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**EASTMAN
PROFESSIONAL
FILMS**

www.orphancameras.com

EASTMAN KODAK COMPANY
Rochester, N. Y.

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EASTMAN PROFESSIONAL FILMS

Par Speed Portrait • Super Speed Ortho Portrait • Super
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mercial Antihalation • Commercial Matte • Commercial
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Panchro-Press • Super Panchro-Press • Portrait Panchro-
matic • Portrait Panchromatic Antihalation • Super
Sensitive Panchromatic • Super Sensitive Panchromatic
Antihalation • Commercial Panchromatic • Panatomic
• Panatomic Antihalation • Process Panchromatic •
Process • Process Antihalation

Eastman Kodak Company
Rochester, N. Y.

1938

Eastman Professional Films

THE purpose of this booklet is to acquaint the users of Eastman Films with the various brands, the work for which each is best suited, and the most practical formulas and processing methods. The formulas recommended have been found by long experience to produce the most satisfactory results and should be used under all normal conditions. If unusual conditions make it impossible to use the proportions of chemicals recommended in any formula, we shall be glad to advise by correspondence the changes necessary to meet the situation.

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**Eastman Kodak Company
Rochester, N. Y.**

EASTMAN FILM

Film negatives have a distinctive quality which is due to the thinness of the film support. As to convenience, films have but one-tenth the weight of plates, and occupy about one-sixth the amount of space in storage. They are coated on a support which is very much thinner than the thinnest glass it is possible to use for plates and, hence, film negatives are practically free from halation. Films are unbreakable and yet have sufficient rigidity to make them lie perfectly flat in the special Film Holders or Film Sheaths made for use with them. Another decided advantage of the thin support is that retouching may be done on both the face and the back of the film. Coarse retouching is softened if it is done on the back of the negative.

Films for Every Purpose

Films are available for all purposes which fall within the field of work of the professional photographer. For photographs which do not require excessive speed or sensitiveness to color, the regular Portrait or Commercial Films meet every need. For an orthochromatic film of extreme speed, Super Speed Ortho Portrait Film, *regular* and *antihalation*, is available, while Process Film serves well the needs of the photoengraver for a material giving high contrast and sufficient density.

Wherever it is necessary to photograph colored objects in such a way as to give tonal renderings comparable with the brightness differences seen by the eye, where it is required to make separation negatives for color work, and particularly where it is convenient to use incandescent tungsten lighting, panchromatic films are available.

For general portraiture and home portraits, especially of children, Super Sensitive Panchromatic and Portrait Panchromatic Films, *regular* and *antihalation*, are recommended. These films are also useful for many types of commercial and illustrative photography but where fine grain and brilliancy are especially desired and great speed is not essential, Safety Panatomic Film will be found to be very satisfactory. It is particularly well suited for enlargements from small portions of negatives and for the making of photo murals.

Three films are supplied for press photography: Ortho Press, Panchro-Press, and Super Panchro-Press. Each one is coated on

safety support, with antihalation backing. These materials possess all the properties desired by the modern news photographer for various types of work, their range of color sensitiveness and speed being ample to meet the most severe demands of the trade.

There are many classes of commercial work requiring emulsions of different characteristics. All the demands can be satisfactorily met by proper selection of one of the following films manufactured by the Eastman Kodak Company:

Eastman Commercial and Commercial Matte, *regular* and *antihalation*, Commercial Ortho, Safety Ortho Press, Par Speed Portrait, Super Speed Ortho Portrait, *regular* and *antihalation*, Safety Panatomic, *regular* and *antihalation*, Commercial Panchromatic, Portrait Panchromatic, *regular* and *antihalation*, and Super Sensitive Panchromatic, *regular* and *antihalation*, Panchro-Press and Super Panchro-Press, Panchromatic Process, and Process Films.

Classification of Eastman Professional Films

A classification and description of Eastman Professional Films are as follows:

Non-Color-Sensitive Materials

Eastman Commercial Film, *regular* and *antihalation*, has an emulsion of medium speed and is, as its name implies, especially suitable for commercial work and copying where color correction is not necessary but where a fairly high degree of contrast is desirable.

Eastman Commercial Matte, *regular* and *antihalation*, is the same film with a matte emulsion and permits the use of a pencil for blocking out or retouching without the use of a retouching medium. Commercial Matte, *antihalation*, has a matte back as well as a matte emulsion.

Eastman Process Film, *regular* and *antihalation*, gives an extremely high degree of contrast and is equally suitable for negatives or positive transparencies. It will be found useful for the reproduction of line drawings and tracings, and for all purposes where strong contrast is needed.

Orthochromatic Films

Eastman Par Speed Portrait and Super Speed Ortho Portrait Films have been used extensively for many kinds of commercial work. They are, of course, most used for portraiture where

daylight, arc, or mercury light is available, but they are of great value in all cases where an orthochromatic film having speed, soft gradation, and wide latitude is required. Super Speed Ortho Portrait Film is considerably faster and appreciably more green-sensitive than the regular Portrait Film and is still faster when making exposures under artificial light when its yellow-green sensitiveness may be utilized most effectively. The antihalation backing makes this film one of the most universally useful emulsions for general portraiture.

Eastman Commercial Ortho Film has a high degree of sensitiveness to yellow-green light, in addition to its sensitiveness to blue and violet. It gives good color rendering for all kinds of commercial work not requiring a red-sensitive film. When used with a yellow filter, it reproduces yellows and greens very satisfactorily. With a Wratten K1 or K2 Filter, it is extremely desirable for the reproduction of oak, unfinished mahogany furniture, and all subjects where the correct rendering of yellows is necessary. Eastman Commercial Ortho Film has great latitude, allowing for considerable variation in exposure.

Eastman Safety Ortho Press Film is fast, orthochromatic, and especially sensitive to green. It produces clean, brilliant negatives so desirable in press photography. It also has excellent nonhalation properties, due to a backing which absorbs reflected light.

Panchromatic Films

Panchromatic films are sensitive to all colors. They are, therefore, essential when it is desired to photograph colored objects so as to record the different colors in the same relative brightness values visible to the eye. To accomplish this exactly, it is necessary to use a yellow or pale green filter over the lens, but without this filter the rendering is much more nearly correct than is obtainable on a non-color-sensitive or even on an orthochromatic material.

Eastman Super Sensitive Panchromatic and Portrait Panchromatic Films are among the most sensitive photographic materials available. They are nearly twice as fast as the older Portrait Panchromatic Film, with incandescent tungsten illumination. These films have a long scale of gradation and will give negatives of finest printing quality, having excellent rendering of shadow detail.

The chief difference between the Super Sensitive and Portrait Panchromatic Films lies in their color sensitiveness. The Super Sensitive Panchromatic Film has been specially made to have extreme sensitiveness to yellow, orange, and red light. It is, therefore, emi-

nently suitable for use with incandescent tungsten lamps and the carbon arc, where it is desirable to make negatives with the shortest possible exposures.

The color sensitiveness of Portrait Panchromatic Film differs from that of the Super Sensitive material in being somewhat lower in the red but relatively higher in the green region of the spectrum. Its sensitivity corresponds approximately to the color sensitiveness of the eye.

The selection of Portrait Panchromatic or of Super Sensitive Panchromatic Films for portrait work in the studio will depend somewhat on the lighting and the personal likes of the photographer for the work at hand. It may happen in certain instances that Super Sensitive Panchromatic Film used with tungsten lighting tends to give slight overcorrection of red objects, such as lips, and may falsify slightly the correct rendering of blue eyes and blonde hair. If this is found to be the case, then Portrait Panchromatic Film should be used, or the lighting should be changed to be somewhat less red in color, as by substituting some blue-bulb tungsten lamps, white flame arcs, or daylight. Both Super Sensitive Panchromatic and Portrait Panchromatic Films are now available on safety antihalation backed support.

Eastman Panchro-Press and Super Panchro-Press are completely color-sensitive films, supplied especially for the press photographer. Both films are coated on safety support, with antihalation backing. Both emulsions are physically hardened to withstand the rough treatment often given photographic materials in press and commercial work when wet printing is employed to save time. With normal exposure and development, the speed of Super Panchro-Press is nearly double that of Panchro-Press.

For many of the problems that face the press photographer, regular Panchro-Press has ample speed, latitude, and contrast; but when working under extreme conditions of poor lighting, or when it is desired to use a smaller stop to secure greater depth of field, or to double the shutter speed with a moving subject, Super Panchro-Press is recommended. This new emulsion has the advantage that underexposures, when necessary, may be forced in development and a negative of good printing quality will be obtained.

The panchromatic emulsions used for both of these press films have ample green and red sensitivity to make them especially satisfactory for use with Photoflood and Photoflash lamps. While designed primarily to meet the needs of the press photographer, they also are ideal materials for many types of commercial and illustrative photography.

Eastman Safety Panatomic Film is a very fine grained, long scale panchromatic emulsion especially recommended for commercial and press photography. In color sensitivity, it resembles Eastman Super Sensitive Panchromatic Film but it has slightly less speed, develops more rapidly, and produces negatives of greater contrast. Because of its fine grain, it is an ideal emulsion for enlargements of more than average size. Its maximum effective speed and shadow detail are obtained by the use of the D-76 Developer.

Eastman Commercial Panchromatic Film is a negative medium of good speed and considerably higher contrast than the panchromatic materials previously discussed.

Eastman Process Panchromatic Film, *antihalation*, is completely color-sensitive and produces negatives of extremely high contrast. It is especially suited for such work as copying maps or drawings in color, or for photographing faded legal documents.

Use of Filters

All panchromatic materials have their maximum sensitiveness to blue and violet light. The eye, on the other hand, is most sensitive to the green region of the spectrum. If, therefore, it is desired to photograph colored objects so that in the black-and-white result the tones are in the same brightness ratio as seen by the eye, it is necessary to use a filter over the camera lens which will remove much of the blue and violet light. Such a filter is yellow in color.

With modern panchromatic materials having an extremely high sensitiveness to red light, it may be necessary to remove some red light in addition to the blue and violet to give correct rendering. In this case, the filter should be pale green in color.

Filters are unnecessary in portraiture with the extremely fast panchromatic films.

The choice of filter will depend on the type of photographic material and the nature of the source of light. For instance, to obtain correct tone rendering with Portrait Panchromatic Film in daylight, the Wratten K2 Filter should be used, while for tungsten lighting, the pale green X1 Filter is correct. On the other hand, with Super Sensitive Panchromatic Film, the X1 Filter should be used with daylight and the somewhat darker green X2 Filter with tungsten illumination.

As all filters absorb some light, it is necessary to give increased exposures when using them. The number of times the exposure *without* a filter must be multiplied to give correct exposure *with* a filter is called the "filter factor" of that filter. A card giving filter factors for

some of the commonly used light sources is enclosed with each box of Eastman panchromatic films.

Since the quality of light used in practice may vary somewhat from that under which the filter factors were measured in the laboratory, the actual factors may be slightly different from those on the cards. They will, however, provide a satisfactory guide.

Approximate filter factors are given below for sunlight, white flame arc, Photoflood and incandescent tungsten lamps (clear bulb), for several orthochromatic and panchromatic materials.

Approximate Filter Factors

Films	Sunlight or White Flame Arc				Photoflood or Tungsten			
	K1	K2	X1	X2	K1	K2	X1	X2
Commercial Ortho	3	5	—	—	2.5	4	—	—
Super Speed Ortho Portrait	2.5	3.5	—	—	2	2.5	—	—
Ortho Press	2	2.5	—	—	1.5	2	—	—
Super Speed Ortho Portrait, Antihalation								
Portrait Panchromatic	1.5	2	—	—	1.5	1.5	3	—
Super Sensitive Panchromatic	1.5	2	5	—	1.5	1.5	—	5
Safety Panatomic								
Super Panchro-Press, Safety Panchro-Press, Safety								
Commercial Panchromatic	2	3	—	—	1.5	2	—	—

In addition to using filters to give true rendering of colors in black and white, it is often necessary in commercial work to vary the tonal contrast in a subject to a value best suited to that particular subject. For instance, in photographing furniture, it might be desirable to emphasize the grain of the wood. For purposes such as this, contrast filters are used. Those most likely to be of value are the Wratten Filters A, B, C5, F, and G, which are, respectively, red, green, blue, red, and deep yellow. Filter factors for these filters are given on the cards enclosed in the boxes of films.

For a fuller discussion of the properties of color-sensitive materials and the uses of filters, the reader should consult "The Photography of Colored Objects" published by the Eastman Kodak Company (price, \$1).

Film Speeds

The speed numbers of the various brands of Eastman Professional Films are shown in the following table. The figures given were obtained according to the standard system of speed evaluation employed in the Kodak Research Laboratories. They are for light of sunlight quality and are not valid when the materials are exposed to light of different quality, such as incandescent tungsten.

Panchromatic Materials

(Sensitive to All Colors)

	Sunlight
Eastman Super Panchro-Press Safety Film.....	500
Eastman Panchro-Press Safety Film.....	300
Eastman Super Sensitive Panchromatic Film.....	200
Eastman Portrait Panchromatic Film.....	200
Eastman Safety Panatomic Film.....	150*
Eastman Commercial Panchromatic Film.....	120
Eastman Panchromatic Process Film.....	16

*With development in D-76.

Orthochromatic Materials

(Sensitive to Blue and Green)

	Sunlight
Eastman Super Speed Ortho Portrait, Antihalation.....	220
Eastman Super Speed Ortho Portrait Film, Regular.....	200
Eastman Safety Ortho Press Film.....	160
Eastman Par Speed Portrait Film.....	120
Eastman Commercial Ortho Film.....	100

Non-Color-Sensitive Materials

Eastman Commercial Film.....	40
Eastman Commercial Matte Film.....	40
Eastman Process Film.....	12

Safelights

Because they are so sensitive to red as well as to all of the other colors of the spectrum, Panchromatic Films *cannot* be handled in the usual red light of the darkroom. Particular care must be taken in the case of Super Sensitive Panchromatic, Portrait Panchromatic, Super Panchro-Press, and Panchro-Press Films. These should be handled in total darkness. After development has been in progress for several minutes, they may be examined for a few seconds by the light of a Series 3 Safelight in conjunction with a 10-watt bulb (15-watt bulb if used in the overhead Indirect Light Box). The other Panchromatic Films can be handled either in total darkness, or by the light from a Series 3 Safelight, provided with a 25-watt bulb, if used in the indirect safelights, such as the Wratten and Kodak Safelight Lamps. A 10-watt bulb should be used in the direct safelights, such as the Eastman and Brownie Safelight Lamps.

For ceiling illumination the use of one 10 by 12-inch Eastman Indirect Light Box, fitted with a Series 3 Wratten Safelight and a 15-watt, 120-volt bulb, is recommended for every 80 square feet of floor space.

THE PROCESSING OF FILM

Tank Development

The development of film is very simple with either the tray or tank method. For convenience, economy, and *quality of negatives*, we recommend tank development.

We supply Eastman Film Developing Boxes, Film Developing Hangers, and the Film Developing Hanger Racks, so that a number of 5 by 7-inch or 8 by 10-inch films can be developed at the same time and with greater uniformity in the quality of the negatives that will be produced.

The use of the Film Developing Hanger Rack is strongly urged, especially where handling a batch of six or more film hangers. Its use insures greatest uniformity of agitation.

Films may be developed, fixed, washed, and dried without removing them from the film hangers.

Film Developing Hangers should be agitated slightly when first placed in any solution and at intervals of two or three minutes while remaining in the solution. Placing the hangers too close together, and agitating them constantly, may cause streaks and uneven development.

Tray Development

In tray development, it is best to use trays that are large enough to permit handling the films in two piles. Use sufficient developer to submerge films completely during the time of development. Slide the first film under the developer, breaking any air bells that may form on its surface. When it is thoroughly saturated, proceed in the same way with the other films until a pile is made. Take them one at a time from the top of the pile and place them in another pile at the other end of the tray. When fully developed, place them in the hardening bath before fixing.

Development

Formulas DK-50 and D-61a are specially recommended. They contain Elon and hydroquinone as the developing agents. These developers are capable of giving excellent negatives free of stain or fog and have the advantage over pyro in that it is possible to duplicate results readily, whereas with a pyro developer the degree of stain and, hence, the printing contrast tend to vary from batch to batch of negatives.

For development to low contrast which favors minimum graininess, Formula D-76 is recommended. Formula DK-50 contains the Eastman alkali, *Kodalk*, which has the advantage over carbonate that no gas is liberated when the developer is brought into contact with the acid hardening bath or acid fixing bath. Trouble from blisters, therefore, is eliminated with developers containing *Kodalk*. The activity of the developer may also be controlled more precisely by varying the quantity of *Kodalk* in Formula DK-50. The activity of D-76 may also be increased by using more borax, but maximum activity is obtainable by substituting *Kodalk* for borax and increasing the quantity of *Kodalk*. *Kodalk* is not recommended for use with pyro developers.

Those who prefer pyro developers will find that very satisfactory results can be obtained with Formulas D-1 and D-7. Both of these developers, however, have much poorer keeping qualities than any of the Elon-hydroquinone formulas.

For press work where rapid development and fairly high contrast are often desired, Formulas D-19 and D-72 are recommended. Negatives of extreme density as required for line work may be obtained with Formulas D-8 and D-9. Formula D-8 has somewhat better keeping properties than D-9 and is especially recommended for line and halftone screen negatives intended for printing directly on metal. Formula D-11 is recommended for general commercial work and for halftone screen negatives from which positive transparencies are to be made for dot etching.

Kodalk Developer

[Formula
DK-50]

For Normal Contrast on Professional Films

Stock Solution

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	64 ounces	2.0 liters
Elon.....	145 grains	10.0 grams
Sodium Sulphite, desiccated (E. K. Co.)....	4 ounces	120.0 grams
Hydroquinone.....	145 grains	10.0 grams
<i>Kodalk</i>	1 oz. 145 grains	40.0 grams
Potassium Bromide.....	29 grains	2.0 grams
Cold water to make.....	1 gallon	4.0 liters

Dissolve the chemicals in the order given.

For tank development of Commercial Panchromatic Film, use without dilution. Develop about 9 minutes at 65° F. (18° C.).

For tank development of SS Pan and Portrait Pan Film, take 1 part stock solution and 1 part water. Develop about 9 minutes at 65° F. (18° C.).

For tray development, use without dilution. Develop about 5 minutes at 65° F. (18° C.).

Greater or less contrast can be obtained by developing for longer or shorter times than those specified.

By increasing or decreasing the quantity of *Kodalk* in the formula, it is possible (a) to increase or decrease the contrast obtained in a given time of development, or (b) to decrease or increase the time of development without affecting the contrast.

[Formula]
[DK-50R]**Replenisher Solution**
For Use with Formula DK-50**Stock Solution**

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	96 ounces	3.0 liters
Elon.....	290 grains	20.0 grams
Sodium Sulphite, desiccated (E. K. Co.) . . .	4 ounces	120.0 grams
Hydroquinone..... 1 oz.	145 grains	40.0 grams
Kodalk.....	5¼ ounces	160.0 grams
Cold water to make.....	1 gallon	4.0 liters

Dissolve the chemicals in the order given.

Add to the tank as needed to maintain the level of the solution. If the developer stock solution is diluted 1:1, the replenisher should be diluted in the same proportion.

NOTE: If the quantity of Kodalk is increased in DK-50 over that in the regular formula, it may be necessary to discard some of the developer before adding the replenisher in order to obtain an approximately constant time of development.

[Formula]
[D-61a]**Elon-Hydroquinone Developer**
For Tray or Tank Use**Stock Solution**

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	16 ounces	500.0 grams
Elon.....	45 grains	3.1 grams
Sodium Sulphite, desiccated (E. K. Co.) . . .	3 ounces	90.0 grams
Sodium Bisulphite (E. K. Co.).....	30 grains	2.1 grams
Hydroquinone.....	85 grains	5.9 grams
*Sodium Carbonate, desiccated (E. K. Co.)... 165	grains	11.5 grams
Potassium Bromide.....	24 grains	1.7 grams
Cold water to make.....	32 ounces	1.0 liter

Dissolve the chemicals in the order given.

*If monohydrated sodium carbonate is used, the quantity given above must be increased to 195 grains (13.5 grams).

For tray use, take 1 part of stock solution to 1 part of water. Develop about 7 minutes at 65° F. (18° C.).

For tank use, take 1 part of stock solution to 3 parts of water.

At a temperature of 65° F. (18° C.), the development time is about 14 minutes. While Formula D-61a does not produce negatives of warm tone, they have good printing density and quality and the developer has excellent keeping properties. It is one of the most satisfactory developers for continued use and, when kept up to normal strength, will give excellent results over a period of several weeks.

As with all tank developers, when not in use it should be covered with a floating lid or thin Kodaloid, cut to the exact size of the tank and floated on the solution. The surface of the developer should be skimmed each morning with the aid of a blotter.

If the developer in the tank is of normal strength, but the volume of solution has been reduced, add a sufficient amount of the surplus stock solution (diluted 1:3) to fill the tank.

If the strength of the solution, as well as the volume, has been reduced, add a sufficient quantity of the following replenisher solution:

[Formula]
[D-61R]**Replenisher Solution**
For Use with the Tank Dilution of Formula D-61a**Stock Solution A**

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	96 ounces	3.0 liters
Elon.....	85 grains	5.9 grams
Sodium Sulphite, desiccated (E. K. Co.) . . .	6 ounces	180.0 grams
Sodium Bisulphite (E. K. Co.).....	55 grains	3.8 grams
Hydroquinone.....	170 grains	11.9 grams
Potassium Bromide.....	45 grains	3.1 grams
Cold water to make.....	1½ gallons	6.0 liters

(Continued on page 13)

Stock Solution B

*Sodium Carbonate, desiccated (E. K. Co.) . . .	8 ounces	240.0 grams
Water to make	64 ounces	2.0 liters

Dissolve the chemicals in the order given.

*If monohydrated sodium carbonate is used, the quantity given above must be increased to 9 ounces 160 grains (280 grams).

For use, take 3 parts of Solution A and 1 part of Solution B and add to the tank of developer as needed. Do not mix these solutions until ready to use.

Elon-Hydroquinone-Borax Developer

For Greatest Shadow Detail on Panchromatic Films

[Formula D-76]

	Avoirdupois	Metric
Water (about 125° F.) (52° C.)	96 ounces	3.0 liters
Elon	116 grains	8.0 grams
Sodium Sulphite, desiccated (E. K. Co.)	13 1/4 ounces	400.0 grams
Hydroquinone	290 grains	20.0 grams
Borax, granular (E. K. Co.)	116 grains	8.0 grams
Cold water to make	1 gallon	4.0 liters

Dissolve the chemicals in the order given.

Use without dilution.

For tank use, develop about 20 minutes at 65° F. (18° C.). For tray use, decrease the time about 20 per cent. Greater or less contrast can be obtained by developing for a longer or shorter time than that specified.

A faster working developer can be obtained by increasing the quantity of borax. By increasing the borax about 10 times, from 116 grains to 2 ounces 290 grains per gallon (from 8 grams to 80 grams per 4 liters), the development time will be about one-half that of the regular D-76.

Maximum activity can be obtained by substituting Kodalk for borax and using 290 grains of Kodalk per 32 ounces of developer (20 grams per liter). With this concentration, the contrast of a negative developed for 4 1/2 minutes in the more rapid developer will approximate that obtained in 18 minutes in D-76.

With use, Formula D-76 becomes slightly muddy, due to the formation of a suspension of colloidal silver, and the tank usually becomes coated with a thin deposit of silver. Both these effects are harmless, however, and may be ignored.

Replenisher Solution

For Use with Formula D-76

[Formula D-76R]

	Avoirdupois	Metric
Water (about 125° F.) (52° C.)	96 ounces	3.0 liters
Elon	175 grains	12.0 grams
Sodium Sulphite, desiccated (E. K. Co.)	13 1/4 ounces	400.0 grams
Hydroquinone	1 ounce	30.0 grams
Borax, granular (E. K. Co.) 2 oz.	290 grains	80.0 grams
Cold water to make	1 gallon	4.0 liters

Dissolve the chemicals in the order given.

Use the replenisher without dilution and add to the tank to maintain the level of the solution.

NOTE: When Kodalk is substituted for borax in Formula D-76 and a replenisher is required, it is necessary to substitute Kodalk for borax in Formula D-76R as follows:

Kodalk Concentration in the Developer		Time of Tank Development 65° F. (18° C.)	Kodalk Concentration in the Replenisher	
Per Liter	Per Gallon		Per Liter	Per Gallon
2 grams	116 grains	20 min.	7.5 grams	1 ounce
5 grams	290 grains	10 min.	20.0 grams	2 oz. 290 grains
10 grams	1 oz. 145 grains	7 1/2 min.	40.0 grams	5 oz. 145 grains
20 grams	2 oz. 290 grains	5 min.	*40.0 grams	5 oz. 145 grains

*Discard some developer before adding replenisher.

[Formula]
D-19**Elon-Hydroquinone Contrast Developer**

For Use with Super Panchro-Press and Panchro-Press Films

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	64 ounces	2.0 liters
Elon.....	128 grains	8.8 grams
Sodium Sulphite, desiccated (E. K. Co.) 12 oz.	360 grains	384.0 grams
Hydroquinone..... 1 oz.	75 grains	35.2 grams
Sodium Carbonate, desiccated (E. K. Co.) 6 oz.	180 grains	192.0 grams
Potassium Bromide.....	290 grains	20.0 grams
Cold water to make.....	1 gallon	4.0 liters

Dissolve the chemicals in the order given.

Use without dilution. Develop Super Panchro-Press Film about 7 minutes in a tank or about 5 minutes in a tray at 65° F. (18° C.). Develop Panchro-Press Film about 5 minutes in a tank or about 4 minutes in a tray of fresh developer at 65° F. (18° C.). Greater or less contrast may be obtained by developing longer or shorter times than those indicated.

Formula D-72 (diluted 1:1) may also be used, but it does not keep as well in a tank as D-19. For equal contrast in D-72 as compared with D-19, decrease the times given about 20 per cent.

For commercial subjects, develop Super Panchro-Press about 12 minutes and Panchro-Press about 10 minutes at 65° F. (18° C.) in Formula DK-50 with tank agitation.

[Formula]
D-72**Elon-Hydroquinone Developer**

For Press Photography

Stock Solution

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	16 ounces	500.0 cc.
Elon.....	45 grains	3.1 grams
Sodium Sulphite, desiccated (E. K. Co.) ...	1½ ounces	45.0 grams
Hydroquinone.....	175 grains	12.0 grams
*Sodium Carbonate, desiccated (E. K. Co.) ...	2¼ ounces	67.5 grams
Potassium Bromide.....	27 grains	1.9 grams
Water to make.....	32 ounces	1.0 liter

Dissolve the chemicals in the order given.

*If monohydrated sodium carbonate is used, the quantity given above must be increased to 2 ounces 275 grains (79 grams).

For average contrast, with tank development, take 1 part stock solution to 1 part water. Develop about 5 minutes in a tank or 4 minutes in a tray at 65° F. (18° C.). For less contrast, dilute 1:2; for extreme contrast, use without dilution.

[Formula]
D-82**Maximum Energy Developer**

For Use with Underexposed Negatives

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	24 ounces	750.0 cc.
Wood Alcohol.....	1½ ounces	48.0 cc.
Elon.....	200 grains	14.0 grams
Sodium Sulphite, desiccated (E. K. Co.) ...	1¾ ounces	52.5 grams
Hydroquinone.....	200 grains	14.0 grams
Sodium Hydroxide (Caustic Soda).....	125 grains	8.8 grams
Potassium Bromide.....	125 grains	8.8 grams
Cold water to make.....	32 ounces	1.0 liter

Dissolve the chemicals in the order given.

Develop about 5 minutes in a tray at 65° F. (18° C.).

The prepared developer does not keep more than a few days. If wood alcohol is not added and the developer is diluted, the solution is not so active as in the concentrated form. This developer gives the greatest possible shadow density with negatives having a minimum exposure.

Elon-Pyro Developer[Formula
D-7]**For Tank or Tray Use**

Stock Solution A	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	16 ounces	500.0 cc.
Sodium Bisulphite (E. K. Co.).....	$\frac{1}{4}$ ounce	7.5 grams
Elon.....	$\frac{1}{4}$ ounce	7.5 grams
Pyro.....	1 ounce	30.0 grams
Potassium Bromide.....	60 grains	4.2 grams
Water to make.....	32 ounces	1.0 liter

Stock Solution B	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
Sodium Sulphite, desiccated (E. K. Co.)....	5 ounces	150.0 grams

Stock Solution C	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
*Sodium Carbonate, desiccated (E. K. Co.)....	$2\frac{1}{2}$ ounces	75.0 grams

Dissolve the chemicals in the order given.

*If monohydrated sodium carbonate is used, the quantity given above must be increased to 3 ounces (90 grams).

For tray development, take 2 ounces (64 cc.) each of A, B, and C solutions to 16 ounces (500 cc.) of water. Develop about 4 minutes at 65° F. (18° C.).

For tank development, take 8 ounces (250 cc.) each of A, B, and C and add water to make 1 gallon (4 liters). At a temperature of 65° F. (18° C.), development time is about 8 minutes. Greater or less contrast can be secured by developing longer or shorter times than those indicated. Formula D-7 can be used repeatedly for about two weeks if kept up to its normal volume by adding fresh developer in the proportion of 2 ounces (64 cc.) each of A, B, and C to 8 ounces (250 cc.) of water, although it is usually necessary to increase the development time as the developer ages.

All tank developers must be kept covered with a floating lid or a piece of thin Kodaloid with the edges turned up to form a shallow boat, and then floated on the solution. This prevents oxidation. After removing the floating cover, the surface of the developer should be skimmed with a blotter.

Three-Solution Pyro Developer[Formula
D-1]**For Warm Tones Using Tank or Tray**

Stock Solution A	Avoirdupois	Metric
Sodium Bisulphite (E. K. Co.).....	140 grains	9.8 grams
Pyro.....	2 ounces	60.0 grams
Potassium Bromide.....	16 grains	1.1 grams
Water to make.....	32 ounces	1.0 liter

Stock Solution B	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
Sodium Sulphite, desiccated (E. K. Co.)....	$3\frac{1}{2}$ ounces	105.0 grams

Stock Solution C	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
*Sodium Carbonate, desiccated (E. K. Co.)....	$2\frac{1}{2}$ ounces	75.0 grams

Dissolve the chemicals in the order given.

*If monohydrated sodium carbonate is used, the quantity given above must be increased to 3 ounces (90 grams).

Prepare fresh developer for each batch of films.

For tank development, take 9 ounces each (285 cc.) of A, B, and C and add water to make 1 gallon (4 liters). For the $3\frac{1}{2}$ -gallon tank, take 32 ounces (1 liter) each of A, B, and C and add water to make $3\frac{1}{2}$ gallons. Develop for about 12 minutes at a temperature of 65° F. (18° C.). Any scum that may form on the surface of the developer *must be removed by means of a sheet of blotting paper before developing films.*

For tray development, take 1 ounce (30 cc.) each of A, B, and C and add 7 ounces (210 cc.) of water. Develop about 6 minutes at 65° F. (18° C.).

Process Film Developers

The following Hydroquinone-Caustic Developers D-8 and D-9 will give very high density and will be found best for line work. They should be used at a temperature of 65° F. (18° C.), not warmer, and should never be used colder than 55° F. (13° C.). It is important to wash all negatives very thoroughly before fixing, or stains and dichroic fog will result. Fix in an acid-hardening fixing bath.

[Formula]
D-8

Single-Solution Hydroquinone-Caustic Developer

For Maximum Density on Process and Process Panchromatic Films

Stock Solution

	Avoirdupois	Metric
Water	96 ounces	3.0 liters
Sodium Sulphite, desiccated (E. K. Co.)	12 ounces	360.0 grams
Hydroquinone	6 ounces	180.0 grams
Sodium Hydroxide (Caustic Soda) (E. K. Co.)	5 ounces	150.0 grams
Potassium Bromide	4 ounces	120.0 grams
Water to make	1 gallon	4.0 liters

Dissolve the chemicals in the order given.

For use, take 2 parts of stock solution and 1 part of water. Develop about 2 minutes at 65° F. (18° C.). This formula is especially recommended for making line and halftone screen negatives intended for printing directly on metal.

A formula which is slightly less alkaline and gives almost as much density can be obtained by using 3¾ ounces of sodium hydroxide per gallon of stock solution (112 grams per 4 liters) instead of the quantity given in the formula.

[Formula]
D-9

Hydroquinone-Caustic Process Developer

For High Contrast
For Tray Use

Stock Solution A

	Avoirdupois	Metric
Water (about 125° F.) (52° C.)	16 ounces	500.0 cc.
Sodium Bisulphite (E. K. Co.)	¾ ounce	22.5 grams
Hydroquinone	¾ ounce	22.5 grams
Potassium Bromide	¾ ounce	22.5 grams
Water to make	32 ounces	1.0 liter

Stock Solution B

*Cold water	32 ounces	1.0 liter
Sodium Hydroxide (Caustic Soda) (E. K. Co.)	1¾ ounces	52.5 grams

Dissolve the chemicals in the order given.

Use equal parts of A and B. Shake bottles well before using. Develop about 2 minutes at 65° F. (18° C.). This developer will not keep when mixed and, therefore, is not suitable for tank development.

*Cold water should always be used when dissolving sodium hydroxide (caustic soda) because considerable heat is evolved. If hot water is used, the solution will boil with violence and may cause serious burns if the alkali spatters on the hands or face.

A developer which gives almost as much density, keeps better than D-8 or D-9, and can be used for tank or tray developing, is given below:

[Formula]
D-11

Elon-Hydroquinone Process Developer

For Tank or Tray Use

	Avoirdupois	Metric
Water (about 125° F.) (52° C.)	16 ounces	500.0 cc.
Elon	15 grains	1.0 gram
Sodium Sulphite, desiccated (E. K. Co.)	2½ ounces	75.0 grams
Hydroquinone	130 grains	9.0 grams
*Sodium Carbonate, desiccated (E. K. Co.)	365 grains	25.0 grams
Potassium Bromide	73 grains	5.0 grams
Water to make	32 ounces	1.0 liter

Dissolve the chemicals in the order given.

*If monohydrated sodium carbonate is used, the quantity given above must be increased to 1 ounce (30 grams).

Use full strength. Develop 5 minutes at 65° F. (18° C.).

This formula is useful for general commercial photography and for making halftone screen negatives from which positive transparencies are to be made for dot etching.

When great contrast is not desired, dilute the mixed developer with an equal volume of water.

Tropical Development

For best results it is advisable to have the temperature of the solutions as near 65° F. (18° C.) as possible. There are times, however, when it is impossible to do this owing to unusual conditions. This is especially true in tropical countries where the temperatures are high and where it is difficult to obtain fresh, cool water.

To develop films at temperatures up to 90° F. (32° C.), Kodak Developer, Formula DK-15, is especially recommended. This formula has the following advantages: (1) It is non-blistering because no gas is formed when the developer is added to the acid hardening bath or the acid fixing bath. (2) The development rate changes slowly with time so that on slight overdevelopment the negatives will not be too dense. (3) It has a minimum scumming tendency in conjunction with the average acid fixing bath.

Kodak Tropical Developer

[Formula
DK-15]

Non-blistering

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	24 ounces	750.0 cc.
Elon.....	82 grains	5.7 grams
Sodium Sulphite, desiccated (E. K. Co.)....	3 ounces	90.0 grams
Kodak.....	34 ounce	22.5 grams
Potassium Bromide.....	27 grains	1.9 grams
*Sodium Sulphate, desiccated.....	1½ ounces	45.0 grams
Cold water to make.....	32 ounces	1.0 liter

Dissolve the chemicals in the order given.

*If it is desired to use sodium sulphate crystals instead of desiccated sulphate, use 3½ ounces per 32 ounces of developer (105 grams per liter).

At normal temperatures of 65° to 75° F. (18° to 24° C.), development will be more rapid if the sodium sulphate is omitted, but it should always be used when working above 75° F. (24° C.).

Average time for tank development *without* the sulphate is 5 to 7 minutes and *with* the sulphate 9 to 12 minutes at 65° F. (18° C.) in the fresh developer according to the contrast desired. Develop about 20 per cent less for tray use.

By increasing or decreasing the quantity of Kodak in the formula, it is possible (a) to increase or decrease the contrast obtained in a given time of development or (b) to decrease or increase the time of development without affecting the contrast. *Prolonging the development time, however, is very undesirable, as excessive swelling and softening of the gelatin will occur.*

Approximate times of development at 80° to 90° F. (26.5° to 32° C.) are from 5 minutes at 80° F. (26.5° C.) to 2½ minutes at 90° F. (32° C.).

After development, rinse the films not more than 1 second in water [omit water rinse above 85° F. (29.5° C.)], and immerse directly in the following Tropical Hardener (Formula SB-4, page 18) for 3 minutes. Then fix in Formula F-5, page 18, for at least 10 minutes and wash for 10 to 15 minutes in water not over 95° F. (35° C.).

Further details on handling films under high temperature conditions are included in our booklet "Tropical Development," obtainable on request.

[Formula]
SB-4**Tropical Hardening Bath**

For Use at 75° to 90° F. (24° to 32° C.)

	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
Potassium Chrome Alum.....	1 ounce	30.0 grams
*Sodium Sulphate, desiccated.....	2 ounces	60.0 grams

*If it is desired to use sodium sulphate crystals instead of the desiccated sulphate, then 4½ ounces per 32 ounces of hardener (140 grams per liter) should be used.

Immerse the films for 3 minutes in the bath. Agitate them when first immersed and at intervals during treatment to avoid streaking. After about twenty 8 by 10-inch films per gallon have been processed, the bath should be replaced. If overworked, scum markings will be produced.

Rinsing and Fixing

After the development has been completed, the films should be rinsed for at least 5 seconds in water and then placed in a clear acid hardening fixing bath, such as F-5.

Freedom from stain formation will be assured, especially under hot weather conditions, by using the following hardening bath after the water rinse. The use of the chrome alum bath also extends the life of the fixing bath.

[Formula]
SB-3**Chrome Alum Hardening Bath**

	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
Potassium Chrome Alum.....	1 ounce	30.0 grams

When developed, rinse the films for about 5 seconds in water and place for 3 minutes in the hardening bath; then place immediately in the fixing bath.

Agitate the negatives for a few seconds when first immersed in the hardener; otherwise a chromium scum, which is very difficult to remove, may form on the film. If negatives have been rinsed, the potassium chrome alum is sufficiently acid to neutralize any alkali carried over from the developer. The chrome alum hardening bath should be renewed frequently, and, if any scum tends to form, it should be removed before the bath is used.

[Formula]
F-5**Acid Hardening Fixing Bath**

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	80 ounces	2.5 liters
Hypo.....	2 pounds	960.0 grams
Sodium Sulphite, desiccated (E. K. Co.)....	2 ounces	60.0 grams
*Acetic Acid (28% pure) (E. K. Co.).....	6 fluid oz.	190.0 cc.
**Boric Acid, crystals.....	1 ounce	30.0 grams
Potassium Alum (E. K. Co.).....	2 ounces	60.0 grams
Cold water to make.....	1 gallon	4.0 liters

Dissolve the chemicals in the order given.

*To make 28 per cent acetic acid from glacial acetic acid, dilute 3 parts of glacial acetic acid with 8 parts of water.

**Crystalline boric acid should be used as specified. Powdered boric acid dissolves only with great difficulty and its use should be avoided.

If films are fixed in a tank, they should be left in the developing hangers. They should be fixed properly in 10 minutes if a freshly prepared fixing bath has been used. Leaving them in the solution a few minutes longer than the time specified will not do any harm, but prolonged immersion, especially in warm weather, may tend to bleach the image.

When the total fixing time (twice the time to clear) exceeds 20 minutes, the F-5 bath should be discarded. This will occur usually after eighty to one hundred 8 by 10-inch films (or their equivalent in other sizes) have been fixed per gallon (4 liters). This bath gives good hardening and should not sludge throughout its useful life.

Stock Hardener Solution[Formula
F-5a]

For Use with Formula F-5

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	80 ounces	2.5 liters
Sodium Sulphite, desiccated (E. K. Co.)....	10 ounces	300.0 grams
*Acetic Acid (28% pure) (E. K. Co.).....	30 fluid oz.	940.0 cc.
**Boric Acid, crystals.....	5 ounces	150.0 grams
Potassium Alum (E. K. Co.).....	10 ounces	300.0 grams
Cold water to make.....	1 gallon	4.0 liters

Dissolve the chemicals in the order given.

*To make 28 per cent acetic acid from glacial acetic acid, dilute 3 parts of glacial acetic acid with 8 parts of water.

**Crystalline boric acid should be used as specified. Powdered boric acid dissolves only with great difficulty and its use should be avoided.

A fixing bath is made by adding 1 part of cool Stock Hardener Solution to 4 parts of cool 30 per cent hypo solution [2½ lbs. hypo per gallon of water (1200 grams per 4 liters)] while stirring the hypo rapidly.

Chrome Alum Fixing Bath[Formula
F-16]**Solution A**

	Avoirdupois	Metric
Hypo.....	2 pounds	960.0 grams
Sodium Sulphite, desiccated (E. K. Co.)....	2 ounces	60.0 grams
Water to make.....	96 ounces	3.0 liters

Solution B

Water (not above 125° F.) (52° C.).....	32 ounces	1.0 liter
Potassium Chrome Alum.....	2 ounces	60.0 grams
Sulphuric Acid, C. P. (E. K. Co.).....	¼ fluid oz.	8.0 cc.

Dissolve the chemicals in the order given.

Pour Solution B into Solution A slowly while stirring A rapidly.

Always rinse films thoroughly before fixing. The above bath is especially recommended for use in hot weather.

A fresh bath should be prepared frequently because the chrome alum fixing bath loses its hardening properties in a few days either with or without use, while with an old bath there is a tendency for scum to form on the surface of the film. Any such scum should be removed by swabbing with cotton before drying. Formula F-5 (page 18) maintains its hardening properties throughout the useful life of the bath and has a minimum sludging tendency.

The Importance of Agitation

When processing films in tanks, it is important to agitate the films at intervals during treatment in the various solutions. Agitation during development insures uniform development. The films should also be agitated when first placed in the fixing bath to arrest development and minimize the tendency for streaks and mottle. Move the film hangers up and down in the solution. Rocking the tank will not produce uniform agitation.

The No. 4 Film Developing Hanger Rack (page 30) offers an effective means of agitating six or more films uniformly. After loading the rack with film hangers, lower it into the developer. Then raise each hanger separately about ½-inch and tap it sharply several times on the side of the rack. This dislodges any air bells which may cling to it.

After developing for 1 minute, lift the entire Hanger Rack out of the solution and immerse again. Then allow development to go to completion.

Washing

When fixed, the films are removed to the washing tank or tray. The secret of thorough washing is to insure a constant supply of fresh water at the surface of the film and frequent renewal of the water in the washing tank. Fairly complete hypo elimination can be insured by 20 to 30 minutes' washing. For thorough washing, the water in the tank should be replaced at least every 5 minutes.

[Formula
HT-1a]

Hypo Test Solution

	Avoirdupois	Metric
Potassium Permanganate.....	4 grains	0.3 gram
Sodium Hydroxide (Caustic Soda) (E. K. Co.).....	8 grains	0.6 gram
Water (distilled) to make.....	8 ounces	250.0 cc.

To make the test, take 8 ounces (250 cc.) of pure water in a glass and add $\frac{1}{4}$ dram (1 cc.) of the permanganate-caustic soda solution.

Then take an 8 by 10-inch film or its equivalent in other sizes from the wash water and allow the water from it to drip for 30 seconds into the glass of test solution. If a small percentage of hypo is present, the violet color will turn orange in about 30 seconds, and with larger concentration the orange color will change to yellow. In such case, washing should be continued. When further tests produce no change in the violet color, this indicates that the hypo content has been reduced to a safe margin, thereby insuring satisfactory permanency.

NOTE: Oxidizable organic matter if present in the water reacts with the permanganate solution and changes its color in the same manner as hypo. The water should, therefore, be tested as follows:

Prepare two samples of permanganate test solution, using distilled water. Then add a volume of the tap water to one test sample equal to that of the wash water drained from the film into the other sample. If the sample to which tap water has been added remains a violet color, this indicates the absence of organic matter and it will be unnecessary to make the test in duplicate. If the color is changed slightly by the tap water, however, the presence of hypo in the film will be shown by the relative color change of the two samples. For example, if the tap water sample turned pink and the wash water sample became yellow, it would indicate the presence of hypo; while if both turned the same shade, this would indicate the absence of hypo.

Hardening Negatives for Aftertreatment

Negatives which normally would be softened considerably by a chemical treatment in the removal of several types of stains or by intensification or reduction should be hardened by treatment with the alkaline formalin solution, Formula SH-1, given below:

[Formula
SH-1]

Formalin Hardener For All Professional Films

	Avoirdupois	Metric
Formalin (37% Formaldehyde solution).....	2½ drams	10.0 cc.
Sodium Carbonate, desiccated (E. K. Co.)....	70 grains	5.0 grams
Water to make.....	32 ounces	1.0 liter

After hardening for 3 minutes, the films should be rinsed and, if incomplete fixation is suspected, they should be immersed for 5 minutes in a fresh acid fixing bath and washed thoroughly before any further chemical treatment.

Intensifying and Reducing

If films need intensification or reduction, it is best to give them such treatment immediately after they have been washed. Much time is saved and the negatives, when dry, are ready for finishing.

Precautions: Stains are sometimes produced during intensification or reduction unless the following precautions are observed: (1) The negative should be fixed and washed thoroughly before treatment and be free of scum or stain. (2) It should be hardened in the Formalin Hardener (SH-1) before the intensification or reduction treatment. (3) Only one negative should be handled at a time and it should be agitated thoroughly during the treatment. Following the treatment, the negative should be washed thoroughly and wiped off carefully before drying.

Mercury Intensifier

[Formula In-1]

	Avoirdupois	Metric
Potassium Bromide.....	34 ounce	22.5 grams
Mercuric Chloride.....	34 ounce	22.5 grams
Water to make.....	32 ounces	1.0 liter

Bleach the negative in the above solution until it is white; then wash thoroughly. Blacken it with 10 per cent sodium sulphite solution, a developing solution, such as Formula D-61a diluted 1:1 (page 12), or 10 per cent ammonia (1 part conc. 28 per cent ammonia to 9 parts water), these giving progressively greater density in the order listed. To increase contrast greatly, blacken with the following solution:

Solution A

	Avoirdupois	Metric
Water.....	16 ounces	500.0 cc.
*Sodium or Potassium Cyanide.....	½ ounce	15.0 grams

Solution B

Water.....	16 ounces	500.0 cc.
Silver Nitrate, crystals (E. K. Co.).....	¾ ounce	22.5 grams

*Cyanide is a deadly poison and should be handled with extreme care. Use rubber gloves and don't expose yourself to its fumes. Cyanide reacts with acid to form poisonous hydrogen cyanide gas. When discarding a solution containing cyanide, always flush it out of the sink quickly with water.

To prepare the intensifier, add the silver nitrate solution (B) to the potassium cyanide solution (A) until a permanent precipitate is just produced; allow the mixture to stand a short time and filter. This is called *Monckhoven's Intensifier*. Redevelopment cannot be controlled as by the chromium method (Formula In-4 below) but it must go to completion.

Note: See precautions on handling negatives, above.

Images having greater permanency may be obtained by using the chromium intensifier formula given below:

Chromium Intensifier

[Formula In-4]

Stock Solution

	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
Potassium Bichromate.....	3 ounces	90.0 grams
Hydrochloric Acid, C. P. (E. K. Co.).....	2 fluid oz.	64.0 cc.

For use, take 1 part of stock solution to 10 parts of water. Bleach thoroughly, then wash five minutes and redevelop in artificial light or daylight (not direct sunlight) in a nonstaining developer,* such as Formula D-61a diluted 1:3, given on page 12. If the negative is not redeveloped fully, fix for five minutes, and then wash thoroughly. Fixing is unnecessary if redevelopement is thorough.

Repeating the process gives greater intensification.

(Continued on page 22)

The degree of intensification can be controlled by varying the time of redevelopment. The Eastman Chromium Intensifier supplied in tubes is equally as satisfactory as Formula In-4.

***Warning:** Developers, such as Formula D-76, containing a high concentration of sulphite, are not suitable for redevelopment, since the sulphite tends to dissolve the bleached image before the developing agents have time to act on it.

Note: See precautions on handling negatives, page 21.

[Formula
In-5]

Silver Intensifier

This is the only known intensifier which gives an image of neutral color. The progress of intensification may be followed visually and arrested at any stage.

Stock Solution No. 1	Avoirdupois	Metric
Silver Nitrate, crystals (E. K. Co.).....	2 ounces	60.0 grams
Water, distilled, to make.....	32 ounces	1.0 liter
Keep Stock Solution No. 1 in a brown bottle.		
Stock Solution No. 2		
Sodium Sulphite, desiccated (E. K. Co.)....	2 ounces	60.0 grams
Water to make.....	32 ounces	1.0 liter
Stock Solution No. 3		
Hypo.....	3½ ounces	105.0 grams
Water to make.....	32 ounces	1.0 liter
Stock Solution No. 4		
Sodium Sulphite, desiccated (E. K. Co.)....	½ ounce	15.0 grams
Elon.....	350 grains	24.0 grams
Water to make.....	96 ounces	3.0 liters

The intensifier solution is prepared as follows:

Slowly add 1 part of Solution No. 2 to 1 part of Solution No. 1, shaking or stirring to obtain thorough mixing. The white precipitate which appears is then dissolved by the addition of 1 part of Solution No. 3. Allow the resulting solution to stand a few minutes until clear. Add, with stirring, 3 parts of Solution No. 4. The intensifier is then ready for use and the film should be treated immediately. The degree of intensification obtained depends upon the time of treatment, which should not exceed 25 minutes. After intensification, the film should be immersed and agitated for 2 minutes in a plain 30 per cent hypo solution and then washed thoroughly.

The mixed intensifier is stable for approximately 30 minutes at 70° F. (21° C.).

Note: See precautions on handling negatives, page 21.

Reducers

Eastman reducer formulas may be classified according to their use as follows:

1. Cutting or Subtractive Reducers for Correcting Overexposed Negatives.

R-2 Acid Permanganate.

R-4a Farmer's (Single-Solution) Reducer.

2. Proportional Reducers for Correcting Overdeveloped Negatives.

R-4b Two-Solution Farmer's Reducer.

R-5 Acid Permanganate-Persulphate.

R-8 Modified Belitzski (Also a cutting reducer).

Permanganate Reducer

For Correcting Overexposed Negatives

[Formula
R-2]**Stock Solution A**

	Avoirdupois	Metric
Water	32 ounces	1.0 liter
Potassium Permanganate	1 3/4 ounces	52.5 grams

Stock Solution B

Water	32 ounces	1.0 liter
Sulphuric Acid, C. P. (E. K. Co.)	1 fluid oz.	32.0 cc.

Warning: When preparing Stock Solution B, *always add the acid to the water slowly with stirring—never the water to the acid.* Otherwise, the solution may boil over and spatter on the hands and face, causing serious burns.

The negative must be washed thoroughly to remove all traces of hypo before it is reduced. For use, take 1 dram (4 cc.) of A, 2 drams (8 cc.) of B, and 8 ounces (250 cc.) of water. When the negative has been sufficiently reduced, place it in a fresh Acid Fixing Bath (Formula F-5, page 18) for a few minutes, to remove yellow stain, after which, wash thoroughly.

If reduction is too rapid, add more water. Do not use this solution as a stain remover as it will attack the image before removing the stain. Use Formula S-6, page 24, for removal of stains.

NOTE: If a scum forms on the top of the permanganate solution or a reddish curd appears in the solution, it is because the negative has not been sufficiently washed to remove all hypo, or because the permanganate solution has been contaminated by hypo. The separate solutions will keep and work perfectly for a considerable time if proper precautions against contamination are observed. The two solutions should not be combined until immediately before they are to be used. They will not keep long in combination.

A close observance of the foregoing instructions is important. Otherwise, an iridescent scum will sometimes appear on the reduced negatives after they are dry, and this is difficult, if not impossible, to remove.

When washed, the films may be dried in the developing hangers or a clip may be attached to a corner and the films hung on a line to dry. The films should be dried in a clean place, free from dust.

Any slight tendency of the films to curl when dry may be overcome by placing them under slight pressure for a few hours. When removed, they remain quite flat.

Farmer's Reducer

For Correcting Overexposed Negatives

[Formula
R-4a]**Stock Solution A**

	Avoirdupois	Metric
Water	16 ounces	500.0 cc.
Potassium Ferricyanide (Red Prussiate)	1 1/4 ounces	37.5 grams

Stock Solution B

Water	64 ounces	2.0 liters
Hypo	16 ounces	480.0 grams

For use, take Stock Solution A, 1 ounce (30 cc.); Stock Solution B, 4 ounces (120 cc.); water, 32 ounces (1 liter). Add A to B; then add the water and pour over the negative to be reduced. Watch closely. The action is best seen when the solution is poured over the negative in a white tray. When the negative has been reduced sufficiently, wash thoroughly. The two solutions should not be combined until they are to be used. They will not keep long in combination.

Farmer's Reducer may also be used as a two-solution formula by treating the negative in the ferricyanide solution first and subsequently in the hypo solution. This method has the advantage of giving almost proportional reduction and correction for overdevelopment. The single-solution Farmer's gives only cutting reduction and corrects for overexposure.

[Formula
R-4b]**Two-Solution Farmer's Reducer**
For Correcting Overdeveloped Negatives

Solution A	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
Potassium Ferricyanide.....	¼ ounce	7.5 grams
Solution B		
Water.....	32 ounces	1.0 liter
Hypo.....	6 ¾ ounces	200.0 grams

Treat the negatives in Solution A with uniform agitation for 1 to 4 minutes at 65° to 70° F. (18° to 21° C.), depending upon the degree of reduction desired. Then immerse in Solution B for 5 minutes and wash thoroughly. The process may be repeated if more reduction is desired. For the reduction of general fog, 1 part of Solution A should be diluted with 1 part of water.

[Formula
R-5]**Proportional Reducer**
For Correcting Overdeveloped Negatives

Stock Solution A	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
Potassium Permanganate.....	4 grains	0.3 gram
*Sulphuric Acid (10% solution).....	½ fluid oz.	16.0 cc.
Stock Solution B		
Water.....	96 ounces	3.0 liters
Ammonium Persulphate.....	3 ounces	90.0 grams

*To make a 10 per cent solution of sulphuric acid, take 1 part of concentrated acid and add it to 9 parts of water, slowly, with stirring.

For use, take 1 part of A to 3 parts of B. When sufficient reduction is secured, the negative should be cleared in a 1 per cent solution of sodium bisulphite. Wash the negative thoroughly before drying.

[Formula
R-8]**Modified Belitzski Reducer**
For Treatment of Dense Contrasty Negatives

	Avoirdupois	Metric
Water (about 125° F.) (52° C.).....	24 ounces	750.0 cc.
Ferric Chloride, crystals.....	365 grains	25.0 grams
*Potassium Citrate.....	2 ½ ounces	75.0 grams
Sodium Sulphite, desiccated (E. K. Co.)....	1 ounce	30.0 grams
Citric Acid.....	290 grains	20.0 grams
Hypo.....	6 ¾ ounces	200.0 grams
Water to make.....	32 ounces	1.0 liter

Dissolve the chemicals in the order given.

*Sodium citrate should not be used in place of potassium citrate because the rate of reduction is slowed up considerably.

Use the reducer solution full strength for maximum rate of reduction. Treat the films for 1 to 10 minutes at 65° to 70° F. (18° to 21° C.). Then wash thoroughly. If a slower action is desired, dilute 1 part of the solution with 1 part of water.

This modified Belitzski Reducer is the only known single-solution reducer which keeps well in a tank.

[Formula
S-6]**Stain Remover**

Developer or oxidation stain may be removed by first hardening the film for 3 minutes in the Formalin Hardener (SH-1), page 20, then washing for 5 minutes, and bleaching in:

Stock Solution A	Avoirdupois	Metric
Water.....	32 ounces	1.0 liter
Potassium Permanganate.....	75 grains	5.3 grams
Stock Solution B		
Water.....	32 ounces	1.0 liter
Sodium Chloride (table salt).....	2 ½ ounces	75.0 grams
Sulphuric Acid, C. P. (E. K. Co.).....	½ fluid oz.	16.0 cc.

Use equal parts of A and B. The solutions should not be mixed until ready for immediate use, since they do not keep long after mixing. All particles of permanganate should be dissolved completely when preparing Solution A, since undissolved particles are likely to produce spots on the negative. Bleaching should

be complete in 3 or 4 minutes. The brown stain of manganese dioxide formed in the bleaching bath is best removed by immersing the negative in 1 per cent sodium bisulphite solution. Then rinse well and develop in strong light (except direct sunlight) with any nonstaining developer, such as Formula D-61a (page 12), diluted with an equal part of water.

Warning: Developers containing a high sulphite and low alkali concentration (such as D-76) should not be used for redevelopment because the sulphite tends to dissolve the silver image before the developing agents have had time to act upon it.

Tray Cleaner

[Formula]
TC-1

	Avoirdupois	Metric
Water	32 ounces	1.0 liter
Potassium Bichromate	3 ounces	90.0 grams
Sulphuric Acid, C. P. (E. K. Co.)	3 fluid oz.	96.0 cc.

Add the sulphuric acid slowly to the bichromate solution with stirring when mixing; never the bichromate or water to the acid, because the solution will boil and may spatter on the hands or face, causing serious burns.

For use, pour a small volume of the tray cleaner solution into the vessel to be cleaned. Rinse around so that the solution has access to all parts of the tray; then pour the solution out and wash the tray 6 or 8 times with water until all traces of the cleaning solution disappear.

Tray Cleaner

[Formula]
TC-2

For Removal of Silver Stains

Solution A

	Avoirdupois	Metric
Water	32 ounces	1.0 liter
Potassium Permanganate	73 grains	5.0 grams
Sulphuric Acid, C. P. (E. K. Co.)	2½ drams	10.0 cc.

Add the sulphuric acid slowly while stirring the permanganate solution rapidly.

Solution B

	Avoirdupois	Metric
Water	32 ounces	1.0 liter
Sodium Bisulphite (E. K. Co.)	145 grains	10.0 grams

For use, pour Solution A into the tray and allow it to remain for a few minutes; then rinse with water. Apply Solution B and wash thoroughly.

This formula will remove most types of stains, but it is especially recommended for the removal of silver stains.

Retouching Advantages

Eastman Portrait Films offer an important advantage in that retouching can be done on both the face and back of the film. Any coarse retouching is greatly softened in the print if it is done on the back of the negative.

After the retoucher has become accustomed to film, twice as much retouching can be done in a given time. There is a resiliency to the film that makes for speed and sureness.

Opaquing is easily done by laying the film on a piece of glass, the method being the same as for glass plates.

If a film is to be coated with Ground Glass Substitute, it can be placed in a No. 2 Film Developing Hanger and the solution flowed over the back in exactly the same way a plate is handled.

An advantage in the thinness of the Eastman Film is that prints can be made from either side of the negative with practically no loss of detail.

Varnishing or Waterproofing



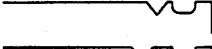

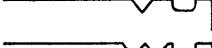

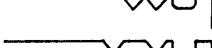
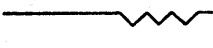

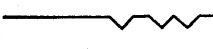
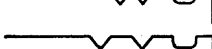
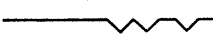
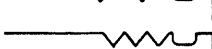
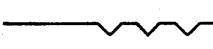
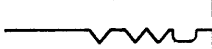


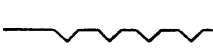




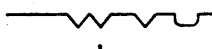
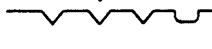
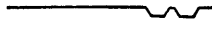

Any negative of unusual value, either film or plate, should have its gelatin surface protected. We especially recommend Kodalak WP

as a protection for the film negative, because it is as pliable as the film itself, makes the film waterproof and protects the surface of the negative from finger marks, stains, etc. A negative that has received an application of Kodalac WP can be cleaned with a wet cloth without injury.

The negative should never be coated until it has been retouched. Equal parts of Kodalac WP and Kodalac Thinner should be used, and as the solution thickens by evaporation, on exposure to the air, Thinner should be added to keep it at the proper consistency.

Whether the film is flowed with the solution or drawn through the solution in a tray, the surface must be covered with one continuous flowing motion. A backward and forward motion may remove the retouching, and the coating will dry in streaks.

Film-Notching Code

Safety Film		Nitrate Film	
	Portrait—Par Speed		Portrait—Par Speed
	Portrait—Super Speed Ortho		Portrait—Super Speed Ortho
	Commercial		Commercial
	Commercial Ortho		Commercial Ortho
	Commercial Pan- chromatic		Commercial Pan- chromatic
	Process		Process
	Portrait Panchromatic		Portrait Panchromatic
	Process Panchromatic		Portrait Panchromatic
	Panatomic		Commercial Matte
	Commercial Matte		Super Sensitive Pan- chromatic
	Ortho Press		
	Kodalith		
	Ortho Kodalith		
	Panchro-Press		
	Super Sensitive Pan- chromatic		
	Super Panchro-Press		

This film-notching code is used on Eastman Cut Film from $2\frac{1}{4} \times 3\frac{1}{4}$ inches to 20×24 inches, and from 45×107 mm. to 50×60 cm., inclusive. Ortho Press Film 22×24 inches also carries the identification notch. Sizes larger and smaller than those given above carry the single notch as used for Par Speed Portrait Film. Any emulsions not listed on the chart also carry the single notch, regardless of film size.

Weights and Measures—Conversion Tables

In photographic practice, solids are weighed and liquids are measured either by the Avoirdupois or the Metric system.

The following tables of weights and measures give all the equivalent values required for converting photographic formulas:

Avoirdupois to Metric Weight

Pounds	Ounces	Grains	Grams	Kilograms
1	16	7000	453.6	0.4536
0.0625	1	437.5	28.35	0.02835
		1	0.0648	
	0.03527	15.43	1	0.001
2.205	35.27	15430	1000	1

U. S. Liquid to Metric Measure*

Gallons	Quarts	Ounces (Fluid)	Drams (Fluid)	Cubic Centimeters	Liters
1	4	128	1024	3785	3.785
0.25	1	32	256	946.3	0.9463
		1	8	29.57	0.02957
0.000975	0.0039	0.125	1 (60 mins.)	3.697	0.003697
		0.03381	0.2705	1	0.001
0.2642	1.057	33.81	270.5	1000	1

Solid Conversion Values

Grains per 32 oz.	multiplied by 0.06847	=grams per liter
Ounces per 32 oz.	multiplied by 29.96	=grams per liter
Pounds per 32 oz.	multiplied by 479.3	=grams per liter
Grams per liter	multiplied by 14.60	=grains per 32 oz.
Grams per liter	multiplied by 0.03338	=ounces per 32 oz.
Grams per liter	multiplied by 0.002086	=pounds per 32 oz.

Liquid Conversion Values*

(U. S. System)

Ounces (fluid) per 32 oz. multiplied by 31.25 = cubic centimeters per liter.
Cubic centimeters per liter multiplied by 0.032 = ounces (fluid) per 32 oz.

*These tables do not apply when converting British Imperial to metric measure.

PRICE LIST

Eastman Par Speed Portrait, Super Speed Ortho Portrait Antihalation, Commercial,* Commercial Matte,* Commercial Ortho, Safety Ortho Press, and Process* Films

Price per dozen films.

2¼ x 3¼	\$.45	7 x 11	\$ 3.20
3¼ x 4¼	.65	8 x 10	3.20
3¼ x 5½	.90	10 x 12	5.60
4 x 5	.90	7 x 17	5.60
4¼ x 6½	1.30	11 x 14	8.05
5 x 7	1.45	8 x 20	8.35
6½ x 8½	2.20	14 x 17	13.70
12 x 20			\$12.65

Centimeters

4½ x 6	\$.40
6½ x 9	.50

Centimeters

9 x 12	\$.80
10 x 15	1.15

Price per box of two dozen films.

5 x 7	\$2.90	6½ x 8½	\$4.40
8 x 10			\$6.40

*Antihalation supplied when specified.

Eastman Portrait Panchromatic,* Super Sensitive Panchromatic,* Panchro-Press Antihalation, Safety Panatomic,* Commercial Panchromatic, and Panchromatic Process Antihalation Films

Price per dozen films.

4¼ x 6½	\$1.45	10 x 12	\$ 6.20
5 x 7	1.60	7 x 17	6.20
6½ x 8½	2.45	11 x 14	8.90
7 x 11	3.55	8 x 20	9.20
8 x 10	3.55	14 x 17	15.10
12 x 20			\$13.95

Price per box of two dozen films.

5 x 7	\$3.20	6½ x 8½	\$4.90
8 x 10			\$7.10

*Antihalation supplied when specified.

Eastman Super Panchro-Press Antihalation Film

Price per dozen films.

2¼ x 3¼	\$.55	7 x 11	\$ 3.95
3¼ x 4¼	.85	8 x 10	3.95
3¼ x 5½	1.10	10 x 12	6.85
4 x 5	1.10	7 x 17	6.85
4¼ x 6½	1.60	11 x 14	9.80
5 x 7	1.80	8 x 20	10.15
6½ x 8½	2.70	14 x 17	16.65
12 x 20			\$15.35

Eastman Super Panchro-Press Antihalation Film—Continued

Centimeters		Centimeters	
4½ x 6.....	\$.50	9 x 12.....	\$1.00
6½ x 9.....	.65	10 x 15.....	1.45
Price per box of two dozen films.			
5 x 7.....	\$3.60	6½ x 8½.....	\$5.40
8 x 10.....			\$7.90

Eastman Film Holder No. 1

It fits Century View Cameras, Century Studio Reversible Adapters, Eastman View Cameras, R. B. Cycle Graphics 5 x 7 and 8 x 10.

5 x 7.....	\$2.90	7 x 11.....	\$3.50
6½ x 8½.....	3.65	8 x 10.....	4.00

Eastko Film Holders

This holder fits all cameras using Eastman Film Holder No. 1.

Eastko Film Holder 5 x 7.....	\$2.10
Eastko Film Holder 8 x 10.....	3.00

Eastman Film Sheaths No. 3

4¼ x 6½.....	\$.20	6½ x 8½.....	\$.25
5 x 7.....	.20	8 x 10.....	.30

Sterling Film Holders

8 x 10.....	\$5.50	11 x 14.....	\$10.50
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These holders fit the F. & S. Home Portrait Camera, F. & S. Sky Scraper Camera, Folmer Commercial Camera, and any other camera taking Sterling Holders.

Graflex Film Holder

5 x 7.....	\$4.50
Fits any 5 x 7 Graflex Camera.	

Graflex Cut Film Magazine

5 x 7.....	\$19.00
Holds twelve films in septums and fits any 5 x 7 Graflex Camera.	

Eastman Portrait Film Washing Tank

Accommodates eighteen No. 2 or twenty-four No. 4, 8 x 10 Hangers and twenty-four No. 2 or thirty-two No. 4, 5 x 7 Hangers. A cross-piece makes it practical to wash both 5 x 7 and 8 x 10 films in the Tank at the same time.

Eastman Portrait Film Washing Tank.....	\$6.00
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Eastman Film Developing Hanger No. 2

8 x 10.....	\$.75	11 x 14.....	\$1.35
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Eastman Film and Plate Developing Hanger No. 4A

4¼ x 6½.....	\$.60	6½ x 8½.....	\$.75
5 x 7.....	.60	8 x 10.....	.75

No. 4 Film Developing Hanger Rack

This Rack holds nineteen 5 x 7, or fourteen 8 x 10, No. 4 Film Developing Hangers and fits the No. 3 Eastman Hard Rubber Developing and Fixing Box. The films may be developed, rinsed, fixed, and washed without removing the hangers from the Rack. This Rack is made of the same highly noncorrosive metal as the Developing Hangers.

No. 4 Film Developing Hanger Rack.....	\$3.00
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Eastman Developing and Fixing Box, Hard Rubber**For Developing or Fixing Films in Film Developing Hangers**

No. 2, for 4¼ x 6½, or 5 x 7 Films.....	\$4.50
No. 3, for 4¼ x 6½, 5 x 7, 6½ x 8½, or 8 x 10 Films.....	6.75
No. 3A, for 6½ x 8½ and 8 x 10 Films only.....	5.75
No. 2 Hard Rubber Floating Lid.....	1.20
No. 3 Hard Rubber Floating Lid.....	1.50

Kodakak WP

Kodakak WP, 16-oz. bottle.....	\$1.00
Kodakak WP Thinner, 16-oz. bottle.....	.80

Wratten Safelight Lamps

These popular indirect-light lamps use 25-watt bulbs and 8 x 10 safelights. They have two compartments. The lamp is in the upper, the safelight in the lower. The two models are similarly constructed except that No. 1 has a slide of opal glass in the upper compartment for white light.

These lamps are supplied with safelight but not electric bulb. When no safelight is specified, the Series 2 will be furnished.

	No. 1	No. 2
Wratten Safelight Lamp, including safelight, cord and plug.....	\$10.00	\$8.00
Extra Safelights, any series, each.....	1.25	1.25

Kodak Safelight Lamp Improved

This is a smaller indirect-light lamp for 5 x 7 safelights. It uses a 25-watt lamp and is furnished with a Series 2 Safelight. It has an adjustable bracket for attaching to wall or shelf and for tilting the lamp.

Kodak Safelight Lamp, including safelight, electric cord and plug...	\$4.00
Extra Safelights, any series, 5 x 7.....	.75

Eastman Safelight Lamp

This is a 5 x 7 lamp giving direct light for which a 10-watt lamp must be used. It may be attached to a drop cord or an ordinary wall fixture. Series 2 Safelight is furnished.

Eastman Safelight Lamp, including safelight, screw plug and lamp socket.....		\$3.00
Extra Safelights, any series, 5 x 7.....		.75

Indirect Light Boxes

These metal boxes are to be hung from the ceiling to provide general, indirect illumination. The single boxes hold one 10 x 12 safelight—the double boxes, two, there being a switch for each light. Cord and plug are included, but not safelights, electric bulb, or supporting chains.

	Single	Double
Indirect Light Box with cord and plug.....	\$7.50	\$14.00
Wratten Safelights, any series, 10 x 12, each.....	—	1.75

Wratten Safelights

Series 00, for Developing-out Papers

Series 0, a bright orange for use with Bromide Paper and Lantern Slide Plates

Series 0A, a greenish yellow safelight for use with Bromide Papers and Lantern Slide Plates

Series 1, for Films and Plates not color-sensitive

Series 2, for *Super Speed* and Orthochromatic Plates and Films including Verichrome

Series 3, for Panchromatic Films and Plates

	5 x 7	8 x 10	10 x 12
Wratten Safelights, any series.....	\$.75	\$1.25	\$1.75

Wratten Filters

Wratten Filters for use with Orthochromatic and Panchromatic Films are supplied in three forms: Gelatin Film, "B" glass cemented filters (a good optical glass), and "A" glass cemented filters, commonly called "Flats" (hand-surfaced optically flat glass). Unless otherwise specified, "B" filters are supplied for photographic use.

The filters most commonly used are:

K1, a light yellow filter giving good correction for short exposures.

K2, a stronger yellow filter producing good correction with daylight and approximately correct color rendering with Mazda clear globe lamps.

X1, a pale green filter which gives correct rendering of all colors when used with Eastman Super Sensitive Panchromatic Film with daylight, or Eastman Portrait Panchromatic Film with incandescent tungsten lighting.

X2, a deeper green filter which gives correct rendering when used with Eastman Super Sensitive Panchromatic Film with incandescent tungsten lighting.

G, a strong yellow filter for photographing dark yellow woods, badly stained copies, or for eliminating haze in distant landscapes.

F, a deep red filter for photographing dark mahogany, blueprints, etc.

Tricolor: A, orange-red; B, green; C5, blue.

A is for photographing mahogany, rosewood, and similar materials.

B is for photographing typewriting, figured rugs, carpets, etc.

C5 is for three-color work only.

Commercial Set of 8 Filters

This set includes the filters most generally used: K1, K2, X1, G, F, A, B, and C5. The exposure factors for these filters are given in every package of Panchromatic Film.

Cemented in B glass, 3-inch squares, per set in case.....	\$35.00
Cemented in B glass, 2-inch squares, per set in case.....	22.00
Single Filters, 3-inch squares, each.....	3.75
Single Filters, 2-inch squares, each.....	2.10

Eastman Adjustable Filter Holders

For use with the 2-, 3-, and 4-inch square Wratten Filters. By means of a simple automatically adjusted ring, the 4-inch filters may be securely attached to any lens barrel from $2\frac{3}{8}$ to $3\frac{7}{8}$ inches in diameter, and 3-inch filters to any lens barrel from $1\frac{1}{8}$ inches to $2\frac{3}{8}$ inches in diameter, and the 2-inch filters to lens barrels from $1\frac{1}{8}$ inches to $1\frac{9}{16}$ inches in diameter.

	2 inches	3 inches	4 inches
Eastman Adjustable Filter Holder, for Wratten Square Filters.....	\$1.25	\$1.50	\$2.50

Prices subject to change without notice.

Eastman Kodak Company
Rochester, N. Y.

August, 1938

Printed in United States of America

BALANCE . . .

DEPENDABLE developers demand that the chemicals with which they are compounded be of a standard strength and purity. Eastman-Tested Chemicals are maintained at invariable standards to insure balanced chemical reactions—to enable Eastman formulas to produce the finest possible negatives and prints. Eastman Kodak Company, Rochester, N. Y.

Specify

EASTMAN TESTED CHEMICALS