



Cranfield Precision EcoR1664

High accuracy diamond turning machine



Ultra-Precision diamond turning drum roll manufacture

- Optical quality diamond turning
- Outstanding thermal stability
- High system stiffness and damping

Diamond turning machine for the production of ultra-precision optical film

The Cranfield Precision EcoR1664 roll turning machine has been designed for production level machining of optical quality components. Using Advanced 3D CAD techniques and FEA the EcoR1664 has been designed to have excellent thermal stability, high stiffness and damping. The main axis of the machine uses a stepped hydrostatic design with rail positioning that provides virtually zero roll errors in the tool infeed direction drastically reducing the majority of errors experienced on conventional lathes.

Model	Cranfield Precision EcoR1664
Machining capacity	
Maximum roll diameter (OD)	410 mm (16")
Maximum roll length	2,200 mm (86.6")
Maximum roll mass	1,000 kg (2,204 lb)
X axis (tool infeed)	
Axis stroke	205 mm (8.1")
Compensated accuracy	<0.5 µm
Feedback resolution	1 nm
Maximum linear motor force	1,385 N
Maximum axis velocity	50 mm/sec (2 in/sec)
Maximum axis acceleration	50 mm/sec ² (2 in/sec ²)
Z axis (tool traverse)	
Axis stroke	2,200 mm (86.6")
Compensated accuracy	<2 µm
Feedback resolution	1 nm
Maximum linear motor force	1,748 N
Maximum axis velocity	50 mm/sec (2 in/sec)
C Axis (headstock spindle)	
Load capacity	500 kg (1,102 kg)
Max speed	1,200 rev/min
Axis resolution	<0.05 arc sec
A Axis (tailstock spindle)	
Load capacity	500 kg (1,102 kg)
Max speed	1,200 rev/min
Axis resolution	<0.05 arc sec
B Axis (tool spindle)	
Load capacity	100 kg (220.5 lb)
Feed back resolution	0.05 arc sec
Maximum torque	40 Nm
Environmental control	
Microclimate (oil shower temp. control)	0.01°C

WORKPIECE

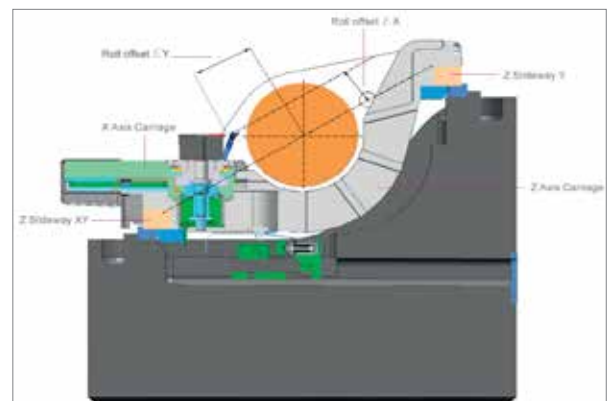
- Diameter: 410 mm (16")
- Length: 2,200 mm (86.6")
- Weight: 1,000 kg (2200 lb)

CONTROL SYSTEM

- Cranfield Precision CNC6400 Delta Tau
- Compatible with FTS

ENVIRONMENTAL CONTROL

- Hydrostatic oil temperature control to 0.01 °C
- Microclimate with oil shower temperature control to 0.01 °C
- 1 Micron repeatability



EcoR machine cross section for minimum roll error



EcoR used to pattern roll for UV cure process

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CONTACT US

grinding-ultraprecision@fivesgroup.com

Bryant | Cincinnati | Cranfield Precision | Daisho | Gardner | Giustina | Landis

www.fivesgroup.com



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