Nikon Photoengraving Lenses

EL-Nikkor Apo-Nikkor Process-Nikkor Micro-Nikkor

Various Versatile Nikkors

Rapid developments in printing techniques, the application of photoengraving to a wider range of industrial fields, stricter quality requirements and cost-benefit considerations — all these have combined to bring about higher and higher standards for precision and versatility in photoengraving work.

To meet these higher standards, Nikon has developed a group of professional photoengraving lenses with features to fill any user's requirements. Nikon is continuing research and development of optics in this field to meet the requirements of the future.

EL-Nikkor 210mm f/5.6

In selecting a suitable lens among a variety of Nikkors, the most important considerations are focal length, aperture, image size and standard magnification.

EL-Nikkor

- No image-plane displacement or image-size difference in the color separation process.
- High resolution and faithful reproduction of detail and contrast.
- Large apertures for shorter exposure times.

Subject area	Film size	Enlargement
45mmϕ	24x36mm	50mm f/2.8
45mmϕ	24x36mm	50mm f/4
56mmϕ	32x45mm	63mm f/3.5
80mmϕ	56x56mm(2¼x2¼in.)	75mm f/4
100mmϕ	56x72mm	80mm f/5.6
130mmϕ	65x90mm	105mm f/5.6
160mmϕ	90x120mm(4x5in.)	135mm f/5.6
190mmϕ	100x125mm(4x5in.)	150mm f/5.6
230mmϕ	130x180mm(5x7in.)	180mm f/5.6
270mmϕ	150x210mm(5x7in.)	210mm f/5.6
300mmϕ	180x240mm(8x10in.)	
330mmϕ	180x240mm(8x10in.)	240mm f/5.6
410mmϕ	270x330mm(10x12in.)	
432mmϕ	24x36mm	
440mmϕ	270x330mm(10x12in.)	300mm f/5.6
450mmϕ		
460mmϕ (at f/16)		
500mmϕ	300x400mm(11x14in.)	360mm f/5.6
520mmϕ	300x400mm(11x14in.)	
590mmϕ (at f/16)		
600mmϕ	14x17in.	
630mmϕ (at f/22)		
662.4mmϕ	32x45mm	
710mmϕ	16x20in.	
720mmϕ (at f/22)		
770mmϕ		
800mmϕ (at f/22)		
820mmϕ		
1030mmϕ	24x32in.	
1150mmϕ	64x95.5mm	
1170mmϕ	28x36in.	
1360mmϕ	31x44in.	
1750mmϕ		
2310mmϕ		

Standard magnification for the Apo-Nikkor and Process-Nikkor lenses is 1 : 1. As magnification is reduced, the image size also decreases. The image size at a particular magnification can be found by multiplying the image size at 1 : 1 reproduction ratio by the appropriate conversion factor given below.

Magnification	3	2	1	1/2	1/3	1/4	1/5	1/10
Conversion factor	2		1	3/4	2/3	5/8	3/5	11/20

Example: To find the image size for the Apo-Nikkor 360mm f/9 lens at 1/2X magnification, multiply the image size of the lens at 1 : 1 reproduction ratio (600mm) by the conversion factor (3/4) to get 600mm x 3/4 = 450mm.

Apo-Nikkor

■No image-plane displacement or no image-size difference in the color separation process.
■Corrected for optimum performance at around 1 : 1 reproduction ratio.
■High resolution for reproducing complicated typefaces.
■Accepts slip-in diaphragms.
■Suitable for distortion-free reproduction of figures at ratios near 1 : 1.

Process-Nikkor

■Designed for optimum performance at around 1 : 1 reproduction ratio.
■Wideangle design makes for compact unit, saves on working distance (e.g., up to 40 percent compared with the Apo-Nikkor when photographing a 17-1/2 x 22-1/2 inch original).
■Remarkable fidelity over the entire image area for a super wideangle design lens.
■For monochromatic reproduction.

Micro-Nikkor

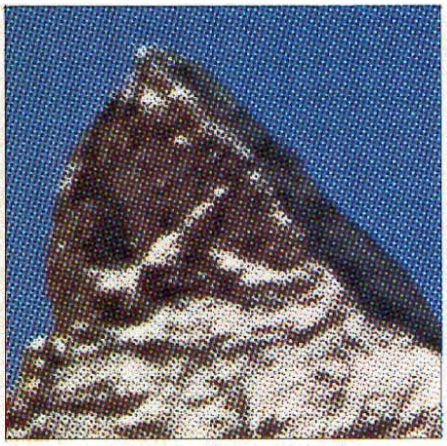
■Standard reproduction ratio of 1 : 10 or 1 : 12 gives optimum performance for reproduction work.
■Comparatively small image size.
■High resolving power over the entire picture area.
■For color work as well as monochrome.

1 : 1 Reproduction		Reduction
180mm f/9		
240mm f/9		
		55mm f/3.5
	210mm f/7 (FAX)	
	160mm f/5.6 (FAX)	
305mm f/9		
	210mm f/5.6 (FAX)	
360mm f/9		
	210mm f/10	
		70mm f/5
420mm f/9		
	240mm f/10	
455mm f/9		
	260mm f/10 (Q)	
480mm f/9		
610mm f/9		
		150mm f/5.6
760mm f/11		
890mm f/11		
1210mm f/12.5		
1780mm f/14		

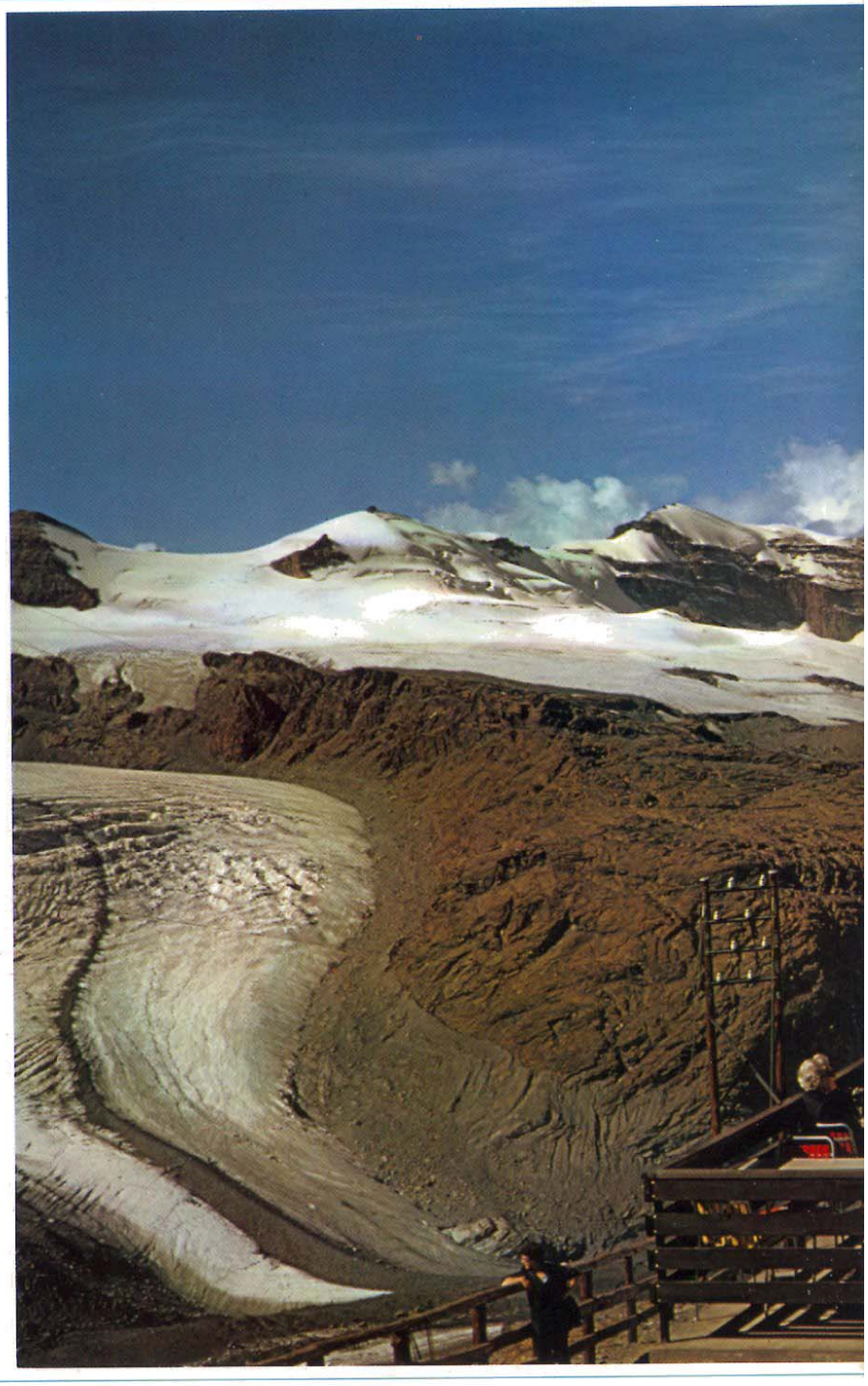
EL-Nikkor for Direct Screening Technique

This picture was printed by a direct screening technique using an EL-Nikkor lens.

Process work data:
Process: Direct method
Magnification: 10.15X
Lens: EL-Nikkor 63mm f/3.5 (stopped down to f/8)
Masking: Highlight mask and color correction mask (85B & 58)
Camera: Dainippon Screen C-56-E
Light source: Pulsed xenon, diffused lighting
Contact screen: Kodak chain screen, 150 lines/in. Emulsion: Sakura PH OH
Developer: Pakkoror 24-II, Sakura Dole 211
Offset: 6 colors
Plate: Aluminium deep-etch plate
Ink: Toyo King GT
Paper: Mitsubishi special art paper 25 x 37 in./93.5kg



20X magnified detail of the summit of the Matterhorn.

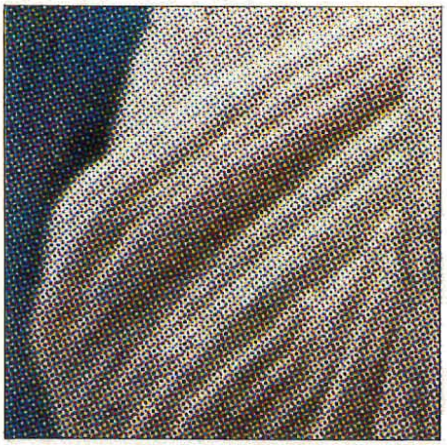


Picture data:
Lens: Nikkor Auto 50mm f/1.4 (1/250 second at f/5.6)
Film: Kodachrome II
Photographer: Eisuke Ishikawa

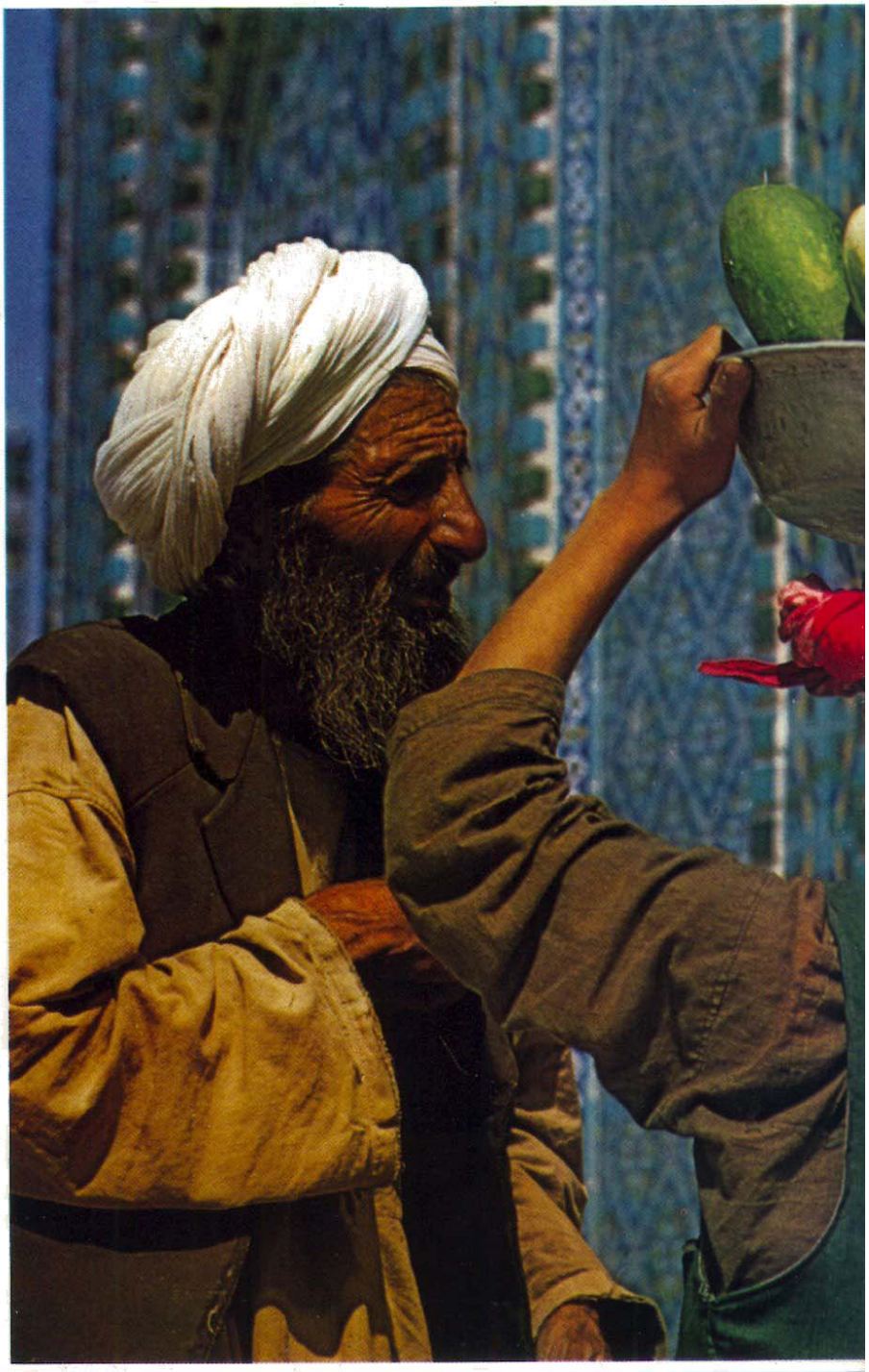
EL-Nikkor and Apo-Nikkor for Indirect Method

This picture was printed by an indirect method using EL-Nikkor and Apo-Nikkor lenses.

Process work data:
Process: Indirect method
Color separation
Magnification: 5X
Lens: EL-Nikkor 80mm f/5.6 (stopped down to f/16)
Masking: Highlight mask and color correction mask (TRI-mask)
Camera: Hoh & Hahne Selectron
Light source: Pulsed xenon, diffused lighting
Emulsion: Cronar separation negative, medium contrast
Developer: Pakkoror 17-1 Super G, Fuji LD-225
Screening
Magnification: 1.92X
Lens: Apo-Nikkor 305mm f/9 (stopped down to f/16)
Camera: Dainippon Screen Vertomatic Super C-632-E
Light source: Pulsed xenon, diffused lighting
Contact screen: Dainippon Screen Square-Dot 150 lines/in.
Emulsion: Fujilith Ortho V.O.
Developer: LogEflow LD-31, Fuji LD-322
Offset: 6 colors
Plate: Aluminium deep-etch plate
Ink: Toyo King GT
Paper: Mitsubishi special art paper
25 x 37 in./93.5kg



20X magnified detail of the turban on the left side of the photograph.



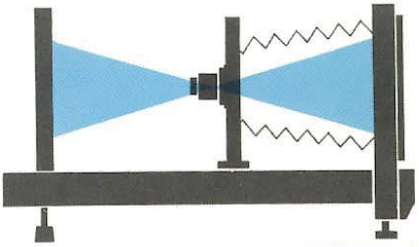
Picture data:
Lens: Nikkor Auto 135mm f/2.8
Photographer: Suzanne G. Hill

Apo-Nikkor and EL-Nikkor for Color Separation Process

Here are some of the reasons why Apo-Nikkor and EL-Nikkor lenses are so popular for color separation process.

Apo-Nikkor Lenses

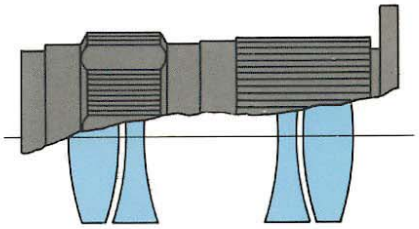
■Apo-Nikkor lenses are corrected for optimum performance in the area near 1 : 1 reproduction ratio at which photoengraving work is usually done.



■The lenses have high resolving power which faithfully reproduces delicate and complicated typefaces.

■Apo-Nikkors are apochromatic, which means that chromatic aberrations are strictly corrected and no displacement of image plane or difference in image size occurs.

■The lens configurations are symmetrical so they can be used for either enlargement or reduction without reversing the lens.

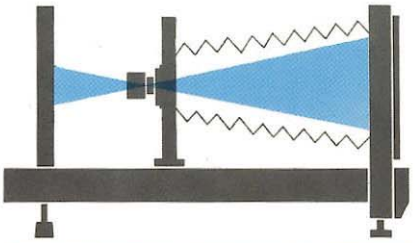


■The lenses accept easy-to-mount slip-in gelatine filter holders and diaphragm plates. Diaphragm plates can be easily machined to change the shape of the screen dots for special printing effects.

■The wide diaphragm control flange has four service holes which can be used for mounting a remote diaphragm control ring or manual diaphragm index scale.

EL-Nikkor Lenses

■EL-Nikkors are designed exclusively for best performance when used for enlarging.



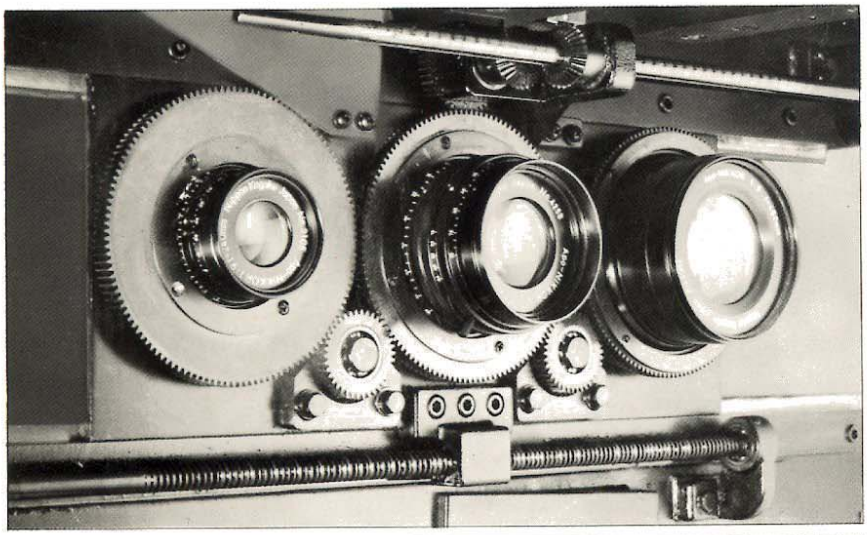
■They are made of specially selected high-quality optical glass. Like the Apo-Nikkor series, they are strictly corrected for chromatic aberrations and have high resolving power.
■Large apertures save on exposure time, especially advantageous in the direct screening color separation work which normally requires long exposures.
■Special mounting rings or adapters allow the EL-Nikkors to be mounted to the camera in normal or reverse position.

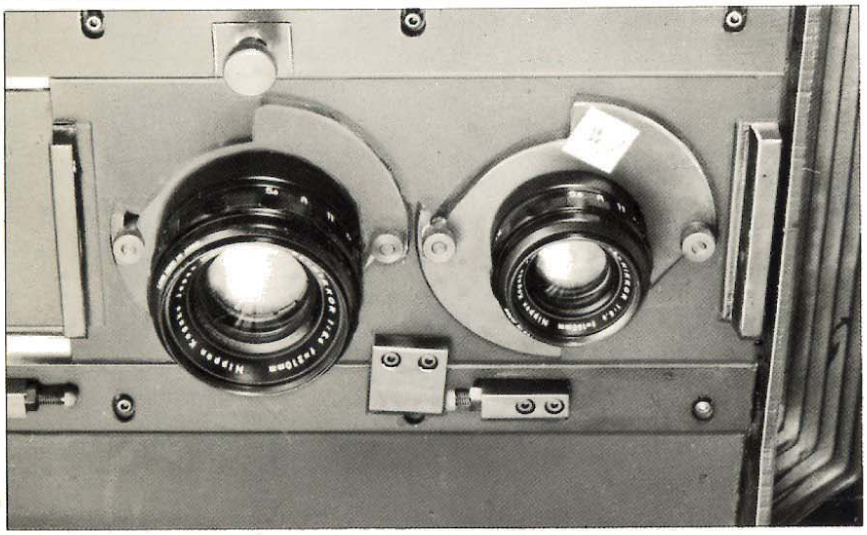
Correction for chromatic aberrations

Since the spectrum sensitivity of film emulsions does not always correspond with that of the human eye, the Apo-Nikkor and EL-Nikkor lenses are corrected for aberrations even in the near ultraviolet range. They can be focused easily and accurately with the naked eye even when used with emulsions sensitive to near-ultraviolet rays.

Choose the Right Lens

For best results, select the lens with features that fulfill your specific photographic requirements.





Lens selection

Except for special cases where a camera/lens setup is used permanently for photographing originals of uniform size at constant magnification, photographic requirements normally change depending on the size of the original, the final picture size, magnification or other factors.

Thus,in order to meet various customer's specifications it is ordinarily necessary to keep a number of lenses on hand and select the best one for each job. Even though it may be possible to get by with a single camera and lens of large covering capacity (large effective image diagonal length), this will not deliver highest quality results in every situation.

If a lens is not used correctly, you cannot expect good results. For example, when you use the Apo-Nikkor 480mm lens for enlargement and color separation of a 4" x 5" format film, the rated performance of this lens is not guaranteed since the lens is corrected for optimum performance in covering a subject area of 820mm in diagonal length at near 1 : 1 reproduction ratio—and not for enlargement covering a smaller area, such as the 4" x 5" (150mm diagonal) film. Image quality improves surprisingly when an enlarging lens specifically designed for the 4" x 5" format (such as the EL-Nikkor 150mm lens) is used. Aberrations other than chromatic aberration increase with the focal length of the lens.

If you want the best quality results for every job, the investment in two, three or even more lenses for popular image sizes will pay dividends, even though you use only one for each picture-taking session.

Focusing

Regardless of the f-number to be used for taking the picture, always focus with the lens wide open. The larger aperture makes for brighter focusing images, and reduced depth of focus makes sharp focusing easier.
Be sure to check the focus for maximum sharpness over the entire image area, not just at the center.

Service life of lenses

The service life of a particular lens depends on the conditions under which it is used. Incorrect use or poor ambient conditions can reduce the life of a lens. Some users replace their lenses every year. However, used correctly in a proper studio, lenses will ordinarily give good service for three or four years. The following are some considerations affecting lens life.

■The chemicals used in photoengraving shops can contribute to deterioration of lens performance, although not to any great extent. Normally a good quality lens will last three to four years.

■Dust, dirt, moisture or scratches on lens surfaces also cause lens contrast and resolution to deteriorate and eventually make replacement necessary.

For all these reasons, periodic replacement of lenses is advisable for photoengraving shops which want to keep abreast of developments and to offer quality service to customers.

Note: Every Apo-Nikkor lens is supplied with a data sheet which gives the exact measured focal length of the lens. Exact focal lengths vary from one lens to another within certain dimensional limits. For some automatic focusing cameras which require replacement of a lens having a focal length as close as possible to that of the old lens, it is advisable to allow plenty of time for the order to be filled.

Selecting the aperture

Although it is commonly believed that a lens should be used with its diaphragm stopped down, theoretically higher resolving power can be obtained at larger apertures.
The resolving power at the center of the image area in accordance with effective f-number is shown in the table below. The values given apply where the wavelength is 560mμ (e-line).

Remarks: Effective f-number = f-number x (1 + magnification ratio). When an ordinary lens is used at full opening, some slight aberrations remain and resolving power obtained is lower than the rated theoretical value. As the diaphragm is stopped down, the residual aberration disappear and overall performance improves. However, if the lens is stopped down too much, the resolving power decreases by diffraction as proved theoretically. Therefore, care must be taken not to stop down too much except for special purposes. EL-Nikkor or Apo-Nikkor lenses give the best results when the diaphragm is stopped down one or two stops (three stops for long focal length lenses).

Effective f-number	Resolving power (lines/mm)
5.6	268
8	188
11	136
16	94
22	68
32	47
45	33
64	23
90	17
128	12

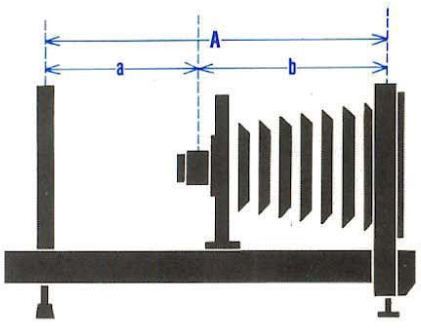
※ Theoretically calculated values

Relationship between lens focal length, magnification and working distance

(distance from original to film plane)

Focal length (f)	Longer	Shorter
Original to film distance (A)	longer	shorter
Original to lens mount distance (a)	longer	shorter
Lens mount to film distance	longer	shorter

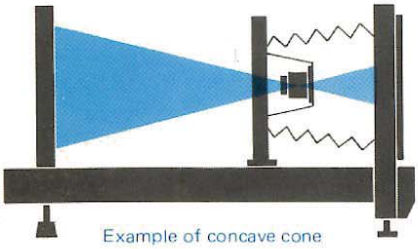
Magnification (M)	Higher	1X	Lower
Original to film distance (A)	longer	4 times the focal length	longer
Original to lens mount distance (a)	shorter	2 times the focal length	longer
Lens mount to film distance (b)	longer	2 times the focal length	shorter



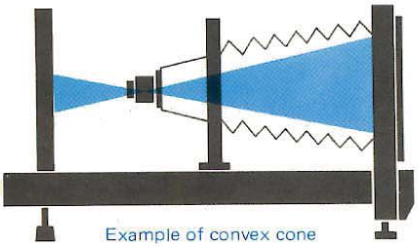
$A = a + b$
$= f(2 + M + 1/M)$
$a = f(1 + 1/M)$
$b = f(1 + M)$

Lens adapters

When setting up a camera with a main lens of given focal length for a required magnification, it is necessary to consider physical limitations such as the length of the bed and the locations of the original holder and lens mount. It may become necessary to consider if a sub-lens can cover the desired magnification. If for some reason a particular sub-lens can be used in view of the physical limitations of the setup, a concave or convex cone can be used as an adapter.
The type of adapter used will depend on the lens to be used and the magnification required. Your Nikon dealer can furnish details.



Example of concave cone

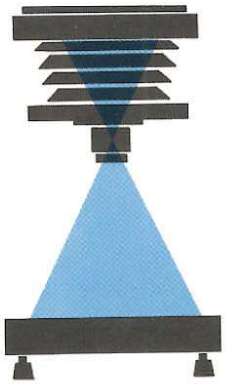


Example of convex cone

EL-Nikkors and enlarger-type process camera

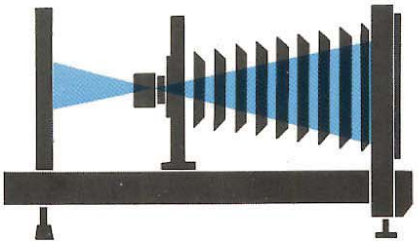
This is the standard way of mounting EL-Nikkor lenses. The lens should be mounted with its rear end facing the camera.

Note: The end of the lens marked EL-Nikkor is the front side.



EL-Nikkors and darkroom process camera

With process cameras, the lens must be mounted with its front end facing the camera. Remove the front ring from the EL-Nikkor 105mm, 135mm, 150mm or 210mm lens by turning it counterclockwise. Be sure not to touch the lens surface.
The EL-Nikkor 150mm or 210mm lens may be mounted using a baseplate.
The 50mm, 63mm or 80mm lens is mounted on a process camera using the front attachment thread.



Nikon Auto-Edger

Edging and bordering effect can easily be obtained with the use of the Nikon Auto-Edger by the simple repetition of routine photographic procedures.
Unlike conventional manual tracing and retouching, it effects fast, effortless bordering work mechanically—irrespective of typeface or pattern complexity—with utter precision and uniform quality.
Attachable directly to Apo-Nikkor 180mm f/9 and 240mm f/9 lenses.
With an adapter, it is used with 305mm f/9 and 360mm f/9 Apo-Nikkors.
Available on order.

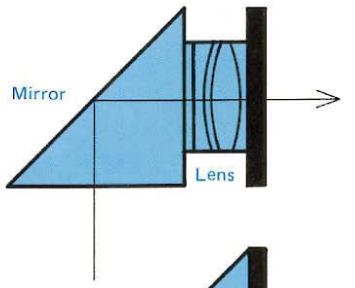
Recommended Combinations with Mirrors and Prisms

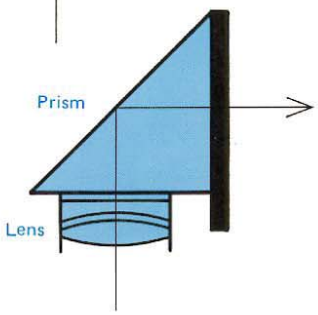
Mirror
The mirror is polished from a single thick block of hard optical glass to insure perfect surface planes and is aluminum plated by a vacuum evaporation process and coated with a silicon oxide film. This process guarantees a high rate of reflection and eliminates color dispersion (unlike prisms in which the light passes through the prism). This complements the superb quality of Apo-Nikkor lenses. Thus for best results the use of mirrors is recommended. Note that the mirror is sensitive to moisture, dust or chemical vapor in the atmosphere. Handle it with extreme care and in an atmosphere free from excessive chemicals.

Prism and roof prism
All the prisms are made of the highest quality optical glass. The degree of angles and surface flatness are finished with the upmost precision. The hypotenuse surface of the prism is coated with silver and protected with a black lacquer coating to prevent reduction of reflecting light even after a long period of use.

Recommended combinations of Apo-Nikkor, prisms and mirrors
Reflects the light at right angles and laterally reverses the image. For use with vertical L-shaped cameras.

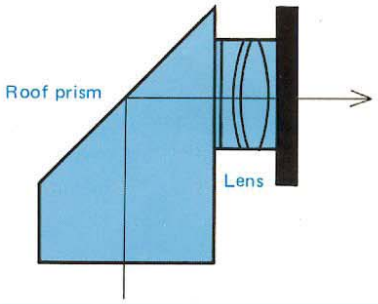
Type of prism and mirror	Apo-Nikkor focal length	Subject area
Prism S	180mm 240mm	300mmϕ 410mmϕ
Prism M	305mm 360mm	520mmϕ 600mmϕ
Prism L	420mm 455mm 480mm	710mmϕ 770mmϕ 820mmϕ
Mirror S	180mm 240mm	300mmϕ 410mmϕ
Mirror M	305mm 360mm	520mmϕ 600mmϕ



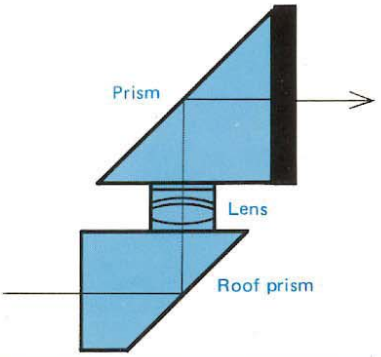


Recommended combinations of Apo-Nikkor and roof prisms
Reflects the light at right angles without reversing the image. Note that image size is slightly reduced. For use with vertical L-shaped cameras.

Type of roof prism	Apo-Nikkor focal length	Subject area
S	180mm 240mm	240mmϕ 360mmϕ
M	305mm 360mm	420mmϕ 500mmϕ
L	420mm 455mm 480mm	580mmϕ 630mmϕ 660mmϕ



Lens, prism and roof prism
Shifts the vertical height of light path parallel to the initial beam axis and laterally reverses the image without changing the direction of light (reflects the light twice at right angles and reverses the image). For use with low bed or overhead process cameras.



Specifications

	Focal length	Minimum f-stop	Lens construction (group-element)	Standard magnification	Usable magnification range	Picture angle
EL-Nikkor						
50mm f/2.8	51.6mm	f/16	4–6	8X	2X ~ 20X	46°
50mm f/4	51.6mm	f/16	3–4	8X	2X ~ 20X	46°
63mm f/3.5	63mm	f/16	4–6	8X	2X ~ 20X	46°
75mm f/4	75mm	f/45	3–4	5X	2X ~ 10X	52°
80mm f/5.6	80mm	f/45	4–6	5X	2X ~ 15X	57°
105mm f/5.6	105mm	f/45	4–6	5X	2X ~ 10X	56°
135mm f/5.6	135mm	f/45	4–6	5X	2X ~ 10X	54°
150mm f/5.6	150mm	f/45	4–6	4X	2X ~ 8X	54°
180mm f/5.6	180mm	f/45	4–6	4X	2X ~ 8X	54°
210mm f/5.6	210mm	f/45	4–6	4X	2X ~ 8X	54°
240mm f/5.6	240mm	f/45	4–6	3X	1X ~ 6X	54°
300mm f/5.6	300mm	f/45	4–6	2X	1X ~ 4X	52°
360mm f/5.6	360mm	f/45	4–6	2X	1X ~ 4X	50°
Apo-Nikkor						
180mm f/9	180mm	f/128	4–4	1X	–	46°
240mm f/9	240mm	f/128	4–4	1X	–	46°
305mm f/9	305mm	f/128	4–4	1X	–	46°
360mm f/9	356mm	f/128	4–4	1X	–	46°
420mm f/9	419mm	f/128	4–4	1X	–	46°
455mm f/9	455mm	f/128	4–4	1X	–	46°
480mm f/9	483mm	f/128	4–4	1X	–	46°
610mm f/9	610mm	f/128	4–4	1X	–	46°
760mm f/11	762mm	f/128	4–4	1X	–	42°
890mm f/11	889mm	f/128	4–4	1X	–	42°
1210mm f/12.5	1206.5mm	f/128	4–4	1X	–	40°
1780mm f/14	1778mm	f/128	4–4	1X	–	36°
Process-Nikkor						
210mm f/10	210mm	f/32	4–4	1X	1/3X ~ 3X	68° (f/10) 74° (f/22)
240mm f/10	240mm	f/32	4–4	1X	1/2X ~ 2X	68° (f/10) 74° (f/22)
260mm f/10 (Q)	267mm	f/32	4–4	1X	1/2X ~ 2X	68° (f/10) 74° (f/22)
160mm f/5.6 (FAX)	160mm	f/22	4–6	1X	1/3X ~ 3X	66° (f/5.6) 72° (f/16)
210mm f/5.6 (FAX)	210mm	f/22	4–6	1X	1/3X ~ 3X	64° (f/5.6) 70° (f/16)
210mm f/7 (FAX)	210mm	–	4–6	1X	1/3X ~ 3X	56°
Micro-Nikkor						
55mm f/3.5	55mm	f/32	4–5	1/10X	∞~ 1X	43°
70mm f/5	70mm	f/22	4–5	1/12X	1/30X ~ 1/5X	43°
150mm f/5.6	150mm	f/22	4–6	1/10X	1/30X ~ 1/5X	41°

Corrected wavelength range	Subject area	Film size	Weight	Front mount (dia. x pitch)	Rear mount (dia. x pitch)	Flange diameter
380 ~ 700mμ	45mmφ	24 x 36mm	100g	–	39mmφ x 1/26"	–
380 ~ 700mμ	45mmφ	24 x 36mm	100g	–	39mmφ x 1/26"	–
380 ~ 700mμ	56mmφ	32 x 45mm	130g	–	39mmφ x 1/26"	–
380 ~ 700mμ	80mmφ	56 x 56mm (2-1/4 x 2-1/4 in.)	80g	–	39mmφ x 1/26"	–
380 ~ 700mμ	100mmφ	56 x 72mm	150g	–	39mmφ x 1/26" 32.5mmφ x 0.5mm	–
380 ~ 700mμ	130mmφ	65 x 90mm	220g	39mmφ x 1/26"	39mmφ x 1/26" 32.5mmφ x 0.5mm	–
380 ~ 700mμ	160mmφ	90 x 120mm (4 x 5 in.)	260g	46mmφ x 0.5mm	39mmφ x 1/26" 45mmφ x 0.5mm	–
380 ~ 700mμ	190mmφ	100 x 125mm (4 x 5 in.)	300g	53mmφ x 0.75mm	53mmφ x 0.75mm	74mmφ
380 ~ 700mμ	230mmφ	130 x 180mm (5 x 7 in.)	430g	62mmφ x 1mm	62mmφ x 1mm	88mmφ
380 ~ 700mμ	270mmφ	150 x 210mm (5 x 7 in.)	600g	72mmφ x 1mm	72mmφ x 1mm	98mmφ
380 ~ 700mμ	330mmφ	180 x 240mm (8 x 10 in.)	910g	82mmφ x 1mm	82mmφ x 1mm	108mmφ
380 ~ 700mμ	440mmφ	270 x 330mm (10 x 12 in.)	1550g	100mmφ x 1mm	100mmφ x 1mm	131mmφ
380 ~ 700mμ	500mmφ	300 x 400mm (11 x 14 in.)	2700g	130mmφ x 1.5mm	130mmφ x 1.5mm	165mmφ
380 ~ 750mμ	300mmφ	–	210g	53mmφ x 0.75mm	53mmφ x 0.75mm	74mmφ
380 ~ 750mμ	410mmφ	–	220g	53mmφ x 0.75mm	53mmφ x 0.75mm	74mmφ
380 ~ 750mμ	520mmφ	–	430g	72mmφ x 1mm	72mmφ x 1mm	98mmφ
380 ~ 750mμ	600mmφ	–	470g	72mmφ x 1mm	72mmφ x 1mm	98mmφ
380 ~ 750mμ	710mmφ	–	780g	90mmφ x 1mm	90mmφ x 1mm	121mmφ
380 ~ 750mμ	770mmφ	–	810g	90mmφ x 1mm	90mmφ x 1mm	121mmφ
380 ~ 750mμ	820mmφ	–	860g	90mmφ x 1mm	90mmφ x 1mm	121mmφ
380 ~ 750mμ	1030mmφ	–	1450g	110mmφ x 1mm	110mmφ x 1mm	145mmφ
380 ~ 750mμ	1170mmφ	–	1350g	110mmφ x 1mm	110mmφ x 1mm	145mmφ
380 ~ 750mμ	1360mmφ	–	3600g	162mmφ x 1.5mm	162mmφ x 1.5mm	208mmφ
380 ~ 750mμ	1750mmφ	–	3800g	162mmφ x 1.5mm	162mmφ x 1.5mm	208mmφ
380 ~ 750mμ	2310mmφ	–	6430g	213mmφ x 1.5mm	213mmφ x 1.5mm	260mmφ
400 ~ 650mμ	570mmφ (f/10) 630mmφ (f/22)	–	510g	–	72mmφ x 1mm	98mmφ
400 ~ 650mμ	650mmφ (f/10) 720mmφ (f/22)	–	730g	–	82mmφ x 1mm	108mmφ
400 ~ 650mμ	720mmφ (f/10) 800mmφ (f/22)	–	930g	–	90mmφ x 1mm	121mmφ
350 ~ 700mμ	420mmφ (f/5.6) 460mmφ (f/16)	–	320g	–	62mmφ x 0.75mm	77.5mmφ
350 ~ 700mμ	530mmφ (f/5.6) 590mmφ (f/16)	–	660g	–	72mmφ x 1mm	98mmφ
350 ~ 700mμ	450mmφ	–	500g	–	72mmφ x 1mm	98mmφ
400 ~ 650mμ	432mmφ	24 x 36mm	235g	–	Nikon F-bayonet	–
400 ~ 650mμ	662.4mmφ	32 x 45mm	250g	–	39mmφ x 1/26"	57mmφ
400 ~ 650mμ	1150mmφ	64 x 95.5mm	600g	–	72mmφ x 1mm	98mmφ

The models in this catalogue represent the design of our instruments at the time of printing.
The design and specifications are subject to change due to further improvements.

Nikon

NIPPON KOGAKU K.K.
Fuji Bldg., 2-3, 3-chome, Marunouchi,
Chiyoda-ku, Tokyo 100, Japan
☎ (03) 214-5311 **Telex:** 02222950 (NIKON J)

NIPPON KOGAKU (U.S.A.) INC.
623 Stewart Avenue, Garden City, New York 11530, U.S.A.
☎ (516) 248-4120 **Telex:** 096-7756 (NKUSA GRCY)

NIKON EUROPE B.V.
Freeport Bldg., Schiphol-Centrum, The Netherlands
☎ (020) 156633 **Telex:** 13328 (NIKON NL)

NIKON AG
Kirchenweg 5, 8008 Zürich, Switzerland
☎ (01) 474640, 474641 **Telex:** 53208 (NIKON CH)

NIKON VERTRIEBSGESELLSCHAFT m.b.H.
4000 Düsseldorf, Uerdingerstrasse 96/102, West Germany
☎ (0211) 451061 **Telex:** 8584019 (NIKO D)

Code No. 8205-01 KEC Printed in Japan