



LIGHT GUIDE

LIGHT GUIDE OPTICS PVT. LTD.

Customized Photonics Solutions Delivered

COMPANY PROFILE 2020



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Chairman's message

Dear Reader,

As this brochure reaches your hands, we at Light Guide have completed first phase of our journey and are all set to embark upon the Phase 2. Two decades back when we conceptualized the very being of Light Guide, we wanted to be a team well known for its technological expertise; as they say, "sharpen the saw"; and this remained our core guiding principle for these years.

Having successfully lived our dream, now we are ready to take a leap into the Phase 2, where we retain our old value of technological expertise and add one more, that of commercial growth and footprint beyond national boundaries.

As a body corporate, we have reached our prime youth. Now we are looking forward to optimizing our knowledge and skills to build sustainable wealth through value engineering and future technologies.

I am sure, with our sound knowledge bank and dedicated team; we would convert the second phase of our plan into reality, for sure. We would like to invite all likeminded people to associate with us for mutual growth as we at Light Guide truly believe "success is a team sport".

Let us succeed together

Regards,

H.K. Dhawale
(Chairman)



Vision

“Delivering customer value par excellence and beyond imagination, through future technology and value engineering.”

Mission

“We would like to be a partner of choice for global players in the electro-optic domain, by virtue of our techno-commercial ability, to achieve minimal cost in minimal time and optimum technology.”

Values

- Integrity
- Constant learning
- Risk taking
- Excellence
- Agility
- Teamwork



Our Team



Hemant Dhawale
Chairman & MD

Siddharth Dhawale
Executive Director



Amber Arondekar
Director
Business Strategies

Pawan Kothari
Director
Finance



Avinash Tamhane
Director
Product Development





Overview

Introducing ourselves:

Founded by qualified, bright technocrats, **Light Guide** came into existence in the year 1997. As a professionally managed company, today we have ISO 9001:2015 and ISO 14001:2015 certifications for our well evolved and documented processes. Light Guide today is a partner of choice for many defense research organizations.

What we do:

Our core competence is in manufacturing of components, sub-assemblies and optical instruments i.e. opto-mechanical instruments and electro-optic devices. We provide end to end instrumentation solutions for atomic research, defense production, industrial optics and medical devices.

Why us:

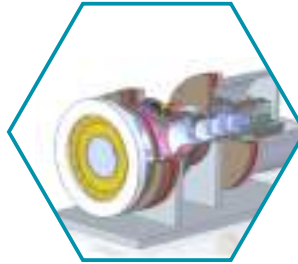
- We have in-house design/ simulation facility for optical, mechanical and electronic design.
- Light Guide has precision metrology lab, traceable to NABL standards.
- For testing of components, the metrology lab is well equipped with Zygo GPI-XP Fizeau Interferometer. Thermo Fisher Spectrophotometer, Shearing Interferometer and various other precision instruments.
- Light Guide has established system integration facility that can very well measure quality of the integrated system during and after the complete assembly, using software.
- Light Guide has an enriched knowledge base that has evolved with time while working on a wide variety of instrumentation projects.
- Light Guide has proven its might in developing a wide range of import substitutes, be it large diameter metal mirrors for HPL or Beam Directors for DEWs.
- Light Guide has a profound insight for developing instruments that are field worthy, transportable, which can perform in extreme temperatures or radiation hazardous environment.
- Most of the manufacturing processes like optics fabrication, thin film coating, mechanical fabrication, system integration, electronics and software are performed internally with the help of conventional and CNC machines.
- Our strength is our well trained human resource that has grown with our products.



Our journey

- 1997 The journey begins
- 1999 Commencement of commercial production of optics
- 2000 Developed Mach-Zhender and Shearing Interferometers
- 2001 Developed metal mirrors for CO2 laser application
Developed metal mirror for Muzzle Reference system of a Battle Tank
- 2002 Resonator mirrors for 100 KWatt Gas Dynamic Laser
- 2003 Muzzle bore sight for MBT
- 2004 Large diameter (500mm) metal mirror
- 2005 Diameter 700mm Ellipsoidal Mirror for a Cassegrain Telescope
- 2006 Periscope for Hot Cell application for Atomic Research
- 2007 Stereo microscope (Tube length 2000mm) for metallographic study of irradiated material
- 2008 System integration of Trans-receiver for Raman Spectroscopy
- 2009 Trans-receiver for LIDAR application
Trans-receiver for LIBS spectroscopy for stand-off detection of elements
- 2010 Imaging lenses for cameras
- 2011 Multi-lens system for Naval Application
- 2012 Export to Elbit System, Israel
- 2015 Development of Beam Directors for High Power Laser applications
- 2016 Developed Laser based system for dental application
- 2017 Developed Laser based system for physiotherapy and veterinary application
Developed optics for operating microscopes
- 2018 Production orders for medical optics and devices
- 2019 Production orders for Integrated Systems for Beam Directors for High Power Laser Applications
Developed laser based combat simulators
- 2020 Developed Fizeau Interferometer

Market Segments



Defence Research

- ◆ Beam directors for DEWs
- ◆ Raman spectroscopy
- ◆ LIBS spectroscopy
- ◆ LIDARS

Defence Production

- ◆ Optical components
- ◆ Sub-assemblies
- ◆ Optical instruments
- ◆ Laser based combat simulators



Atomic Research

- ◆ Optical Vision Aids
- ◆ SPMs for Hot Cell Application

Lasers and Photonics

- ◆ Optics
- ◆ Opto-mechanical systems



Medical application

- ◆ Ophthalmic devices
- ◆ Physiotherapy devices
- ◆ Dental devices

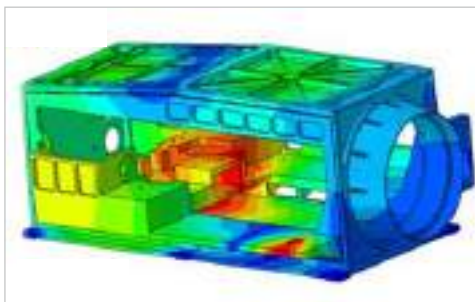
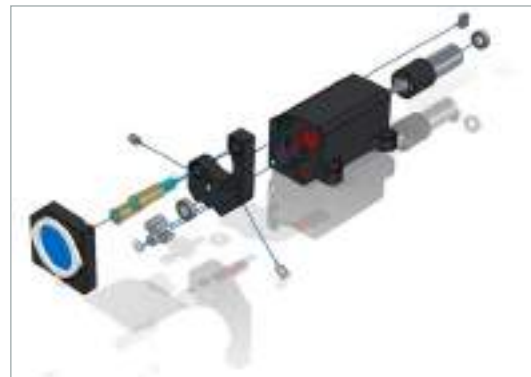
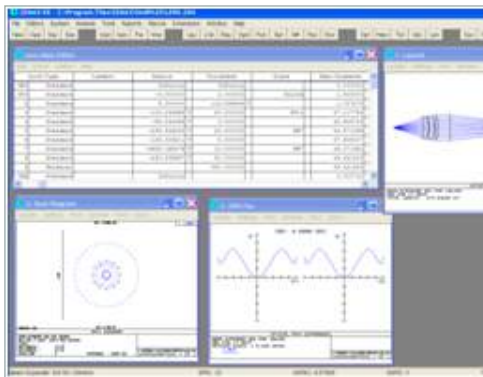
Photography

- ◆ ND Filters
- ◆ Lenses



Design capabilities

- Optical system design using Oslo software.
- Mechanical Modeling (using Siemens Solid Edge)
- FEA Simulation/ Validation (using ANSYS)
- CAM simulation/ Programming (using CamExpress)
- Image processing using Matlab and Python
- Embedded programming in C, using Atmel Studio.
- Development of GUI's using C, DotNet or LabVIEW.
- Developed variety of PCB's and Softwares for motion control systems.
- Motion control systems up to Six Axis (synchronized)
- Experienced Software Professionals working on Medical and Laser devices.



Manufacturing capabilities

Lenses, Prisms, Windows, Wedges, Ball lenses, Domes, Mirrors, Filters

Size: 2mm to 1200mm

Diameter tolerance: +0/0.01mm

Surface Shape

Plane, spherical, cylindrical, aspheric (conics)

Optical material

Optical glasses, Fused silica, Silicon, Germanium, Zinc Selenide, Calcium fluoride, Laser glasses, Nd-YAG,

Crystals

KDP, D-KDP, KTP, LiNbO₃

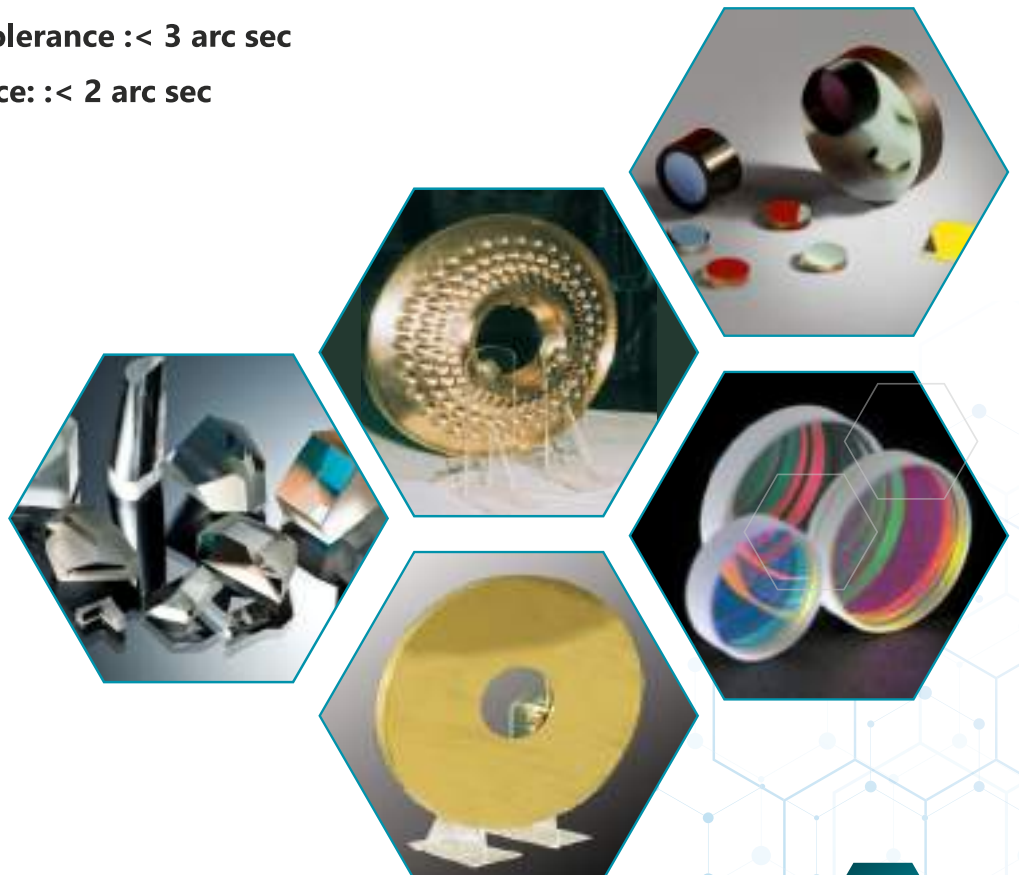
Metals

Aluminum, Copper, Molybdenum, Nickel, Stainless Steel

Surface accuracy: $\lambda/10$

Centeration tolerance : < 3 arc sec

Angle tolerance: : < 2 arc sec



Manufacturing facilities

Precision Optics Fabrication

- Slitting Machines
- Trepanning Machines
- Curve generation (up to 700mm diameter)
- Grinding Machines (up to 1200mm diameter)
- Polishing machine (up to 1200mm diameter)
- Float polishing machine (For Super Polished Surfaces)
- Centering and Edging Machine

Optical Thin Film Coating Machine

- With electron beam gun
- Up to 600mm diameter

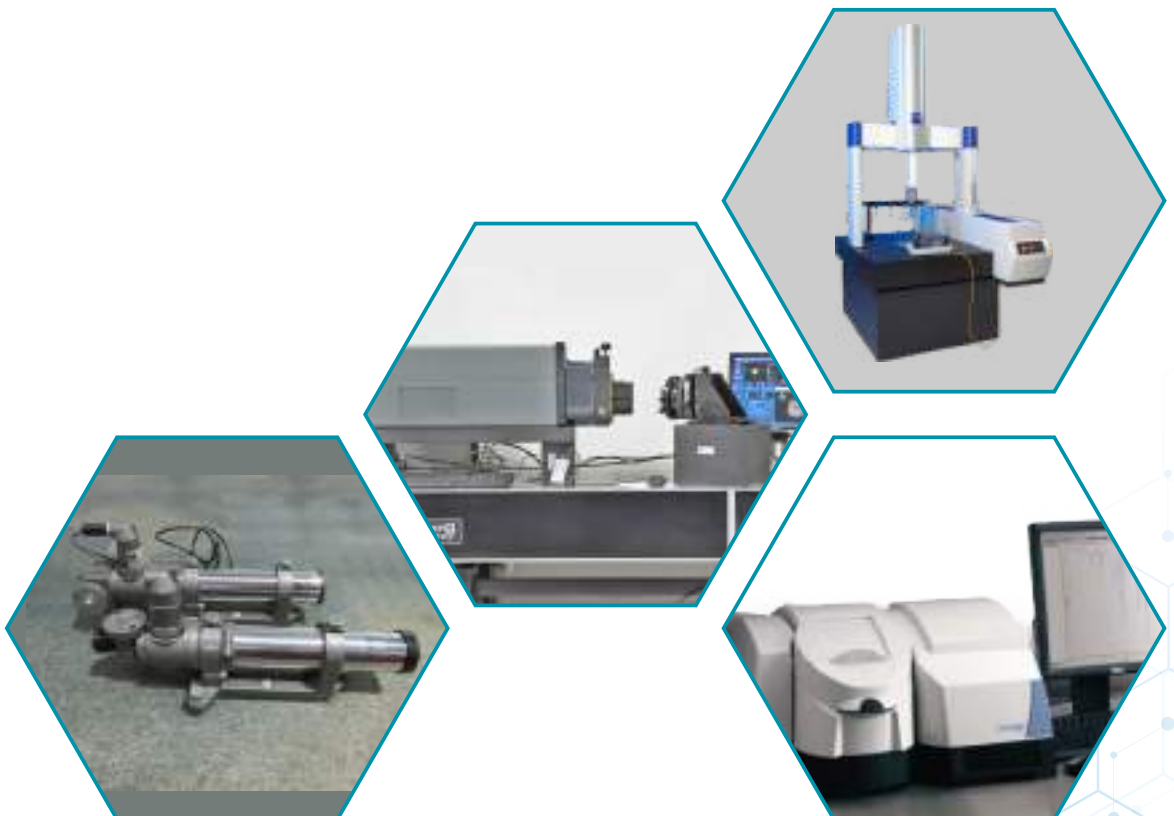
Mechanical fabrication

- Conventional Mechanical Fabrication Shop
- CNC Mechanical Fabrication Shop (up to 2m X 4m bed size)
- Surface Treatment Plant (Anodizing)



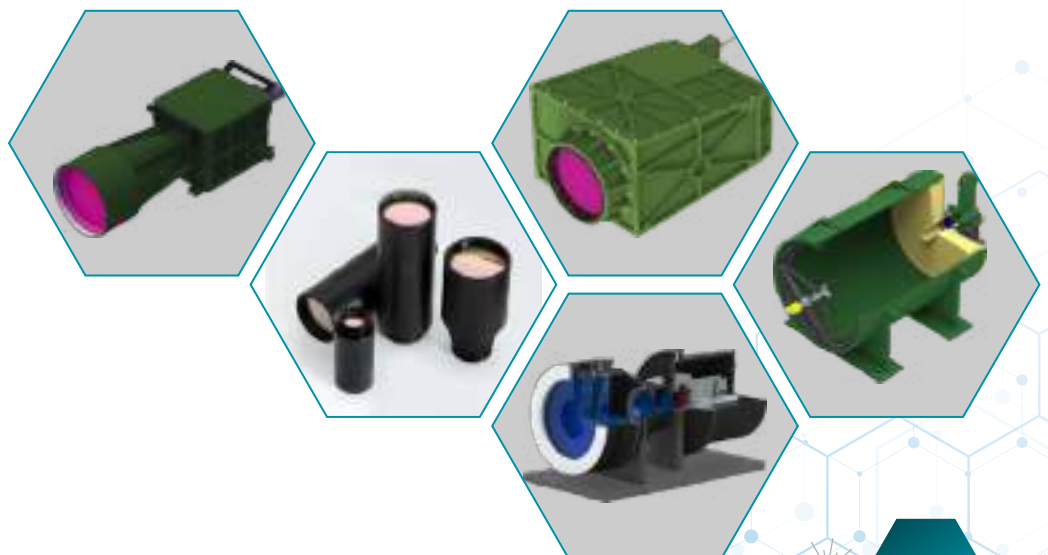
Testing facility

- ROC Measurement Setup
- Surface Accuracy Measurement by Zygo GPI-XP Fizeau Interferometer.
- Various Mach Zehnder, Michelson, Shearing Interferometers.
- Surface Cosmetics Measurement setup as per 13830B
- Angle Measurement using Hilger Watts Auto-collimator
- Centeration measurement of lens assemblies up to 350mm
- Transmission measurement by UV- VIS Spectrophotometer
- Mechanical assembly using CMM
- Measuring devices regularly calibrated and traceable to NABL
- Software enabled Assembly station for payload up to 50 Kg and Centeration accuracy 20 sec for assembly of opto-mechanical systems



Products / projects accomplished

- Various optical components
Lenses, prisms, filters
- Etalon spacer for LIGO
- Aspheric Metal optics up to 700mm diameter
- Laser glass disc polishing
- Miniature Rigid Mask Zhender Interferometer
Package size less than 50mm³ for microscopy
- Various instruments like Autocollimators, Laser Collimators, Fiber Optic Collimators up to 200mm aperture
- Trans-receiver telescopes for Spectroscopic analysis from stand-off distance for Raman, LIBS, Cloud LIDAR and Aerosol LIDAR
- Laser beam directors up to 250mm aperture
- Components for MRS (FCS) of a battle tank
- Muzzle Bore Sight for a battle tank
- Various laser based simulators for tactical application
- Various vision aids for Hot – Cell application to study irradiated fuel in atomic power station
- Design, fabrication and assembly of various electro-optic devices for defense applications



Case study - 1

Vision Aids for Atomic Research

Various metallographic studies are performed on irradiated fuel in a 'Hot Cell'. Optical instruments used in this environment are susceptible to high radiation dosage. Our periscopes and other vision aids perform well in this challenging environment.

Periscope is a device that provides internal view of a Hot Cell, while protecting the user from radiations.

The project involved

- Designing of optical relay system consisting of doublets, triplets, various prisms and mirrors (total 32 components)
- Designing of Opto – Mechanical system while understanding the motion mechanism
- Optics head inside the 'Hot Cell' rotates as the Eye Piece is moved using link mechanism. Designing of link and planetary gear mechanism for motion
- Fabrication of various optical components
- Fabrication of precision mechanical system
- System integration and testing
- Installation at site

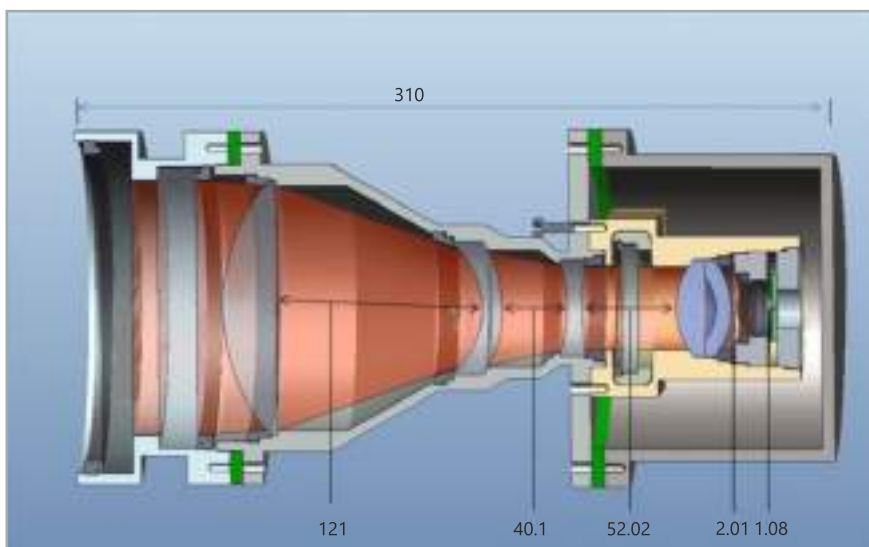
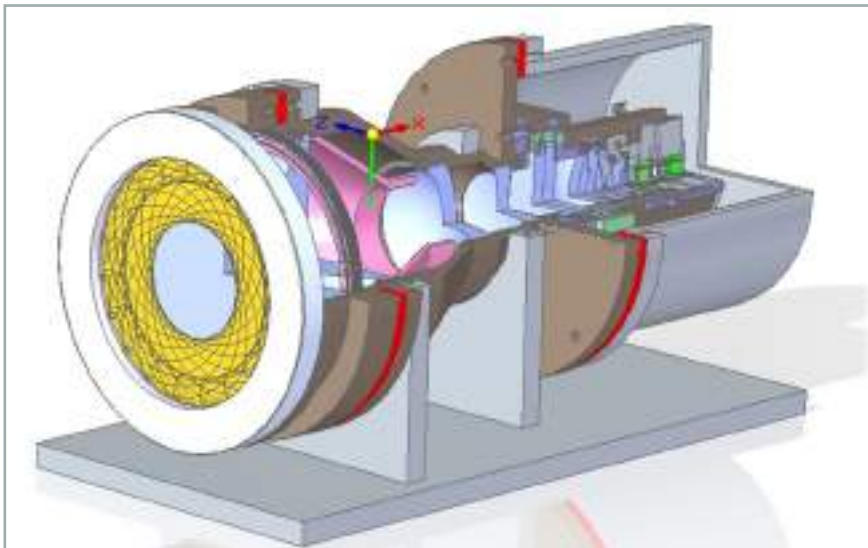


Case study - 2

Fabrication and Assembly of Optics Head of a Naval Surveillance system

This "Build to Print" activity involved:

- Fabrication, thin film coating of seven lens elements; largest being 150mm in diameter
- Fabrication of diameter 120 mm iris
- Fabrication of mechanical components
- Opto – Mechanical integration and installation of Electro – Optic sensor



Picture shown is typical illustration, not to scale

Our business associates:



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