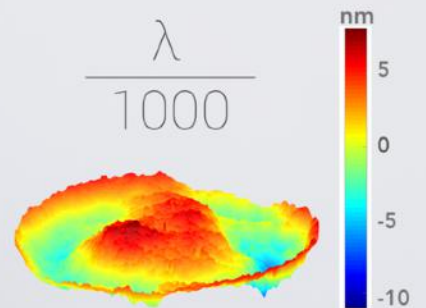


# Difrotec Product & Services

Ultra high accuracy interferometry &  
custom optical solutions



# Interferometer D7

Difrotec's interferometer D7 being the flagship of accuracy on interferometry market is an instrument which measures the form of optical surfaces and wavefronts. Difference between the measured and real forms is below 0.6 nm. It is the D7's accuracy value.

D7 is a standalone hardware that comes along with a fringe patterns processing software, DifroMetric.

$$\frac{\lambda}{1000}$$



D7 is compact, reliable, and easy to use

## World record!

The interferometer D7 provides a world record accuracy 0.6 nm or 6 Ångström with an excellent repeatability

## Technology

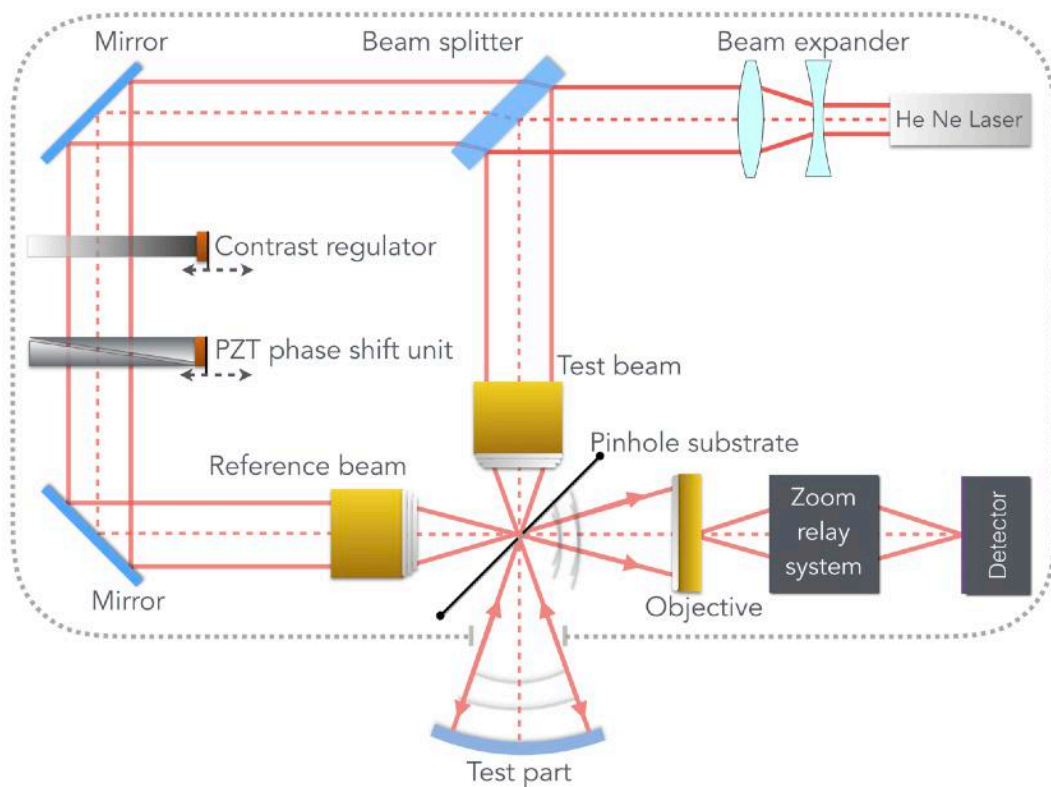
D7 is phase shifting common path point diffraction interferometer (PSPDI). While the common Fizeau interferometers require reference optics, generating additional errors and masking surface details, D7 produces perfect reference – wavefront diffracted from a pinhole (sub-wavelength aperture in a thin metal film). D7 is patent pending.

# Specifications

<b>Performance</b>	
Accuracy:	$\leq 0.6 \text{ nm } (\lambda/1000)$
Wavefront RMS repeatability:	$\leq 0.23 \text{ nm } (\lambda/2800)$
Acquisition time:	10 milliseconds
<b>Optical</b>	
System clear numerical aperture (NA):	0.6 (F# 0.83)
System imaging numerical aperture (NA):	0.55 (F# 0.91)
Image zoom system:	4× optical zoom controlled by software interface
Imaging:	Coherent (no diffuser glass) with artifacts removal option
CCD camera:	0.5k × 0.5k (optional: 1k × 1k, 2k × 2k or 5k × 5k)
Height resolution:	$\lambda/8000$
Pixels depth (digitization):	12 bits
Exposure time:	40 $\mu\text{s}$ minimum
Sensor pixel resolution:	500 × 500 on $\geq 50 \text{ mm}$ diameter part
Focus control:	Motorized & controlled through software interface
Optical focus range:	$\pm 2 \text{ meters}$
<b>Illumination</b>	
Laser type and wavelength:	Stabilized He-Ne, 632.8 nm
Laser power:	2 mW (higher power available on demand)
Polarization:	Adjustable test surface properties
Coherence:	$\geq 100\text{m}$
<b>System</b>	
Data acquisition:	Phase shifting interferometry (PSI) or Static
PSI method:	PZT electronic phase shifting
Alignment range:	$\pm 2.5 \text{ deg.}$
Alignment type:	Dual spot
Alignment reticle:	Computer generated

# D7 has no physical reference optics

Working principle of D7 (specific schematic withheld)



Two-beam phase shifting point diffraction interferometer provides a major advantage over other schemes by availing two independently steerable beams. Here, the test beam and reference beam are perpendicular to each other, where the intensity of the reference can be regulated. Concave shapes can be measured directly, whereas other kinds of optics are measured using a non-precise accessory.