Precision Molded Glass Lenses - A Turnkey Solution...

Our previous News Bulletin highlighted Moore Nanotech being awarded the prestigious Company of the Year accolade and provided a preview of our new state-of-the-art facility due for completion later this year. In this edition we introduce our new Nanotech® 065 GPM-S Glass Press Molding machine which together with GPMSim Software and the Nanotech® 450UPL deterministic grinding system provide a Turnkey Solution for the production of Precision Molded Glass Lenses.

High Efficiency Grinding...

The Nanotech® 450UPL provides an ideal platform for deterministic grinding of both WC and SIC aspheric mold inserts. Its ample carriage capacity allows in-situ fully integrated functions of wheel dressing, wheel setting and subsequent form measurement and compensation following grinding. The hydrostatic linear and B axes provide the ultimate in stiffness and damping while the rugged groove compensated air bearing workspindle doubles as a programmable C axis allowing non-axisymmetric surfaces to be ground using the industry leading Slow Slide Servo process. A high frequency air bearing grinding spindle completes the package permitting optimum surface speed for even the smallest of grinding wheels.

The horizontal grinder configuration allows both two axis and the more desirable ‘wheel normal’ process to be adopted. With all necessary functions resident on a single machine, set-up times and part-to-part cycle times are minimized while both form and surface texture remain optimized through an iterative manufacturing process. In head-to-head trials, the Nanotech® 450UPL was able to provide more than double the output of finished mold inserts when compared to its nearest rival.

Introducing the Nanotech® 065 GPM-S...

Utilizing a single chamber capable of accepting molds up to 65mm diameter at temperatures of up to 800°C, the Nanotech® 065 GPM-S marks a new level of performance in both single and multi-cavity precision Glass Press Molding technology. An advanced PC based controller provides position or force control mode with integrated heating and cooling loops. A Windows based touch-screen operator interface allows a user friendly platform for both programming and process monitoring. All-important cooling cycles are accomplished using inert gas while both vacuum or an inert gas purge is utilized for evacuation of the chamber during the molding process. The system is complimented by GPMSim FEA Predictive Process Simulation software described below. The larger capacity Nanotech® 140 GPM-S and the Nanotech® 065 GPM-S permit optional robotic handling for added efficiency.

Results & Molding Cycle...

GPMSim - Predictive Process Simulation...

GPMSim is an FEA software package designed to predict the behavior of the molding process for glass optics. GPMSim's unique capabilities include a simplified user interface to create molds with aspheric cavities and assign materials for glass and molds from a built in materials library. The software automatically generates a quadrilateral mesh and computes the results by going through the five stages of the glass molding cycle including; heating, soaking, pressing, and two cooling stages, (an annealing stage, and a steep cooling stage). Some of the predictions include residual stresses in the glass, also glass deformation and glass shrinkage.