

Zeta 3D Optical Profiler

Zeta-20



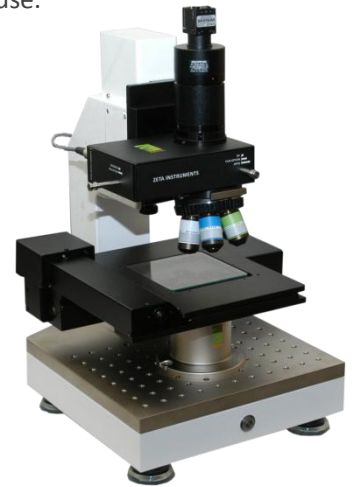
Exceptional 3D Imaging and Metrology

Based on *proprietary ZDot™ technology*, the Zeta-20 images and analyzes surface features on samples of all types: smooth to rough, low reflectivity to high reflectivity, transparent to opaque. Hardware and software options customize the Zeta-20 for specialized measurement needs. All hardware is easy to install and easy to use.

Key Features

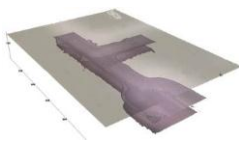
The **Zeta-20** is available with several advanced imaging techniques to match your requirements:

- **ZDot™** innovative 3D imaging is standard on all our optical profilers. The ZDot technology with our unique transmissive and dark field illumination schemes as well as a variety of objectives allows the tool to **handle the most ‘difficult’ of surfaces**.
- **ZiC** enhanced differential interference contrast imaging is great for **nanometer level surface roughness**
- **ZSi** shearing interferometer provides **Angstrom level vertical resolution**
- **ZX5** vertical scanning interferometry is ideal for measuring **nanometer heights over large field of view**
- **ZFT** reflectometry based **thin film thickness** measurement option

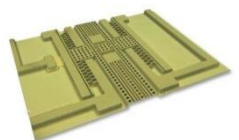


Zeta-20 with Motorized XY Stage

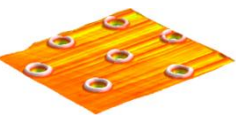
Micro-fluidic Device (mm)



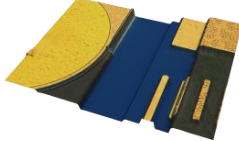
MEMS Device (μm)



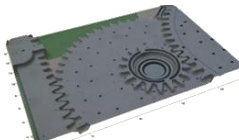
Laser Texture (Å)



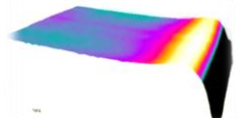
IC Wafer Surface (nm)



Micro Gear / MEMS (mm)



Disk Roll-Off (Å)



Measurement Channels and Sensitivity

	ZDOT	ZX5	ZiC	ZSi	ZFT
Roughness > 40 nm	✓				
Roughness < 40 nm			✓	✓	
Large feature with small Z height		✓			
15 nm to 25 mm step height	✓				
5 nm to 100 μm step height		✓			
< 10 nm step height				✓	
Defect: < 1 μm in size, < 75 nm in height			✓	✓	
Defect: > 1 μm in size, < 75 nm in height				✓	
30 nm < film thickness < 15 μm					✓
Film thickness > 15 μm	✓				

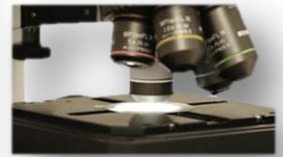
Optical System Parameters

Specifications for standard objectives are shown below. Other options available: long working distance objectives, immersion objectives, and through transmission materials objectives; 0.63X and 1X couplers. *XY resolution is nominal.

	NA	Working distance (mm)	Z resolution for ZDot (μm)	XY resolution (μm)*	Optical resolution (μm)	FOV with 0.35X coupler		FOV with 0.5X coupler	
						1/3" camera	2/3" camera	1/3" camera	2/3" camera
2.5X	0.08	10.7	22	3.60	4.20	5364 × 4024	9394 × 7044	3788 × 2840	6614 × 4960
5X	0.15	20.0	5.9	1.80	2.20	2682 × 2012	4697 × 3522	1894 × 1420	3307 × 2480
10X	0.30	11.0	1.5	0.90	1.10	1335 × 1000	2327 × 1745	944 × 708	1644 × 1233
20X	0.45	3.1	0.5	0.45	0.75	668 × 500	1169 × 877	468 × 351	822 × 616
50X	0.8	1.0	0.1	0.18	0.42	267 × 200	466 × 349	189 × 142	328 × 246
100X	0.9	1.0	0.013	0.09	0.37	133 × 100	234 × 175	93 × 70	164 × 123
150X	0.9	1.0	0.013	0.06	0.37	88 × 66	156 × 116	62 × 46	109 × 82

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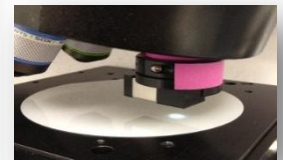
	Standard Zeta-20 ZDot System	Hardware and Software Options
Measurement System	Infinite depth imaging microscope ZDot based Optical Profiler	Standard objectives: 2.5X, 5X, 10X, 20X, 50X, 100X, 150X Special purpose objectives: LWD, TTM, immersion Interferometer package (ZX5): X5 objective, piezo stage, and leveling stage
	Dual high brightness white LED light source	Nomarski (ZIC) package: prism, polarizer, turret and analyzer Spectrometer (ZFT) for film thickness measurements Shearing Interferometer (ZSI) with 0.5 Angstrom resolution and 0.1 nanometer step height repeatability
	True color CCD camera (1/3"), 1024 x 768 pixels 30 frames/sec data acquisition	High resolution camera (2/3"), 1280 x 1024 pixels Back light LED for transmitted light applications
	One coupler, choice of four options 5-lens manual objective turret Auto focus Upto 25mm vertical scan in one scan using 20X LWD objective 40mm working Z range (longer Z travel optional, up to 100mm)	Automatic objective detector (AOS) or 6-lens auto turret Couplers: 1X, 0.63X, 0.5X, 0.35X
Stages and Chucks	Manual XY stage (100mm x 100mm)	Manual 150 mm x 150 mm stage
	Motorized Z stage with high precision closed loop scanner Configurable stage platform (breadboard design)	Motorized 100 mm x 100 mm stage Piezo Z stage (0.2 nm steps, 100 µm range) Extended Z range: > 100 mm Coarse tip/tilt stage (± 20 deg) Fine tip/tilt stage (± 6 deg) Manual R-theta stage
		Wafer chucks: 2 in to 8 in round, 5 in or 6 in square Hard disk chucks: 65 mm to 95 mm Back light compatible chucks Custom chucks for other applications, such as biotech
Software	Noncontact measurements of step height, surface roughness, feature diameter, area, and volume	Wafer shape measurement (bow) up to 4 in diameter
	Measurements on very low reflectivity (<0.5%) to very high reflectivity (>85%) materials within the same scan	Film thickness spectrometer, visible light (film thickness 30 nm to 10 µm)
	Measurements on transparent materials Analysis of layers within transparent structures Analysis of high roughness and high aspect ratio structures	Stitching for large area images Sequences Advanced analysis package
	Several leveling modes, including leveling-free measurement in ZDot™ mode Ra, Rq, Rz, Rsk, Rk and other ISO4287 parameters Sa, Sq, Sz, Ssk, Sk and other ISO25178 parameters Color or height based region analysis 3D display software, with image processing filters, true and false color options, and annotation Customizable reports Easy file management and data export in a variety of formats Time to data: 30 sec typical	Off-line software Custom applications recipes: Patterned sapphire substrate measurements Diamond wire measurements for solar wafer slicer Diamond (for CMP pads) Solar pyramid (wafer texture) Solar contact finger metrology Solar cell bus bar metrology Solar wafer bow measurements



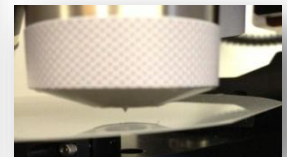
Transmissive Illumination



Edge Inspection Fixture



ZX5 Interferometer



Diamond Scribe to mark defects

Workstation

Processor: Intel Dual Core
Operating system: Windows 7, 64-bit
Memory: 4GB RAM (16GB available), ≥320 GB HDD
Monitor: 24-inch LCD standard, 1920 x 1200 pixels

Support

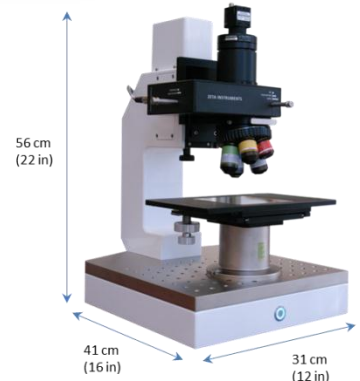
Warranty: One year parts and labor
Software: Two years free upgrades
User manual: Upon delivery
Service manual: With optional service training
Calibration: Step height and film thickness standards
CE mark certification

Vibration Isolation

Built-in vibration isolation suitable for most applications
Optional passive or active vibration isolation tables available for noisy environments
Optional acoustic isolation case available

Facilities

Power: 100 – 230 VAC, 2 A
Operating temp: 15° – 30° C, non-condensing
Vacuum (optional): 600 mm Hg
Tool dimensions (W x D x H): 31 x 41 x 56 cm
Workstation dimensions: 52 x 66 x 51 cm
Weight: 29.5 kg
All cabling included with tool



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*Actual features included will depend on configuration
Specifications subject to change without notice*