

# INJECTION-MOLDED LENS PREDICTION



## GREENLIGHT OPTICS SIMULATION REDUCES MANUFACTURING TIME

To enable the exploration and deployment of new applications, Greenlight Optics, based in Loveland, Ohio, provides clients with the design, development, prototyping and manufacturing of integrated optical systems. They specialize in LED illumination, projection displays, imaging systems and instrumentation for both research and consumer applications. In 2011, Greenlight partnered with AweSim to pursue cloud-based simulation of molding precision plastic optics that have traditionally been produced in glass. Through the use of Moldex 3D software, Greenlight was able to improve modeling capability and greatly reduce cycle time for a high volume lens in a consumer application.

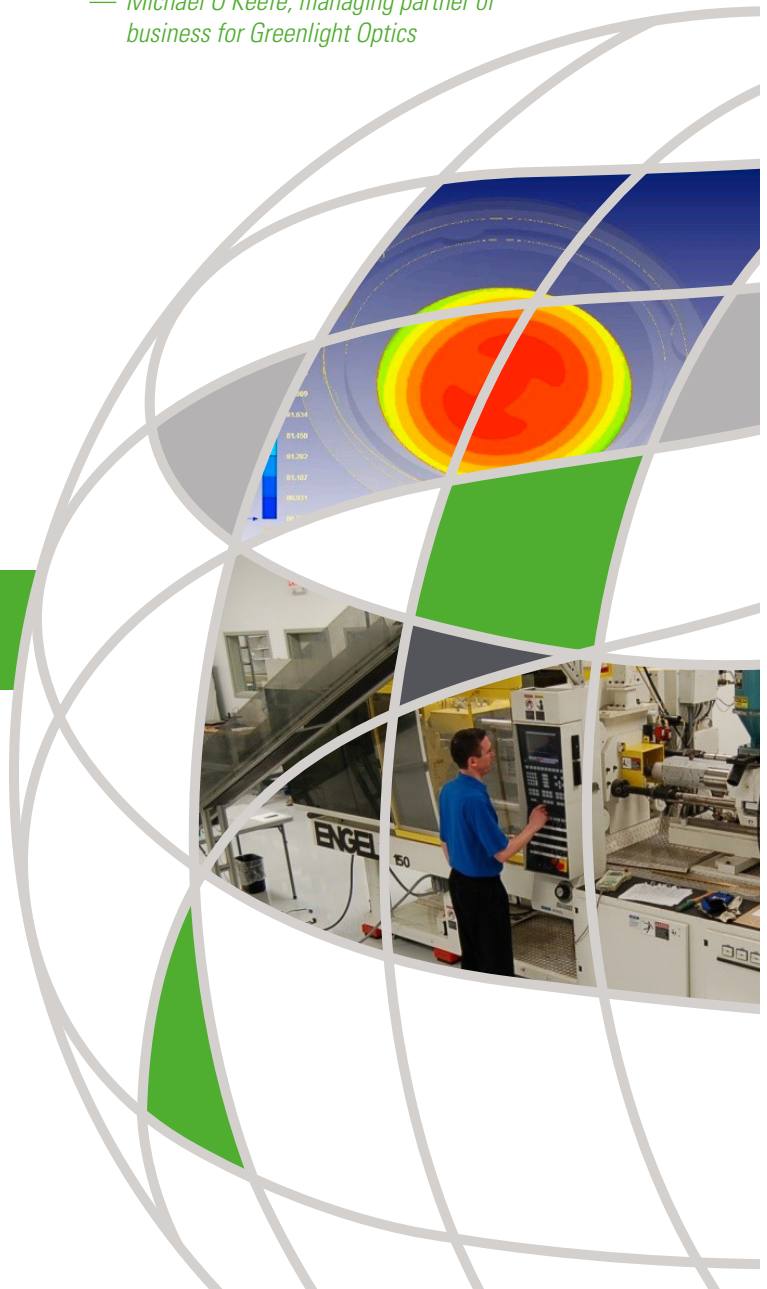
Access to modeling and simulation has reduced manufacturing cycle time by 64 percent, and has subsequently set up Greenlight as a strong competitor in the optics industry. The advanced

*“Through [AweSim], we were able to model thermal properties involved in producing an injection-molded lens used for collimating LED light. With the modeling software, we were able to accurately predict a problem with the lens and, subsequently, to reduce the manufacturing cycle time by 64 percent.”*

*— Michael O’Keefe, managing partner of business for Greenlight Optics*

## VIRTUAL DESIGNS. REAL BENEFITS.

plastic optics molding capability has fueled sustainable growth, allowing retention of manufacturing and jobs in the United States that otherwise may have been outsourced.



BIOHEALTH



## THE CHALLENGE

Officials at Greenlight Optics agreed in 2011 to collaborate with the Ohio Supercomputer Center on a demonstration project with the National Digital Engineering and Manufacturing Consortium, or NDEMC. Greenlight sought to improve mold and molding processes for plastic optics that were traditionally made of glass. Additionally, the company wanted to mold optics in high volume and reduce cycle time, therefore increasing their competitiveness and keeping operations local.

## THE APPROACH

For Greenlight's computational modeling needs, they accessed Moldex3D software through the Polymer Portal, an online "one-stop resource" developed by PolymerOhio, Inc. and OSC as part of a project funded by the National Institute of Standards and Technology's Hollings Manufacturing Extension Partnership (NIST MEP). The portal bundles access to commercial cloud-based software modeling and simulation services with training in computation and 3-D modeling.

## THE SOLUTION

Through the Ohio Supercomputer Center, Greenlight Optics was able to model thermal properties involved in producing an injection-molded lens used for collimating LED light. With the Moldex3D, they were able to accurately predict a problem with the lens and subsequently reduced the manufacturing cycle time by 64 percent.

The advanced capability could allow Greenlight to partner with more high-tech U.S. companies, thereby improving the competitiveness of these companies. The reduction in cycle time to produce the lens allowed Greenlight to keep a production job that was going to be made in China. The company's advancement in plastic optics molding capability enabled by simulation will fuel sustainable growth.