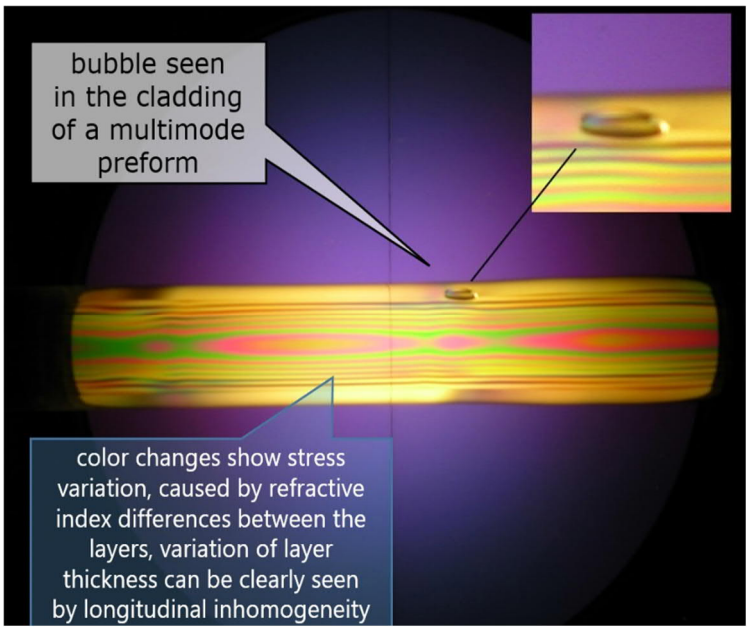
POL Preform Polariscope

Application

Polariscope is an essential tool in optical fiber preform production. It provides visual analysis of core preforms prior to sleeving, finished sleeved preforms or quartz tubes / rods. it helps detect bubbles, inclusions, cracks, strain regions and other defects in glass structure.
Defects are detected by inserting preform between two crossed polarization filters and placing the whole assembly in a white light beam. To help detect small point defects, preform is also illuminated longitudinally by a bright LED light source.
Sturdy mechanical construction ensures proper preform fixing, preventing vibrations and damage, as well as touch-free handling.
Built-in magnifying lens and gradation on the guide rail enable exact positioning of defects relative to a chosen reference point, for process database collection and drawn fiber reference position.
NOTE: polariscope cannot determine the exact defect or inclusion size (diameter) due to cylindrical shape of the preform.

Description

POL polariscope consists of a sturdy bed (extruded Al-profiles), preform chuck and tip support, white light source, two rotating polarizer filters (different OD available) and camera support. Light source and polarizer filters are mounted on a carriage that can be moved along the preform. A tape measure helps record the position of the carriage in millimeters form origin. A line is provided inside the two polarizer filters, to be able to align the observed defect and read its relative position along preform longitudinal axis. Another LED light source and pigtail is provided for preform illumination along its length.



Features

- white light LED planar source
- rotatable top polarizer filter
- suitable for detection of:
  - o *bubbles, inclusions, defect*
  - o *geometry and index variations*
  - o *preform stress zones*
- camera support
- defect position detection
- LED source for longitudinal illumination

Options (on request only)

- UV light source flow patterns or striation marks in glass preforms
- twice perpendicular measurement of core preform luminescence (specify wavelength)

Specifications

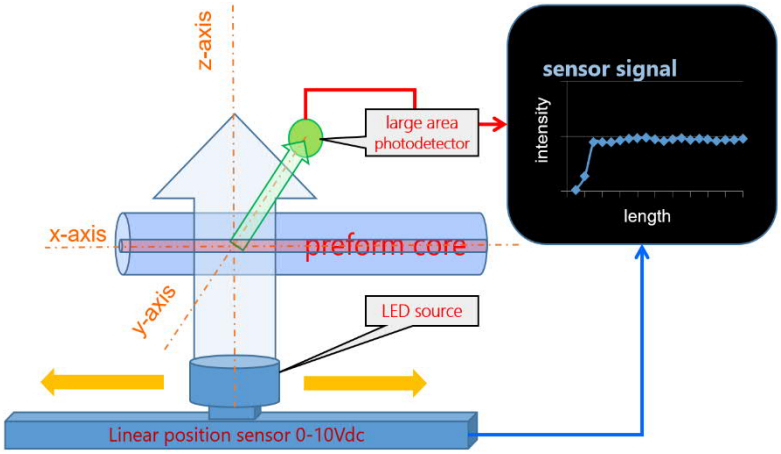
Preform Length:	up to 1500 mm, max to be defined at order
Preform OD	from 6 to 50 mm standard, other on request
Preform rotation:	manual, adjusting clamping and using tip support
Handle Length:	defined by customer, typically 800 to 1500 mm
Carriage Sliding Length:	approx. 200 mm shorter than the POL bed length
Polarizer filter Size:	OD 40 – 78 mm
Position accuracy	typically ± 1 mm
Angle accuracy:	typically ± 1-2°
Camera support:	Standard camera screw mount

UV light analysis

A special UV light source with projection screen is provided for analysis of flow patterns or striation marks in glass preforms (see some images below). The light source and screen are interchangeable with the polariscope source and bottom polarizer, the top polarizer has to be removed to install UV light source.

Dopant distribution detection

Option to detect dopant distribution in the preform core is available for active fiber preforms, doped by RE-ions. A twice perpendicular method is used to determine active ion distribution along the length of a preform. White light source has to be replaced by a monochrome source, adapted in wavelength to the active dopant in preform, as ump light source. When preform is illuminated by pump light, luminescence of the core is observed and intensity measured by a large area or integrating detector, position at right angle to the pump light direction. Pump source position (POL carriage) position and luminescence intensity are recorded by microprocessor or computer and displayed as a graph or exported as spreadsheet file.



Accessories

POL units can be supplied with the following accessories:

POL-LED-1	*LED white source for carriage*
POL-LED-1	*LED white light source with pigtail for longitudinal illumination*
POL-FIL-1	*Polarizer filter (specify OD) - bottom*
POL-FIL-2	*Polarizer filter (specify OD) - top*

Service and spare parts:

Service and spare parts for POL polariscope are provided by OCTech.

Additional information

Visit www.octech.si/applications or write to borutl@octech.si

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