

PHOTONICS

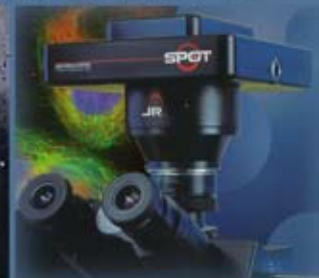
LASER

OPTICS

VISION

TELECOM

LASER SAFETY



INSTRUMENTATION

OPTICS/ELECTRONICS

SPECTROSCOPY

www.photonics.bfioptilas.co.uk

STANDARD AND CUSTOM /OEM OPTICAL COMPONENTS

Standard Optics

Spherical lenses, cylindrical lenses, multi-element lenses, aspheric lenses, windows, prisms, blanks, mirrors, beamsplitters, interference filters, bandpass filters, notch filters, ND filters, fluorescence filters, colour glass, etalons, polarisers, beam expanders, interferometer accessories, optical materials

Substrates Available :

- BK7
- Fused Silica
- Float Glass
- Schott Glass
- CAF2
- GE
- Si
- Sapphire
- MgF2
- ZnSe
- Plastic & Others on request

Applications :

- Laser fabrication
- Medical
- Military
- Environment
- Vision
- Research



Specialist Optics

Mirrors - Standard & OEM

- Glass or metal substrate
- Elliptical, parabolic, spherical
- 10-500mm diameters available
- UV-MIR coatings available
- Ultra high damage threshold
- High reflectance
- High scratch/dig specifications, high surface quality

Molded/Pressed Optics

- Precision parts
- Low cost
- High volume
- Spherical or aspherical lenses, fresnel lenses, prisms, diffractive elements and custom parts

F-Theta Lenses

- Wavelengths: 266, 355, 532, 1064, 1550 nm
- CO₂, single, double or triple elements
- Wide range of focal lengths
- Telecentric and achromatic lenses

Applications :

- Biomedical
- Military
- Semiconductor
- Research



Specialist Optics (cont...)

CO₂ Optics

- Meniscus lenses, beamsplitters, beam expanders, shapers, plano convex lenses, windows, mirrors, etc.
- ZnSe, Mb and Cu substrates

Applications :

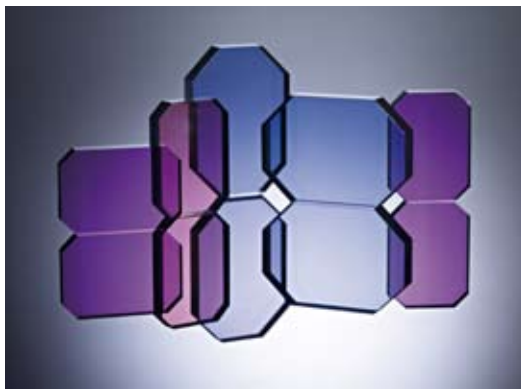
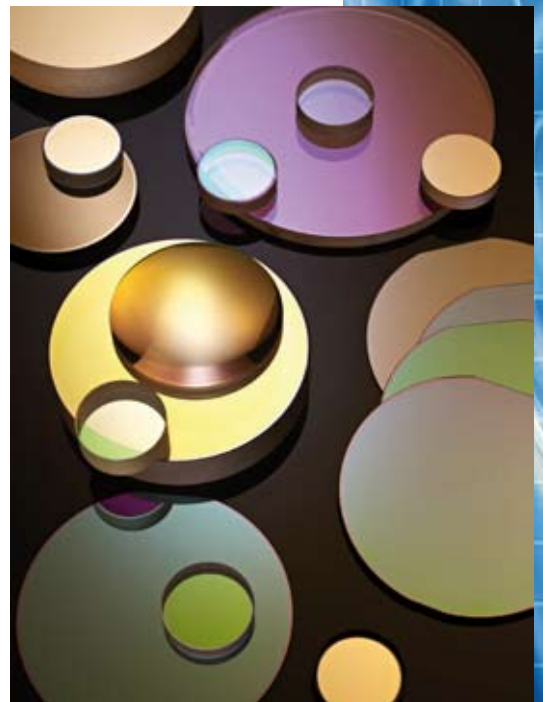
- Laser beam manipulation
- Industrial machining
- R&D
- Biomedical
- Spectroscopy
- Thermal imaging
- Semiconductors
- Military
- Machine vision
- Imaging
- Projection

Thermal Imaging

- Multi-element lens assemblies, in Ge and ZnSe
- Windows
- Diamond light coated
- Full environmental specifications available
- Mil spec

Laser Crystals

- Length up to 250mm
- ND:YAG, ND:YILF, Ti:Sa, Er:YAG, Non-linear, BBO, LBO, KTF, LiNbO₃, KTA etc



Specifications :

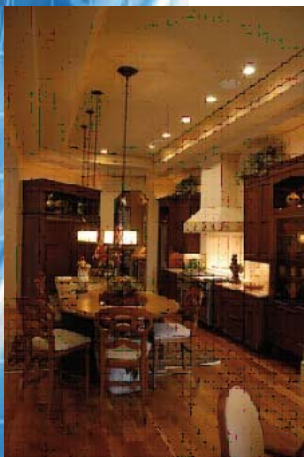
- Superior optical transmission from 400nm to 1600nm of 85-92%
- Precise control, shape and distribution of light in circular or elliptical patterns
- Available in symmetrical angles ranging from 0.5° to 80° FWHM
- Available in asymmetric angles ranging from 10° to 95° in major axis and 0.2° to 60° FWHM in minor axis
- Available in a range of substrates, sizes and thicknesses
- Work with LEDs, halogen, xenon and laser sources

Applications :



Lighting Systems

- Architectural lighting
- Set/event lighting
- LED residential/commercial/mood lighting
- Aircraft and rail (reading light)
- Car Lighting (lamps, dash board)
- Signage (pedestrian crossing, exit and safety)



Displays

- 3D displays
- Automotive applications
- Avionics displays
- LED based signage and displays
- Instrument clusters
- Projection screens



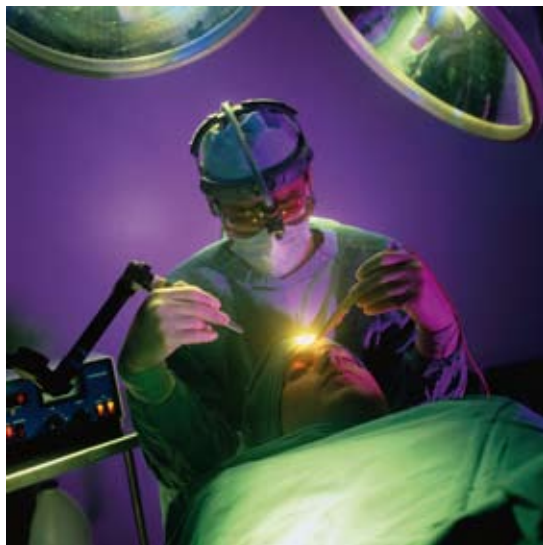
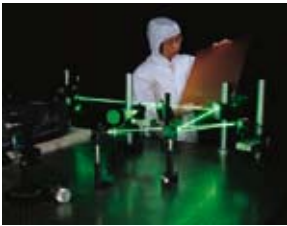
Backlights and Edge Lighting

- PDA and mobile phone display
- Cockpit Display
- Navigation System
- LCD
- Light Box



Specialist/High Tech Applications

- Laser systems - High Power/UV requirements
 - Glass on glass diffusers available in two versions
 - Pure glass diffusers, 0.5° to 15°, operating up to 500° C and LDT of 8J/cm²
 - Hybrid glass diffusers, 0.5° to 50°, operating up to 200° C
 - Also available in silica UV53 substrate, transmission efficiency of 70% at 190nm
- Tactical lighting
 - Night vision, gun sighting, HUDs
- Biomedical
 - Laser eye and cosmetic surgery, bacteria identification systems, biological imaging systems, teeth whitening systems, blood analyser systems
- Line Scan Metrology
 - Lightline, backlighting, coaxial lighting, ring lighting
- Bar code scanners
- Boroscope/Endoscope illumination
- Forensic lighting
- High brightness projectors
- LED systems



LED Lightline with 40' by 0.2' diffuser on left



STANDARD AND CUSTOM SOURCES AVAILABLE

Laser diodes, laser chips, laser diode modules, Telco lasers, laser cavities, fibre lasers, DPSS lasers, CO₂ lasers, nanosecond and picosecond lasers, ND:YAG lasers

Diodes

Laser Diodes

- Low cost chip level devices
- C-Mount, To-Can and custom packages
- Wavelengths from blue (405nm) to IR (980nm) and Telco (1550nm)
- Power levels from eye-safe to 1000's of milli-watts

Laser Diode Modules

- UV to IR wavelengths
- 0.9 milliwatts to several watts
- Standard and custom packages including butterfly, TEC cooled, pigtailed and fibre delivered
- Line, cross and spot operating optics
- DFB modules

Applications :

- Blu-ray
- Laser printing
- Biomedical imaging
- Fluorescence
- Laser alignment
- Sample alignment and manipulation
- Bore sighting
- Machine vision
- Invisible laser guidelight
- Medical laser seed and pumping lasers
- Laser heating
- LIDAR
- Telco

Fibre Lasers

Specifications

- CW, pulsed and modulated systems for industrial applications
- High rep rate systems for laser printing
- Doped fibre amplifiers
- LIDAR source
- Telecom sources
- Powers up to 100W CW modulated

Advantages of Fibre Lasers

- Low maintenance
- Stability
- Compact footprint
- Low maintenance
- High performance

Applications :

- Micromachining
- Cutting
- Marking
- Welding
- Folding
- Drilling
- Trapanning
- Engraving
- Sintering
- Lidar
- Rapid prototyping
- Image processing
- Atom trapping
- Laser tweezers
- Distributed Temperature Sensing (DTS)
- Anilox



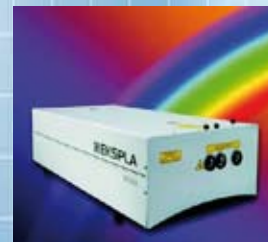
CO₂

Specifications

- 10.6 micron wavelengths
- 10 to 400 W air/water-cooled systems
- Compact, rugged RF excited units
- OEM packages available

Applications :

- Micromachining
- Cutting (metal, cloth, ceramics)
- Marking (glass, metal, wood)
- Welding (metal, plastic, nylon)
- Drilling (metal, plastic, ceramic)



Nd:YAG & Nd:YLF Lasers

Specifications

- Output wavelengths via OPO or fixed in UV - IR range
- Solid state and DPSS lasers
- Tunable laser sources
- Pulse widths from standard/quasi CW to Pico and Nano seconds
- High peak powers
- Repetition rates from single shot to 10's of MHz
- High beam quality
- Low jitter
- Custom systems
- Diagnostic pre-triggering available

Applications :

- SFG, PIV, LIF, CARS, Spectroscopy
- Materials analysis
- Microscopy
- Optical tweezing
- Micro-machining
- Holography
- Industrial cutting and marking

Other Wavelengths

Compact Picosecond Modules

- Wavelength: 1030 and 1550 nm
- Power: <5 ps, 75 MHz, 10 mW to <1W



DPSS Lasers

- Wavelength: 262 - 1625 nm
- Power: 0.9 mW to several Watts
- CW, Q-switched or modulated
- Fibre or non-fibre



He-Ne Lasers

- Wavelength: 632,8 - 543 - 594 nm
- Power: 0.5 mW to 40 mW



Precision Lamps

- Long-life subminiature and miniature vacuum, gas-filled and halogen lamps
- Consistent, Reliable Light Output Performance
- Maximum Light Output
- Superior Light Maintenance
- Precision Performance
- Tighter tolerance than Industry standard

Gas-Filled - Advantages:

- Lamp design offers higher colour temperatures
- Higher luminous efficacy
- Better light maintenance and longer life
- Not adversely affected by short duty cycles or heat sinking
- Colour temperatures typically range from 2,600°K to 3,200°K, with current draw less than 2.0 amperes

Halogen - Advantages:

- Highest colour temperature
- Highest luminous efficacy
- Superior maintenance and life as a result of the halogen regenerative cycle
- Colour temperatures typically range from 2,700°K to 3,350°K with current draw less than 3.0 amperes
- Surface temperature is similar to comparable gas-filled lamps (halogen lamps do run slightly higher than a vacuum lamp of comparable size and wattage)
- Halogen lamps can be readily designed to meet most lamp application requirements

Vacuum

- Light output through the incandescence of a tungsten filament in a vacuum environment within the lamp glass envelope.
- Good general-purpose light source where lower luminous efficacy is acceptable
- Not adversely affected by short duty cycles.
- Colour temperatures typically range from 2,400°K to 2,700°K and current draw is less than .8 amperes.



Precision Miniature Lighting

Cont...

Heraeus Noblelight Ltd. in Cambridge develops and produces continuous arc and Flash lamps. Xenon/Krypton specialty lighting sources

Successfully used in many laser and non-laser applications such as drilling, welding, cutting, marking, engraving, medical and aesthetic applications as well as sun-simulation.

- Automotive Welding & Cutting
- General Cutting & Welding
- Drilling
- Marking/Engraving
- Resistor Trimming
- Diamond Processing



Source: Heraeus Noblelight Ltd
www.heraeus-noblelight.com



Metal Halide Arc Lamps

- Unique metal-halide arc lamp technology,
- Bright, daylight-quality light
- Minimal power.
- Compact, rugged
- Highly efficient

Products :

- Lamps
- Ballasts
- Illuminators
- Light Modules
- Power supplies



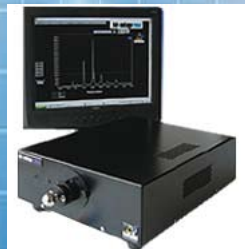
Our Sōlarc® lamps offer a three-fold increase in efficiency over comparable halogen sources. Whether it is more intense light driven by an equivalent amount of watts or equivalent light output that lasts three times as long, Sōlarc® lamps provide OEMs with significant cost and performance advantages.

Integrated into a host of products, including fibre optic illuminators, medical and industrial endoscopy or portable sources such as bicycle lights, dive lamps and industrial flashlights.



Spectrometers

- Miniature USB spectrometers
- Absorbance systems
- Fluorescence measurement
- Oxygen and gas sensing
- Colour measurement
- Fourier transform spectrometers
- Hand held and bench raman and SFG spectrometers
- Mineral analysis systems
- CARS, terahertz laser spectroscopy
- Calibrating light sources
- Fibre optics
- OEM packages available in high volume
- Spectral analysis software



Applications :

- Reflectance, absorbance and irradiance measurements
- Laser beam characterisation
- Optics characterisation
- Tissue, plant and biological sample analysis
- Chemical analysis and identification
- Forensics
- Sorting foodstuffs and pharmaceuticals
- Hazard detection



Grating Spectrometers & Fourier Transformers

Fluorescence - Spectroscopy - Absorbance - Reflectance - Analysis of Light - Reflection of Colour - UV-VIS - Colorimetry

Specifications

- Wavelength: 200-1100 nm & 900-2500 nm
- Resolution: 0.01 to 10 nm
- Pixels: 1024 to 3648 elements
- Admission: free space or fibered
- USB port

Accessories

- CW or pulsed optical sources
- Cosine correction
- Sources of calibration Hg, Ar

Applications

- Chemistry, biochemistry, pharmacy
- Metrology, LIBS
- Astronomy
- Raman Spectroscopy
- Medical Research
- Thin Film Reflectivity
- Bowls
- Fibres, variable filters,
- Integrating Sphere
- Lenses



Miniature Spectrometers

Arcspectro Range NIR to MEMS Technology

- Range of wavelength: 900 nm to 4.5 microns
- Si-Detector InGaAs / PbSe
- Spectral resolution of 0.8 nm
- Input SMA 100 micron fiber core
- USB2.0 Interface

Arcspectro Range HT Technology to Polarise Light

- Range of wavelength: 400 to 1000 nm
- Spectral resolution of 0.6 nm
- Optical input space of 4 mm
- USB2.0 Interface

ScaScanners & Marking Heads

For CO₂, Nd:YAG, HeNe, Argon, Diodes and Fibre Lasers

Modular Solution

- Opening from 3 to 50 mm
- Linearity: 99.9%
- Repeatability <8 μrad
- Card interface
- Software

Scan Heads & Galvonometers

- YAG (+ Harmonics) and CO₂ Scanners
- Complete scan head or galvo packs
- 3D Scanner
- Software and sophisticated control module
- High speed optical digital encoders

Marking Heads & Software

- 2 to 3 axis
- Opening: 7 to 30 mm
- Marking area: 60 x 60 mm <1 x 1m

Applications :

- Marking
- Biomedical Systems
- Laser Projection
- Semiconductor
- Vision



Pockels Cells, Q-Switch Crystals

Specifications

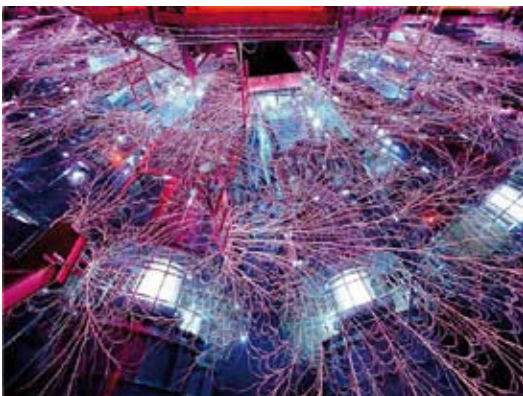
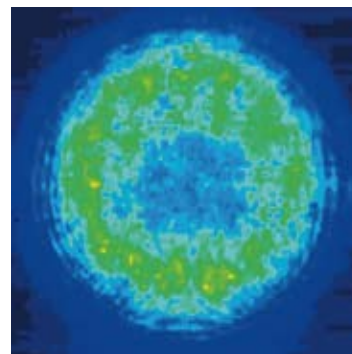
- Materials: KDP, RTP
- Spectral range of 300 nm? 1.2 microns
- Aperture of 3 mm? 16 mm
- Rise time: <0.25 ns? 1ns
- Sol-Gel Processing and Polymer

Applications :

- Modulation
- Q-switching
- Pulse slicing
- Pulse piking

Power Supplies

- Bias supplies
- Pockel cell drivers
- Capacitor chargers
- Precision temperature controllers
- Current sources
- Multi-channel laser diode controllers
- OEM drivers available



Usually a shutter is used because the light source being controlled becomes unstable when turned on and off or light entering a system needs to be precisely controlled, as when capturing an image.

Electro-programmable Shutter Systems

- Fast - Millisecond and sub-millisecond switching times from open to closed states.
- Consistent - Very low variation from one exposure to the next.
- Reliable - Most UNIBLITZ® shutters can achieve more than one million operations (shutter cycles)!

CS Series (Unique Patented Design)

- Applications: Video Imaging, Telescoping, Microscopy, and Holography
- Long Lifetime
- Small Size to Aperture Ratio

DSS Series

- Flush mounting capability – no protruding components.
- Circular envelope and concentric aperture - easy and fast integration
- Simplicity of design permits scaling from apertures as small as 10mm

LS Series (Laser Switching)

- Applications: Video Imaging, Telescoping, Microscopy and Holography
- Operation Frequency up to 400 Hz

NS Series (N-CAS® Patent Pending Design)

- Non-Contact Actuation System (N-CAS) - accurate and reliable shutter operation
- Versatile design - easily configured bi-stable, normally open or normally closed
- Five bladed design minimizes outside diameter to fit where space is at a premium
- Machined aluminium body - direct mounting to flat surfaces



Cont...

TS Series

- Single bladed design, bi-stable configuration, only requiring power to change state
- Alternate blade material available by special order for x-ray or other unique customer applications
- No protruding components - flush mounting on either side of the device.
- Circular envelope and concentric aperture - easy and fast integration into customer specific applications

VS Series

- Applications: Video Imaging, Telescopy, Microscopy, and Holography
- Ideal For Custom Applications
- Fast Open Times

XRS Series (X-RAY Shutter)

- Applications: X-Ray Switching
- Capable of Blocking up to 30 keV continuously



Drivers, mounts and accessories also available to create your shutter system.

Sensor Heads & Meters

Features:

- High stability, high durability, highest damage thresholds on the market
- Wide range of measurement parameters
- OEM configurations available
- Fibre connections available
- FDA approved for medical applications
- Smart Head technology allows multiple head use with single displays
- Wide range of versatile displays and PC connectivity available

Thermopile Heads for Power

Measurement:

- Measurement from microwatts to kilowatts
- Highest damage thresholds available whilst offering high sensitivity/stability
- Air and water cooled units for widest measurement range
- Single shot and average power measurement configurations from most heads
- Surface and Volume absorbers for measurement of pulsed beams
- OEM configurations available

Special Sensors:

- Integrating Spheres for Divergent Beams
- IPL Head with Gel Coupled Window for measurement of IPL systems
- HD Head for High Power 193nm Excimer Laser Measurement
- LUX Meter for LED/Lighting measurement
- 157nm Vacuum Flange for pyroelectric heads
- Fast Response Thermal Head
- TeraHertz Measurement Head
- Fast Photodetector and Wavelength characterisation meters

Pyroelectric Heads for Energy

Measurement:

- Measurement from pJ up to 10's of J
- Diffuser and reflective configurations available for high energies
- Fast response, high sensitivity
- Specific calibration coatings available for specialist lasers
- OEM configurations available

Photodiode Heads for low power

measurement:

- High sensitivity and stability
- Filter combinations for higher power measurement
- UV and IR sensitive configurations available
- Specialist Photodiode Sensors for Eye Response/Bar Code Scanners/Radiometry measurement available



Cont...

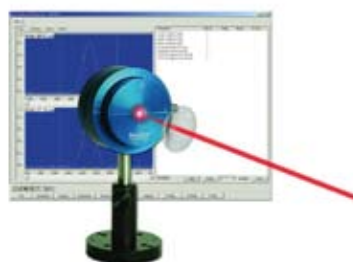
Power Meters:

- Versatile Hand-Held meters available with colour screen displays and RS232/USB interfaces
- Direct Computer Connectivity available
- Wireless Connectivity available



Applications :

- Laser beam monitoring
- LED and Lighting Power Measurement
- Laser beam pickoff for process control
- Laser Safety characterisation



From UV to IR - From pW to kW - from pJ to kJ

Displays

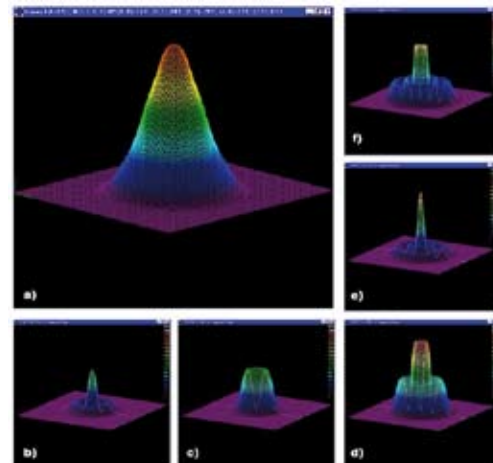
- Detectors are compatible with all displays
- Six versions of tools available
- 1, 2 or 4 measurement channels (20000 / s)
- Digital or analogue
- Connections: USB, RS-232, GPIB and Bluetooth

High Speed Photodetectors : Time Measurement

- Response time of 6 ns
- 193 to 1100 nm
- Clear or bundle

Applications :

- Q-Switch
- Deflection
- Modulation/Frequency Shift



SPATIAL ANALYSIS OF CONTINUOUS BEAMS AND MODULES UV TO IR

Laser Beam Analysis

Scanning Slit Laser Beam Profiler:

- Ge, Si or Pyro
- Accuracy Position: 0.05 to 3 microns
- Resolution: 0.006-18 microns
- Scan 12 bit
- Input Power: <1 kW
- Spectral range: UV to FIR (20 microns)

CCD or CMOS Camera

- From 193 to 1600 nm
- Sensors: 1/2" and 2/3" with Firewire or or USB port
- External trigger: BNC port
- Lasers: pulsed or continuous
- Accessories: Beamsplitter, beam enlarger or reducer, optical density filter

Near & Far Field Profilers:

- MFD, NA and Aeff
- Spatial resolution: 0.0055°
- Dynamic: 93 dB
- Goniometric Radiometer

Industrial Beam Analyser

- Camera & CCD sensor for thermal able CW or pulsed laser beam

Laser Beam Profilers :

- High power pyroelectric scanning slit laser beam profilers for up to 1 kilowatt direct beam measurement
- Precision silicon and germanium scanning slit profilers
- Automated M2 measurement systems
- Near and far field profiling
- Goniometric radiometer for LED and VCSEL profiling

Applications :

- Industrial
- Medical
- Biotechnology
- Cutting
- Marking
- Welding



Cont...

Wavelength & Wavefront Measurement

Laser Wavelength Meters

- High accuracy wavelength meters with spectrum analysis
- DWDM Measurement
- CW & pulsed wavelength measurement

Laser Diode Instrumentation & Test Systems

- Laser diode current sources
- Laser diode temperature controllers
- Laser diode mounts
- DFB laser source banks
- Burn In test systems
- Fibre optic power meters

Shack-Hartmann Wavefront Sensors

- Precision beam profiling and monitoring
- Lens characterisation and aberration correction
- Closed loop adaptive optic systems for real-time beam correction



Glasses, Goggles, Masks, Shielding Windows

- Certified according to EN207 standards (total protection) and EN 208 (laser alignment work)
- A wide range of glass and polycarbonate filters (UV to far IR)

Applications :

- Industrial
- Scientific Research
- Military
- Medical

Laser Curtains and Shields

- Unique fire-retardant curtain, tested and certified according to the latest European standards DIN EN 12254
- Flexible curtain
- Mobile Screen for CO₂ laser - certified EN207



COMPONENTS AVAILABLE IN SI OR INGAAS

Photodiodes, Hybrid Photodiodes, X-Ray to IR

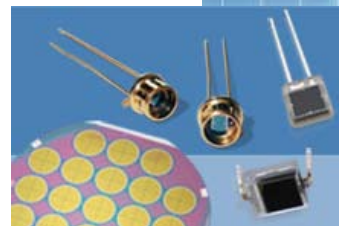
Applications :

- Fire protection
- Bar code reader
- Particle analysis
- Profilometry
- Laser range finding
- X-ray spectroscopy
- Cosmetics
- Guidance system
- Telecoms
- Radiography
- Detection of charged particles

Eye Response Photodiodes

Applications :

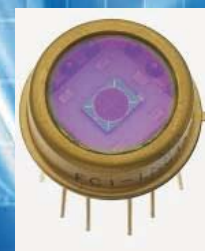
- Photometry / Radiometry
- Medical instrumentation
- Analytical chemistry



Avalanche Photodiodes

Applications :

- High speed optical communication
- Laser range finding
- Bar code
- Remote optical
- Medical equipment
- High speed photometry



Photodiodes Array/ Quadrant Detector

Applications :

- Beam alignment
- Position detection
- Angle measurement
- Profilometry
- Targeting
- Guidance System
- Motion analysis

Custom Developments - (Components or subsystems)

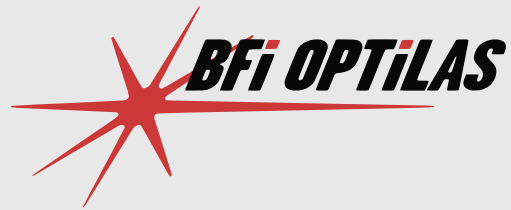
- Optoelectronics
- Photodiodes
- LED
- Hybrid photodiodes
- PCB
- Integration-Encapsulation



Aerospace & Defense Markets

Applications :

- ISO-9001: 2000
- MIL-I-45208 (MoD Certification)
- MIL-PRF-19500 (Quality Certification)
- MIL-STD-883 and MIL-STD-750 (Standard Test Certification)



Photonics Contact Details

Duncan Cooper

Sales Manager

07827 923627

duncan.cooper@bfioptilas.com

Dan Barlow

Field Sales Engineer

07785 904054

dan.barlow@bfioptilas.com

Clive Morrison

Field Sales Engineer

07786 337667

clive.morrison@bfioptilas.com

Lis Eastham

Sales Engineer

01908 326311

lis.eastham@bfioptilas.com

Edward Williams

Internal Sales Engineer

01908 326310

edward.william@bfioptilas.com

Janet Taylor

Sales Administrator

01908 326350

janet.taylor@bfioptilas.com

Mill Court :: Wolverton Mill South :: Milton Keynes :: MK12 5EU

T :: 01908 326326 F :: 01908 221110

E :: info.uk@bfioptilas.com

www.photonics.bfioptilas.co.uk