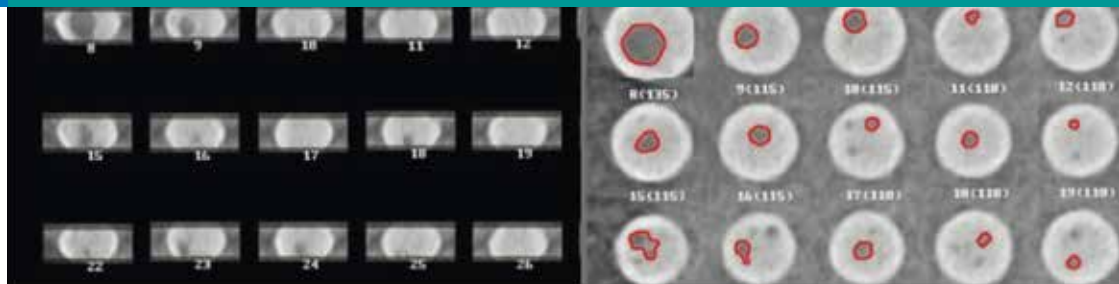


# YXLON FF70 CL

Highest resolution advanced 2D and 3D X-ray system for fully automated analysis of the smallest features

Ultimate automated semiconductor analysis



Inspection result list:

Part No.	Pin No.	Type	Judge	Judgment table	X[μm]	Y[μm]	HeadBumpArea[μm <sup>2</sup> ]	ZD-gravityPosition[μm]	Top2BottomAlignment[μm]	BumpVolume[μm <sup>3</sup> ]
1	5	BGA	NG	C-Size-Test	1506	342	8226.740	134.000	▲5.100	0.000
1	2	BGA	NG	C-Size-Test	2024	344	9279.780	131.000	▲2.820	0.000
1	7	BGA	NG	C-Size-Test	817	341	9530.430	130.000	▲1.000	0.000
1	29	BGA	NG	C-Size-Test	974	987	8289.960	133.000	▲4.560	0.000
1	15	BGA	OK	C-Size-Test	747	681	9149.130	129.000	1.430	0.000
1	43	BGA	OK	C-Size-Test	220	1287	8899.830	130.000	0.660	0.000
1	24	BGA	OK	C-Size-Test	1183	824	7632.830	131.000	1.660	0.000
1	17	BGA	OK	C-Size-Test	1183	663	8642.960	130.000	1.390	0.000
1	49	BGA	OK	C-Size-Test	1346	1306	8494.980	133.000	1.370	0.000
1	13	BGA	OK	C-Size-Test	329	687	8523.890	137.000	2.060	0.000
1	16	BGA	OK	C-Size-Test	966	662	7899.690	134.000	1.740	0.000
1	14	BGA	OK	C-Size-Test	356	686	9306.680	129.000	1.330	0.000
1	12	BGA	OK	C-Size-Test	1683	499	8554.810	134.000	2.050	0.000
1	61	BGA	OK	C-Size-Test	1526	1646	9030.460	131.000	1.890	0.000
1	19	BGA	OK	C-Size-Test	1903	662	8339.420	133.000	2.480	0.000
1	45	BGA	OK	C-Size-Test	571	1284	7921.880	133.000	2.210	0.000

Judgment table: C-Size-Test

Edit Judgment table

	HeadBumpArea[μm <sup>2</sup> ]	ZD-gravityPosition[μm]	Top2BottomAlignment[μm]	BumpVolume[μm <sup>3</sup> ]
Upper limit	1000000000.000	1000000000.000	2.700	1000000000.000
Lower limit	0.000	0.000	0.000	0.000

Statistical Inspection result

	HeadBumpArea[μm <sup>2</sup> ]	ZD-gravityPosition[μm]	Top2BottomAlignment[μm]	BumpVolume[μm <sup>3</sup> ]
Max	9530.930	137.000	4.560	0.000
Min	7482.840	129.000	0.660	0.000
Av.	4130.973	66.615	0.933	0.000
Std Dev.	4162.198	66.903	1.012	0.000
Total NG	0	0	3	0

Inspection Image



# The very best automated X-ray test and inspection solutions

Semiconductor manufacturing requires automated, high-quality, reliable, fast and non-destructive inspection and analysis for optimum production as flaws can be found on the wafer, on a substrate, in a strip in the sub-assembly or in the final device. The new YXLON FF70 CL X-ray inspection system has been specifically developed to enable the very best automated analysis of the smallest and most demanding features within these samples. The result: impressively precise and reproducible test and inspection excellence.

The FF70 CL uses 2D and 3D X-ray techniques that are based on the renowned strengths of Yxlon's technology and innovation: the open micro-focus X-ray sources with high-

power targets, the latest generation of optimized high-resolution X-ray detectors with long service life and a high-precision, fully automated manipulation system. Together, these make the FF70 CL the perfect solution for automatically analyzing bumps and filled vias to find non-wetted bumps, voiding and misalignments in these most challenging features. As the market leader for X-ray and CT inspection systems in the electronics industry, Yxlon is constantly innovating and providing solutions precisely where they are needed. The YXLON FF70 CL continues this tradition to ensure that the semiconductor industry is completely supported for today's and tomorrow's manufacturing challenges. This includes access to our world-class, interlinked, global

service network with eight regional service centers and more than 50 local customer support partners to ensure that our highly trained and qualified team are ready to help straight away – quickly and efficiently – to minimize downtime.

## Applications for the FF70 CL

Solder bump and filled via analysis for:

- Micro-Bumps/C4s, TSVs, Micro-Vias and Cu-Pillars in today's advanced packaging including:
- PoP, 3D, FOWLP, WLFP, WL-CSP, SiP, flip chip and their sub-assemblies

YXLON FF70 CL	
Imaging method	X-ray and microCL (computed Laminography)
Detail detectability	< 150 nm
Inspection area	510 mm x 610 mm
Source	Open source 130 kV
X-ray detector	6 MPixel
CL detector	8 MPixel
CL angle	< 60 degrees
Weight	7.200 kg
Width/depth/height	1.940 mm/2.605 mm/2.000 mm
Rated power	< 10 kVA
Rated voltage	3 phase 240 V, 50/60 Hz
Oil-free air	0.5–0.6 MP
X-ray shielding	< 0.5 µSv/h
Safety standard	CE (EU), SEMI S2/S8, SECS/GEM*, NFPA79 (UL), FDA (UL)

\* under preparation



**Our experience is  
the key to your success**



## The perfect solution for high-volume, automated and reliable semiconductor joint analysis

The YXLON FF70 CL is distinguished by its large inspection area of 510 x 610 mm and the extreme detail detectability of <150 nm, making it ideal for automatically and non-destructively analyzing solder bumps and filled vias in 3D ICs, flip chips and wafers.

The innovative vacuum mechanism of the system manipulator holds the sample securely and precisely during analysis and counteracts the effects of sample warpage.

The FF70 CL provides 2D (top-down) with a high-performance flat-panel and 3D (CL-Computed Laminography) automated analysis using a high-resolution Image Intensifier within a special manipulation assembly for its inclined rotations.

The latest generation of nano-focus X-ray tubes creates 2D and 3D images that can reveal and measure the smallest voids and features. This enables the YXLON FF70 CL to analyze the most demanding advanced semiconductor challenges.

A user-friendly and intuitive graphical user interface (GUI) allows the easy creation of automated, multi-point and multi-functional analysis inspection programs.




Measurement repeatability over time is ensured by automatic, continuously monitoring background calibration tests over all aspects of the system.

### System properties at a glance:

- Automated high-throughput analysis with the best reproducibility and reliability of the results
- Simple creation of automated, multi-point and multi-functional analysis inspection programs allowing rapid change between sample and measurement tasks
- Continuous background monitoring and optimization to ensure measurement repeatability and accuracy
- Fast and reproducible accuracy of all measurements

### Your benefits for semiconductor production

- Improved quality monitoring – inspect more locations at better resolution to identify failures that otherwise could be missed
- Significant cost reduction through better test coverage leading to improved yield
- Reliable and reproducible check of consistency of process and defect parameters at any time
- This innovative automated analysis solution is easy to use, optimizing cost of operation

			
Feature	FF65 IL	FF65 CL	FF70 CL
Top Down Inspection Coverage	350 x 350 mm	400 x 296 mm [515 x 500 mm]*	515 x 610 mm
PCT Inspection Coverage	350 x 350 mm	400 x 292 mm [495 x 480 mm]*	475 x 570 mm
Max. Sample Size	350 x 350 mm	400 x 300 mm [515 x 610 mm]*	515 x 610 mm
Min. Sample Size	80 x 50 mm	30 x 30 mm [30 x 30 mm]*	30 x 30 mm
Sample Holder	Automatically adjustable conveyor	Standard jig [Carbon-fiber vacuum jig]*	Carbon-fiber vacuum jig
Warpage Allowance	3 mm	2 mm	Vacuum jig
Max. Sample Weight	2 kg	2 kg	2 kg

\*optional

# YXLON

Technology with Passion

## GERMANY – HEADQUARTERS

### YXLON International GmbH

Essener Bogen 15  
22419 Hamburg  
Germany  
T: +49 40 527 29-0

www.yxlon.com

## CHINA

### YXLON (Beijing) X-ray Equipment Trading Co., Ltd.

Middlegate, First Floor, Building 2,  
103 Beiqing Road,  
Haidian Dist. Beijing 100004,  
China  
T: +86 10 8857 9581  
F: +86 10 8857 9580

## USA

### YXLON Sales & Service Location COMET Technologies USA Inc.

5675 Hudson Industrial Parkway  
Hudson, OH 44236  
USA  
T: +1 234-284-7849

## JAPAN

### YXLON International KK

New Stage Yokohama Bldg.,  
1st Floor  
1-1-32 Shinurashima-cho  
Kanagawa-ku  
Yokohama, 221-0031  
Japan  
T: +81 45 450 1730