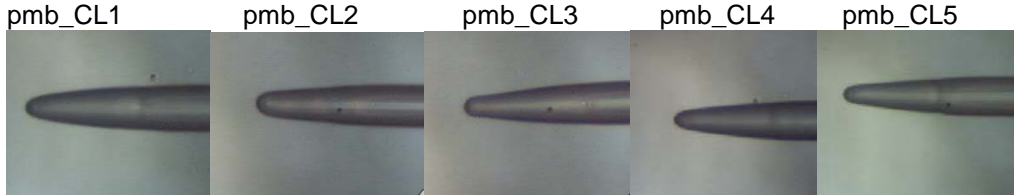


## Testing report

<b>Part Number:</b>	CL5(specialty tapered cone lensed fiber)				
<b>Unit Number:</b>	pmb_CL1	pmb_CL2	pmb_CL3	pmb_CL4	pmb_CL5
<b>Fiber:</b>	S405-HP-PM, primary coated , 0.9 mm loose tube (green)				
<b>Fiber end termination:</b>	FC/APC				
<b>Fiber pigtail length (m):</b>	~ 1	~ 1	~ 1	~ 1	~1
<b>Stripped area (mm):</b>	~12	~12	~12	~12	~12
<b>Intermediate taper :</b>	105	105	105	105	105
<b>End taper:</b>	105	105	105	105	105
<b>Testing wavelengths, nm</b>	~405				
<b>Far field divergence(FWHM), Deg</b>	22.2x21.5	21x19.8	21x20	~22x24	~23x24.5
<b>Slow axis orientation wrt key</b>	45Deg	90 Deg	~40 Deg	~0 Deg	~90 Deg
<b>Working distance, um</b>	>20	>25	>25	>25	>25

Process:1-41(0.5s)/ 3.3x1\*x ms



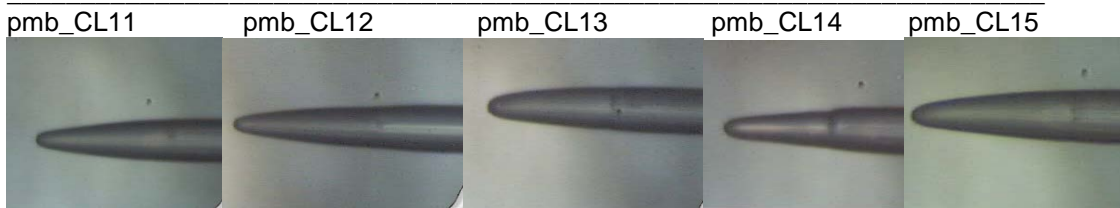
<b>Part Number:</b>	CL5(specialty tapered cone lensed fiber)				
<b>Unit Number:</b>	pmb_CL6	pmb_CL7	pmb_CL8	pmb_CL9	pmb_CL10
<b>Fiber:</b>	S405-HP-PM, primary coated , 0.9 mm loose tube (green)				
<b>Fiber end termination:</b>	FC/APC				
<b>Fiber pigtail length (m):</b>	~ 1	~ 1	~ 1	~ 1	~1
<b>Stripped area (mm):</b>	~12	~12	~12	~12	~12
<b>Intermediate taper :</b>	105	105	105	105	105
<b>End taper:</b>	105	105	105	105	105
<b>Testing wavelengths, nm</b>	~405				
<b>Far field divergence(FWHM), Deg</b>	21.6x20.5	21.2x21.8	24x22.1	~25.3x25.1	~21.6x22.5
<b>Slow axis orientation wrt key</b>	~20 Deg	~20 Deg	~ 90 Deg	~ 0 Deg	~ 0 Deg
<b>Working distance, um</b>	>20	>25	>25	>25	>25

Process:1-41(0.5s)/ 3.3x1\*x ms



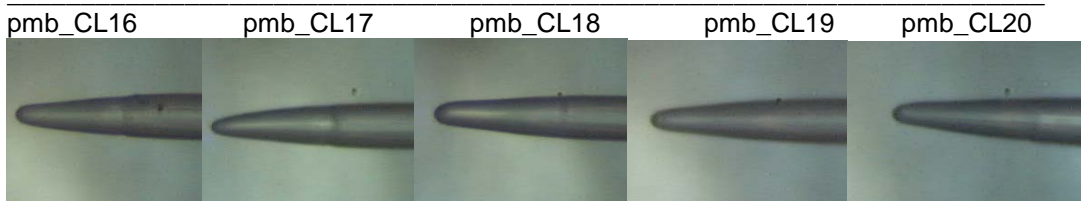
<b>Part Number:</b>	CL5(specialty tapered cone lensed fiber)				
<b>Unit Number:</b>	pmb_CL11	pmb_CL12	pmb_CL13	pmb_CL14	pmb_CL15
<b>Fiber:</b>	S405-HP-PM, primary coated , 0.9 mm loose tube (green)				
<b>Fiber end termination:</b>	FC/APC				
<b>Fiber pigtail length (m):</b>	~ 1	~ 1	~ 1	~ 1	~1
<b>Stripped area (mm):</b>	~12	~12	~12	~12	~12
<b>Intermediate taper :</b>	105	105	105	105	105
<b>End taper:</b>	105	105	105	105	105
<b>Testing wavelengths, nm</b>	~405				
<b>Far field divergence(FWHM), Deg</b>	25.7x27.1	26x26	23x22.8	~22x22.4	~23x24.7
<b>Slow axis orientation wrt key</b>	~ 90 Deg	~ 90 Deg	~0 Deg	~0 Deg	~75 Deg
<b>Working distance, um</b>	>20	>25	>25	>25	>25

Process:1-41(0.5s)/ 2.6x1\*x ms

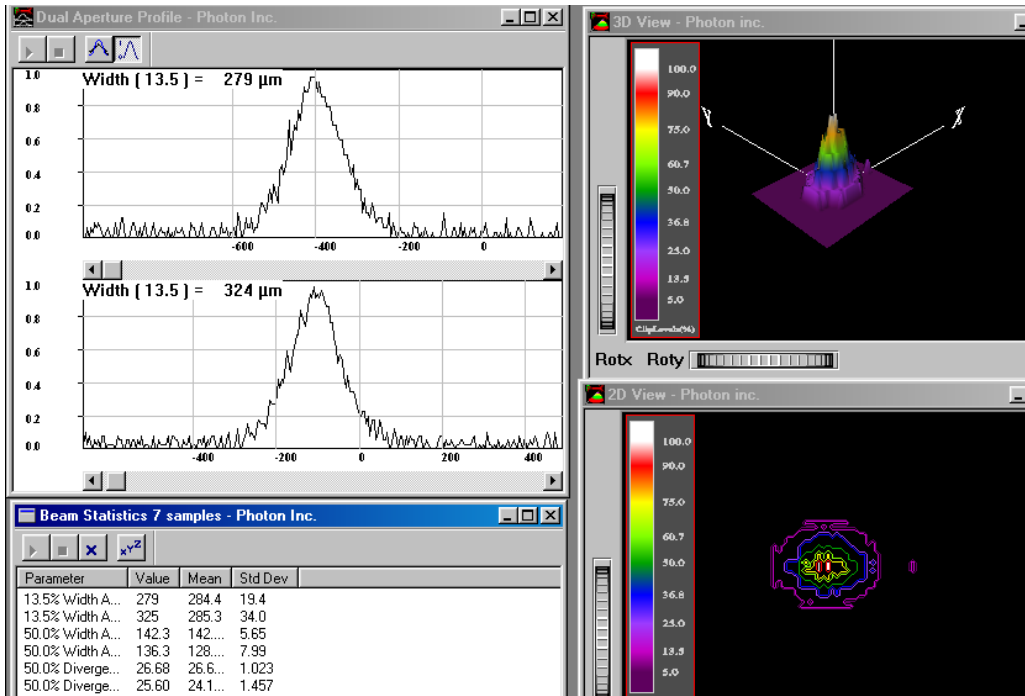


<b>Part Number:</b>	CL5(specialty tapered cone lensed fiber)				
<b>Unit Number:</b>	pmb_CL16	pmb_CL17	pmb_CL18	pmb_CL19	pmb_CL20
<b>Fiber:</b>	S405-HP-PM, primary coated , 0.9 mm loose tube (green)				
<b>Fiber end termination:</b>	FC/APC				
<b>Fiber pigtail length (m):</b>	~ 1	~ 1	~ 1	~ 1	~1
<b>Stripped area (mm):</b>	~12	~12	~12	~12	~12
<b>Intermediate taper :</b>	105	105	105	105	105
<b>End taper:</b>	105	105	105	105	105
<b>Testing wavelengths, nm</b>	~405				
<b>Far field divergence(FWHM), Deg</b>	23x22	22.5x24.2	19x21.1	~26x23.8	~22x22.4
<b>Slow axis orientation wrt key</b>	~90 Deg	~40 Deg	~0 Deg	~0 Deg	~20 Deg
<b>Working distance, um</b>	>20	>25	>25	>25	>25

Process:1-41(0.5s)/ 1.6x1\*x ms



Typical Far Field distribution of light from the tip of lensed pmb\_CLx fibers, measured at ~405 nm



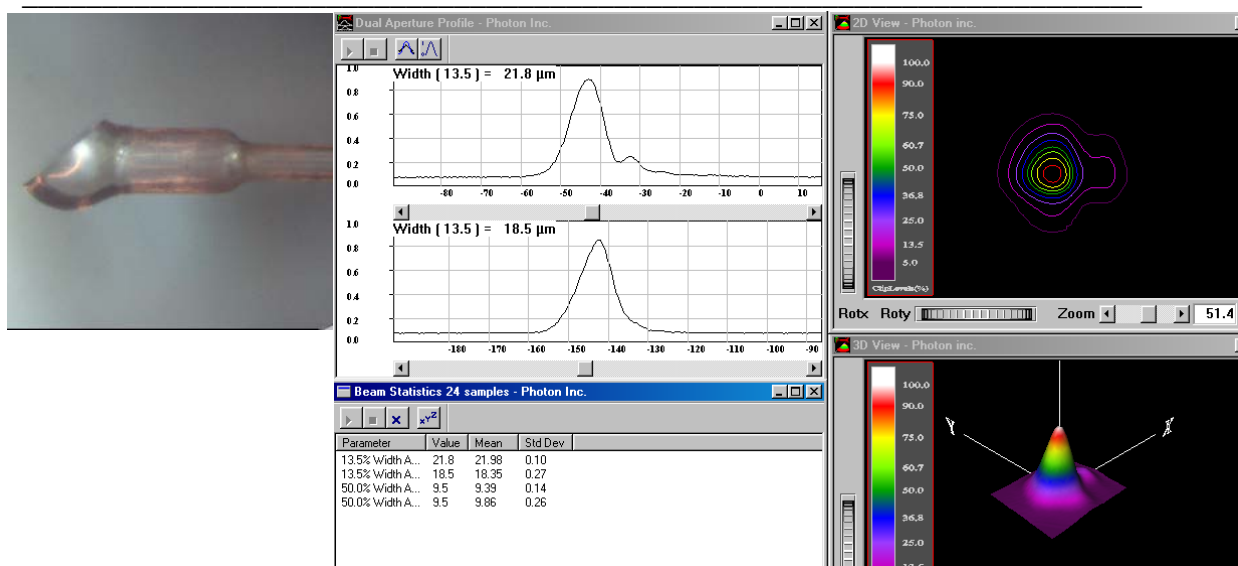
**Lensed fiber sample has been tested using following equipment:**

Laser source: LD051R; LD-4s (WT&T)  
 Blue Laser diode: N/A (LDC)  
 Optical field profile: BeamScan (Photon Inc.)  
 Optical Beam profiler H.R.: BeamScan 2180 (Photon Inc.)  
 Micro-photo @VL: Nikon  
 T&M/Quality control: Operator 5

## Testing report

<b>Part Number:</b>	<b>BL5-AF</b> (Specialty ball lensed fiber with angled reflector)
<b>Unit Number:</b>	AIT_1
<b>Fiber:</b>	Single-mode fiber, HP780, primary coated
<b>Fiber termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~1
<b>Length of stripped fiber (mm):</b>	~16
<b>Intermediate taper :</b>	200/240MM
<b>Reflector set angle, Deg</b>	~46
<b>Spot size FWHM (@~0.9 mm)*, um.</b>	~9.5x9.9
<b>Testing wavelength, nm</b>	~800
<b>Process</b>	1/41/66x4/60ms/g12/g3

\* Measured at central wavelength of ~780/ ~800 nm/ ~980 nm/ ~1100 nm



Near optical field profile (spot size) has been measured at distance of ~900 um away from the lensed fiber tip, using injected light at central wavelength of ~800 nm

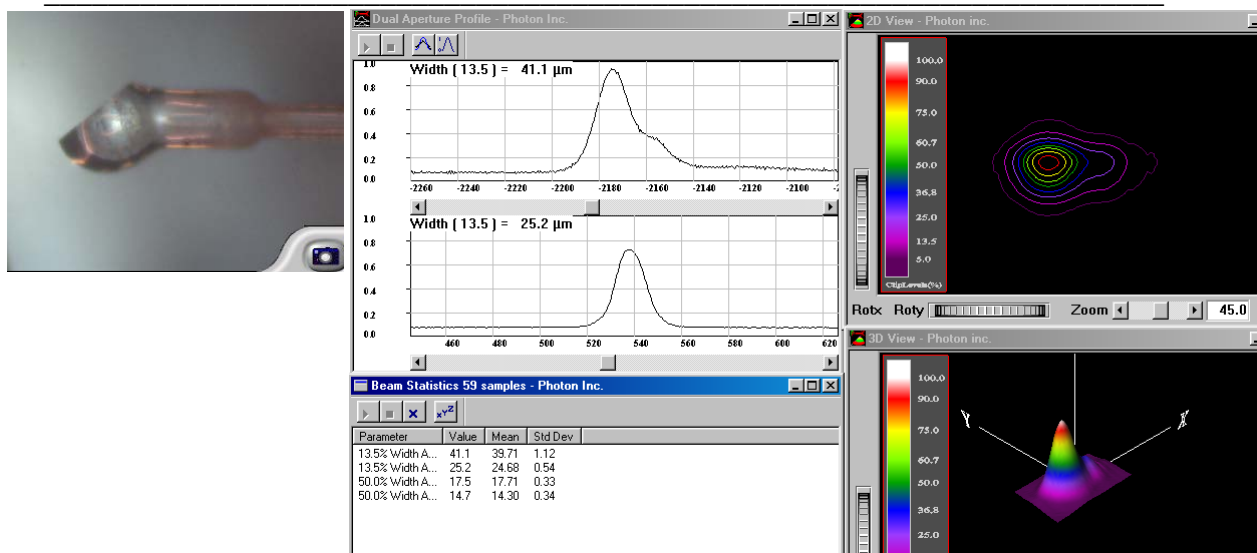
*Lensed fiber sample has been tested using following equipment:*

Laser source: LD-05-4@780nm; 800 nm ; 980nm; 635 nm; 1310 nm (WT&T)  
 Back-reflection: ODB-3SW (WT&T)  
 Optical field 2D scan: BeamScan (Photon Inc)  
 Micro-photo @VL: Nikon  
 T&M/Quality control: Operator 3

## Testing report

<b>Part Number:</b>	<b>BL5-AF</b> (Specialty ball lensed fiber with angled reflector)
<b>Unit Number:</b>	AIT_2
<b>Fiber:</b>	Single-mode fiber, Hi1060, primary coated
<b>Fiber termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~1
<b>Length of stripped fiber (mm):</b>	~16
<b>Intermediate taper :</b>	200/240MM
<b>Reflector set angle, Deg</b>	~46
<b>Spot size FWHM (@~1.0 mm)*, um.</b>	~17x14
<b>Testing wavelength, nm</b>	~1100
<b>Process</b>	1/41/72x4/60ms/g12/g3

\* Measured at central wavelength of ~780/ ~800 nm/ ~980 nm/ ~1100 nm



Near optical field profile (spot size) has been measured at distance of ~1000 um away from the lensed fiber tip, using injected light at central wavelength of ~1100 nm

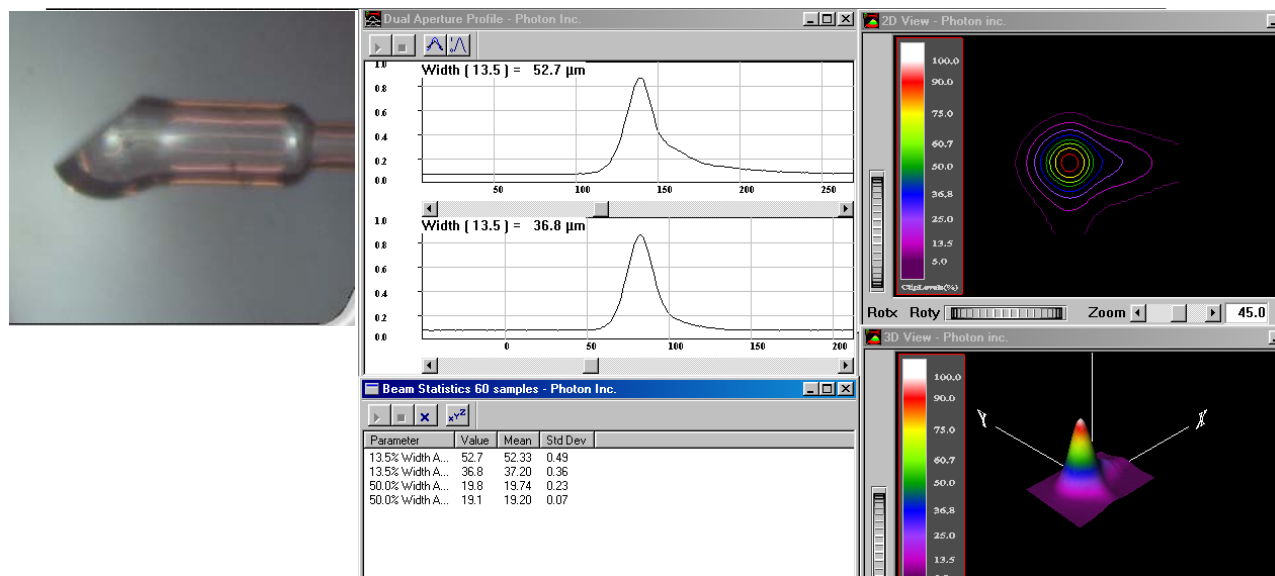
*Lensed fiber sample has been tested using following equipment:*

Laser source: LD-04-1100@1100 nm (WT&T)  
 Back-reflection: ODB-3SW (WT&T)  
 Optical field 2D scan: BeamScan (Photon Inc)  
 Micro-photo @VL: Nikon  
 T&M/Quality control: Operator 3

## Testing report

<b>Part Number:</b>	<b>BL5-AF</b> (Specialty ball lensed fiber with angled reflector)
<b>Unit Number:</b>	AIT_3
<b>Fiber:</b>	Single-mode fiber, smf-28, primary coated
<b>Fiber termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~1
<b>Length of stripped fiber (mm):</b>	~16
<b>Intermediate taper :</b>	200/240MM
<b>Reflector set angle, Deg</b>	~46
<b>Spot size FWHM (@~0.9 mm)*, um.</b>	~20x19
<b>Testing wavelength, nm</b>	~1550
<b>Process</b>	1/41/72x2/60ms/g12/g3

\* Measured at central wavelength of ~780/ ~800 nm/ ~980 nm/ / 1310 nm./ 1550 nm



Near optical field profile (spot size) has been measured at distance of ~900 um away from the lensed fiber tip, using injected light at central wavelength of ~1550 nm

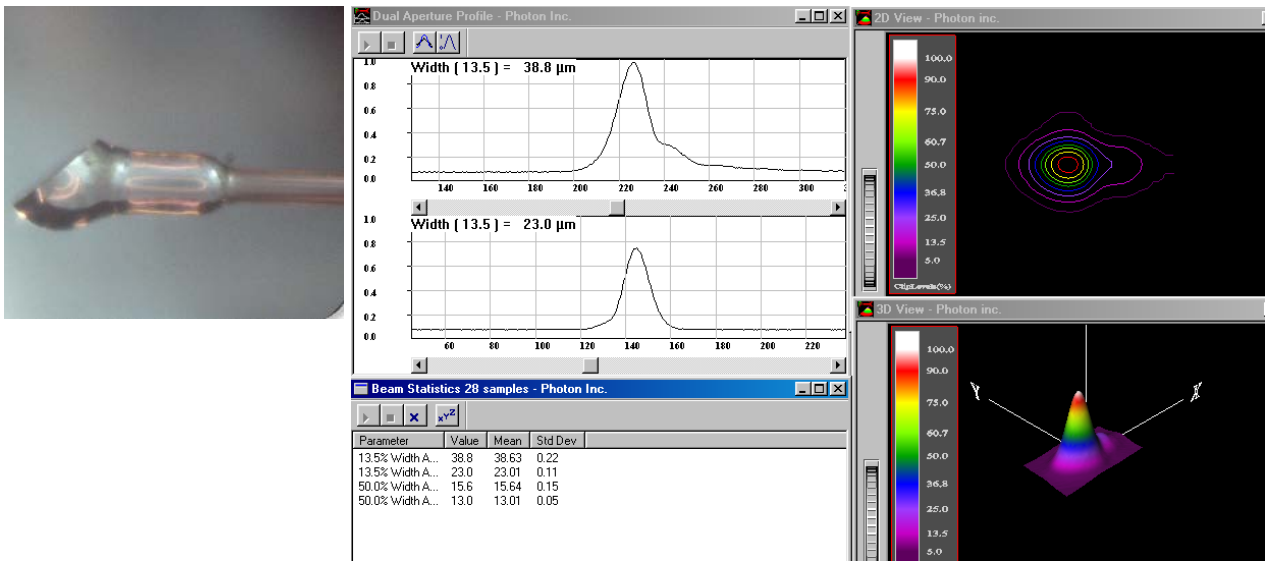
*Lensed fiber sample has been tested using following equipment:*

Laser source:	LD-04-1550@1550 (WT&T)
Back-reflection:	ODB-3SW (WT&T)
Optical field 2D scan:	BeamScan (Photon Inc)
Micro-photo @ VL:	Nikon
T&M/Quality control:	Operator 3

## Testing report

Part Number:	BL5-AF (Specialty ball lensed fiber with angled reflector)
Unit Number:	AIT_4
Fiber:	Single-mode fiber, Hi1060, primary coated
Fiber termination	Normal cleaved end
Fiber pigtail length (m):	~1
Length of stripped fiber (mm):	~16
Intermediate taper :	200/240MM
Reflector set angle, Deg	~46
Spot size FWHM (@~0.9 mm)*, um.	~15.6x13
Testing wavelength, nm	~1100
Process	1/41/72x5/60ms/g12/g3

\* Measured at central wavelength of ~780/ ~800 nm/ ~980 nm/ 1100 nm



Near optical field profile (spot size) has been measured at distance of ~900 um away from the lensed fiber tip, using injected light at central wavelength of ~1100 nm

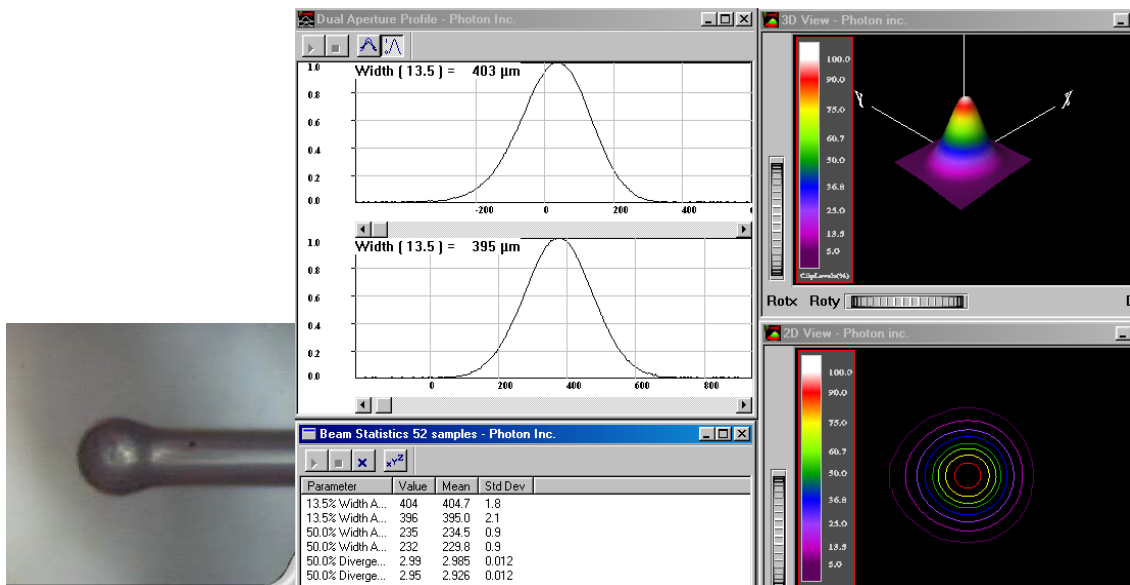
*Lensed fiber sample has been tested using following equipment:*

Laser source: LD-04-1100@1100 nm (WT&T)  
 Back-reflection: ODB-3SW (WT&T)  
 Optical field 2D scan: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon  
 T&M/Quality control: Operator 3

### Testing report

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_3D-1
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	AFS_105/125_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~3x3
<b>Return loss (@1310nm), dB:</b>	~-44

Proc: 1; 41; 26.6x18



Far field distribution, measured @ ~4.5 mm from the fiber tip

#### Lensed fiber sample has been tested using following equipment:

Laser source: LD-05 @ 1310/1550/670 nm (WT&T)  
 Back-reflection @ 1310 nm: ODB-3 (WT&T)  
 Far field @ 1310 nm: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon

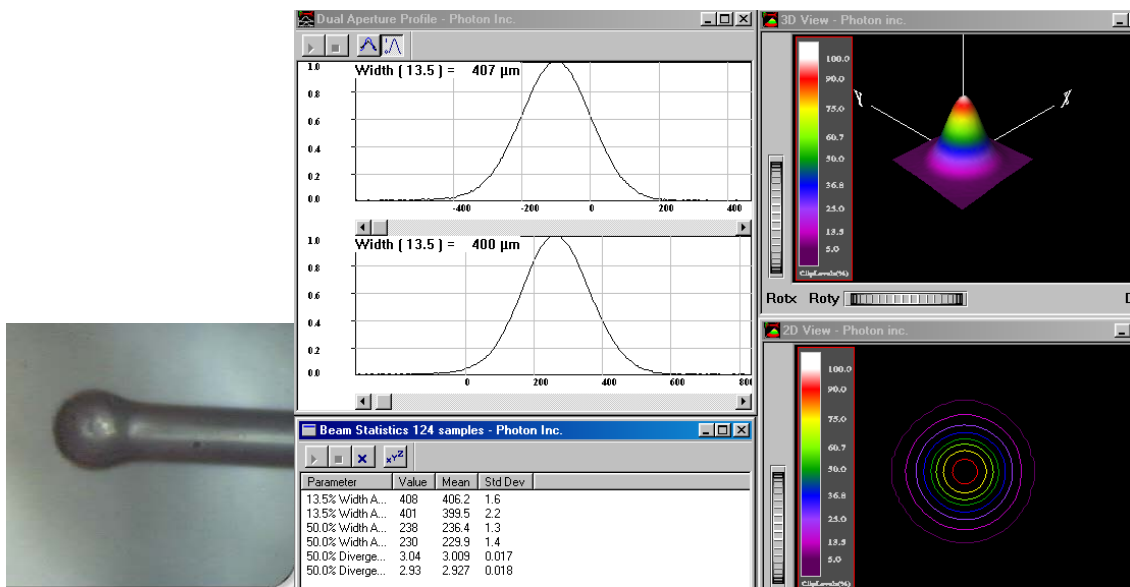
T&M/Quality control: Operator 3



### Testing report

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_3D-2
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	AFS_105/125_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~3x3
<b>Return loss (@1310nm), dB:</b>	~-44.2

Proc: 1; 41; 26.6x28



Far field distribution, measured @ ~4.5 mm from the fiber tip

### Lensed fiber sample has been tested using following equipment:

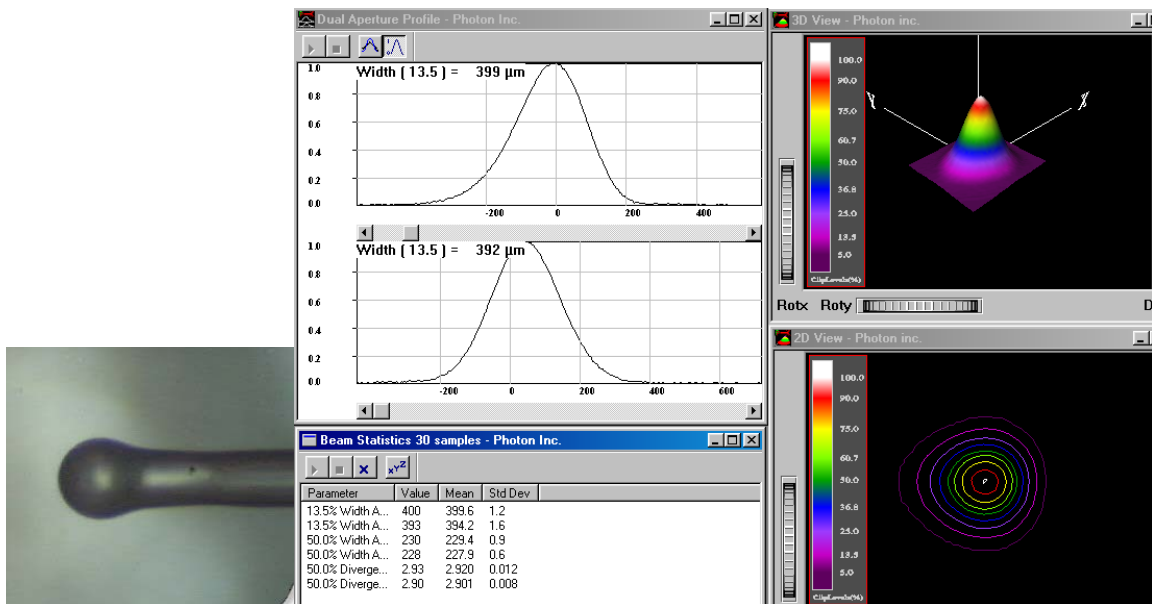
Laser source: LD-05@ 1310/1550/670 nm (WT&T)  
 Back-reflection @ 1310 nm: ODB-3 (WT&T)  
 Far field @ 1310 nm: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon

T&M/Quality control: Operator 3

### Testing report

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_3D-3
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	AFS_105/125_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~3x3
<b>Return loss (@1310nm), dB:</b>	~-43

Proc: 1; 41; 26.6x28



Far field distribution, measured @ ~4.5 mm from the fiber tip

#### Lensed fiber sample has been tested using following equipment:

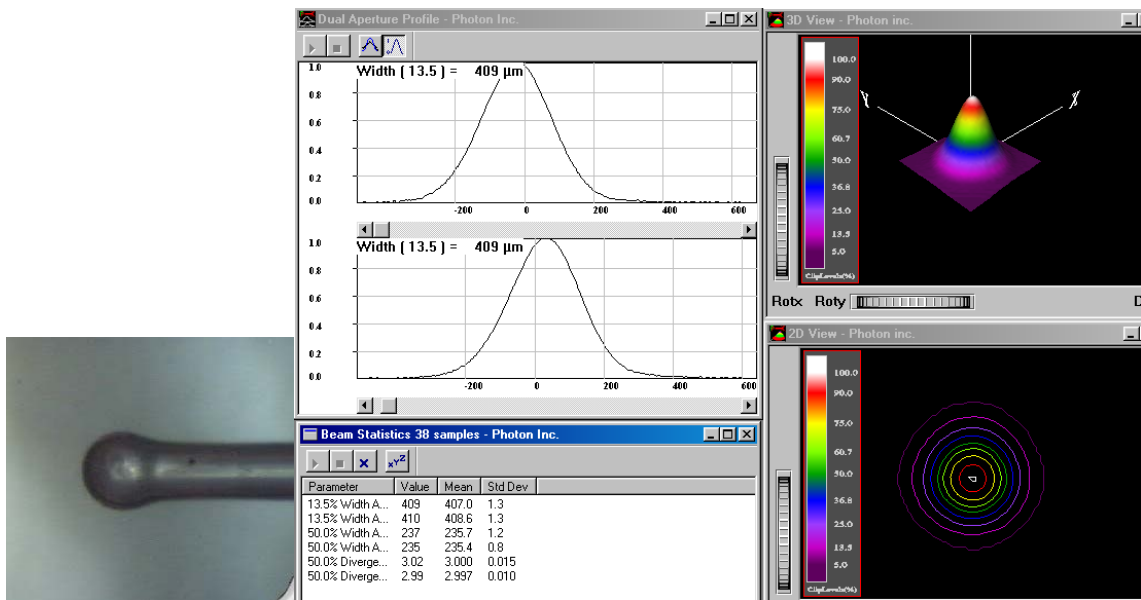
Laser source: LD-05@1310/1550/670 nm (WT&T)  
 Back-reflection @1310 nm: ODB-3 (WT&T)  
 Far field @1310 nm: BeamScan (Photon Inc)  
 Micro-photo @VL: Nikon

T&M/Quality control: Operator 3

### Testing report

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_3D-4
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	AFS_105/125_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~3x3
<b>Return loss (@1310nm), dB:</b>	~-43.4

Proc: 1; 41; 26.6x32



Far field distribution, measured @ ~4.5 mm from the fiber tip

### Lensed fiber sample has been tested using following equipment:

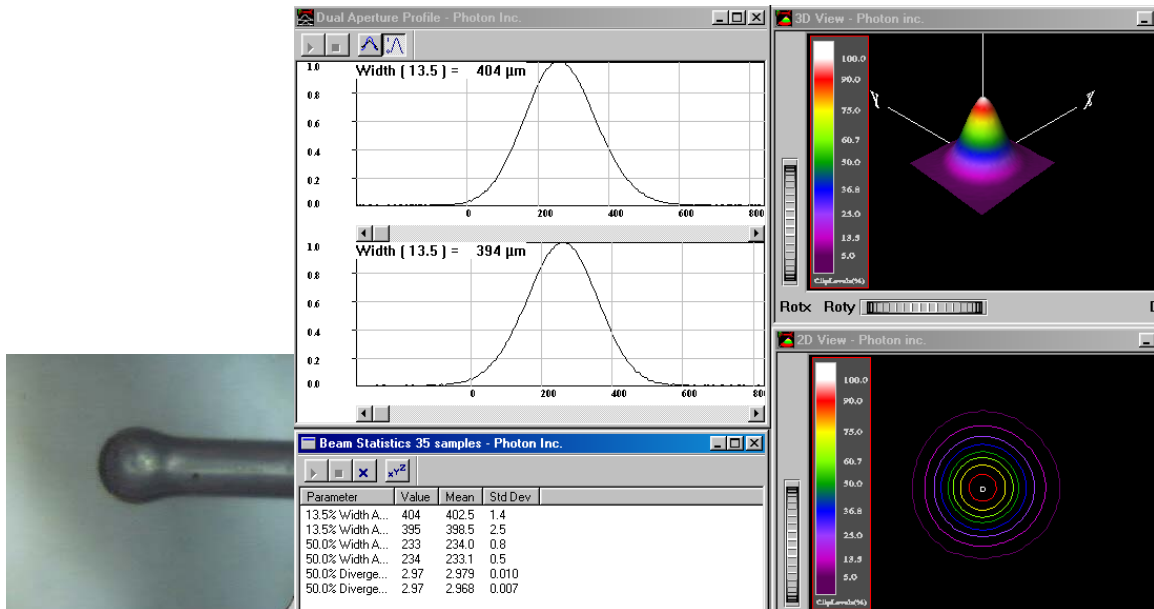
Laser source: LD-05 @ 1310/1550/670 nm (WT&T)  
 Back-reflection @ 1310 nm: ODB-3 (WT&T)  
 Far field @ 1310 nm: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon

T&M/Quality control: Operator 3

### Testing report

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_3D-5
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	AFS_105/125_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~3x3
<b>Return loss (@1310nm), dB:</b>	~-42

Proc: 1; 41; 26.6x42



Far field distribution, measured @ ~4.5 mm from the fiber tip

#### Lensed fiber sample has been tested using following equipment:

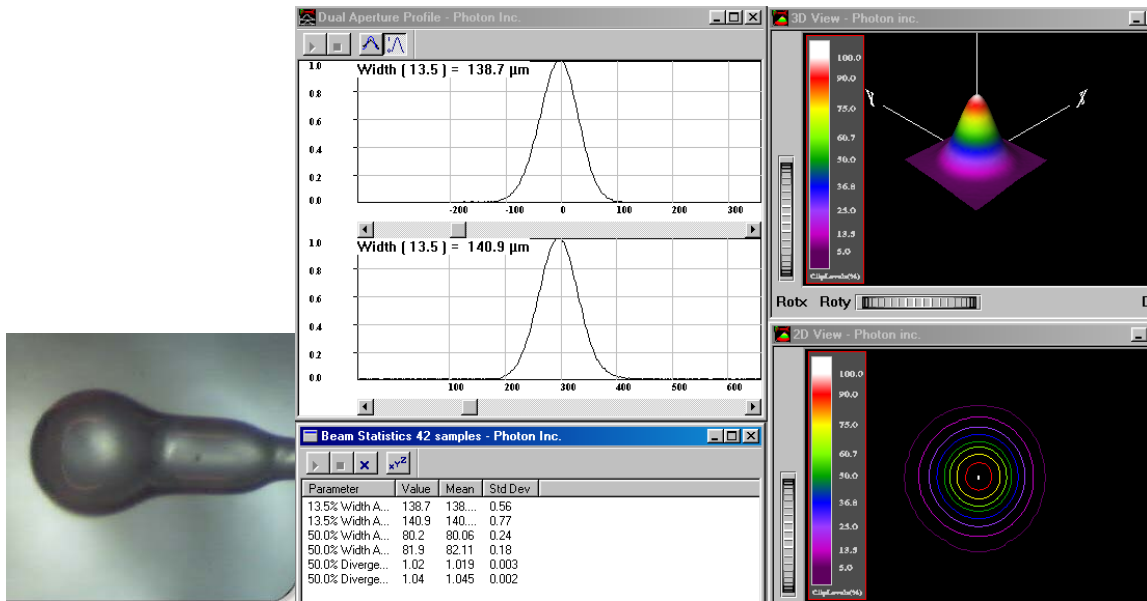
Laser source: LD-05 @ 1310/1550/670 nm (WT&T)  
 Back-reflection @ 1310 nm: ODB-3 (WT&T)  
 Far field @ 1310 nm: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon

T&M/Quality control: Operator 3

**Testing report**

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_1D-1
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	200/220_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~1x1
<b>Return loss (@1310nm), dB:</b>	~-45

Proc: 1; 41; 66.6x37



Far field distribution, measured @ ~4.5 mm from the fiber tip

**Lensed fiber sample has been tested using following equipment:**

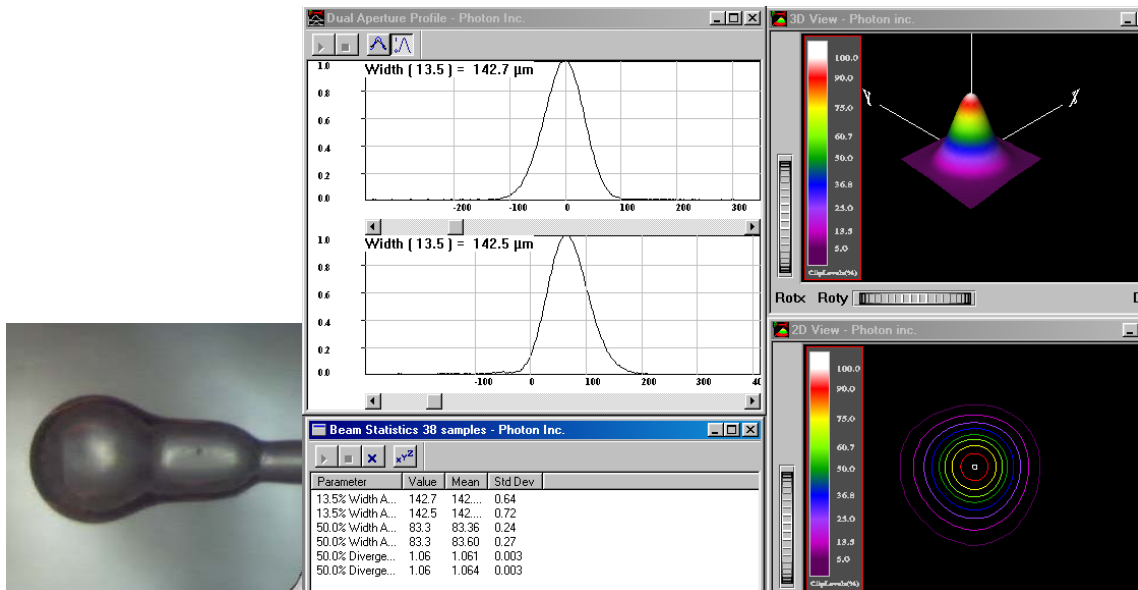
Laser source: LD-05@ 1310/1550/670 nm (WT&T)  
 Back-reflection @ 1310 nm: ODB-3 (WT&T)  
 Far field @ 1310 nm: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon

T&M/Quality control: Operator 3

**Testing report**

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_1D-2
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	200/220_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~3x3
<b>Return loss (@1310nm), dB:</b>	~-44.8

Proc: 1; 41; 66.6x35



Far field distribution, measured @ ~4.5 mm from the fiber tip

**Lensed fiber sample has been tested using following equipment:**

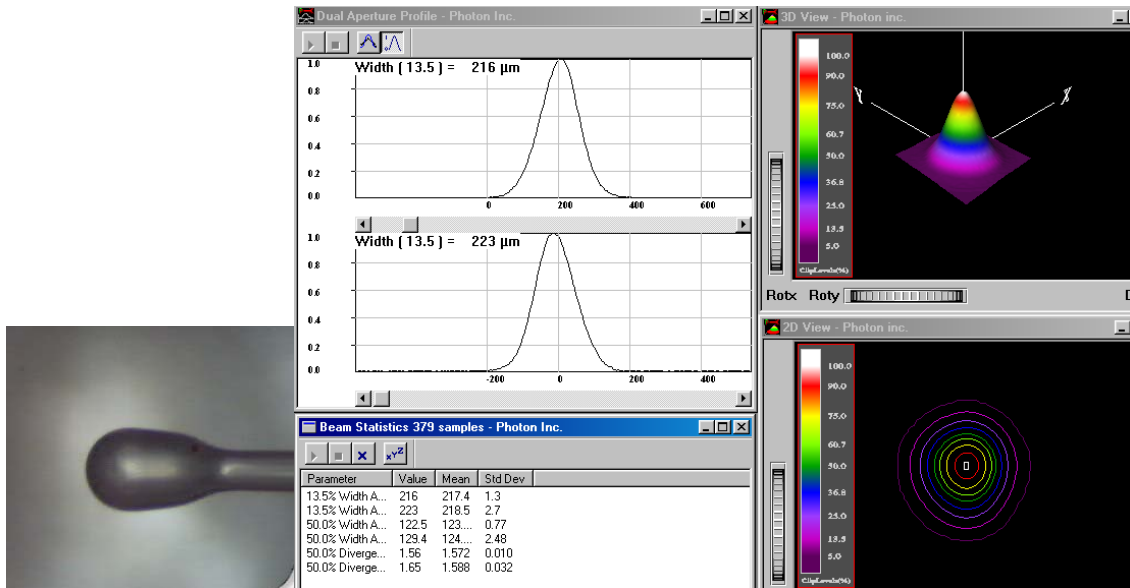
Laser source: LD-05 @ 1310/1550/670 nm (WT&T)  
 Back-reflection @ 1310 nm: ODB-3 (WT&T)  
 Far field @ 1310 nm: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon

T&M/Quality control: Operator 3

### Testing report

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_1D-3
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	200/220_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~1.5x1.5
<b>Return loss (@1310nm), dB:</b>	~-35

Proc: 1; 41; 66.6x16



Far field distribution, measured @ ~4.5 mm from the fiber tip

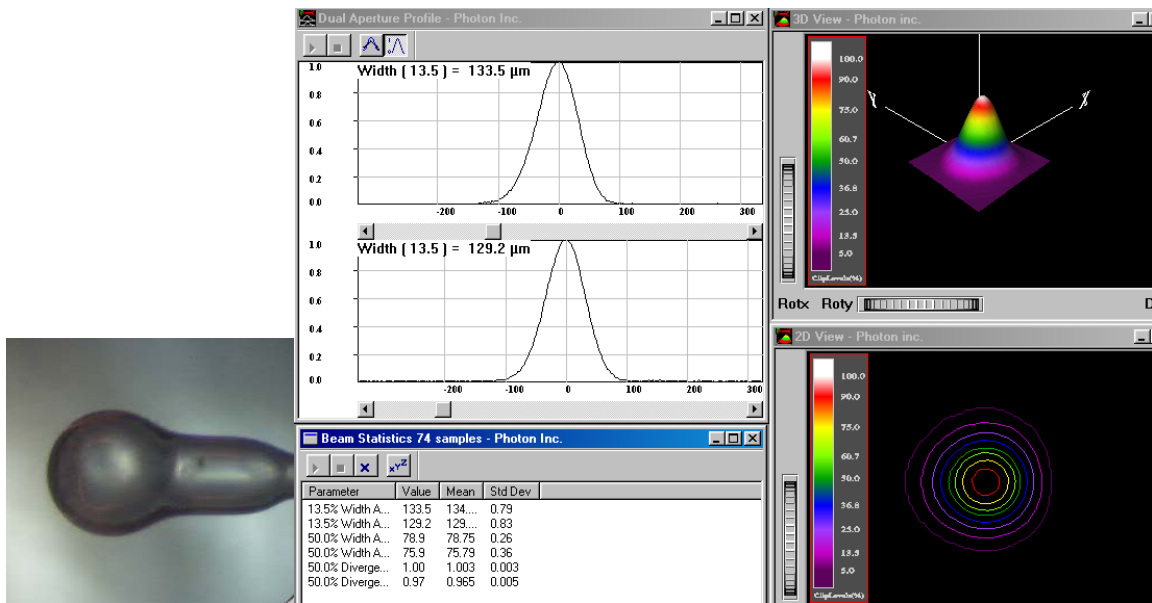
#### Lensed fiber sample has been tested using following equipment:

Laser source: LD-05@ 1310/1550/670 nm (WT&T)  
 Back-reflection @ 1310 nm: ODB-3 (WT&T)  
 Far field @ 1310 nm: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon  
  
 T&M/Quality control: Operator 3

### Testing report

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_1D-4
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	200/220_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~1x1
<b>Return loss (@1310nm), dB:</b>	~-41.3

Proc: 1; 41; 66.6x65



Far field distribution, measured @ ~4.5 mm from the fiber tip

### Lensed fiber sample has been tested using following equipment:

Laser source: LD-05@1310/1550/670 nm (WT&T)  
 Back-reflection @1310 nm: ODB-3 (WT&T)  
 Far field @1310 nm: BeamScan (Photon Inc)  
 Micro-photo @VL: Nikon

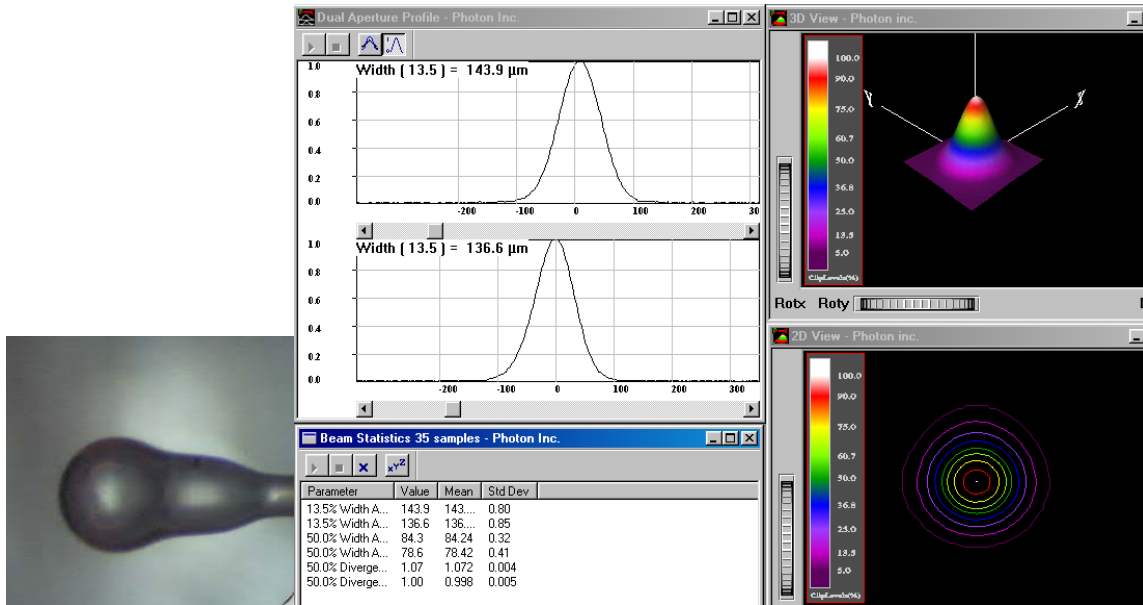
T&M/Quality control: Operator 3



**Testing report**

<b>Part Number:</b>	<b>BL5 (Specialty ball lensed fiber)</b>
<b>Unit Number:</b>	BL5_smf1_1D-5
<b>Fiber:</b>	Single-mode fiber (smf-28), primary coated
<b>Stripped area (lens side), mm</b>	~20
<b>Fiber end termination</b>	Normal cleaved end
<b>Fiber pigtail length (m):</b>	~3
<b>Length of stripped fiber end (mm):</b>	~12
<b>Intermediate taper :</b>	200/220_0.22
<b>End taper:</b>	BL5
<b>Far Field FWHM (@1310nm), deg.</b>	~1x1
<b>Return loss (@1310nm), dB:</b>	~-36.2

Proc: 1; 41; 66.6x52



Far field distribution, measured @ ~4.5 mm from the fiber tip

**Lensed fiber sample has been tested using following equipment:**

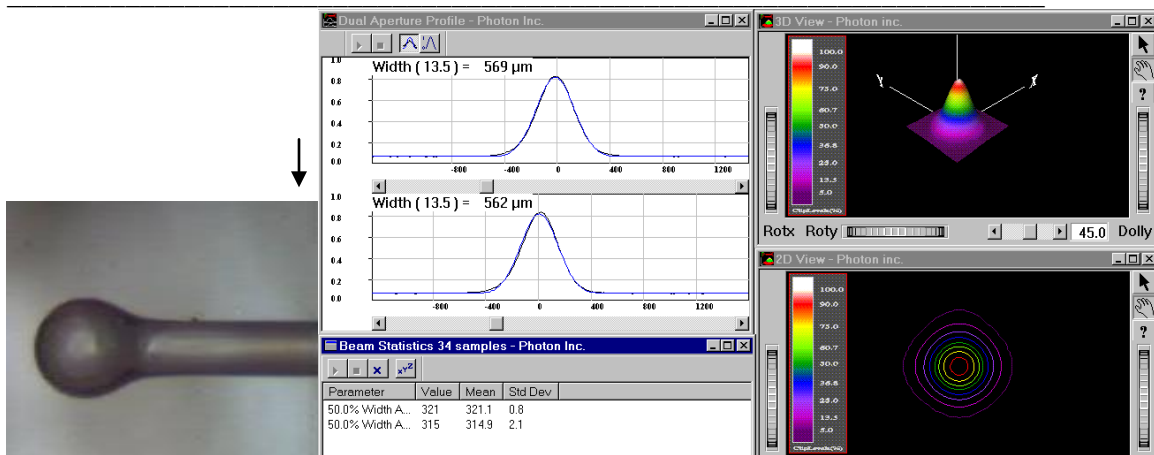
Laser source: LD-05@ 1310/1550/670 nm (WT&T)  
 Back-reflection @ 1310 nm: ODB-3 (WT&T)  
 Far field @ 1310 nm: BeamScan (Photon Inc)  
 Micro-photo @ VL: Nikon

T&M/Quality control: Operator 3

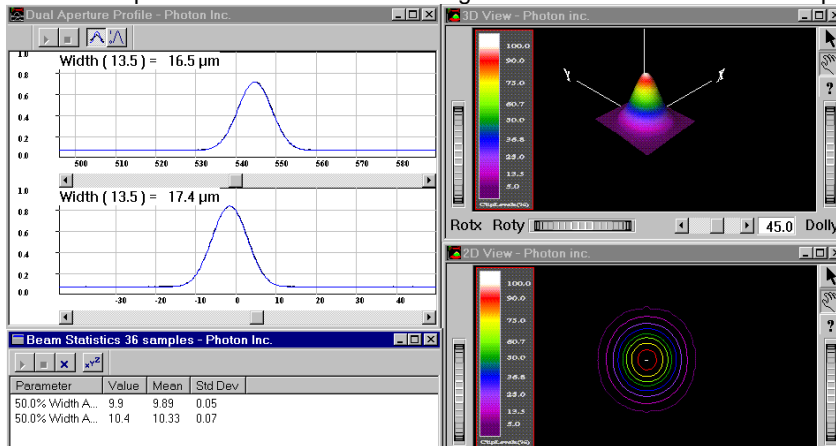
## Testing report

Part Number:	BL5(specialty ball lensed fiber)
Unit Number:	BL4_105_D4
Fiber:	Smf-28, primary coated
Fiber end termination:	FC/PC
Fiber pigtail length (m):	~1.5
Length of stripped fiber (mm):	~14
Intermediate taper :	Type 1/105
Working distance, um:	~700
Testing wavelengths, nm	670nm, 1300nm
Spot size FWHM @~4.5 mm, um	~320x315
Spot size FWHM @~ 0.7 mm, um	~10x10
Return loss, dB	N/A

Process: 41; 59msx45



Measured optical Far Field distribution of light emitted from the lensed fiber tip. Distance ~ 4.5 mm.



Measured distribution of light emitted from the lensed fiber tip. Distance from the lensed end is ~ 0.7 mm.

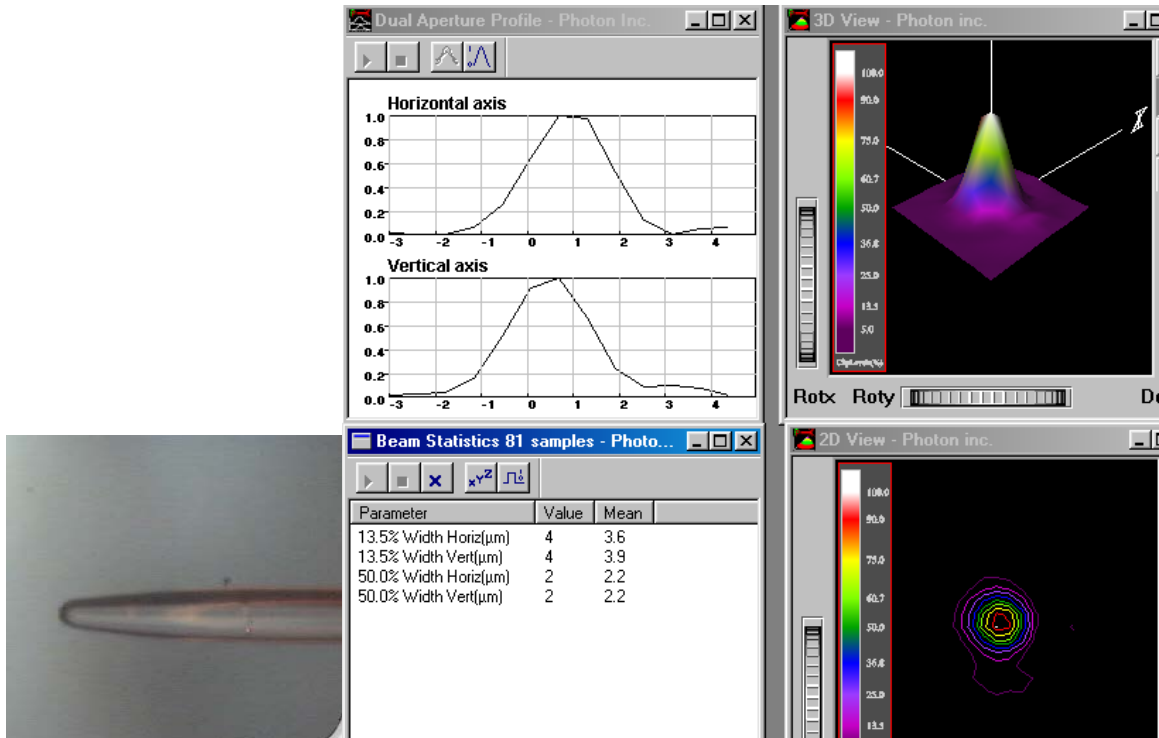
**Lensed fiber sample has been tested using following equipment:**

- Tunable laser: LD05IR (WT&T)
- Back-reflection @ 1310 nm: ODB06 (WT&T)
- Optical field profile: BeamScan (Photon Inc.)
- Micro-photo @ VL: Nikon
- T&M/Quality control: Operator 2

## Testing report

Part Number:	CL5(specialty tapered cone lensed fiber)
Unit Number:	CL5_630_1
Fiber:	HP600, single mode, primary coated
Fiber end termination:	FC/PC
Fiber pigtail length (m):	~1
Length of stripped fiber (mm):	~12
Intermediate taper :	mm105/125
End taper:	mm105/125
Testing wavelengths, nm	632.8
Focused spot size (FWHM), um	~2x2
Working distance, um	>20

Process:1-41(0.5s)/9.9x7ms



Measured optical near field distribution (spot size) of light focused by the lensed fiber tip

### Lensed fiber sample has been tested using following equipment:

Laser source: LD05IR; LD-4s (WT&T)  
 Optical field profile: BeamScan, BeamPro (Photon Inc.)  
 Micro-photo @VL: Nikon  
 T&M/Quality control: Operator 2