Wafer Loaders for IC Inspection Microscopes

NWL200 Series

Class 1 Laser Product

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⚠ WARNING	TO ENSURE CORRECT USAGE, READ THE CORRESPONDING MANUALS CAREFULLY BEFORE USING THE EQUIPMENT.

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Wafer Loaders for IC Inspection Microscopes
NWL200 Series

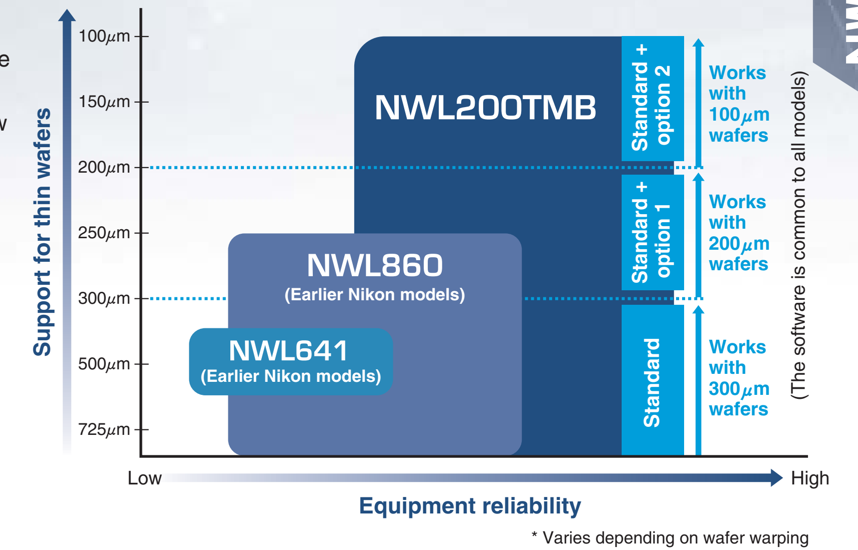
Nikon's proprietary technology ensures reliable loading of ultra-thin 100μm wafers

In the semiconductor manufacturing process, wafers are following a trend toward ever greater thinness. Nikon's outstanding proprietary technology makes the NWL200 Series the first lineup of wafer loaders for inspection microscopes capable of loading 100μm thin wafers. The NWL200 Series achieves highly reliable loading suitable for inspection of next-generation semiconductors.

Nikon's original technology ensures safe, reliable loading of thin wafers

Support for ultra-thin 100μm wafers

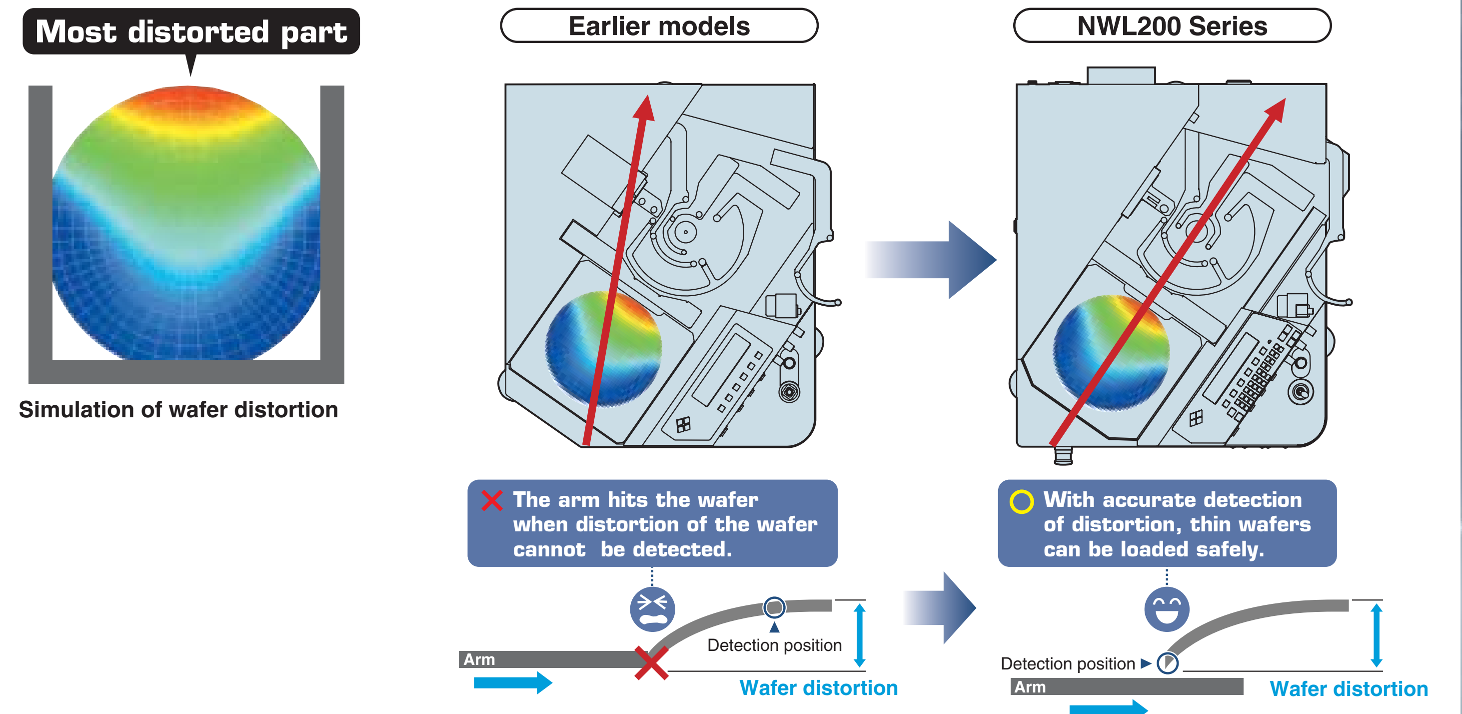
Wafers are getting thinner with advances in manufacturing processes, making it necessary to place very thin wafers on the microscope by hand for inspection at the post-process stage. With Nikon's new chuck system, the NWL200 Series can load ultra-thin wafers with a thinness of as little as 100μm. This high level of safety and reliability meets all of the requirements for inspection of the latest wafers.



* Varies depending on wafer warping

Improved wafer-sensing functions

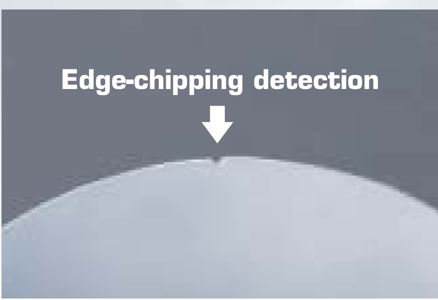
Since thin wafers can undergo significant distortion in the carrier, the arm may damage them if the position sensors are not accurate. In the past, it was difficult for sensors to read distortion of the wafers accurately, but with optimized arrangement of the wafer sensor beams, the NWL200 Series can accurately detect the shape of thin wafers in the cassette.



II Accurate detection of wafer-edge chipping

Additional edge-chipping detection function (optional)

Edge-chipping detection, which was difficult with conventional wafer loaders for microscopes, can now be performed automatically. This enables macro inspections of all areas, adding to the support for inspection of pattern side, back side center, and back side periphery that was already available with earlier models. With high-precision automatic detection, edge defects that cause wafer cracking can be removed promptly.



III Outstanding operability

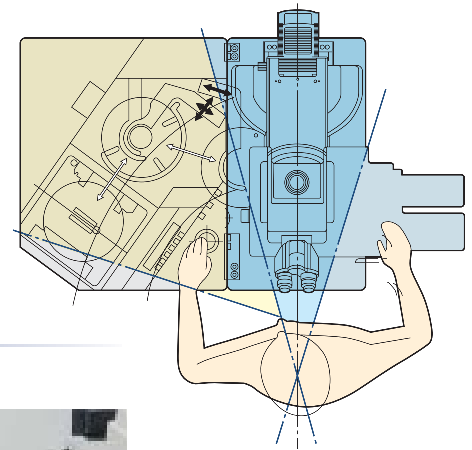
The wafer-slot buttons offer improved operability

The new wafer-slot buttons on the front panel allow users to select any wafer from its slot with a single button. In addition, the large and prominent LCD panel allows users to set the conditions such as the sampling and inspection patterns, and to check the operating status and the content of errors at a glance.

The screens are arranged in a hierarchical structure with one screen for each task, resulting in an intuitive dialog format for smooth progress through the steps. A comprehensive suite of file management functions for carriers, samples and so on is useful for automating inspection.

Elegant ergonomic design

To assure operation in a natural posture, ergonomic efficiency is designed into every aspect of the system. Operation keys and knobs are located within easy reach of the operator, so that operation requires minimum movement of the hand or eye. The wafer carriers are located at the front and 35° to the left of the operator, making it easy to load carriers and to check the wafers inside the carriers visually.



High throughput

Not only is the elevator surprisingly fast, but the non-contact centering mechanism makes it possible to perform alignment quickly and accurately. The multi-arm system also allows loading and unloading of wafers with complete precision, increasing the overall efficiency of transfer and wafer exchange. This dramatically decreases cycle times, achieving levels of throughput never before seen in any other system.

Anti-contamination measures for highly integrated production

To prevent dust arising from friction or impact when centering the wafers, centering and alignment of the orientation flats and notches is performed without contact using photoelectric sensors. The system is configured so as not to interrupt the downflow of clean air in the clean room, and measures are taken to prevent particles arising on the suction surface of the wafer. In addition, the cover is stainless steel to prevent the build-up of static electricity and dust. Every measure has been taken to ensure that today's highly integrated semiconductor production process is secure from contamination during inspection.

High reliability

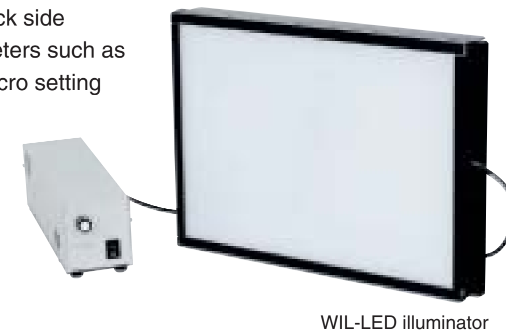
Should an error occur, an error message is displayed on the LCD panel. Even when the power is turned off, the vacuum chuck of the macro inspection mechanism stays on. If a problem occurs, wafers on the loader can be returned to the carrier without the use of tweezers.

IV High-performance macro inspection and a range of illumination systems

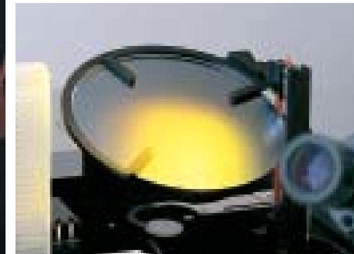
A range of macro inspection function are provided as standard

In addition to pattern side macro inspections of all areas, macro inspection of the back side periphery and back side center are supported as standard. Macro inspection parameters such as wafer rotation speed and tilt angle can be set automatically or manually. Use the macro setting knobs to preset initial settings and make further adjustments using the joystick.

In addition the new WIL-LED illumination system enables more uniform illumination over a wider area. Various illumination systems are available, from spot lighting to uniform wide area lighting.


WIL-LED illuminator

Pattern side macro inspection (using a WIL-LED illuminator)


Back side center macro inspection (using a fiber optic illuminator)

Back side periphery macro inspection (using a fiber optic illuminator)

V Convenient Web-linked functions

Remote access tool

The loader is equipped with a Web server function. When the loader is connected to a LAN, you can create inspection recipes on a PC and easily backup data from the loader.

1) Recipe preparation support functions

A Web browser wizard guides you through the steps which are reflected in the NWL200. This allows you to prepare optimum recipes safely and simply, while checking the status of the wafers.

2) Equipment maintenance

Easily back up and restore inspection recipes.

VI System upgrades

■ Mix and match options for a range of applications

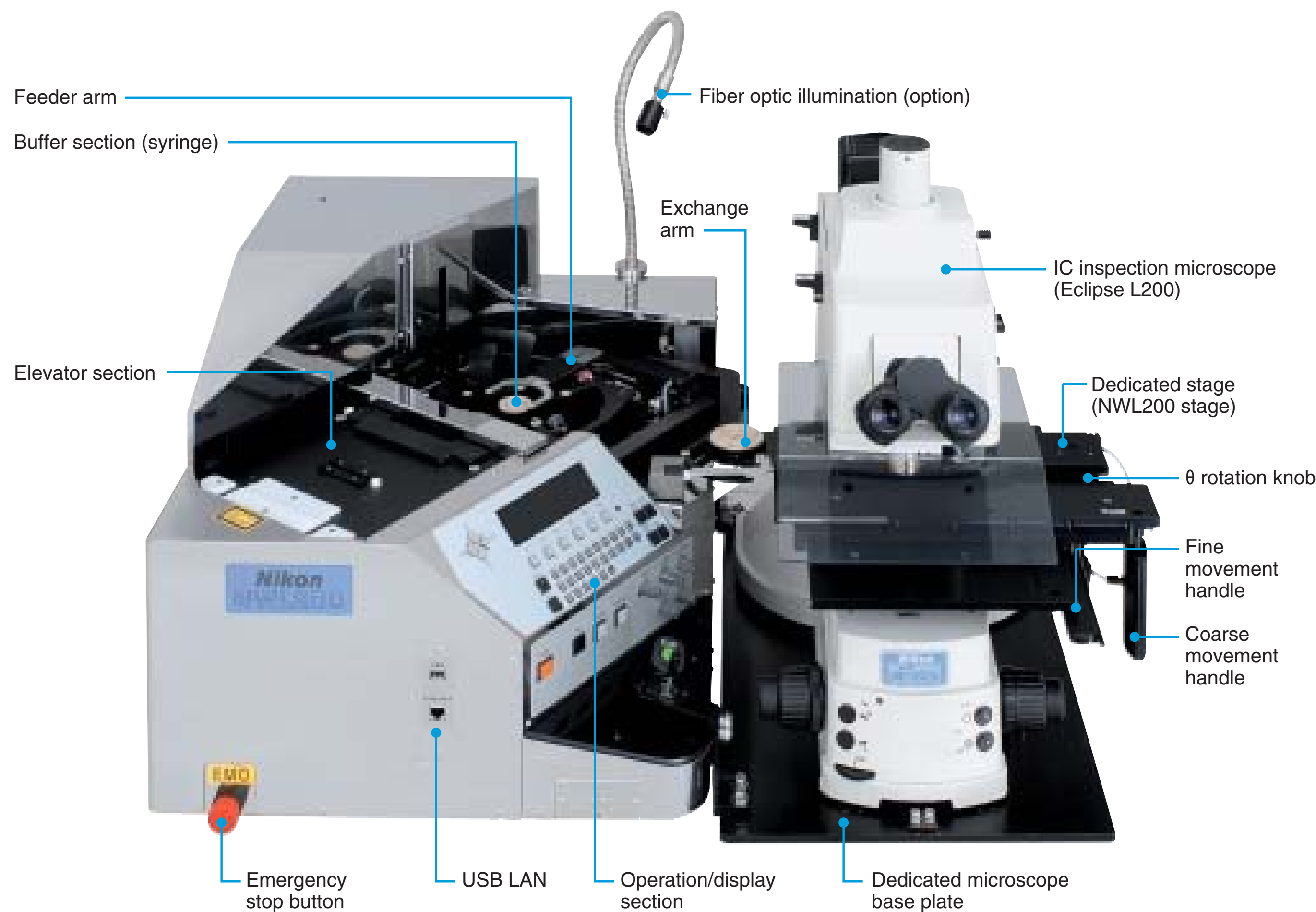
• Microscope system upgrades
By combining the inspection microscope with an auto stage, auto focus unit, review software and other options, you can build the optimal system for your inspection application.

• External communication functions
With external communication functions, the NWL200 can be connected to a host computer and built into a network. The system can not only transfer data from inspection results online over an RS-232C link but can also be operated remotely.

• Combined with a digital camera and imaging software
Combined with the Digital Sight Series microscope digital camera and the NIS-Elements imaging software, the system offers comprehensive multidimensional image capture, measurement and analysis capabilities.

Digital camera for microscopy
DS-Ri1

VII Nomenclature



Specifications

		NWL200TMB/T
Compatible wafer size	Diameter	200mm / 150mm[*1]
	Thickness (standard)	300μm
	Thickness (thin wafer option)	300~100μm
Compatible carrier		SEMI 25 (26) wafer carrier [*2]
Centering		Non-contact, photoelectric sensors
Notch/orientation flat detection		Non-contact, photoelectric sensors
Operation/display section		Wafer slot buttons and interactive LCD interface
External dimensions (WxDxH)		535 x 626 x 350
Weight		50kg
Safety standards		Electrical safety: CE mark compatible SEMI: S2-0706, S8-0307, F47 compatible Laser safety: FDA Class 1
Utilities		Power supply: AC 100~240 V, 50/60 Hz, 1.5 A~0.7 A Vacuum: -80kPa Connection tube diameter: ϕ 6mm

*1: For ϕ 125mm wafers and non-silicon wafers, please contact your nearest Nikon distributor.
*2: For other carriers, please contact your nearest Nikon representative.

Model comparison

Model	TMB-86	T-86
Wafer size	ϕ200mm／ϕ150mm	
Microscope inspection	○	○
Pattern side macro	○	
Back side center macro	○	
Back side periphery macro	○	

Dimensional diagram