An introduction to Kiriama Pty Ltd and Microstructured Polymer Optical Fibres (mPOF)

The fundamental difference between microstructured polymer optical fibres (mPOF) and other plastic optical fibres (POF), is that mPOF are microstructured fibres: they consist of one material only, and a pattern of microscopic air holes running the length of the fibre is used to define the core and control the light.

The material most commonly used is polymethyl methacrylate (PMMA) which has a transmission window in the visible, but other polymers are also available.

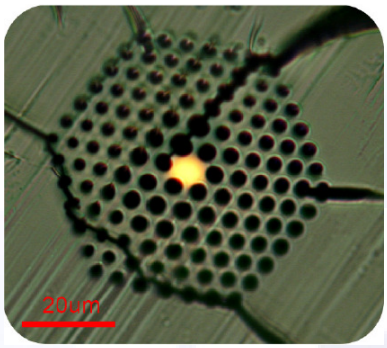
Using air holes to control the light allows for a variety of properties to be achieved, that would otherwise be more difficult, or impossible. This forms the basis of Kiriama's products.

Kiriama offers a range of fibres as standard products, but will also make custom designs for various applications, including non-optical applications. It also supplies polymer capillaries and tubes to order, and offers consultancy services.

Our range of products is summarised below.

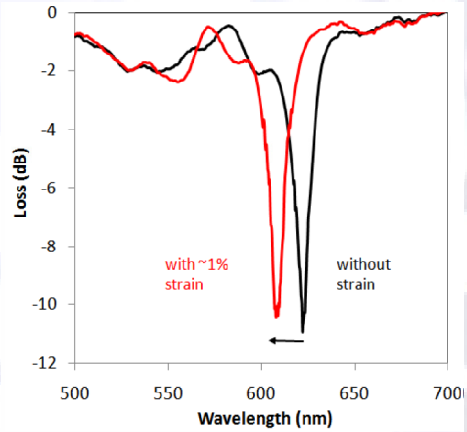
Single-mode polymer fibres in the visible Long Period Gratings (LPG)

Single-mode polymer fibres (SM products), operating in the visible, can be made using the appropriate hole pattern.



The single-mode nature allows for gratings to be inscribed. Long-period gratings are most easily produced, with resonant loss features in the visible.

The grating features are sensitive to strain and temperature, and can be used in strain sensing, from 0.05% up to large strains exceeding 15%. The elastic limit of PMMA is approximately 4%.



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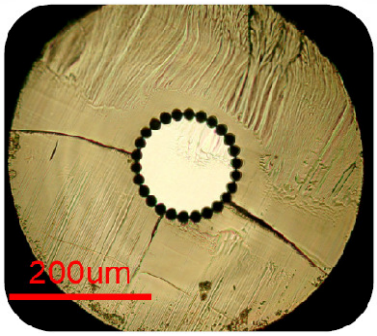

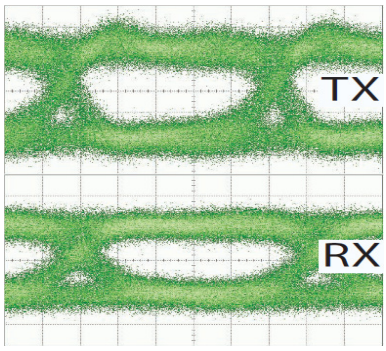

High-bandwidth multimode fibres

Large core multimode fibres with cores from 35 to 150 µm, and losses as low as 0.16 dB/m at 650 nm have been shown to have very high bandwidths.

Most recently, 10 Gb/s over 50 m of fibre was demonstrated. This was limited by the test equipment rather than the fibre. Data rates inferred from other measurements indicate a limit closer to 20 Gb/s over 75 m.

It has been shown that the bandwidth-length product is not constant in these fibres, and increases with fibre length.

Custom fibre, design and characterisation
Capillaries, tubes and unstructured fibre

We can, in consultation with you, design and fabricate a fibre tailored to your application. This includes **birefringent** fibres, fibres for **chemical sensing**, fibres with a **hollow-core**, as well as non-optical applications such as **microfluidics**, and applications in **waveguides for THz radiation.**

We also supply a range of solid polymer fibre, polymer capillaries and tubes. Please inquire for dimensions available.

Materials and support

The polymer we use most frequently is polymethyl methacrylate (PMMA), the same as in common POF. PMMA has a transmission window in the visible, and the default wavelength for specifications is 650 nm. PMMA fibres can be operated up to 90 °C. We offer FC or SMA connectors on selected fibres.

We also offer polycarbonate and zeonex polymers, the latter offers better chemical resistance and excellent transparency at THz frequencies.

More information

Our website (www.kiriama.com) contains more detailed product information, and additional information. Please contact us for any inquiries, availability and pricing.