



**Manufacturer:**  
Arden Photonics

**Product Name:**  
Arden nPA-600 Optical Fiber Refractive Index Profiler

**Manufacturer Part Number:**  
NPA-600



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▶ [Click here for more details on the Arden nPA-600 Optical Fiber Refractive Index Profiler](#)



OPTICAL FIBER MEASUREMENT SPECIALISTS



Measure  
fibers up to  
600  $\mu\text{m}$

## nPA-600

### Refractive Index Profiler

The nPA-600 Refractive Index Profiler uses a modified refracted near-field technique to analyse a fiber end-face to determine the full 2D refractive index distribution.

The nPA-600 is the quick and easy way to get the Refractive Index data you need to verify your specialty fiber design and manufacturing processes. The nPA-600 comes with the nPA v4.0 software which improves measurement speed, enhances user experience, and enables greater measurement customisation possibilities. Its API allows the nPA-600 to integrate to users' systems seamlessly.

Optional software plug-ins enable new functionalities such as measuring the geometry of single-mode fibers, PM fibers, multi-core fibers and various parameters of bend-insensitive multimode (BIMM) fibers.



Measure fibers  
up to 600  $\mu\text{m}$



Measure refractive  
index profiles in  
seconds



Measure most  
standard and  
specialty fibers



Production ready  
software with  
optional plug-ins  
to enable new  
features

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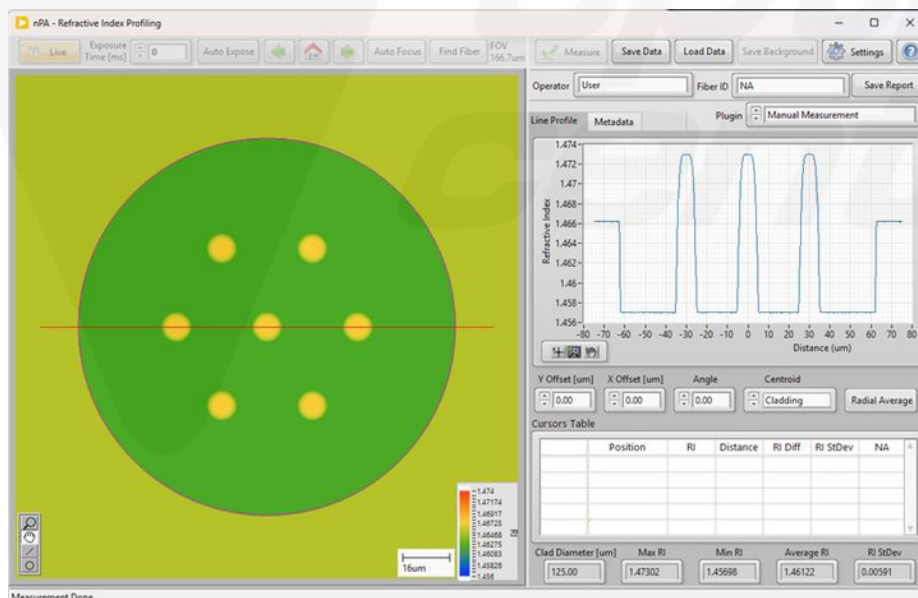


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### Features & Benefits

- Measure fibers up to 600  $\mu\text{m}$  in diameter
- Prepare and measure a fiber sample in under 2 minutes (2D measurement in seconds)
- Measure circularly symmetric fibers and non-circularly symmetric fibers – good for PM, octagonal, multi-core fibers
- Preinstalled with production-ready nPA v4.0 software
  - User Experience enhancement: Various measurement options (refractive index scales, measurement areas) and output options (e.g. PDF measurement reports)
  - Faster measurement of smaller fibers
  - Customisable measurement template for easy comparison vs target values
  - API facilitates users customisation and integration with other systems
  - Optional software plug-ins enabling new functionalities
  - In-field traceable re-calibration enabled by the new calibration tool and the new optional calibration fiber certified by the National Physical Laboratory (NPL) and Arden, without having to send the instrument to Arden service centres.



The nPA-600 with nPA 4.0 software measures fibers (multi-core fibers) up to 600  $\mu\text{m}$  in diameter with customised measurement points and regions.

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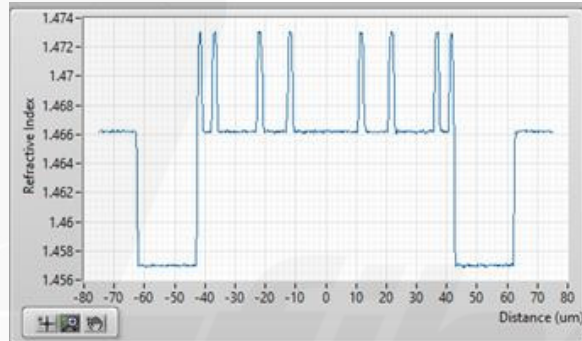
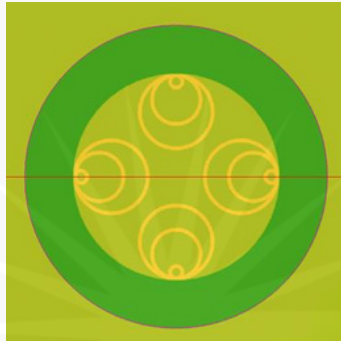
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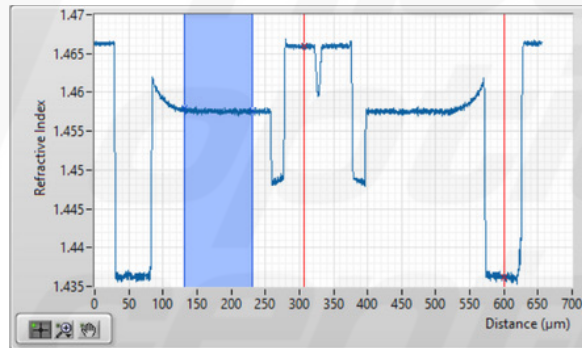
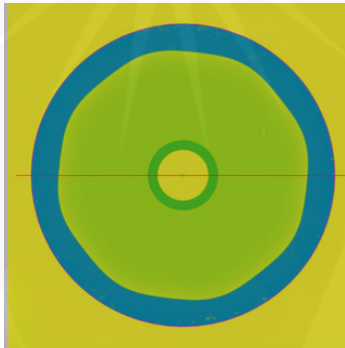
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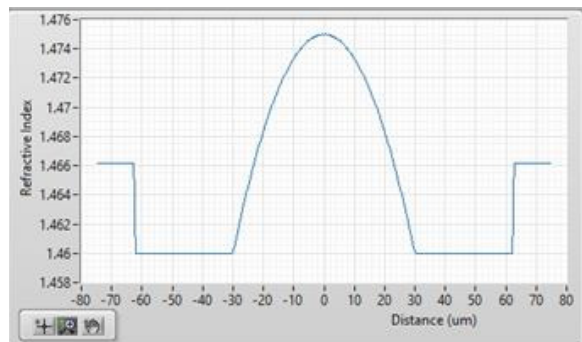
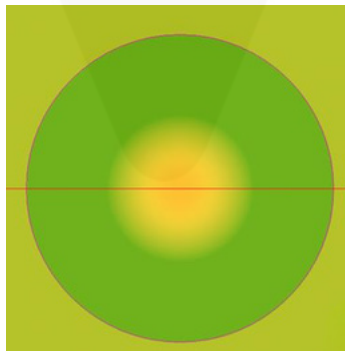
The nPA-600 measures most specialty fibers, such as



Nested Antiresonant Nodeless Fiber (NANF)



Octagonal fiber - for fiber laser applications



Graded index multimode fiber

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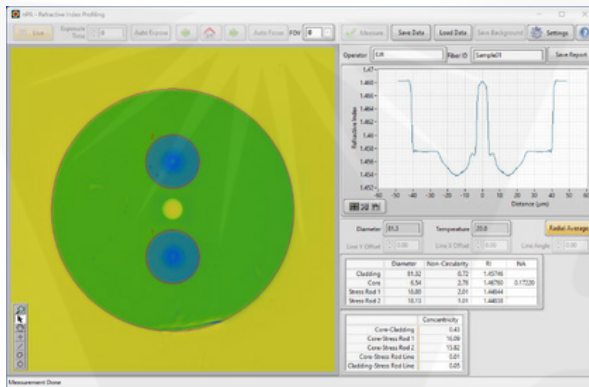
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## Optional Software Plug-ins (Available from nPA 3.0 software onwards)

The optional plug-ins further extend the functionalities of nPA-600. Three optional plug-ins are available for measuring the RI & geometry of specialty fibers.

- nPA-SPI01 : measures the RI & geometry of Panda-style PM fibers, with cladding diameters 80 - 400  $\mu\text{m}$ .
- nPA-SPI02 : measures the RI & geometry of single-mode fibers, with cladding diameter 80 - 400  $\mu\text{m}$ .
- nPA-SPI03: measures the RI & geometry of BIMM fibers, with cladding diameter 125  $\mu\text{m}$ .
- nPA-SPI04: measures the RI & geometry of Multicore Fiber, with cladding diameter 40 - 600  $\mu\text{m}$

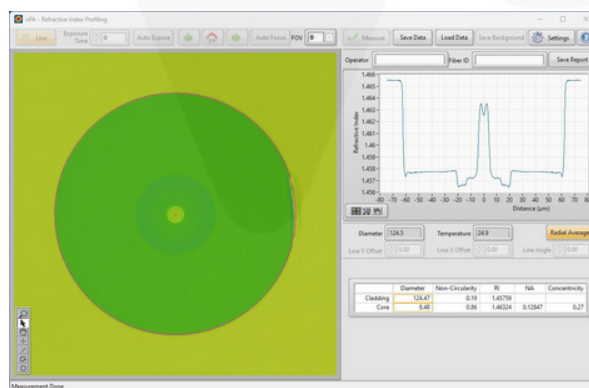
### PM fiber measurement using SPI-01 plug-in



#### Measured values:

- Cladding – diameter, non-circularity, average refractive index
- Core – diameter, non-circularity, average refractive index
- Stress Rods – diameter, non-circularity, average refractive index
- Concentricity – core-clad, core-stress rod
- Stress Rod Line offset to core and cladding

### Single mode fiber measured using SPI-02 plug-in



#### Measured values:

- Cladding – diameter, non-circularity, average refractive index
- Core – diameter, non-circularity, average refractive index
- Core-Clad Concentricity

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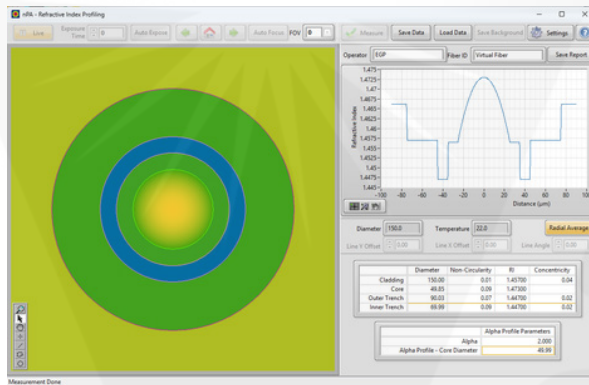
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- nPA-SPI02 : measures the RI & geometry of single-mode fibers, with cladding diameter 80 - 400  $\mu\text{m}$ .
- nPA-SPI03: measures the RI & geometry of BIMM fibers, with cladding diameter 125  $\mu\text{m}$ .
- nPA-SPI04: measures the RI & geometry of Multicore Fiber, with cladding diameter 40 - 600  $\mu\text{m}$

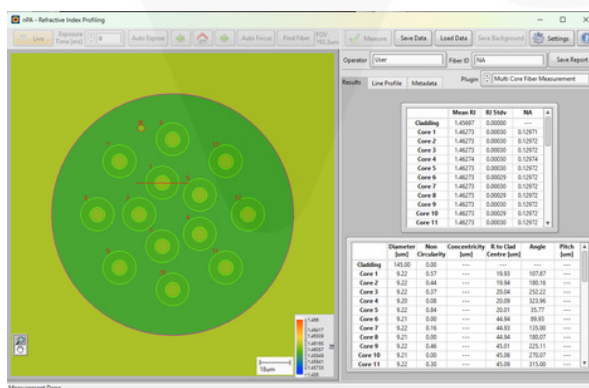
## BIMM fiber measured using SPI-03 plug-in



### Measured values:

- Cladding – diameter, non-circularity, average RI
- Core – diameter, non-circularity, peak RI used for alpha estimations
- Alpha index profile parameters: alpha, theoretical core diameter.
- Core-Clad Concentricity
- Trench – Inner and Outer Diameter, non-circularity, average RI
- Trench-Core Concentricity

## Multi-core fiber measured using SPI-04 plug-in



### Measured values:

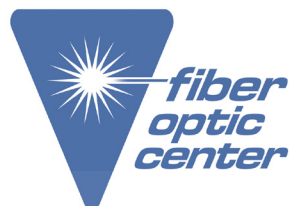
- Cladding – diameter, non-circularity, average RI, RI standard deviation
- Core – diameter, non-circularity, peak RI, Trench/pedestal diameter, Trench/pedestal non-circularity, Trench/pedestal RI, Relative position – either cladding, central core, or average of cores as reference. Expressed as either X-Y or R- $\theta$ .
- Marker - Relative position

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## Technical Specifications

### Measurement Capabilities

|                                 |                         |
|---------------------------------|-------------------------|
| Refractive Index Repeatability* | 0.0002                  |
| Fiber Diameter                  | 40 to 600 $\mu\text{m}$ |
| Fiber Material                  | Silica glass            |
| 2D Measurement Time**           | < 10 sec                |
| Measurement Range***            | +/- 0.025               |

\*Repeatability is measured on a 125  $\mu\text{m}$  MM fiber sample without removing from the measurement cell

\*\* averaging 5 images

\*\*\* around reference fluid index

### Optical

|                        |                   |
|------------------------|-------------------|
| Measurement Wavelength | 630 nm            |
| Maximum Field of View  | 830 $\mu\text{m}$ |

### Physical

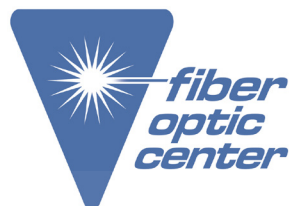
|                           |                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------|
| Weight                    | 6 kg                                                                                 |
| Size                      | 0.5 m x 0.16 m x 0.13 m                                                              |
| Operating Temperature     | 15 - 30°C                                                                            |
| Performance Specification | Validated at 22°C                                                                    |
| Computer Requirements     | All systems are supplied with a computer running up-to-date Windows operating system |
| Data Interface            | 1 X USB 3.0 (USB A to USB B: 1m cable supplied)                                      |

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## Ordering Information

| Part Number    | Description                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>nPA-600</b> | Optical Fiber Refractive Index Profiler for full 2D measurement of optical fibers with diameters between 40 $\mu\text{m}$ and 600 $\mu\text{m}$ . Including optical unit, nPA-IL-1.4680 refractive index liquid kit, nPA-CS100 set of cover slips, nPA-FTK-600 fiber test kit, nPA-CC rigid carrying case, nPA-F0270 and nPA-F0620 ferrule pins, cables, software package, APL-DC desktop computer, keyboard and mouse. |

| Plug-ins         | Description                                                                                        |
|------------------|----------------------------------------------------------------------------------------------------|
| <b>nPA-SPI01</b> | nPA Software Plugin for measurement of RI and geometry of Panda-style PM Fibers                    |
| <b>nPA-SPI02</b> | nPA Software Plugin for measurement of RI and geometry of Single Mode Fibers                       |
| <b>nPA-SPI03</b> | nPA Software Plugin for measurement of RI and geometry of Bend Insensitive Multimode (BIMM) Fibers |
| <b>nPA-SPI04</b> | nPA Software Plugin for measurement of RI and geometry of Multicore Fiber                          |

| Ferrule Pins     | Description                                                                               |
|------------------|-------------------------------------------------------------------------------------------|
| <b>nPA-F0125</b> | nPA Fiber guide assembly for optical fiber with outer diameter of up to 125 $\mu\text{m}$ |
| <b>nPA-F0160</b> | nPA Fiber guide assembly for optical fiber with outer diameter of 125 - 160 $\mu\text{m}$ |
| <b>nPA-F0230</b> | nPA Fiber guide assembly for optical fiber with outer diameter of 160 - 230 $\mu\text{m}$ |
| <b>nPA-F0270</b> | nPA Fiber guide assembly for optical fiber with outer diameter of 230 - 270 $\mu\text{m}$ |
| <b>nPA-F0440</b> | nPA Fiber guide assembly for optical fiber with outer diameter of 270 - 440 $\mu\text{m}$ |
| <b>nPA-F0520</b> | nPA Fiber guide assembly for optical fiber with outer diameter of 440 - 520 $\mu\text{m}$ |
| <b>nPA-F0570</b> | nPA Fiber guide assembly for optical fiber with outer diameter of 520 - 570 $\mu\text{m}$ |
| <b>nPA-F0620</b> | nPA Fiber guide assembly for optical fiber with outer diameter of 570 - 620 $\mu\text{m}$ |

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| Optional Accessories | Description                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>nPA-IL-1.4680</b> | Bottle of Immersion liquid, 10 ml, (Refractive Index = 1.4680, measured at 589 nm and 25°C) for refilling nPA measurement cell assembly, including syringes and nozzles |
| <b>nPA-CP01</b>      | nPA Calibration Fiber                                                                                                                                                   |
| <b>nPA-SOC</b>       | Replacement oil cell for nPA-600                                                                                                                                        |
| <b>nPA-CS100</b>     | Set of 100 replacement cover slips for use with nPA-600 oil cell                                                                                                        |
| <b>nPA-CC</b>        | nPA-600 rigid carrying case                                                                                                                                             |
| <b>nPA-600EW3</b>    | nPA-600 Refractive Index Profiler extended warranty covering parts and labour for 3 years from purchase, return to base.                                                |
| <b>nPA-600EW5</b>    | nPA-600 Refractive Index Profiler extended warranty covering parts and labour for 5 years from purchase, return to base.                                                |

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