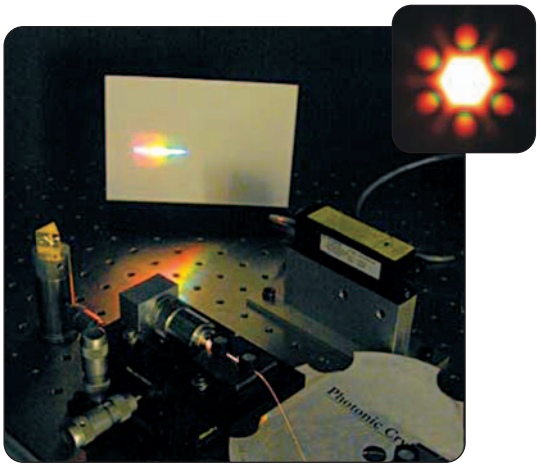
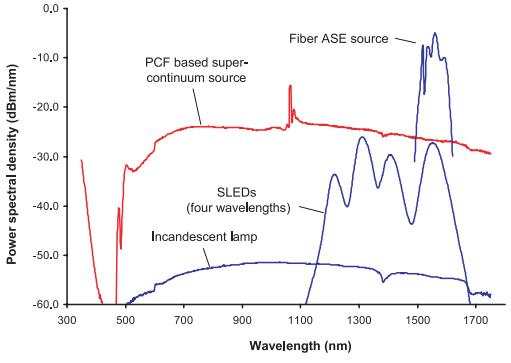
Highly Nonlinear Photonic Crystal Fiber

Nonlinear Fibers for Visible Light



Red-guiding hollow core fiber HC-633-01 back illuminated with white light

Broadband light sources



Red: supercontinuum generation with 75mW average power Nd^{3+} microchip laser and 20m of fiber SC 5.0-1040
Blue: comparison of broadband light sources

Supercontinuum (SC) sources are a new type of light source that combine the high radiant power and high degree of spatial coherence of a laser with the spectral bandwidth usually associated with an incandescent source. Supercontinuum sources can often drastically improve the signal-to-noise ratio, reduce the measurement time, or widen the spectral range in applications that require a broadband source, including high-resolution spectroscopy, the characterization of optical components, or optical coherence tomography (OCT).

Despite the complex nature of the nonlinear optical processes that convert the narrowband output of a laser into a supercontinuum, the practical realization can be surprisingly straightforward. All that is required is a high peak power pulsed laser and a nonlinear element with the right dispersion characteristics. The high power density, long length at comparatively low loss and the ability to achieve zero dispersion at wavelengths shorter than 1250nm – something that is not achievable with conventional fibers – makes small-core PCF ideally suited as the nonlinear element in a SC source. Crystal Fibre offers small-core fibers (NL Series) suitable for use with femtosecond Ti:Sapphire lasers, as well as a fiber specifically designed to generate SC radiation from the output of a compact, low-cost, Nd^{3+}-YAG microchip laser (SC-5.0-1040). Additionally, Crystal Fibre offers a nonlinear pre fiber for SC qualification with Ti:Sapphire lasers. The graph shows the time averaged power spectral density supercontinuum sources realized with these fibers in comparison to the spectrum of other typical broadband sources. Detailed application notes are available at www.thorlabs.com.

Specifications for SC-5.0-1040

- **Core Diameter:** 4.8 ± 0.2µm
- **Mode Field Diameter:** 4.0 ± 0.2µm
- **Zero Dispersion Wavelength λ_0:** 1040 ± 10nm
- **Dispersion Slope at λ_0:** 0.24ps/nm²/km
- **Nonlinear Coefficient:** $11 W^{-1}km^{-1}$
- **Cut Off Wavelength:** <1000nm
- **Cladding Diameter:** 125 ± 3µm
- **Coating Diameter (Single Layer Acrylate):** 244 ± 10µm

†These fibers are experimental and may be subject to modification, production limitations, or cancellations.

Highly Nonlinear Photonic Crystal Fiber for Supercontinuum Generation

Typically 20m is required for supercontinuum generation; length is dependent on pump laser pulse properties.

ITEM#	ZERO DISPERSION λ_0	DISPERSION SLOPE	NONLINEAR COEFFICIENT	MFD @ λ_0	PRICE/m	$	£	€	RMB
SC-5.0-1040	1040 ± 10nm	0.24 ps·nm^{-2}·km^{-1}	11 W^{-1}·km^{-1} (@ 1060 nm)	4.0 ± 0.2µm	1 to 9	$ 495.00	£ 311.90	€ 460,40	¥ 2,978.60
					10 to 49	$ 265.00	£ 167.00	€ 246,50	¥ 1,594.90
					50+	$ 255.00	£ 160.70	€ 237,20	¥ 1,534.70

Crystal Fibre's Popular SC-5.0-1040 Fiber Built Into a Convenient Patch Cable

- High Damage Threshold due to MFD at End Faces >10X Larger Than Internal MFD
- Improved Coupling Efficiency and Stability due to Increased MFD
- Hermetically Sealed Fiber End Faces
- End Faces can be Easily Cleaned
- Rugged Stainless Steel Protective Jacketing

Call for Lead Time

ITEM#	LENGTH	CONNECTORS	PROTECTIVE JACKET	$	£	€	RMB
P1-SC-5.0-FC-20	20m	FC/PC - FC/APC	Flexible Stainless Steel	$ 6,850.00	£ 4,315.50	€ 6.370,50	¥ 65,417.50