KOH YOUNG TECHNOLOGY
INTELLIGENT INSPECTION

Superior **Quality Assurance** Solutions

for Advanced Packaging &
Mini/Micro-LED Applications

The MEISTER Series

- ☑ MEISTER S
- ☑ MEISTER S+
- ☑ MEISTER D
- ☑ MEISTER D+

MEISTER Series

Why Choose Koh Young?

There is an emerging trend within the semiconductor packaging and display markets. In order to maximize production yield and reduce costs, OSAT, chip makers, display, and lighting manufacturers have been adopting flip chip-based processes to create next generation BGAs, SiPs, and FOWLPs (Fan-out, Wafer-level Packages), plus Mini/Micro-LEDs. These applications, including the ultra-fine pitch and Mini/Micro-LED applications, have proven to be a challenge for precise and reliable inspection. What's more, today's electronic devices are becoming more complex and therefore demand increased functionality and higher performance, while packaging more components into a smaller space for miniaturization.

The typical optical triangulation method cannot measure ultra-thin solder or mirror-surface components. The sensor on conventional systems simply struggle to accurately capture the reflected signal. Koh Young's revolutionary Meister Series provides the ultimate solution for these challenges.

Market-proven Solution with Superior Inspection Performance

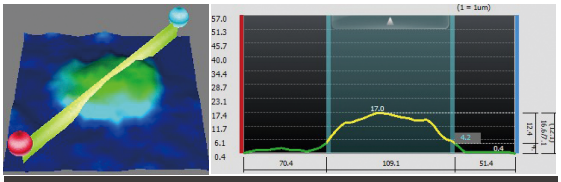
Meister series has been qualified for mass production by major semiconductor foundries and Mini/Micro-LED companies for micro solder and high-density substrates, shiny components, and highly reflective components with full 3D inspection performance. Discover why the global leading companies are using innovative 3D measurement-based inspection solutions from Koh Young.

MEISTER S/S+

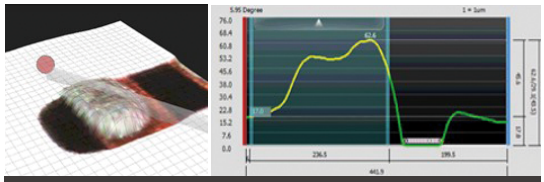
Premium In-line 3D Inspection System for Micro Solder Paste Deposits

Combining innovative vision algorithms and high-resolution optic technology, the Meister S/S+ is the ultimate, True 3D SPI solution for the semiconductor & Mini/Micro-LED packaging process improvement.

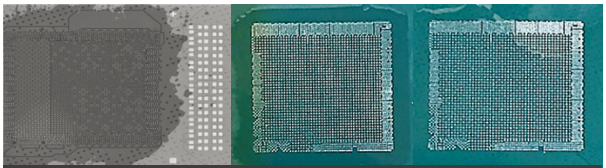
- High-resolution optics with a high-speed camera system (0.1 µm Z resolution)
- Thin solder inspection down to 20 µm (50 µm diameter @ 3.5 µm, 70 µm diameter @ 5 µm)
- Enhanced warpage compensation powered by Koh Young's differentiated optical technology (3D Z-tracking with 2D Pad-referencing)
- Transparent flux inspection using a proprietary optical system



Solder Bump



Mini-LED



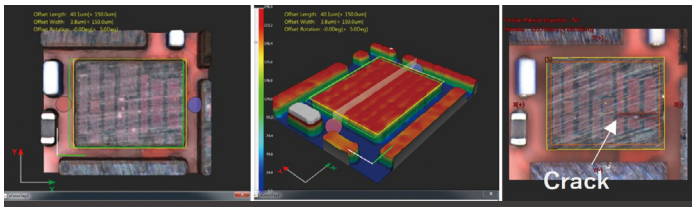
Bare Pad vs. Flux on Pad Area

MEISTER D

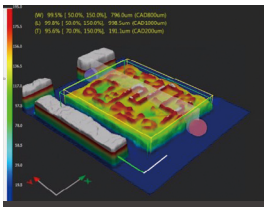
True 3D Measurement for High Density Substrates & Shinny Components

The Meister D is a perfect solution for production-speed 3D inspection for component and die inspection solution targeting die and small MLCCs using an integrated measurement tool with defect analysis software based on advanced optics and AI engines. The system inspects micro cracks, chipping, foreign material, and more.

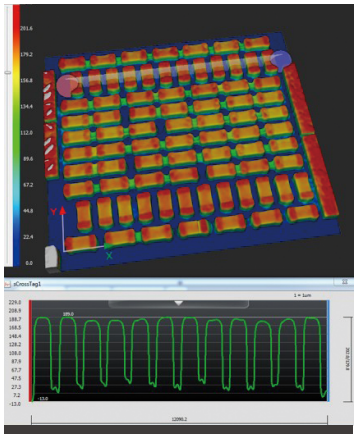
- Inspect Die or small component down to 0201 metric (008004 inch)
- Narrow gap inspection down to 40 µm (@ 3.5 µm)
- Optimized image processing and AI-powered algorithms
- Robust inspection with high accuracy, regardless of die or LED characteristics



Semi-transparent surfaces Inspection



Glass Die



High-density board (50 µm gap) with Shiny Die component

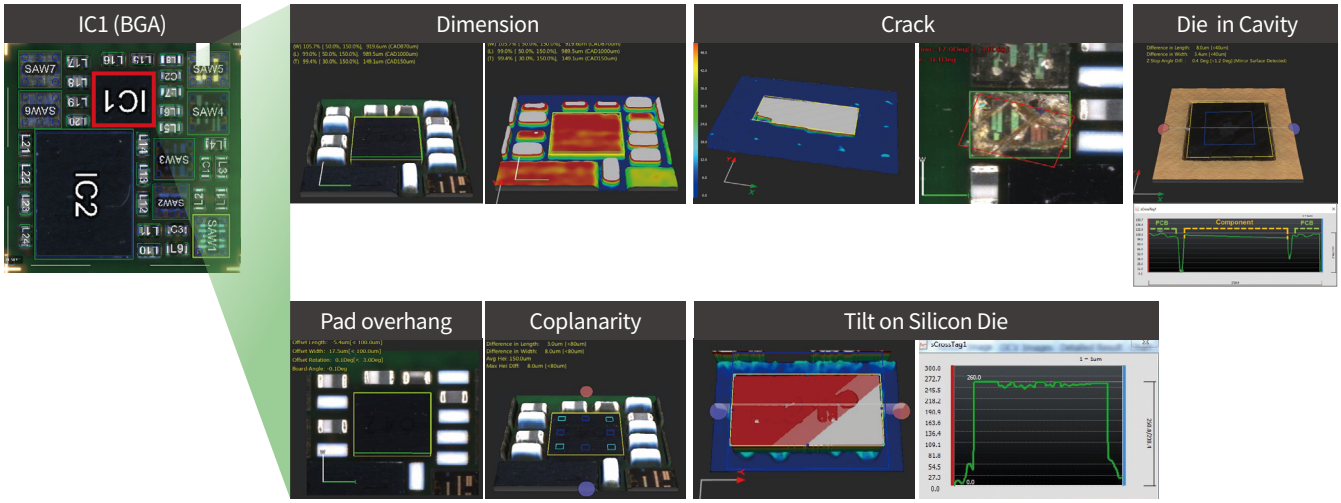
MEISTER D+

Breakthrough in 3D Measurement for Highly Reflective Components

PATENTED

The Meister D+ combines industry-leading Moiré technology and Koh Young's proprietary new optics to support 3D inspection of highly reflective dies (mirror surface), a long-term inspection challenge.

- Equipped with Industry-leading True 3D Measurement Capabilities of the Meister D
- Revolutionary full 3D height and tilt measurement capability for even highly reflective die surfaces

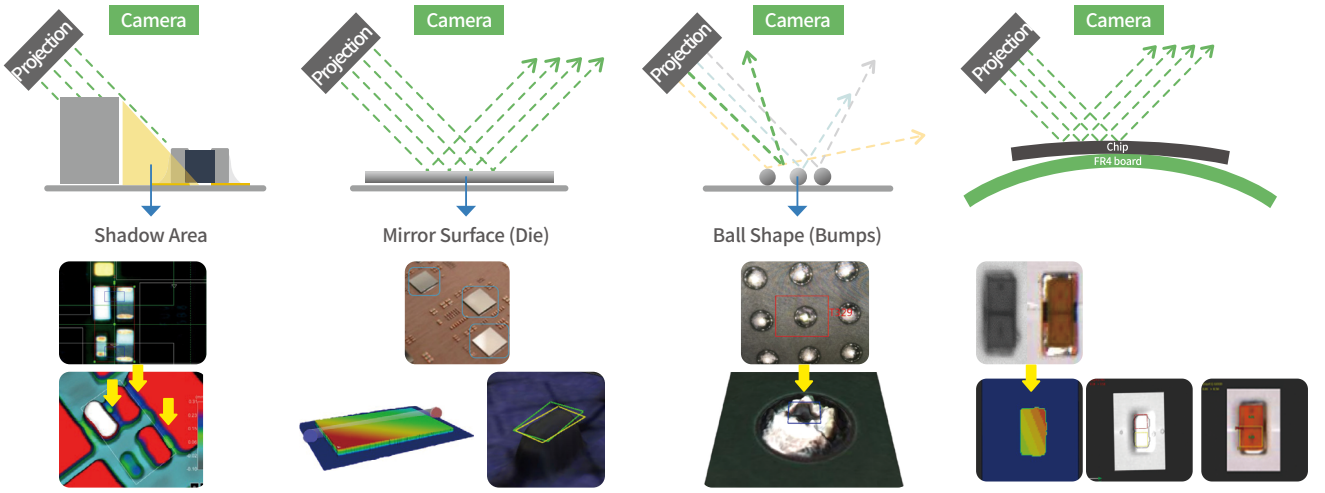


MEISTER Series

Key Highlights of Best-in-Class Advanced Inspection Solution

Enhanced Capabilities with Proprietary AI & Vision Technology

- Unparalleled in-house 2D and 3D multi-modal technology combining Moiré technology and new optics enables robust and stable inspection for bleeding-edge applications (such as highly reflective dies and Mini/Micro-LEDs).
- With its proprietary deep learning technology, the Meister D/D+ offers enhanced inspection capabilities enabling robust inspection for LED polarity even under harsh production environments such as boards with warp.



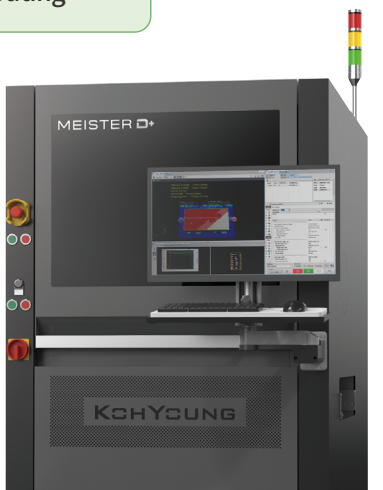
Optimized Solution for Advanced Packaging and Mini/Micro-LED Applications

- The most optimized solution for mass production at major manufacturers of advanced packaging and Mini/Micro-LED applications

CCD CCD — High Speed & High-Resolution Camera	CPU + GPU — Optimized Algorithms
Probe — Fast, but Stable Movement	High Performance Computing

Diverse Substrate and Carrier Handling Options

- Transports laminates, carriers, strips, boats, and frames



Zero-Defect Production through Process Optimization Powered by AI

Creating a closed-loop, connected electronics manufacturing floor for defect-free production by applying an ever-evolving AI-powered suite of interconnected software modules.

Real-time Koh Young Process Optimizer (KPO)

AI-powered solutions to analyze and optimize the SMT process by examining key parameters generated by state-of-art machine learning technologies.

- KPO Printer ensures real-time printing quality without any intervention by an operator or process expert.
- KPO Mounter delivers automated root cause analysis and feedback with actionable information.

Koh Young Offline Program Optimizer (OPO)

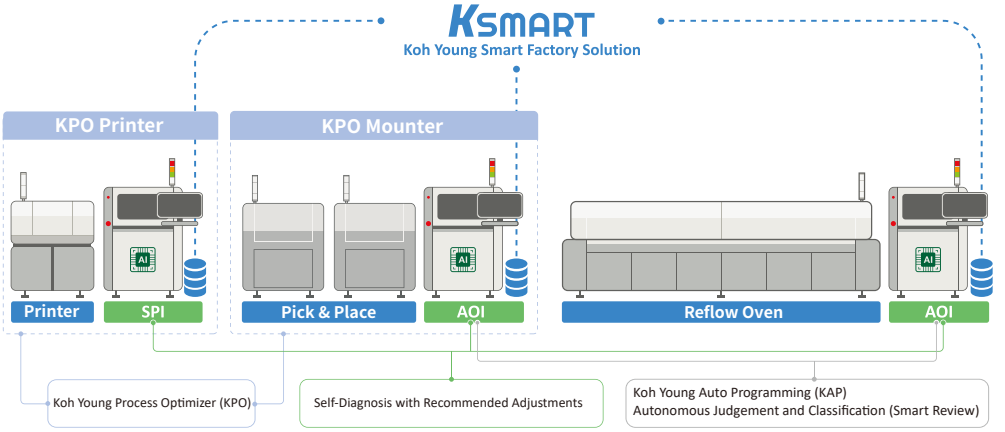
Cyber-physical system to optimize programs in a simulated environment using the identical machine and actual historical 3D images and measurement data.

The Gateway to a Smart Factory

Maximizing production efficiency by combining industry standards with AI engines to go beyond simple machine connectivity and open the gates to a smart factory for everyone.

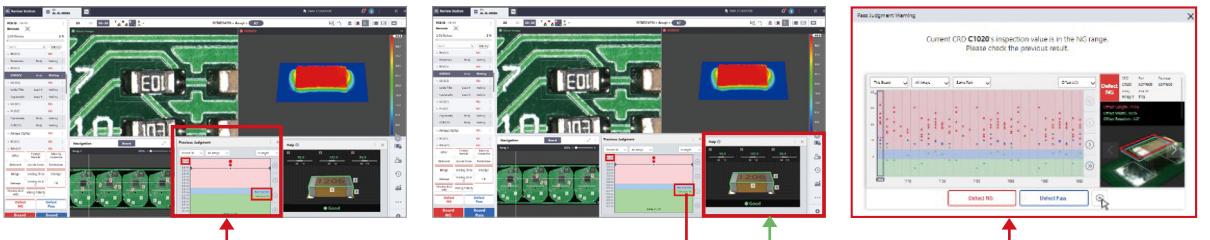
AI-Powered Auto-Programming (KAP)

- The innovative 3D geometric-based auto-programming solution recommends inspection conditions based on 3D measured data to dramatically reduce programming effort and time .



Smart Review: Autonomous Judgement and Classification

- Combining proprietary vision algorithms with a learning-based AI engine from Koh Young, the Smart Review system reduces false calls and operator intervention by automatically assessing OCV and OCR readings. By minimizing false calls, the Smart Review system increases line operator efficiency and boost production line utilization to reduce overall costs. The system also maximizes production performance by reviewing defects from multiple lines, offering judgment history and the help cards with auto-classified defect information.



Provide a smart judgement guide based on AI

Explain the defect and what OP should check.

Specifications

Model	MEISTER S	MEISTER S+	MEISTER D	MEISTER D+
Inspection Range	- Bumps: Printed bump, Solder ball	- Ball (Ball missing, Double ball, Ball bridge) - Flux	- Component: Capacitor & Resistor (Body, Solder Fillet & Joint) - Small component max. 008004 inch - Die (Reflective & Transparent Surface) - Highly Reflective Die (Mirror Surface), except Height & Coplanarity	- Component: Capacitor & Resistor (Body, Solder Fillet & Joint) - Small component max.008004 inch - Die (Reflective & Transparent Surface) - Highly Reflective Die (Mirror Surface)

Camera	12 Mpix	25 Mpix	12 Mpix			25 Mpix	12 Mpix	25 Mpix		
XY Pixel Resolution	5 µm	3.5 µm	5 µm	8 µm	10 µm	3.5 µm	5 µm	3.5 µm	5 µm	
Z Resolution	0.1 µm (15 µm x 4ea), 0.2 µm (21 x 2ea + 27 x 2ea)	0.1 µm	1 µm				1 µm			
FOV Size	20 x 15 mm	17.9 x 17.9 mm	20 x 15 mm	32 x 24 mm	40 x 30 mm	17.5 x 17.5 mm	20 x 15 mm	17.5 x 17.5 mm	25.6 x 25.6 mm	

Inspection Performance

Inspection Speed*	300 mm²/sec	650 mm²/sec	300 mm²/sec	768 mm²/sec	1200 mm²/sec	300 mm²/sec	300 mm²/sec	306 mm²/sec	655 mm²/sec
Height Repeatability (Golden Sample)	<0.30 µm (0.012 mils) at 3σ	<0.30 µm (0.012 mils) at 3σ	N/A				N/A		
Height Accuracy (KY Calibration Target)	<1 µm	<1 µm	Moire: ± 1.5% (at Meister Calibration Target / 300 µm)				Moire: ± 1.5% (at Meister Calibration Target / 300 µm)		
Max. Part Warp Compensation	±5 mm (0.20 in)	-	±5 mm (0.20 in)				±5 mm (0.20 in)		
Max. Bump Height	150 µm (5.91mils)	100 µm (3.93mils)	N/A				N/A		
Min. Bump Height	20 µm (0.78mils)	20 µm (0.78mils)							
Min. Bump Diameter	70 µm	50 µm							
Min. Pad Gap	50 µm	35 µm							
Min. Component Size	N/A	N/A	100 µm (0201 metric)				100 µm (0201 metric)		
Max. Component Height			500 µm (1005 metric)				500 µm (1005 metric)		
Min. Distance Between Component			50 µm			40 µm	50 µm	40 µm	50 µm

Options	- Offline Programming Station - Barcode Reader (1D /2D) - Side Pusher - Auto-Verification - Hepa Filter	- Review Station - SECS/GEM - Vacuum Back-Up - EMO Link	- Certified Calibration Target - UPS - Data Handling Solution - Underboard Support Unit - VSP Voltage Surge Protector

*Inspection speed varies by board.

Hardware Specifications		Meister S			Meister S+		Meister D/ Meister D+		
		L		XL	L		L		XL
		Single Lane	Dual Lane	Single Lane	Single Lane	Dual Lane	Single Lane	Dual Lane	Single Lane
Max. PCB Size (Standard)		430 x 510 mm (16.9 x 20.1 in)	430 x 285 mm (16.9 x 11.2 in)	780 x 690 mm (30.7 x 27.2 in)	400 x 510 mm (15.7 x 20.0 in)	400 x 320 mm (15.7 x 12.6 in)	450 x 510 mm (17.7 x 20.1 in)	450 x 320 mm (17.7 x 12.6 in)	650 x 690 mm (25.6 x 27.2 in)
Max. PCB Size (Using Auto Laser Focus)		330 x 510 mm (13.0 x 20.1 in)	330 x 285 mm (13.0 x 11.2 in)	680 x 690 mm (26.8 x 27.2 in)	(Side)275 x 510 mm (10.8 x 20.0 in) (Front)400 x 385mm (15.7 x 15.1 in)	275 x 320 mm (10.8 x 12.6 in)	310 x 510 mm (12.2 x 20.1 in)	310 x 320 mm (12.2 x 12.6 in)	510 x 690 mm (20.1 x 27.2 in)
Min. PCB Size		50 x 60 mm (2.0 x 2.4 in)		150 x 150 mm (5.9 x 5.9 in)	50 x 60 mm (2.0 x 2.4 in)		50 x 60 mm (2.0 x 2.4 in)		150 x 150 mm (5.9 x 5.9 in)
PCB Thickness (Without Carrier)		0.4 ~ 5 mm (0.02 ~ 0.2 in)		0.4 ~ 8.0 mm (0.02 ~ 0.31 in)	0.4 ~ 5 mm (0.02 ~ 0.2 in)		0.4 ~ 5.0 mm (0.02 ~ 0.2 in)		0.4 ~ 8.0 mm (0.02 ~ 0.3 in)
Max. PCB Weight		4 kg (8.8 lbs)		10 kg (22.0 lbs)	4 kg (8.8 lbs)		4 kg (8.8 lbs)		10 kg (22.0 lbs)
Clearance	Top	≤10: 2.5 mm >10: 2.5 mm		≤10: 3 mm >10: 13 mm	≤10: 2.5 mm >10: 12.5 mm		≤10: 2.5 mm >10: 12.5 mm		≤10: 3 mm >10: 13 mm
	Bottom	3.5 mm		3.5 mm	3.5 mm		3.5 mm		3.5 mm
Machine Weight		650 kg (1433 lbs)	700 kg (1543.2 lbs)	750 kg (1653.5 lbs)	750 kg (1653.5 lbs)	800 kg (1763.7 lbs)	750 kg (1653.5 lbs)	800 kg (1763.7 lbs)	850 kg (1873.9 lbs)
W		1000 mm (39.4 in)	1000 mm (39.4 in)	1350 mm (53.1 in)	1000 mm (39.4 in)	1000 mm (39.4 in)	1000 mm (39.4 in)	1000 mm (39.4 in)	1200 mm (47.2 in)
D		1295 mm (51.0 in)	1475 mm (58.1 in)	1475 mm (58.1 in)	1600 mm (62.9 in)	1780 mm (70.0 in)	1530 mm (60.2 in)	1710 mm (67.3 in)	1710 mm (67.3 in)
H		1727 mm (68.0 in)	1727 mm (68.0 in)	1727 mm (68.0 in)	1900 mm (74.8 in)	1900 mm (74.8 in)	1900 mm (74.8 in)	1900 mm (74.8 in)	1900 mm (74.8 in)
Supplies		220 Vac ± 10%, 1 Phase, 50/60 Hz, 5Kgf/cm²							

The above specifications are subject to change without notice.

KOH YOUNG TECHNOLOGY
INTELLIGENT INSPECTION

Koh Young Technology, Inc.
18 Poeun-daero 59 beon-gil,
Suji-gu, Yongin-si, Gyeonggi-do,
16864, Korea

T +82.31.5181.8000
F +82.31.5181.8677
E kohyoung@kohyoung.com

Meister Series_HQ_I_ENG_202505_V01