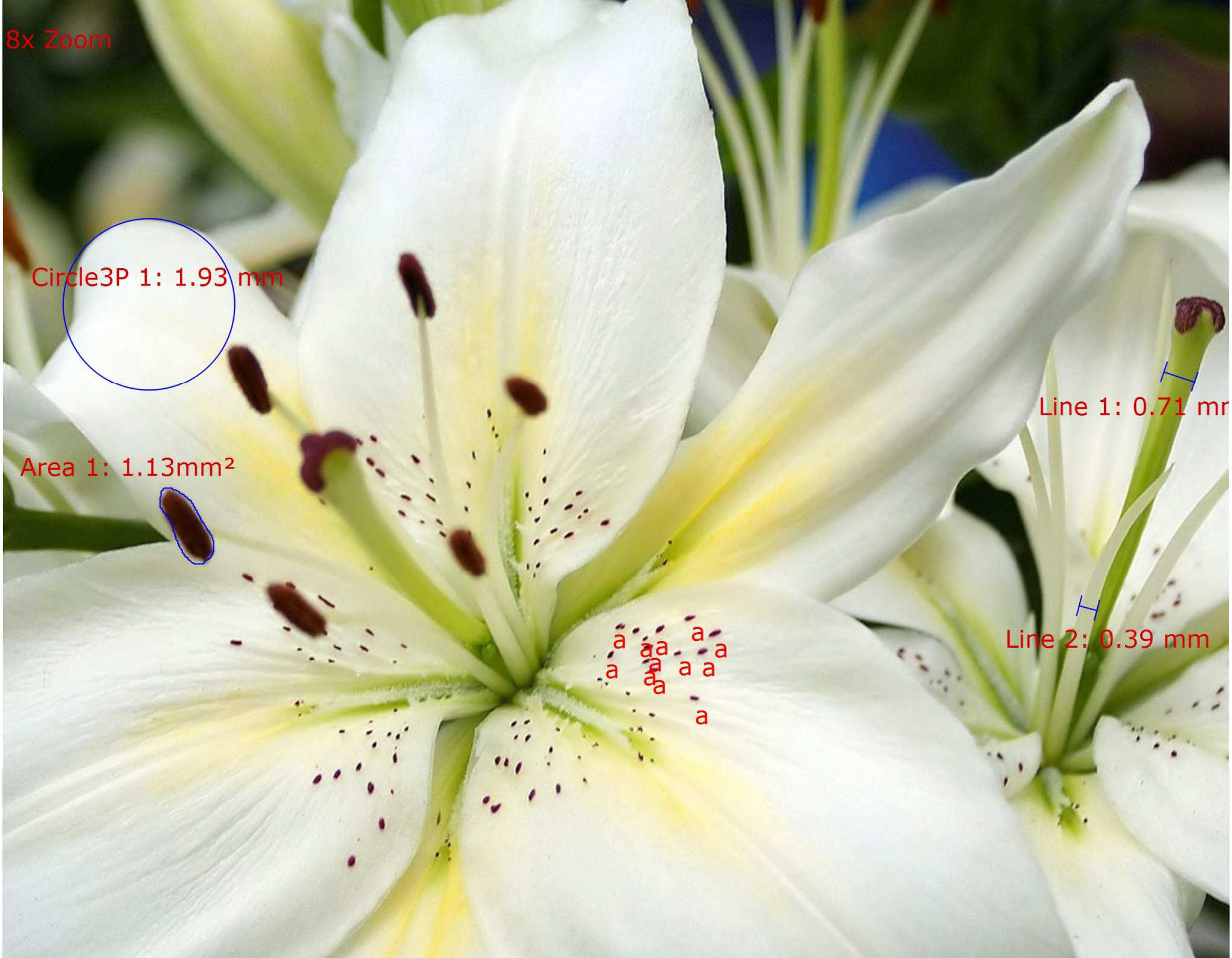
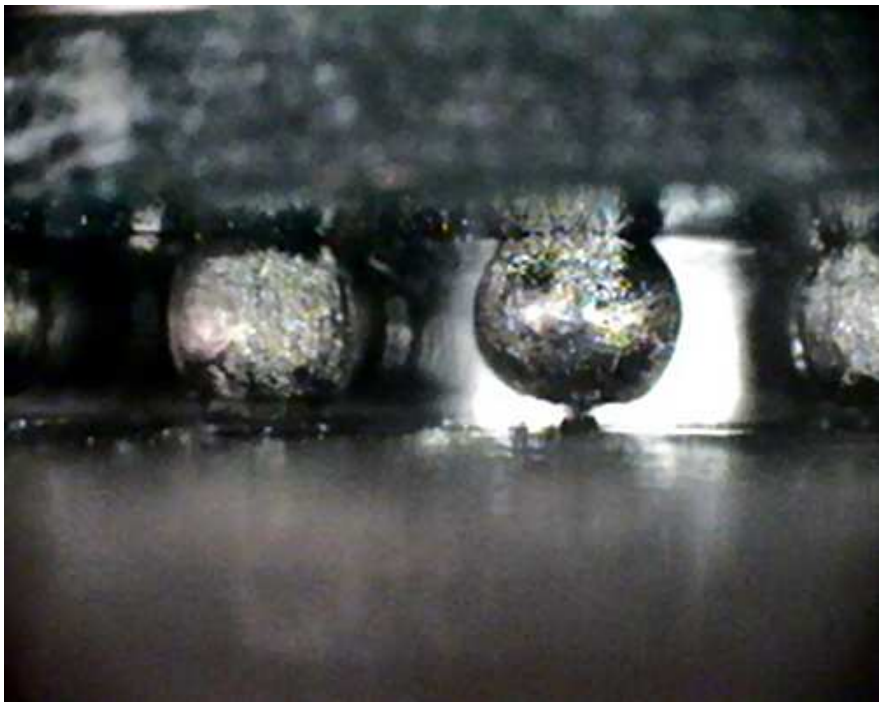
HAGGREN
27


8x Zoom
Circle3P 1: 1.93 mm
Area 1: 1.13mm²
Line 1: 0.71 mm
Line 2: 0.39 mm

Optilia Instruments

Empowering Your Vision!

High Definition Inspection Cameras



BGA systems

Optilia HD Camera family

W30x (1080p, 60fps)

W30x FreeSight (1080p, 60fps)

Optilia

Product matrix:

OP-209 010, W30x-HD, Full HD 1080p inspection camera with 30x zoom, 240mm WD and laser pointer

OP-006 660, Bench top Boom Stand

OP-006 339, Articulating Knuckle for Optilia stands

OP-006 662, Single-rod Boom Stand, Table Clamp mount

OP-006 663, Single-rod Boom Stand, Wall mount

OP-006 599, 90 deg. Camera Adapter for Boom Stand

OP-006 660, Bench top Boom Stand

OP-006 334, 4-directions Camera Tilt Unit

OP-006 338, Bench-top XY Stand

OP-006 333, In-line XY Stand

OP-006 328, Weight Less Parallel Arm

OP-006 190, Aluminum Transport Case, 450x350x250mm with Foam Inlet

OP-009 020, Camera Control Unit

OP-009 019, Foot Switch for Camera Control Unit

OP-009 304, +2 Diopter Close-up Lens (f=500mm)

OP-009 305, +5 Diopter Close-up Lens (f=200mm)

OP-009 308, +10 Diopter Close-up Lens (f=100mm)

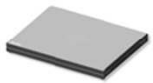
OP-006 381, UV Fluorescent Ring-Light Set

OP-006 368, White Ring-Light Set, 80 LEDs, Segment control with Dimmer, WD 120-500mm

OP-006 385, White Ring-Light set, 40 LEDs, Segment control with Dimmer, WD 60-120mm

OP-006 375, Polarization filter with analyzer for RingLight 80 LED system

OP-006 380, Polarization filter with analyzer for RingLight 40 LED system



OP-006 500, XY-floating Table

OP-006 501, XY-floating Table with Position Lock

OP-006 505, Foot Switch for XY Floating Table with Position Lock

OP-006 309, PCI HD Frame Grabber with OptiPix Lite

OP-006 310,Desk-top USB3.0 HD Frame Grabber with OptiPix Lite

OP-006 119, Optipix Full, Image View, Capture & Measurement Software

OP-006 121, Optipix Full with Data Base

OP-006 369, USB Image Capture Foot Switch for OptiPix

Sample picture

20x zoom with +5 close-up
RingLight LED Illumination

Optilia

W30x 1080p Full HD Camera

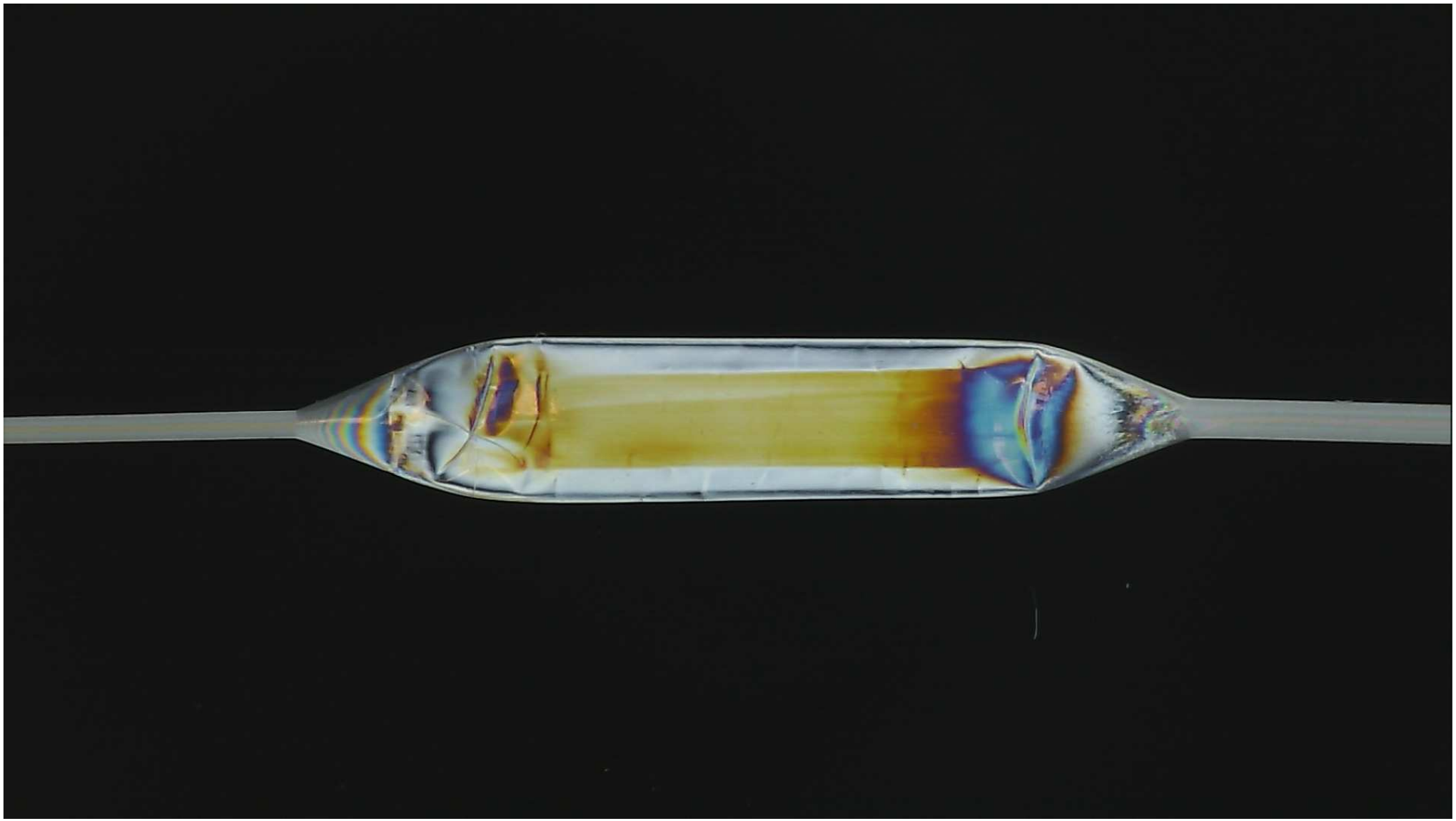
Modular system with powerful 30x Zoom!

Best image quality with 60fps video output
Joystick Camera/Lens control and Laser Pointer
Optimized for image analysis and mearurement

Replaces your microscope!

Optilia

Sample picture - plastic ballon



15x zoom
Darkfield Illumination with Polariser

Optilia

M30x EasyView, 1080p Full HD Camera

Exceptional Performance-to-Price ratio!

For all kind of Optical Inspection!

Crisp Full HD video with powerful 30x optical Zoom
Easy to setup and to operate
Laser pointer

Optilia

Sample picture - coin

20x zoom with +5 close-up
RingLight LED Illumination

ptilia

FreeSight Cameras

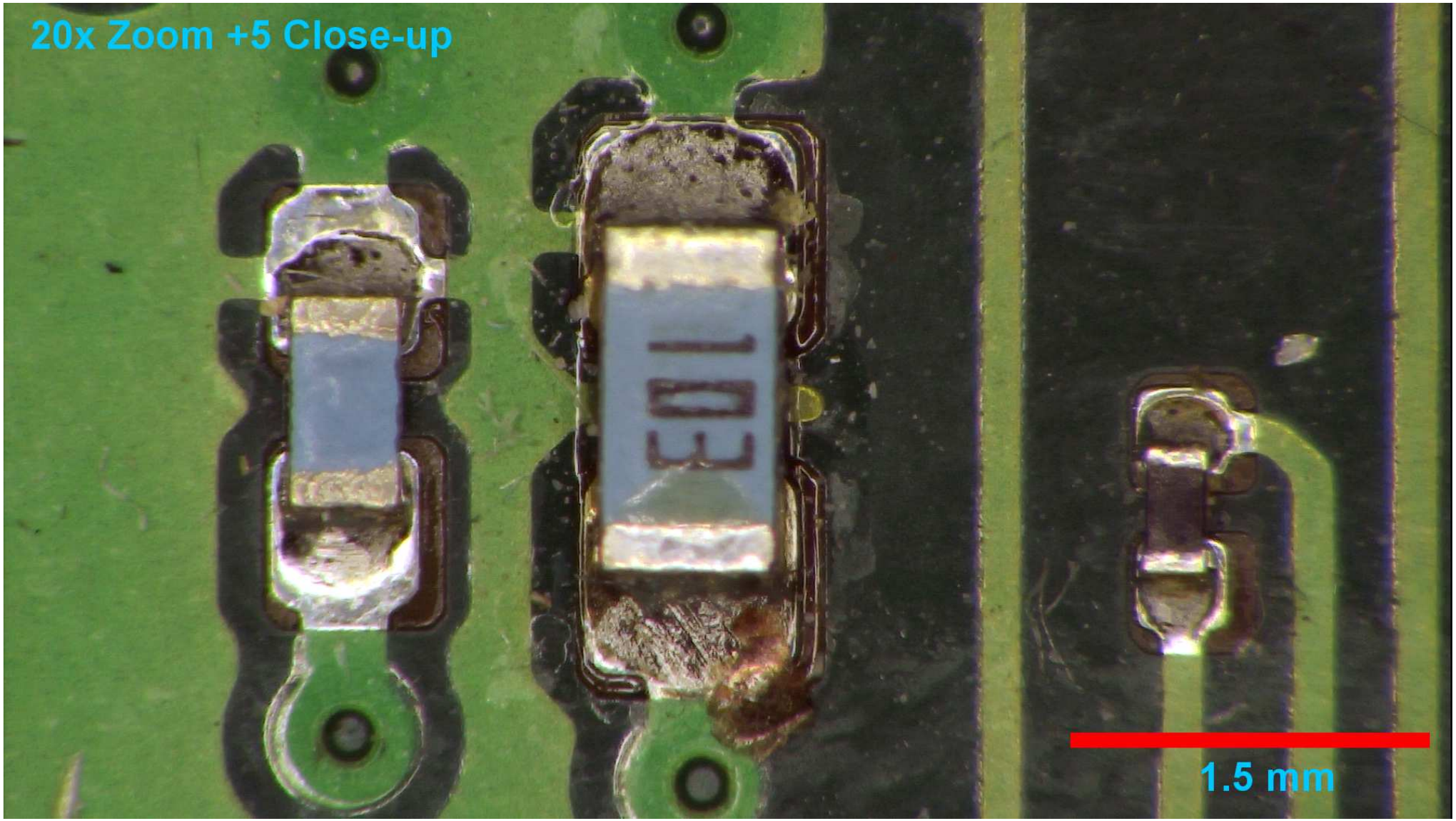
Extended 350 to 490 mm Working Distance !

For assembly, rework and reparation!

Clutter-free working space with clear viewing of the monitor
Excellent Depth of Field
Maximum comfort ergonomics

Optilia

Sample picture



20x zoom with +5 close-up
RingLight LED Illumination

Optilia

MHD30 / WHD30 Cameras

Extra long working distance, up till 1200 mm!

Clutter-free working space with clear viewing of the monitor
Excellent Depth of Field
Maximum comfort ergonomics

Optilia

Sample picture - sprouts

20x zoom with standard lens
Ambient light

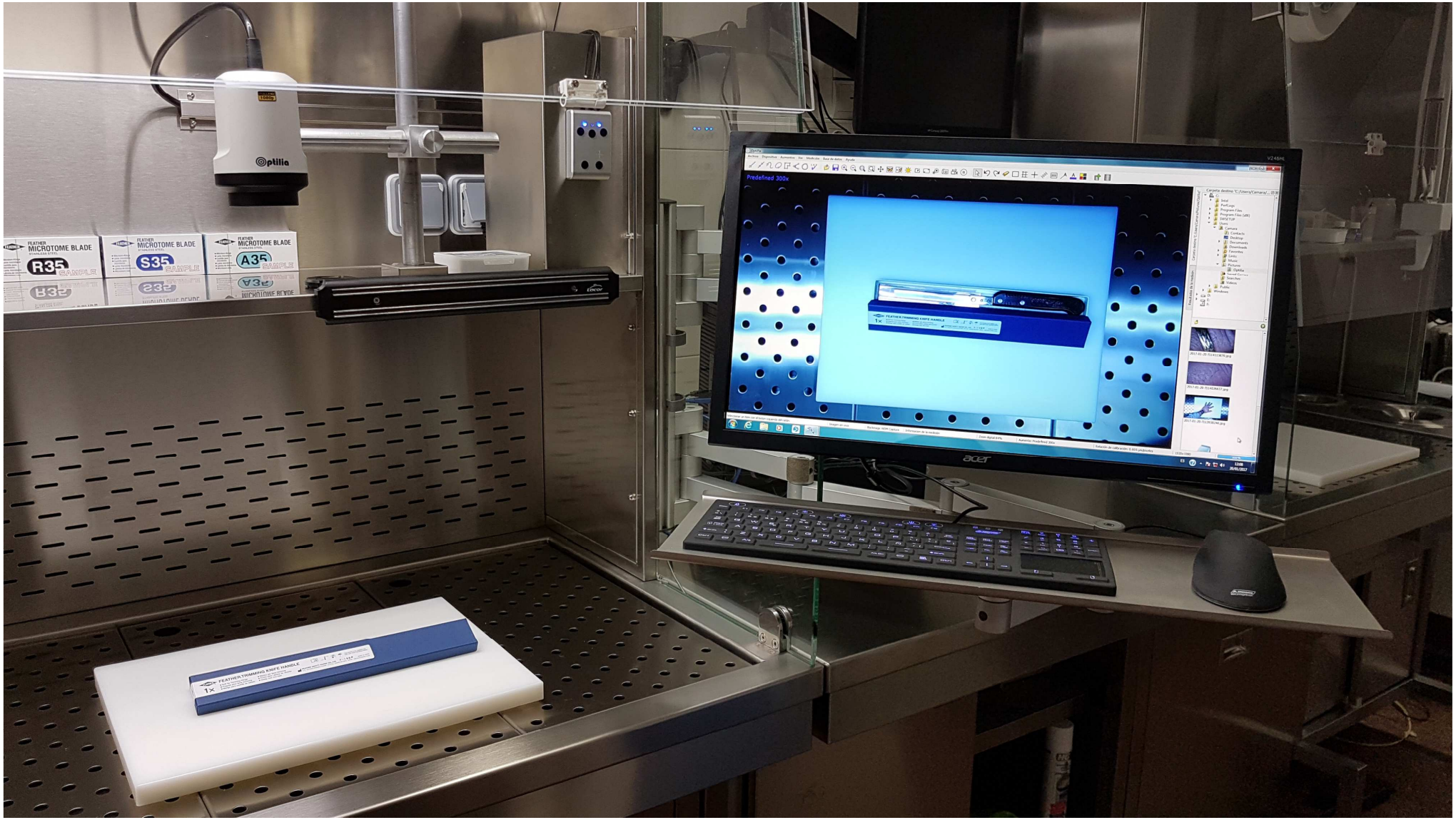
Optilia

In-line large working area XY-Stand

The Camera positioned over conveyor after Pick & Place

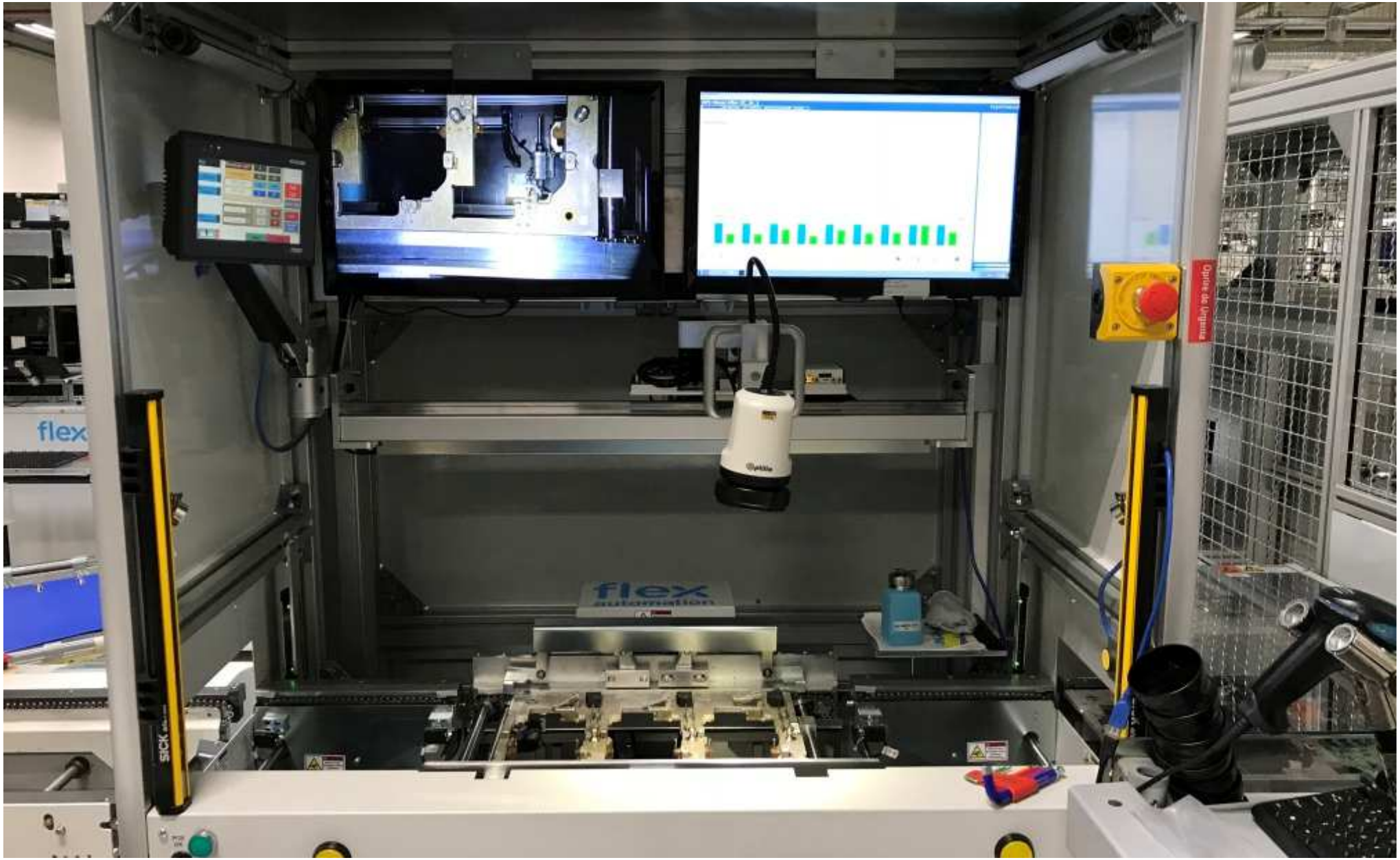
Optilia

Pathology station with M30x



Optilia

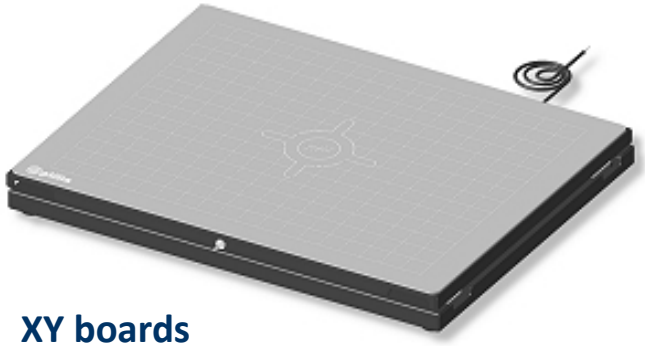
Manual inspection station at Flextronics – M30X



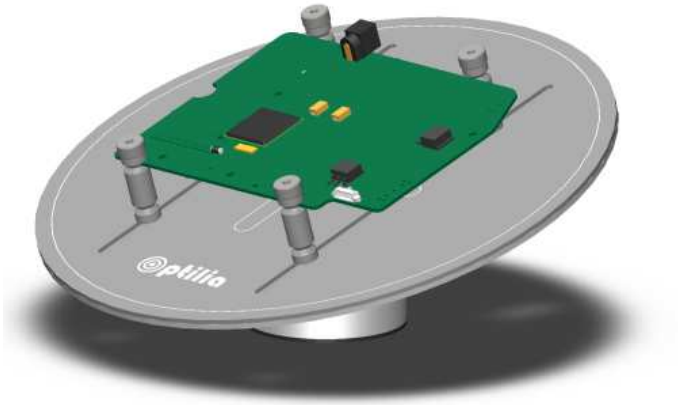
Manual inspection station with W30X

Optilia

Accessories



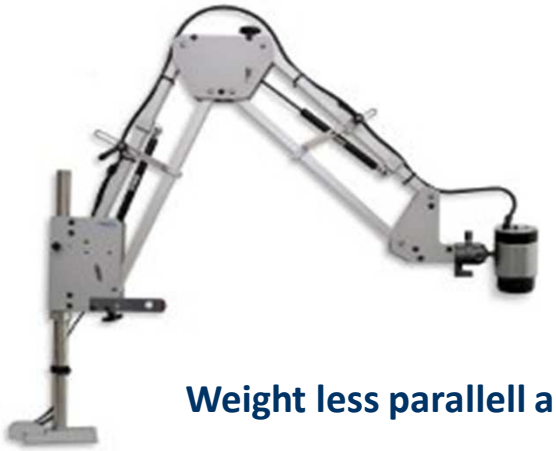
XY boards



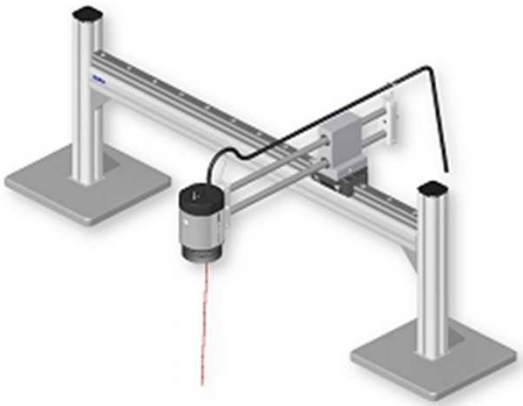
Tilt tables

Lighting and filters

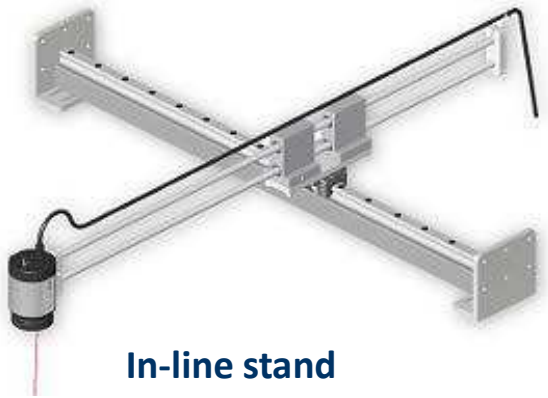
Accessories



Weight less parallell arm



Bench top stand



In-line stand

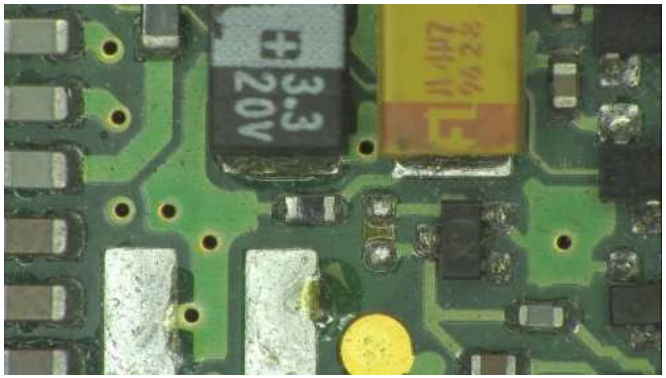
Sample picture - crops

20x zoom with standard lens
Ring light

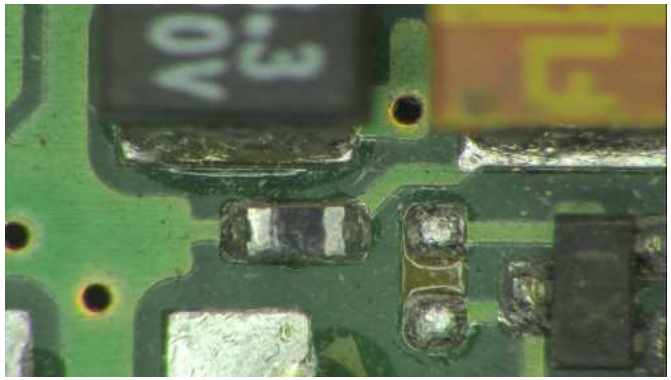
Optilia

Optional Close-up Lenses

- **30X with +2 - 52 X magnification**
- **30X with +5 - 95 X magnification**
- **30X with +10 – 144 X magnification**
- **30X with +10 and +5 – 196 X magnification**



W30x, standard lens

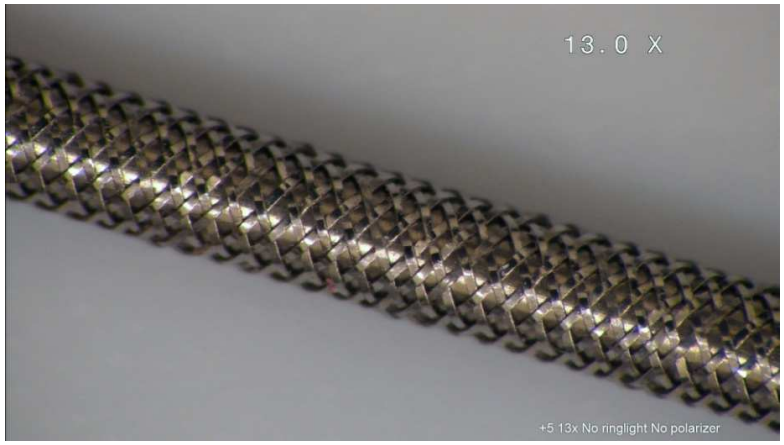


W30x, standard lens +5 Close up

Specially designed for best Colour and highest Image Quality!
Several Close-up Lenses can be stacked for more optical power!

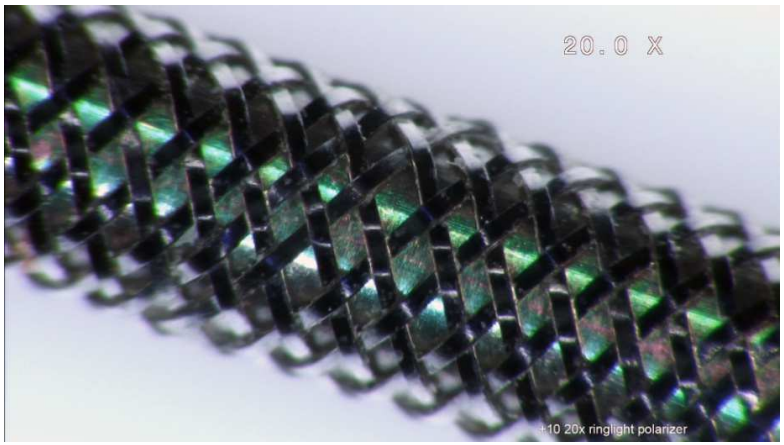
Optilia

Illuminations effect on Object!

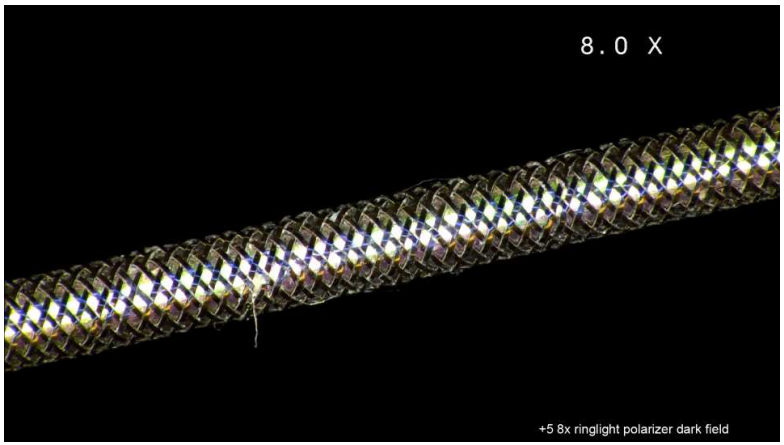


13x Zoom +5, Ambient office light!

20x Zoom +5, with Ring light & Polarizer!



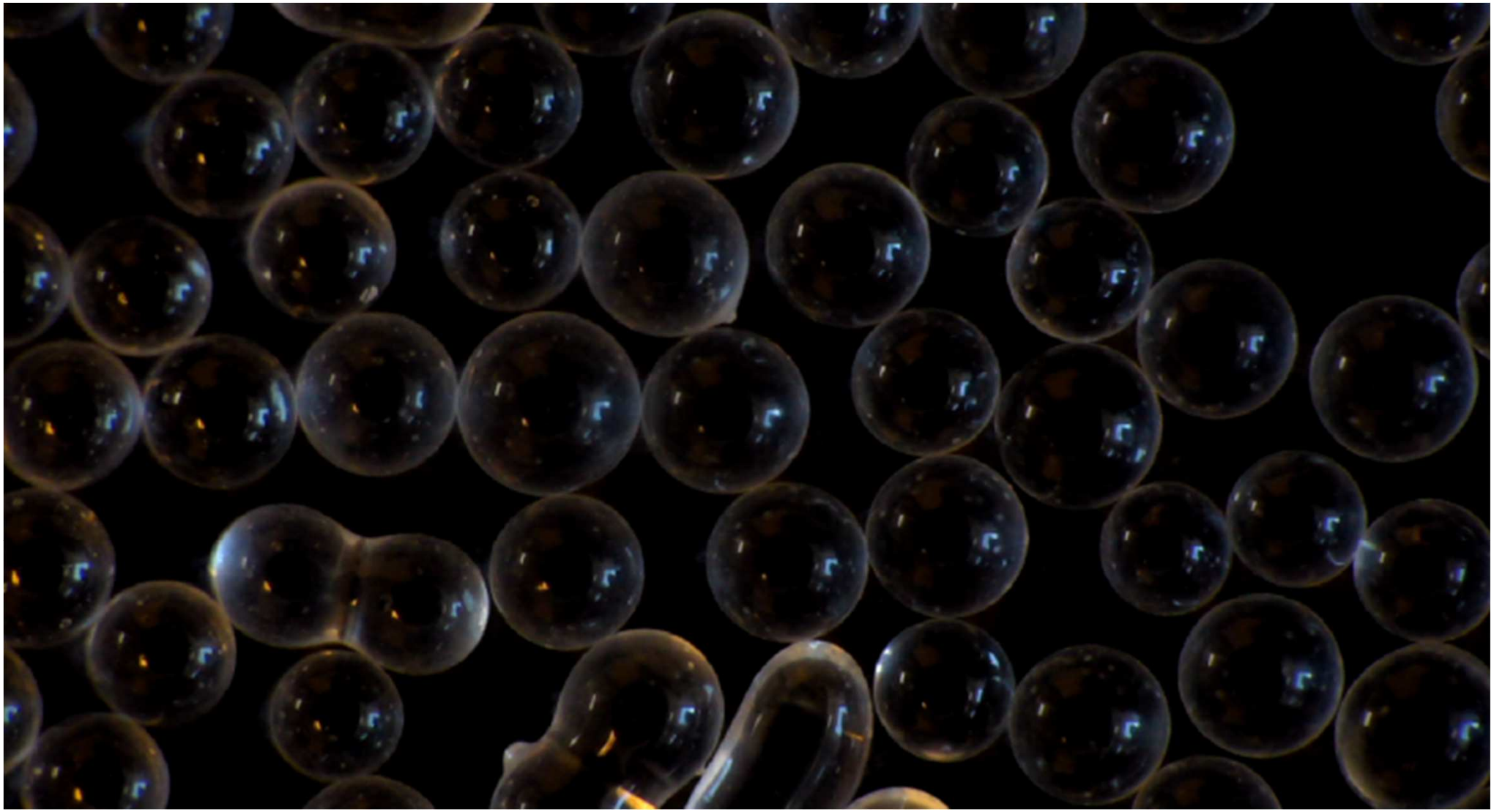
20x Zoom +10, with Ring light & Polarizer!



8x Zoom +5, with Dark Field & Ring light!

All images taken by W30x-HD, same sample
Tube ϕ1.65 mm

Sample picture - Plastic ball with diameter of 0,6 mm.



W30X with +5 and +10 len = 196X magnification.

Optilia

Capture and Measurement with PC / Laptop

1080HD Frame grabber with Software for image capture.

USB3.0

Software

OP-006 120, Opti*P*ix Lite. Display/Capture/Line measurement
Included in Frame Grabbers.

OP-006 119, Opti*P*ix Full. Display/Capture/Geometrical Measurements/Overlay
Micrometer Calibration Scale included.

OP-006 121, Opti*P*ix Full with Database. Display/Capture/ Geometrical Measurements/Overlay/Database/Reporting.
Micrometer Calibration Scale included.

Optilia

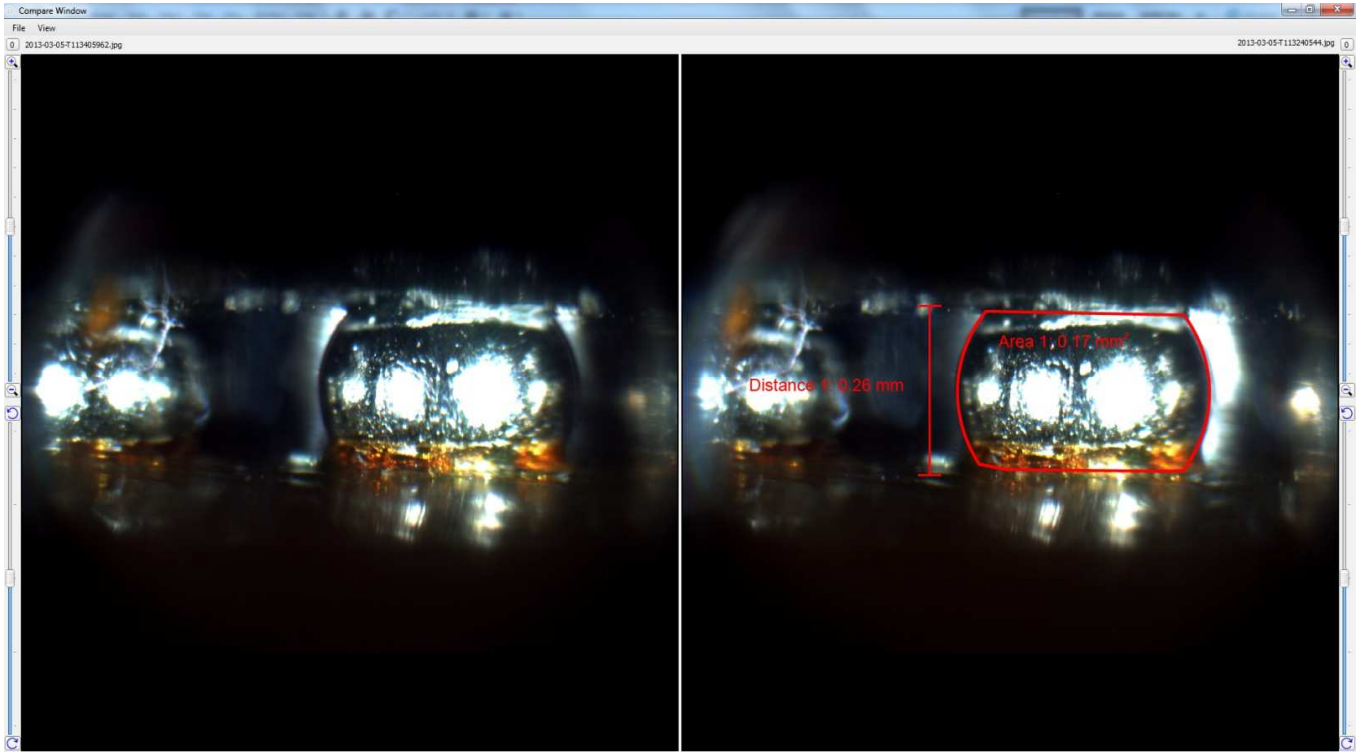
Sample picture

30x zoom with standard lens

Optilia

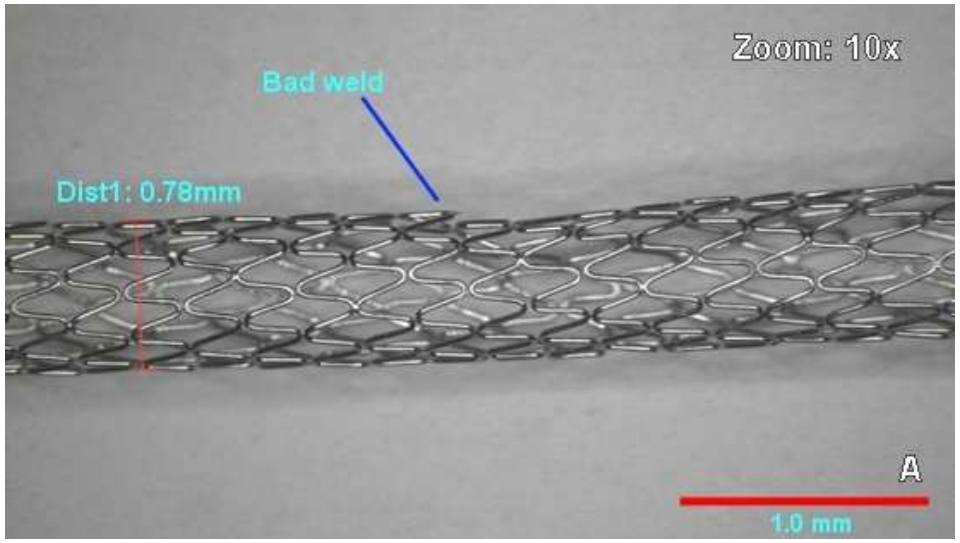
Software

Compare Image

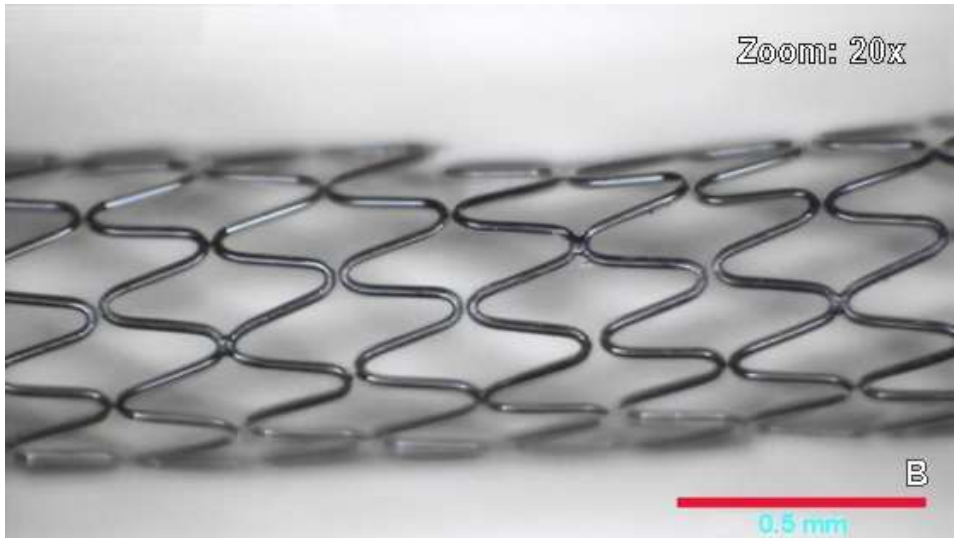


- OptiPix enables you to view and compare the live image side by side with a reference image.

Sample pictures in OptiPix



W30x with **+10 lens**, 10x zoom RingLight



W30x with **+10 lens,** 20x zoom, RingLight

Capture Full HD Digital Image without PC

Capture 32 GB of Full HD still pictures on removable SD-card

Full HD 1080

Only Full HD 1920x1080 external capture device on the market!

- HDMI output
- Dual picture display via USB output as reference
- Overlay lines, patterns, annotations or CAD drawings on live image "Digital Graticule"
- Foot switch for hand-free operation

ptilia

Sample picture - fingerprint

30x zoom with +10 lens

Optilia

Advantages over Traditional Ocular Microscopes

- Less tiring than looking under binocular based cameras / ocular microscopes
- Longer working distances no risk of board contact. Crucial for efficient assembly, reparation and rework
- Auto focus optics ‘frees up’ the hands and allows quick inspection of objects at different heights and magnifications
- Larger depth of field for easier and quicker work
- Powerful optical zoom 1x to 30x produces “large field” to “high magnification” images
- Remote control of magnification, focus, brightness, Iris etc. provides flexibility to different inspection objects and lighting conditions
- Live image overlay for displaying graticules, cross-line, zoom factor
- Foot switch allows hand free control of zoom image capture etc.
- Full HD 1080p resolution 60 fps video with no lag for easy optical inspection

Ergonomic – relax, have a coffee or tea

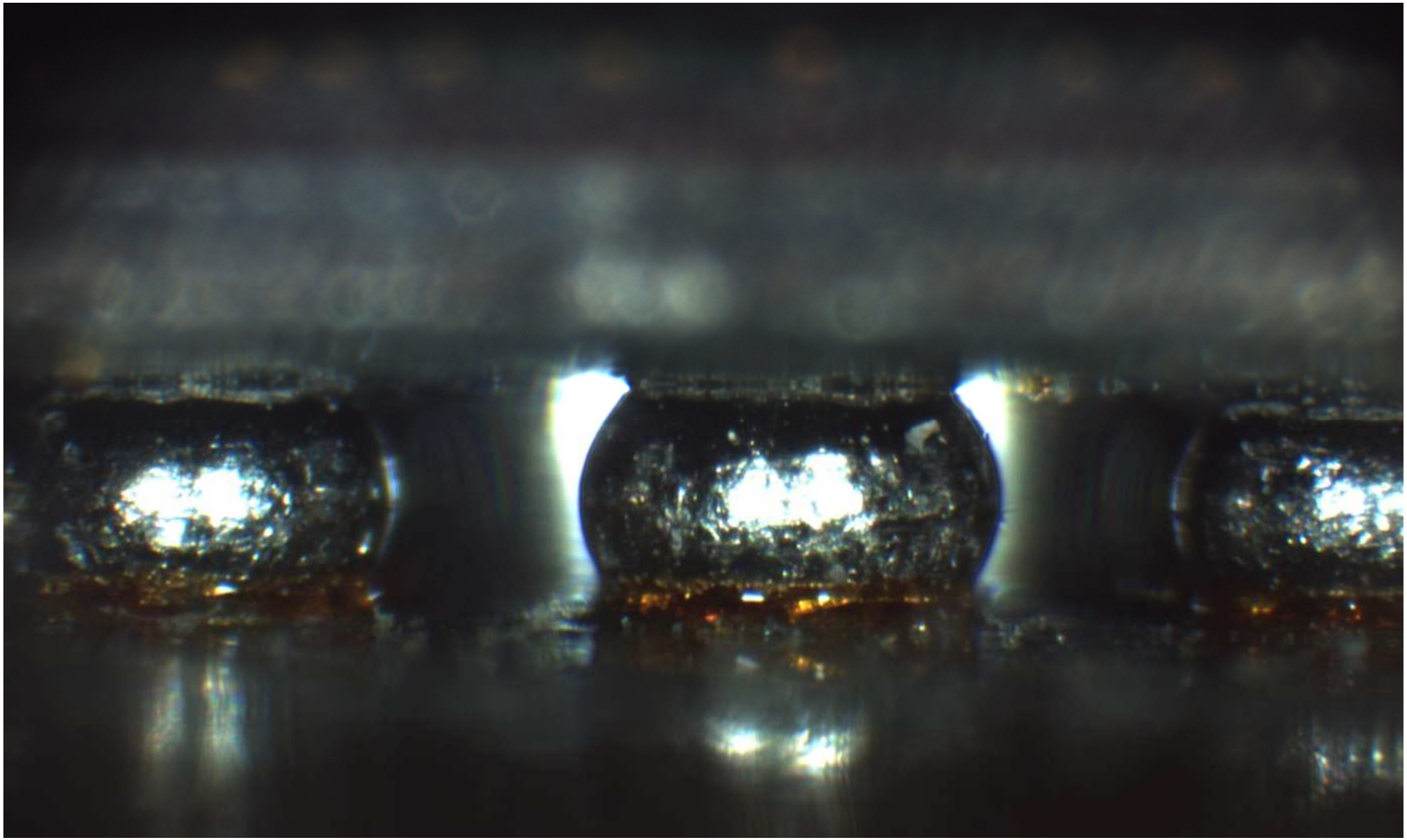
Optilia

Advantages over Stereo Microscopes

Performance	HD Video	Stereo Microscope
Ergonomic Inspection	Excellent	Poor
Large Working Distance	Excellent	Good
Large Depth of Focus	Excellent	Good
Large Field Of View	Excellent	Good

Application	HD Video	Stereo Microscope
Optical Inspection	Excellent	Excellent
In-line Inspection	Excellent	Poor
Video / Image Recording	Excellent	Optional
Documentation	Excellent	Optional
Repair / Rework	Good	Excellent
Assembly Work	Excellent	Good

Optilia BGA inspection systems



Optilia

Optical BGA Inspection vs. X-ray

Capabilities

BGA	Optical Inspection	X-ray Inspection
Placement	✓	✓
Bridging	✓	✓
Cold Solder Joints	✓	✓
Reflow Problems	✓	✓
Excess Flux	✓	✗
Contamination	✓	✗
Ball Shape	✓	✓
Voids	✗	✓

PCB	Optical Inspection	X-ray Inspection
Top Inspection	✓	✗
Assembly and Rework	✓	✗

Optilia Instrument's

BGA Inspection Systems

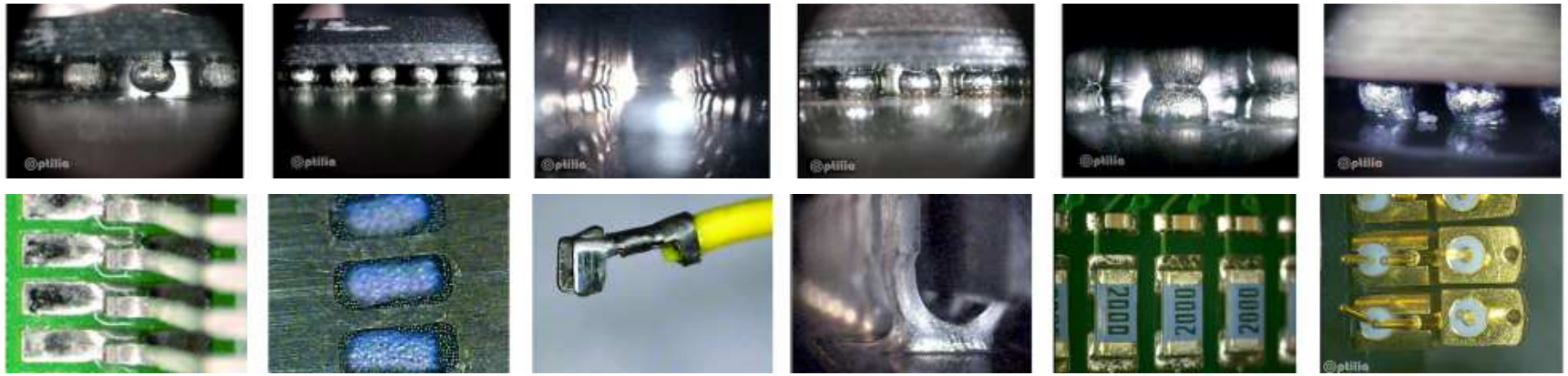
PRODUCT REVIEW

Optilia

BGA Applications

Optical Inspection, recording, analysis and documentation of

- BGA
- µBGA as low as 40 microns stand-off
- CSP
- Flip-Chip
- SMD Solder Joints
- Printed Solder Paste
- Assembled PCBs
- Stencil Apertures
- Components, pad, scores, connectors, cables



ptilia

Lenses and Illumination options for Flexia Definition Digital & Analogue Video Microscopes

Basic Flexia microscope unit:

Flexia Definition Digital **OP-019 191**
Flexia Definition Digital HM **OP-019 197**
Flexia Definition PAL **OP-019 001**
Flexia Definition PAL HM **OP-019 152**

100x lens is always included in Flexia Definition

100x Objective lens
OP-019 400

Fixed focal length Objective lenses replace 100x lens in order to achieve higher magnification

170x Objective lens
OP-019 113

250x Objective lens
OP-019 114

500x Objective lens
OP-019 116

Side viewing BGA Inspection Lenses:

Side Viewing BGA Lens, Small Size, **OP-006 560**

* Optical Head for BGA lens, Small Size, **OP-006 561**

Side Viewing BGA Lens, Low Aperture, **OP-006 550**

* Optical Head for BGA lens, Low Aperture, **OP-006 551**

* Items are spare parts

Varifocal Lenses:

1-100x varifocal lens with built-in LED RingLight (Ultra intensity), **OP-019 407**

8-80x varifocal lens with built-in LED RingLight, **OP-019 110**

10-50x varifocal lens with Polarized LED RingLight (Ultra intensity), **OP-019 408**

Fixed focal length Objective Lenses and RingLights:

Ringlight for 100x & 170x lens, **OP-006 205**

Diffuser (contact) adapter for 100x lens, **OP-006 203**

Diffuser (contact) adapter for 170x lens, **OP-006 204**

Diffuse (contact) ringlight for 250x lens, **OP-006 205**

Diffuse (contact) ringlight for 500x lens, **OP-006 206**

TR-0743, Rev C April-09

E-mail: Info@optilia.eu
Web: www.optilia.eu

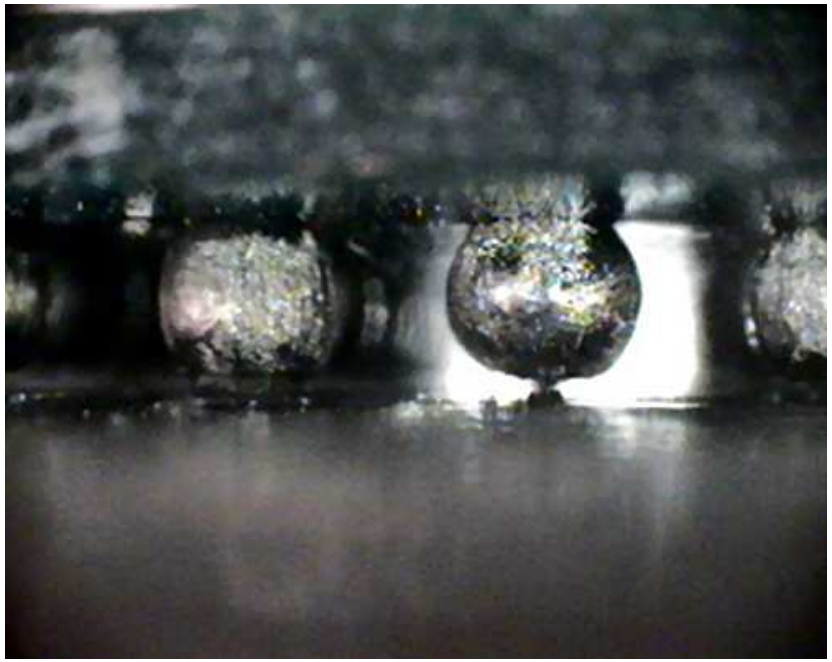
Optilia

High Quality, Flexible Visual Inspection Systems

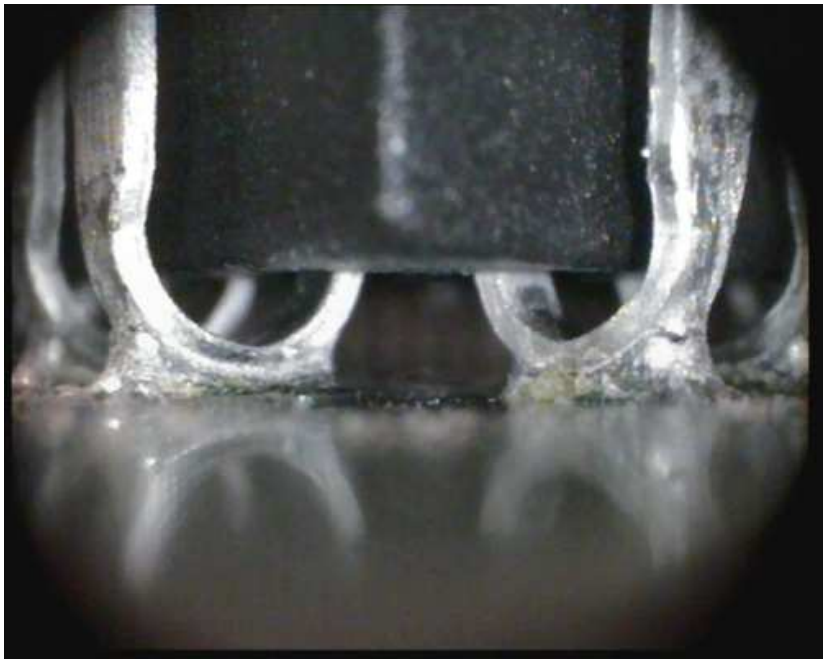
Optilia

Optilia BGA inspection technology

Sample pictures



Connection failure, BGA component.



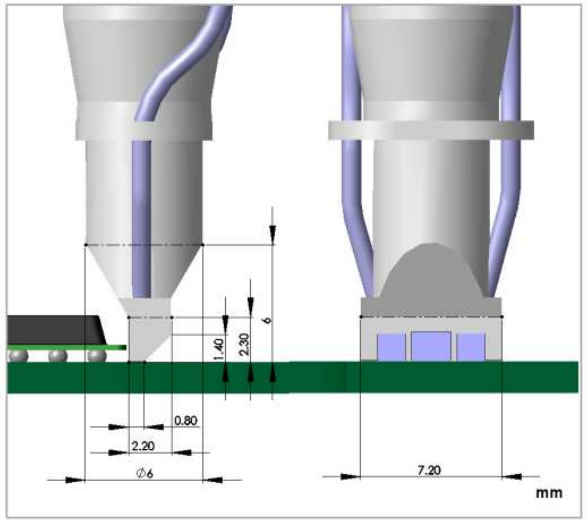
Crack on lead solders, JLCC component.

BGA lens with Low Aperture 90° Optical Probe

Robust and Long-life Operation

OP-006 550

OP-006 551



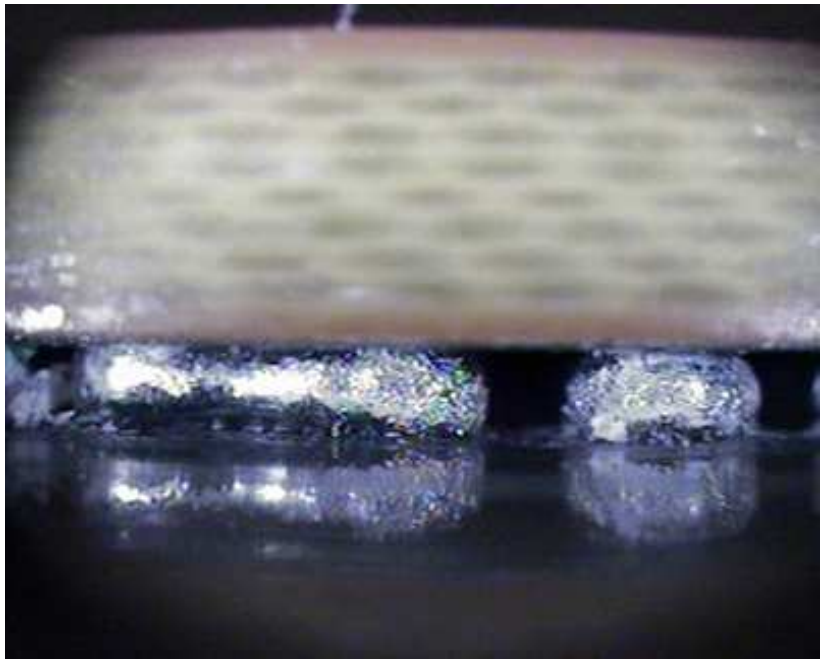
- 40 microns BGA stand-off inspection capability
- Exchangeable Optical Probe (spare part)
- Magnification Up to 280x on a 24” Monitor
- Built-in LED illumination

Optilia

Optilia BGA inspection technology

Sample pictures with Low-aperture BGA lens

Fibres between BGA balls



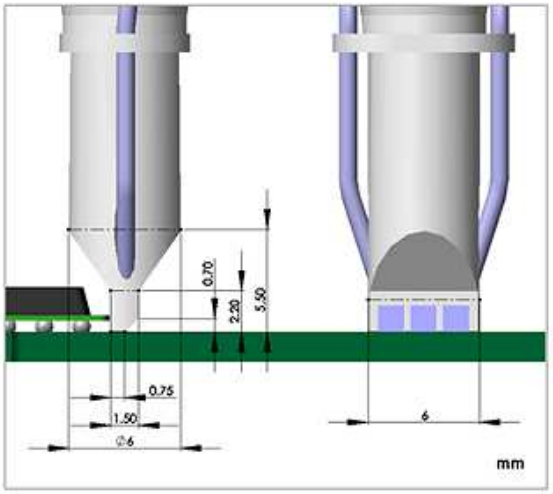
Bridge

BGA lens with Small Size 90° Optical Probe

Slim Optical Probe for Reliable Inspections

OP-006 560

OP-006 561

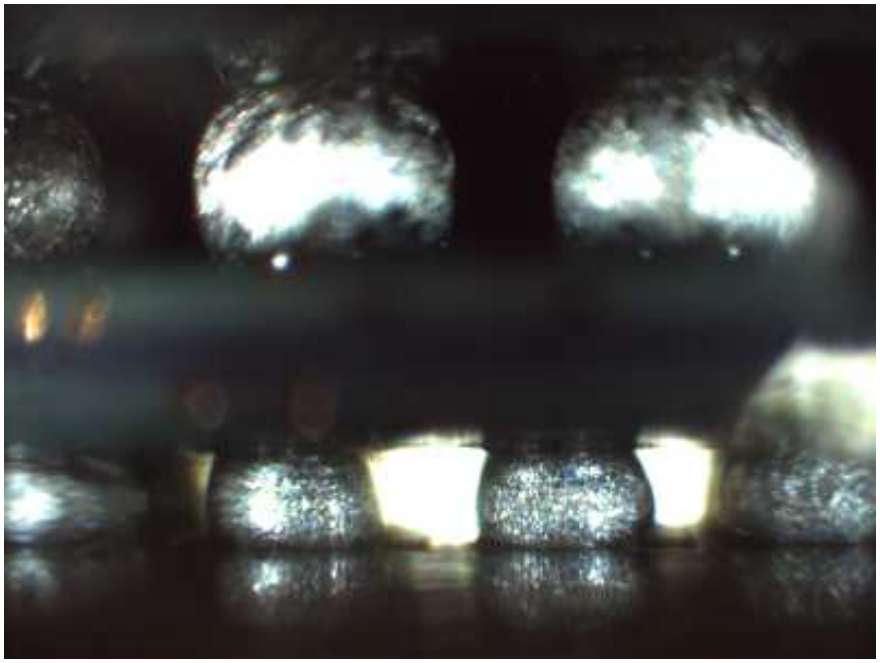


- 40 microns BGA stand-off inspection capability
- < 1.5 mm thin optical head (0.8 mm foot print)
- Exchangeable Optical Probe (spare part)
- Magnification Up to 350x on a 24” Monitor

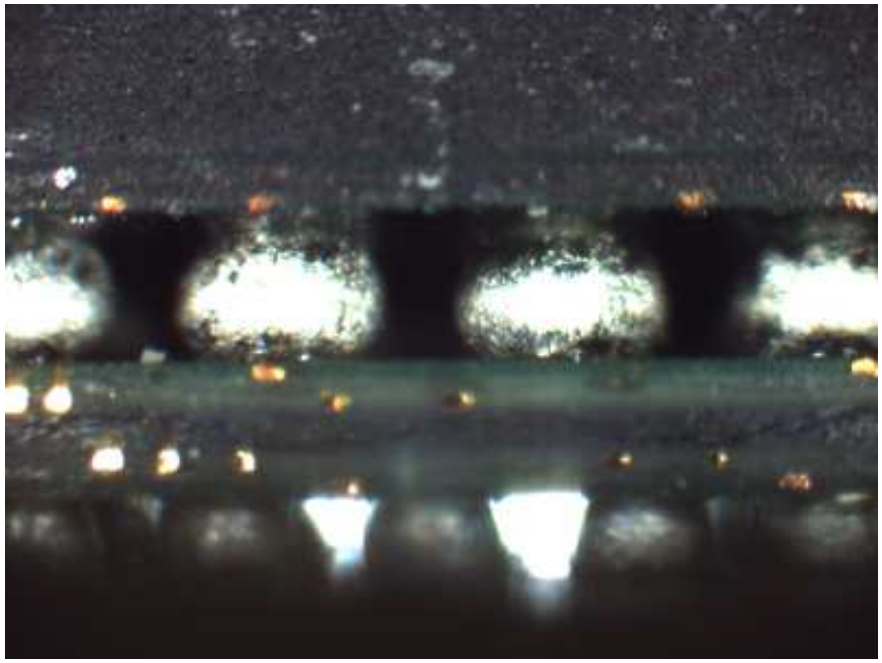
Optilia

Optilia BGA inspection technology

Sample pictures with Low aperture BGA lens



Flip-chip component.



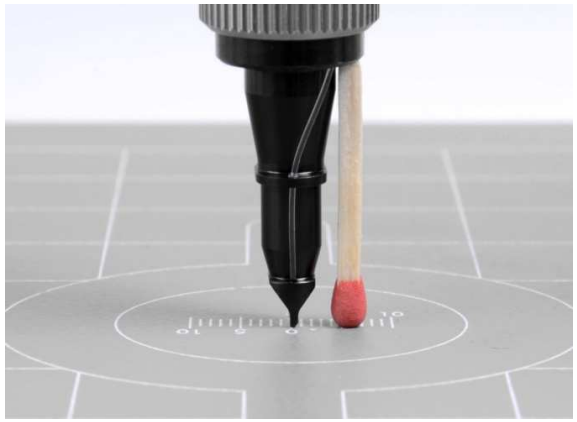
Same component. Lens is re-focused!

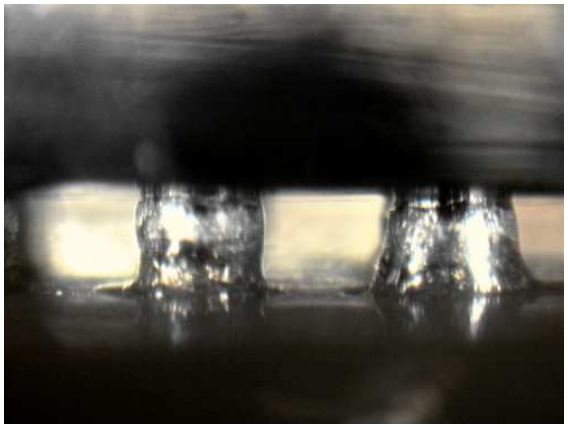
BGA lens with Ultra Small Size 90° Probe

Ultra Slim 0.8mm Optical Head for Narrow Inspections

OP-006 570

OP-006 571





- Tiniest BGA probe in the market (0.4x3.4 mm foot print)
- 40 microns BGA stand-off inspection capability
- Exchangeable Optical Probe (spare part)
- Magnification Up to 350x on a 24” Monitor

Top-View Varifocal Lenses

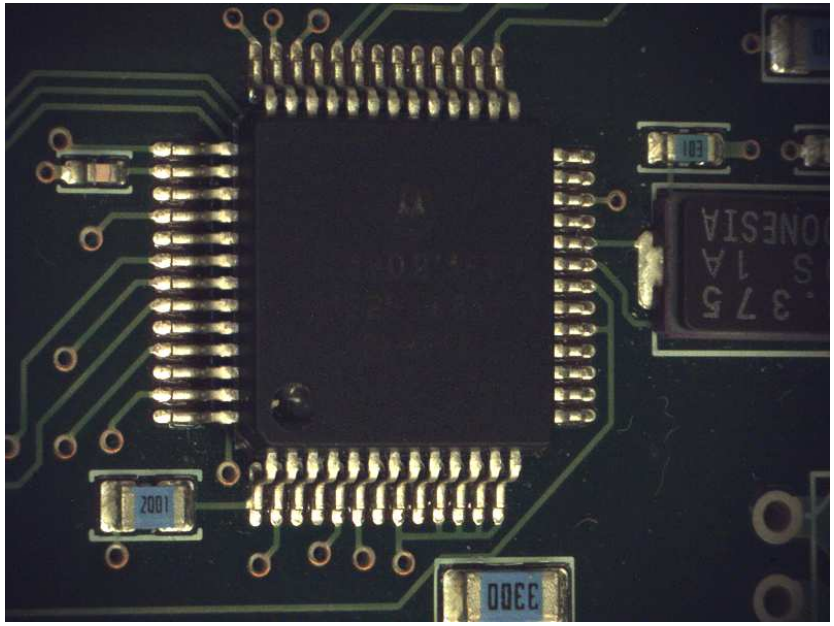
Attachable lenses with Built-in LED light for Top Inspection

1-100x varifocal lens with built-in LED RingLight, **OP-019 407**

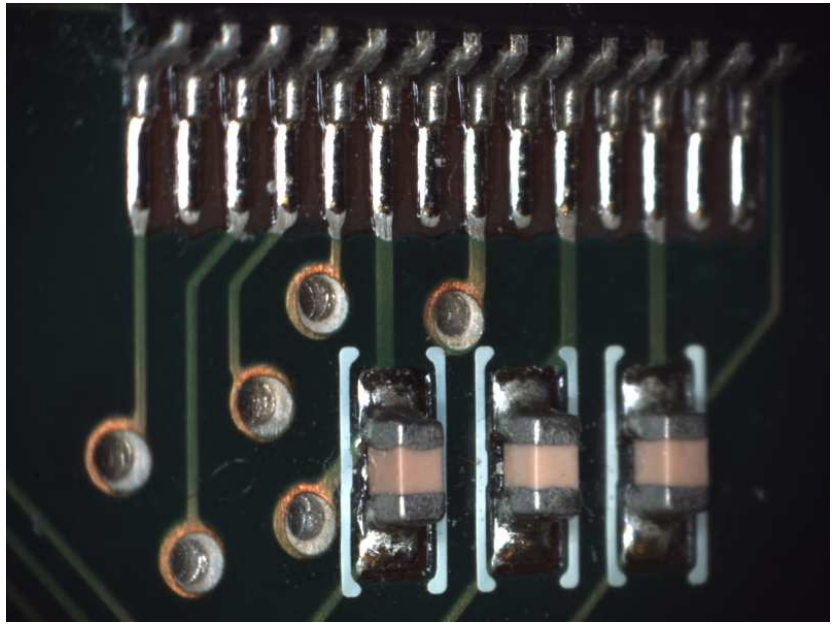
Built-in LED Light

10-50x varifocal lens with Polarized LED RingLight, **OP-019 408**

Polarized LED Light



10x magnification, built-in RingLight

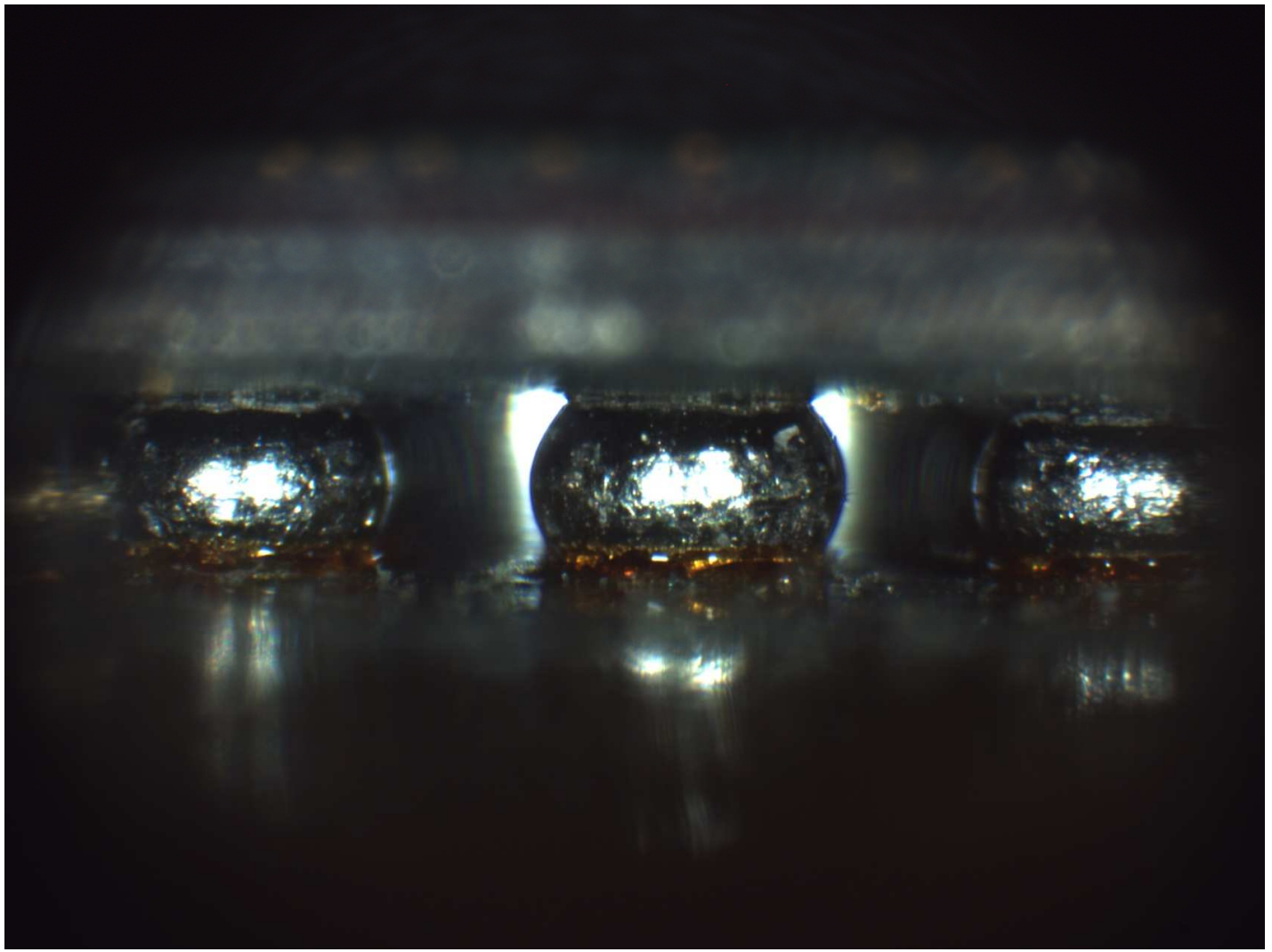


50x magnification, built-in RingLight

Optilia

Why use Optilia BGA inspection systems?

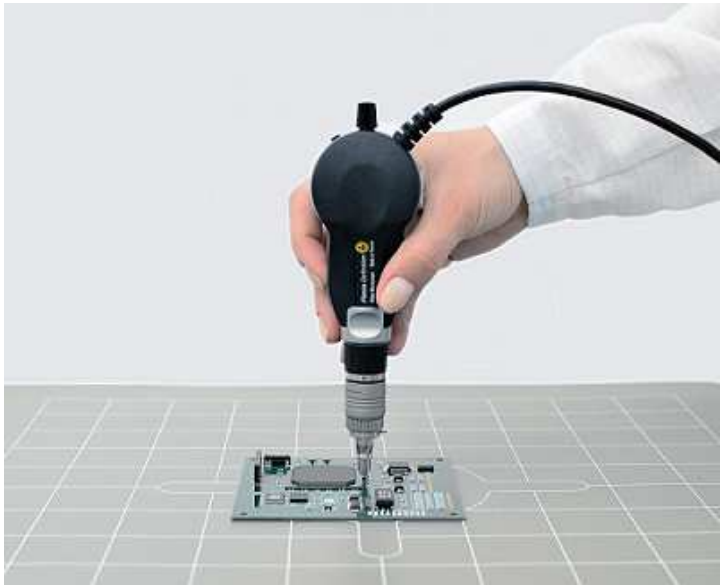
Adjustable Focus for imaging up to 20 Rows for BGA



Optilia

Why use Optilia BGA inspection systems?

Flexible and Configurable

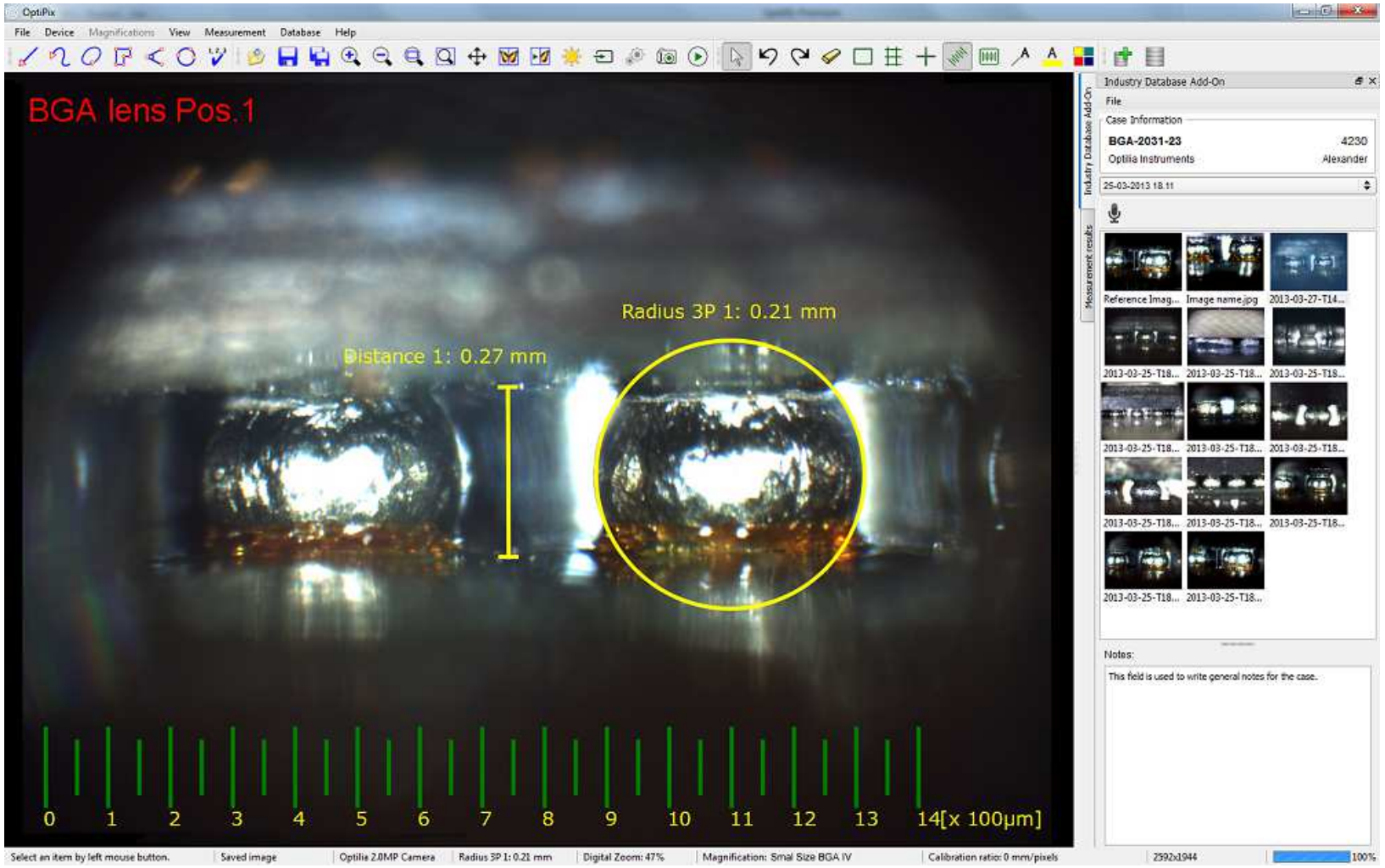


- Free hand operation
- Stand mount with background light and XY-translation
- XL-configuration with PCB holder for large size PCBs

Optilia

Software

OptiPix, Image Capture, Analysis, Measurements and Archiving.



Optilia

Software

Reporting

Optilia

CB Certificate
Verified by Optilia

2013-03-25

Case Name:	Case ID:	Company:	Inspection Date:
BGA-2031-23	4230	Optilia Instruments	25-03-2013 18.11
Used System:		**Manager:**	
Flexia HM		Hazar	

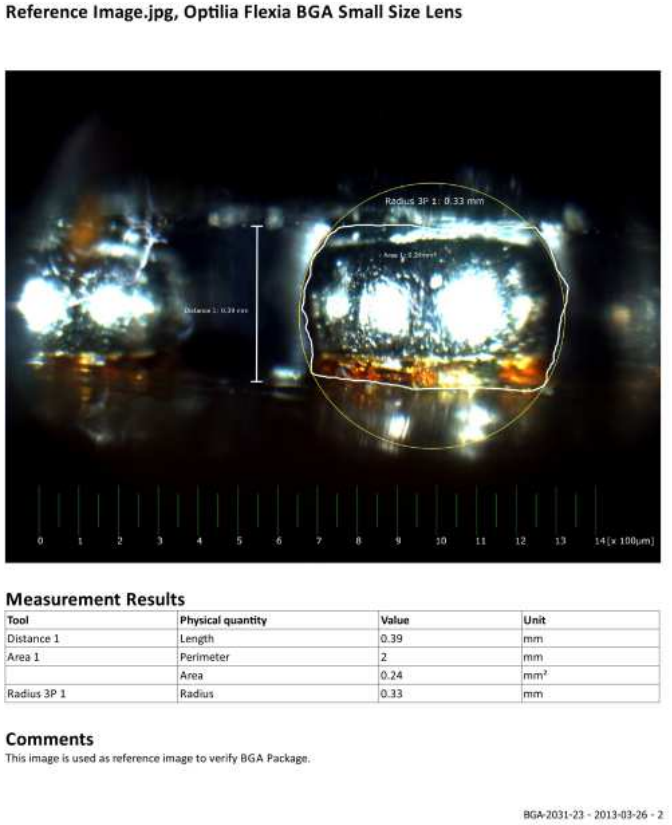
Notes:
This is the front page of the report. The selected images shown below has its own page. This Report has for example 17 page (front page + 16 images). Every data that is connected to the image such as measurements, comments, magnifications, calibration et.c. are visible on each image page.

This field is used to write general notes for the case. The two titles above "Used System" and "Manager" are customisable and it is possible to add additional five customisable fields (maximum 7).

Image name.jpg
2013-03-25-T184947959.jpg
2013-03-25-T182924714.jpg
2013-03-25-T182847665.jpg
2013-03-25-T182624948.jpg
2013-03-25-T182646348.jpg
2013-03-25-T182554691.jpg
2013-03-25-T182545066.jpg
2013-03-25-T182513033.jpg
2013-03-25-T181431571.jpg
2013-03-25-T181317399.jpg
2013-03-25-T181300431.jpg

Alexander
Printed name of Operator

Signature of Operator



Reference Image.jpg, Optilia Flexia BGA Small Size Lens

Measurement Results

Tool	Physical quantity	Value	Unit
Distance 1	Length	0.39	mm
Area 1	Perimeter	2	mm
	Area	0.24	mm²
Radius 3P 1	Radius	0.33	mm

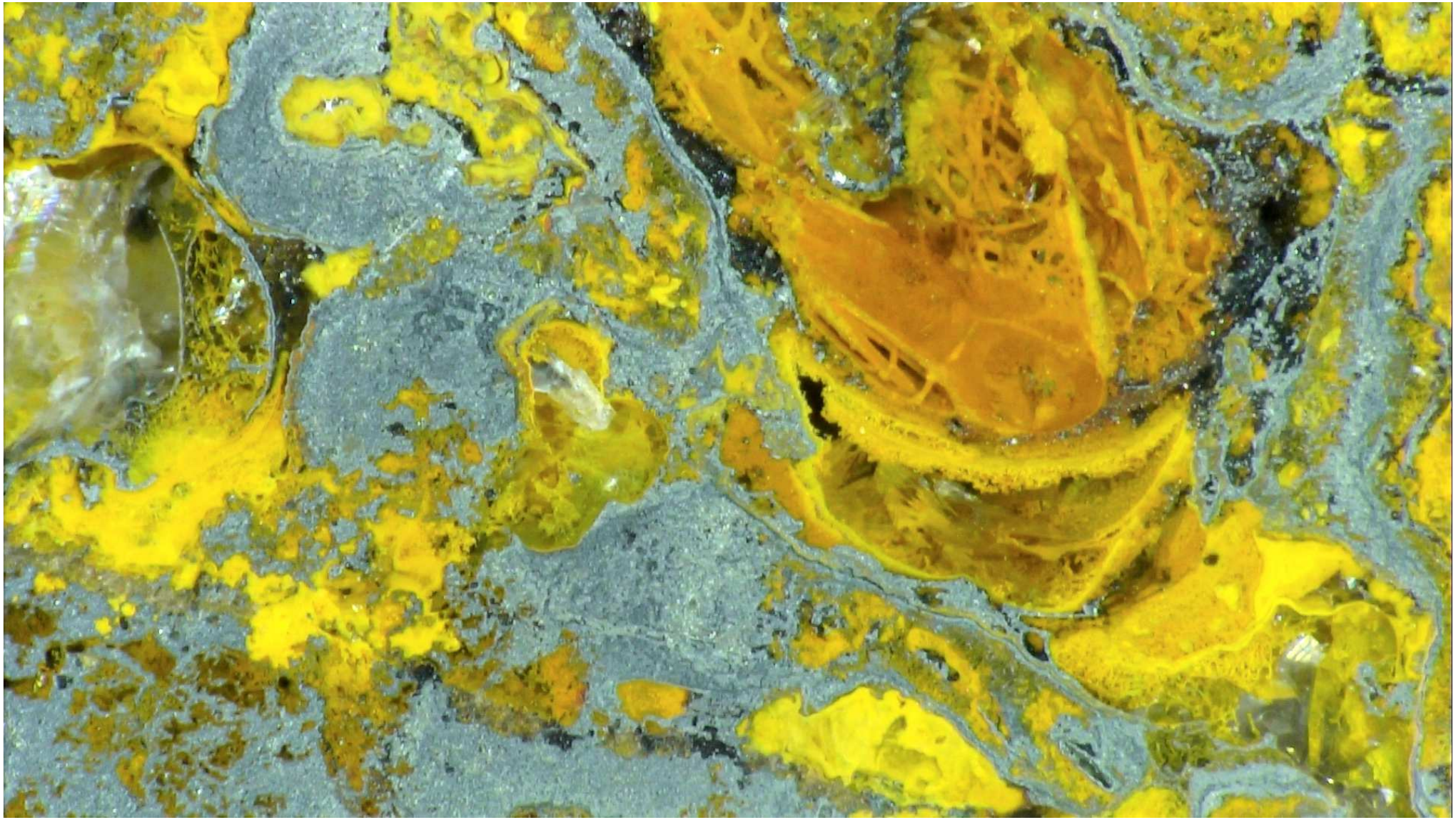
Comments
This image is used as reference image to verify BGA Package.

- Results can be printed, copied to excel sheets or created as an inspection report

Optilia Advantages over Competitors

- Best image quality and true colour resulting from Optilia´s superior optics and SONY´s Exmor ® image sensor, facilitating more accurate and reliable inspection tasks
- Fast Autofocus allows quick inspection of objects at different heights and magnifications
- Extended 500mm working distances in Optilia´s FreeSight models provides clutter-free working space with clear viewing of the monitor
- Full HD 1920x1080 still image capture with Optilia´s unique SD-card Capture Device for documentation and communication
- Dual display of still reference image and live image of inspected object using Optilia´s unique SD-card Capture Device
- Live Image Overlay utility for superimposing custom made soft Graticules, Test patterns, CADs, and Scales allows simple and quick dimensional control and geometrical measurement of inspecting parts
- Modular Camera System Design with SDK for system integration and flexibility for adaptation according to customer´s needs

Sample picture - Iron oxide



20x zoom with standard lens

Optilia

Examples of applications

- Small items manufacturing
- Electronics production
- Automotive
- Defense industry
- Aerospace
- Medical production
- Quality control
- Welding control
- Forensics
- Pathology