles. Process recipes (cutting speeds, depths of cut, etc.) are easily created and stored with the lens part profile for processing with the A3200 operator interface motion control software.

LensPRO-HP SPECIFICATIONS

Feature		Description
Machine Configuration		T-style two-axis air-bearing lathe with linear motor drive, granite base with air-isolation
X/Z Travel		225 mm (X-axis), 120 mm (Z-axis)
Spindle		Air-bearing spindle: 10,000 rpm standard, 15,000 rpm optional
Workholding		1/2 inch diameter collet standard, 3/8 inch or other custom -sizes available Internal or face-mounted dead-stop design
Tooling		Standard: Qty. 3 tool posts with micro-height adjustment and integral dial indicator
		Optional: LVDT front surface probe, additional tool posts, TLG-4000 fast tool servo, marking/milling spindles
Machine Requirements	Power	230 VAC, 50/60 Hz, single-phase (different power requirements available upon request); External UPS system available as an option
	Air	100 - 250 psig (6.9 - 17.2 bar) inlet pressure, 5 scfm (142 slpm) air consumption
	Vacuum	3 inch duct connection standard, custom sizes available; Customer must supply external swarf collection vacuum system
Machine Footprint and Mass		905 mm (width) x 1100 mm (length) Note: Machine can fit through standard 34" (864 mm) office door by removal of vacuum extraction hose; 700 kg mass

LensPRO-HP ORDERING INFORMATION

Standard features

LensPro-HP	<p>High-performance, two-axis, air-bearing lathe. Standard features include:</p> <ul style="list-style-type: none"> • Air-bearing, linear-motor-driven XZ axes with sub-nm resolution glass encoder scales, 225 mm X travel, 120 mm Z-travel • Granite-base with pneumatic air-isolation system • 10,000 rpm air-bearing spindle with 0.5 inch dead-length collet system • Qty. 3 tool posts with micro-height adjustment and integral dial indicator • A3200 CNC operator interface motion control software with LensPro lens design and recipe management software
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Optional Machine Features

- Front surface probe (LVDT) for final lens thickness control
- TLG-4000 fast-tool servo with 4 mm of total stroke
- Additional tool posts; a total of seven tools can be used at any one time on the tooling platform
- 15,000 rpm air-bearing spindle
- Haptic milling spindle
- Toric marking spindle
- Automatic parts loader (customized for specific pallet and part sizes)
- Uninterrupted power supply (UPS)
- Jog pendant