

401 INTRODUCTION

This section covers the procedures for processing Metalphoto, Metalphoto Plus, PolyColor, UltraColor and Clear UltraColor plates from exposure through development.

410 METALPHOTO

Before proceeding with the processing instructions which follow, we recommend that you re-read Section 100, Section 276, Section 300 and Appendix B.

411 LINE SHOT EXPOSURE

Metal photo plates are exposed through a high contrast film negative (or positive) with a light source rich in ultraviolet. The recommended light sources are quartz or Mercury vapor. Quartz lights are available from us in two sizes: 600 and 1,000 watt lamps, supplied as part of our Instaplate Departments or available separately. Typical recommended exposures are shown in *Fig. 411.1*. Exposures using a Mercury light source are shown in *Fig. 411.2*.

Any light sources other than these recommendations must produce uniform light intensity over the entire exposure area. The most consistent results are obtained with lamps that have a constant output of ultraviolet. Photoflood lamps are not recommended because they weaken with use and gradually lose ultraviolet output. Over a period of time such lamps cause exposure variations resulting in image inconsistency. Always grasp film and Metalphoto plates by the edges, not by the surface. (*Fig. 411.3*) Film size should be the same size as the plate being imaged or slightly smaller. Place the film with the emulsion side against the sensitized surface of the plate. If the film size is slightly smaller than the plate size, center the film on the plate with even margins on all edges. If the Metalphoto plate is to be image intensified, reduce film size by 1/2" in one dimension to accommodate the inclusion of a

**EXPOSURE TIME
FOR METALPHOTO LINE SHOTS**

QUARTZ LIGHT (watt)	EXPOSURE FROM LIGHT TO EXPOSURE PLANE (inches)	SILVER BACKGROUND TIME (seconds)	BLACK BACKGROUND TIME (seconds)
650	24	15	30
1000	24	10	20

Fig. 411.1

**EXPOSURE GUIDE FOR
NuArc 26-1K & 40-1K UNITS**

PRODUCT	LIGHT UNIT WITH FILTER	LIGHT UNIT W/O FILTER
Metalphoto		
Silver Background	.8	*
Black Background	1.5	*
Metalphoto Plus		
Silver Background	.8	*
Black Background	1.5	*
Metalphoto Plus - Red		
Red Background	2.0	*
Black Background	4.0	*
Metalphoto Plus (All other precolored except Red)		
Precolored Background	1.5	*
Black Background	3.0	*
UltraColor		
Clear	45.0	15.0
Pre-Dyed	150.0	50.0
Instacolor	45.0	15.0
PolyColor	150.0	50.0
Alanex	300.0	100.0
Alutique	Not Recommended	

*Mercury Exposure Units without diffusion filter are not recommended in these applications as they will probably expose the opaque portions of your film, causing fog. Fig. 411.2



Fig. 411.3



Fig. 411.4



Fig. 411.5

Stouffer 21 Step Wedge in the exposure step. (Fig. 411.4)

Intimate contact of film to plate is essential for image clarity and is obtained with a vacuum frame or pressure plate. Eliminate all air bubbles between film and plate, taking special care when exposing Metalphoto plates thinner than .020" (Fig. 411.5) Air bubbles between the film and plate allow the exposing light to pass under black areas of the film causing blurred image edges.

412 HALFTONE EXPOSURE

Halftone exposure should be the same as that shown for line shots if the density of the dots on the halftone film is in the proper range. However, in practice, many halftone films do not have sufficient dot density and require an adjustment in the exposure time to avoid overexposure. Make this exposure time adjustment in one of two ways:

1. Reduce the exposure time to 2 to 3 seconds. If film density is unknown, make a test strip exposure to verify the reduced time.
2. Expose for the normal length of time but through 2 sheet of our interleaving paper. Hold the paper halfway between the light source and the exposure plane. The paper should be at least six inches from the lamp to avoid a fire hazard. (Fig. 412.1)

IMPORTANT: *If you still have a problem with overexposure of halftones, either the film density is too low to correct or contact between the plate and film is poor. (Best contact is achieved using a glass covered vacuum frame.) Decreasing exposure may result in brown rather than black images. If a brown image color is unacceptable, you must remake a proper density negative and process Metalphoto.*



Fig. 412.1



MODEL 14-4 ZIP PROCESSOR



MODEL 28-5 ZIP PROCESSOR

according to recommendations. Refer to Section 276 for proper density requirements.

Once the plate is exposed, it is ready for chemical developing and fixing.

413 DEVELOPING AND FIXING

Metalphoto plates can be chemically processed automatically in a Zip Processor, or manually in tanks or trays. (See Appendix B - Mixing and Handling of Zip and Tray Chemistry.)

414 ZIP PROCESSOR METHOD

The Zip Processor automatically develops and fixes an exposed Metalphoto plate, applying the appropriate chemicals for the required times. It is necessary when using a Zip Processor to follow several simple rules to insure high quality results.

1. Make sure your machine is level.
2. Fill the fixer reservoir to the proper level with undiluted Zip and Tray Fixer.
3. Fill the developer reservoir to the proper level with undiluted Zip Developer.
4. Turn on the machine and allow it to run for 60 seconds. All rollers should be uniformly wet at this point.
5. The recommended operating temperature range for Zip chemistry is 68-72°F. Best results are obtained at 72°F.

Under normal operating circumstances, both the developer and fixer should be changed after 40 working hours if the Zip Processor was operated with the cover in place and turned off when not in use. Always drain the chemicals from the Zip Processor into suitable bottles for storage if the processor will not be used for a long period.

IMPORTANT: *If you have already processed a number of plates in the Zip Processor and do not have sufficient developer to wet the rollers uniformly, replace BOTH developer and fixer with fresh chemicals.*

Both must be replaced because the fixer chamber has accumulated too much developer to permit complete fixing of your metal.

Short-cutting here will lead to lost production due to poorly processed plates.

The Zip Processor is ready to process Metalphoto plates once it is level, properly filled, and running. To process an exposed plate, insert it in the processor with the *EXPOSED SIDE DOWN*. Hold the plate by the edges in a horizontal position (so that it cannot scrape against the lip of the Zip developer well) until the rolls in the machine grab and hold it in that position. (*Fig. 414.1*) As the plate emerges from the fixer end of the machine, again grasp the plate by the edges and keep it horizontal until it is free of the processor. (*Fig. 414.2*) The plate is now completely developed and fixed. Be sure to wait a few seconds before inserting the next plate so that the rolls become sufficiently wet with chemicals. This pause is especially important when processing 1220 size plates and larger.

Immediately after fixing the plate, rinse it thoroughly on both sides. (*Fig. 414.3*) The recommended methods for doing this are to wash the plate with clean water and a soft sponge making sure all of the plate gets sponged, or to spray rinse the plate. Always make sure both sides are thoroughly rinsed. An alternate method is to put the plate in the rinse bath of your Instaplate Department for 2 minutes making sure that the tank has a good, constant flow of fresh water. Proper rinsing is necessary to remove all fixer from the plate. If this is not done, it is possible to bleach the image areas on the plate and contaminate the sealing bath.

To maximize the effectiveness of Zip processing, always operate the machine with its protective cover in place. (*Fig. 414.4*) This helps



Fig. 414.1



Fig. 414.2



Fig. 414.3



Fig. 414.4

prevent contamination of the chemicals from dirt and retards evaporation. Turn off the Zip Processor when not in use to reduce oxidation of the chemicals.

Once fixer has been rinsed from the plate, it is ready to be sealed.

IMPORTANT: All coloring processes as well as image intensification must be done prior to sealing. See Section

417 for a description of the image intensification process and Section 500 for color processes.

415 TANK OR TRAY METHOD

Processing Metalphoto plates in tanks or trays is simple and effective if several procedures are followed carefully:

1. Make certain that your trays or tanks contain enough solution to provide good coverage of the plate.
2. Use Metalphoto Developer, either Zip or Tray, diluted 1 part developer to 3 parts distilled or deionized water.
3. Use Metalphoto Zip and Tray Fixer, diluted 1 part fixer to 3 parts distilled or deionized water.
4. The recommended operating temperature range is 68-72°F. Best results are obtained at 72°F.

IMPORTANT: Trays used for image intensification should never be used for anything other than the intensification process.

Approximately 15, 10" x 12" plates or their equivalent surface area can be processed per 1 quart (working strength) of chemicals. If tank processing is employed, tanks should be covered when not in use. It is advisable to discard chemicals after 1 week, even if the appropriate number of plates have not been processed.

Start by rinsing both sides of the exposed plate with tap water. (Fig. 415.3) This slows down initial development and allows the entire plate to develop evenly. Failure to do this may cause spotting. Keep developer temperature between 68° and 72°F (20° to 22°C.) Develop plate, with occasional agitation, until the image is a good, dense black. The exact time required for development depends primarily on developer concentration. Freshly prepared developer will develop the first plate in 15-20

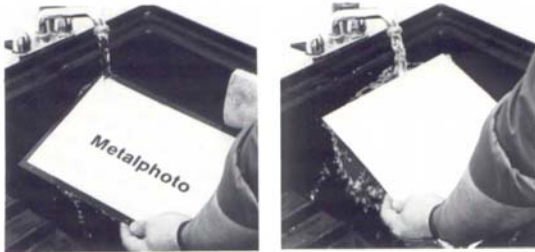


Fig. 415.3



Fig. 415.4

seconds. If plates are immersed in developer for too long, black spots may develop in the unexposed areas of the plate. The more plates run through a tank or tray of developer, the weaker the developer becomes, causing developing times to increase. If more than 4 minutes are required to develop a plate to a good black, discard the solution and start with a fresh batch. Immediately after developing, rinse both sides of the plate for 1 minute in running tap water. Use of a tray for rinsing collects contaminants and is not recommended. A continuous flow of fresh water is critical here. (Fig. 415.3)

After rinsing, immerse the plate in diluted Zip and Tray Fixer for 2 minutes and occasionally agitate. (Fig. 415.4) After fixing, rinse both sides of the plate in running water for 1 minute.

Once fixer is rinsed from the plate it is ready to be sealed.

IMPORTANT: All coloring processes as well as image intensification must be done prior to sealing. See Section 417 for a description of the image intensification process and Section 500 for color processes.

415.1 METALPHOTO STOP BATH

Metalphoto's stop bath halts development of the Metalphoto image while leaving the balance of the plate photosensitive.

The stop bath technique provides the processor with two important benefits, both of which result in the elimination of wasted material and lost production time.

1. It assures the accuracy of double burn exposures.
2. It permits the repair of voids in the black image due to imperfect film.

415.2 DOUBLE BURN PROCEDURE

The addition of the stop bath in the processing procedure permits viewing the image produced by the first negative to facilitate visual registration of the second negative.

IMPORTANT: Metalphoto stop bath is used "full strength, as is" in both Zip machine and tray processing.

Stop bath procedure for short runs or one of a kind

1. Develop the plate in a tray of working strength Tray Developer (see Section 415).
2. Rinse both sides of the plate with running tap water.
3. Immerse the plate in a tray of stop bath for 30 seconds.
4. Rinse and dry.
5. Visually register second exposure to developed image and expose.
6. Process plate through Zip machine in normal manner.

Stop bath procedure for long runs

1. Drain fixer chamber and replace with stop bath.
2. Process plate through Zip machine. The exposed image is fully developed, while the unexposed areas remain photosensitive.
3. Rinse and dry.
4. Visually register second burn to

5. Replace stop bath in second chamber with fixer and process plate through Zip machine in normal manner.

415.3 REPAIR VOIDS IN BLACK IMAGE

The stop bath technique permits the checking of a fully developed, but unfixer, Metalphoto image for voids and quickly repairs them thus saving the plate. It is extremely useful when processing large or heavy gauge sheets.

IMPORTANT: *Metalphoto stop bath is used "full strength, as is" in both Zip machine and tray processing.*

1. Use either of the two methods outlined in Section 415.2 to add stop bath to your processing procedure.
2. Develop and stop bath. The exposed image is fully developed while the unexposed areas remain photosensitive.
3. Rinse and dry.
4. Examine image for voids.
5. In white light, dip "Q Tip" in developer and paint developer on white voids.
6. Fix plate in normal manner.

416 PROCESSING TWO-SIDED MATERIAL

Product Group II Metalphoto plates are anodized and photosensitized on both sides and can be processed with imagery on both sides.

Processing both sides of a Metalphoto plate can be done in a Zip Processor or in tanks or trays. No special instructions are required for the tank or tray method. Simply process the plate as if it were printed on one side. Process both sides of a plate in a Zip Processor as follows. A Zip Processor in normal operation applies solution to the bottom surface of an exposed plate. To process both sides, remove the Zip Processor cover. Using a clean sponge saturated with Zip Developer,

wet the entire length of the first top roll in the developer well. Continue to keep the roll wet with developer until the plate is no longer under this roll. (Fig. 416.1)



Fig. 416.1



Fig. 417.1

Fixing can be done in the same manner by using a clean sponge saturated with undiluted Zip and Tray Fixer to wet the entire length of the first top roll in the fixer well. (Be careful not to contaminate the developer rolls with fixer at this point.) As an alternative, immerse the plate for 60 seconds in a tray of Zip and Tray Fixer.

417 IMAGE INTENSIFICATION

Image intensification is a chemical process for converting the image on Metalphoto plates, which consists primarily of metallic silver, into an image consisting primarily of metallic gold. Metallic gold images appear to be a deeper (blue) black and have somewhat greater durability than those made from metallic silver. Image intensification improves the resistance of the image to fading, if the finished product made from Metalphoto plates will be exposed to temperatures above 400°F for a reasonable period of time, or if the

product application requires extended outdoor durability.

Metalphoto image Intensifier is supplied as a two component system. Follow the instructions listed on the package. *All equipment and containers used for mixing, storing or using Metalphoto Image Intensifier must be made of plastic or glass. Metal materials contaminate Image Intensifier. (Fig. 417.1)*

IMPORTANT: *Trays used for image intensification should never be used for anything other than the intensification process.*

The following instructions apply to mixing a 5 gallon batch. Other volumes are prepared proportionately.

Fill a clean, plastic or glass 5 gallon container with 4 gallons of deionized or distilled water. Add the entire contents of the bottle of gold chloride and stir thoroughly with a clean plastic or glass rod.

In a separate glass container, heat 1 gallon of deionized or distilled water to at least 125°F (52°C). Add some of the hot water to the jar of ammonium thiocyanate until the jar is nearly full. With a clean glass or plastic stirring rod, stir the ammonium thiocyanate until all the powder is completely dissolved. Without cleaning the rod (used to mix the ammonium thiocyanate solution), use it to stir the container in which the gold chloride was mixed. Stir the gold chloride solution until it changes from red to milky white. A few additional drops of ammonium thiocyanate solution may be necessary to make the gold chloride turn milky. The gold chloride solution will turn from milky to clear when enough drops of ammonium thiocyanate have been added to “prime” the gold chloride solution sufficiently. Now slowly add the ammonium thiocyanate solution to the gold chloride solution while

continuing to stir. Stop adding if the solution becomes red and continue stirring until it clears. Continue the procedure to completely blend the two solutions.

When the two solutions are completely blended, add water to bring the total to 5 gallons. Store in an air-tight plastic or glass container. Use of a brown bottle extends the life of the solution. Avoid storage in a warm area.

Image intensification requires 60 to 90 seconds and is done after the exposed plate has been developed, fixed and rinsed. The process is complete when the image color shifts towards a purple hue. When using the image intensification process, it is sometimes difficult to determine the proper immersion time in the intensifier because of the type of image on the plate. To eliminate this difficulty, expose a Stouffer 21 Step Wedge along one edge of the plate, outside the usable image area. (Fig. 417.2)

Intensify until the lower gradations of the scale turn to purple. The life of the image intensification bath depends on the number of plates that have been intensified. Typically, 5 gallons of image intensification solution intensifies the equivalent of 300 to 400, 10” x 12” Metalphoto plates, depending on the amount of black area on each plate.

Rinse intensified plates thoroughly on both sides with running water. ***It is essential that all intensifier solution be removed from the plate before sealing to avoid sealing bath contamination and tank and heater corrosion.*** (Fig. 417.3)

After a plate has been intensified, color can be added if required (see Section 500). Otherwise, the plate is ready to be sealed.



Fig. 417.2

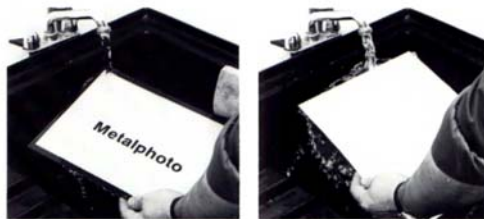


Fig. 417.3

**EXPOSURES FOR
PRE-DYED METALPHOTO PLUS**

**EXPOSURE TIME
FOR METALPHOTO LINE SHOTS**

QUARTZ LIGHT (watt)	DISTANCE FROM LIGHT TO EXPOSURE PLANE (inches)	BLACK BACKGROUND TIME (secs.)		COLORED BACKGROUND TIME (secs.)	
		Red	Other	Red	Other
650	24	120	60	60	30
1000	24	80	40	40	20

Fig. 421.1

420 METALPHOTO PLUS

Before proceeding with the processing instructions which follow, we recommend that you re-read Section 100, Section 300 and Appendix B.

421 LINE SHOT EXPOSURE

Metalphoto Plus plates are exposed with a light source rich in ultraviolet through a high contrast film negative (or positive). The re-

commended light sources are quartz or Mercury vapor. Two sizes are available from us in quartz: 600 and 1,000 watt lamps. Typical recommended exposures are shown in *Fig. 421.1*.

Note that red Pre-Dyed Metalphoto Plus plates require an exposure different from other colors to achieve approximately the same density of black image. Use of a Mercury vapor light source with Metalphoto Plus plates requires exposures such as those shown in *Fig. 411.2* for NuArc units.

Any light source other than these recommendations must produce uniform light intensity over the entire exposure area. The most consistent results are obtained with lamps that have a constant output of ultraviolet. Note that photoflood lamps weaken with use and gradually lose ultraviolet output. Over a period of time such lamps cause exposure variations resulting in image inconsistency.

Always grasp film and Metalphoto Plus plates by the edges, not by the surface. (*Fig. 421.2*) Film size should be same size as the plate being imaged or slightly smaller. If the film size is smaller than the plate size, center the film on the plate with even margins on all edges. (*Fig. 421.3*) Place the film with the emulsion side against the sensitized surface of the plate. Intimate contact of film to plate is essential for image clarity and is obtained with a vacuum frame or pressure plate. Eliminate all air bubbles between film and plate, taking special care when exposing Pre-Dyed Metalphoto Plus plates thinner than .020 inch. (*Fig. 421.4*)

422 HALFTONE EXPOSURE

Halftone exposure should be the same as that shown for line shots in *Fig. 421.1* if the density of the dots on the halftone film is in the proper range. In practice, many halftone films do not have sufficient dot density and require an adjustment in the exposure time to avoid overexposure. Make this exposure time adjustment in one of two ways:

1. Reduce the exposure time. If the film density is unknown, make a test strip exposure to verify the reduced time.
2. Expose for the normal length of time but through 2 sheets of our interleaving paper.

Hold the paper halfway between the light source and the exposure plane. The paper should be at least 6 inches from the lamp to avoid a fire hazard. (Fig. 422.1)

IMPORTANT: *If you still have a problem with overexposure of halftones, either the film density is too low to correct or contact between the plate and film is poor. (Best contact is achieved using a glass covered vacuum frame.)*

Decreasing exposure may result in brown rather than black images. If a brown image color is unacceptable, you must remake a proper density negative and process Metalphoto Plus according to recommendations. Refer to Section 276 for proper density requirements.

Once the plate is exposed, it is ready for chemical development and fixing.

423 DEVELOPMENT AND FIXING

Metalphoto Plus plates can be chemically processed automatically in a Zip Processor, or manually in tanks or trays. (see Appendix B - Mixing and Handling of Zip and Tray Chemistry.)

424 ZIP PROCESSOR METHOD

The Zip Processor automatically develops and fixes an exposed Metalphoto Plus plate applying the appropriate chemicals for the required times. It is necessary when using a Zip Processor to follow several simple rules to insure high quality results.

1. Make sure your machine is level.
2. Fill the fixer reservoir to the proper level with undiluted Zip and Tray Fixer.
3. Fill the developer reservoir to the proper level with undiluted Zip Developer.
4. Turn on the machine and allow it to run for 60 seconds. All rollers should be uniformly wet at this point.

IMPORTANT: *If you have already processed plates in the Zip Processor and do not have sufficient developer to*



Fig. 421.2



Fig. 421.3



Fig. 421.4

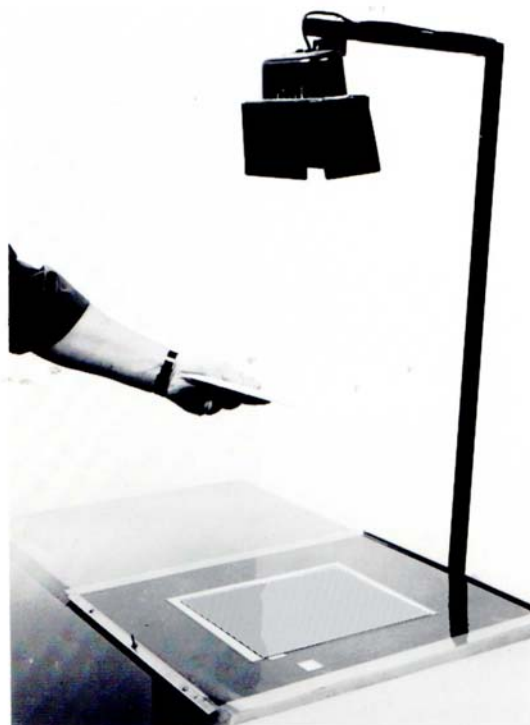


Fig. 422.1

wet the rollers uniformly, replace BOTH develop and fixer with fresh chemicals. Both must be replaced because the fixer chamber has accumulated too much developer to permit complete fixing of your metal.

The Zip Processor is ready to process Metalphoto Plus plates once it is level, properly filled, and running. To process an exposed plate, insert it in the processor with the *EXPOSED SIDE DOWN*. (Fig. 424.1) Hold the plate by the edges in a horizontal position (so that it cannot scrape against the lip of the Zip developer well) until the rolls in the machine grab and hold it in that position. As the plate emerges from the fixer end of the machine, again grasp the plate by the edges and keep it horizontal until it is free of the processor. (Fig. 424.2) The plate is now completely developed and fixed. Be sure to wait a few seconds before inserting the next plate, so the rolls become sufficiently wet with chemicals. This pause is especially important when processing 1220 size plates and larger.

Immediately after fixing the plate, rinse it on both sides. The recommended methods for doing this are to wash the plate with clean water and soft sponge making sure all of the plate gets sponged, or to spray rinse the plate. Always make sure both sides are rinsed. (Fig. 424.3) An alternate method is to put the plate in the rinse bath of your Instaplate Department for 2 minutes making sure that the tank has a good, constant flow of fresh water.

Proper rinsing is necessary to remove all fixer from the plate. If this is not done, it is possible to bleach the image areas on the plate and contaminate the sealing bath. To maximize the effectiveness of Zip processing, always operate the machine with its protective cover in place. (Fig. 424.4) This helps prevent contamination of the chemicals from dirt and retards evaporation.



Fig. 424.1

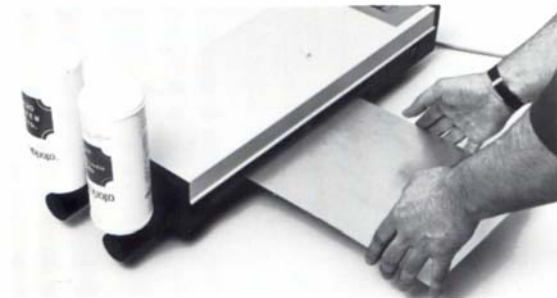


Fig. 424.2

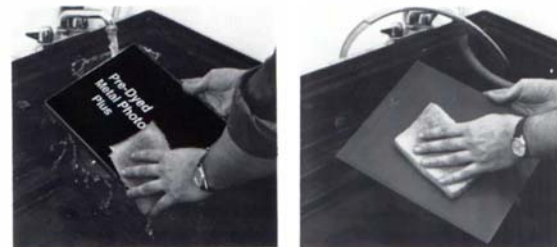


Fig. 424.3



Turn off the Zip Processor when not in use to reduce oxidation of the chemicals. Once fixer has been rinsed from the plate, the plate is ready to be sealed.

425 TANK OR TRAY METHOD

Processing Metalphoto Plus plates in tanks or trays is simple and effective if several procedures are followed carefully:

1. Make certain that your trays or tanks contain enough solution to provide good coverage of the plate.
2. Use Metalphoto Developer, either Zip or Tray, diluted 1 part developer to 3 parts distilled or deionized water.
3. Use Metalphoto Zip and Tray Fixer, diluted 1 part fixer to 3 parts distilled or deionized water.

Rinse both sides of the exposed plate with tap water. (Fig. 425.2) This slows down initial development and allows the entire plate to develop evenly. Failure to do this may cause spotting. Keep developer temperature between 68° and 72°F (20° to 22°C). Develop the plate with occasional agitation until the image is a good, dense black. The exact time required for development depends primarily on developer concentration. Freshly prepared developer solution will develop the first plate in 15-20 seconds. The more plates run through a tank or tray of developer, the weaker the developer gets, causing developing times to increase. If more than 4 minutes are required to develop a plate to a good black, discard the solution and start with a fresh batch. Immediately after development, rinse both sides of the plate for 1 minute in running tap water. Use of a tray for rinsing collects contaminants and is not recommended. A continuous flow of fresh water is critical. (Fig. 425.2)

430 PRE-DYED ULTRACOLOR

Before proceeding with the processing instructions which follow, we recommend that you re-read Sections 100 and 300, and Appendix B.



Fig. 424.4



Fig. 425.1



Fig. 425.2

431 LIGHT SOURCE SELECTION

Pre-Dyed UltraColor plates are exposed through a high contrast film negative (or positive) with an ultraviolet light source. Quartz lights that are suitable for Metalphoto and Metalphoto Plus are not satisfactory. We recommend mercury vapor, black light tubes, 20-35 amp carbon arc or pulsed xenon lights. NuArc printers are suitable mercury vapor exposure devices and typical exposures are shown in Fig. 411.2, Exposures times vary depending on the light source employed and the number of hours of prior use. Use the following calibration technique to determine the proper exposure time.

432 CALIBRATION

To calibrate a particular exposure lamp for use with Pre-Dyed UltraColor plates, cut a test strip from a plate and expose it through a Stouffer 21 Step Wedge. The correct exposure time is the time required to produce at least 4 solid steps after exposure and processing.

IMPORTANT: Shorter exposure times can lead to breakdown of the resist in the developer. When such a plate is bleached, dye may be removed from areas that should be protected from dye removal.

433 EXPOSURE

Once the light source is calibrated, proceed with production exposures on Pre-Dyed UltraColor. Always grasp film and Pre-Dyed UltraColor plates by the edges, not by the surface. (Fig. 433.1) The film size should be the same size as the plate being imaged or slightly smaller. If the film size is smaller than the plate size, center the film on the plate with even margins on all edges. (Fig. 433.2) Place the film with the emulsion side against the sensitized surface of the plate. Intimate contact of film to plate is essential for image clarity and is obtained with a vacuum frame or pressure plate. Eliminate all air bubbles between film and plate, taking special care when exposing Pre-Dyed UltraColor plates thinner than .020". (Fig. 433.3)

After the plate is exposed, it is ready for chemical development.



Fig. 433.1



Fig. 433.2



Fig. 433.3

434 DEVELOPMENT

Pre-Dyed UltraColor plates are developed in a solution of 0.3% hydrogen peroxide. Hydrogen peroxide can be purchased at local drugstores or chemical supply houses. Typically, the drugstore variety is a 3% solution that must be diluted with 9 equal parts of water to make up a working strength solution. If 30% hydrogen peroxide is purchased from a chemical supply house, it must be diluted 100 to 1.

IMPORTANT: 30% hydrogen peroxide can burn skin on contact. Use rubber gloves and proper face protection when handling 30% hydrogen peroxide.

Do not use warm water to dilute hydrogen peroxide. To avoid partial dissolution of the resist coating, use only COLD water (the colder the better, but temperature must be below 75°F) to dilute hydrogen peroxide.

Immerse an exposed Pre-Dyed UltraColor plate in the 0.3% hydrogen peroxide solution with the image side up. (Fig. 434.1) When the image is visible, remove the plate and hold under cold running water (the colder the better, but temperature must be below 75°F) for 15 seconds or rinse by placing the plate in a tray with cold water

overflowing. (Fig. 434.2) Developing may take as little as 15 seconds or as long as 60 seconds.

IMPORTANT: Actual development time depends on the age of the developing solution used. Older or previously used developer takes longer than developer that is freshly prepared.

Carefully sponge off the excess rinse water and allow the plate to dry. Allowing the plate to drain dry can cause some migration of resist into areas that should not be protected. The Pre-Dyed UltraColor plate is now protected with a layer of hardened resist in the exposed areas and the dyed, anodized layer remains unprotected in the unexposed areas.

435 BLEACHING

Perform bleaching under normal lighting conditions. Safelight conditions can distort visual perception of colors during this step. Use UltraColor Bleach to remove dye from all unexposed areas of the plate.

IMPORTANT: UltraColor Bleach contains acid. Use it full strength (do not dilute) in a plastic tray. Rubber gloves are recommended.

Immerse a developed, rinsed and dried Pre-Dyed UltraColor plate in UltraColor Bleach until the unexposed portions of the plate are no longer colored with dye. If the bleach is fresh, this process normally requires about 30 seconds. If the solution is not freshly made or it has been previously used, the process takes longer. It is normal to expect that different dye colors bleach at different rates.

Example: Dark Blue bleaches in about 15 seconds.

Gentle agitation of the tray speeds bleaching action. (Fig. 435.1) When the unexposed area of the plate is clear, remove the plate and rinse both sides under running tap water. (Fig. 435.2)

IMPORTANT: If bleaching time exceeds 60 seconds, discard the exhausted bleach solution.



Fig. 434.1



Fig. 434.2

436 CLEANING

The developed and bleached Pre-Dyed UltraColor plate is now made up of dyed image areas and silver areas. The dyed image areas are still protected by hardened resist. Remove this resist with UltraColor Cleaner, which is packaged as a dry powder and is dissolved 1 package per 1 gallon of warm deionized or distilled water. Soak the plate in the solution of UltraColor Cleaner for 1 to 2 minutes.

Rub the softened resist with a nylon bristle brush and rinse.

CAUTION: USE ONLY A NYLON BRISTLE BRUSH FOR THIS STEP. TOO VIGOROUS BRUSHING WITH OTHER MATERIALS WILL DAMAGE THE ANODIC LAYER. USE ONLY ENOUGH PRESSURE TO REMOVE THE RESIST. (Fig. 436.1)

If the resist is not removed with the technique described, immerse the plate in very hot water and brush again. After all the resist is removed, rinse the plate in running tap water and **WIPE DRY**. After cleaning, UltraColor plates must be sealed. See Section 610 for sealing instructions.

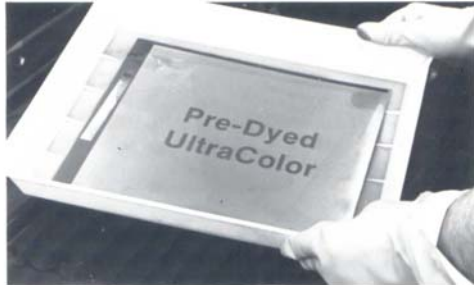


Fig. 435.1



Fig. 435.2



Fig. 436.1

440 CLEAR ULTRACOLOR

Before proceeding with the processing instructions which follow, we recommend that you re-read Sections 100 and 300, and Appendix B.

441 LIGHT SOURCE SELECTION

Recommendation is the same as for Pre-Dyed UltraColor. See section 431

442 CALIBRATION

To calibrate a particular exposure lamp for use with clear UltraColor plates, cut a test strip from a portion of a plate and expose it through a Stouffer 21 Step Wedge. The correct exposure time is the time required to produce at least 4 solid steps after exposure and developing. When the plate is dyed, color will penetrate steps 5 through 21.

IMPORTANT: Shorter exposure times can lead to breakdown of the resist in the developer. When such a plate is dyed, dye may penetrate those areas that are not intended to be colored.

443 EXPOSURE

Once the light source is calibrated, proceed with production exposures on Clear UltraColor. Always grasp film and Clear UltraColor plates by the edges, not by the surface. (Fig. 443.1) Film size should be the same size as the plate being imaged, or slightly smaller. If the film size is smaller than the plate size, center the film on the plate with even margins on all edges. (Fig. 443.2) Place the film with the emulsion side against the sensitized surface of the plate. Intimate contact of film to plate is essential for image clarity. Such contact is obtained with a vacuum frame or pressure plate. Eliminate all air bubbles between film and plate, taking special care when exposing Clear UltraColor plates thinner than .020". (Fig. 443.3)

After the plate is exposed, it is ready for chemical development.

444 DEVELOPMENT

Clear UltraColor plates are developed in a solution of 0.3% hydrogen peroxide.

Hydrogen peroxide can be purchased at local drugstores or chemical supply houses. Typically, the drugstore variety is a 3% solution that *must be diluted with 9 equal parts of water to make up a working strength solution.* If 30% hydrogen peroxide is purchased from a chemical supply house, it *must be diluted 100 to 1.*

IMPORTANT: 30% hydrogen peroxide can burn skin on contact. Use rubber gloves and proper face protection when handling 30% hydrogen peroxide.

Do not use warm water to dilute hydrogen peroxide. To avoid partial dissolution of the

resist coating, use only *COLD* water (the colder the better, but temperature must be below 75°F) to dilute hydrogen peroxide. Immerse an exposed Clear UltraColor plate in a solution of 0.3% hydrogen peroxide for Approximately 30 seconds with the image side up. When the image is visible remove the plate and hold under cold, running water for 15 seconds or rinse by placing the plate in a tray with cold water overflowing. (Fig. 444.1) Developing may take as little as 20 seconds or as long as 60 seconds.

IMPORTANT: *Actual development time depends on the age of the developing solution used. Older or previously used developer takes longer than developer that is freshly prepared.*

To prevent resist breakdown, immediately dry the plate by wiping the excess water from the plate with a clean, flat sponge using full strokes across the plate. (Fig. 444.2)

Complete drying by placing the plate, image side up, on a flat surface and drying with a warm forced-air gun. (Fig. 444.3) The unexposed areas of the plate are now receptive to organic dyes. The exposed areas are protected from dyeing by a layer of hardened resist.

445 DYEING CLEAR ULTRACOLOR PLATES

Dye Clear UltraColor plates with Metalphoto Solvent Soluble InstaColor Dyes or PolyColor Dyes. The quantity of InstaColor dye per package is formulated for use with anhydrous isopropyl alcohol only. **DO NOT USE RUBBING ALCOHOL** since it contains a significant amount of water which destroys the effectiveness of the dye. PolyColor dyes are sold as solvent solutions, ready for use. Use with adequate ventilation and avoid flames or sparking equipment.



Fig. 443.1



Fig. 443.2



Fig. 443.3



Fig. 444.1

To prepare a solution of Metalphoto Solvent Soluble InstaColor Dye, dissolve the entire contents of 1 package of InstaColor Dye powder in 1 quart of anhydrous isopropyl alcohol.

IMPORTANT: Isopropyl alcohol is a flammable solvent. Do not use it near arc lights, sparking equipment, or open flames. Make sure you have adequate ventilation. Stir the dye solution well to insure that all dye powder is completely dissolved in the solvent.

Pour a small amount of dye solution on an Appli-Pad and rub the areas to be dyed with straight passes until the color is the shade and intensity desired. (Fig. 445. 1) In order to inspect the coloring, the excess dye on the plate must be removed. To do this, wipe the entire plate with a damp sponge (Fig. 445.2) and dry immediately with a warm forced-air gun. The dyed area should have an even color. If there are streaks, or if a more intense shade is desired, make sure the plate is completely dry and then repeat the color swabbing process described above.

Use of a thin, vertical dip tank for dyeing is recommended for dyeing large area. This technique minimizes streaking usually present when trying to swab dye over large areas. Evaporation of solvent is a problem when using tank dyeing with Solvent Soluble InstaColor Dye solutions. To minimize this problem, use a narrow-mouthed tank and be sure to keep the tank covered when not in use. To dye in a tank, immerse the plate for 2 minutes at room temperature. Then remove the plate, rinse, and sponge off excess dye with a damp sponge.

446 CLEANING

The developed and dyed Clear UltraColor plate is now made up of dyed image areas and resist protected silver areas. Remove this resist with UltraColor Cleaner which is packaged as a dry powder and is dissolved 1 package per 1 gallon of warm deionized or distilled water. Soak the plate in the solution of UltraColor Cleaner for one to two minutes. Rub the softened resist with a nylon brush and rinse. **CAUTION: USE ONLY A**



Fig. 444.2



Fig. 444.3



Fig. 445.1



Fig. 445.2

NYLON BRISTLE BRUSH FOR THIS STEP. (FIG. 446.1) TOO VIGOROUS BRUSHING WITH OTHER MATERIALS WILL DAMAGE THE ANODIC LAYER. USE ONLY ENOUGH PRESSURE TO REMOVE THE RESIST.

If the resist is not removed by the technique described, immerse the plate in very hot water and brush again. After all the resist is removed, rinse plate in running tap water and *WIPE DRY*.

Once cleaned, the dyed Clear UltraColor plates must be sealed. See Section 600 for sealing instructions.



Fig. 446.1