

### Freeform® MGG



Set up



In process

#### Goal:

Demonstrate the capability to machine optical grade micro-grooves on a freeform surface with a groove depth variability under 3  $\mu\text{m}$ .

#### Process:

Flycut grooves on a gullwing freeform surface using a Freeform MGG® (micro-groove generator) with HS75FF spindle. The fully contouring vertical axis of the Freeform MGG follows the gullwing surface resulting in groove depth variability under 3  $\mu\text{m}$ .

#### Part Details:

**Material:** Bronze  
**Diameter:** 164.0 mm  
**Vertical departure from flat surface:** 2 mm

#### Groove Details:

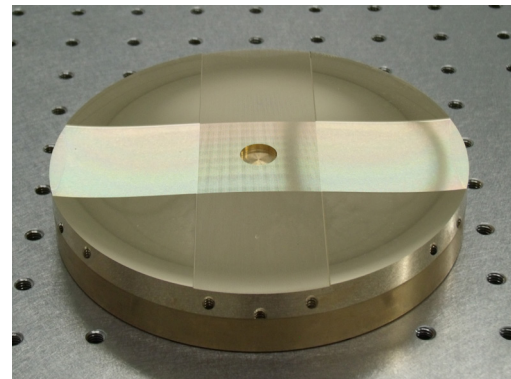
**Depth:** 50  $\mu\text{m}$   
**Pitch:** 350  $\mu\text{m}$   
**Number:** 115 – 90 degree intersection sets  
**Groove area:** 40 mm  
(intersecting groove area 40 mm x 40 mm)

#### Process Details:

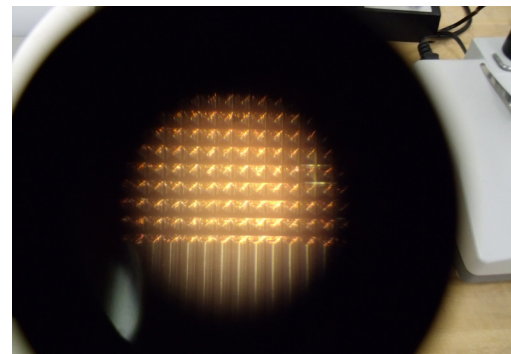
**Tool:** 0.38  $\mu\text{m}$  radius diamond tool  
**Spindle speed:** 2000 rpm  
**Feed rate:** 100.0 mm/min  
**Flycutter swing radius:** 87.96 mm

#### Results:

**Total groove depth variability:** < 3  $\mu\text{m}$



Part Photo



Part photo under magnification on  
Taylor Hobson Form Talysurf