

# AS ... IR FIBERS

## Features

- Higher transmission than PCS-Fibers between 1500 nm and 2600 nm
- Broad useful spectral transmission range
- Specialty coatings available for high temperatures, high vacuum and harsh chemicals environments
- Biocompatible materials
- Sterilizable by ETO, steam, e-beam, gamma radiation
- Radiation resistant
- Laser damage resistant



## Fiber-Design

- Pure fused silica core (low OH-)
- Fluorine doped fused silica cladding
- Acrylate coating (-40°C to 85°C)
- Silicone resin coating (-40°C to 180°C)
- Polyimide coating (-190°C to 385°C)

## Properties

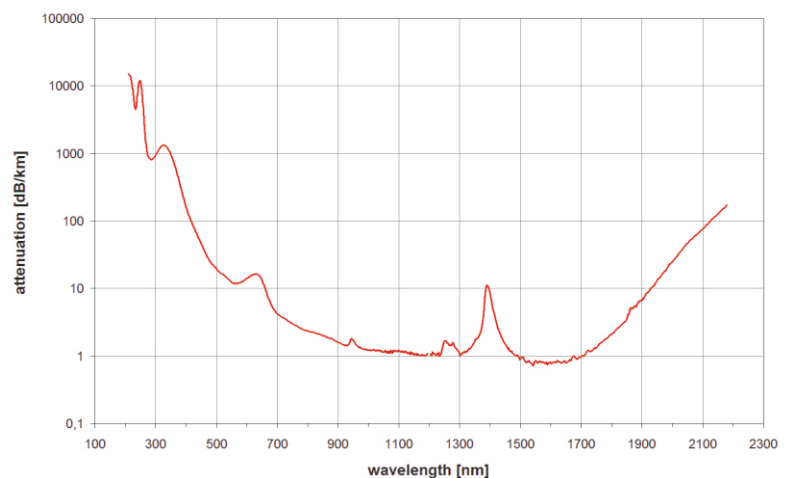
- Core/clad ratio: 1.1, 1.2, 1.4
- Numerical aperture:  $0.22 \pm 0.02$
- Operation wavelength range: 350 nm to 2600 nm
- Proof test level (bend method): 70 kpsi
- Bend radius: momentary 100 times the fiber radius long term 600 times the fiber radius
- Laser damage threshold:  $> 5 \text{ J/mm}^2$  (Nd:YAG, 1ms pulse at 1060 nm)  
 $> 1.3 \text{ kW/mm}^2$  (Nd:YAG, cw at 1060 nm)

## Buffer

- Nylon (-40°C to 100°C)
- ETFE (-200°C to 150°C)
- Acrylate (-40°C to 85°C)
- Polyimide (-190°C to 385°C)

## Options

- Core/clad ratios 1.15, 1.30, 1.4 ... 2,5
- Numerical apertures 0.07 to 0.28
- Metal coating
- Fiber bundles
- Tapered fibers
- Connectors (SMA, FC/PC, ST, DIN)
- AS-Fiber cables
- high temperatur acrylate -40°C to 200°C



## AS ... IR FIBERS

### NYLON BUFFERED FIBERS

(-40°C to 85°C)

#### NOTE

For silicone coating  
 replace A with S in  
 product code.

Product code	Core (μm) ± 2%	Cladding(μm)±2%	Coating (μm) ± 5%	Coating Material	Buffer (μm)±5%
AS 100/140 IRAN	100	140	200	Acrylate	500
AS 200/220 IRAN	200	220	350	Acrylate	500
AS 200/280 IRAN	200	280	500	Acrylate	700
AS 300/330 IRAN	300	330	500	Acrylate	700
AS 400/440 IRAN	400	440	550	Acrylate	700
AS 600/660 IRAN	600	660	800	Acrylate	1000
AS 800/880 IRAN	800	880	1000	Acrylate	1200
AS 1000/1100 IRAN	1000	1100	1250	Acrylate	1500
AS 1500/1650 IRAN	1500	1650	1800	Acrylate	2000

### ETFE BUFFERED FIBERS

(-40°C to 150°C)

#### NOTE

For acrylate coating  
 replace S with A in  
 product code.

Product code	Core (μm) ± 2%	Cladding(μm)±2%	Coating (μm) ± 5%	Coating Material	Buffer (μm)±5%
AS 100/140 IRSE	100	110	180	silicone	300
AS 200/220 IRSE	200	220	350	silicone	500
AS 200/280 IRSE	200	280	500	silicone	700
AS 300/330 IRSE	300	330	500	silicone	700
AS 400/440 IRSE	400	440	550	silicone	700
AS 600/660 IRSE	600	660	800	silicone	1000
AS 800/880 IRSE	800	880	1000	silicone	1200
AS 1000/1100 IRSE	1000	1100	1250	silicone	1500
AS 2000/2100 IRSE	2000	2100	2800	silicone	4000

### POLYIMIDE COATED FIBERS

(-190°C to 385°C)

Product code	Core (μm) ± 2%	Cladding (μm) ± 2%	Coating (μm) ± 3%
AS 100/140 IRPI	100	140	155
AS 200/220 IRPI	200	220	235
AS 200/280 IRPI	200	280	295
AS 300/330 IRPI	300	330	345
AS 400/440 IRPI	400	440	460
AS 600/660 IRPI	600	660	680

### BUNDLES FIBER SPECIFICATIONS

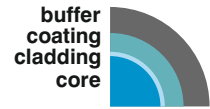
Product code	Core (μm) ± 2%	Cladding(μm)±2%	Coating (μm) ± 3%	Coating Material	Wavelength Rng nm
AS 50/70 IRVV	50	70	78	Wet coating	350 to 2600
AS 50/70 IRPI	50	70		Polyimide	350 to 2600
AS 58/70 IRVV	58	70	78	Wet coating	350 to 1500
AS 58/70 IRPI	58	70		Polyimide	350 to 1500
AS 100/110 IRVV	100	110	120	Wet coating	350 to 1500
AS 100/110 IRPI	100	110		Polyimide	350 to 1500
AS 100/120 IRVV	100	120	120	Wet coating	350 to 2600
AS 100/120 IRPI	100	120	160	Polyimide	350 to 2600
AS 125/150 IRPI	125	150	180	Polyimide	350 to 2600
AS 150/165 IRPI	150	165	235	Polyimide	350 to 1800
AS 200/220 IRPI	200	220		Polyimide	350 to 2600

OTHER SPECIFICATIONS UPON REQUEST.

# AS ... UV-FIBERS

## Features

- Higher transmission than PCS-Fibers between 180 nm and 300 nm
- High core to clad ratio available for high efficiency bundles
- Specialty coatings available for high temperatures, high vacuum and harsh chemicals environments
- Biocompatible materials
- Sterilizable by ETO, steam, e-beam, gamma radiation
- Radiation resistant
- Laser damage resistant



## Fiber-Design

- Pure fused silica core (high OH-)
- Fluorine doped fused silica cladding
- Acrylate coating (-40°C to 85°C)
- Silicone resin coating (-40°C to 180°C)
- Polyimide coating (-190°C to 385°C)

## Properties

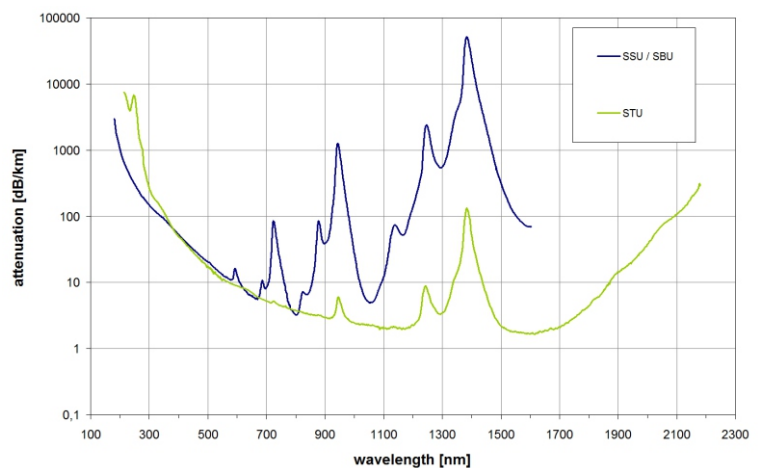
- Core/clad ratio: 1.1
- Numerical aperture:  $0.22 \pm 0.02$
- Operation wavelength range: 180 nm to 1100 nm
- Proof test level (bend method): 70 kpsi
- Bend radius: momentary 100 times the fiber radius long term 600 times the fiber radius
- Laser damage threshold:
  - > 50 mJ/mm<sup>2</sup> (XeCl, 25 ns pulse at 248 nm)
  - > 150 mJ/mm<sup>2</sup> (XeCl, 30 ns pulse at 308 nm)
- Radiation induced attenuation: < 10 dB/km at dose values above 1 Mrad

## Buffer

- Nylon (-40°C to 100°C)
- ETFE (-200°C to 150°C)
- Acrylate (-40°C to 85°C)
- Polyimide (-190°C to 385°C)

## Options

- Core/clad ratios 1.05, 1.07, 1.15, 1.20, 1.30, 1.40
- Numerical apertures 0.07 to 0.28
- Metal coating
- Fiber bundles
- Tapered fibers
- Connectors (SMA, FC/PC, ST, DIN)
- AS-Fiber cables





# CAPILLARIES

## Features

- High strength capillaries
- Pressure resistant
- Specialty coating for high temperature and harsh chemicals
- Sterilizable by ETO, steam, e-beam, gamma radiation
- UV and IR optical quality available



## Capillary-Design

- Capillary Design: Pure fused silica tube  
Polyimide coating (to 385°C)  
uncoated (to 950°C)

## Properties

- Inner diameters: 2  $\mu\text{m}$  to 2000 $\mu\text{m}$
- Wall thickness: 10  $\mu\text{m}$  to 1000  $\mu\text{m}$
- Length: 1 m to 10 km (depends on diameter)
- Standard tolerances:  $\pm 1\%$  (Inner diameter)

## Options

- Coating: Acrylate (-40°C to 85°C)  
Silicone resin (-40°C to 180°C)  
Metal (-190°C )
- Inner coating
- Capillary bundles
- Tapered capillaries

# CAPILLARIES

## SPECIFICATIONS

Product code	Inner diameter ( $\mu\text{m}$ ) $\pm 1\%$	Outer diameter ( $\mu\text{m}$ ) $\pm 3\%$	Coat diameter ( $\mu\text{m}$ ) $\pm 3\%$	Coating Material
CAP10/50 PI	10	50	60	Polyimide
CAP10/100 PI	10	100	120	Polyimide
CAP20/100 PI	20	100	120	Polyimide
CAP20/200 PI	20	200	220	Polyimide
CAP30/72 PI	30	72	85	Polyimide
CAP30/150 PI	30	150	170	Polyimide
CAP40/95 PI	40	95	110	Polyimide
CAP40/200 PI	40	200	220	Polyimide
CAP50/85 PI	50	85	100	Polyimide
CAP50/120 PI	50	120	140	Polyimide
CAP80/130 PI	80	130	150	Polyimide
CAP100/125 PI	100	125	145	Polyimide
CAP100/165 PI	100	165	185	Polyimide
CAP128/160 PI	128	160	180	Polyimide
CAP128/210 PI	128	210	230	Polyimide
CAP170/215 PI	170	215	235	Polyimide
CAP170/280 PI	170	280	300	Polyimide
CAP250/315 PI	250	315	335	Polyimide
CAP250/410 PI	250	410	430	Polyimide
CAP420/530 PI	420	530	550	Polyimide
CAP420/700	420	700		
CAP550/700	550	700		
CAP550/900	550	900		
CAP800/1000	800	1000		
CAP800/1320	800	1320		
CAP950/1200	950	1200		
CAP950/1570	950	1570		

### NOTE

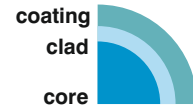
For Silicone coating  
 replace PI with S in  
 product code.

For Acrylate coating  
 replace PI with A in  
 Product code.

# GRADED-INDEX FIBERS

## Features

- Standard communication fibers for 850 nm and 1300 nm
- Low loss, high bandwidth
- Laser power transmission fibers up to 600 µm core diameter
- Better beam profile than step index fibers
- Specialty coatings for high temperatures, high vacuum and harsh chemicals environments
- Radiation resistant type



## Fiber-Design

- Communication fibers: Doped fused silica core (graded-index)  
Pure fused silica cladding  
Dual layer Acrylate coating (-40°C to 85°C)
- Power transmission fibers: Doped fused silica core (graded-index)  
Pure fused silica cladding  
Acrylate coating (-40°C to 85°C)  
Silicone resin coating (-40°C to 150°C)  
Polyimide coating (-190°C to 385°C)

## Properties

- Proof test level (Screen test): 50 kpsi (Communication fibers)
- Proof test level (Bend method): 70 kpsi (Fiber diameter > 200 µm)
- Bend radius: momentary 100 times the fiber radius  
long term 600 times the fiber radius

## Options

- Core/clad ratios 1.1, 1.2
- Metal coating
- Jacket: Nylon (-40°C to 100°C)  
ETFE (-200°C to 150°C)
- Connectors (DIN, FC/PC, ST, SMA)
- Graded-index fiber cables

## GRADED-INDEX FIBERS

<b>ACRYLATE COATED FIBERS</b>	Product code	Core ( $\mu\text{m}$ ) $\pm$ 2%	Cladding ( $\mu\text{m}$ ) $\pm$ 2%	Coating ( $\mu\text{m}$ ) $\pm$ 5%	Coating Material	NA $\pm$ 0.015
(-40°C to 85°C)	G 100/140A	100	140	200	Acrylate	0.290
	G 200/280A	200	280	450	Acrylate	0.290
	G 400/560A	400	560	700	Acrylate	0.290
	G 600/840A	600	840	1000	Acrylate	0.290

<b>POLYIMIDE COATED FIBERS</b>	Product code	Core ( $\mu\text{m}$ ) $\pm$ 3 $\mu\text{m}$	Clad ( $\mu\text{m}$ ) $\pm$ 3 $\mu\text{m}$	Coating ( $\mu\text{m}$ ) $\pm$ 3 $\mu\text{m}$	NA $\pm$ 0.015	Attenuation 850/ 1300 nm (dB/km)	Bandwidth 850/ 1300 nm (MHz*km)
(-190°C to 385°C)	G 50/125PI	50	125	140	0.200	<2.8/0.9	>400/1200
	G 62.5/125PI	62.5	125	140	0.275	<3.3/1.0	>200/600
	G 85/125PI	85	125	140	0.260	<3.3/1.0	>200/200
	G 100/140PI	100	140	155	0.290	<4.0/1.5	>200/200
	G 200/280PI	200	280	300	0.290		
	G 400/560PI	400	560	580	0.290		

<b>COMMUNICATION FIBERS</b>	Product code	Core ( $\mu\text{m}$ ) $\pm$ 3 $\mu\text{m}$	Clad ( $\mu\text{m}$ ) $\pm$ 3 $\mu\text{m}$	Coating ( $\mu\text{m}$ ) $\pm$ 3 $\mu\text{m}$	NA $\pm$ 0.015	Attenuation 850/ 1300 nm (dB/km)	Bandwidth 850/ 1300 nm (MHz*km)
(-190°C to 385°C)	G 50/125	50	125	250	0.200	<2.5/0.6	>400/1200
	G 62.5/125	62.5	125	250	0.275	<3.0/0.7	>200/600
	G 85/125	85	125	250	0.260	<3.0/0.7	>200/200
	G 100/140	100	140	250	0.290	<3.5/1.0	>200/200

Other specifications upon request.



# HPCS-FIBERS

## Features

- High numerical aperture fiber for fiber bundles and short haul data transmission
- Cost effective
- High core to clad ratio
- Biocompatible materials
- Sterilizable by ETO, e-beam, gamma radiation
- Radiation resistant
- Excellent chemical and abrasion resistance



## Fiber-Design

- Fiber design: Pure fused silica core  
 Polymer cladding (-50°C to 120°C)
- Jacket: ETFE (-200°C to 150°C)

## Properties

- Numerical aperture: 0.55 (2 meters)
- Operation wavelength range: 300 nm to 1100 nm (HPCS-UV)  
 400 nm to 1600 nm (HPCS-IR)
- Proof test level (bend method): 70 kpsi
- Bend radius: momentary 100 times the core radius  
 long term 600 times the core radius

Product code	Core (μm) ± 2%	Cladding (μm) ± 2%	Coating (μm) ± 3%
HPCS50UV	50	58	
HPCS70UV	70	78	
HPCS100UV	100	110	
HPCS125UV	125	140	500
HPCS200UV	200	230	500

For HPCS-IR fiber, replace UV with IR in product code.  
 Other specifications upon request.

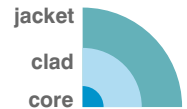
# PCS-FIBERS

## Features

- Cost effective alternative to All Silica Fibers (AS)
- Better UV and IR transmission than Hard clad silica fibers
- High numerical aperture
- Biocompatible materials
- Sterilizable by ETO, steam, e-beam, gamma radiation
- Radiation resistant

## Fiber-Design

- Fiber design: Pure fused silica core  
Silicone resin coating (-40C to 180C)  
Polyimide coating (-190C to 385C)
- Jacket: Nylon (-40C to 100C)  
ETFE (-200C to 150C)



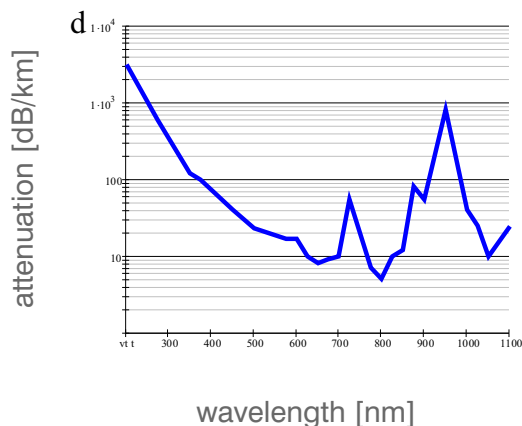
## Properties

- Numerical aperture: 0.40 (2 meters)  
0.30 (steady state)
- Operation wavelength range: 220 nm to 1100 nm (PCS-UV)  
350 nm to 2400 nm (PCS-IR)
- Proof test level (bend method): 70 kpsi
- Bend radius: momentary 100 times the core radius  
long term 600 times the core radius
- Laser damage threshold: >1.3 kW/mm<sup>2</sup> (Nd:YAG, cw at 1060 nm)

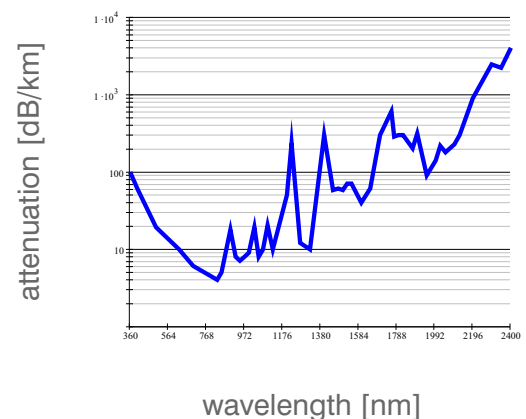
## Options

- Special jacket materials
- PCS-Fiber bundles
- Tapered fibers
- Connectors (SMA, FC/PC, DIN)
- PCS-Fiber cables

### Spectral Attenuation PCS...UV



### Spectral Attenuation PCS...IR



# PCS-FIBERS

## NYLON BUFFERED FIBERS

(-40°C to 85°C)

### NOTE

For silicone coating  
 replace A with S in  
 product code.

Product code	Core (μm) ± 2%	Cladding (μm) ± 5%	Coating (μm) ± 3%
PCS 100 UVN	100	200	500
PCS 200 UVN	200	350	600
PCS 300 UVN	300	450	900
PCS 400 UVN	400	550	900
PCS 600 UVN	600	800	1200
PCS 800 UVN	800	1000	1400
PCS 1000 UVN	1000	1200	1600
PCS 1300 UVN	1300	1500	1900
PCS 1500 UVN	1500	1700	2100
PCS 2000 UVN	2000	2200	2600

## ETFE BUFFERED FIBERS

(-40°C to 150°C)

### NOTE

For acrylate coating  
 replace S with A in  
 product code.

Product code	Core (μm) ± 2%	Cladding (μm) ± 5%	Coating (μm) ± 3%
PCS 200 UVE	200	350	600
PCS 400 UVE	400	550	900
PCS 600 UVE	600	800	1200
PCS 800 UVE	800	1000	1400
PCS 1000 UVE	1000	1200	1600

## POLYIMIDE COATED FIBERS

(-190°C to 385°C)

Product code	Core (μm) ± 2%	Cladding (μm) ± 5%	Coating (μm) ± 3%
PCS 200UV	200	240	No Jacket
PCS 200IR	200	240	No Jacket

Other specifications upon request.

# SINGLE-MODE FIBERS

## Features

- Single mode transmission at a range of standard wavelength between 350 nm and 1550 nm
- All fibers available with 125  $\mu\text{m}$  diameter to allow the use of standard connectors
- High NA fibers available
- Specialty coatings available for high temperatures, high vacuum and harsh chemicals environments
- Radiation resistant type available
- Standard communication fibers available

## Fiber-Design

- Doped fused silica core
- Pure fused silica cladding
- Dual layer Acrylate coating ( -40°C to 85°C )
- Polyimide coating ( - 190°C to 385°C)

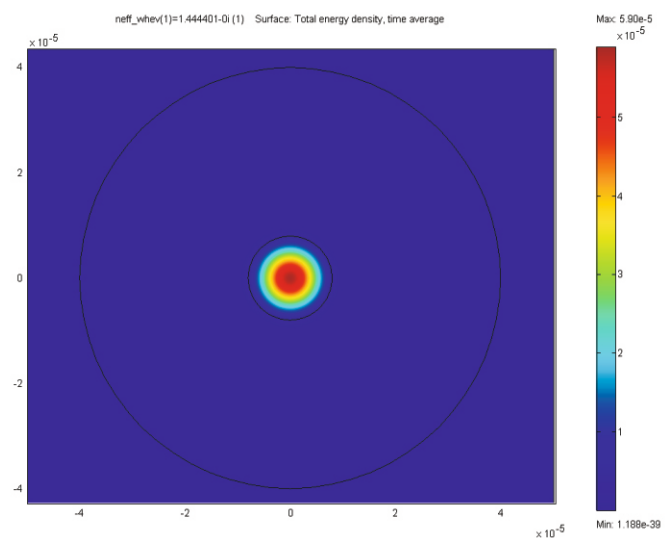


## Buffer optional

- Silicone
- Acrylat
- Hard Clad
- Polyimide

## Options

- Numerical apertures 0.10 to 0.35
- Metal coating (-190°C to 750°C)
- Connectors (DIN, FC/PC, ST, SMA)
- Single-mode fiber cables
- 80 $\mu\text{m}$  cladding
- high NA  $\leq 0, 2$
- high temperature acrylate (-40°C to 200°C)

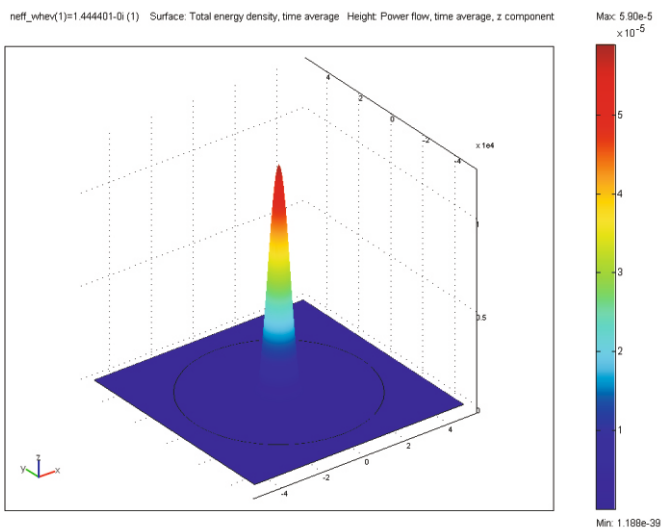


# SINGLE-MODE FIBERS

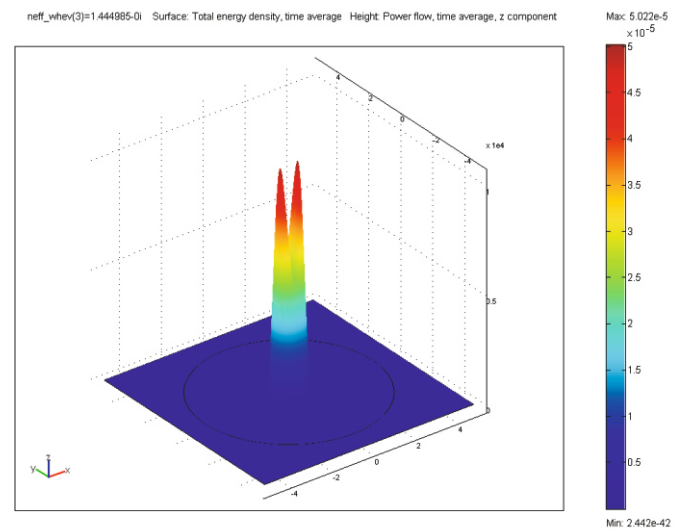
ACRYLATE COATED FIBERS	Product code	Nominal Core Diameter ( $\mu\text{m}$ )	MFD ( $\mu\text{m}$ )	Coating Diameter ( $\mu\text{m}$ )	Operation Wavelength (nm)	Cutoff Wavelength (nm)	Max. Attenuation (dB/km)
(-40°C to 85°C)	SM 400/125 A	2.2	2.7	250 $\pm$ 15	400	340 $\pm$ 50	65
	Sm 488/125 A	2.7	3.2	250 $\pm$ 15	488, 514	420 $\pm$ 50	30
	SM 633/125 A	3.7	4.4	250 $\pm$ 15	633	580 $\pm$ 30	12
	SM 780/125 A	4.6	5.5	250 $\pm$ 15	780	720 $\pm$ 40	5
	SM 850/125 A	4.9	5.9	250 $\pm$ 15	850	770 $\pm$ 50	4
	SM 1060/125 A	6.2	7.4	250 $\pm$ 15	1060	970 $\pm$ 60	2
	SM 1310/125 A	8.0	9.5	250 $\pm$ 15	1310, 1550	1260 $\pm$ 60	0.36, 0.22

POLYIMIDE COATED FIBERS	Product code	Nominal Core Diameter ( $\mu\text{m}$ )	MFD ( $\mu\text{m}$ )	Coating Diameter ( $\mu\text{m}$ )	Operation Wavelength (nm)	Cutoff Wavelength (nm)	Max. Attenuation (dB/km)
(-190°C to 385°C)	SM 400/125 PI	2.2	2.7	145 $\pm$ 3	400	340 $\pm$ 50	65
	SM 488/125 PI	2.7	3.2	145 $\pm$ 3	488, 514	420 $\pm$ 50	30
	SM 633/125 PI	3.7	4.4	145 $\pm$ 3	633	580 $\pm$ 30	12
	SM 780/125 PI	4.6	5.5	145 $\pm$ 3	780	720 $\pm$ 40	6
	SM 850/125 PI	4.9	5.9	145 $\pm$ 3	850	770 $\pm$ 50	5
	SM 1060/125 PI	6.2	7.4	145 $\pm$ 3	1060	970 $\pm$ 60	3
	SM 1310/125 PI	8.0	9.5	145 $\pm$ 3	1310, 1550	1260 $\pm$ 60	0.8, 0.5

Other specifications upon request.  
 (e.g. Two Mode Fibers)



Energy density - Single Mode Fiber



Energy density - Two Mode Fiber