Goal:
Demonstrate the capability to reduce part cutting time for Infrared (IR) Germanium lenses without sacrificing form accuracy or surface finish.

Process:
Using a Nanoform® X with Hydroround oil hydrostatic B axis and HS150 work holding spindle to machine Germanium at 3 times* typical part cutting times.

B Axis Specifications:
- Bearing type: Oil Hydrostatic
- Radial stiffness: 225 N/µm (1,280,000 lbs/in)
- Axial stiffness: 600 N/µm (3,428,000 lbs/in)
- Moment stiffness: 3.4 N-n/µrad (30 lbs-in/µrad)

Part Details:
- Material: Germanium
- Diameter: 100 mm
- Concave Radius: 163 mm

Process Details:
- Tool: Limited sweep, large radius, negative rake diamond tool
- Tool set: Off the center of B utilizing Virtual Center Technology (VCT)
- Spindle speed: 5000 rpm
- Feed rate: 15 mm/min
- Feed per revolution: 3 µm/rev
- Coolant: Odorless Mineral Spirits (OMS)

Results*:
- Form accuracy: .197 µm PV
- Surface finish: .4845 nm Ra

* speed can be increased up to 7 times typical processing time and still yield form and finish results below typical IR specifications