Goal:
Demonstrate the capability to manufacture a tungsten carbide diffractive optical element mold.

Process:
Two axis diamond turning on a Nanoform® Xtc with μLAM tool.

Part Details:
Material: FB01 WC
Diameter: 15 mm

Machine Details:
Slide type: dovetail, for dynamic stillness
Bearing type: hydraulic oil, for damping
Oil temperature control: water cooled

Process Details:
Tool: μLAM
Tool radius: 0.31 mm
Spindle speed: 2000 RPM
Feed rate: 3 μm/rev
Depth of cut: 6 μm
Coolant: OMS

Results:
- Surface finish*: 2.1 nm Sa
- Form accuracy**: 0.15 μm

* Measured on a Zygo NewView
** Measured on a Taylor Hobson PGI Freeform