

Led by experience. Driven by curiosity.

FF35 CT

The high-resolution, multi-application
CT system for science & research.



comet
yxlon

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!

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.

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Driven by curiosity.**



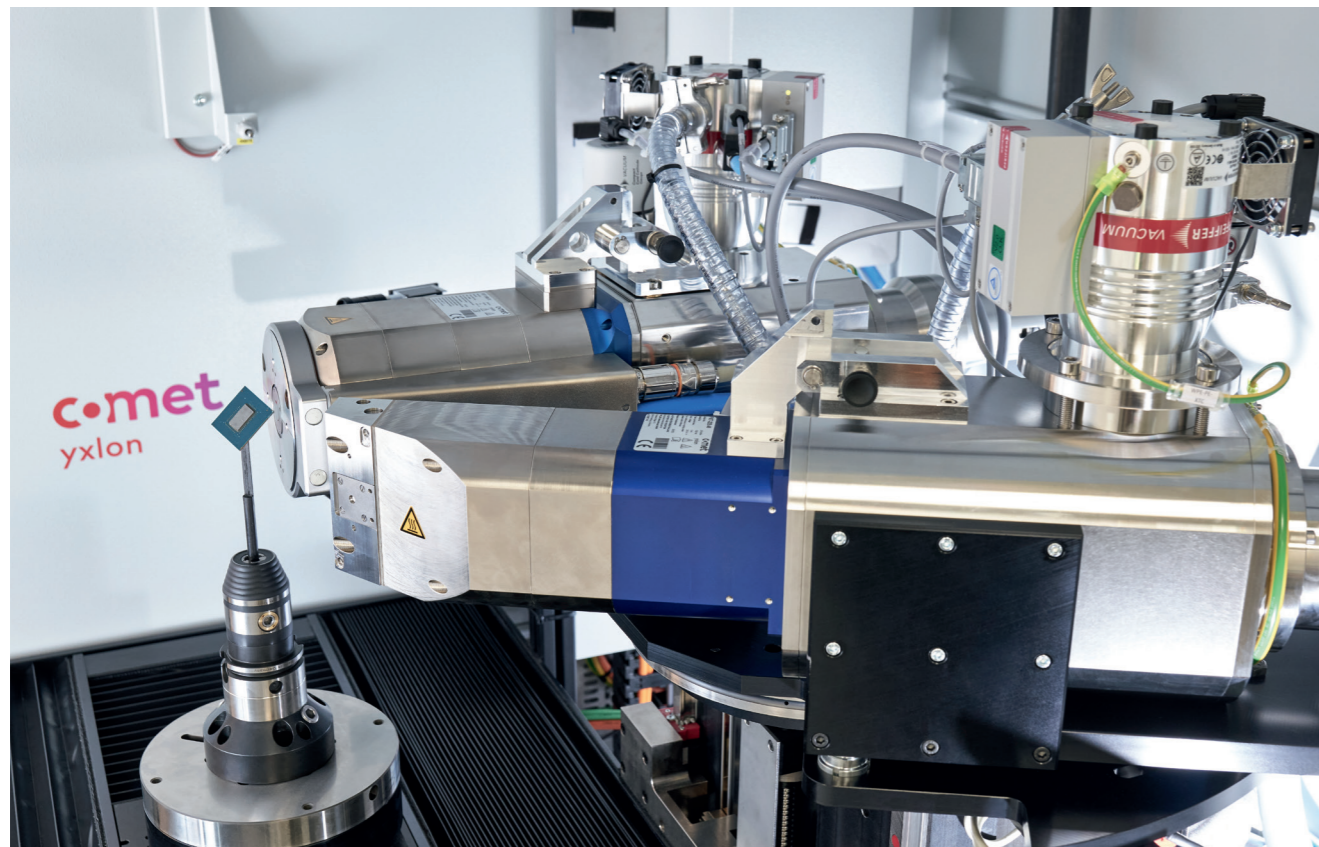
The flexible system with dual-tube set-up covers a wide range of applications.

Your benefits with the FF35 CT:

- Single or dual tube configuration for highest versatility in laboratory micro-CT applications
- Precise manipulation and temperature stability
- Various CT trajectories and FOV extensions
- Metrology version available
- Special version for the semiconductor sector available

Two tubes, one goal: maximum versatility.

With its optional dual-tube set-up the FF35 CT combines unprecedented CT data quality with highest versatility when inspecting small and medium-sized parts.



High-power 225 kV micro-focus tube and 190 kV nano-focus transmission tube - the perfect combination.

From improved material testing in the R&D department, to optimization of process control and small series inspection, to various science applications – the Comet Yxlon FF35 CT covers an extraordinary range of applications.

225 kV micro-focus directional beam tube

With its high power of 320 W and the water-cooled target, the 225 kV Comet Yxlon directional beam tube allows quick CT scans in less than a minute. In 2D operation, the tube reaches a spatial resolution of 4 μm .

Optional 190 kV nano-focus transmission tube

For part sizes of 10 mm and smaller, the 190 kV nano-focus transmission tube with its resolution in the submicron range is the right choice. While its water-cooled tube head allows for quick temperature balance and highest focal spot stability, four modes enable the optimal adjustment of the focal spot size in relation to power. Since both tubes have their own generator and HV cable, they can be switched without the need of reconfigurations.

Choice of detectors for larger FOV

With an active area of up to 430 x 430 mm the recommended Y.Panel 4343 CT Flat-panel detector offers a generous field of view. The CsI scintillator guarantees maximum contrast sensitivity and a high spatial resolution with a pixel pitch of 150 μm and a matrix of 2,880 x 2,880 pixels.

Which items can be inspected with the FF35 CT?

Electronic components incl. SMD

Products involving new materials or manufacturing methods, e.g. AM components, fiber-reinforced plastics

Battery cells and modules

Injection molded plastics

Microsystems (MEMS, MOEMS)

Medical objects, e.g. cannulas

Light-alloy castings

Geological, paleontological and biological samples

Which applications is it designed for?

Quality assurance, material analysis, material research

Failure and structure analysis

Assembly checking

Inspection of small serial productions

Process control

Digitization

Segmentation

Easy operation. Ultimate flexibility.

Our Geminy software helps users perform inspections as easily as possible – and boasts some highly potent CT techniques for maximum image quality and diverse field-of-view extensions.

As the single user interface for all workflows, Geminy uses automation, wizards and presets to guide users of different skill levels smoothly through the inspection process. In addition, its powerful CT techniques facilitate the optimum part size spectrum, speed, and image quality.



Geminy's Healthmonitor shows the current system condition.

Circular and helical scan trajectories

- QuickScan® – continuous rotation image acquisition
- QualityScan – start-stop image acquisition, also for ring-artifact reduction
- HeliExtend – to avoid cone-beam artifacts
- HeliExtend Dual – combined offset and helical CT scan for very large parts

Your ROI is our center

No matter where your region of interest (ROI) is, you can easily keep your part lined up with FlexCenter, our virtual rotation axis.

Scan extensions

- 1.8 times horizontal field-of-view extension
- Vertical field-of-view extension
- Combination of horizontal and vertical field-of-view extensions

Image quality optimizations.

ScatterFix 2.0

The innovative ScatterFix 2.0 functionality developed by Comet Yxlon reduces scatter radiation to improve the quality of the CT data, e.g. for optimized surface determination.

Beam hardening correction (BHC)

It allows the correction of unwanted gray-value gradients in otherwise homogeneous materials, e.g. in order to reliably carry out a pore analysis.

Metal artifact reduction (MAR)

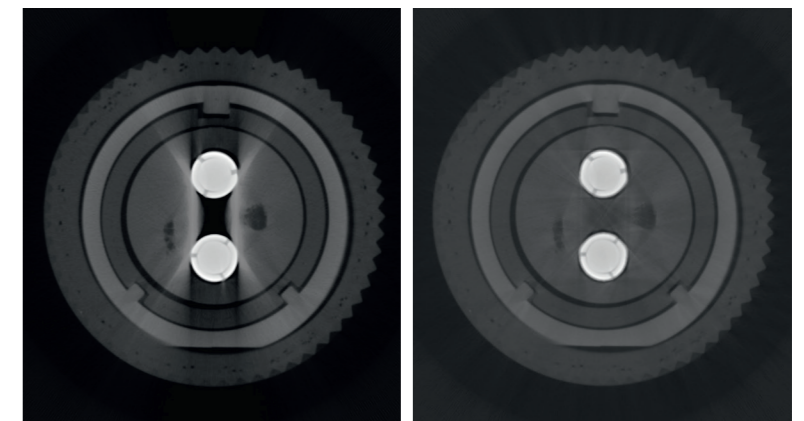
With complex components consisting of plastics and metals, MAR significantly reduces the interfering effects causing the less dense material to 'disappear'.



Improving image quality: Cone-beam CT without (left) and with ScatterFix 2.0 (right).



Eliminating unwanted gray-value gradients: Cone-beam CT without (left) and with Beam Hardening Correction (right).



Reducing interferences: Cone-beam CT without (left) and with Metal Artifact Reduction (right).

**Ergonomic.
Intuitive.
Accessible.**



In the FF35 CT, software and hardware work hand in hand to make system operation as easy as possible. The clean layout of the operator desk with tiltable touchscreens allows users to stay focused on the inspection task. The height of the desk can be adjusted, facilitating operation from a sitting or standing position. Healthmonitor and push messages keep the user informed about system status and inspection progress at all times.

**The FF35 CT
Metrology:
measuring finest
inner structures.**

With its ability to capture nearly unlimited measuring points in one CT scan decoupled from the measurement evaluation, the metrology version of the Comet Yxlon FF35 CT takes accuracy to the next level. Seamless defect analysis and nominal-actual comparison save time and reduce correction loops. Smart fan control enables the stabilization of the interior temperature, making the FF35 CT Metrology compliant with temperature range regulations defined by VDI 2627.

**FF35 CT SEMI:
for applications in
the semiconductor
field.**

The Comet Yxlon FF35 CT SEMI is an innovative, versatile high-resolution CT system for use in R&D and quality assurance. It was developed specifically for inspections in semiconductor-related industries. The FF35 CT SEMI meets the high SEMI® standards, including the hazard and safety standards SEMI® S2-0818 & SEMI® S8-0218, and is certified accordingly.



Service Engine 4.0: taking customer care to the next level.

First-class technical problem solving combined with high economic efficiency – that's what we call Service Engine 4.0. It drives our service, processes and partners to detect and correct failures quickly and reliably by remote access and during on-site visits. Feel free to contact our service centers and partners worldwide by phone, e-mail or via our website.

Your benefits with Service Engine 4.0

- Guaranteed operational safety
- Maximized system availability
- Minimized repair times
- Full cost control of life-cycle costs
- Extended product lifetime
- Maintaining the measuring capability of metrology systems [FF20/35 CT Metrology]

Our module-based approach with performance and feature upgrades enables you to adapt to future requirements and safeguard your initial investment by extending the product lifetime. Service Engine 4.0 does not only provide fast support now, but is predictive of your future needs.

The Comet Yxlon Lifecycle Services

Academy – full performance from day one through tailored training solutions

SmartExchange – direct replacement of defective or worn-out components to minimize unscheduled system downtime

SpareParts – 100% compatibility and safety through Comet Yxlon qualified spare parts

WarrantyPass – full cost control through our customizable warranty extension program

ServicePass – predictive maintenance and servicing, tailored to your requirements

SmartPass – maximum system uptime for customers with particularly high demands

LifeCyclePass – all-inclusive concept for full cost control over the entire product lifetime

Support – fully digitalized 1st-line support organized in a worldwide expert network, available remote or on-site

Upgrades – performance increase and new features for your Comet Yxlon system portfolio

The FF35 CT in numbers.

Tube	Y.FXT 225.48 reflection tube	Y.FXT 190.61 transmission tube	Detector	YXLON Panel 4343 CT ^{4,5)}	Yxlon Panel 2530 ⁵⁾
Max.	225 kV	190 kV	Active area	432 x 432 mm	249 x 302 mm
Max. power	320 W	80 W	Pixel pitch	150 µm	139 µm
Detail visibility	≥ 4 µm ¹⁾	up to 150 nm ³⁾	Pixel matrix	2,880 x 2,880	1,792 x 2,176
TXI	yes ²⁾	yes ²⁾	Frame rate	up to 15 Hz	up to 30 Hz

Manipulator / Inspection Part

FDD (Focus Detector Distance) ⁶⁾	~ 520 mm – 1170 mm
FOD (Focus Object Distance) ⁶⁾	~ 0 mm – 930 mm
Tilting axis (optional)	+/- 30°
Tube pivot axis	motorized
Loading door	motorized
Max. part weight ⁷⁾	27 kg
Max. part size ⁸⁾	~ 530 mm Ø x 800 mm height

CT - Trajectories and Scan Fields

Circular scan trajectories	continuous rotation "QuickScan" start/stop scan "QualityScan"
Helical scan trajectories	standard "HeliExtend" dual "HeliExtend Dual"
Scan extension	1.8 times horizontal extension, vertical extension, combination
Further trajectories	virtual rotation axis "FlexCenter"
CT field of view, std. circular scan ⁹⁾	~ 325 mm Ø x 270 mm height
CT field of view, hor. extended ⁹⁾	~ 510 mm Ø x 190 mm height
CT field of view, max. ^{9,10)}	~ 510 mm Ø x 600 mm height

Dimensions

	Cabinet /System	Operator Desk
Width	~ 2,960 mm	~ 1,800 mm
Height	~ 2,120 mm (w/o levelling wedges)	~ 700 mm – ~ 1,200 mm, motorized
Depth	~ 1,590 mm	~ 800 mm
Weight	~ 6,800 kg – ~ 6,900 kg (single tube – dual tube)	~ 175 kg
Manipulator design / Monitor	Granite base, vibration isolation with active level control, all axes equipped with Heidenhain length and angle encoders	2 pcs, capacitive touchscreen, 1920 x 1080 pixel, 21", as well as separate reconstruction and evaluation station with 27" or 30" monitor

The FF35 CT Metrology.

Features, Options	see as above, but without virtual rotation axis "FlexCenter"
Air conditioning inside cabinet	yes, temperature range referring to VDI 2627 measuring room quality class 3
Systems ambient conditions	Measuring room quality class 4
Messuring accuracy MPE _{SD} ¹¹⁾	5.9 µm + L/75 [L=mm]

¹⁾ With JIMA IQI RT RC-02B ²⁾ TXI = True X-Ray intensity – controls real output dose for constant intensity ³⁾ With YXLON IQI for 2D at minimum focal spot size and HRP Target ⁴⁾ Recommended ⁵⁾ Qualified acc. ASTM E-2597. Specification for more detectors on request ⁶⁾ Values are average. Exact values are dependent on tube and detector configuration ⁷⁾ Inspection item placed centrally on turntable, no tilting axis. More values on request ⁸⁾ Max. size which can be set by manual collision protection envelope ⁹⁾ Values valid for detector YXLON Panel 4343, collision protected, optimized for diameter ¹⁰⁾ Standard cone beam scan with horizontal and vertical field-of-view extension ¹¹⁾ Referring to VDI/VDE 2630 part 1.3. Measured as deviation of sphere distance in tomographic static mode (TS) with std. circular scan. More details on request. Values valid only for YXLON FF35 CT Metrology under compliance with conditions described beside.

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