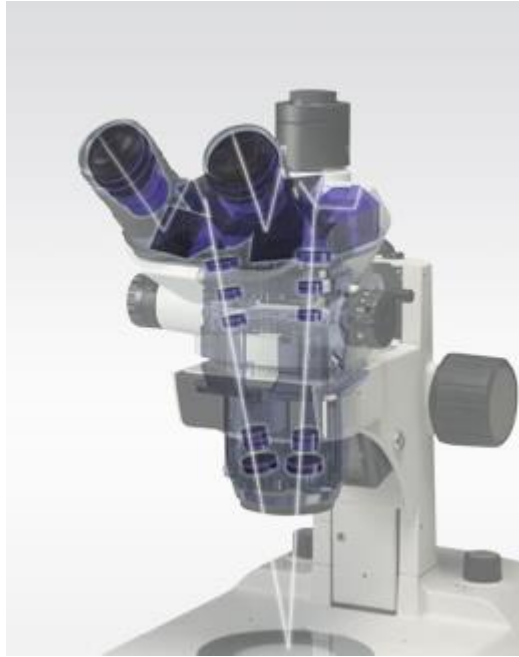


# Manual Ryeco RSZ-45 / RSZ-45-T



# Instruction Manual RSZ-45/T

# Manual Ryeco RSZ-45 / RSZ-45-T



## 1. Introduction to the Ryeco RSZ-45/T:

The Ryeco zoom stereo microscopes RSZ-45 series are high performance Greenough stereo microscopes with continuous zoom system 0,67 : 4.5 Total magnification varies from 6.7x to 45x / depending on the eyepieces and auxiliary objectives (0.5x, 0.75x, 1.5x or 2.0x) used less or higher .

It is the best equipment to examine all types of materials in three dimensions for industrial, biological and educational applications. With the bilateral zoom knob, the user can change the magnification in a factor of 6,428 with predict parfocality (focus is always maintained during the change of magnification) and par centering (magnification changes in a concentric pattern).

There are 2 models in the RSZ series:

- RSZ-45: Binocular head, professional stand with focus (different illuminators are available)
- RSZ-45T: Trinocular head, professional stand with focus different illuminators are available)

All the above versions may be fitted with a low cost overhanging universal Ryeco boom stand (Base Ø250mm/ stand height 480mm) or with the professional Ryf RUS-1 or RUS-2 Ryf Universal Stand (table clamp or 25 kg cast base plate (Swiss made), or a simple low cost boom stand version.



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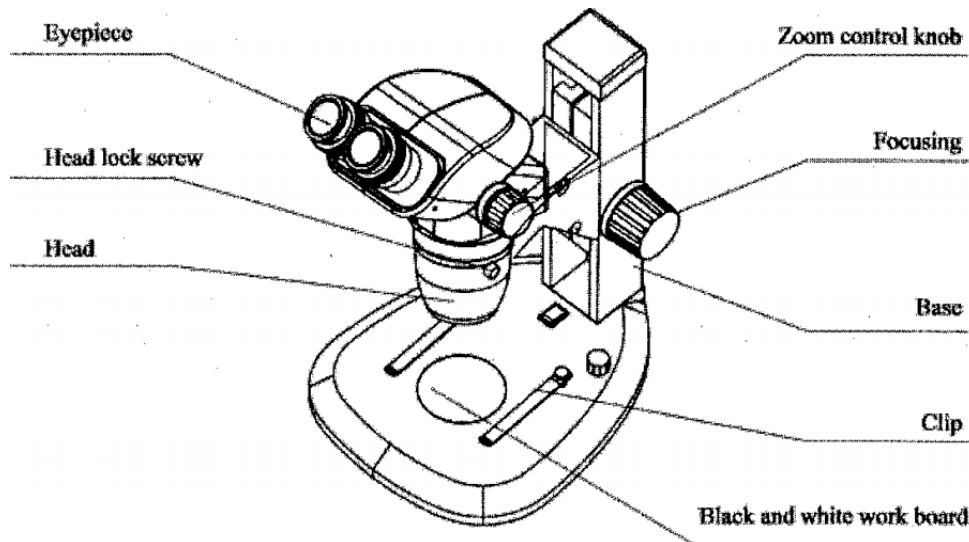
## 2. Unboxing and Assembling of the Ryeco Microscope

### Unboxing the Microscope

The components for the Ryeco RSZM series stereo microscopes are shipped detached for protection. Open the Styrofoam packing with care and do not leave any components attached to the packing being removed. Do not discard any of the packing materials until all components have been located. If damage occurs during transit, contact both the carrier and your supplier immediately.

### Assembling the Microscope

- When handling the components, especially all the optical parts, avoid touching any lens surface with naked hand or fingers. Any fingerprints or grease stains will negatively affect the image quality.
- After unpacking the stand, put it on a good stable table. Loosen the lock screw of the focusing carrier, adjust the height of the focusing carrier and lock the lock screw again. Make sure that the support collar is secured firmly below the focusing carrier along the vertical post. This is important as this collar functions to avoid the accidental falling of the microscope along the column.
- The focusing carrier should rest on the support collar and both the focusing carrier lock screw and the lock screw of the collar should be tightened.
- Put the stereo-body onto the focusing carrier and lock it by the lock screw on the right hand side of the focusing carrier. To maintain the best stability, it is advisable e to lock the screw on the left hand side of the focusing carrier.
- After removing the wrapping papers, End packing materials around the eyepieces and other optical parts (avoid touching the lens surface), carefully place the eyepieces into the eyepiece tubes.



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## 3. Alignment and Operation of the RSZ-45 Stereomicroscope

### Interpupillary Distance:

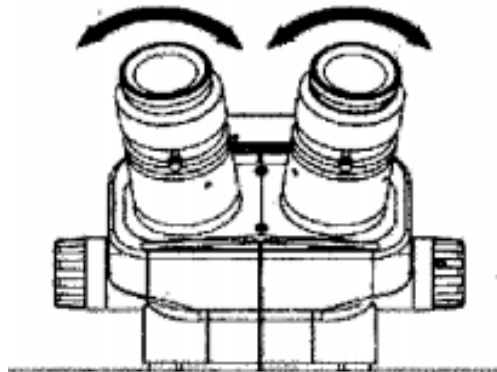
- Move the two eyepiece tubes until only one circular field may be seen through the two eyepieces. If two circles appear, the interpupillary distance is too big, and if 2 overlapped circles appear, the interpupillary distance is too small.

### Focusing the Stereomicroscope:

- Try to focus the sample at the highest magnification with the focusing knob. If it cannot be done, adjust the height of the microscope along the vertical post. Remember to lock the lock screw and support collar after aligning the height of the microscope.
- Turn the zoom to the highest magnification. By turning the focusing knob, focus the sample until the image is clear and sharp.
- Turn the zoom down to the lowest magnification. Adjust the diopter focusing knob of the right eyepiece until the image of the right eyepiece is clear and sharp.
- Repeat the procedure for the left eyepiece. Then, check the focus of the image for the whole zoom range. It should now be perfectly parfocal.

### Magnification and Working Distance:

- Select the desired magnification by adjusting the zoom knob. Change the eyepieces and/or add an appropriate magnifying objective lens if necessary.
- Total magnification used can be calculated by the following equation: Total magnification = Eyepiece magnification x Zoom magnification x objective lens magnification
- Normal working distance for the standard configuration [1x objective lens] is 95mm.



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## 4. Knowing your Ryeco Stereo Microscope

### Stereo Body with Binocular or Trinocular Head:

For the RSZ-45 series stereomicroscopes, the binocular or trinocular tube is built together with the stereo body to form a single piece named "stereo head".

### Stereo body

- The Stereo body is the key part of the microscope which includes the Greenough stereo zoom system 0,67 : 4,5. This system includes two telescopic zoom optics working for the left and the right eyepiece tube separately.
- With this system, the user can enjoy excellent depth of field and stereo effect. With the help of the precision optics from Ryeco, perfect parfocality may be maintained throughout the whole zoom range.
- Zoom knob is located bilaterally on both sides of the microscope and is printed with scale showing the zoom magnification used. Adjust this knob for changing the magnification of the image. If the microscope is properly aligned, the image focus should always be maintained when zoom magnification is changed (parfocal). For alignment procedure, please refer to section 3 of this manual.
- The stereo body is mounted onto the circular mount of the focusing carrier, and is locked by the lock screw on the left hand side of the carrier. During the operation of the microscope, this lock screw should always be locked firmly to maintain utmost stability.

### Binocular tube

The interpupillary distance may be adjusted by turning the two eyepiece tubes. For proper alignment of the interpupillary distance, please refer to section no. 3 of the manual.

### Trinocular / Beam Splitter tube for Ryeco RSZ-45T:

- Concerning the interpupillary distance adjustment and eyepiece lock see above Binocular tube
- By pulling out the slider at the back of the trinocular tube, all the light from the right eyepiece tube will be deflected into the phototube for TV or photography. At the same time, no light will enter into the right eyepiece tube for observation.
- At the top of the trinocular tube you can find the photo,/video attachment. With specific adaptor is possible the connection with CCD camera, photo,/camera reflex (Digital Nikon D70S or conventional) or a Nikon Coolpix 8400

### Stand

- Focusing carrier comes with the stand, see picture on page 1.
- To focus the sample, focusing knob is located bilaterally on both sides of the focusing carrier. By turning this knob, the microscope can be moved up or down for a certain distance to focus the sample. This movement is brought about by the Pinion Rack mechanism. The tension of the focusing knob can be adjusted by rotating the right focusing knob keeping still the left focusing knob.

### Original Ryeco Eyepieces and Auxiliary objectives:

- There are eyepieces of different magnifications for choices including 10x, 15x and 20x. The standard equipment goes with a pair of 10x eyepieces.
- To change the eyepieces, remove the original eyepieces, replace the new pair of eyepieces.
- There are additional objectives of different magnifications for choices including 0,5x, 1 ,5x, and 2x. We recommend to use additional objectives depending on the requirements of the working distance and magnification.
- To add an additional objective (auxiliary lens) onto the microscope, the user can simply screw the additional objective onto the stereo- head. The height of the microscope has to be readjusted as the working distance is changed when additional lenses are used.

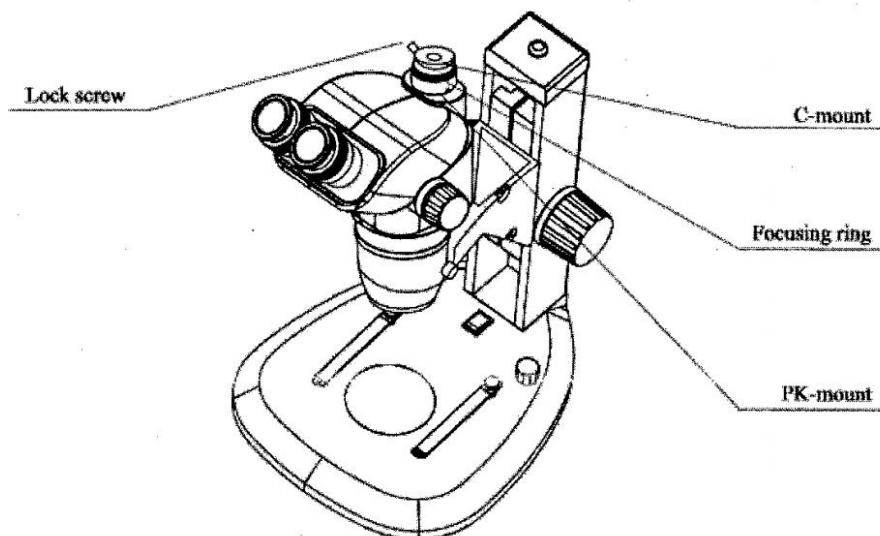
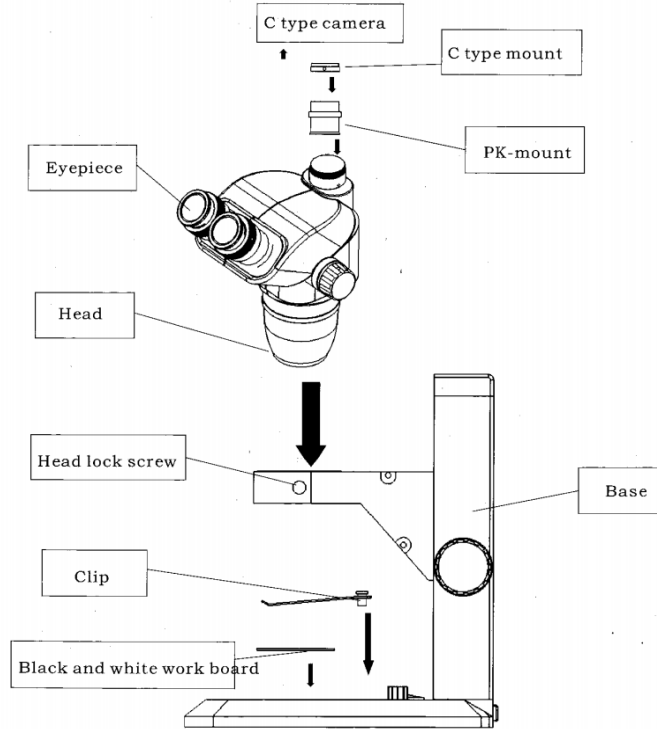
### Other Accessories:

For Ryeco RSZ-45 series there are other accessories designed to serve different special applications:

### TV-Adapter C-mount:

With this accessory fitting onto the trinocular head, Digital cameras may be screwed to the trinocular tube for observation c-mount should be used depending on the CCD or CMOS camera from Jenoptik or Nikon (ask Ryf AG or your local Dealer for more Details).

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## 5. Moving the Microscope

- If moving is unavoidable, the user should ensure that the eyepieces are firmly locked in the eyepiece tube, the microscope is firmly locked onto the vertical post and the support collar is firmly locked before moving.
- When moving the microscope user should use both hands, one hand holding the bottom of the stand, and the other hand holding the top of the vertical post on the focusing carrier of the microscope.
- The microscope should always be kept vertical throughout the process of moving.

### Electrical Parts of the Microscope

- Before plugging in the power cord with the supply, make sure that the supplying voltage matches with the operation voltage of the Equipment (Ryeco are only available for 220V only)
- Turn off the equipment before plugging in the power cord with the supply.
- Users should observe all safety regulations of the region The equipment has acquired the CE safety label. However users do have full responsibility to use this equipment safely.

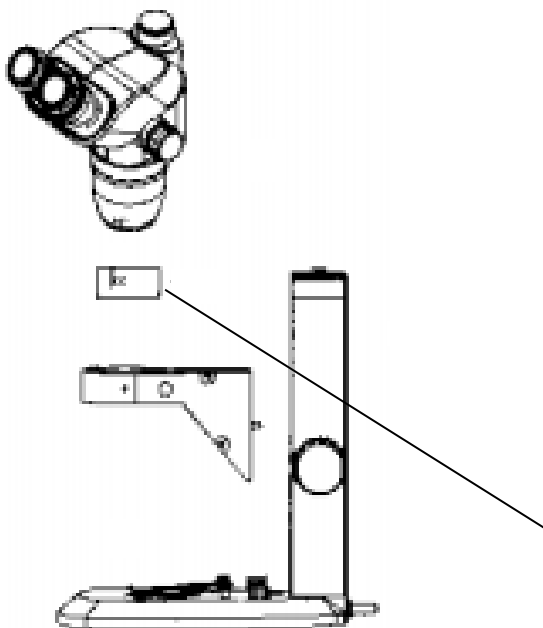
## 6. Cleaning and care of the microscope

### Cleaning

If dust is found on the optical surface, try to remove by air blower or better with canned air (Ryf cleaning Set). For fingerprint, grease stain or dust which cannot be removed by the air blower possible methods are recommended:

- To breathe lightly on the glass surface and wipe with a clean piece of cloth, lens paper or cotton swab.
- Please notice that small cotton fiber may be left onto the lens surface if cotton swab is used.
- Use a cotton swab or lens paper dip with a small amount of absolute alcohol (or better with Ryf cleaning Set) and clean the lens surface carefully. No other aggressive solvents should be used.
- In no circumstances should the user clean any lens surface with dry cotton swab, cloth or lens paper. This will scratch the lens surface causing irreparable damage.
- We do not recommend water for cleaning of lenses as it will leave some water stain on the lens surface and if water residue is left on the lens, fungus can grow causing irreparable damage.

| Ryeco no. | Eyepieces for RSZ-45:          |  |
|-----------|--------------------------------|--|
| RSZ-1002  | RWF 10x/22 eyepiece for RSZ-45 |  |
| RSZ-1003  | Eye hood RWF 10x               |  |
| RSZ-1013  | Eye hood ring RWF 10x          |  |
| RSZ-1004  | RWF 15x/16 eyepiece RSZ-45     |  |
| RSZ-1005  | RWF 20x/12 eyepiece RSZ-45     |  |



| Ryco. no. | Additional lenses RSZ-45: | Working distance (mm) |
|-----------|---------------------------|-----------------------|
| RSZ-1006  | 0.5x                      | 185mm                 |
| RSZ-1007  | 0.75x                     | 125mm                 |
| RSZ-1008  | 1.5x                      | 50mm                  |
| RSZ-1009  | 2.0x                      | 33mm                  |

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