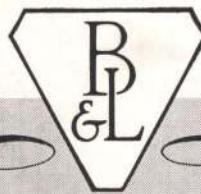


# OPTI-LUME MICROSCOPE ILLUMINATOR

CAT. NO. 31-33-02

REFERENCE MANUAL



BAUSCH & LOMB  
OPTICAL COMPANY  
ROCHESTER 2, NEW YORK

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## Description

The 31-33-02 Opti-lume is a convenient, compact unit designed to provide sufficient light for all visual observations of transparent specimens in bright-field illumination. It may be used in three ways: (1) with the microscope mirror, (2) without the microscope mirror, or (3) attached to the substage equipment of the microscope.

## Variations of the 31-33-02 Opti-lume

The Opti-lume is supplied with one of three available filters or with a condenser lens combined with one of three filters. It may also be supplied with or without an aluminized reflector which clips on to the lamp. The filters available are:

COLORLESS GROUND GLASS — used when maximum image brightness is desired.

BLUE GLASS (FROSTED) — to eliminate the slightly yellowish color of the lamp.

DAYLIGHT FILTER (FROSTED) — to provide light of a quality near that of northern skylight; preferred in many instances for the better evaluation of stains.

The addition of the condenser lens increases the image brightness considerably and improves the distribu-

tion of light in the field of view. The aluminized reflector further increases the image brightness.

## Using the Microscope Mirror

In cases where it is desirable to leave the mirror on the microscope, place the Opti-lume on the table in front of the microscope at a distance of two to three inches from the microscope mirror. The switch knob and electrical cord should be next to the table. Connect the cord to any 115-volt line. Turn the switch knob clockwise to turn on the lamp.

Position the Opti-lume so as to place its window centered with the microscope mirror and squared with the microscope base. Tilt the microscope mirror and adjust the microscope substage condenser until the field of view is brightly and evenly illuminated.

## The Opti-lume Without the Mirror

The 31-33-02 Opti-lume may be placed on the table directly beneath the substage condenser of the microscope in cases where the microscope mirror is easily removable.

With the mirror removed, lay the Opti-lume between the feet of the microscope base. The switch button should be to the left and toward the toe of the microscope base. Move the

Opti-lume to center it with the substage condenser, and adjust the substage condenser until the field of view is brightly and evenly illuminated.

It should be realized that when the Opti-lume is used in either of the manners described above, the microscope should not be tilted at the inclination joint, else uneven illumination will result.

#### **Attaching the 31-33-02 Opti-lume to the Microscope**

Three brackets are available by means of which it is possible to make the Opti-lume an integral part of the laboratory, student type microscope and

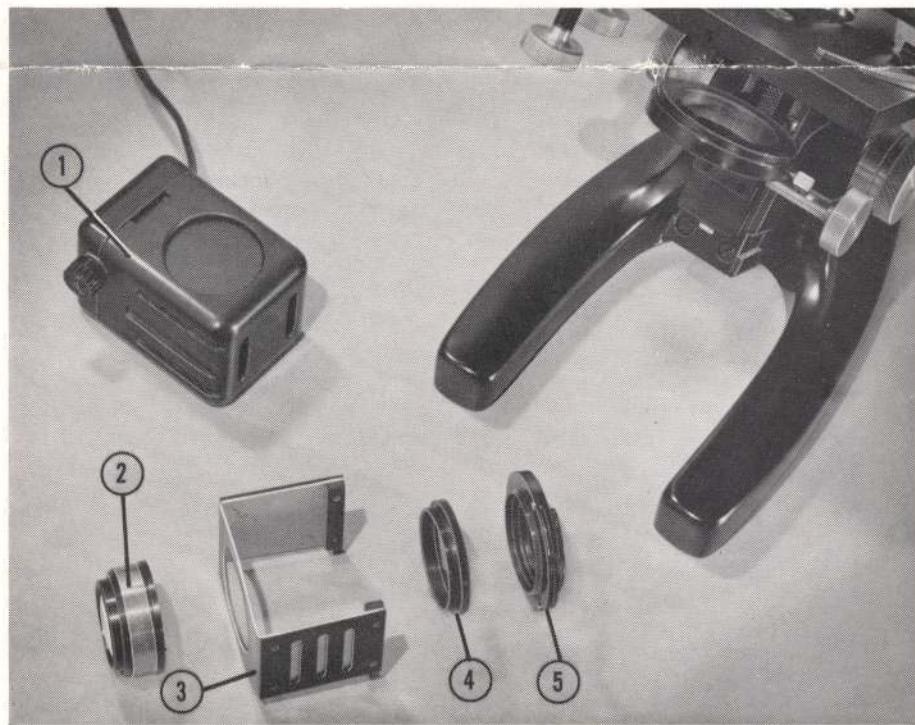
polarizing microscope stands. They are Cat. Nos. 31-34-47, 31-34-48 and 31-58-20 Brackets.

#### **Microscopes with Rack-and-Pinion Ring Type Mounts for Substage Condensers**

To this type of microscope the Opti-lume can be attached with the Cat. No. 31-34-47 Bracket. This includes the variable focus condenser models in which the lower lens of the condenser is held in the ring mount.

To attach the Opti-lume, remove the substage condenser from the ring mount and unscrew the iris diaphragm. Screw the iris diaphragm into the adapter ring supplied with the

*Figure 1 — The Opti-lume (1) with lower condenser element (2), Cat. No. 31-34-47 Bracket (3), adapter ring (4) which is supplied with the bracket, and condenser iris diaphragm (5).*



31-34-47 bracket. Insert the iris diaphragm between the sides of the bracket and extend the thread of the adapter ring through the round opening in the bracket. Screw the substage condenser onto the adapter thread to clamp the bracket between the substage condenser mount and the adapter ring.

Locate the iris diaphragm so that the handle may be moved through its full excursion between the sides of the bracket. Slip the substage condenser back into the substage mounting ring and clamp in place. With the window of the Opti-lume facing upward, insert the top of the lamphouse between the sides of the bracket. Engage the two fiber strips on the inner sides of the bracket in the central slots along the sides of the lamphouse. Slide the Opti-lume into the bracket as far as it will go. With the lamp turned on, focus the substage condenser until the field of view is evenly illuminated and the back aperture of the objective is filled with light.

#### **Microscopes with Tubular Type Variable Focus Substage Condenser**

The 31-34-47 bracket is also used to attach the 31-33-02 Opti-lume to this model substage condenser. The threaded adapter ring accompanying the bracket is not used, however.

Tilt the microscope at the inclination joint to a horizontal position. Remove the substage mirror and bracket assembly by pulling it straight outward away from the substage support. Slide the lower element of the substage condenser to its upper position. With a small screwdriver loosen the three set screws in the condenser tube immediately above the filter holder in bottom end of the tube. Turn the screws out equal distances, just far enough to permit removal of the filter holder.



*Figure 2 — Sliding the Opti-lume  
into the bracket.*

Insert the filter holder through the circular opening of the 31-34-47 bracket. Slip the filter holder back into the end of the substage condenser tube and lock it in place by turning in the three set screws referred to above. Before locking the assembly securely, turn the filter holder to position the filter slot to the front of the microscope and locate the sides of the bracket parallel to the feet of the microscope base.

Insert the lamphouse into the bracket, top foremost and with the window toward the substage condenser. Engage the fiber strips of the bracket in the center slots along the sides of the housing. Slide the housing into the bracket as far as it will go. Place a specimen slide on the stage. Turn the lamp on. Focus on the specimen and adjust the sliding lens of the substage condenser until the field of view is evenly illuminated and the back aperture of the objective is filled with light.

## FL Type Student Microscopes

For attaching the Opti-lume to this type of microscope the 31-34-48 bracket will be needed.

Tilt the microscope back at its inclination joint. With a small screwdriver remove the two screws which hold the mirror in the mirror fork. Now take out the screw holding the center of the mirror fork to the support post. Exchange the bracket for the mirror fork and secure it in place with the screw just removed. Rotate the bracket to position the fiber strips toward the base of the microscope. Insert the lamphouse between the sides of the bracket, top foremost, engaging the fiber strips in the central slots along the sides of the housing. Seat the housing in the bracket.

## Polarizing Microscopes

The 31-58-20 Bracket has been designed primarily for attaching the Opti-lume to the Polarizing Microscopes, although its use is not limited to these microscopes. The bracket is of a double fork type construction, one of the forks being identical to that of the substage mirror, the other receiving the Opti-lume housing. Remove the microscope mirror and replace it with the bracket. The bracket should be oriented so that the offset of the two forks is in the direction of the microscope base. Insert the lamphouse between the sides of the bracket, top foremost, and the fork arms engaging the slots in the lamphouse. Slide in to its fullest extent.

## To Replace Lamps

When it is necessary to replace a burned out lamp, the lower portion of the lamphouse, containing the switch, lamp, and socket assembly, will have

to be removed. This is most easily accomplished by inserting a coin, such as a twenty-five cent piece, in the slot in the lamphousing directly beneath the window, and twisting it, forcing the two parts of the lamp housing apart. The lower part may then be withdrawn, making the lamp immediately accessible.

If your Opti-lume is equipped with the clip-on aluminized reflector, remove it from the burned out lamp by pulling it off or by hooking the thumbnail under one corner and prying up slightly. The reflector may be placed on the replacement lamp by simply snapping it on—avoid using unnecessary force when doing this. Be sure that the reflector is placed on the lamp in the proper orientation, i.e., the reflector should be to the rear of the lamp when it is assembled in the lamp housing. The inner surface of the reflector has been aluminized for high reflectance—avoid touching this surface.

Manufacturer designation for replacement lamp is General Electric No. 15S11/102 (Refrigerator lamp). These are available at all stores carrying lamps for general household use and household appliances.

Replacement lamps may also be obtained from Bausch & Lomb; order by Cat. No. 31-31-15.

## To Replace Filters

Removal of the filter glass for cleaning or replacement is most easily done in the following manner. Place the lamp housing, window-side up, on the table. Withdraw the bottom section as described above. Insert the first two fingers of one hand into the housing. Press downward on the sheet metal light shield and draw outward at the same time. The light shield will slide

out easily, carrying the filter glass with it. A shallow, V-shaped spring between the box-like light shield and the rear wall of the lamphousing serves to hold the filter glass in place over the window of the housing. When replacing the filter, first insert the spring through the bottom opening part way into the housing.

The spring should lie with the apex of the V against the rear wall of the housing and parallel to the vent slots. Place the filter glass across the shoulders on the one open side of the light shield opposite the circular opening in the shield. Holding the filter in place, press the light shield down on the V spring and slide the whole assembly into the housing. Filter, spring and

shield should all be pushed into the housing as far as they will go.

If the condenser lens is involved, it is necessary to insert the lens first. In this case it will be more convenient to hold the lamphouse window opening down. Place the lens in the opening, convex side outward. Lay the filter glass in over the flat side of the lens, and slide the light shield in over the filter part way. Insert the V spring between the shield and rear wall of the housing, and slide the whole assembly into the housing.

The bottom of the lamphouse can be inserted in one position only. Align the switch knob with the V notch in the lower edge of the housing and insert the bottom section into the housing.

## Guarantee

From raw materials to final inspection, Bausch & Lomb products are made under the rigid control of mechanical and optical experts. The formulae for the glass used in optical elements and the design and manufacture of both optical and mechanical parts contribute to one purpose—a product which will afford you the highest satisfaction.

If a product of our manufacture proves defective in material or workmanship, an appropriate adjustment will be made. This guarantee does not cover damage in transit, damage caused by carelessness, misuse or neglect, or unsatisfactory performance as a result of conditions beyond our control.

*BAUSCH & LOMB OPTICAL CO.*