



Main characteristics

- High damage threshold
- Nearly single mode guidance
- Ultra low dispersion in the transmission bands

Applications

- Low latency data transmission
- Gas-filled AR hollow core fibre laser
- Molecular tracing, gas detection
- High power delivery for pico- and sub-picoseconds optical pulses

Optical signal in a hollow core anti-resonant fibre propagates in an air core surrounded by single ring of anti-resonant tube elements. Guidance is based on an anti-resonance from the thin glass membranes constituted by the non-touching tubes surrounding the hollow core. The extremely low overlap of guided power with the surrounding silica, less than 2×10^{-5} , added to the mode effective area, confers to this fibre design record material non-linearity.

Fibre specifications

Fibre type Optimised for	ARF-40-240 750 nm transmission	ARF-33-160 1064 nm transmission	ARF-45-240 1550 nm transmission	ARF-40-230 2 μ m transmission	ARF-120-400 3 μ m transmission
Optical parameters					
Attenuation (dB/km)	<50 @ 750 nm	< 50 @ 1064 nm	< 35 @ 1550 nm	< 80 @ 2 μ m	<70 @ 3 μ m
Transmission bandwidth (nm) (< 100 dB/km)	700 - 915	1000 - 1350	1350 - 1850	1600 - 2200	2900 - 3150
Mode field diameter (μ m)	29 @ 750 nm	26 @ 1064 nm	37 @ 1550 nm	33.5 @ 2 μ m	90 @ 3 μ m
Dispersion (ps/nm/km)	-0.8 @ 750 nm	- 2 @ 1064 nm	- 1 @ 1550 nm	- 2 @ 2 μ m	-0.8 @ 3 μ m
Mode overlap with core	> 99.99 %				
Numerical aperture	-0.02	~ 0.03			
HOM suppression (dB)	N.A.	10 (after 3 m)	10 (after 5 m)	> 25 (after 3 m)	N.A.
3 dB Bend loss radius (cm)	4 +/- 1 @ 750 nm	4 +/- 1 @ 1064 nm	6 +/- 1 @ 1550 nm	8 +/- 1 @ 2 μ m	11 +/- 1 @ 3 μ m
Physical/Material parameters					
Fibre material	Air Core				
Core diameter (μ m)	38 +/- 2	33 +/- 2	46 +/- 2	40 +/- 2	119 +/- 2
Cladding diameter (μ m)	71 +/- 3	66 +/- 3	99 +/- 3	105 +/- 3	233 +/- 3
Fibre diameter (μ m)	242 +/- 5	160 +/- 5	239 +/- 5	230 +/- 5	404 +/- 5
Coating outside diameter (μ m)	398 +/- 10	325 +/- 10	355 +/- 10	340 +/- 10	492 +/- 10
Coating type	dual coat high index acrylate				

Typical measured attenuation and dispersion

