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SMZ18

SMZ1270

SMZ1270i

SMZ800N

Greenough Type

SMZ745

SMZ745T

SMZ445

SMZ460

SMZ-2

Zoom Ratio

Zoom Range

Total Magnification

W.D.*2

Camera

SMZ Series

The highly cost-effective SMZ series offer outstanding optical performance, flexible system expandibility, and superb operability.

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Data Processor – DP-E1A

Metrology Software – LV-DF

Autocollimators / DIGIMICRO

Autocollimators – 6B-LED / 6D-LED

DIGIMICRO – MF-5001 / MF-501 / MH-10M

Optical Flat / Optical Parallel / Standard 300mm Scale

Please refer to individual product brochures for further details.

*1: Depending on combination of Eyepiece and Objective lens. *2: Combination of Eyepiece 10x and Objective lens 10x. *3: Objective lens 1x or no Auxiliary Objective lens.

Rease refer to individual product brochures for further details.
# Industrial Microscopes

Nikon's Industrial Microscopes utilize the CFI-2 optical systems, highly evaluated for its unique concept of high NA combined with long W.D.

## Upright Microscopes (General model)

**LV150N**  
**LV150NA**  
**LV150NL**  

Stand and illumination units are selectable according to observation methods and purpose of use.

<table>
<thead>
<tr>
<th>Observation Method</th>
<th>BF</th>
<th>DF</th>
<th>DIC</th>
<th>S-POL</th>
<th>FL</th>
<th>2-Beam</th>
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</thead>
<tbody>
<tr>
<td>EPI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>DIA</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Available / Not available

*Only BF, DIC, and S-POL are available for LV150NL Upright Microscopes (Large-sized stage model)

**L300N**  
**L300ND**  

Stage with stroke 350×300mm is available. Suitable for ø200mm wafer observation.

<table>
<thead>
<tr>
<th>Observation Method</th>
<th>BF</th>
<th>DF</th>
<th>DIC</th>
<th>S-POL</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>DIA</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

*Available / Not available

*Only BF, DIC, and S-POL are available for L300NL

## Upright Microscopes (Large-sized stage model)

**L200N**  
**L200ND**  

Stage with stroke 200×200mm is available. Suitable for ø200mm wafer observation.

<table>
<thead>
<tr>
<th>Observation Method</th>
<th>BF</th>
<th>DF</th>
<th>DIC</th>
<th>S-POL</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPI</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>DIA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Available / Not available

*Only BF, DIC, and S-POL are available for L200NL

## Inverted Metallurgical Microscopes

**MA200**  

With its unique, solid-box structure, the MA200 offers high stability, durability, and a smaller footprint than conventional models.

<table>
<thead>
<tr>
<th>Observation Method</th>
<th>BF</th>
<th>DF</th>
<th>DIC</th>
<th>S-POL</th>
<th>FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPI</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIA</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Available / Not available

## Polarizing Microscopes

**LV100NPOL**  

High quality polarizing microscopes with superb optical performance that accommodate various observation needs.

<table>
<thead>
<tr>
<th>Observation Method</th>
<th>BF</th>
<th>POL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPI</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>DIA</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

*Available / Not available

## Multi-purpose Zoom Microscopes

**AZ100**  

Multi-zoom AZ100 and AZ100M combine the advantages of stereoscopic and metallographic microscopes.

<table>
<thead>
<tr>
<th>Observation Method</th>
<th>BF</th>
<th>DF</th>
<th>DIC</th>
<th>S-POL</th>
<th>POL</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPI</td>
<td>✓</td>
<td>✓</td>
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<td></td>
</tr>
<tr>
<td>DIA</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Available / Not available

## Reversing Table

Refer to individual product brochures for further details.
Digital Cameras for Microscopes

The Stand-Alone Model is capable of high-definition image acquisition without a control unit.

Microscope Camera

DS-Ri2

Capable of expressing images as is, this microscope digital camera offers high resolution, color reproduction, and frame rate.

Frame Rate: 49fps (1636x1088)
Max Recordable Pixels: 4908x3264

Microscope Camera

DS-Fi3

Three main features of the previous models, high-resolution, high sensitivity and low noise, and high-speed live display are offered in 1 camera.

Frame Rate: 30fps (1440x1024)
Max Recordable Pixels: 2880x2048

*See the “Digital Sight series” catalog for other cameras.

Microscope Camera control unit

DS-L4

DS-Fi3 can be optionally connected to the DS-L4 tablet-style control unit, eliminating the need and space requirements of a desktop PC. DS-L4 has a large number of built-in security for network connectivity.

Scene Mode

Optimal imaging parameters for each sample type and observation method can easily be set through the icons.

Variety of Tool Features

Enables easy measurements directly on images, with input of lines and comments. These can also be written and saved with the image and measurement data can also be output.

Imaging software

NIS-Elements series

Image Stitching

Stitches together images acquired from multiple fields of view to create one image.

EDF (Extended Depth of Focus)

Create a single, all-in-focus image from images of differing focus.

Digital Sight Series

Digital Microscopes

An all-new, one-of-a-kind digital microscope that can either be portable to accommodate any sample size or docked on a stand to take high-magnification images and perform various measurements.

Motorized Focusing Stand + Touch Panel Monitor

Through the intuitive operation of touching icons or using the screen stylus, precise image capturing and simple measurement are now possible.

One-touch EDF

EDF images can be easily acquired by selecting the start and end positions on the sample.

Handheld Set

The lightweight, ergonomic camera head allows for easy handling for all users.

Simple Stand

This all-in-one set features a battery operated zoom camera head and a compact simple reflection stand, both of which can be taken anywhere to capture high-resolution images.

Super High Vertical Resolution Non-Contact 3D Surface Profilers

Nikon’s proprietary scanning-type optical interference measurement technology achieves 1pm height resolution. Nikon offers variety application, lustrous surfaces, such as silicon wafer, glass and metallic deposition surfaces.

BW-D500 Series/BW-S500 Series

High-Speed Model

Number of Pixels: 510x510
Height Measurement Time: 4s (10um scan)
Field of view: < 2.015x2.015um*

High Pixel Resolution Model

Number of Pixels: 2,046x1,022
Height Measurement Time: 16s (10um scan)
Field of view: < 4.458x4.448um*

* The range can be extended by changing the relay lens or by stitching.

Re-use refer to individual product brochures for further details.

Re-use refer to individual product brochures for further details.
Objective Lenses

CFL60-2 / CFL60 / CF&IC

Nikon's CF60-2/CFL60/CF&IC optical systems are highly evaluated for its unique concept of high NA combined with long working distance. These lenses have further evolved to achieve the apex in long working distance, correct chromatic aberration, and optimized lens weight.

Near-infrared Objective Lenses

NIR / NIR-C

Achieves high transmission of 90% or more at visible range and 1.064μm. Significantly improved machining accuracy at a small size with low power. Suitable for Semiconductor and LCD by laser repair.

For Incorporation into Microscopes

For Incorporation into Microscopes

IM-4, LV-IM/LV-IMA, LV-FM/LV-FMA

Suitable for incorporating into systems, these focusing units enable the mounting of a universal illuminator and a motorized nosepiece.

Dynamic Auto-Focus Unit

LV-DAF

Hybrid Auto-focus features a wide focus range and fast tracking ability. A wide range of observation methods are supported, including brightfield, darkfield, and DIC. Reflective and transparent samples can both be observed.

Compact Reflected Microscopes

CM Series

Ultra-compact reflected microscopes designed for integration into production lines to observe on monitors.

Wafer Loaders

NWL200 Series

Nikon's proprietary technology ensures reliable loading of ultra-thin 100um wafers. The NWL 200 series achieve highly reliable loading, suitable for inspection of next-generation semiconductors.
Both brightfield and 3D images are available for various customer requirements.

### Wide FOV Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Wide FOV</th>
<th>Standard</th>
<th>High Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMA-5655 Series</td>
<td>250×200</td>
<td>300×200</td>
<td>450×400</td>
</tr>
<tr>
<td>VMR / VMZ-R</td>
<td>450×400</td>
<td>600×550</td>
<td>850×850</td>
</tr>
<tr>
<td>VMR-H</td>
<td>1000×800</td>
<td>1250×1200</td>
<td>1500×1500</td>
</tr>
</tbody>
</table>

### Standard Type

<table>
<thead>
<tr>
<th>Model</th>
<th>Wide FOV</th>
<th>Standard</th>
<th>High Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMR / VMZ-R</td>
<td>200×150</td>
<td>250×200</td>
<td>300×300</td>
</tr>
<tr>
<td>VMR-H</td>
<td>350×300</td>
<td>450×400</td>
<td>600×600</td>
</tr>
</tbody>
</table>

### High Accuracy Type

<table>
<thead>
<tr>
<th>Model</th>
<th>Wide FOV</th>
<th>Standard</th>
<th>High Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMR / VMZ-R</td>
<td>300×200</td>
<td>350×200</td>
<td>450×400</td>
</tr>
<tr>
<td>VMR-H</td>
<td>450×400</td>
<td>600×600</td>
<td>800×800</td>
</tr>
</tbody>
</table>

### Zoom Heads

#### Type A

- Wide FOV and long working distance enable comfortable operation.
- Laser AF and Touch Probe can be attached as optional accessories.

#### Type T2

- Equipped with 1:150× ultra high zoom ratio with 8 steps. Suitable for measurements of small targets up to several micrometers.

#### Zoom Heads

<table>
<thead>
<tr>
<th>FOV</th>
<th>Wixwex (mm)</th>
<th>Type A</th>
<th>Type 2</th>
<th>Type 3</th>
<th>Type 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Head</td>
<td>7.6 / 7.6</td>
<td>7.5 / 7.5</td>
<td>6.5 / 6.5</td>
<td>6.5 / 6.5</td>
<td>7.6 / 7.6</td>
</tr>
<tr>
<td>High Magnification Head</td>
<td>5.3 / 5.3</td>
<td>5.0 / 5.0</td>
<td>4.5 / 4.5</td>
<td>4.5 / 4.5</td>
<td>5.3 / 5.3</td>
</tr>
</tbody>
</table>

### Simultaneous wide-area height measurements with confocal optics and 2D measurement with 15× brightfield zoom optics.

**Conical NEXIV Series**

<table>
<thead>
<tr>
<th>Main Body (Type / Stage Stroke)</th>
<th>VMZ-K3040</th>
<th>VMZ-K6555</th>
</tr>
</thead>
<tbody>
<tr>
<td>XY Stroke (mm)</td>
<td>300×400</td>
<td>650×500</td>
</tr>
<tr>
<td>Magnification (Type H)</td>
<td>1.5× / 3×</td>
<td>1.5× / 3×</td>
</tr>
<tr>
<td>Magnification (Type T2)</td>
<td>1.25× / 2.5×</td>
<td>1.5× / 3×</td>
</tr>
<tr>
<td>Z-axis Stroke (mm)</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Max. guaranteed loading capacity (kg)</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Max. permissible error U1 / U2 / U3 (mm)</td>
<td>1.4+2 L/1000</td>
<td>1.5×+2 L/1000</td>
</tr>
</tbody>
</table>

### High Contrast and Multileveled Sample (PCBs)

Brightfield observation can sometimes be difficult due to blurred lines along sample structure. These lines can be clearly observed and measured using confocal optics.

**Thin Transparent Samples (Metal Surface Film / Semiconductor Resist)**

Top layers of both thin transparent film and metal surface can be easily detected using confocal optics.
Measuring Microscopes

Focused on high-precision and easy operability, a wide range of MM-products are available.

<table>
<thead>
<tr>
<th>MM Type</th>
<th>Compact Model</th>
<th>Basic Model</th>
<th>Large-Stage Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MM-200</td>
<td>MM-400</td>
<td>MM-800</td>
</tr>
</tbody>
</table>

With Nikon’s optical technology and newly developed stages, high-precision measurement can be achieved.

Newly Developed High-Precision Stages

The coarse/fine changeover lever and the RESET and SEND buttons are located near the X- and Y-axis knobs.

Focusing Aid (FA)

The newly developed Split-Prism FA delivers sharp patterns to allow accurate focusing during Z-axis measurements. FA patterns are clearly visible because they are split vertically.

Universal Type

Offers a line-up compatible with dimensional measurement and various observation methods.

Profile Projectors

Nikon’s profile projectors apply the principles of optics to the inspection of manufactured parts by projecting magnified silhouettes on a screen.

Data Processing System

Provides the user with various advanced measurements and processing functions. Automated edge detection with sub-pixel processing enables more precise and repeatable measurements.

Desktop Model

<table>
<thead>
<tr>
<th>V-12B</th>
</tr>
</thead>
<tbody>
<tr>
<td>60×60mm / 5kg</td>
</tr>
<tr>
<td>100×100mm / 10kg</td>
</tr>
<tr>
<td>150×150mm / 15kg</td>
</tr>
<tr>
<td>200×150mm / 20kg</td>
</tr>
<tr>
<td>250×150mm / 20kg</td>
</tr>
<tr>
<td>300×150mm / 20kg</td>
</tr>
</tbody>
</table>

Max. Workpiece Height: 105mm

Screen: 305mm

Image: Erect

Projection Lens: 5x/10x/20x/50x/100x

Digital Protractor: 30.5mm

Digital Counter: 50mm

Data Processor

EFFECTIVELY USED WITH A MEASURING MICROSCOPE / PROFILE PROJECTOR, IT QUICKLY CALCULATES AND PROCESSES MEASUREMENT DATA. FEATURE ORIENTED OPERATION OF THE DP-E1A ALLOWS THE USER TO CONDUCT MEASUREMENTS WITH THE GRAPHICS, PROVIDING A SEAMLESS MEASURING ENVIRONMENT.

Metrology Software

U-DP

The browsed geometric dimensioning software can be effortlessly connected via Ethernet or Wi-Fi to electronic devices. Interactive navigation enables immediate operation, while the simple screen layout enables easy measurement results confirmation.

Data Processing Software

E-MAX

Provides the user with various advanced measurements and processing functions. Automated edge detection with sub-pixel processing enables more precise and repeatable measurements.

Connected with profile projector, data processing functions only.

Connected with profile projector, retrofit counter and DP units are required.

<table>
<thead>
<tr>
<th>Operating environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: Windows®</td>
</tr>
<tr>
<td>Optional memory: 2GB (min.)</td>
</tr>
<tr>
<td>Recommended browsers: Windows® Internet Explorer Ver6.0-2.0 or later</td>
</tr>
</tbody>
</table>

Please refer to individual product brochures for further details.

Data Processor

Universal Type

Offers a line-up compatible with dimensional measurement and various observation methods.

Connected with profile projector, data processing functions only.

<table>
<thead>
<tr>
<th>Universal Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offered with various advanced measures and processing functions.</td>
</tr>
</tbody>
</table>

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</tr>
</tbody>
</table>

Please refer to individual product brochures for further details.
Autocollimators

Autocollimator is an easy-to-use but precise metrology instrument for angularity, parallelism, perpendicularity, straightness of precision components machine guideway and many other applications.

**Optical Flat**
The optical flat is used to check the flatness level of a surface provided with mirror-smooth finish. Flatness level can be measured by observing interference fringes by placing the optical flat in contact with the workpiece.

**Optical Parallel**
Both planes of the optical parallel have been precisely finished flat and parallel. It is used to check the flatness and parallel levels of a workpiece by observing interference fringes by placing the optical parallel in contact with the workpiece.

**Optical Flat / Optical Parallel / Standard 300mm Scale**

- **Optical Flat**
  - The optical flat is used to check the flatness level of a surface provided with mirror-smooth finish. Flatness level can be measured by observing interference fringes by placing the optical flat in contact with the workpiece.
  - Please refer to individual product brochures for further details.

- **Optical Parallel**
  - Both planes of the optical parallel have been precisely finished flat and parallel. It is used to check the flatness and parallel levels of a workpiece by observing interference fringes by placing the optical parallel in contact with the workpiece.
  - Please refer to individual product brochures for further details.

**DIGIMICRO**

With built-in photoelectric digital length measuring systems, DIGIMICRO offers flawless contact measurements of dimension, thickness, and depth.

**Main Unit**
- **MF-1001**
  - Measuring Range: 0–100mm
  - Accuracy (20°C): ±0.7µm
  - Measuring Force: Downward direction 1.225 to 1.813N (variable to about 0.441N), lateral 0.637 to 1.225N
  - Operating Temperature: 5 to 40°C

- **MF-501**
  - Measuring Range: 0–50mm
  - Accuracy (20°C): ±1µm
  - Measuring Force: Downward direction 0.245N, downward 0.637N, lateral to 1.225N
  - Operating Temperature: 0 to 40˚C

- **MH-15M**
  - Measuring Range: 0–15mm
  - Accuracy (20°C): ±0.7µm
  - Measuring Force: Upward direction 0.245N, downward 0.637N, lateral 0.441N
  - Operating Temperature: 5 to 40°C

**Observation Method**
- 6B-LED: Brightfield, 6D-LED: Darkfield

**Readout System**
- Adjustment in viewfield and reading on micrometer

**Measuring Range**
- 30 minutes of arc (both vertical and horizontal axes)

**Minimum Range**
- 0.5 seconds of arc

**LED Illuminator AC-L1**
- LED illumination unit for retrofitting onto Autocollimator 6B/6D illumination unit.

**Power Source**
- AA batteries×2, AC adaptor

**Standard 300mm Scale**

Gauges stage travel accuracy up to 300mm. Both 10mm-interval sensor patterns and calibrations are provided. Made of low heat-expansion glass, for minimizing influence of heat.

- *Optical flats and parallels with greater precision are available by custom orders.*
Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. November 2016 ©2014-2016 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.