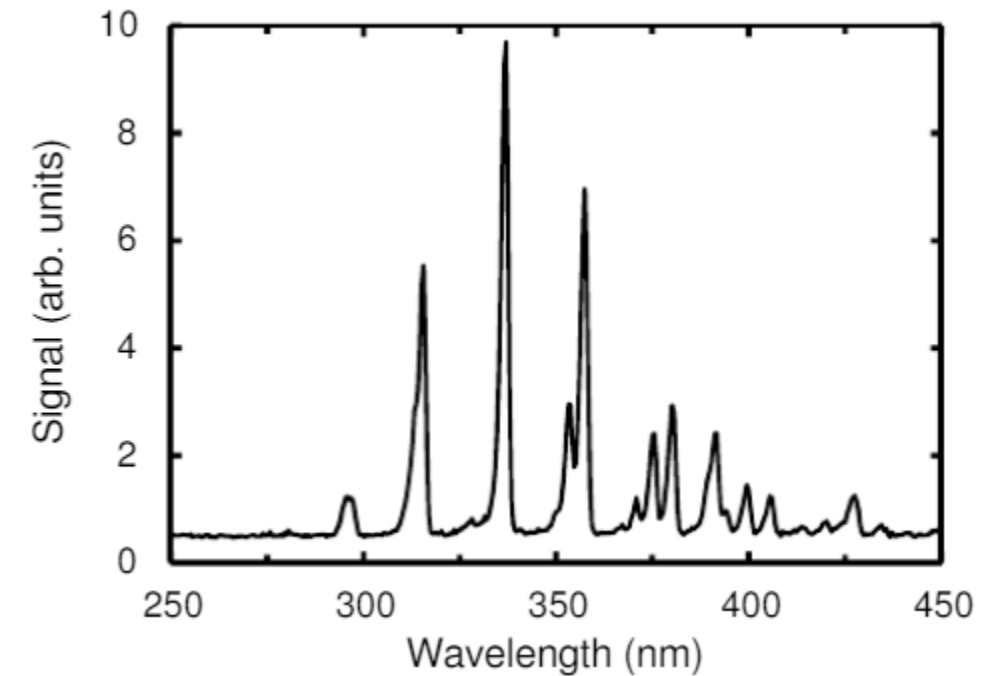


Plasma Emission Monitoring Using UV-VIS-NIR Spectroscopy

UV-VIS-NIR Spectrometer Plasma Monitoring

- The tec5 high sensitivity UV-VIS-NIR spectrometers are ideal for inline plasma monitoring
- For thermal stability, the central body of the MCS FLEX spectrometers is made of a special aluminum alloy (coefficient of expansion $\alpha \sim 13 \times 10^{-6}$)
- MCS-CCD spectrometer provides the high sensitivity to UV light and fast readout speed for plasma emission monitoring

Typical UV plasma emission spectrum for PECVD SiNx.



“Recent Developments in Real-Time Thickness Control Of Plasma Deposited Thin Film Dielectrics Using Optical Emission Interferometry”
Kenneth. D. Mackenzie, et al. CS MANTECH Conference, May 13th - 16th, 2013

Compact Spectroscopy

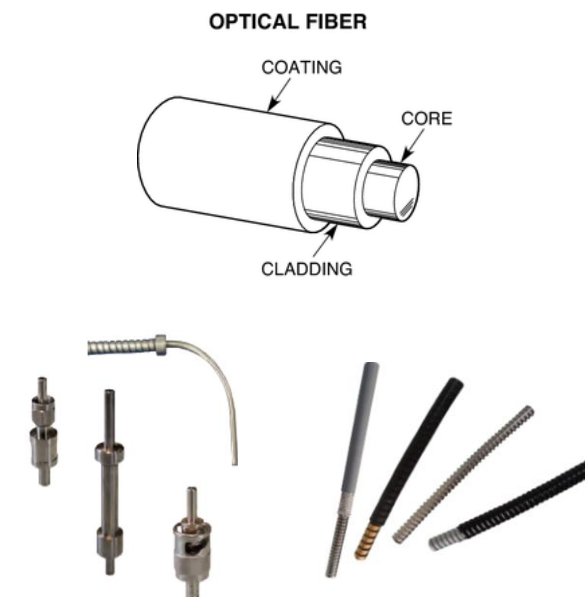
MCS-CCD UV-VIS-NIR

- High sensitivity to UV light
- High throughput with fiber bundle 600 μm cross-section converter
- Hamamatsu back-thinned, TE-cooled CCD, 1044 x 64pixel
- Fan-cooled heat sink
- Permanently Calibrated, temperature induced drift $\leq 0.009 \text{ nm /K}$
- Holographically blazed, flat field gratings
- N.A. 0.22
- Spectral Range: 190-1000 nm
- Resolution $\Delta\lambda_{\text{FWHM}} \approx 3 - 4 \text{ nm}$
- Wavelength accuracy: 0.5 nm
- Low Stray Light
- Dimensions L x W x H: 198 x 68 x 122 mm



Optical Fibers

- Quartz monofibers and fiber bundles for UV/VIS and NIR
- Solarization-resistant UV fibers
- 600 μm fiber standard, various diameters available
- Materials: glass, plastics, quartz (low OH), others upon request
- N.A. = 0.22
- Connectors: SMA, FC, Ferrule, others upon request
- Jacket material: silicon, polyamide, PVC
- Various coatings & cementing available to meet different temperature stability requirement



Coatings:

- Acrylate (-40° to 85°C)
- Silicone (-40° to 150°C)
- High Temp Acrylate (-40° to 20°C)
- Polyimide (-190° to 385°C)
- Others upon request

Various Accessories

- Cross Section Converter: circular-to-linear converter
To improve the light throughput
Various connectors available: SMA, FC/PC, etc.
- Flanges and Feed-through
To pass from normal pressure into vacuum, the light guide is fed through the vacuum chamber wall via flanges
- Fiber Optic Switches
To move the ends of the fibers matching it with other fibers
allowing a user to direct light into different channels

Interfaces:

- RS-232
- USB
- Parallel (TTL)
- I²C

Characteristics:

- Up to 32 channels
- Up to 600 μ m fibers
- High reproducibility
- High optical isolation
- Low insertion loss
- Lifetime: 10^8 switches

