

Led by experience. Driven by curiosity.

Cheetah EVO

Efficient inspections with crystal clear images
for SMT, semiconductors and labs.



c•met
yxlon



Comet Yxlon – this is who we are.

Comet Yxlon designs and manufactures high-end X-ray and CT system solutions for industrial environments – based on customer-centric product development. We're proud to be part of Comet, the globally leading Swiss technology company with a focus on plasma control and X-ray technology.

**Led by experience.
Driven by curiosity.**

Deeper insights.

Looking beyond the surface is our core competency at Comet Yxlon – but not only in a technical way.

Zooming in on your industry, applications and business challenges allows us to develop innovative and relevant solutions that help you shape future markets. Faster time to market? Avoiding production downtimes? The perfect image with the highest resolution, as fast and easy as possible? Whatever your goal – let's talk about it!



Automated 2D and laminography inspection for maximum productivity.

Your benefits with the Cheetah EVO:

- Outstanding CT quality: High detail resolution and scan repeatability due to water-cooled tube option.
- Increased efficiency through automated inspection and software-assisted image review.
- Easy-to-use dynamic image enhancement filters
- Best available laminography
- Dose monitoring for sensitive parts
- Optional high load capacity (≤ 20 kg)

The smart choice for the smart factory.

Connectivity, self-optimizing processes, automation – Industry 4.0 demands new solutions. Challenge accepted: The Cheetah EVO helps increase speed, image quality, and efficiency in the SMT and semiconductor industry as well as in laboratories.

Increase yield

Deeper insights from repeatable scan results keep your production on target.

Improve your efficiency

Faster results due to dedicated inspection workflows boost your productivity.

Enhance your quality

Precise image details reveal process trends.

Already Aristotle realized: "The whole is greater than the sum of its parts". With the Cheetah EVO, it's the combination of state-of-the-art hardware like the new water-cooled tube, innovative visualization software and smart workflows like VoidInspect, that makes this system stand out.

New water-cooled FXT 160.51 X-ray tube

When the temperature of the tube housing and the target inside increases during the inspection process, focus drift may occur. Thanks to improved heat dissipation at the tube optics, Comet Yxlon's new water-cooled tube stabilizes the focal spot and significantly improves CT results – expect crystal clear CT images with higher resolution and less image distortion. This is also the basis for a significantly improved repeatability of results of 2D and laminography scans during, e.g., batch inspections – a vital quality for using the data in production process control.

Cheetah ECO

Are you looking for an inexpensive entry-level solution? You'll find more information on the ECO version of our Cheetah on page 8.

Smart workflows and visualization

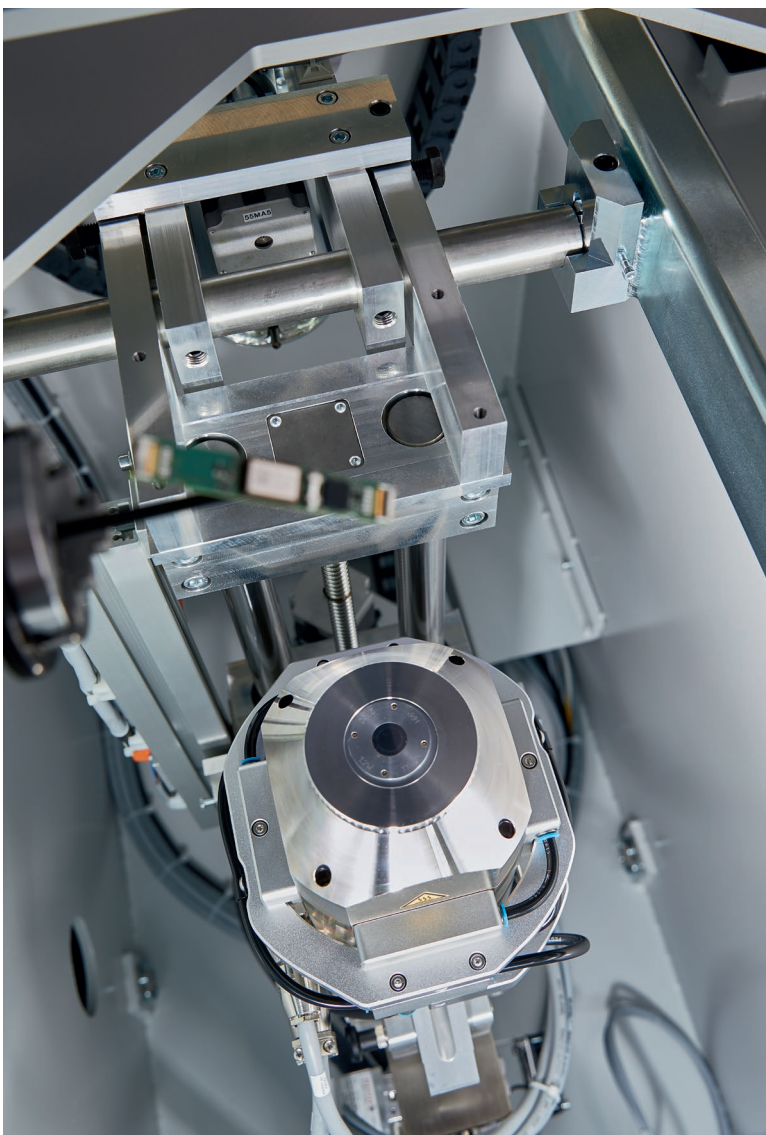
The Cheetah EVO responds to the need for improved, automated operation with integrated workflows in the FGUI operating software. Once images are captured, the Comet Yxlon FF CT software automatically performs a fast reconstruction of outstanding quality and, finally, offers brilliant visualization. It has a unique ability to render 3D cinematic images with a preset selection of transfer functions (TF), resulting in the most realistic, vivid visualization.

Large flat-panel detectors

The Cheetah's large flat-panel detectors offer an up to 50 % larger field of view for a better overview. Manufacturers benefit from faster working processes due to the reduced number of steps in automated processes.

Production line integration with ProLoop

The Cheetah EVO supports ProLoop, Comet Yxlon's smart factory solution for the optimization of production processes. It enables direct communication with the inline AOI / AXI inspection systems and thus helps achieve maximum yield performance.



The water-cooled FXT 160.51 tube delivers repeatable and precise scan results.

Optional high load capacity (≤20 kg)

The reinforced mechanics and sample table are suitable for components up to 20 kg, so several parts and electronic interconnects in fixed packages can be inspected at once – a real time saver.

Different applications. Same great quality.

SMT inspections: grand performance for small devices

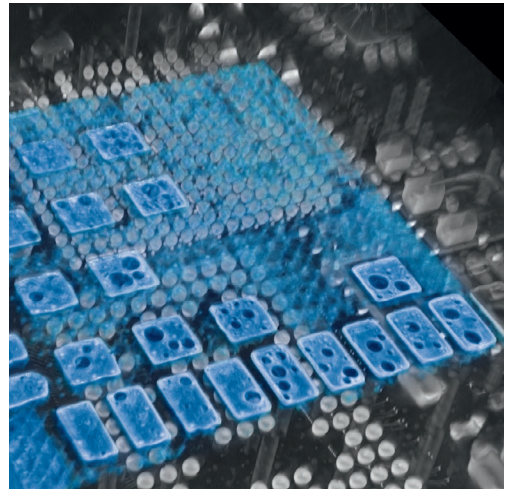
Due to the miniaturization and performance increase of more and more features must fit in an ever-smaller area. Cheetah enables accurate, repeatable inspection routines with void compilations, including multi-area voiding. It does not only provide high performance and resolution, but is also equipped with enhancement filters and powerful automation tools.

SMT applications

PCB (BTC, BGA, LGA, QFN / QFP, THT)

IGBT

LED



Computed laminography of PCB, clipping plane.

Semiconductor inspections: maximum resolution at minimum voltage

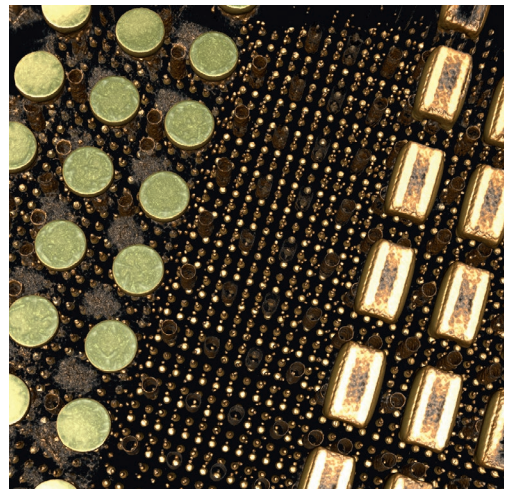
Cheetah enables accurate, repeatable inspection routines with void compilations, including multi-area voiding. Its high detail resolution laminography is key for inspecting the internal connections of state-of-the-art advanced packaging IC devices.

Semiconductor applications

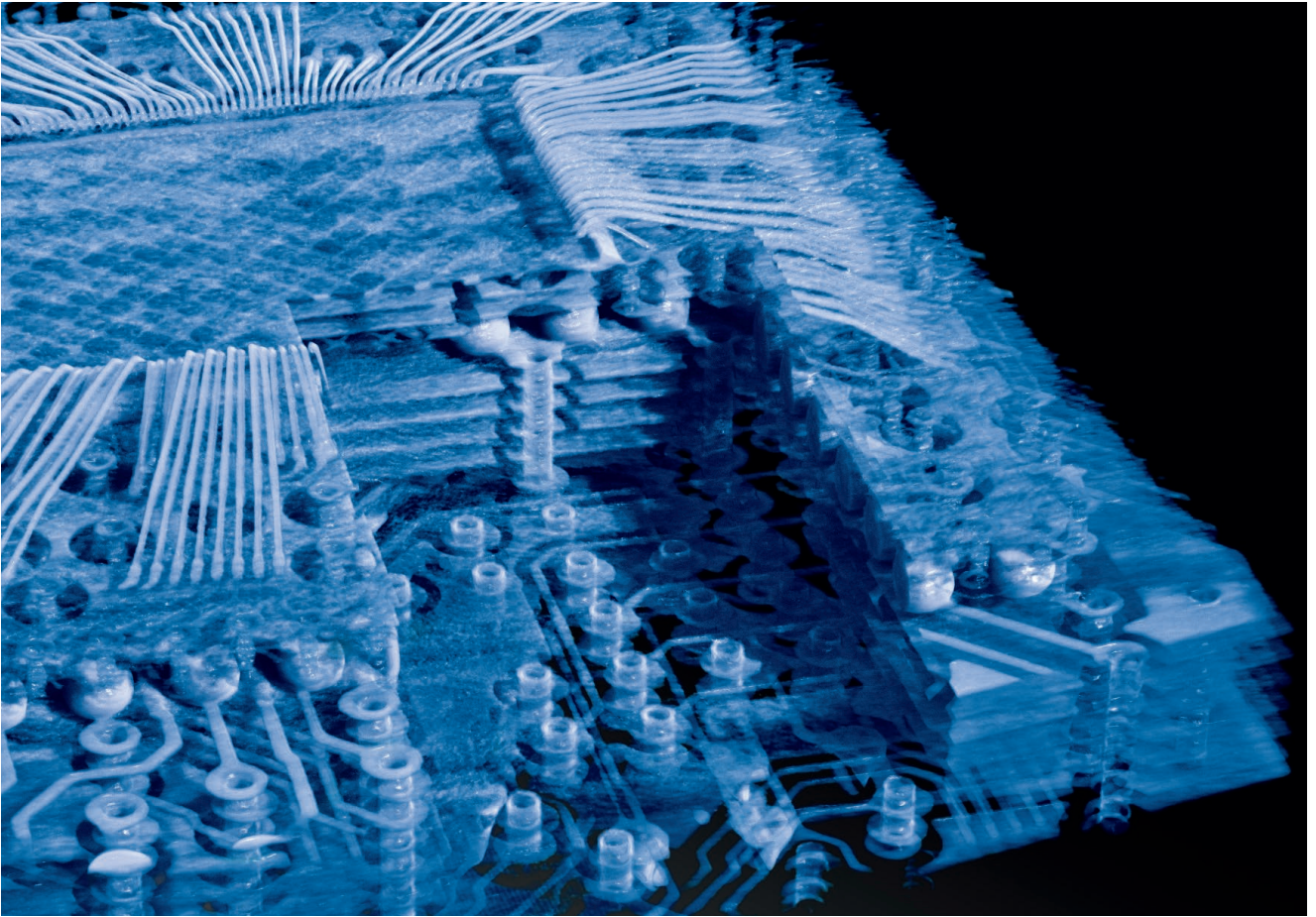
Wafers and integrated circuits
(die attach connections, 3D IC joints, TSV)

Sensors

MEMS and MOEMS



Overview of BGA and bumps with laminography.



3D visualization of a multi-layer board using the Comet Yxlon FF CT Software.

Laboratory inspections: leading technology for precise analysis

The inspection of electronic components during research and development is highly complex and requires a broad range of features. Computed tomography with the Comet Yxlon Cheetah EVO is the technology of choice for detailed analyses of micro components such as those used in batteries, connectors, and medical devices.

Lab applications

Batteries

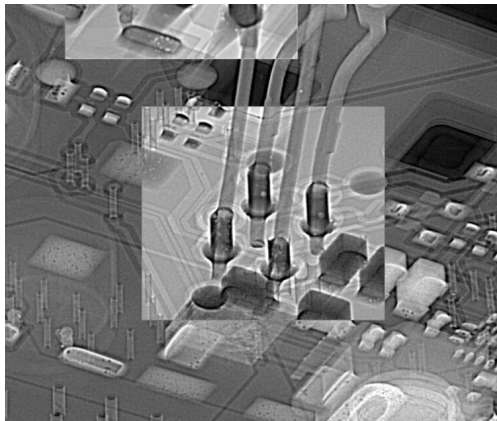
Connectors and other electronics components

Medical material

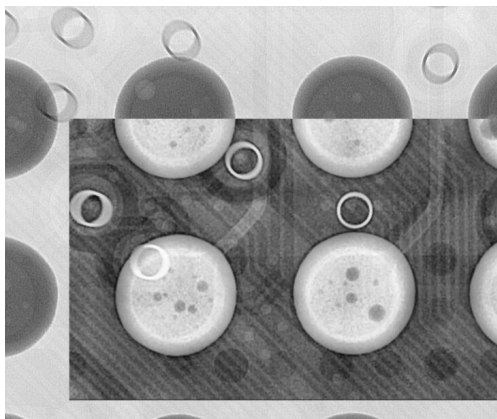
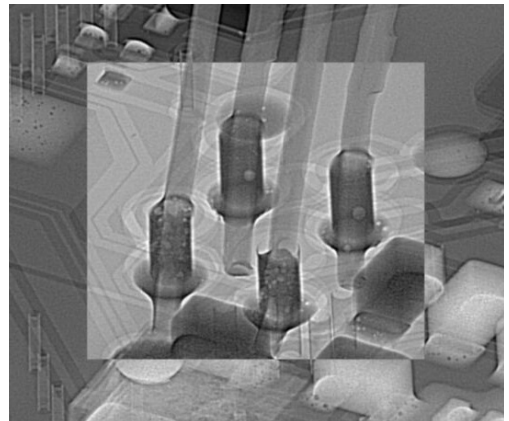
Military and space electronics

Software solutions for accurate, repeatable, fast results.

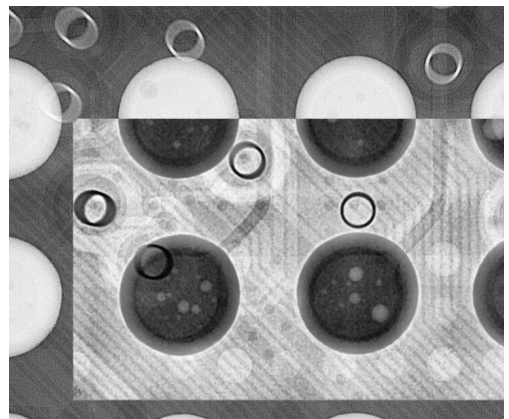
From image acquisition with the FGUI user interface, to the reconstruction of the volume with FF CT software, to image analysis and evaluation: the Cheetah offers a wide range of integrated software features. They help increase the efficiency of manual labor – and save inspection cost per part.



THT with voids.



Voids in BGA balls.



THTInspect DR

THTInspect DR is the semi-automated defect analysis for fill level inspections on THT-based components in 2D. It enables an assisted inspection routine for quantitative analysis, in both sampling and batch testing and works with plated and non-plated pin holes. The evaluation results according to specification are visualized in green and red.

VoidInspect CL and DR

VoidInspect based on computed laminography (CL) or digital radiography (DR) is the first-class analysis tool of solder joints to identify and evaluate potential voids. It is an automated inspection routine for quantitative analysis, with very high accuracy and repeatability, that helps save time and minimize error. It is qualified for the inspection of electronic components like BGA, LGA, BTC and QFN Central Pads, LED, IGBT and DPAK.

2D multi area void calculation (MAVC)

QFNs and other bottom-terminated devices without overlapping can also be inspected with 2D digital radiography. Faulty or missing solder joints and large areas of voiding are reliably detected, and MAVC helps analyze voids in complex soldering designs. With just four parameters to adjust, setup is quick, simple, and costefficient. Precise void analysis of multi-layer components needs computed laminography and VoidInspect.

Extended BGA inspection

Cheetah allows to quickly select and index individual balls, either manually or using automatic grid detection. A wizard guides the operator through the inspection process step-by-step and ensures perfectly accurate and repeatable results.

Automated sequences

The productivity of working with the Cheetah EVO on recurring test tasks can be significantly increased by automating and customizing test sequences via the scripting interface.

eHDR

To ensure highest product quality, the eHDR filter highlights complex structures with just one click. Thanks to our advanced software and enhanced 16-bit gray scale values, it detects even the slightest variances in gray scale, so that no defect will be missed. This allows operators to easily see faults that were invisible before.

Artifact reduction

Powerful image quality optimizations help improve the quality of the scan data, e.g. through BHR / BHC Beam Hardening Reduction/ Correction, Ring Artifact Reduction or Noise Reduction.

Dose Monitoring

The Cheetah's Dose Monitoring technology prevents damaging X-ray sensitive electronics during the inspection process. The absorbed X-ray dose is automatically monitored – when a critical threshold is reached, the operator is informed and the scan is aborted.

Our supportive Life Cycle Service.

At Comet Yxlon, service is not an add-on, but an integral part of every product. We support you through the entire life cycle of your system – for easy operation and extended product life.

1. Getting you started

Our professional Comet Yxlon field service technicians or certified service providers will ease your way into working with your new inspection system.

- Bringing the system to life: installation & commissioning
- Power on: introductory training by Comet Yxlon Academy
- Correct measurements from the start: SmartCalibration
- Cost transparency from the beginning: flat fee service rates

2. Running things smoothly

Is there an issue? No problem.

Our skilled service technician team helps with troubleshooting, maintenance, and part exchange for easy operation.

- High efficiency thanks to remote control and VisualAssist
- Professional phone support and on-site visits
- Preventive maintenance and SmartExchange
- High-end system monitoring with SmartCalibration

3. Enhancing performance

With our upgrades and conversion kits, your Comet Yxlon system remains in top-notch condition and keeps its value as market demands change.

- System release upgrades, feature & performance upgrades
- Component upgrades
- System software upgrades
- Advanced Academy training

Tailor-made Service Level Agreements

Our Service Level Agreements are based on different performance factors, e.g.

ServicePass – for fast reaction times and seamless maintenance

SmartPass – focusing on the highest possible system availability

LifeCyclePass – the all-inclusive premium contract for guaranteed life-cycle-costs

Please contact us to learn more about the specifics of our different service contracts!

Cheetah ECO: The market's best entry-level system.

Our advanced X-ray inspection solution sounds good, but at this point in time you are looking for an entry-level system? Then our Cheetah ECO version is the perfect match for you – with state-of-the-art technology at a reasonable price!

Cheetah ECO version

FXT-160.50 Microfocus tube

High-resolution detector

High-resolution target

FGUI Frame and Zoom

FGUI Map and Report

FGUI MAVC Inspection

FGUI BGA Inspection

FGUI Extended

FGUI Traceability

FGUI AXI Traceability

Optional CT capability

Cheetah EVO in numbers.

Inspection parts

Max. part size (Ø x H)	800 x 500 mm (31" x 19")
Max. inspection envelope 2D (W x H)	460 x 410 mm (18" x 16")
Max. part weight	5 kg
Max. part weight rotation	2 kg
Max. part weight heavy load	20 kg

X-ray source

	FXT-160.50	FXT-160.51
Tube type	microfocus, open	
Energy range	20 - 160 kV	
Max. power	64 W	
Max. target power	15 W	
Spatial resolution ¹⁾	2.0 µm	0.8 µm
Features	TXI ²⁾	TXI ²⁾ , multifocus

Detector

	1308	1313	1515	1616
Active area	128 x 79 mm	128 x 128 mm	152 x 152 mm	162 x 162 mm
Pixel matrix	1,004 x 620 px	1,004 x 1,004 px	1,256 x 1,256 px	1,276 x 1,276 px
Pixel pitch	127 µ	127 µ	119 µ	127 µ
Max. frame rate	48 Hz	48 Hz	60 Hz	48 Hz

Manipulation

Focus-detector distance (FDD)	124 - 526 mm
Oblique viewing	+/- 70° (140°)
Turntable (Ø)	440 mm

Cabinet / System

Dimensions (W x D x H)	1,650 x 1,400 x 2,050 mm
Weight	~ 2,200 kg
Loading door clearance (W x H)	650 x 687 mm
Mains connection	230 V ±10 % AC, 50 / 60 Hz, 1 phase, neutral and ground conductor
Max. power consumption	2.5 kVA

¹⁾ Measured with JIMA RT RC-02B or HiCo micro-chart test specimen. Acceptance criteria CNR*MTF > 5 %; MTF > 5 %; CNR > 0.5. ²⁾ TXI = true X-ray intensity – controls real output dose for constant intensity.

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