

# Y.Cougar Series

## Compact and versatile X-ray solutions for 2D and 3D microfocus inspection



Continuous miniaturization and increasing quality and reliability demands drive the need for high resolution inspection tools. As a leading supplier of industrial X-ray inspection systems for microfocus and non-destructive testing, YXLON International is taking up this challenge. Across various domains, including electronics, micro-systems, assemblies and materials, product integrity can be ensured through deployment of the Feinfocus product family – high performance X-ray solutions optimized for the use in research and development, prototyping, failure analysis, process monitoring and higher volume production testing.

Y.Cougar is the product line of compact and ergonomic Feinfocus X-ray solutions especially designed for maximum versatility.

*YXLON. The reason why.*

- rapid, high resolution inspection results
- Y.QuickScan® – the ultra fast  $\mu$ CT solution
- easy to use
- 16 bit digital imaging chain
- small footprint



## Y.Cougar X-ray solutions

Designed to meet a wide range of rigorous needs of the electronics, automotive, military and aerospace, telecom and medical device markets, the compact Y.Cougar platform provides the most versatile X-ray solution for 2D and 3D inspection in the market. The extensive expertise acquired by the pioneer of microfocus X-ray inspection technology with more than 2500 system installations worldwide steered the development of a user-friendly, compact and versatile micro-focus inspection solution, the Y.Cougar platform.

The result is a range of high quality X-ray solutions that adapt themselves flexibly to changing customer needs. Advanced technological solutions enable ergonomic and reliable operation across the outstandingly economic system range.

Y.Cougar systems are the ideal solution for real-time micro-focus X-ray inspections ranging from manual single device to fully automated high volume applications.

## Applications

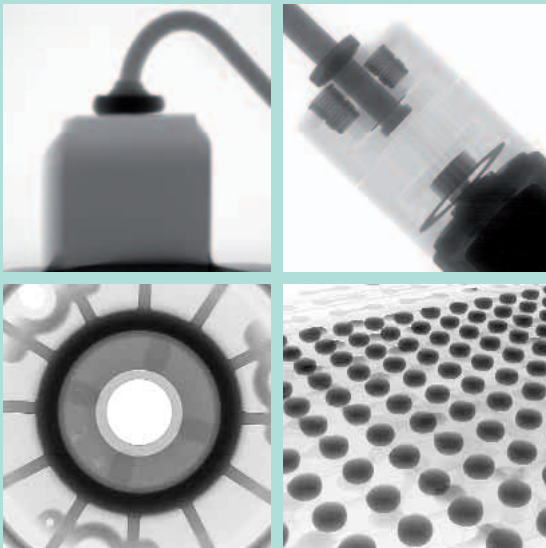
The Y.Cougar platform addresses constantly changing market and application requirements through maximum operator flexibility. Ranging from failure analysis and R&D to production volume X-ray inspection, an array of configurations is offered. These are ideally suited for a wide range of two-dimensional and three-dimensional microfocus computed tomography ( $\mu$ CT) applications:

- Printed circuit boards (PCB)
- Semiconductor packages and interconnects
- Electronics assemblies
- Sensors, micro-systems and encapsulated components
- Medical devices
- Wafer-level chip scale packages (WLCSP)
- Micro-Electro-Mechanical Systems (MEMS, MOEMS)
- Photonics assemblies
- Cables, harnesses, plastics and many more

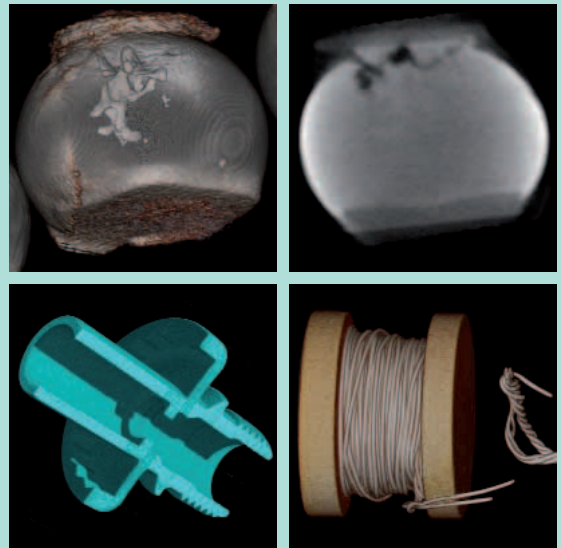
## Compact design

The Y.Cougar features a small footprint (1.1 m x 1.1 m), low system weight (~1450 kg) and convenient front and side door service access. Two basis configurations are supported by a wide range of modular options:

- **Y.Cougar F/A**  
Most cost effective Failure Analysis (F/A) configuration
- **Y.Cougar SMT**  
Advanced Surface Mount Technology (SMT) configuration



Ball bond, micro motor gear box, aluminum casting, and ball grid array (BGA) in oblique view



$\mu$ CT of BGA ball (3D view and virtual slice), plastic component, and sensor coil

## Configuration and specifications

- Geometric magnification up to 2,000 x, total magnification up to 10,000 x
- Inspection area of 310 mm x 310 mm (12" x 12"), maximum sample size of 550 mm x 440 mm (21" x 17")
- Optional multifocus X-ray tube (MFT) offering micro-focus ( $\mu$ f), nanofocus (nf), and High Power (HP) modes
- Detail detectability down to < 500 nm
- 16 bit real-time image processing as standard
- CNC capabilities for X-ray, manipulation and image processing (optional for Y.Cougar F/A)
- Optional automatic BGA analysis, voiding calculation, universal Automatic Defect Recognition (ADR), and AVI recording

### ■ Y.Cougar F/A

- Optional 90 kV sealed tube
- 6" standard image intensifier (II 150) with 9" image intensifier (II 230) or high definition 6" image intensifier (II 150 HD) option

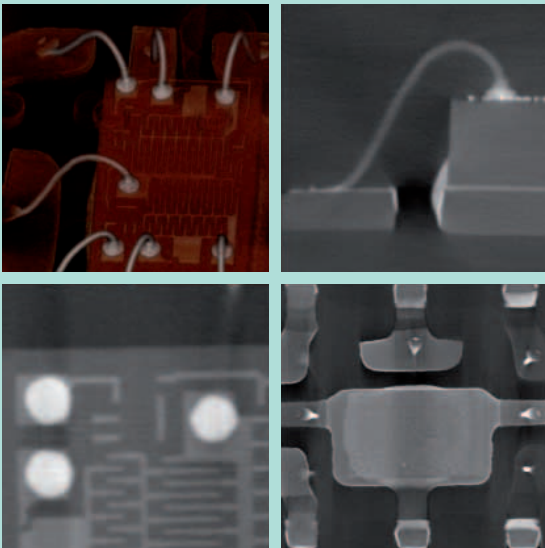
### ■ Y.Cougar SMT

- High definition digital flat panel detector (Panel 0505 HD) as standard with larger high definition (Panel 1212 HD) or high speed (Panel 1313 HS) option
- Oblique viewing (140°) at high magnification
- Optional 360° sample rotation table
- Microfocus computed tomography (Y. $\mu$ CT) option
- Optional Y.QuickScan® - the ultra fast  $\mu$ CT solution

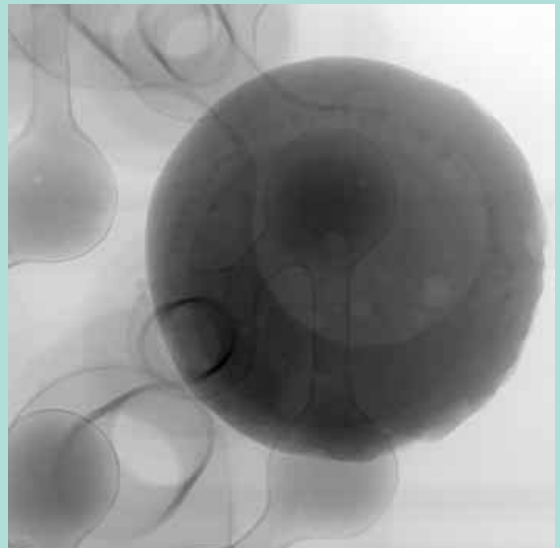
## Ergonomics, easy usage and safety

Easy usage and ideal ergonomics are achieved through the deployment of advanced technological solutions. These reduce the strain of operating a high-tech X-ray inspection system yet still provide highest quality inspection results.

- Easy-to-use mouse manipulation and navigation by "Click & Center" in image or via joysticks
- Anti-collision design for damage free inspection
- Auto Isocentric Motion (AIM): a Feinfocus exclusive smart manipulation technology automatically keeping the region of interest in the center of view – regardless of magnification, viewing angle and tilt/rotate
- Y.FGUI: Intuitive-to-use Feinfocus Graphical User Interface for image analysis and system control
- Easy Teach-In: enabling code-free programming of customer inspection routines yet maintaining additional customization through Visual Basic
- Easy-View: a dedicated, flexibly configurable operator workspace
- True X-ray Intensity (TXI) technology achieving sharp, consistent image quality through continuous feedback of X-ray source status
- Virtually unlimited X-ray tube life due to open tube design
- Change between 2D,  $\mu$ CT and fully automated sample manipulation within seconds
- Operator console adjustable in height and position
- Easy access sliding door with automatic X-ray off for safe sample loading
- Radiation safety < 1  $\mu$ Sv/h



Integrated micro-system – 3D view and virtual cross-sections of bonding wire and die attach



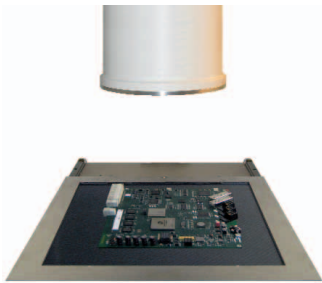
Single BGA ball and micro-vias



## Y.Cougar F/A

The most cost effective Y.Cougar F/A system is ideally suited for manual two-dimensional X-ray inspection. With 16 bit image processing as standard and optional CNC for automated inspection workflows, Y.Cougar F/A manipulation includes:

- Image intensifier Z axis (motorization optional)
- Sample tray X/Y manipulation
- Optional sample rotate & tilt device (360°/60°)
- Tube Z-axis



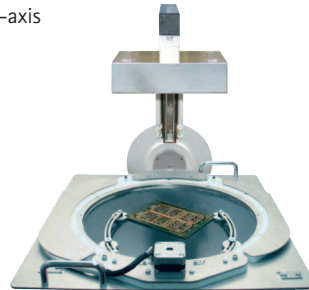
### ■ Inspection workflow

Y.Cougar F/A systems are conceived for failure analysis, spot-check and small-series manual inspection. Samples can be loaded via the sliding door without usage of any special fixtures. X-ray can only be activated when the sliding door has been closed. Magnification and X/Y sample manipulation is conducted by joystick operations. Immediate visual feedback is given through the use of the real-time image chain. Images can be analyzed, annotated and saved via the Easy-View operator mode.

## Y.Cougar SMT

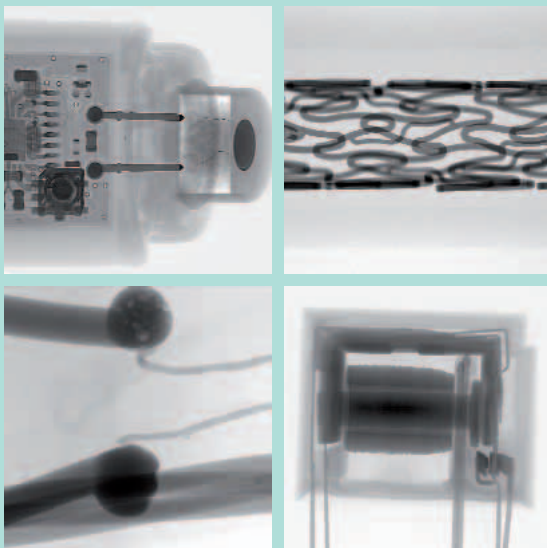
The more advanced Y.Cougar SMT system offers larger versatility for low to higher volume, manual and semi-automated, 2D and 3D  $\mu$ CT X-ray inspection. With digital flat panel detectors, CNC and oblique viewing as standard, Y.Cougar SMT manipulation includes:

- Flat panel detector Z axis and 140° tilt
- Sample tray X/Y manipulation
- Sample rotation table 360° (option)
- High accuracy  $\mu$ CT sample rotation (with Y. $\mu$ CT module)
- Tube Z-axis

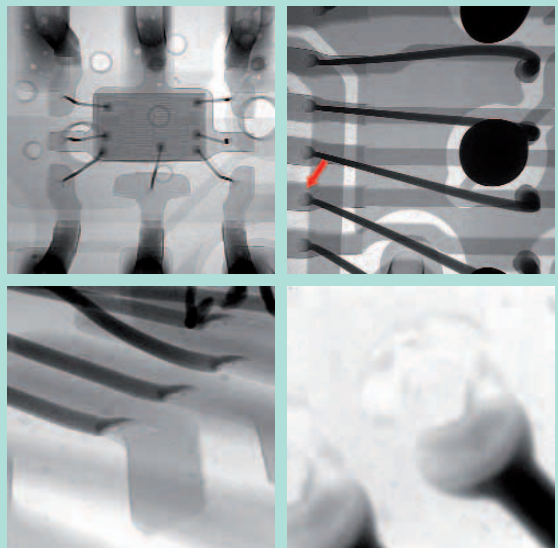


### ■ Inspection workflow

Y.Cougar SMT systems are ideally suited for advanced applications offering oblique viewing and CNC as standard. The system is controlled manually via joysticks or "Click & Center" manipulation in the X-ray or overview image. Fast code-free training of inspection routines is achieved by a few mouse clicks. The corresponding Visual Basic script is ideally suited for further customization where desired. Libraries of taught inspection workflows are comfortably available in the Easy-View operator mode.



Smart sensor, stent, fault-affected wire connection, and relays



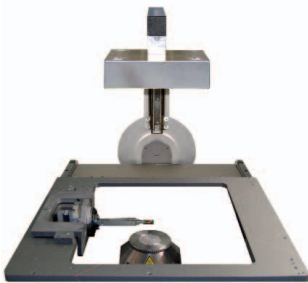
Bonding wires with ball and wedge bonding



## Y.μCT module with Y.QuickScan® option

The Y.μCT module gives a real insight into the three-dimensional composition of a sample including virtual cross-sections and slices and measurements. Available for Y.Cougar SMT and Y.Cougar PRO systems, the Y.μCT module includes:

- μCT manipulator with high accuracy sample rotation
- Easy-to-use scanning and reconstruction software
- Reconstruction and visualization workstation
- Y.QuickScan® offering μCT scans in a few seconds and reconstruction within a couple of minutes (optional)



### ■ Inspection workflow

Systems with Y.μCT module can easily be deployed for high quality volume scanning and analysis. Tube parameters and positioning can be adjusted in a matter of seconds or predefined μCT scan routines can be deployed. Upon 360° sample rotation a sequence of projections is acquired. Fast reconstruction is achieved through dedicated hardware solutions with visualization in a CAD-like environment offering in-depth inspection of virtual cross-sections and slices and much more.

## Y.FGUI

The Y.FGUI (Feinfocus Graphical User Interface) offers an ideal solution regarding easy operation and advanced system control while placing an emphasis on the real-time X-ray image. Easily associated icons and controls, supported by clutter-free workspaces enable intuitive usage and fast operator training.

### ■ Easy-View Workspace

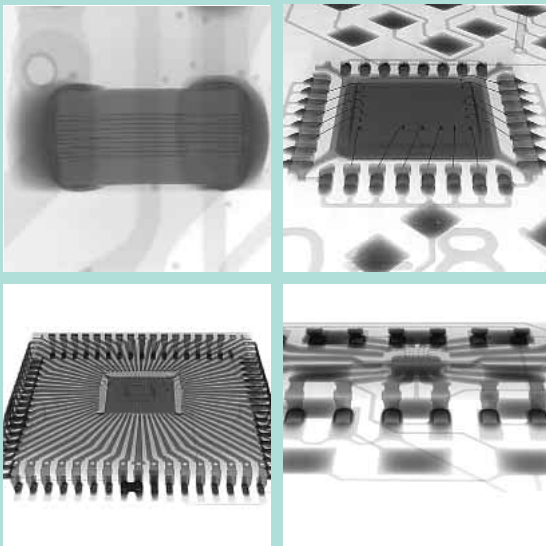
The Easy-View Workspace enables a quick and easy operator training and provides control auf main tube settings, sharpening and automatic contrast. The operator can display settings in the X-ray image, add freely etitable text and save images.

### ■ Easy Teach-In

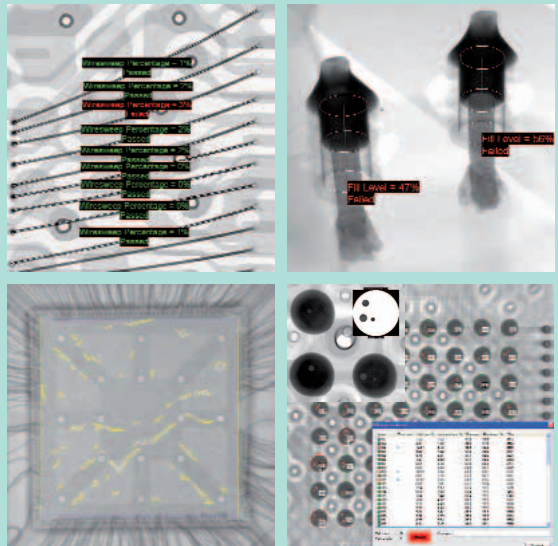
Code-free Teach-In by a few mouse clicks.

### ■ Image Process (IP) Workspace

- Straightforward drag & drop composition of image chain and adjustment operator parameters
- Easy-to-use operators and analysis tools as standard including contrast, sharpening, average, OSD with spatial, wire sweep and THT measurements, etc.
- Additional optional operators for image analysis (BGA, voiding calculation) supported by configuration wizards

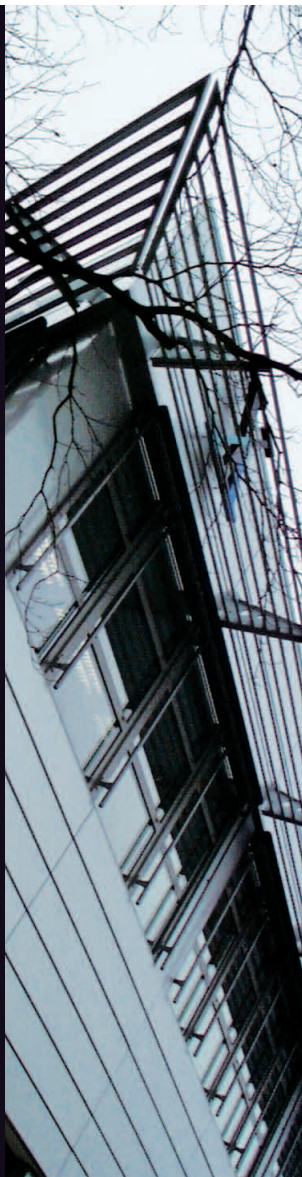


Surface mount technology: chip passive, MLF, PLCC, and SOIC



Measurements for wire sweep, barrel fill (THT), voiding calculation, and BGA analysis





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