Sintec Optronics

STG Series Hollow-core Crystal Fibers

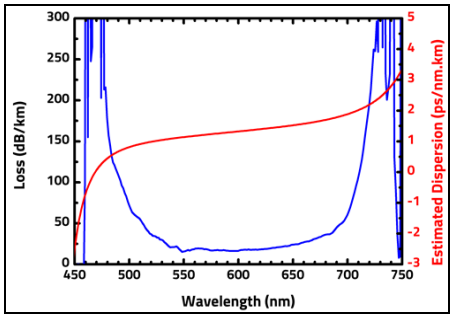
- Nearly single mode guidance
- Low dispersion, low loss
- High power and energy handling
- Broadband spectral coverage

1. STG-C-Green Series Hollow-core Fibers

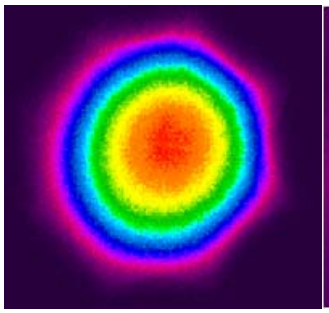
Hollow-core fiber optimized for 500-700nm range

Physical Properties	
Core contour	Hypocycloïde
Inner core Ø	63 µm ± 1
Outer fiber Ø	300 µm ± 3%
Fiber coating layer	Primary polymer coating
Optical Properties	
Center Wavelength	800nm / 1600 nm
Attenuation @ 532nm	30 dB/km ±10
Dispersion @ 532nm	1.5 ps/nm.km ± 0.5
Transmission Band**	200 nm
Mode field Diameter	24 µm ± 1
3dB bend loss radius	10 cm ± 2

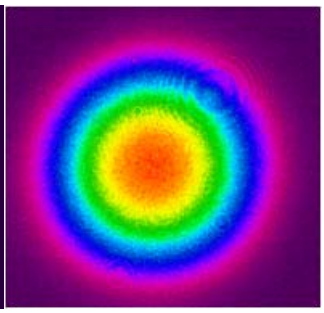
***Attenuation lower than 100 dB/km for the 500-700nm*



Typical attenuation and dispersion



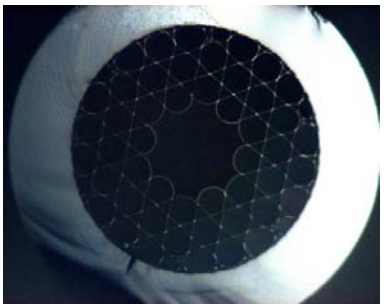
Output near field profile



Output far field profile

2. STG-C-TiSa_Er-7C

Kagome hollow core fiber with optimized performance for 800nm and 1550nm. Ideal for Ti-Sapphire and Erbium based lasers

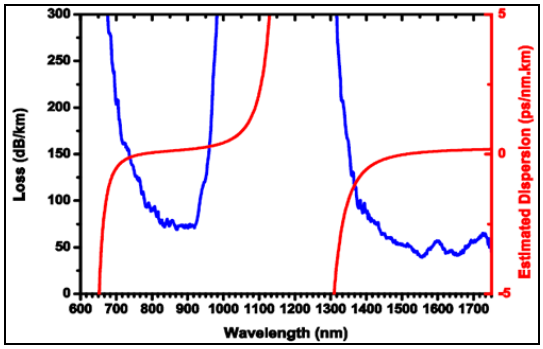


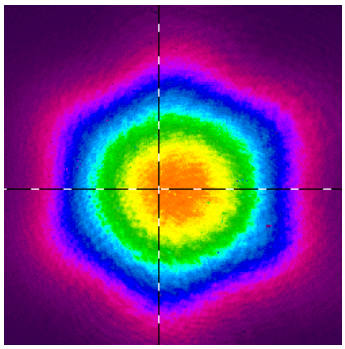
- Broad spectral coverage
- Large core size
- Nearly single mode guidance
- Low dispersion
- Record–high laser damage threshold

Physical Properties	
Core contour	Hypocycloïde with negative curvature parameter b=1*
Inner core Ø	63 µm ± 1
Outer fiber Ø	300 µm ± 3%
Fiber coating layer	Primary polymer coating
Optical Properties	
Center Wavelength	800 / 1600 nm
Attenuation @ 532nm	<80 dB/km ±10
Dispersion @ 532nm	1 ps/nm.km ± 0.5
Transmission Band**	>100nm / >300nm
Mode field Diameter	44 µm ± 1
3dB bend loss radius	5 cm ± 2

***Attenuation lower than 100 dB/km for the 1300-1750nm*

10 Bukit Batock Crescent #07-02 The Spire Singapore 658079 Tel: 6316 7112 Fax: 63167113
http://www.SintecOptronics.com http://www.sintec.sg sales@sintec.sg sales@SintecOptronics.com





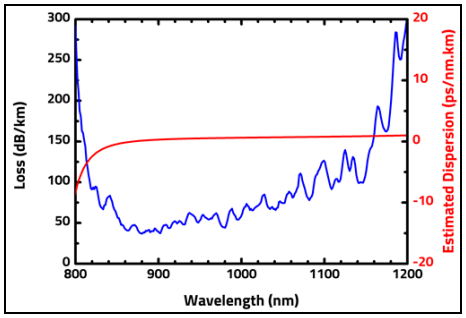
Typical attenuation and dispersion *Typical output near field profile @ 800nm*

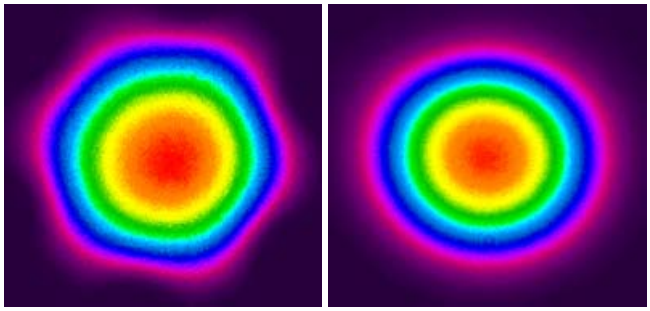
3. STG-C-Yb-7C

Hollow-Core Fiber optimized for 900-1100nm range. Ideal for Yb and Nd:YAG based lasers.

Physical Properties	
Core contour	Hypocycloïde with negative curvature parameter b>0.7*
Inner core Ø	57 µm ± 1
Outer fiber Ø	320 µm ± 3%
Fiber coating layer	Primary polymer coating
Optical Properties	
Center Wavelength	1030 nm
Attenuation @ 532nm	<100 dB/km
Dispersion @ 532nm	1 ps/nm.km ± 0.5
Transmission Band**	300 nm
Mode field Diameter	39 µm ± 1
3dB bend loss radius	5 cm ± 2

***Attenuation lower than 100 dB/km for the 850-1150nm*





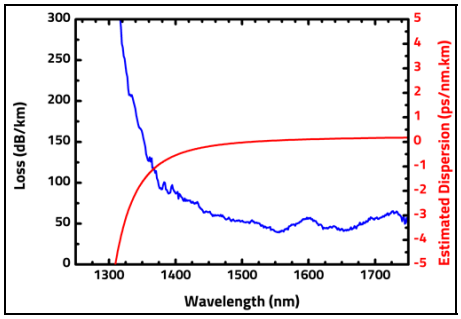
Typical attenuation and dispersion *Output near field profile* *Output far field profile*

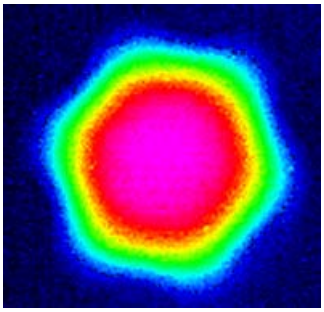
4. STG-C-Er-7C

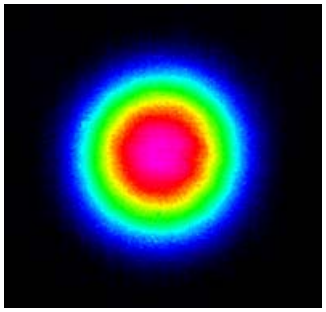
Hollow-Core Fiber optimized for 1550nm. Ideal for Erbium lasers.

Physical Properties	
Core contour	Hypocycloïde with negative curvature parameter b=0.8*
Inner core Ø	61 µm ± 1
Outer fiber Ø	432 µm ± 3%
Fiber coating layer	Primary polymer coating
Optical Properties	
Center Wavelength	1550 nm
Attenuation @ 532nm	<50 dB/km
Dispersion @ 532nm	1 ps/nm.km ± 0.5
Transmission Band**	400 nm
Mode field Diameter	42 µm ± 1
3dB bend loss radius	5 cm ± 2

***Attenuation lower than 100 dB/km for the 1375-1750nm*







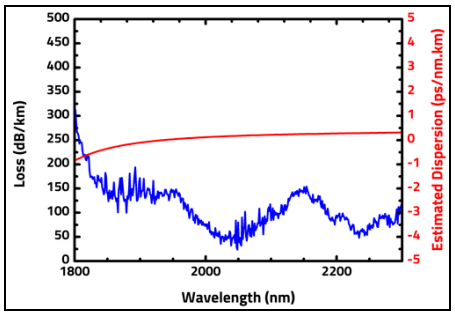
Typical attenuation and dispersion *Output near field profile* *Output far field profile*

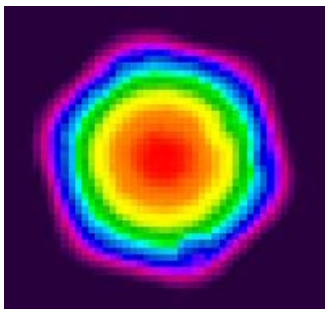
5. STGLO-C-2µm-7C

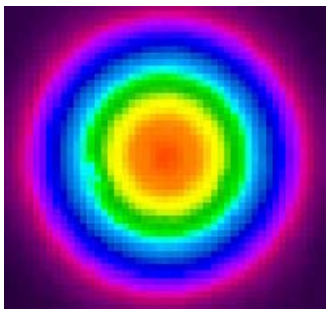
Hollow-Core Fiber optimized for 2-3µm range.

Physical Properties	
Core contour	Hypocycloïde with negative curvature parameter b>0.7*
Inner core Ø	56 µm ± 1
Outer fiber Ø	415 µm ± 3%
Fiber coating layer	Primary polymer coating
Optical Properties	
Center Wavelength	2000 nm
Attenuation @ 532nm	60 dB/km
Dispersion @ 532nm	1 ps/nm.km ± 0.5
Transmission Band**	>350 nm
Mode field Diameter	42 µm ± 1
3dB bend loss radius	5 cm ± 2

***Attenuation lower than 100 dB/km for the 850-1150nm*

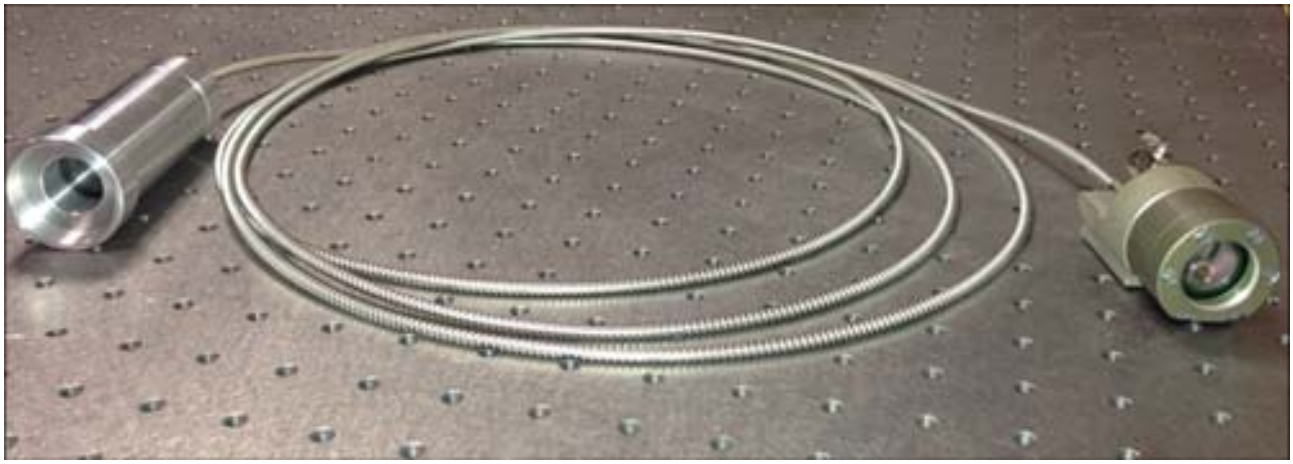






Typical attenuation and dispersion *Output near field profile* *Output far field profile*

STG Photonic Microcell

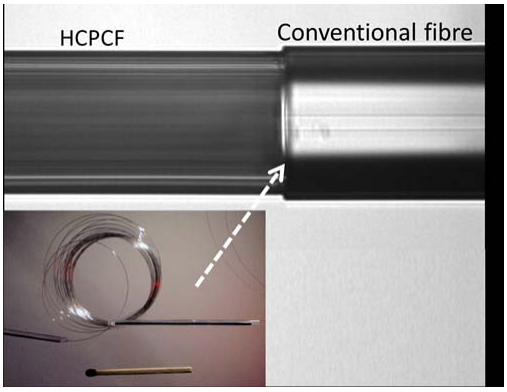


Our technology is based on Hollow-Core Photonic Crystal Fiber (HC-PCF) and the process of filling the fiber with a chosen gas to offer photonic functionalities such as (i) Optical frequency conversion, (ii) Ultra-high power pulsed laser delivery (iii) Laser pulse compression or (iv) Frequency standards.

A PMC is a stand-alone and modular component that consists of a HC-PCF filled with gas and fiber terminations. The presence of gas within an optical fibre on a micron scale provides a million-fold increase in the gas-laser efficiency compared to traditional lasing methods and opens up the unique ability for functionalization. For example, with a Raman gas one can produce new wavelengths and hence create new applications. There are different variants of HC-PCF used within the PMC family of components. The Inhibited-Coupling guiding HC-PCF such as Kagome fiber produces particularly good results with a high damage threshold and a very wide bandwidth.

The PMC comes in different forms tailored to either the applications or the laser power requirements or to specific housing requirements. Below is a list of the different PMC forms we can deliver.

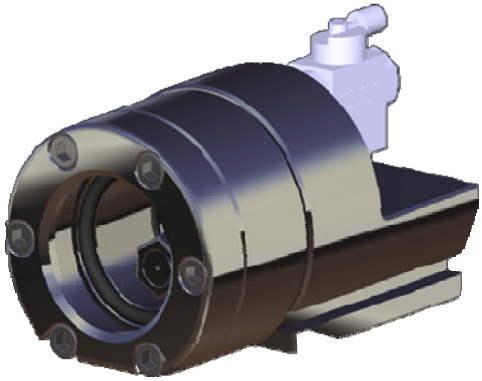
1. ALL-FIBER PMC



An optical fiber made of a length of HC-PCF filled with gas and spliced to a solid optical fiber.

- Gas type: typically any molecular gas. atomic vapor
- Gas pressure ranges: from High vacuum pressure to several bars.
- Splice loss: typically 1 dB/splice.
- Ideal for low power laser applications such as telecommunications, instrumentations, frequency standards, Frequency conversion.

2. GAS-FILLABLE & TRAVEL STAGE MOUNTABLE PMC-TERMINATION



This PMC has at least one of its terminations exhibiting a gas-fillable cell. This cell is mountable on standard translation stages for quick and efficient laser coupling.

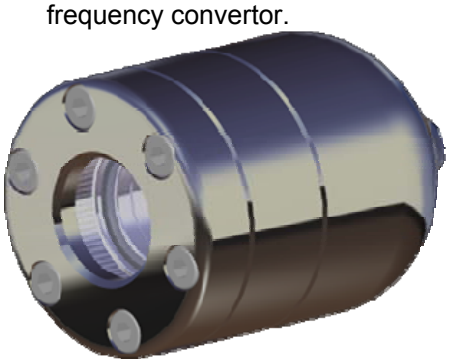
- Gas injection
- Rugged tube-over-fiber
- Micro-bending elimination
- Macro-bending restraint
- Dust contamination prevention
- Ideal for high power applications such as ultra-short pulse laser beam delivery, laser pulse compression, frequency converter.

3. TUBULAR CELL PMC-TERMINATION

This PMC has at least one of its terminations exhibiting a tubular cell. This cell can be mounted on and/or integrated in standard opto-mechanical holders or systems.

- Rugged tube-over-fiber

- Micro-bending elimination
- Macro-bending restraint
- Dust prevention
- Ideal for high power applications such as ultra-short pulse laser beam delivery, laser pulse compression, frequency convertor.



STG Beam Delivery System

STG-BDS is a new and user friendly module for high power laser beam delivery. It brings the outstanding fast lasers pulse energy and power handling of our fiber's technology in a ruggedized and pre-aligned module.

1. STG-BDS-Green Beam Delivery System

Physical Properties	
Fiber length**	2 m , 3 m, 5 m
Output beam quality	M²<1.3
Gas/Vacuum connection	KF16
Fiber protection**	Metallic monocoil
Min bend radius	200 mm
Optical Properties	
Working wavelength**	515 nm / 532 nm
Attenuation	<100 dB/km
Dispersion @ Working wavelength	1 ps/nm/km ± 0.5
Transmission band*** ****Attenuation lower than 100 dB/km*	>100 nm
Input beam requirement**	3 mm ± 0.1
Bend loss @ 20 cm bend radius	< 1 dB

**Others upon request
All specifications could be changed without notice

2. STG-BDS-Yb&NdYag

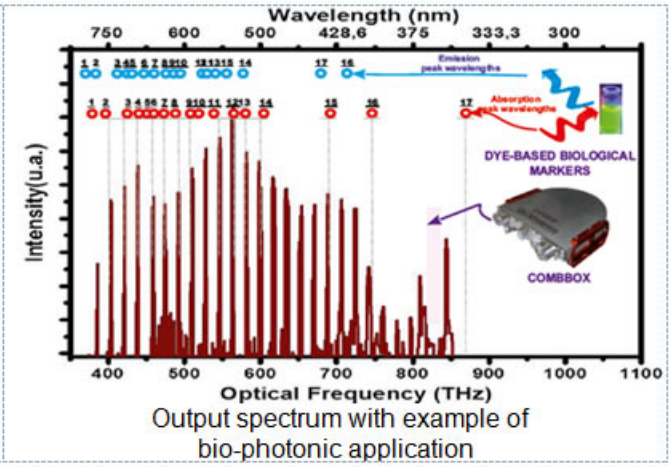
Physical Properties	
Fiber length**	2 m , 3 m, 5 m
Output beam quality	M²<1.3
Gas/Vacuum connection	KF16
Fiber protection**	Metallic monocoil
Min bend radius	200 mm
Optical Properties	
Working wavelength**	1030 nm / 1064 nm
Attenuation	<50 dB/km
Dispersion @ Working wavelength	1 ps/nm/km ± 0.5
Transmission band*** ****Attenuation lower than 100 dB/km*	>200 nm
Input beam requirement**	2.9 mm ± 0.1
Bend loss @ 20 cm bend radius	< 1 dB

**Others upon request
All specifications could be changed without notice

3. STG CombLas

- Photonic Micro-Cell based Raman wavelength convertor
- Ruggedized packaging
- Long life-time
- Ultra-low pump threshold
- Compatible with most pulsed lasers
- Battery powered
- UV-VIS spectral coverage (over 20 lines)
- Single mode
- Ideal for bio-photonic applications

More than 20 lasers in 1



Output spectrum with example of bio-photonic application

Optical Properties*	
Pump wavelength	532 nm
Spectral coverage	350-800 nm
Line spacing	17.6 Thz
Average output power	9 mW