



Nikon
100th
anniversary

Wafer Loaders for IC Inspection Microscopes

NWL200 Series



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

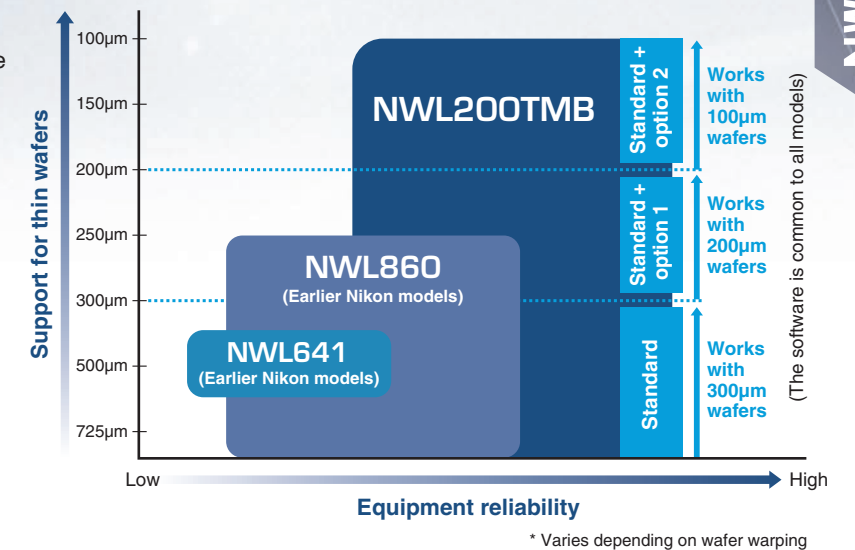
In the semiconductor manufacturing process, wafers are following a trend toward ever greater thinness. Nikon's outstanding proprietary technology makes the NWL200 Series the first lineup of wafer loaders for inspection microscopes capable of loading 100μm thin wafers. The NWL200 Series achieves highly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

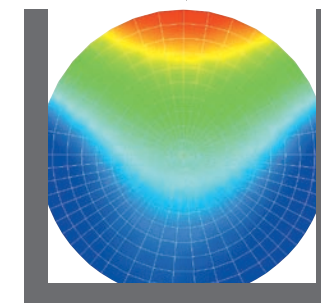
Wafers are getting thinner with advances in manufacturing processes, making it necessary to place very thin wafers on the microscope by hand for inspection at the post-process stage. With Nikon's chuck system, the NWL200 Series can load ultra-thin wafers with a thinness of as little as 100μm. This high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



Improved wafer-sensing functions

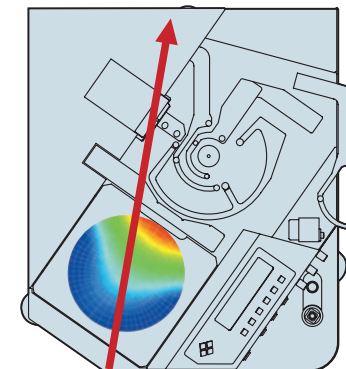
Since thin wafers can undergo significant distortion in the carrier, the arm may damage them if the position sensors are not accurate. In the past, it was difficult for sensors to read distortion of the wafers accurately, but with optimized arrangement of the wafer sensor beams, the NWL200 Series can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

Most distorted part

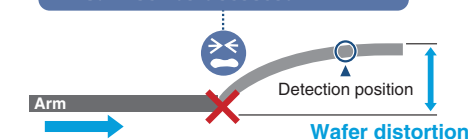


Simulation of wafer distortion

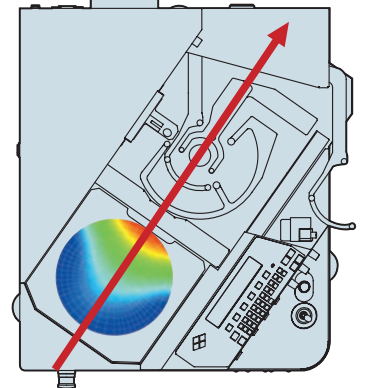
Earlier models



✗ The arm hits the wafer when distortion of the wafer cannot be detected.



NWL200 Series



○ With accurate detection of distortion, thin wafers can be loaded safely.



II Transfer of Chemical Compound Semiconductor (Wafer) is possible

■ Addition of Alignment sensor for Chemical Compound wafer (optional)

The alignment of half transparent wafer which was difficult with conventional Waferloaders is now possible with the Nikon original optical system providing a safer transfer of Sapphire / Quartz / gallium arsenide substrate for LED.

Additionally for devices such as MEMS which require process on the backside, non-contact backside inspection waferloader is now available.

III Outstanding operability

■ The wafer-slot buttons offer improved operability

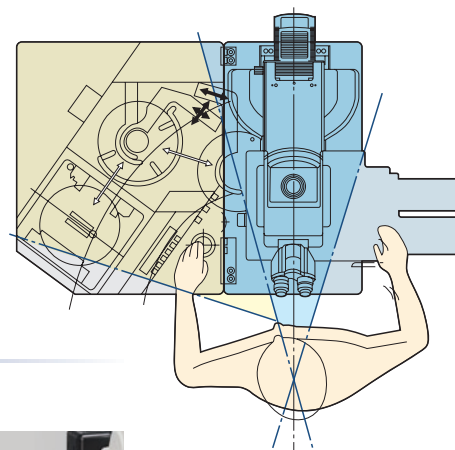
The wafer-slot buttons on the front panel allow users to select any wafer from its slot with a single button. In addition, the large and prominent LCD panel allows users to set the conditions such as the sampling and inspection patterns, and to check the operating status and the content of errors at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



III Outstanding operability

■ 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.

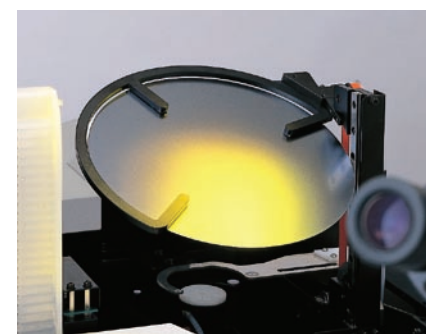
■ High reliability

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.

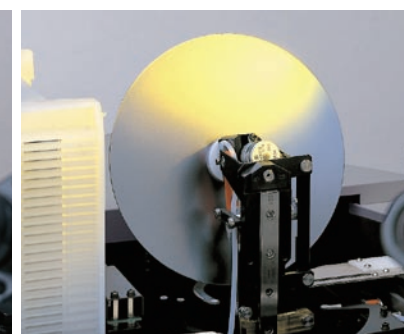
IV High-performance macro inspection and a range of illumination systems

■ 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. Various illumination systems are available, from spot lighting to uniform wide area lighting.



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

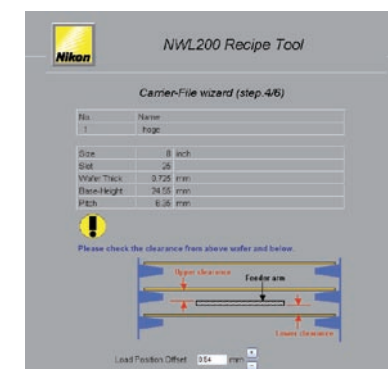
The loader is equipped with a Web server function. When the loader is connected to a LAN, you can create inspection recipes on a PC and easily backup data from the loader.

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.

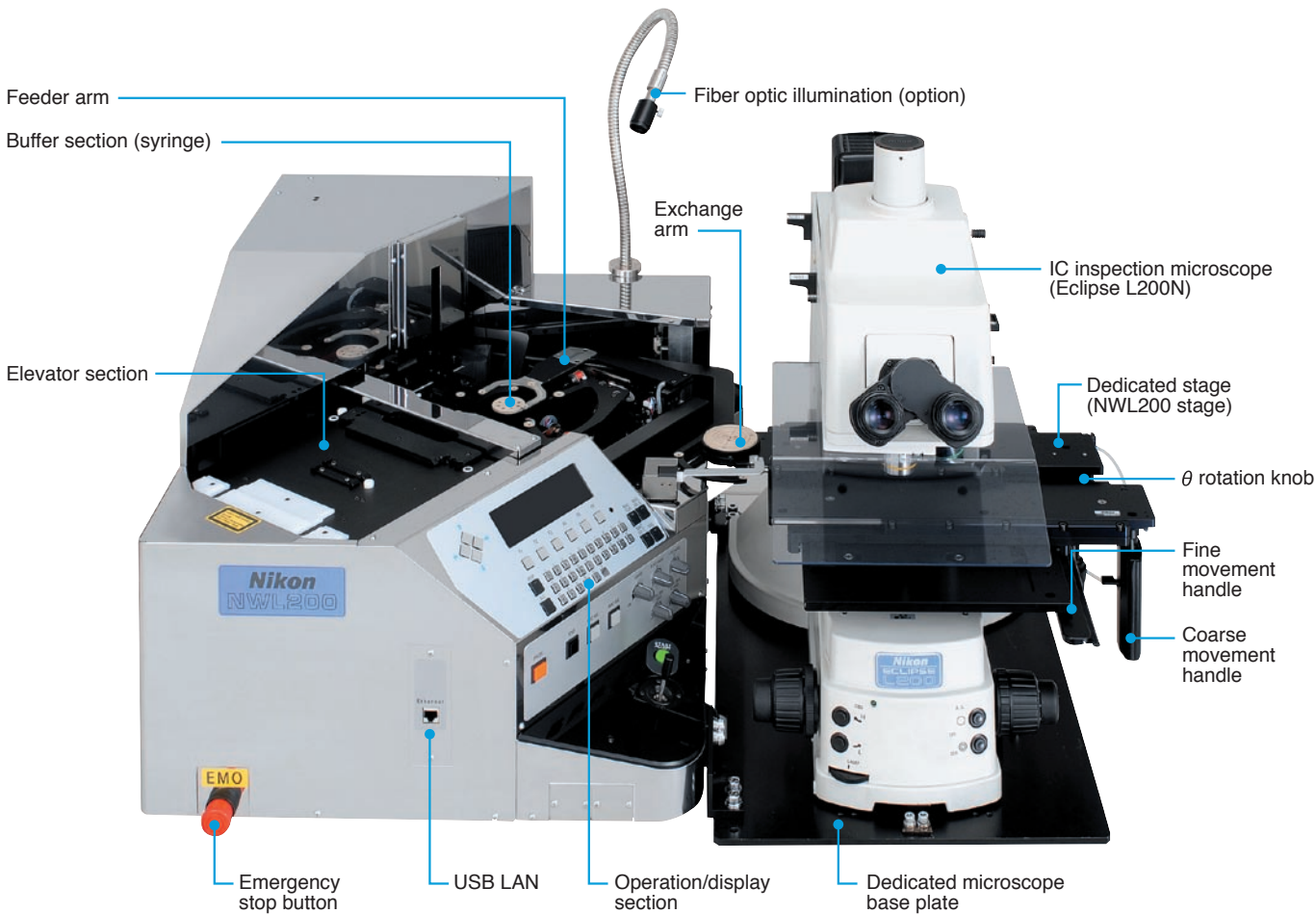
• External communication functions

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.

VII Nomenclature



Specifications

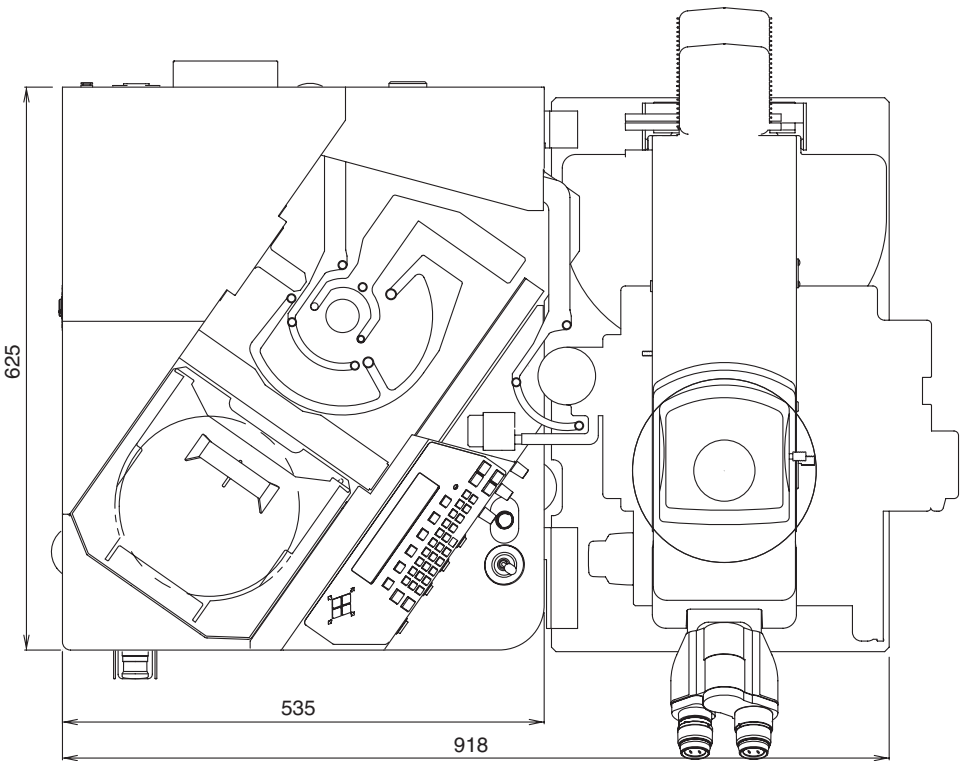
NWL200TMB/T		
Compatible wafer size	Diameter	200mm / 150mm ^{*1}
	Thickness (standard)	300μm
	Thickness (thin wafer option)	300~100μm
Compatible carrier		SEMI 25 (26) wafer carrier ^{*2}
Centering		Non-contact, photoelectric sensors
Notch/orientation flat detection		Non-contact, photoelectric sensors
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: φ6mm

^{*1}: For φ125mm 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



Class 1 Laser Product

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. August 2017 ©2008-2017 NIKON CORPORATION

N.B. Export of the products* in this catalog is controlled under the Japanese Foreign Exchange and Foreign Trade Law. Appropriate export procedures shall be required in case of export from Japan.

*Products: Hardware and its technical information (including software)



WARNING

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



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