Optical Workshop

Instrument Design Development Centre (IDDC) has an optical workshop which houses conventional fabrication machines and metrology tools for the production of optical elements such as mirrors, retroreflectors, lenses, parabolic optics, penta prisms, porro prisms optical flats, achromatic doublets and beam splitters. The workshop has capability to process optical materials such as glass, crystals and metals.

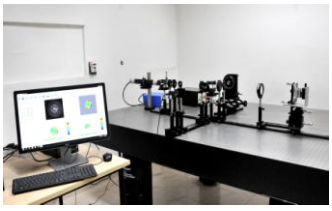
The workshop is having four different Sections; (i) Curve generation and grinding Section, (ii) Polishing and Centering & Edging Section (iii) Metrology Section, and (iv) Coating and assembly Section. The Curve generation and grinding Section is equipped with slitting, trepanning, curve generation and rough grinding machines. The polishing Section comprises four spindle machines and two spindle machine for polishing up to 12 inch optics. It also has Centring and edging machine.

Curve generation

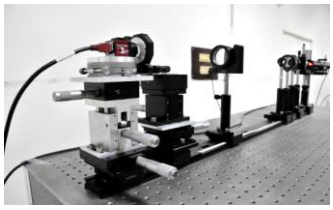
Conventional polishing process

Newton interferometer

Equipped with interferometry (Newton, Fizeau, Phase Shifting Twyman Green interferometry, Moire), Shack Hartmann wavefront sensor and other surface quality inspection instruments, the metrology laboratory is capable of measuring surface accuracy upto $\lambda/10$. The coating and assembly Section comprises coating units and autocollimators for optical assembly.



Phase shifting Twyman-Green interferometer



Shack-Hartmann wavefront sensor

Typical optics developed

The optical workshop is used to impart hand-on-training to master level students and provides a basic understanding of the methodology and processes used in the fabrication of precision optical elements. Emphasis is placed on the selection and use of tooling, materials and equipment used in the manufacturing process. The laboratory exposes the student to abrasive grits, slurries, pitch polishing and the conventional fabrication and testing process. Glass types and part shapes are assigned to illustrate the degree of difficulty required to achieve optical quality surfaces with hand and machine operations.