FS70 MICROSCOPE

Ergonomic High-Power Microscope for Semiconductor Inspection
### FS70 Series Features:
- Erect Image Trinocular (50/50, 100/100), Erect Image Tilting Trinocular (50/50)
- Mitutoyo Infinity Corrected Optics
- Siedentopf Design Trinocular Body Tube
- Widefield (FN=24) 10X Eyepieces
- Four Main Body Types:
  - FS70 - Main Body (Non-Laser) with 1X-tube lens
  - FS70Z - Main Body (Non-Laser) with 1X-2X Zoom Magnification Changer
  - FS70L - Main Body 1X for Three YAG Laser Wave lengths 1064/532/355nm*
  - FS70L4 - Main Body 1X for Two Wave Length Ranges 532/266nm*
- Brightfield Objective Magnification Selections from 1X to 200X
- Extra Long Working Distance Plan Apochromat Objectives
- Laser Cutting Objectives
- Long Working Distance Plan Objectives for IR, NIR, UV and NUV applications
- Differential Interference Contrast (DIC) Option for Nonlaser Configurations
- Reverse 4X Nosepiece
- Optional Motorized 4X Centerable Nosepiece
- Six-foot Cable Remote Intensity Control for Fiber Optic Illuminator
- Concentric Coarse and Fine Focus –0.1mm Rev/Fine Focus
- Manual Focus Block

* Mitutoyo assumes no responsibility for the performance and/or safety of the laser system used with Mitutoyo microscopes.

### SPECIFICATIONS

|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|

**Focus adjustment**
- 50mm travel range with concentric coarse (3.8mm/rev) and fine (0.1mm/rev) focusing wheels (right / left)

**Image**
- Erect image

**Pupil distance**
- Siedentopf type, adjustment range: 2 - 3" / 51 - 76mm

**Field number**
- 24

**Tilt angle**
- 0° - 20°

**Optical pass ratio**
- 50/50
- 1000 or 0/100
- 50/50
- 1000 or 0/100
- 100/0 or 0/100
- 100/0 or 0/100

**Protective filter**
- —
- —
- Built-in laser beam filter
- Built-in laser beam filter

**Tube lens**
- 1X
- 1X - 2X zoom
- 1X
- 1X

**Applicable laser**
- —
- —
- 1064/532/355nm
- 532/266nm

**Camera mount**
- C-mount (using optional adapter B)
- Use a laser with TV port.
- C-mount receptacle (with green filter switch)

**Illumination system, optional**
- Reflective illumination for bright field (Koehler illumination, with aperture diaphragm)

**Objective, optional (for observation)**
- C-mount (using optional adapter B)
- Use a laser with TV port.
- C-mount receptacle (with green filter switch)

**Objective, optional (for laser-cutting)**
- M Plan Apo, M Plan Apo SL, G Plan Apo

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- M Plan Apo, M Plan Apo SL, G Plan Apo

**Loading weight***
- 32lbs/14.5kg
- 30lbs/13.6kg
- 31lbs/14.1kg
- 29lbs/13.2kg
- 31lbs/13.9kg
- 29lbs/13.1kg

**Mass (main unit)**
- 13lbs/6.1kg
- 15.5lbs/7.1kg
- 14.5lbs/6.6kg
- 16.5lbs/7.5kg
- 14.5lbs/6.7kg
- 16.5lbs/7.5kg

*Loading weight on optical tube excluding weight of objective lenses and eyepieces.*
System diagram

C-mount compatible analog camera or digital camera

0.5X TV adapter unit (375-054)

Differential interference contrast unit (378-076, 378-078, 378-079, 378-080)

Adapters

Eyepieces
WF10x/24 (378-856)
WF15x/16 (378-857)
WF20x/12 (378-858)

Polarizer (A) (378-092)

Polarizer (A) (378-092)

Polarizer (C) (378-094, 378-095)

FS70ZD
FS70Z (378-185-1)
FS70ZD-TH*1
FS70Z-TH (378-185-3)
FS70L
FS70L-TH (378-186-1)
FS70L4
FS70L4-TH (378-186-3)
FS70L4-TH (378-187-3)

Manual turret nosepiece unit (for BF/DF)
(176-211)

Self-aligning motorized turret nosepiece unit (for BF)
Quad (378-016A)

Self-aligning motorized turret nosepiece unit (for BF)
Quad (378-018)

Self-aligning motorized turret nosepiece unit (for BF)
Quad (378-016A)

Self-aligning motorized turret nosepiece unit (for BF)
Quad (378-018)

Fiber-optic illumination unit
100W (378-700A)
150W (176-316A)

Fiber-optic illumination unit
100W (378-700A)
150W (176-316A)

Filters (for fiber-optic illumination unit No. 378-700)
12AA8251 ND2
12AA8252 ND4
12BAA583 GIF
12BAA584 LB80

Third-party motorized X-Y stages (50x50mm) *3

Transmitted light unit
(378-730)

Simple stand (378-730)

Third-party motorized X-Y stages (50x50mm) *3

FS70Z
FS70L (378-186-1)
FS70L4 (378-187-1)

Objective
BD Plan Apo series (for observation): M Plan Apo series (for observation):
G Plan Apo series (for observation):
M/LCD Plan Apo NIR series (for fundamental/second harmonic laser machining); Used for L
M/LCD Plan Apo NUV series (for second/third harmonic laser machining): Used for L
M Plan UV series (for second/fourth harmonic laser machining): Used for L4

Objectives
BD Plan Apo series (for observation): M Plan Apo series (for observation):
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M/LCD Plan Apo NUV series (for second/third harmonic laser machining): Used for L
M Plan UV series (for second/fourth harmonic laser machining): Used for L4

WF10×/24 (378-856)
WF15×/16 (378-857)
WF20×/12 (378-858)

12AA8251 ND2
12AA8252 ND4
12BAA583 GIF
12BAA584 LB80

Filters (for fiber-optic illumination unit No. 378-700)

*1: Mitutoyo does not handle these lasers. Consult Mitutoyo for more information.

*2: A separate adapter may be required when mounting any of these stages. Consult Mitutoyo for more information.

*3: Dark-field model made to order

*4: 378-093 for FS70-L

*See Finescope Price List for complete list of accessories.
Optional Accessories for FS70

**Manual turret**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>378-018</th>
<th>378-211</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation method</td>
<td>Bright field</td>
<td>Bright/dark field</td>
</tr>
<tr>
<td>No. of objective mounts</td>
<td>4, with centering and parfocal adjustment (378-018)</td>
<td>—</td>
</tr>
<tr>
<td>View field adjustment</td>
<td>±0.5mm</td>
<td>—</td>
</tr>
<tr>
<td>Parfocal adjustment</td>
<td>±0.5mm</td>
<td>—</td>
</tr>
<tr>
<td>Mass</td>
<td>1.9kg</td>
<td>1.2kg</td>
</tr>
</tbody>
</table>

**Polarizer and analyzer**

For simplified polarized-light observation. Also suitable for enhancing contrast of low-magnification objectives.

For FS70Z 378-092
For FS70L4 378-094

**DIC unit**

Used for differential interference contrast observation in conjunction with the polarizer.

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Magnification</th>
</tr>
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<tbody>
<tr>
<td>378-076</td>
<td>100X, SL80X, SL50X</td>
</tr>
<tr>
<td>378-078</td>
<td>50X, SL20X</td>
</tr>
<tr>
<td>378-079</td>
<td>20X</td>
</tr>
<tr>
<td>378-080</td>
<td>10X, 5X</td>
</tr>
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**Adapter B**

Used for mounting a C-mount camera.

**0.5X TV adapter unit**

Allows observation over a wide field of view on the monitor (2X wide) due to the 0.5X relay optics. It is used in conjunction with the optional adapter B.

**Dimensions**

**Finescope FS70 Zoom Models**

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<td>378-080</td>
<td>14.5 lbs (6.6 kg)</td>
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<tr>
<td>FS70Z-THS (378-185-4)</td>
<td>378-081</td>
<td>16.5 lbs (7.5 kg)</td>
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<tr>
<td>FS70L-S</td>
<td>378-186-2</td>
<td>14.1 lbs (6.4 kg)</td>
</tr>
<tr>
<td>FS70L-THS</td>
<td>378-186-4</td>
<td>15.8 lbs (7.2 kg)</td>
</tr>
<tr>
<td>FS70L4-S</td>
<td>378-187-2</td>
<td>14.7 lbs (6.7 kg)</td>
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<tr>
<td>FS70L4-THS</td>
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Finescope FS70L & FS70L4 for laser applications

FS70L-S (378-186-2)  
FS70L-THS (378-186-4)  
FS70L4-S (378-187-2)  
FS70L4-THS (378-187-4)

Intermediate image position

All models
Whatever your challenges are, Mitutoyo supports you from start to finish.

Mitutoyo is not only a manufacturer of top-quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.