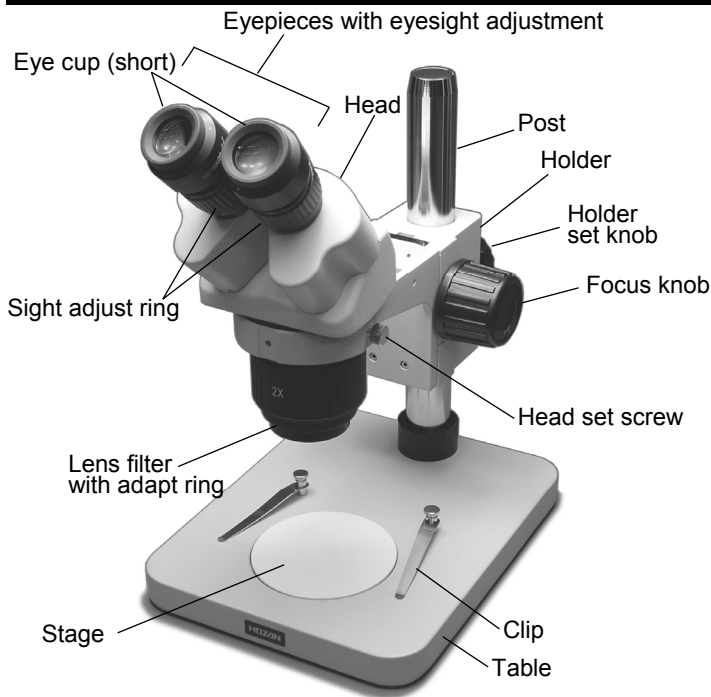


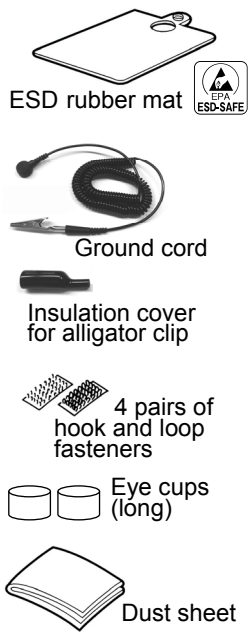
L-51 STEREO MICROSCOPE

Thank you for purchasing the HOZAN L-51 STEREO MICROSCOPE. With proper care and handling, this fine instrument will provide years of trouble-free operation. Please read this entire instruction manual carefully before attempting to place this instrument in service. Please keep this instruction manual available for reference.

Identification of parts and contents



Accessories



Specifications

Total magnification	10X/20X
Objectives	1X/2X selection format
Eyepieces	WF10X, Field number:20 (L-546-10)
Eyesight adjustment	Independent left and right, $\pm 5D$ ptr
Working distance	84mm (attaching lens filter w. adapt ring)
Focusing	Raise/lower stereo head (range 50 mm)

Stereo head spec.	Binocular 45° tilted head scope
Pupil distance range	54-75mm·left/right interlocking
Table dimensions	200(W)X255(D)mm
Post height	282mm
Distance between lens center and post	133mm
Weight	3.8kg

Warning and caution symbols

These symbols are used throughout the instruction manual to alert the user to potential safety hazards as follows :

⚠ Warning ··· Notice when incorrect handling could cause the user's death or serious injury.

⚠ Caution ··· Notice when incorrect handling could cause injury to the user or material damage.

Even if the instructions do not have **⚠ Caution** mark, there are some possibilities for a serious situation. Follow the instructions.

Precautions

⚠ Warning

1. To prevent the unit from falling and possibly causing injury to personnel, do not place this unit on unstable places, on tables with casters.
2. Do not unnecessarily remove the stereo head or the holder from the post or the holder. If it becomes necessary to remove them, hold them with both hands to prevent dropping them and possibly causing injury to personnel.

⚠ Caution

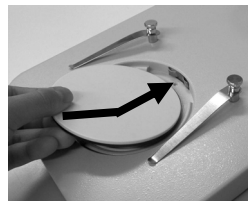
1. Do not disassemble or modify the L-51 yourself, otherwise this could cause a malfunction.
2. Always keep the lens filter in place to prevent dust or fumes from contaminating the interior of the microscope.
3. When using the rubber mat, be sure to ground, otherwise this could damage the object such as PCB.
4. Protect the unit against physical shock or vibration during transport. Otherwise, this could cause a malfunction.
5. Do not expose the unit to prolonged direct sunlight, high temperature, high humidity, or dust. Such exposure could cause a malfunction.

Preparation

First, make sure that the contents are complete.

Procedures in case of not using the ESD rubber mat

1. Settle the table accompanied by the post and the holder on an appropriate place.
Put on the stage. Orient it pressing the spring at the end of the hole as shown in the photo.
Choose black and white faces of the stage in accordance with object to be inspected.

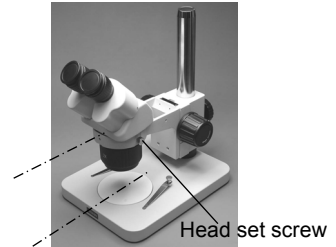


Preparation

- 2 Mount the holder at the low end on the post.
Turn toward the front, then securely tighten the holder set knob.



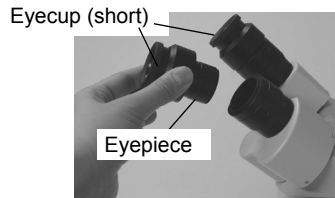
- 3 Mount the head.
Turn toward the front and secure the head set screw into any female screws, right, left or front.



- 4 Remove the cap from the objectives and attach the lens filter accompanied by the adapt ring.



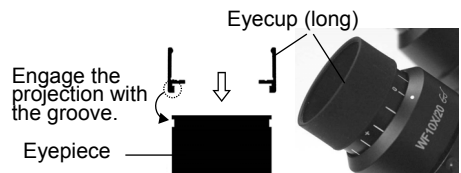
- 5 Remove the caps from the barrels. Then, insert the eyepieces into the barrels.



Please use eyecups (long) if necessary.

< How to attach the eyecup (long) >

1. Remove the eyecup (short).
2. Attach the eyecup (long) as shown in the illustration.



Choose to suit

Eyecup (short)

- for persons in spectacles

Eyecup (long)

- for persons in contact lenses or without spectacles

Bringing inspector's cheekbones at eyecups (long) stabilizes his/her eye points.

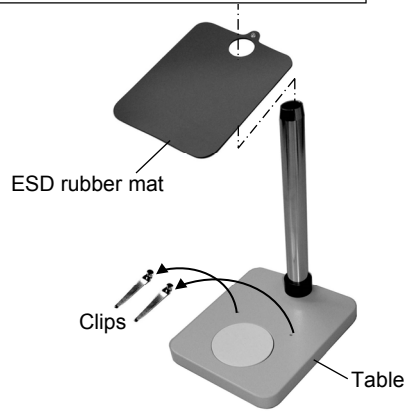
- for blocking the slanting rays

Preparation

Procedures in case of using the ESD rubber mat

The provided rubber mat is a static controlled ESD rubber mat. Use it with grounding when inspecting electronic components which are sensitive to static electricity. Refer to page 8 regarding ESD measures.

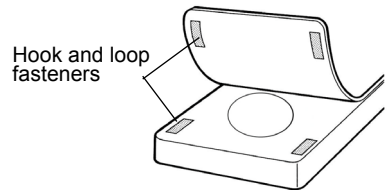
- 1 Settle the table accompanied by the post and the holder on an appropriate place. Also the stage should be set on the table.



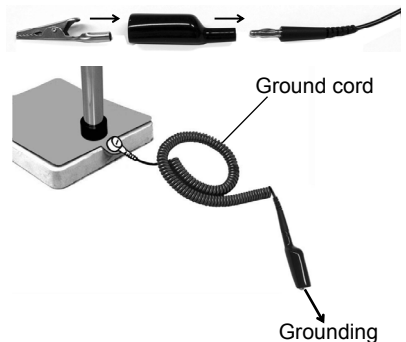
- 2 Loosen the holder set knob and remove the holder. Then, remove the clips. Finally, insert the rubber mat through the post with the green side up.



- 3 Attach the hook and loop fasteners to the top of the table and the black side of the rubber mat so that they can stick together.



- 4 Insert the alligator clip into the insulation cover for protection of electric shock. Then, attach the socket of the ground cord to the stud of the rubber mat behind the post. Finally, connect the insulated* alligator clip to the ground.



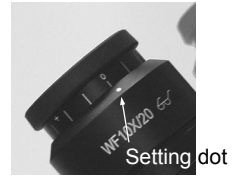
*Cut the cover to the proper length as needed.

- 5 Mount the holder on the post.

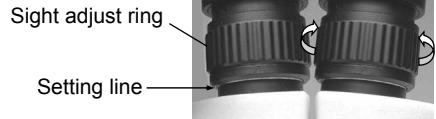
After this procedure, refer to 2-5 of "Procedures in case of not using the ESD rubber mat" on pages 3.

Operation

- 1 Be agreed "0" of the graduation with each setting dot, refer to the photo, of both the eyepieces. Keep this setting since the right and left eyesight will be adjusted at the main unit side (refer to 6 of page 6).



- 2 Rotate both the sight adjust rings so that the silvery setting lines are barely visible.



- 3 Adapt the eyepiece distance with your pupil distance to view a single circle of the field. The stereo barrels will rotate drawing arcs interlocking with (refer to the photo).

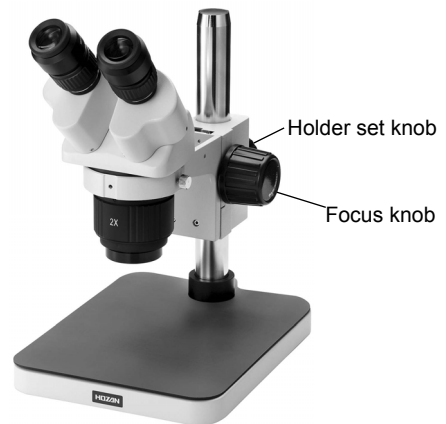


- 4 Place an object just under the objectives. Prepare lighting apparatus such as Hozan's L-711 LED LIGHT (refer to page 7) if necessary.

- 5 Adjust for proper focus with the focus knob while looking with both eyes. If the focus knob does not focus enough, move the holder up and down under loosening the holder set knob.

Always aim the same point if the surface of the object is not simply flat, otherwise the working distance* could differ from before and this could not come into focus.

*Working distance means the dimension from the top of lens filter to the object.



Caution

Loosen the holder set knob while supporting the holder with one hand when move it up and down. Otherwise, the holder could fall down suddenly damaging the unit, the object and the operator.

Operation

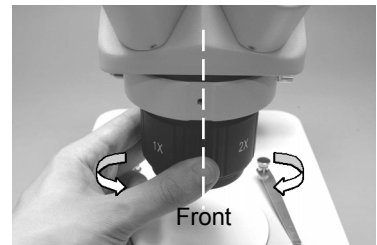
- 6** If the image is out of focus, it is due to the difference of right and left eyesight. First, turn the sight adjust ring for proper focus by looking with the dominant eye while closing the other eye. Then, adjust the other eyepiece similarly.



Proceed to procedure **8** if the image looking with both eyes is in focus. If the image is still not in focus, adjust each eyepiece again.

- 7** Treat procedures **4** to **5** and check if the image is in focus. Repeat these procedures so that a clear image can be obtained whenever the zoom magnification is changed.

- 8** Choose magnification among 1X and 2X. The working magnification is indicated by the stamp, carved on the objective barrel, which comes the front. The objective barrel rotates only 90° between these 1X and 2X.



- 9** Store the L-51 putting the dust sheet and such on after use.

Transfer

Hold the table by one hand and the post by the other hand tightly when transfer the L-51.

Inspecting a long object

The section of a long object and such can be inspected through the hole from which the stage has been detached.

⚠ Caution

Carefully work not to throw the table down.



Adjusting the tightness of the focus knob

The tightness of the focus knob for vertical movement can be adjusted. Turn the right focus knob counterclockwise while holding the left focus knob securely to decrease the tightness, or turn it clockwise to increase the tightness.

*Do not loosen unnecessarily, otherwise the stereo head could suddenly slide down.

Optional accessories

Use only the following optional accessories.

Photographic equipment

L-835 USB camera

Specimens under a microscope are photographed (still and video) mounting on it through the L-845 Adapter kit. Still images can be edited using the provided software. Without lenses.



L-835

L-846 Lens unit L-846-2 Adapter

Connecting the microscope and a digital camera with C mount, images of the full field being seen actually through the microscope are taken in high-definition.



L-846



L-846-2

Lighting systems

L-711 LED light

The light has few fluctuations of brightness and no flicker at all.



L-711

Various lighting systems can be used. Please refer to our catalog or web catalog.

Option lenses

L-546-10 Eyepieces (10X), standard L-546-20 Eyepieces (20X)

- A pair per pack
- With eyecups (long & short)
- * Eyecups (short) are attached when ship.



L-546-10



L-546-20

Conversion lenses

L-57-0.5 Conversion lens (0.5X), L-57-1.5 Conversion lens (1.5X) and L-57-2.0 Conversion lens (2X) are available. To install, first remove the lens filter, then replace the conversion lens and lens filter. Do not remove the adapt ring.

The magnification, filed of view and working distance gotten when combining eyepieces, objectives and conversion lenses are follows.

Magnification table Standard item

Objective	1X			2X			1X			2X			1X			2X								
Conversion lens							L-57-0.5						L-57-1.5						L-57-2					
Eyepiece	Magnification X	Field of view mm φ	Working distance mm	Magnification X	Field of view mm φ	Working distance mm	Magnification X	Field of view mm φ	Working distance mm	Magnification X	Field of view mm φ	Working distance mm	Magnification X	Field of view mm φ	Working distance mm	Magnification X	Field of view mm φ	Working distance mm	Magnification X	Field of view mm φ	Working distance mm			
L-546-10 (WF10X)	10	20	84	20	10	84	5	40	163	10	20	163	15	13.33	38	30	6.67	38	20	10	27	40	5	27
L-546-20 (WF20X)	20	10		40	5		10	20		20	10		30	6.67		60	3.33		40	5		80	2.5	

*The "working distance" is the distance from the end of the filter to the subject.

Daily care

Lenses


- Wipe away any dust gently with a soft cloth or a piece of gauze.
 - Clean away fingerprints or oil stains with a cloth which is lightly soaked in denatured alcohol (such as ethyl alcohol or methyl alcohol).
- * Alcohol is extremely flammable, so handle it with care.

Stereo head and plastic parts

- Wipe with a soft, dry cloth.
Do not use any organic solvents such as thinner, alcohol or either.
- When out of use for an extended period, store this unit in a dry dust-free place.

Antistatic standards

HOZAN's ESD-safe products are controlled with reference to the Japanese standard (RCJS-5-1*) which is based on the international standard (IEC61340-5-1).

Products which bear the “” mark are products to which the standard values (see table below) apply. The “ESD Standard” listed on each of the product pages denote the HOZAN standard for the product.

ESD-safe item requirements (Excerpted from RCJS-5-1)		
[Item-specific requirements]		
	Point to point resistance Rp (Ω)	EPA ground resistance or resistance Rg (Ω) of groundable point
Work surfaces, Storage shelves, Trolleys, and Carts	$1 \times 10^4 \leq R_p \leq 1 \times 10^{10}$ *1	$7.5 \times 10^5 \leq R_g \leq 1 \times 10^9$ *1

*1...A resistance lower than the minimum-limit resistance is acceptable of approved by the ESD coordinator.

- * Reliability Center for Electronic Components of Japan (RCJ).
“Protection of Electronic Devices from Electrostatic Phenomena-General Requirements” (RCJS-5-1)

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