

In-line testing of all optical disc formats, including DVD±R DL, Blu-ray Disc and HD-DVD

Overview

dr.schwab's latest generation in-line scanner, IQPC^{blu}, offers many new features combined with state-of-the-art performance.

- Each measurement channel has its own powerful digital signal processor (DSP) for parallel data processing, resulting in a very short evaluation time.
- Results from numerous different measurements can be displayed simultaneously in easy to read graphics, enabling the status of the replication line to be seen at a glance.
- For production traceability, individual moulding machines, dye bowls and bonding units can be identified. Unit-specific evaluation and statistics provide valuable feedback on process efficiency.
- A standard Pentium PC is used for collecting, visualising, storing and exporting the data, and for managing the IQPC^{blu} system settings; the replication line computer can be used for this purpose. Multiple scanners can be controlled from a single PC via Ethernet connection.



Process Control: Example for DVD±R production

A version of IQPC^{blu} is available for every stage of replication for all disc formats, providing detailed, up-to-the-minute feedback and enabling the replicator to keep the process within limits. For example, DVD±R production:

Moulded substrate: IQPC^{blu} Substrate Scanner
<ul style="list-style-type: none">■ Local defects (transmission)■ Birefringent defects■ Diffraction orders*■ Angular deflection (8 radii)*

Dye-coated substrate: IQPC^{blu} Dye Scanner
<ul style="list-style-type: none">■ Local defects (transmission)■ Dye thickness (via optical density)■ Dye edge determination■ Angular deflection (8 radii)*

Finished (half-) disc: IQPC^{blu} Final Scanner
<ul style="list-style-type: none">■ Local defects (reflection)■ Angular deflection (8 radii)■ Substrate thickness*■ Hardcoat thickness*

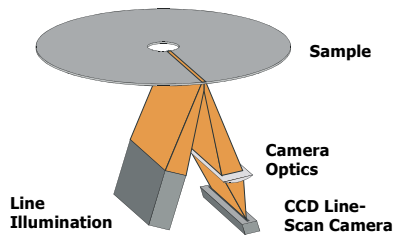
*Optional

- ✓ **Angular deflection includes radial tilt, tangential tilt, vertical deviation, vertical runout and axial acceleration**
- ✓ **Each measurement result can be displayed either over the radius (radial view) or over 360° (tangential view)**

General Features

- Easy integration within all replication lines
 - Communication with the production line via PROFI-Bus or digital I/O
 - Extensive possibilities for storing and archiving inspection results
 - Complete network capability via Ethernet (TCP/IP)
- ✓ **Space layer thickness measurement for DVD-9 and dual layer recordable DVD±R DL (standard: 5 radii; option: 8 radii)**

Local Defect Detection



- Local defect detection on both sides of the disc
- CCD line-scan camera with high resolution optics
- LED illumination at the optimum wavelength for the sample and task; custom-made optics for constant light distribution; closed-loop power control
- High-precision defect detection including bumps and bonding gaps
- Advanced defect classification based on image processing
- Clamping area inspection for detecting bubbles and pearls, including crack detection and resin shortage/overflow

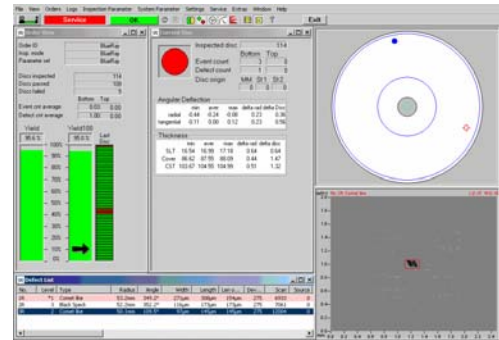
- ✓ **Uses the optimum task-specific wavelength for local defect detection**

Easy Handling and Operation

The IQPC^{blu} is designed to be as user-friendly as possible, with a fully automated measurement process and easy-to-use Windows-based visualisation software.

An overview window displays the most important measurement results from the last disc tested, including a traffic light to indicate pass/fail status. Local defects are displayed on a disc map and as a zoomable 256-grey-scale image. Full colour graphs show the radial and tangential distribution of tilt and layer thickness results.

A line overview window displays results from multiple scanners (eg: substrate, dye and final), providing key statistical information for the line at a glance.



Special Features for High-Density Formats

- Space layer thickness and cover layer thickness (plus summation of both) for Blu-ray Disc
- Space layer thickness for HD-DVD

- ✓ **Cover layer eccentricity for Blu-ray Disc**

Further Options

- Barcode reading for disc traceability, including both half discs of dual-layer formats
- Hardcoat thickness measurement by white light spectrometer

Technical Data

Sample Types	All optical discs including DVD±R DL, Blu-ray Disc and HD-DVD
Local Defect Detection	Radial resolution 10µm (4096 pixels) or 20µm (2048 pixels); task-specific illumination wavelength 470nm, 660nm, 645nm or 850nm
Angular Deflection	8 laser-PSD (position-sensitive detector) arrangements
Space/Cover Layer Thickness	Digital spectrometer measurement at 5 fixed radii (option: 8 radii)
Hardcoat Thickness	White light spectrometer; measurement taken on a spiral line via linear unit

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