

NEO-500

Nano Engineering Optical System

System Outline

Nanofabrication system, NEO-500, is developed with National Institute of Advanced Industrial Science and Technologies based on thermal lithography method combined laser lithography method and thermal non-linear material.

The system can fabricate nano-scale structure on the wide-area with low-cost and high-speed. The size of the system is desktop type and can be used in the laboratory.



Specification

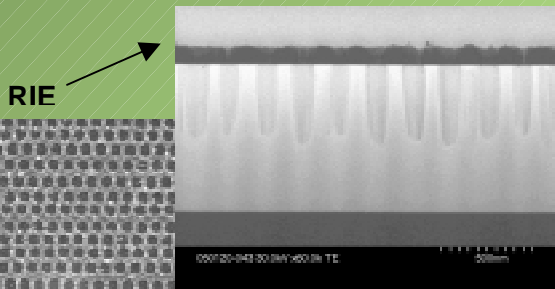
· Wavelength	: 405nm
· NA	: 0.85
· Max output	: 20mW Pulse (Autopower control)
· Laser class	: Class 2M
· Tr/Tf	: 1.4ns
· OL actuator	: Single axis VCM (Autofocus)
· Stage resolution	: 5nm / 0.07nm
· Stage accuracy	: ±30nm / ±4nm
· Stage drive method	: Piezo-electric device / VCM
· Spindle motor	: DC motor / Air spindle motor
· Jitter	: $\sigma < 0.01\%$ / $\sigma < 0.0005\%$
· Dehumidification	: None / Equipped
· Thermal modulation	: None / Equipped
· Objective sample	: Si, SiO ₂ , etc.(AIST)
· Sample size	: 5 inch wafer size (Customizable)

Function and Application

- Creation of nano dot pattern
 - Continuous dot pattern
 - Periodic dot pattern
- Creation of nano-scale grating

Application example

- Optical filter
- Antireflective structure
- Photonic crystal
- Nano-imprint mold
- Biotechnology



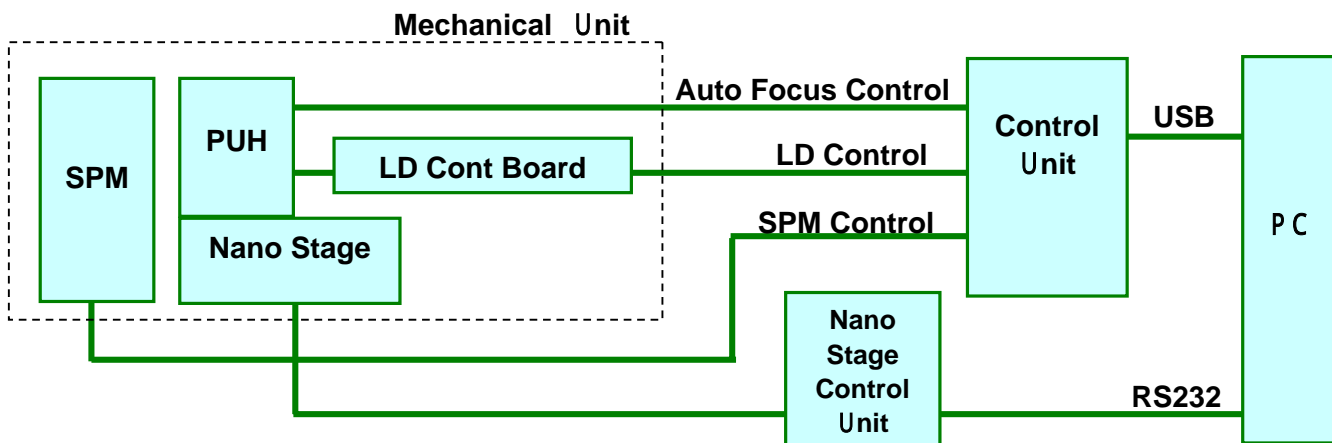
Sectional picture

Example of nano dot pattern

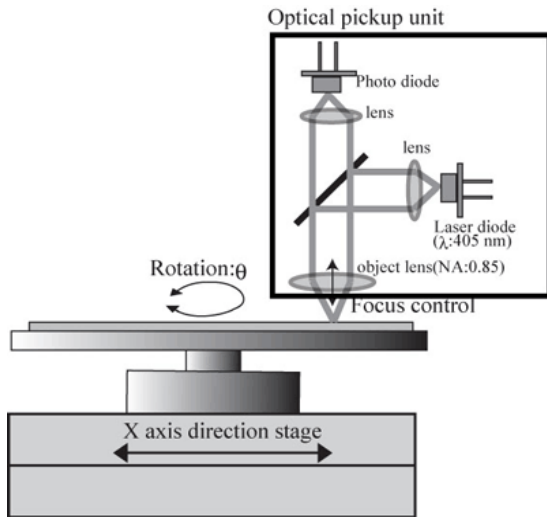
Photo provided

NATIONAL INSITUTE OF
**ADVANCED INDUSTRIAL SCIENCE
 AND TECHNOLOGY(AIST)**
 Center for Applied Near-field Optics Research

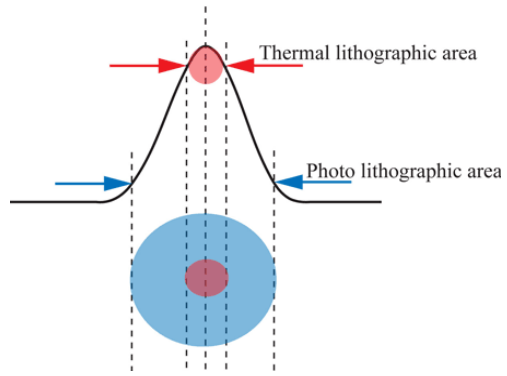
Block Diagram



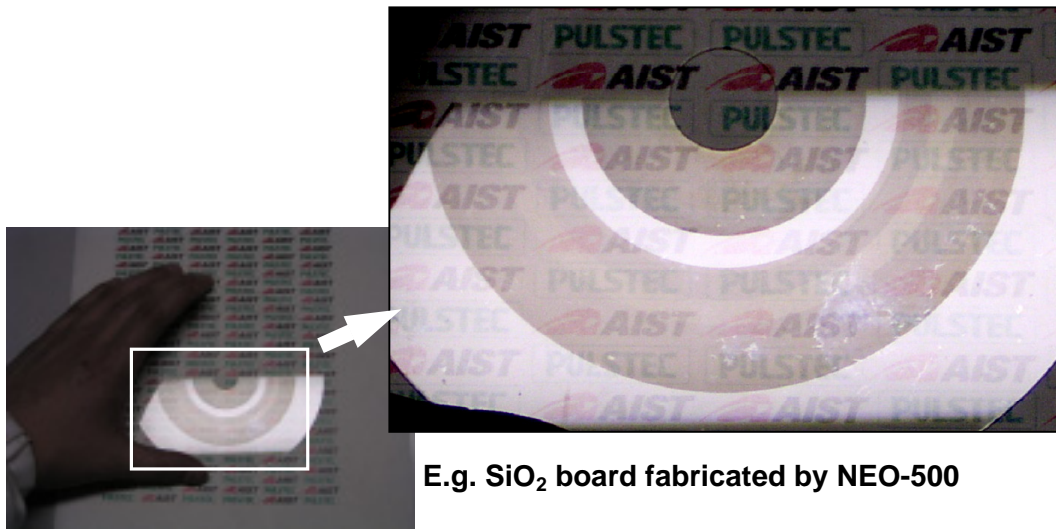
Optics and System structure



System structure



Light intensity distribution in spot and drawing area by thermal distribution



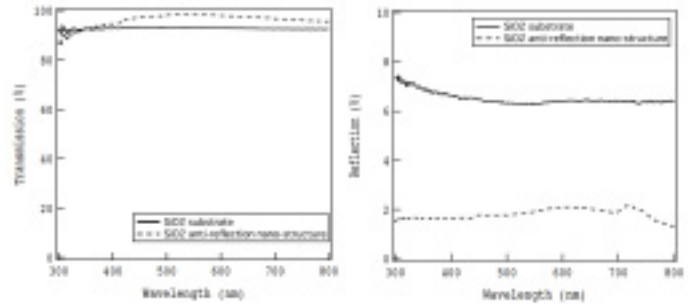
E.g. SiO₂ board fabricated by NEO-500

Customization

This system can be customized according with the customer request.

- Optics, Spot size, Laser output
- Nano stage, Feed accuracy
- Chuck mount structure, etc.

Sample board for evaluation will be manufactured by Center for Applied Near-field Optics Research, AIST.



E.g. Optical characteristic of SiO₂ board



Pulstec Industrial Co.,Ltd.
 7000-35 Nakagawa, Hosoe-cho, Kita-ku,
 Hamamatsu-city, Shizuoka Pref., 431-1304 Japan
 Phone:+81-53-522-3611 Fax: +81-53-522-5622
<http://www.pulstec.co.jp>
 E-mail:sales@pulstec.co.jp



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