



Single  
Mode



Large  
Mode-area



Polarization  
Maintaining

# Single-mode LMA Fibers

## Features

- Endlessly single mode (no cutoff) and low loss
- High power handling and low nonlinearities
- Mode field diameter is wavelength independent
- Core sizes from 5 to 35 microns

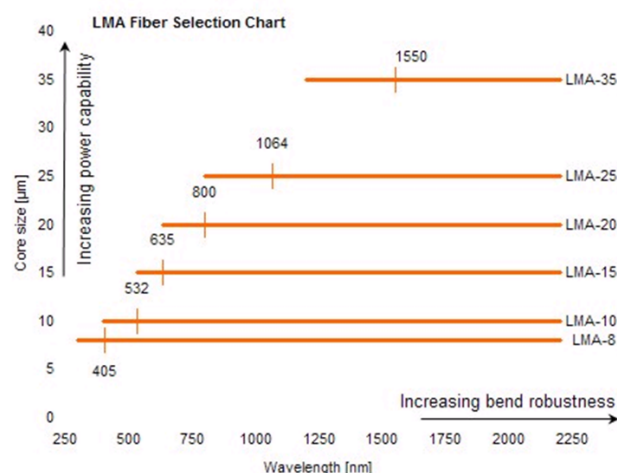
## Applications

- Single-mode transport and delivery
- Ultra broadband transmission
- Short pulse and high power delivery

Our selection of Large Mode Area (LMA) fibers covers a range of fibers for diffraction-limited power delivery. The large mode area enables higher power levels without nonlinear effects or material damage. With standard technology, you have to trade large mode areas for single-mode operation, but the Crystal Fibre LMA fibers provide single mode operation in the entire transmission window of the fiber — also known as endlessly single mode operation — making them ideal for broad band applications. Some of the fibers are also available in polarization-maintaining versions.

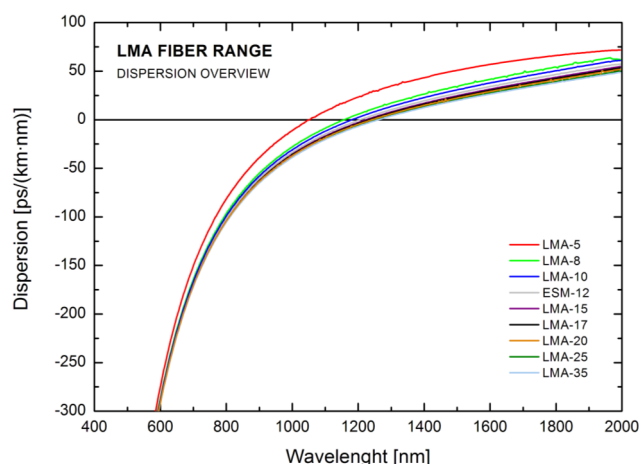
The chart below provides an overview of the fibers. Please refer to the individual fiber data sheets for more detailed information.

Most fibers are available with a variety of termination and cabling options, and some are available in our standard *aero*GUIDE configurations and as fiber delivery systems for our SuperK range of supercontinuum lasers.



**Above:** For high power delivery, it is important to choose the largest feasible core size. However, single mode fibers become bend sensitive at some short wavelength edge - the larger the core size, the longer the wavelength the bend loss induced edge will have. The chart provides a general guide to help choose the most appropriate fiber for a given wavelength.

**Below:** The dispersion of the LMA fibers is close to the material dispersion of silica.



| Nominal Parameter              | LMA-5 | LMA-8 | LMA-10   | LMA-10-UV | ESM-12-01 | LMA-15 | LMA-20 | LMA-25 | LMA-35 | LMA-PM-5 | LMA-PM-10 | LMA-PM-15 |
|--------------------------------|-------|-------|----------|-----------|-----------|--------|--------|--------|--------|----------|-----------|-----------|
| Core size [μm]                 | 5.0   | 8.0   | 10.0     | 10.0      | 12.0      | 15.0   | 20.0   | 25.0   | 35.0   | 5.0      | 10.0      | 15.0      |
| Coating diameter [μm]          | 245   | 245   | 240      | 400       | 245       | 405    | 350    | 410    | 488    | 245      | 350       | 350       |
| Coating diameter [μm]          | 245   | 245   | 240      | 400       | 245       | 405    | 350    | 410    | 488    | 245      | 350       | 350       |
| MFD (1/e <sup>2</sup> ) [μm]   | 4.3   | 7.3   | 8.6      | 8.6       | 10.3      | 12.7   | 16.5   | 20.5   | 29     | 4.3      | 7.5       | 12.7      |
| eff. MFA [μm <sup>2</sup> ]    | 15    | 42    | 58       | 58        | 83        | 127    | 214    | 330    | 661    | 15       | 44        | 127       |
| Relative power handling        | Low   | Low   | Moderate | Moderate  | Moderate  | High   | High   | High   | High   | Low      | Moderate  | High      |
| Relative bend loss at short WL | Low   | Low   | Moderate | Low       | Moderate  | High   | High   | High   | High   | Low      | Moderate  | High      |
| Low attenuation band           |       |       |          |           |           |        |        |        |        |          |           |           |
| Min WL [nm]                    | 400   | 400   | 500      | 400       | 600       | 500    | 700    | 800    | 1300   | 400      | 500       | 600       |
| Max WL [nm]                    | 1700  | 1700  | 1700     | 900       | 1700      | 1700   | 1700   | 1700   | 1700   | 1200     | 1700      | 1700      |

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