

Lasertec

Blue Laser Confocal Microscope

VL2000D



Blue Laser Microscope VL2000D

Blue Laser Microscope "VL2000D" debuts

Blue Laser Diode newly adopted extensively improves resolution

Employment of blue diode laser as a light source has extensively improved resolution compared with that of the conventional laser microscopes

The newly designed camera head optics specially tuned to the blue laser wavelength (410 nm) has improved the line & space resolution up to $0.15\mu\text{m}$.

Magnification is extendable up to 7200 \times -fold on a monitor when a 200 \times objective lens is used.

Features

Real time image observation and high-speed measurement by high scan rate

AO device (Acoust Optic Deflector) scans laser beam. As the AO device has no mechanical moving parts, it is capable of high rate scan with semi-permanent operating life. A highly interactive man to machine interface is realized with real time imaging of video rate by employing an AO device.

Digital signal processing system

Usage of auto processing command brings about better operation performance such as controlling of the motorized stage and image splicing, and higher operation efficiency. Image data and measurement data are transferable by using Network.

Observation/Measurement of samples with low reflection and slant surface are available.

The VL2000D employs one-dimensional image sensor of ultra high sensitivity/speed, which achieves 10 times higher sensitivity than our conventional microscopes, and consequently, samples with low reflectivity are now observable.

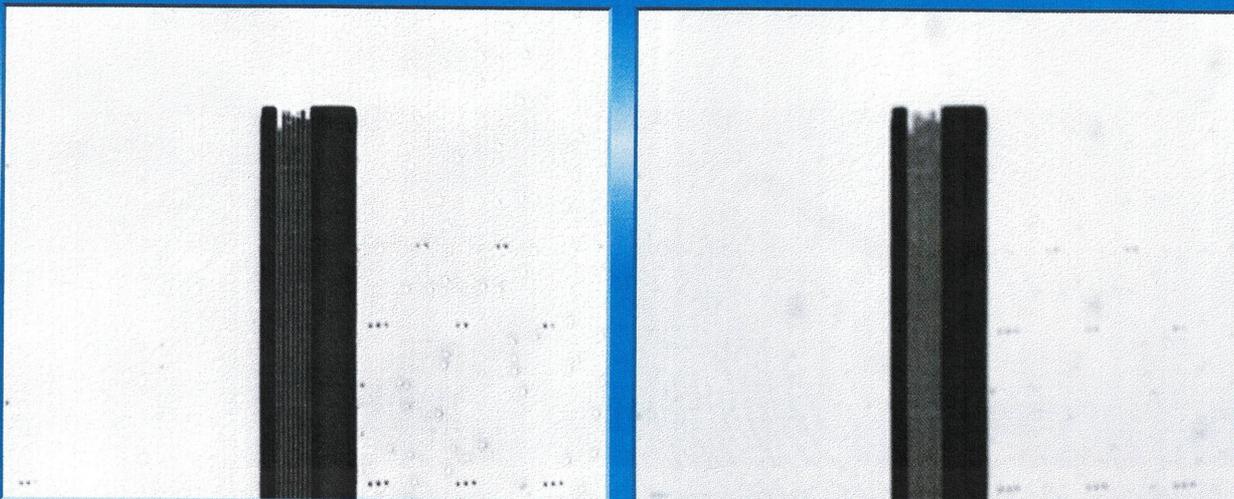
High accuracy measuring function for line width and height

High accuracy measurement using one-dimensional image sensor shows excellent repeatability and reliability. Height measurement with the Laser-Scale equipped in the microscope is extremely stable with high resolution.

Image analysis software

Image analysis software consists of the following standard functions; measurement functions for 3D display, grain size distribution, surface roughness, area and volume, data processing functions such as template generation, thumbnail image filing and laying out with high flexibility.

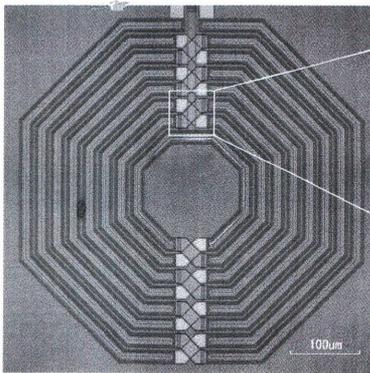
0.16 μm line & space



Blue Laser

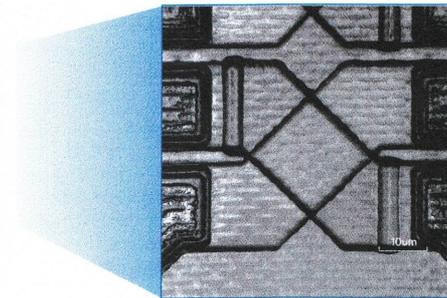
Photo Library

Images of wide view and high resolution by patchwork

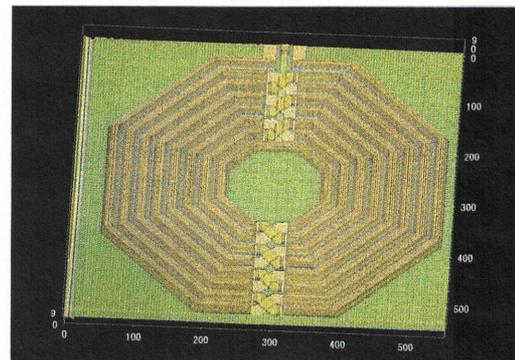
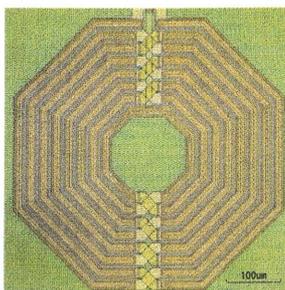


A composite image of 4 photo images (2×2) made by patchwork

A composite image of Laser Microscope and color CCD



Objective lens of 100×



3D image

Wide view image with high resolution maintained is available by using patchwork function.

● The low power RF circuit employing MEMS technology

A small and thick oxide layer is embedded on silicon substrate as a coil for high-frequency circuit by employment of MEMS technology.

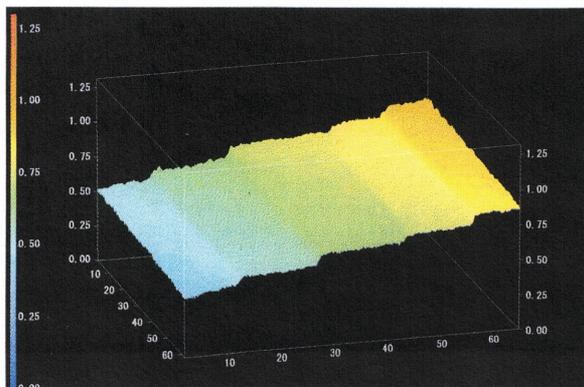
By the courtesy of assistant professor Makoto Fujishima, The University of Tokyo and DENSO CORPORATION.

Step measurement with high accuracy

High accuracy height measurement with longterm repeatability is available.

● A three dimensional nano mold for nano-imprinting

Application of the technology that generates nano-size structure by embossing (nano-imprinting) to recording medium may bring about CD and DVD with recording hours of dozens of times the hours of the current CD and DVD.



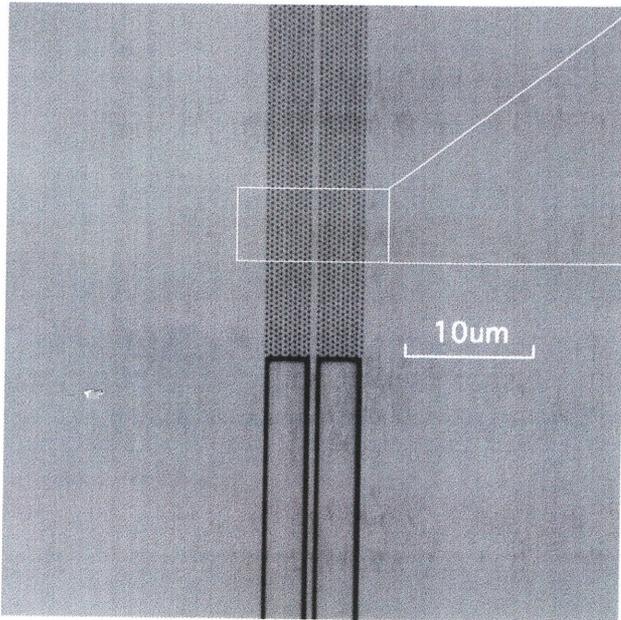
By the courtesy of Lecturer Jun Taniguchi,

Photo Library

High-resolution image taken by the blue laser diode

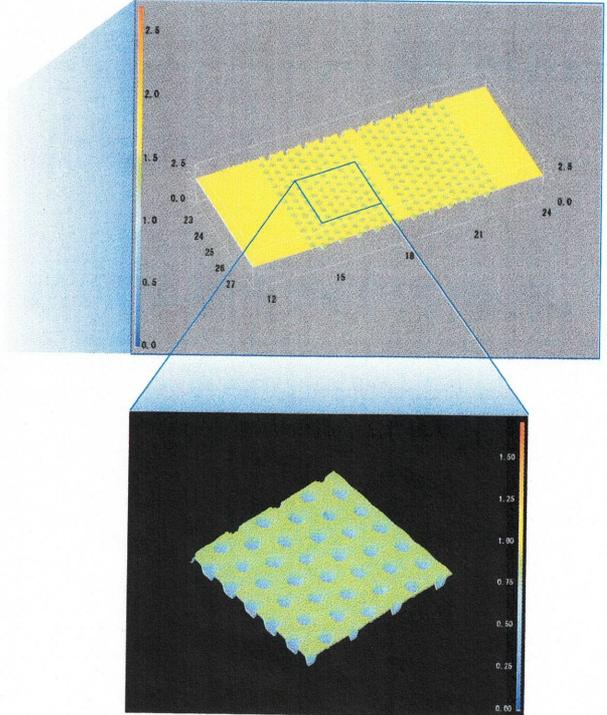
Wide variety of 3D representations such as rotation and scaling are interchangeable in a second.

- Photonic Crystal (line defect wave guide)



Objective lens 100X

3D image Sample structure: hole pitch of 450 nm and depth of 200 nm

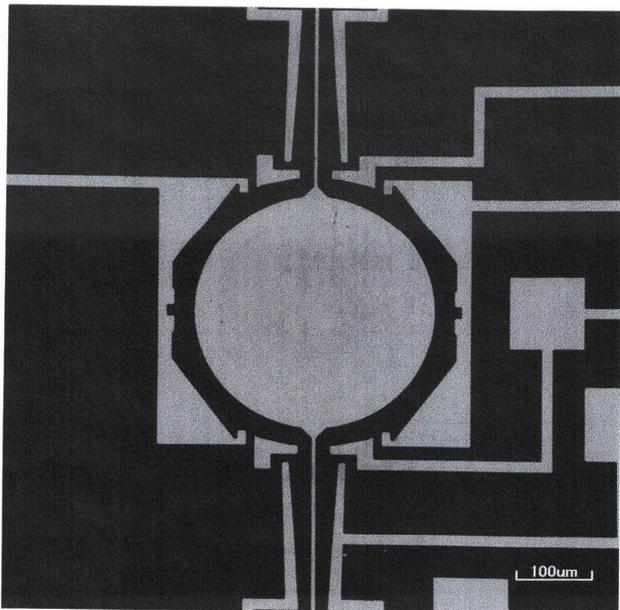


By the courtesy of Arakawa/Iwamoto Research Laboratory, The University of Tokyo

Samples with vertical steps are observable with ease

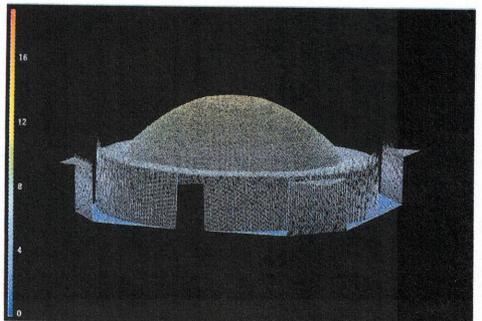
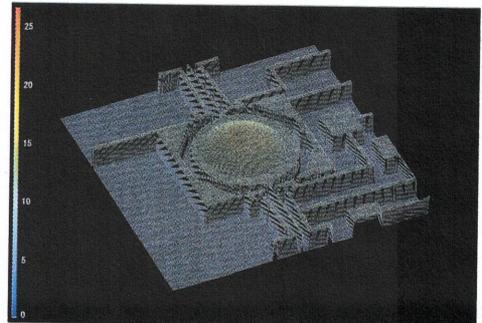
Images with deep focal depth are easily attainable

- A 2 dimensional lens scanner made by silicon micro machining
- A 2 dimensional micro scanner made by the silicon bulk micro machine processing technology



Objective lens 20X

3D image



Specifications

Main specifications

Resolution	0.14 μm (*1)		
Magnification/Field of view	Objective lens magnification	Magnification on monitor	Field of view
	10 \times	360 \times	640 μm
	20 \times	720 \times	320 μm
	50 \times Apo	1800 \times	128 μm
	100 \times Apo	3600 \times	64 μm
	200 \times Apo	7200 \times	32 μm
Scanning speed	15 Frame/sec.		
Monitor	22 inch monitor		
Light source	Blue laser diode (wavelength 408 nm)		
Frame memory	Image	900(H)x900(V) \times 8bit	
	Surface profiling measurement	900(H)x900(V) \times 16bit	
Slow scan function	2, 4, 8, 16, 32, 64, 128, 256, 512 (reduces scanning speed at above rate as "normal" is set at 1.)		
Critical dimension measurement	Precision	0.001 μm	
	Repeatability (3 σ)	0.02 μm (*2)	
Surface profiling	Precision	0.01 μm	
	Repeatability (σ)	0.02 μm (*3)	
Image processing software	3D imaging (color), surface roughness analysis (Ra,Ry,Rz,Sm,S,Sp,etc.), height difference, binarization, measurement of area and volume, video filtering, FFT analysis, film thickness measurement, data filing, and so on.		
Utility	Electricity	AC100V, 50/60Hz, 6A (Max.)	
	Pressure Air	4~7kgf/cm, 40NI/minute, Φ 6mm	
Dimensions & weight	Stage	670(W) \times 790(D) \times 1670(H)mm, Approx.300kg	
	Controller	860(W) \times 790(D) \times 1122(H)mm, Approx.150kg	

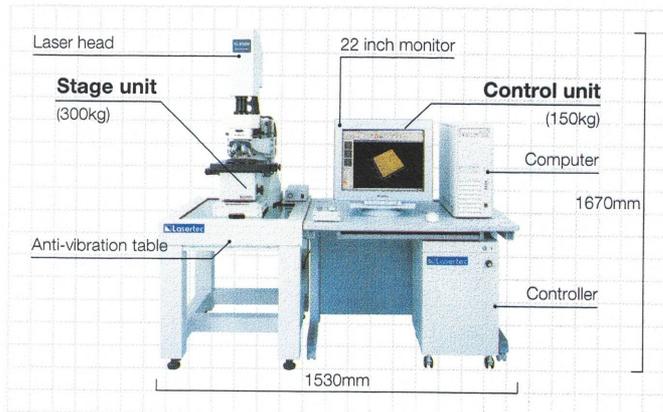
*1 Defined by the minimum distinguishable line and space pattern on a silicon wafer.

*2 This figure is assured when a standard pattern on a photo mask is measured with a 100 \times /0.95 apochromat object lens.

*3 This figure is assured when a height standard reference is measured with a 100 \times /0.95 apochromat object lens.

Composition

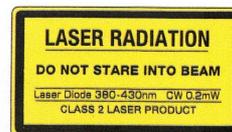
Configuration



Sample of a special order



- Notice about safety**
Please read the [Operation Manual] carefully before you actually operate this microscope so that you can operate this microscope in an appropriate way.
- The contents of this catalog are as of March 2004.
 - The specification and the product are subject to change without any liability of seller or manufacturer.
 - All the monitor pictures are inset synthetographs.
- Lasertec Corporation head office was ISO9001 : 2000 certified in April 2002.



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