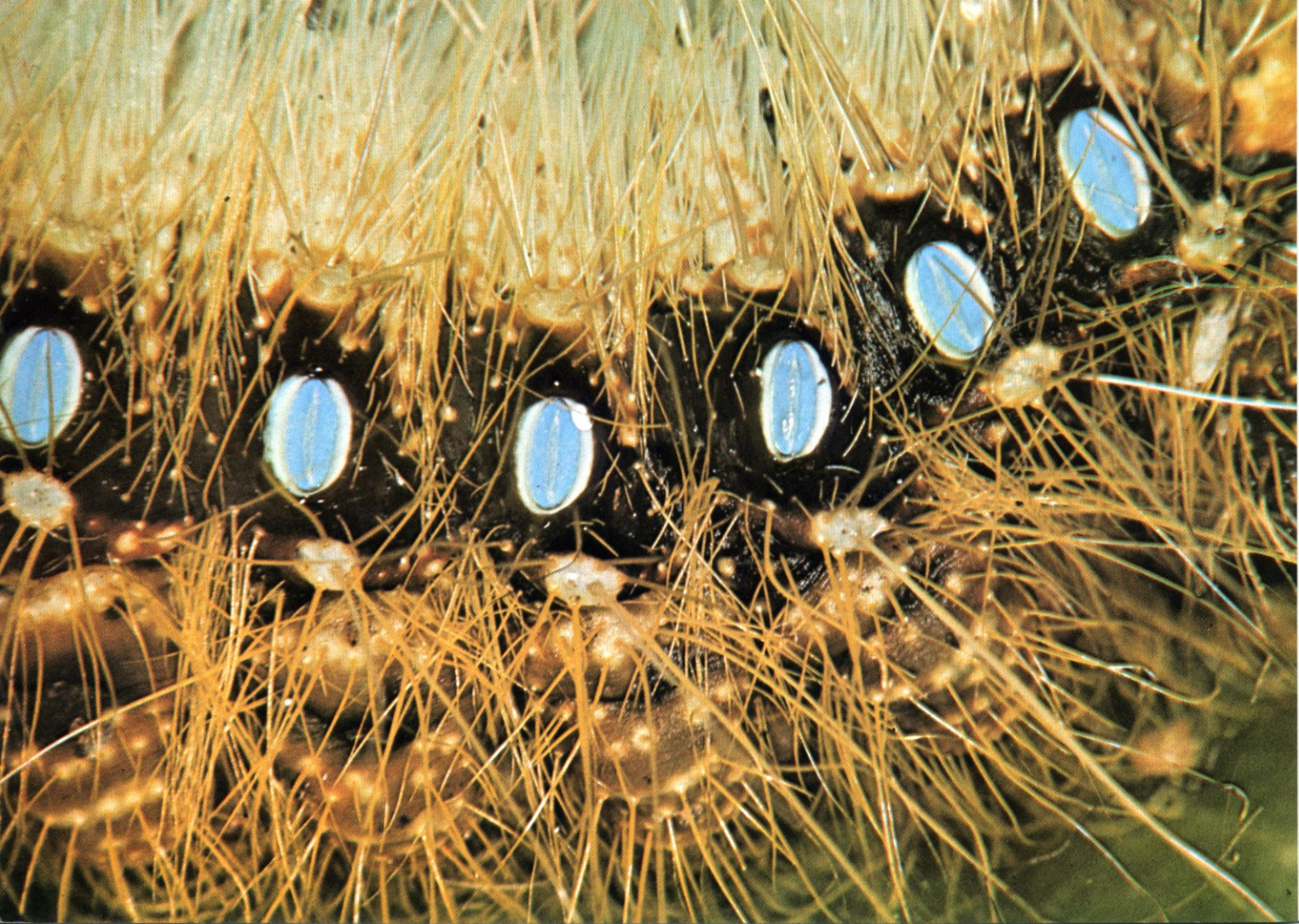
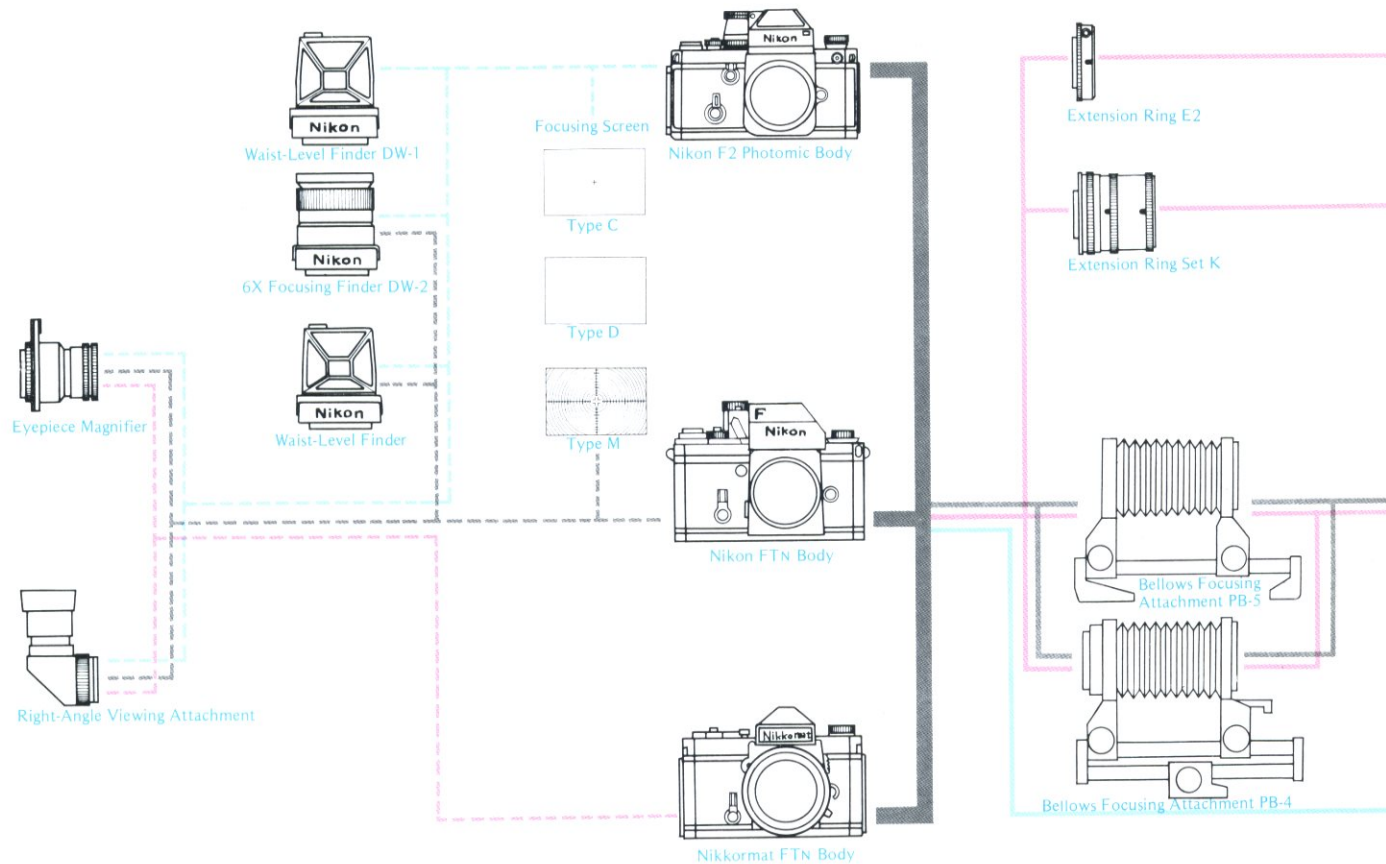


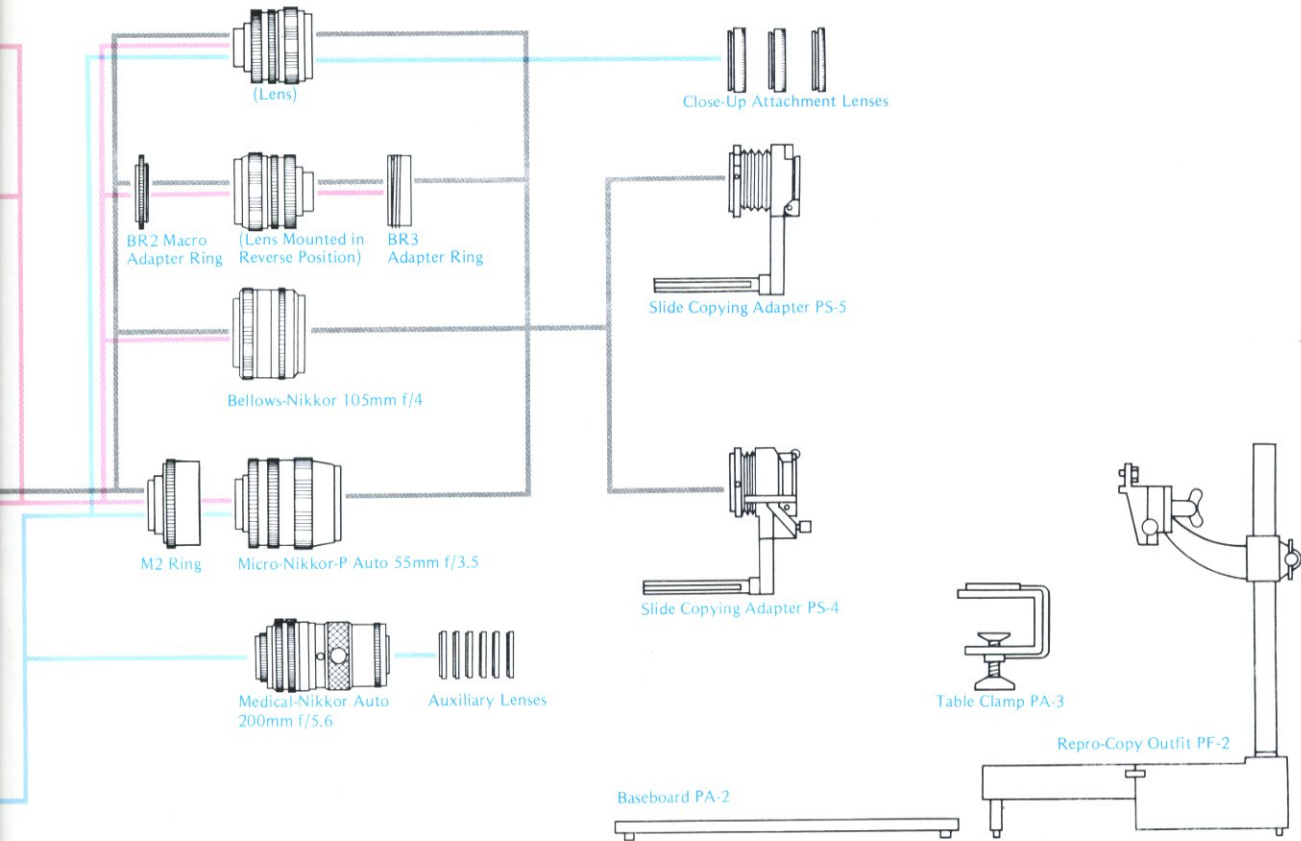


**Nikon**  
Close-Up  
Equipment



# Nikon close-up system





# Discover the magic of Close-ups

If you haven't tried close-up photography, you're missing half the fun of owning a Nikon or Nikkormat camera. And with Nikkor lenses and accessories, you can

take exciting close-ups without going any further than your own backyard. All you have to do is take a closer look at the world all around you.

Nikon offers the most complete and comprehensive system for close-up photography ever put together. From simple attachment lenses to high-precision equipment for scientific research, every item is designed and built with the same painstaking attention to quality that earned Nikon its worldwide reputation.

With Nikon accessories the possibilities are endless. Whether you're a demanding professional in search of a specialized tool, or a weekend hobbyist who wants to add a new dimension to picture-taking enjoyment, Nikon has the equipment you need to take the pictures you want to take.





Easy-to-use screw-on accessories



# Close-up attachment lenses

Compact and easy to use, attachment lenses are available in three powers, Numbers 0, 1 and 2. They screw right onto the front of any lens with a 52mm thread, either individually or in combination, to let you shoot medium close-ups without having to calculate exposure increase or losing the auto-diaphragm feature of Nikkor lenses. These lenses are fine for photographing subjects like flowers, insects, etc. which do not require extreme magnification.







# For greater magnification Extension rings



If you want to shoot at closer distances than the attachment lenses allow but would still like a compact, economical accessory, consider one of the extension rings that fit between the camera and lens.

The **E2 Ring** adds an extension of 14mm to the lens and has a built-in plunger that is pressed to open the lens diaphragm to full aperture for bright viewing and focusing. Releasing the plunger stops down the lens to taking aperture.

The more versatile **Extension Ring Set K** consists of five rings which are used individually or in various combinations to get a variety of magnifications. The rings can be used with any lens from 20mm to 300mm. The set comes in a leather case.



E2 Ring



K Ring Set



A superb two-in-one close-up lens

# Micro-Nikkor-P Auto 55mm f/3.5



Designed primarily for close-up photography, this remarkable lens features superb resolution and excellent image contrast and color correction. Its dual-helical focusing mount lets you focus from infinity down to 1/2X magnification. Add the M2 Ring which comes with the lens and you can shoot close-ups down to life-size. The Ring bayonets on or off in seconds. With a bellows focusing attachment or other accessory, you can even take photographs larger than life-size.

You can leave the lens right on the camera and use it for candid, landscapes or other general subjects — performance is virtually unchanged throughout the entire focusing range.





A close-up system for scientific and industrial photography

# Medical-Nikkor Auto 200mm f/5.6



Supplied with six auxiliary lenses, the Medical-Nikkor offers a choice of 11 magnifications from 1/15 actual size to 3X to meet virtually any medical, industrial or scientific photographic requirement. The lens has its own built-in electronic flash for shadowless lighting or for use in confined spaces and a focusing lamp to illuminate the subject during focusing. The correct lens aperture is set automatically in accordance with the magnification and the speed of film in use, and the long focal length allows close-up shooting from a distance. Even inexperienced photographers can count on quality results with this lens.

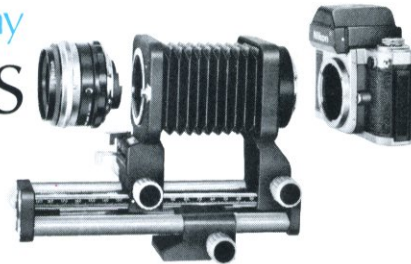




# Versatile attachments for macrophotography

## Bellows focusing attachments

*The most flexible of all close-up accessories, bellows attachments are essential for macrophotography (photography at larger-than-life-size magnification). They accept Nikkor lenses from 24mm wideangle to 300mm telephoto and can be mounted on a tripod or Nikon Repro-Copy Outfit.*

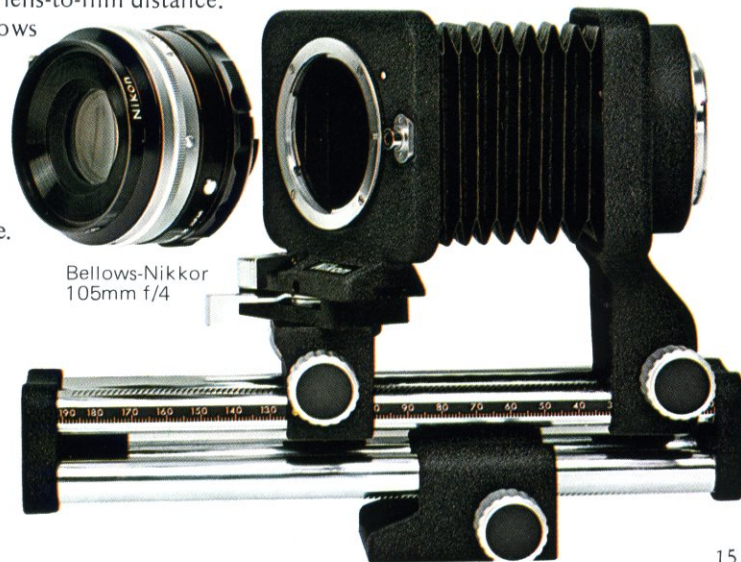


### **PB-4**

This is the most versatile of all the Nikon Bellows Focusing Attachments. The front lens panel swings and shifts to allow perspective correction and control over depth of field. And the unit features dual twin tracks one above the other so the entire camera/lens/bellows can be moved along the lower tracks for fine focusing without changing lens-to-film distance. With one of the slide copying adapters, the bellows can be used to duplicate or crop 35mm film or transparencies. Magnification extends from 1.2X to 3.6X with the 50mm f/2 lens (from 1.6X to 4.4X when the lens is mounted in reverse with the BR-2 Macro Adapter Ring). With the 24mm wideangle lens, magnification extends all the way to more than 10 times life-size.

### **Bellows-Nikkor 105mm f/4 lens**

Designed exclusively for use with bellows focusing attachments, this lens focuses continuously from infinity to 1.3X magnification when used with the PB-4 or PB-5 bellows unit. Focusing is done by adjusting the bellows extension. The lens has a preset diaphragm with two intermediate click stops between each pair of settings for more precise exposure adjustments.



*Small sculpture  
and finishing chisel*

## **PB-5**

A simplified version of the PB-4 but without the lower tracks or swing/shift provision. Accepts either PS-4 or PS-5 slide copying adapter.

## **Slide copying adapters**

Designed for use with Bellows Focusing Attachment PB-4 or PB-5, **Slide Copying Adapter PS-4** can be used to duplicate mounted 35mm transparencies or unmounted film in rolls. A pair of trays holds a roll of film. Originals can be moved up and down or sideways for

cropping. The bellows folds up when not in use and a magnet holds it shut for protection.

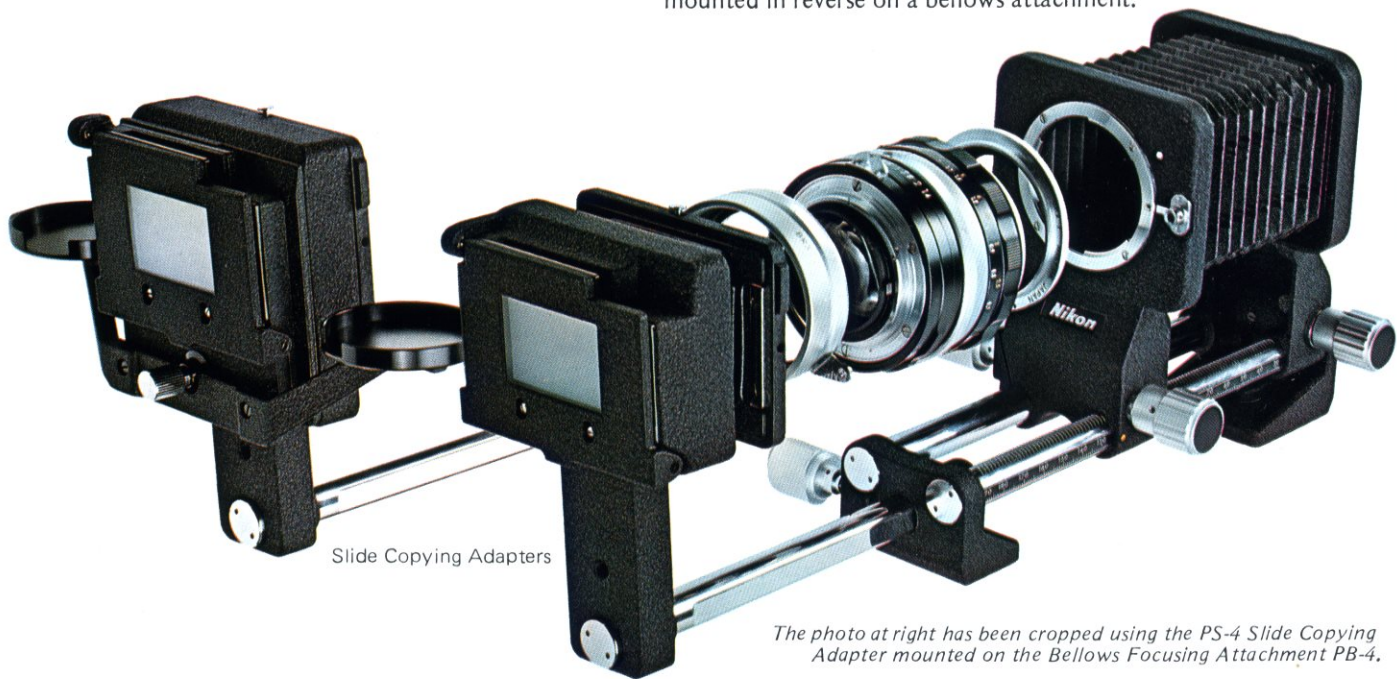
**Slide Copying Adapter PS-5** is similar to the PS-4 but without film trays or shifting mechanism. Intended mainly for exact duplication of slides.

## **BR-2 Macro Adapter Ring**

For mounting any lens with 52mm screw-threaded front mount in reverse position on the bellows unit when magnification greater than life-size is desired.

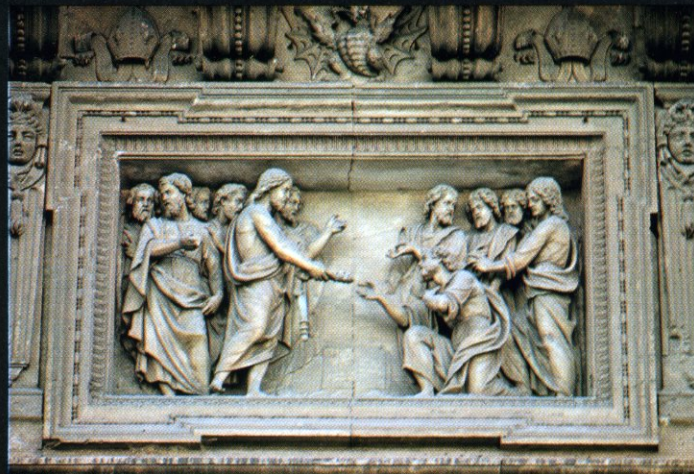
## **BR-3 Adapter Ring**

Used to connect Slide Copying Adapter PS-4 or PS-5 to a lens mounted in reverse on a bellows attachment.



*The photo at right has been cropped using the PS-4 Slide Copying Adapter mounted on the Bellows Focusing Attachment PB-4.*





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## Solid support for convenient copying Repro-copy outfit

Model PFC-2 consists of an upright column and a sliding arm and camera mount provided with a rack-and-pinion mechanism for fine focusing. Its solid wooden carrying case also serves as a base. The unit can be used with a bellows attachment, extension rings or other accessory mounted on Nikon cameras.

Model PFB-2 is provided with a baseboard instead of the wooden carrying case.

# Viewing/focusing aids

Nikon offers a number of accessories that facilitate accurate viewing and focusing — the critical considerations in close-up photography.

## Waist-level finder

Easily interchangeable with the Nikon viewfinder, this is particularly convenient for waist-level shooting, or when the camera is mounted either on a bellows/tripod assembly or the Nikon Repro-Copy Outfit. Self-erecting focusing head blocks out stray light, and pop-up magnifier aids in accurate focusing.

## Right-angle viewing attachment

This unit screws into the eyepiece of the Nikon or Nikkormat finder and permits viewing at a  $90^\circ$  angle. With a 50mm lens, magnification is approximately 0.6X; eyesight adjustment is from +3 to -5 diopter.

## 6X focusing finder

Designed for the most critical close-up work, this finder magnifies the entire viewing field 6 times, as well as allows waist-level viewing. Combined with cross-hair focusing screens such as types C and M, it enables pinpoint focusing through either the parallax or aerial-image focusing method or the regular method of split-image prisms, micropisms or matte screens. +3 to -5 diopter eyesight adjustment is possible.

## Eyepiece magnifier

The central viewfinder image is magnified 2 times for accurate focusing. The unit itself screws easily into the eyepiece of the Nikon or Nikkormat viewfinder and conveniently swings out of the way when not in use. Eyesight adjustment is from +1 to -5 diopter.

## Focusing screens

Choice of focusing screen is a decisive factor in effective close-up photography. The rule of thumb is to select a focusing screen that corresponds to the focal length of the lens. The improper adoption, for instance, of an ordinary split-image or micropism focusing screen in high-ratio image reproduction is likely to make focusing difficult because the image is usually dark. For efficient viewing and focusing, Nikon recommends the following focusing screens—





**Type B:** Fine-ground matte field over the entire screen, and Fresnel field outside a 12mm-dia. circle in the center. As Fresnel lens makes for bright image throughout the screen and matte surface allows focusing on any part of the screen, Type B is widely recommended for general close-up work.

**Type C:** Fine-ground matte field with a cross-hair reticle in a clear 4mm-dia. spot in the center. The bright viewfinder image is observed through the spot and can be accurately focused by means of the aerial-image or parallax focusing methods with the cross-hair reticle. Recommended for use with the 6X focusing finder.

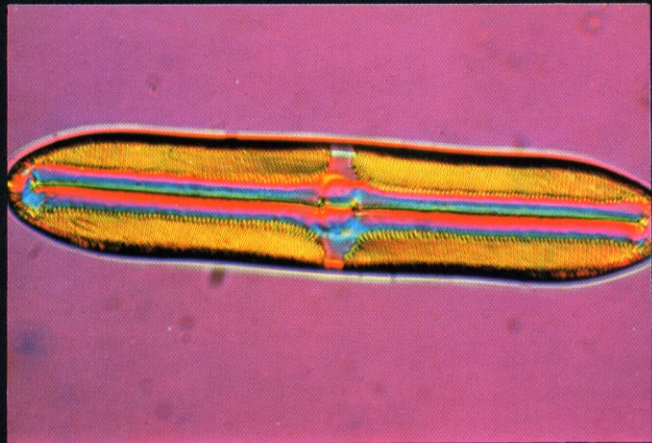
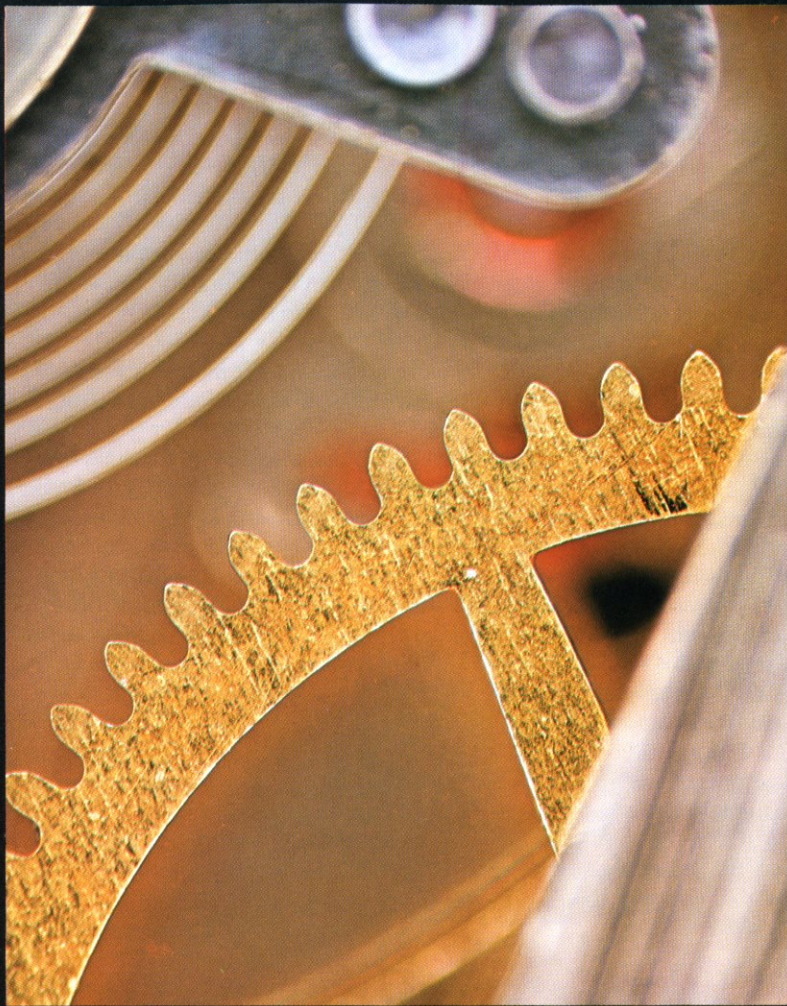
**Type D:** Fine-ground matte field over the entire focusing screen. Having neither a Fresnel lens nor any additional focusing aid, Type D is often used for close-up work where unobstructed viewing is required, such as copying documents.

**Type G3:** Clear Fresnel field with extra-bright central 12mm-dia. microprism focusing spot for extremely brilliant viewing and focusing even in poor light. Fresnel lens makes for bright image throughout the screen—including the corners. The prism angle and the power of the Fresnel lens of Type G3 (as well as H3) are suited for most close-up situations.

**Type H3:** Microprism focusing pattern over the entire screen. Clear Fresnel field. Accurate focusing on any part of the screen, optimum edge-to-edge brightness even in poor light.

**Type M:** Clear Fresnel field with a double cross-hair reticle in the center—plus vertical and horizontal scales. Suited for close-up work, involving high magnification, applying parallax or aerial-image focusing. Recommended for use with the 6X focusing finder. Subject image magnification can be measured through the scales.





# Special-purpose accessories for macrophotography and photomicrography

*Technically speaking, macrophotography and photomicrography differ from close-up photography. However, as natural extensions of general and close-up photography they have many uses, particularly in the scientific, medical and industrial fields. The accessories described on these pages were created to answer the demand for high-precision equipment for these and similar applications.*



*Diatom (right)  
Watch mechanism(left)*

## **Multiphot**

A pair of upright columns on a heavy 500 x 500mm base holds a movable H-shaped guide rail which provides rock-solid, vibration-free support for a Nikon F2 or Nikkormat camera, large format camera up to 4 x 5", cine-camera, bellows or other equipment. Four different high-resolution macro lenses are available to cover magnifications ranging from 1/3X to 40X. Diascopic illuminators, condensers, bellows units and a variety of other accessories make the Multiphot a highly versatile tool. Originally designed for macroscopic research on tissues and internal organs, it has other applications in macrophotography, photomicrography, cinemicrography, copying and close-up photography.

## **Microflex PFMF Prism Reflex Photomicrographic Attachment**

The Microflex PFMF is used to attach a Nikon or Nikkormat camera to any standard microscope eyepiece tube for high-quality 35mm photographs of microscopic images. It has its own built-in leaf type shutter and X-synchronization contact.

## **Microscope-Camera Adapter Model 2**

This simple device fits over any standard microscope eyepiece tube and utilizes the shutter and viewing system of a Nikon or Nikkormat camera for low power photomicrography. With the Model 2, even amateur photographers who own a microscope can take photomicrographs for study or pleasure.

# Close-up basics

*Close-ups needn't be more difficult than any other type of photography, especially with easy-to-use Nikon accessories. However, for best results it is worth remembering a few basic principles. Here are some tips to help you get more out of close-up photography.*

## Reproduction Ratio or Magnification

It means the ratio of the image size on film to the actual size of the subject. This relation is expressed in linear rather than areal measure. For example, at 1:5 reproduction ratio, the subject is five times as large as the image recorded on film. Reproduction ratio can be found by measuring the image size and dividing it by the subject size:

$$\text{Reproduction ratio} = \frac{\text{Image size}}{\text{Subject size}}$$

or by dividing the amount of lens extension from the infinity position by the focal length of the lens in use.

## How to Select the Right Equipment

The choice of equipment depends on many factors: type of subject, magnification, purpose of photography, convenience, etc. The best advice is to study and compare the features of the various accessories listed in these pages, then make a decision based on your personal needs and budget.

## Exposure for Close-Ups

When a Nikkormat FTN or Nikon Photomic-series finder is used, there is normally no need for exposure compensation: the TTL meter reads only the light passing through the lens regardless of magnification or whether or not a filter is used. However, when using a separate light meter it is usually necessary to increase the indicated exposure time or open up the lens when making close-ups with a bellows, extension tubes, etc. This is because the amount of light reaching the film plane decreases and the f-numbers

marked on the lens barrel are no longer applicable.

If an exposure meter other than a TTL meter is used, the following formula can be used to determine the correct amount of exposure adjustment:

$$K = (1 + M)^2$$

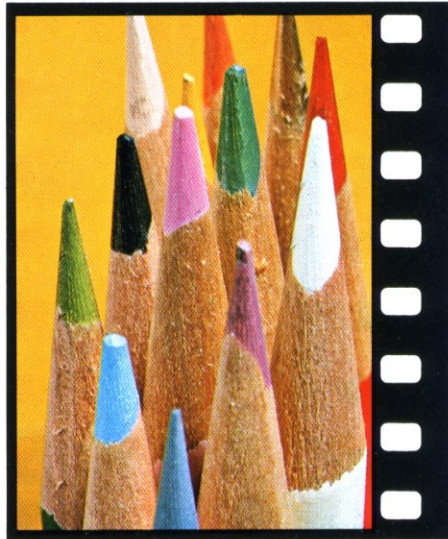
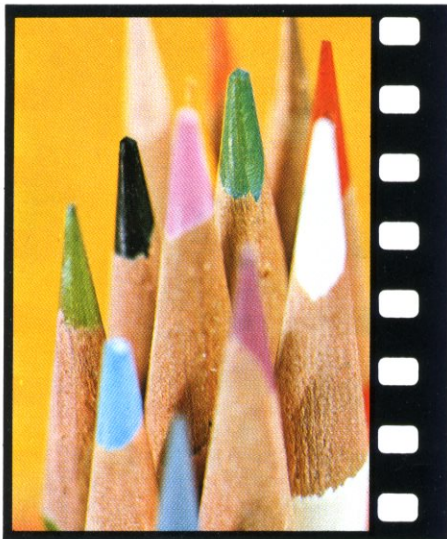
K is the exposure factor and M the magnification. For example, at 1X magnification, the exposure factor is equal to  $(1 + 1)^2$  or 4. This means that the lens must be opened up two stops or the shutter speed decreased by two steps for correct exposure.



## Depth of Field

As a general rule, depth of field decreases as the camera-to-subject distance decreases. In close-up photography it is extremely

shallow and decreases further as magnification is increased. It is advisable to stop down the lens to  $f/5.6$  or a smaller aperture.



## Focusing

Careful focusing is extremely important for good close-ups. Because of shallow depth of field, the slightest error can result in fuzzy pictures. In some cases, the use of a special-purpose focusing screen makes focusing easier (see page 21). The 6X focusing finder or the eyepiece magnifier also helps. To make sure the subject remains in fine focus, the use of a tripod or copy stand to hold the camera steady is recommended.

When making extreme close-ups, the light reaching the focusing screen decreases and the split-image or microprism may darken. In this case, focusing should be done on the ground-glass surface.



life-size

## MAGNIFICATION RANGE OF VARIOUS NIKON CLOSE-UP ACCESSORIES

*The breaks in the magnification range for the Close-Up Attachment Lenses and the Extension Ring Set K indicate the areas which these accessories do not cover. The light blue shaded area in the table shows the magnification range of each lens when used alone.*



2X



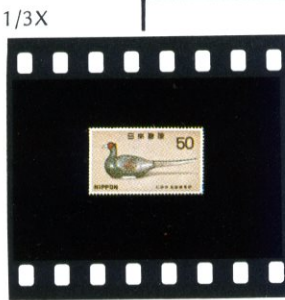
3X



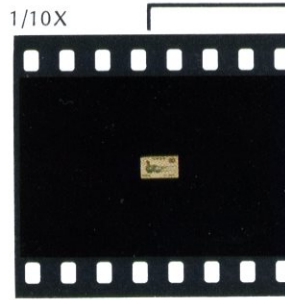
8X



1X



1/3X



1/10X



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