INTRODUCTION

COLORVIR is a newly registered process perfected by Pierre JAFFEUX, a French photographer.

With this process, it is possible to colour in one or several colours a black and white print (paper prints or transparencies).

Contrary to most photographic operations which are carried out in the darkroom, COLORVIR is used in daylight.

You can succeed with COLORVIR even if you are not an experienced photographer. This manual is a detailed technical booklet meant for anyone interested in photography, both professional and amateur. The purpose of this manual is instructional, and the authors sincerely hope that whatever your photographic knowledge, you will find here the basic information to enable even the beginner to use COLORVIR.

Pierre JAFFEUX, an ingenious inventor and patient researcher, has created this «multicoloured magic». We say «magic», as it is an amazingly easy process, and results are truly astonishing.

Above all, COLORVIR opens up new possibilities in the world of creativity.

It enables everyone to produce a personal work and revolutionises the rules of traditional colour photography. Colours are no longer «natural», they are deliberately chosen.

The basic principles set out in the following pages will, we hope, bring you the great joys of artistic creation.

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Publisher P JAFFEUX 22 rue des Charmettes 63200 RIOM
France
This manual is published in French, Spanish, Dutch, and German
Introducing the COLORVIR products

PACKAGE SIZES


Replenishments:
- Toning kit (A, B and C)
- Dyes kit (H, I and J)
- Special Effects kit (F, D and G)

These three kits are sold separately, so that you can replace what you have used in the large kit. If you plan to work only with these three small kits, you must have the Toning kit in order to use either of the other two.

Dyes II or Polychromy kit (K, L and M)
This kit contains dyes K, L and M which facilitate colouring the white parts of an image, but it cannot be used if one does not have solutions B, C, D and F.

Colorvir Sepia Toning Kit: this kit is sold separately from the rest of the Colorvir system described above, it enables the user to obtain «old-fashioned» sepia tones. It contains reference products 1 and 2.

Professional Package:
500 ml bottles of each Colorvir product are sold separately.

Colorvir Peelable varnish mask: this product enables the user to mask a print or an area of the print before toning or in between 2 toning operations. The protected surface will be unharmed by later treatment.

USEFUL WORKING CAPACITY

Toning bath (500 ml)
5 - 10 prints 18 x 24 cm can be toned

Dye bath (500 ml)
20 - 30 prints 18 x 24 cm can be dyed

LIST OF ADDITIONAL CHEMICALS

Necessary chemicals:
- Sodium Chloride (cooking salt)
- Acetic Acid

Useful chemicals:
- Sodium Carbonate
- Sodium Hyposulphite «HYPO» (fixing bath)
- Developer

Optional chemicals:
- Hydrochloric Acid
- Ammonia
- Chrome Alum
- Sodium Sulphate

All these chemicals can easily be obtained from photographic or chemist shops.

WARNING:

1) Recommend the use of protective gloves.

2) Elaborate on aspects of skin care and the possibility of sensitivity.

3) State that any spillage should be washed away promptly with plenty of clear water.

4) State that must be used in a well ventilated area.

5) State that people with a history of respiratory problems or skin disorders should consult their doctor.
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I. What you should know before processing with COLORVIR

A/ THE BLACK & WHITE PRINT

Colorvir is used to colour black and white prints, either paper prints or transparencies. To obtain the best results, read the following instructions carefully.

1) Choice of subject:

Any subject can be treated in Colorvir: portraits, landscapes, still-lifes, abstracts, macrophotography, art composition, provided that you take into account the following:

2) Characteristics of the print:

Best results can be obtained from any good print with a full scale of tonal values from deep black to pure white with good detail in both highlights and shadows.

Remember that:

- Colorvir will have no effect on line work or on too contrasty an image because of the high density of the black areas.
- Take into account the graininess of the material, which may influence final results. But these considerations are not final; everything depends on the photographer's intention.

3) The photographic emulsion support:

- Best results are obtained with resin-coated paper (glossy or mat; colours are brighter on glossy paper)
- LITH films for transparencies 1/4rap IC Kodak, under-exposed black and white negative films

However, it is possible to use Colorvir with any base, provided the following reservations are made:

- Usual bases (single and double weight paper, photographic linen).

These bases will be evenly coloured when dying, so do not dye them unless you wish a coloured background. Whichsoever operation you choose, washing time should be increased.

- Coloured or metallic paper: the colour of the base has a great influence on the result.

- Aluminium plates: the effect of Colorvir is excellent but the handling of the plates calls for many special precautions.
- Kodak Kodaplan, Agfa Dia-direct films (see chapter Colorvir and Transparencies)

4) Processing the black and white print:

The processing of the black and white print that you wish to treat with Colorvir does not pose any particular problem, but best results depend on how careful you are.

a) Development

The time of development must not exceed three minutes using a standard paper developer. If development is carried too far, Colorvir will not work well, if at all. If the print is under-developed, the effect of Colorvir will be unsatisfactory and the final image will have uneven areas.

When making transparencies, it is necessary to decrease the development time. All instructions are given in the section headed 'Transparencies'. Stop bath, with or without acetic acid, does not affect the final result.

b) Fixing and washing

Fix prints in the usual way. Wash prints quickly and thoroughly. Do not leave prints in water, otherwise, Colorvir will react badly or not at all. (This note does not concern transparencies.) Resin-coated papers permit faster washing and drying.

c) Drying

Any print can be treated with Colorvir immediately after washing. If this is not possible, take care to swab lightly over the surface of the print with a cloth, a soft sponge or a paper tissue to remove droplets of water which may adhere to the emulsion.

B/ PRACTICAL ADVICE

1) Equipment

a) Workroom:

If possible, work in a well-lit room (day or artificial light) to be able to control colours and tones in the best possible conditions when working with Colorvir.

b) Water supply:

As Colorvir treatments require washing frequently, it is better to have running water, especially if you are going to work on giant enlargements. Avoid hard water; it is better to work with distilled water. The water temperature is not critical (15°C to 25°C, or 59°F to 77°F).
• c) Containers and Trays:
Six or eight trays are necessary. The more different Colorvir operations you intend to do, the more trays are necessary. Trays and containers should be made of inert plastics and, of course, be perfectly clean. For giant enlargements, it is advisable to use developing troughs. For transparencies, use round bottomed bowls or cups.

• d) Useful Equipment:
For the treatment of small prints and transparencies, we recommend the use of clips or tongs made of plastic or good quality stainless steel and the use of rubber gloves for the treatment of bigger enlargements. This precaution is especially recommended to prevent staining on fingers and possible skin allergy. Colorvir products, especially dyes, stain skin and clothes. Using clips and gloves and wearing an overall obviates these inconveniences. Remember that at any moment you may need a funnel (useful for pouring re-usable solutions for storage), a hand towel (better to use than the one attached to the wash), a timer (to know exactly the time of each treatment). This list is not exhaustive. Everyone will learn from his own experience what equipment is needed.

2) How to proceed:
All Colorvir processes can be performed in daylights.

The quantity of solution needed depends on the surface area to be processed.
- In trays, an average quantity of 500 ml per bath for 18 x 24 cm prints is sufficient.
- In bowls (for transparencies), 250 ml (or less) is sufficient.

All proportions given in this manual are for 500 ml of water.

These proportions are not final: it is possible to use other more or less concentrated formulas depending on desired effect. Only one print should be handled at a time with regular gentle agitation. (However, it is possible to treat in series, several prints in blue or yellow toning solutions).

Special precautions must be taken to avoid contact with the emulsion surface to prevent scratches or fingerprints.

If you wish to partially treat a print, you can work with a fine brush or preserve black and white areas of the print from Colorvir action by applying a cellulose or rubber solution.

The drying of processed prints requires the same precautions as that of black and white prints.

All mixing apparatuses (clips, dropper, test-tube, funnel etc.) used for preparation of the baths should be thoroughly cleaned immediately after use to prevent contamination of solutions. For the same reasons, a vessel of clean water is convenient for rinsing clips and gloves when you are working from one bath to another.

Make note immediately of any personal observations (times of treatments, proportion of solutions, sequence of operations etc.) every time you obtain an original effect without following the instructions given in this booklet. In this way you can build up additional formulas which you have personally achieved, to those included in this manual.

N.B. CLEANING DISHES etc.
A good working method consists of cleaning all the equipment at the end of each Colorvir treatment period.
- Cleaning trays is sometimes possible with clean water, washing otherwise use a basic solution (Sodium Carbonate, ammonia, or merely used developer).
- Bleach or permanganate solution will remove dye stains.
- Caution, do not leave stainless steel clips lying in Colorvir solution.

C / FINISHING OF PRINTS
The final result of a print depends upon the care in finishing. Here are some useful ways to improve your Colorvir results:

1) Recovery of the whites of a print unintentionally coloured
- use a wad of cotton wool soaked in slightly diluted acetic acid or bleach; rinse rapidly and wipe the print with paper tissue before drying it.

2) Positive retouching
- To retouch toned and coloured prints, it is possible to use:
  - dyes H, I, J, K, L and M in their concentrated state.
  - coloured India ink.
  - Cibachrome retouching colours.

3) Mounting
- the coloured and toned prints can be mounted on cardboard or wood with a cold adhesive solution. Remember the film covering on the back of R.C. paper.
- dry mounting under heat into cardboard or canvas is possible, using a dry mounting press, with no risk of altering the colours.

4) Surface protective medium
- transparent surface protective medium, sprays etc. applicable to colour photographs are useable on toned and coloured prints. They will effectively protect the print surface against accidental drops of water.
II. Processing Technique

A/ PRESENTATION

Words and expressions used in this manual are all known to professional and amateur photographers, but it is important to know exactly what we mean when we use them with reference to Colorvir.

1/ WHAT IS MEANT BY «TONING»

Toning is a chemical operation changing a black and white photographic image into a coloured image (single or multi-coloured). For a long time photographic images have been toned in blue and sepia.

Colorvir products permit toning operations as follows: metallic silver of the black and white print is changed into an insoluble and colourless silver salt, at the same time, another metallic salt is deposited; this colours the final toned print. This salt is very sensitive to any alkaline (chalky water, ammonia, sodium carbonate...) which takes the colour out. This is an advantage for reducing the density of any toning.

This silver salt is very important; it represents mordant toning before dyeing. It easily turns brown in daylight. In order to keep the colour of a toned print the silver salt must be removed by fixing the print quickly in a very much diluted fixing bath.

The range of colours obtained with Colorvir is extensive:

- Blue (A)
- Yellow (B and D)
- Yellow to Orange (B)
- Different shades of green (mixing A, B, D)
- Brown-sepia (Colorvir Sepia Toning Kit or C, B and G).

With Colorvir it is possible to obtain, on a single image, several distinct colours according to the scale of grey tones.

2/ WHAT IS MEANT BY A SALT BATH

Any print which has undergone a blue, yellow or green toning will have a yellowish fog afterwards, especially in the light areas of the print. This fog must be eliminated by placing the print in a household salt bath.

To make sure that the fog completely disappears, look carefully at the white parts of the print. It is advisable to keep a white margin around the print for comparison.
3/ WHAT IS MEANT BY «FREEZING OF GREY»

«Freezing of grey» is unquestionably one of the most interesting effects you can obtain with Colorvir.

In effect, the final image retains light grey areas (from the initial black and white print), and only dark areas coloured.

We will explain later the processing technique for freezing the grey tones you choose.

4/ WHAT IS MEANT BY «SOLARISATION»

We shall use the word «solarisation» every time dark and light areas of a toned print are distinctly shaded with different colours and marked out by an outline.

We chose this word because this effect looks like solarisation obtained in a darkroom on a black and white print.

5/ WHAT IS MEANT BY «SULPHURATION»

The transformation of silver salts into silver sulphide gives the image a sepia tone.

Various types of sulphuration can be carried out with Colorvir products.

- The Colorvir Sepia Toning Kit, used alone, gives a brown to sepia tone in 2 baths (the standard method of pre-bleaching).

- Product G, in the large Colorvir kit, can also be used for sulphuration employing the standard method with pre-bleaching.

Moreover, a very diluted sulphur bath, using G as the base, can give partial sulphuration of any toned image whatever the colour, in order to:

- Modify the tones;
- Bring out details which were lost during toning;
- Obtain beige tones in light areas without destroying the colour of the dark areas.

Such partial sulphuration creates a harmon of colours on the print.

6/ WHAT IS MEANT BY «DYEING»

This process enables one to dye a print after it has been toned (toning, in Colorvir precessing, operates as mordanting). This is why the dyeing process necessarily follows the toning process.

1/ Original noir et blanc.
2/ Virage bleu.
3/ Blocaage de gris, puis virage bleu.
4/ Virage jaune long (environ 5 min).
5/ Virage jaune, puis virage bleu.
6/ Virage bleu, puis virage jaune.
7/ Virage jaune, puis teinte rouge J.
8/ Virage bleu, virage jaune, puis teinte rouge J.
9/ Virage solirisation (Sol 1 : B + C + D).
10/ Virage Sol. 1 (environ 10 min), puis teinte turquoise J.
11/ Virage Sol. 1 (environ 4 min), puis teinte rouge J.
12/ Sepia (Coffret COLORVIR Virage Sèpia).
13/ Virage polychromie (F + B + C), puis teinte jaune L.
14/ Virage polychromie (F + B + C), puis teinte bleu M.
15/ Virage polychromie (F + B + C), puis teinte rouge K.
16/ Virage polychromie (F + B + C), puis teintes K, puis L, puis M.
17/ Virage polychromie (F + B + C), puis teinte jaune L, puis teinte bleu M, puis teinte rouge J.

Remarque: ce numero est tres incomplet. Pour chaque couleur ou combinaison de couleurs, des nuances plus ou moins foncées peuvent être obtenues par simple modification des temps de traitement ou des dilutions des bains.

N.B. — Les épreuves originales ont été réalisées sur papier Ilford Ilfospeed.

1. Black and white.
2. Blue toner.
3. Freezing of the grey, then blue toner.
4. Yellow toner (5 minutes).
5. Yellow toner, then blue toner.
6. Blue toner, then yellow toner.
7. Yellow toner, then red dye J.
8. Blue toner, yellow toner, then red dye J.
10. Solarisation (1st formula, 10 minutes) then turquoise dye I.
11. Solarisation (1st formula, 4 minutes) then red dye J.
13. (F + B + C) toner, then yellow dye L.
14. (F + B + C) toner, then blue dye M.
15. (F + B + C) toner, then red dye K.
16. (F + B + C) toner, then K, then L, then M.
17. (F + B + C) toner, then yellow dye L, then blue dye M, then red dye J.

N.B. — One may modify the composition of baths and treatment times: a large variety of results will be obtained.

N.B. — Black and white prints are restated on Ilford Ilfospeed paper.

1. Schwarzweiß Original.
2. Blautonung.
4. Lange Gelbtonung (ungefähr 5 Min.).
5. Gelbtonung, dann Blautonung.
7. Gelbtonung, dann Färbung mit Rotfarbstoff J.
8. Blautonung, Gelbtonung, dann Färbung mit Rotfarbstoff J.
9. Solarisation (Sol 1 : B + C + D).
10. Solarisation (1st formula, 10 minutes) dann Färbung mit Türkisfarbstoff I.
11. Solarisation (1st formula, 4 minutes) dann Färbung mit Rotfarbstoff J.
12. Sepiatonung (COLORVIR Sepiatonungskit).
13. Polychromierung (F + B + C), dann Färbung mit Gelbfarbstoff L.
14. Polychromierung (F + B + C), dann Färbung mit Blaufarbstoff M.
15. Polychromierung (F + B + C), dann Färbung mit Rotfarbstoff K.
16. Polychromierung (F + B + C), dann Färbung mit M.
17. Polychromierung (F + B + C), dann Färbung mit Gelbfarbstoff L, dann Blaufarbstoff M, dann Rotfarbstoff J.

Anmerkung: Diese Farbfarbstoff ist sehr unverhältnis. Für jede Farbe oder Farbmischung können hellere oder dunklere Farbstufen erreicht werden, indem man nur die Dauer oder die Verdünnung der Bilder ändert.

N.B. — Die Originalbilder sind mit Ilford Ilfospeedpapier hergestellt worden.
– Dyes red J, turquoise L and violet H. These are used in colouring the silver image. The white areas of the print remain white.

We shall see later how it is possible to combine these three dyes on a single print.

– Dyes red K, blue M and yellow L. or Polychromy dyes.

In contrast to the preceding, these are used for colouring the white and light grey areas of the print.

In a later chapter, we will learn how these dyes can be used and ways in which they may be mixed.

B/ DESCRIPTION OF BATHS AND PROCESSING

1/ SALT BATH

This bath is absolutely necessary. The yellow fog mentioned above disappears in the salt bath.

Dilution:

50 gm of salt in 1 litre of water.

Immerse every toned print in the solution for 1 to 3 minutes. Do not exceed the treatment time and this concentration: brightness of toning would be weakened.

Every toned print must be immersed in the salt bath.

Working capacity: about 8 prints, 18 x 24 size. Do not hesitate to renew the salt bath before it becomes exhausted: an exhausted bath may be the cause of may a failure. The life of this bath is shorter when treating blue-toned prints. In this case, it is better to prepare two similar salt baths, treating the print in the first and then transferring it to the second bath, until the print in the first and then transferring it to the second bath until the print has cleared. When the first bath approaches exhaustion it should be discarded and replaced by the second bath.

The symbol below represents salt bath on Colorvir processing tables.

2/ FREEZING OF GREY

We shall use the term «freezing of grey» when grey tones of the intiale black and white print are preserved from the colour toning effect.

The bath for «freezing of the grey» can only be used before a toning bath. Its effect is not visible in the bath, but only after the toning which follows.

After removing the print from the freezing bath, plunge it immediately into the toning bath without rinsing.

Dilution: (for 500 ml of water)

F - 3 drops (before blue toning)
F - 10 drops (before yellow toning)

Time of treatment:

2 - 7 minutes (according to the range of greys to be frozen).

N.B. This table is only a basic indication. The concentration can be increased, and the time in the solution decreased. Let experience be your guide. Quantities given here are the minimum. For increasing concentration tests must be made before using the solution.

On a single print may be frozen
- light greys
- light and medium greys
- light, medium and dark greys

The desired effect depends on
- concentration of the solution
- time in the solution
- type of photographic emulsion

Remarks:

1) Success requires two conditions
- solution must be thoroughly mixed before immersing prints.
- during treatment, regular agitation is necessary.

2) If solution F is highly concentrated, it is advisable to wash prints for a few minutes before toning them.

3) After «freezing of grey» treatment, every print may be toned, sulphurised and dyed according to the sequence of treatments given in this manual (also see the general processing table).
If the desired effect is not achieved:

a) grey tones are not frozen
- the solution is not concentrated enough.
- the time of treatment is too short.

b) after “freezing of grey” treatment toning does not work:
- solution F is too concentrated
- the time of treatment (in solution F) is carried too far.

c) after “freezing of grey” treatment and toning the effect is irregular:
- the black and white print has not been washed long enough after fixing.
- insufficient agitation in solution F.
- solution F was not mixed properly. (Mix any newly prepared solutions thoroughly.)

N.B. It happens that some photographic materials freeze a scale of greys even without being treated in that solution; we call this failure “accidental freezing of grey”. It results from characteristics of the photographic material.
chemical properties of washing water.
It is sometimes possible to neutralize this effect by fixing the print (for 5 to 10 minutes) and washing it briefly (about 1 minute).
Remember that:
a) If the washing time of the black and white print is carried too far Colorvir does not work, and this means that the grey tones are frozen.
b) Settling of water drops on the black and white print when it is drying may be the cause of grey stains which will not be sensitive to Colorvir action.

3/ TONERS

• A/ BLUE TONER

The blue toner intensifies the image; thus, it is better to treat light prints (underdeveloped prints)

Dilution (for 500 ml of water)
A : 5 ml
C : 2 ml

N.B. – The manner which the bath is prepared is important in the final result. If A and C are mixed before adding water, the bath will produce a lighter blue and will have less tendency to “run” than if C is added to a mixture of water plus A.
- The present product A was formerly contained in 2 separate products, A1 and A2. The equivalent is as follows:

\[5 \text{ ml of } A = 14 \text{ drops of } A1 + 5 \text{ ml of } A2\]

Time of treatment : 1 to 3 minutes.

N.B. It is sometimes necessary to wipe off the blue sediment which forms on the emulsion surface.
- If the bath becomes clotted, this does not affect its action.
- With the exhaustion of the solution it reacts more slowly an consequently the processing time should be increased. However, the quality of toner remains unchanged.
- The longer the treatment the more intense the blue.
- The activity of the solution is easier to control if the given concentration is diluted in 1 litre of water.

Other possibilities:
a) Freezing of grey and blue is obtained in a single bath by adding 5 to 15 ml of F to the blue toning solution. The image will be grey an blue.
b) This print may be dyed in solution J (red dye) ; purple-red tone will appear on dark areas and blue tone on light areas.

If the desired effect has not been achieved:

a) A tendency for the blue to run:
- the black and white print was too dark (it is better to treat an underdeveloped print).
- the time of treatment was too long.
- the salt bath is exhausted.
b) The blue starts to fade:
- the final washing was too long; initial blue may be recovered by treating the print in the following solution : 10 ml hydrochloric acid to 500 ml of water.

N.B. The toned areas on glossy paper may become mat after dyeing. This is not a fault, it depends on the emulsion.
- A bath of blue toner cannot be stored (working life about one day).

• B/ YELLOW TONER

Yellow toner has a slight tendency to weaken the image, it is better to treat slightly overexposed prints.

Dilution (for 500 ml of water)
B : 5 ml
C : 2.5 ml

Time of treatment :
2 to 10 minutes
- a short time will give a yellow image.
- increased time will give an orange to orange-brown image.

N.B. If this treatment is carried too far, subsequent dyeing treatments will not work.

Other possibilities:
a) By diluting the given concentration in 1000 ml of water, it is possible to freeze the darkest areas of the print.
b) By adding 5 to 10 grammes of Chrome Alum to the yellow toning bath (thoroughly diluted) you will obtain coppery tints on light areas and warm brown on dark areas.

N.B. This solution cannot be stored, particularly not in trays.

Remarks:
1) Remember that it is possible to obtain a light or golden-yellow image in solution D (see Solarisation).
2) We recommend fixing yellow-toned prints in order to prevent fading of colours (especially in the case of long exposure to daylight). Soak the print quickly in a solution of 25 grammes Hypo to 500 ml of water for 30 seconds at most. You can also use a newly prepared fixing bath, providing that you dilute it 7 times.

If the desired effect has not been achieved:
a) Toning works badly.
- emulsion is not suitable for this treatment.
- black and white print was underdeveloped or washed too long.
- toning solution is exhausted.
b) The colour has a tendency to smear:
- treatment was carried too far.
- toning bath was exhausted.

**C/ DOMINANT GREEN TONING**

1) Formula using products A, B and C:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>500 ml</td>
</tr>
<tr>
<td>A</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>B</td>
<td>5 ml</td>
</tr>
<tr>
<td>C</td>
<td>2.5 ml</td>
</tr>
</tbody>
</table>

Treatment time: 2 to 3 minutes.

- This bath gives blues in the light areas and yellow in the medium-grey areas.
- With longer treatment time (5-6 min) yellow can be obtained in the dark areas.

Variations
- the proportion of A in the formula can be increased. Using 1 ml of A, blue can be obtained in the light parts and green in the dark areas.
- The proportion of B can also be varied. Quantities ranging from 1 to 6 will give different results, in the yellow-to-green range of the image.
- A print treated in this type of bath can be partially sulphurated. This will help to bring out "faded" details in the image.

2) Formula using products A, D, and C.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>500 ml</td>
</tr>
<tr>
<td>A</td>
<td>1 ml</td>
</tr>
<tr>
<td>D</td>
<td>5 ml</td>
</tr>
<tr>
<td>C</td>
<td>2.5 ml</td>
</tr>
</tbody>
</table>

Time of treatment: 2 - 3 min
- with bath you will obtain green tones.

Variation:

- If you partially sulphurate a print toned in this bath, you will obtain beige in the light areas and copper-green in the dark parts.

3) Formula using products A, B, D and C.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>500 ml</td>
</tr>
<tr>
<td>A</td>
<td>1 ml</td>
</tr>
<tr>
<td>B</td>
<td>2.5 ml</td>
</tr>
<tr>
<td>D</td>
<td>5 ml</td>
</tr>
<tr>
<td>C</td>
<td>2.5 ml</td>
</tr>
</tbody>
</table>
Time of treatment: 2-4 minutes
The tones will vary according to the proportions of B and D, respectively.

• D/ COMBINAISON OF BLUE AND YELLOW TONING.
  1) Shifting a print from one toning bath to another can give the following results:
     - mixed tints, (blue and yellow, green; yellow and blue-green).
     - monochromatic tints (greenish).
   The result depends on:
     - The density of the black and white print
     - the type of emulsion;
     - the bath dilutions;
     - the order in which baths are used;
     - their moment of use;
     - time of respective treatments in either of the baths.
   For example

   ![Diagram showing different toning combinations to achieve certain effects.]

   N.B. - Since blue toner is very strong, treatment time in this bath should generally be shorter than in a yellow bath.
   - It is recommended that the print be placed in the salt between tonings. While not indispensable, this helps to avoid "running" of the blue and contamination of the yellow toning bath.

   2) By mixing variable proportions of normally prepared quantities of blue and yellow toners, it is possible to obtain a single bath giving both monochromatic and mixed tones.
   For example

   ![Diagram showing a mixture of toners to create a specific effect.]

   N.B. – a mixture of equal volumes of baths of blue and of yellow toners will give a single bath producing a dominant blue.
   - If the proportion of yellow toner is much higher than that of blue, the tone will be predominantly green.

   3) In the chapter « Solarisation », we will see that so called « Solarisation » baths give a light yellow colour.

   Using the same principle as described above, if you mix a given volume of blue toner to a given volume of one of the solarisation baths, you can obtain a single toning bath which then permits colouring in tones other than those mentioned above.

   For example:

   ![Diagram showing a combination of blue and solarisation tonings to create a specific effect.]

   - If treatment time is prolonged to 5-6 minutes, a pseudosolarisation effect occurs (if the emulsion has reacted correctly with the D-base baths).

   Other examples of combinations of blue toner and solarisation (Sol I or Sol II) are given in the « Solarisation » chapter.

   If following combination treatment, one colour turn out to predominate in the print; this means that:
   - One of the baths was exhausted;
   - The proportion of the dominant colour was too high in one bath;
   - the treatment time in the predominant colour bath was too long;
   - The emulsion was not suitable to this type of toning;
   - the overall density of the black and white print was unsatisfactory.

   N.B. – Any print toned in one of the two baths described in paragraphe C/ or D/ above can also be dyed using I or J.

• E/ NOTES ABOUT TONING
A/ How to fix a toned print:
   If your are satisfied with a picture obtained by toning and if you wish to keep it as it is, you can fix it in the following solution:
   25 grammes of hypo to 500 ml of water. Treatment must be very short, not exceeding 30 seconds.
N.B. — This bath can be replaced by a fresh fixer bath (for paper) diluted 7 times.
The purpose of fixing is to prevent alteration of colours in daylight.

CAUTION: Once it is fixed, the toned print is unalterably coloured. It is no longer possible to treat it with any further processing.

B/ How to weaken the colour of a toned print:
If the colour obtained with Colorvir seems too dense, it is possible to weaken it in one of the two following baths:
- 3 grammes of sodium carbonate to 1 litre of water,
- 2 ml of ammonia to 1 litre of water.
Watch the print closely during processing so that you can stop treatment as required. Then bathe the print in the following solution:
- 30 ml of Acetic Acid to 1 litre of water.

C/ How to remove toning completely or partly:
It is possible to remove toning; the toned print will turn black and white again.
- Soak the toned print in used developer.
- It is better to operate in daylight in order to watch the print during processing. Sometimes it is interesting to stop treatment before the print has turned entirely black and white again. You can obtain very interesting tones this way.
- Wash the print for two or three minutes in running water.

Remarks:
1/ Re-development is impossible if:
- the print has been toned for too long;
- the print has been entirely sulphurated.
2/ Taking account of the above remark, it is possible to re-treat with Colorvir any re-developed and well-washed print.
3/ Remember that the blue toner is very effective; any blue toned print will retain the blue tint during any Colorvir operation after re-development.

Ex: blue toning, followed by re-development, followed by yellow toning: the picture will be green.

4/ SOLARISATION
Two formulas of solarisation solution using product D are provided.
These solutions are also used as light yellow toners. The effect of solarisation is not visible in this solution, the print becomes light yellow. Solarisation will appear only during subsequent treatments (other toning bath, dyeing...)

20
1. Virage bleu.
2. Virage jaune, puis teinture rouge J.
3. Virage bleu, virage jaune, puis teinture rouge J.

Remarque : l'effet de granulation a été obtenu par tramage.

NB : les épreuves originales ont été réalisées sur papier Ilford Ilfospeed.

1. Blue toner.
2. Yellow toner, then red dye J.
3. Blue toner, then yellow toner, then red dye J.

NB. – A screen was used when realising black and white print.

NB. – Black and white prints are realised on Ilford Ilfospeed paper.

1. Blautonung.
2. Gelbtönung dann Färbung mit Rotfarbstoff J.
3. Blautonung, Gelbtönung dann Färbung mit Rotfarbstoff J.

Anmerkung. – Der körnige Effekt wird durch Rasterzugabe erzeugt.

NB. – Die Originalabzüge sind mit Ilford Ilfospeedpapier hergestellt worden.

Dilution (for 500 ml of water)

1st formula
- B : 2 ml
- D : 2.5 ml
- C : 2.5 ml

This solution produces a golden-yellow image.

NB. We shall see further on that solution 1 can be used before employing polychrome dyes, K, L or M.

2nd formula:
- D : 10 ml
- C : 2.5 ml

The effect of solarisation is more noticeable.

Time of treatment : 2 to 5 minutes

Solution may be kept for 2 to 5 days.

Remark :
- 1/ Special precaution must be taken during this treatment to avoid abrasions caused by any contact:
  - prints should be treated one at a time, emulsion side up.
  - agitate the print carefully in the solution avoiding contact with fingers, clips etc.
  - if you do not tone or dye prints immediately, wipe them off carefully to prevent water marks and abrasions.
- 2/ All these precautions mean that it is impossible to solarise giant enlargements if they are to be rolled in processing.

If the desired effect has not been achieved:
a) Solarisation does not appear after toning or dyewing.
the black and white print is too light,
the black and white print has been underdeveloped,
the emulsion is not sensitive to this effect,
solution D is exhausted and must be renewed.

b) It is possible to « save » a print treated in a solarisation bath even
if the desired effect has not been obtained or appears irregular in
spots.
To do so, r.b the print with a stiff brush, when the surface « crust »
have been eliminated, the toner or dye may then act, and the image
middle coloured but not solarised.
An excellent red can be obtained by this procedure,(using red dye
J).

5/ DYEING (H, I or J)

Remember that dyeing is possible only if the print has been toned
and correctly washed.

A/ Red dye J

Dilution : (for 500 ml of water)
J : 20 ml
Time of treatment
1 to 10 minutes

N.B. We recommend that this solution be stored in a bottle, to prevent deterioration.
It is possible to extend the life of the solution by adding 1 or 2 ml of Formalin per litre.

Different possibilities :
I) After yellow toning (prepared with B)

- If the time of washing before dyeing is short (10 seconds in running water) the image will be yellow and red.
- If the time of washing before dyeing is longer (5 minutes in running water) the image will be orange to red.

Other possibilities :

- If the time in solution J is prolonged, the image will be magenta.

II) After blue toning

Two possibilities :
1/ Soak the print in blue toning bath in which you have added F.
Medium and light areas will be blue, dark areas will be purple-red.
2) Blue toning bath (10 to 20 seconds) followed by «freezing of the grey» bath (1 to 3 minutes) followed by yellow toning bath (image will become turquoise). Medium and light areas will be blue, dark areas will be mahogany red.

N.B. Best results will be obtained with a soft print, a contrasty print will not work as, it must have light greys and dark blacks.

III) After yellow toning followed by blue toning, or after blue toning followed by yellow toning

Results will be very different, and depend on the time of treatment in toning and dyeing baths, and the time of washing between toning and dyeing. This treatment is one of the most interesting, but it requires many tests before treating the final image. You must always take into account the composition of solutions, the times of treatment, the choice of emulsions, etc.

IV) After light-yellow toning (Solarisation)

Whenever solution D you choose (formula 1 or 2), the print, after dyeing, will be red in dark areas and golden yellow in light areas. An effect of solarisation will occur to a greater or lesser extent.

V) Red dyeing followed by dyeing of another colour H or I

This process enables one to modify the red colour obtained with dye

If the desired effect has not been achieved:

a) dyeing does not work
   - the time of toning treatment was carried too far
   - the print was not washed long enough after the salt bath.

b) white areas remain coloured
   - the time of washing after dyeing was too short (you can bathe the print in a solution of 25 ml of acetic acid to 500 ml of water)

c) magenta red predominates
   - washing times were too long (max. 5 minutes in running water)

d) white areas become pink after drying
   - wash the print again or dab it with a piece of cotton wool soaked in a solution of 10 per cent acetic acid

e) dyeing does not work on a solarised print
   - the black and white print was too dark;
   - treatments before dyeing were carried too far

f) dyeing works irregularly, appearance of strains and scratch marks
   - the sensitized surface has been handled without due care

B/ Turquoise dye I

Dilution: (for 500 ml of water)

I : 20 ml

Time of treatment

1 to 10 minutes

N.B. Sometimes the solution loses colour after some days. You can re-activate it by the addition of acetic acid (10 to 15 ml)

Different possibilities:

I) How to obtain a yellow and turquoise-green image:

   After yellow toning and bleaching in the salt bath, wash the print briefly (about 10 seconds) before dyeing it.

   Light areas will be yellow and dark areas turquoise.

II) How to obtain a turquoise green image:

   After yellow toning (solution B) and bleaching in the salt water bath, wash the print thoroughly (5 minutes) before dyeing.
III) How to obtain a yellow and turquoise-green image with solarisation:
   Tone the print in a solution prepared with D, (formula 1 or 2).
   After dyeing:
   - light areas will be turquoise-green.
   - dark areas will be golden yellow.
   - the solarisation effect will occur to a greater or lesser extent.

If the desired effect has not been achieved:
See above «Red dyeing».

C/ Violet dye H

N.B. Washing time after toning must be short (a few seconds).

Dilution (for 500 ml of water)
H : 20 ml

Time of treatment:
2 to 5 minutes

N.B. Violet dye is very strong, so this treatment requires all your attention.
     In order to prevent discouling white areas, proceed as follows: dye the print for a few seconds, then wash it briefly in tepid water, repeat these operations several times.

Different possibilities:
I) How to obtain a brown image:

After yellow toning, any print which has been bleached in the salt bath and washed for a few seconds may be dyed in violet solution, the image will become brown. A solution of Acetic Acid is necessary to recover whites.

II) How to obtain a violet image:

The process is as follows:
- tone print in yellow toner (prepared with B);
- bleach in salt solution;
- wash briefly;
- dye in violet dye (H);
- wash in running water for a few seconds;
- immerse in a solution of Sodium carbonate or Ammonia (25 ml to 500 ml of water)
- wash print thoroughly.

N.B. This scheme may be applied only with certain emulsions. A test print is recommended before treating the final photograph.

III) How to obtain a yellow and violet image with solarisation:
Tone the print in solution D (formula 1 or 2). Follow the above mentioned method:
light areas will be *violet*;
dark areas will be *golden yellow*;
the solarisation effect will occur to greater or lesser extent

**N.B.** It is possible to modify the time of treatment in the dyeing bath (5 to 15 minutes). The longer it is, the deeper the violet colour

**IV) How to combine several dyes:**
It is possible to treat in *violet dye* (H) prints which have previously been dyed red or turquoise. The combination of dyes can be made to suite your choice. We recommend commencing with red dye (J) as it tends to overpower influence other colours used first.

**If the desired effect has not been achieved:**
- **a) dyeing does not work:**
  - time to toning treatment was carried too far,
  - time of washing after the salt bath was too short.
- **b) light areas are coloured:**
  - washing time after salt bath was too long;
  - time of dyeing was carried too far.

It is possible to recover white areas by soaking the print in a solution of acetic acid (25 ml to 500 ml of water).
- **c) Remember that results depend on emulsions. This remark concerns violet dye in particular.**

**D: General notes concerning the use of dyes**

**1/ How to improve the whites after dyeing:**

- It is usually sufficient to wash the print in tepid water (30°C to 40°C)
- If not, soak the print in the following solution for a few minutes (2 to 5 minutes): 25 ml of acetic acid to 500 ml of water. Watch the print carefully during the treatment and stop it when the desired effect has been reached, then wash in running water.

**2/ How to remove from a print the toning colour whilst keeping the dyeing colour.**

- Soak the print in one of the following solutions for a few minutes (2 to 5 minutes): 25 ml of ammonia to 500 ml of water, or 10 grammes of Sodium Carbonate to 500 ml of water.
3/ How to combine several dyes:
- Do not mix dyes in a single bath. Work with different baths used successively.
- It is better to begin with the red dye (J)

4/ It is always possible to tone a dyed print again:
The colour of the dye is weakened on light areas, and the colour toner is intensified. Watch the print during treatment in order to stop it when the result is satisfactory.

6/ DYEING II or POLYCHROMIE (K, L & M)

General remarks concerning the use of dyes K, L and M
1) The dyes Red K, Blue M and Yellow L (contrary to dyes H, I and J) are intended to colour the white and grey parts of a black and white photographic image. The colour effects obtained are comparable to those produced by treatment on colour material, of solarisation, bas-relief or a selection of equal densities.

2) The products K, L and M are complimentary to the system of toning and dyeing of Colorvir.
It is necessary, in order to use them, to have either a complete Colorvir kit, or two small kits of «Toning» ans «Special Effects».

3) Certain types of subjects will give better results than others; in particular, for the reason mentioned above, those with large areas of white (or light grey).

4) Any black and white print on resin-coated paper can be coloured by means of K, L or M dyes.

N.B. These dyes also give good results with any black and white print on a paper base.

It is advisable to make tests in order to determine the general density of the black and white print giving the most interesting results. In principle, these will be obtained from fairly light images.

Method of Working
1) The dyes, K, L and M can only be used after the treatment of a black and white photographic image in either of the toning baths below.
- F 5 ml + B 1 ml + C 2.5 ml (for 500 ml of water)
  (Mix F and B first).
N.B. The proportions of this bath are given as indicated
if the quantity of F is increased, after toning, the image will be lightly coloured.
if the quantity of B is increased, after toning, the image will be more yellow.

B 2.5 ml + C 2.5 ml + D 2.5 ml (for 500 ml of water).
(This is a bath of solarisation 1).
This toning is meant to preverse the image at the time of dyeing operation which follows.

VERY IMPORTANT : AGITATE THE PRINT CONSTANTLY DURING THE FIRST MINUTE IN THIS BATH.

2) Dilution of dye baths (for 500 ml of water)
5 to 10 ml of dye + 25 ml acetic acid.

N.B. It is possible to more dilute these dyes for better control of the process.

Time of treatment:
30 seconds to 10 minutes (according to effect desired)

N.B. To avoid marking the print at the time of dyeing, it is advisable, during the first few seconds, to place the print emulsion side downwards in the dish and agitate constantly.

Remarks:
1) Acetic acid and helps the « taking » of the dyes in light areas of the image, and to avoid any spreading during the washing and drying operation.

2) A print toned and dyed with K, L or M can be modified by immersion:
- in a blue toning bath (the image will be blue to green);
- in a yellow toning bath (the image will be more yellow);
- in a bath of dye I or J.

N.B. Note that this operation can also be carried out before passing through K, L or M dyes.

3) If you wish to weaken the intensity of the colouring after dyes K, L or M, it is possible to put the print into a basic bath (ammonia - sodium carbonate - used developer) followed by washing in tepid water. It is advisable to stop this washing when the result is judged to be satisfactory and stabilise the colouring by placing the print in an acidic acid bath.

N.B. - the yellow toning I is very strong and difficult to weaken.
- an image toned and dyed with K or M can be completely re-developed and will revert to black and white after washing in tepid water.

4) If you colour with K, L or M a toned image, and then sulphurize, there is partial reduction of the colouring (as after placing in a basic bath, see above). After this treatment, followed by correct washing, it is possible to put the print into the bath F5 + B1 + C2.5 again and restart the colour cycle (K, L, M).

Variations with the blue dye M:

- the whites become blue; the image is slightly coloured.
N.B. The red dye K is absorbed in a wider range of grey tones than dyes L and M. Thus, if you dye a toned print with red K and then with blue M, you will obtain in purplish blue in the whites and some red in a certain range of medium grey.

2) Two or three dyes may be mixed together. It is possible to obtain new colours depending on the mix used, according to the principle mentioned above. In this case, remember that it will often be necessary to add a weak solution of blue to the red and yellow to obtain a new colour.

Examples:
(theses proportions are relative and produce concentrated colours).

- 5 ml K + 12 ml L + 3 ml M = brown
- 10 ml M + 10 ml L = green
- 15 ml K + 5 ml M = garnet red

etc.

This new dye can be used in the same way as K, L or M: 5 to 10 ml of dye + 25 acetic acid for 500 ml of water.

7/ SULPHURATION

We have seen in the description for use of Colorvir products that this process offers various possibilities for sulphuration.

In this section, we will mainly describe the applications of the G product, which is contained in the large Colorvir kit.

At the end of this booklet a special chapter will be devoted to the Colorvir Sepia Toning Kit.

A/ Complete Sulphuration:

By «complete», we mean that the image will become sepia all over. Here are two methods:

1st method (traditional method):

- two baths used successively

Dilution of 1st bath (bleach): (for 500 ml of water)

<table>
<thead>
<tr>
<th>C</th>
<th>10 ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>10 ml</td>
</tr>
<tr>
<td>Salt</td>
<td>10 grammes</td>
</tr>
</tbody>
</table>

or, better, potassium bromide: 10 grammes

Time of treatment:

5 to 10 minutes (image must be almost bleached out, wash the bleached print in running water for several minutes).

Dilution of 2nd bath (Sulphuration): (for 500 ml of water)

G = 5 ml
N.B. This solution must not be stored; it emits sulphuric hydrogen, has an unpleasant smell and may fog photographic material (even hermetically sealed) and discolour the painted surfaces of the work room.

**Time of treatment:** 2 to 5 minutes

It is possible to obtain a wide range of tones from light beige to warm brown by modifying times of treatment.

- **Wash the print thoroughly.**
  - This method is particularly suitable for traditional bromide paper base.
  - The bleaching bath may be stored for a long time (life may be extended by the addition of a little ammonia).

- **2nd method (Colorvir)**
  - This sulphuration is possible on any yellow toned (with B), well-washed print. You will obtain a mustard yellow image.
  - By treating this image is a solution of Acetic Acid (25 ml to 50 ml of water), the yellow colour of toning is removed and the sepia image is obtained.
  - After red dyeing, the image will become both sepia-toned and rusty coloured.

**B. Partial Sulphuration**

As stated above, sulphuration may be combined with any other Colorvir treatment.

By « partial », we mean that the time of treatment will be very short.

Partial sulphuration enables one to:
- strengthen details weakened by toners (especially B and D toners),
- Modify tints;
- Obtain beige in light parts of a print without altering the dark parts.

Create harmonious colours after toning and dyeing, whether using Dyes H, I and Y or dyes K, L and M.

**Dilution:** (for 500 ml of water)  
**G:** 0.5 to 5 ml  
**Time of treatment:**  
30 s. to 3 minutes

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**Examples**

- A black and white toned sulphurated print will give a dark-green to bronze-green picture.

- **Remarks:** There are many other possibilities. Sulphuration is always possible after toning and before dyeing, but it is important to remember that
  - partial sulphuration must not be carried on too long or it may result in complete sulphuration.
  - it is better to precede with sulphuration before dyeing, otherwise, the dye solutions have a tendency to smear.
  - sulphurated prints may not be re-developed.
  - after partial sulphuration, it is important to thoroughly wash the print so as to eliminate any sulphurador. Inadequate washing can result in colour alteration with time.
III. Local or partial dyeing of prints

You may want to colour only certain parts of the print or to emphasize a certain detail with a particular colour.

To do so, Colovir offers various possibilities, mentioned below.

A/ COLOURING WITH A BRUSH OR A Q-TIP

Though this technique is painstaking, it can lead to spectacular effects. The user must proceed with patience, and use his/her skills as an artist; as well as having a steady hand.

First of all, place the print on a sheet of glass, so as to ensure an even plane and to be able to tilt it in all directions, allowing easy elimination of the products and rinsing under the tap. Baths should be more diluted than for treatments requiring total immersion, so that their action is slower and more easily controllable.

To avoid running, the print should be « wrung out » after each operation by passing a rubber scraper (the kind used for car windshields) over it.

Tonings, sulphuration and dyeing can all be performed successfully. Solarisation, however, is difficult to achieve.

A print may be completely coloured by a paintbrush or a cotton Q-tip, but you can also use a print which has already been entirely coloured by total immersion and change a detail in the image.

B/ LOCAL BLEACHING

Using the same principle as above, you may weaken or eliminate the colour obtained on a print.

We have previously shown that, by using diluted paper developer and basic solutions, we could get rid of or transform dyeing which had been carried out using Colovir products.

By first doing, it then becomes easy to apply any one of these products with a paintbrush or cotton Q-tip to a given part of the print or a particular detail.

C/ FREEZING OF THE GREYS

It should be remembered that placing the print in a bath for freezing of greys before toning conserves the light greys and enables coloring only of the medium and dark greys.
D/ COLORVIR PEELABLE VARNISH MASK.

- This product, used on a print, serves as a protection on all or part of the image, both in the white to light grey areas and in the dark greys and blacks.

- It can be used before any dyeing procedure, or between 2 dyeing procedures.

The surface covered by the varnish will not undergo any modifications in colour.

- The varnish is applied with a paintbrush in a uniform, fairly thick layer on a dry print. The thickness of the layer guarantees total protection but also facilitates ease of removal of the varnish film. Drying of the varnish is rapid. 3-10 min at room temperature. If necessary, this can be speeded up by hot air (hair dryer). There is no risk of alteration in the emulsion. Moreover, the varnish does not harm colours already present.

- After dyeing, varnish can be removed by simple rubbing or by scraping and then unscotching the varnish adheres perfectly to the scotch tape and is removed from its temporary backing. If traces of varnish remain, a piece of cotton dipped in acetone can be used to detach them. Acetone may also be used for cleaning brushes used and for diluting varnish which is too thick (several drops will suffice).

**NOTE**: this varnish contains toluene, which is inflammable, volatile, and dangerous if inhaled or ingested. It can also cause skin irritation in sensitive individuals. Thus precautions should be taken during use, and the bottle cap tightly replaced after use.

Colorvir Peelable Varnish can also be used for other photographic purposes: on undeveloped paper before exposure, on exposed paper before developing, on a print which has been developed, fixed and washed but before a local fading or bleaching operation prive to sulphuration by any method.

**Remarks**:

- It is possible to block out before Colorvir dyeing on a print using products other than Colorvir peel-off varnish – nail polish, for example. However, getting rid of such products remains a problem. Also, the product used may run the risk of attacking the emulsion or destroying dyeing already performed.

The combining of one or several of the techniques mentioned in this chapter is possible, and adds to the numerous creative possibilities of the product.
IV. Miscellaneous applications

A/ GIANT ENLARGEMENTS.

Many of the processes mentioned in chapter II can be applied to giant enlargements. For example, decorative panels 3.5 m x 1.20 m can be made without difficulty.

However, the following must be noted:

1) To avoid any abrasions, provide a very large bath, about 3 litres for each square metre to be treated.

2) Colorvir treatment in troughs presents no more problems than a black and white enlargement.

3) It is advisable to do a test strip, on the same scale and in the same baths as the print to be processed, in order to determine the results.

4) Salt bath
   It is advisable, especially where large surfaces are concerned, to use two successive salt baths (4 litres of salt bath per square metre to be treated)

5) Freezing of grey:
   Tests must be carried out in order to calculate the correct dilution for the bath and the time in solution. This depends on the effect desired.

6) Solarisation.
   This is practically impossible on large surfaces. Remember, any mark on the emulsion appears in later processes. Solarisation can only be carried out in a tray, emulsion side up.

7) Blue toning
   Because the blue toning bath works quickly, it is once again advisable to dilute the concentration. This is recommended for giant enlargements, the solution acts more slowly and is easier to control. This dilution is only possible for the blue toning bath.

8) Yellow toning:
   Before toning, the print can be passed through a solution of hydrochloric acid (50 ml to 1000 ml of water), which avoids "metalisation" or marks which are impossible to tone.

9) Dyes:
   Remember that in order to bring out whites after dyeing (if washing in tepid water is not enough) pass the dyed print into a solution of acetic acid (25 ml to 500 ml of water) for 3 to 10 minutes, followed by a wash. The surface to be treated, must be taken on account.

10) Sulphuration:
    For more control of this treatment, the solution can be diluted from one to three times.

11) Drying:
    The same precautions as for smaller prints.

B/ INTENSIFICATION AND REDUCTION OF NEGATIVES

In addition to colouring, which is the main purpose of Colorvir, these chemicals enable one to
- intensify thin negatives,
- reduce dense negatives.

1/ Intensification
   Pass the negative in turn, through
   - bath: B : 5 ml
   - C : 2.5 ml
   into 250 ml of water
   for 2 to 3 minutes
   - salt bath (10 g to 250 ml of water)
   - short wash
   - sulphuration, G : 1.5 ml to 250 ml of water
   - normal washing and drying.
   This intensification increases the density of the negative by tenfold.

2/ Reduction
   Pass the negative in turn, through
   - sodium hyposulphite bath (50 g to 1000 ml of water) or a commercial fixing bath, normally diluted.
   - bath: C : 5 ml to 250 ml of water
   for 1 to 2 minutes.
   - normal washing and drying.
   If the result is not satisfactory, repeat the process.
V. Colorvir and Transparencies

The preceding information concerned the colouring of black and white photographic images on an opaque base. Colorvir can also be used for colouring black and white transparencies.

A/ MAKING «BLACK & WHITE» TRANSPARENCIES

1) Choice of film

In principle, any black and white film can be treated with Colorvir, but if all the possibilities of the products are to be employed it is preferable to use an Orthochromatic, lith or process film, thin base (0.08 to 0.1 mm), e.g. Ilford IT4 or IC4, Kodak Kodalith, Guillmeinot Lithoguill E or S, amongst others.

Half-tone films often give a low contrast and solarise too much. The Kodak reversible film Kodatone gives good results, but it is advisable to make preliminary tests. Agfa Dia-direct, Kodak Panatomic-X and similar films, reversed at the time of processing, can also be coloured (Note the remarks in the paragraphs Exposure and Development)

The choice of film will depend partly on the method of production to be adopted.

2) Methods for making black and white transparencies:

For those without previous experience in producing black and white transparencies, 4 simple methods are listed below:
- contact,
- projection
- photographing a black and white negative
- direct exposure

• a) By contact under an enlarger (see diagram I, next page)

With this method, the entire negative will be reproduced on the slide. A screen is optional, but if used, very interesting effects can be achieved when treated with Colorvir. One can use as a screen certain types of glass (anti-newton, anti-reflection, frosted...). General types of screens, Letraset, textiles or very thin paper can also be used.

For this method, use process or lith film, available in sheets, and process as instructed here.

• b) By projection with an enlarger (see diagram II)

Project the negative, placed in the carrier of the enlarger, onto the selected film. This method permits reproduction of all or part of the negative, and allows a patterned screen (if required) to be placed over the unexposed film.

Note below regarding choice of film.

• c) By photographic copy of a black and white negative

With the aid of slide copying equipment fitted to a 35 mm reflex camera, or with extension bellows fitted in the same way, copy the negative to reproduce a positive.

The film used can be a lith film or process film in 135 format (Kodak Panatomic-X or Tri-X) or even a half-tone film such as Ilford Pan-F. Kodak Panatomic-X or Tri-X (see below)

• d) By direct exposure

The use of Agfa Dia-direct film in exposure gives a direct black and white transparency. It is also possible to obtain black and white transparencies by reversal of Kodak Panatomic-X film (refer to the instructions issued by the manufacturer).
3) Exposure

This must be controlled to give a light negative after development (and very light for certain tonings such as blue toning or solarisation) Half-tone films should be under-exposed.

4) Development:

- half-tone films (under-exposed as noted above) should be developed normally in a film developer type Kodak D 76.
- process or lith films should be developed for 30 seconds to 1 minute maximum in a paper developer diluted normally (e.g. Kodak Dektol 1:2) or 2 to 3 minutes in a film developer (e.g. Kodak D 76).

An over-developed film tones very badly, or not at all.

5) Normal fixing:

6) Quick washing.

5 min in running water

B/ COLOURING OF BLACK & WHITE TRANSPARENCIES

All Colorvir treatments included in this manual are applicable to slides.

1) Dilution of the baths:

One can double, or even quadruple the concentrations given for paper prints when treating transparencies. It is very easy to dilute the same concentrations in 125 to 250 ml of water. Only the blue toner is the same for paper and diapositives.

To treat diapositives, take the precautions indicated in chapter I (L. B).

Noted below some interesting techniques for transparencies.

- A black and white transparency toned for 3 to 5 minutes in a bath of concentrated yellow toner (diluted for 125 ml of water), then toned in blue, gives a beautiful green and yellow solarisation which, dyed in red, gives a green and orange solarisation.

- A black and white transparency toned for 3 to 5 minutes in a bath of concentrated solarisation solution (diluted for 125 ml of water), once tinted, will make the image appear cracked, thus producing an interesting effect.

- A black and white transparency, toned in yellow, dyed in red, put in a bath of solarisation solution, gives an ochre and vivid red toning.

2/ Use of dyes K, L & M with black and white transparencies

- Transparencies on lith film, exposed and developed as in the previous instructions can be treated with dyes K, L and M. Colours will be very saturated and interesting when projected.
- The method of use for dyes K, L and M is the same as for prints on paper.
- Preparation of the toning baths: follow the instructions for dilution noted in paragraph «dilution of the baths» as well as information given in the instructions with the Polychrom kit.
- Preparation of baths for dyes K, L and M: 10 ml of concentrated dye + 50 ml of water + 5 ml of acetic acid.

WARNING: the back of lith films retains colouring. To avoid an accumulation of colour at the bottom of the film, apply dyes K, L or M with a brush (water-colour type) on the emulsion side on the film, keeping the transparency vertical.
on passing from one dye to another, the possibility of mixing two 
baths of dye and modification of the light yellow colour or yellow 
image also remains valid in this case

N.B. It will be noted from the above information that the backs of certain films 
retain colouring. this can be used to advantage

- by separating, from a transparency with an intense black background, the white 
text, diagram or subject (lith or process film developed in lith developer), it is pos-
sible without any previous toning, to directly colour the back of the film according 
to the technique explained above

- by this method, a coloured image, subject or diagram can be obtained on a 
black background

- in this case select a dye from the bottles supplied

- to obtain a range of colours, apply one colour after another, or a concentrated 
or diluted colouring, etc

3/ Sandwich transparencies

It is possible to mount two and even three transparencies in 
one slide mount; for example:

- 2 transparencies of the same subject:
  - 1 black and white transparency + 1 colour transparency
  - 1 colour transparency + 1 transparency of a different colour
  - 1 negative colour transparency + 1 positive colour transparency

Transparencies may be mounted slightly off register or perfectly 
superimposed.

- 2 transparencies of different subjects:

One transparency is used as a screen (e.g. depicting seeds of flo-
wers, the bark of a tree or a section of the trunk, the surface of water 
or of sand etc.) The other transparency will be the predominant sub-
ject of the slide

These are just some examples. Limitless experiments can be made 
with one's own transparencies. With imagination, original creations 
can be produced by varying the mounting, the colours and the subjects

4/ Scientific applications and colouring of continuous tone nega-
tives

- Toning of black and white documents, in one or several colours 
radiography, electron microscopy, multi-phase microscopy. Colorvir facili-
tiates the mounting of these documents in slides for audio-visual 
reading.

- Study of movement, of changes, by using two pictures taken at dif-
f erent times; one can reproduce them as transparencies, each toned 
in a different colour; mounted superimposed, any change of move-
ment between the subject of the two transparencies will be apparent 
immediately because of the very clear change of colours

To obtain a title, diagram or graph against a black background, use 
a lith film (and lith developer) to make a transparency having a very 
black background, with the text, diagram or graph being transpar-
ent. By using concentrated or diluted dyes K, L or M (or a mixture of 
them), you can colour directly onto the back of such transparencies.

- Colorvir makes it possible to produce a blue background for texts 
and diagrams on a clear background.

- Choose a slow film (e.g. 50 ASA, Ilford Pan F).

- Under-expose when taking the picture, i.e. expose the film to a rea-
ding 3 to 8 times higher than that which is usual (e.g. a film of 50 ASA 
will be exposed to a reading of 150 to 400 ASA)

- Develop this film in the usual way, in accordance with the instruc-
tions (e.g. a film of 50 ASA will be developed 6 to 8 minutes in a deve-
loper of the Kodak D 76 type at 20°C)

- Fix the film in the normal manner.

- Wash the film in running water. The duration of washing should not 
exceed 3 to 5 minutes.

- Treat the film Colorvir immediately, processing in the following order:
  - blue toner, salt solution (50 g/mlitre), wash.

  The result will be a transparent text or diagram on a blue back-
ground, very legible when projected.

Remarks:

1) If the film does not have any background fog, after Colorvir treat-
ment, the clearest parts should remain perfectly colourless and trans-
parent.

- In the even of background fog, the film can be immersed, before 
treating with Colorvir, in the following bath

  C - 7 ml (for 500 ml of water)

  Time of treatment: 1 to 2 minutes

  Washing: 1 minute

N.B. This dilution and treatment is for Pan FILFORD film. Use a stronger concen-
tration for faster films. Treat the film normally with Colorvir. This is a question of 
experience: this treatment aims to eliminate the fog by reducing the density of the 
film. this should be taken into account when making future exposures.

2) If the blue toning gives a reversal effect (i.e. the dark parts become 
transparent while, simultaneously the blue colouring only appears on 
the light parts), the film should have had a longer exposure

3) If a negative toned in blue is fixed, this fixer (25 grammes hypo-
sulphite for 500 ml of water) gives more translucence to the diaposi-

VI. Colorvir sepia toning kit

This kit is sold separately from the other Colorvir products. It enables you to carry out sepia toning using the standard principle of sulphuration before bleaching. The baths in this kit are odorless.

The Colorvir Sepia Toning kit makes it possible to treat prints on plastic coated or standard paper, as well as on black and white transparencies.

The kit contains two bottles, labelled 1 and 2.

Dilution of the bleach bath:
Water: 1000 ml
Product 1: 30 to 50 ml
Time of treatment:
3 to 10 minutes.

Dilution of the sulphuration bath:
Water: 1000 ml
Product 2: 40 ml
Time of treatment:
3 - 5 minutes

Directions for use:
- Plunge the print into the bleach bath and leave it there until the image has almost completely disappeared.
- Wash it thoroughly in running water until all traces of yellow have disappeared.
- Next, place the print into the sulphuration bath; the image will "reappear", taking on a sepia tone.
- Wash thoroughly in running water until the sulphur smell has disappeared.

Remarks:
1) The final tone depends on the degree of bleaching of the print. It is possible to obtain various degrees of bleaching, by changing either the treatment time or the concentration of the bleach bath.

2) A yellowish tone means the baths are used up or have deteriorated.

N.B. a yellowish tone may also come from initial printing of the black and white print (too short a time in the developer; careless fixing or washing).

3) After sulphuration, a blue Colorvir toning can be performed, giving a green colour.

ATTENTION:
- do not contaminate contents of bottles 1 and 2;
- do not contaminate or mix, even slightly, the bleach and sulphur baths; a very unpleasant odor will result.

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Conclusion

This manual contains the basic information needed for the proper use of Colorvir products, as well as some suggestions for various colours.

Other dilutions, doses and concentrations may be tried with success, as well.

After having mastered the basic principles of the process, we advise you to let your imagination take over. You will be surprised by the many creative processes available.

N.B.: The last two pages of this manual may be detached and posted in the laboratory.

N.B.: Certain films and developers referred to in the text are not available in some countries.
COLORVIR

Normal dilutions

<table>
<thead>
<tr>
<th>Treatment of</th>
<th>paper</th>
<th>film</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt bath</td>
<td>25 g</td>
<td>500 ml</td>
</tr>
<tr>
<td>Blue toner</td>
<td>A 5 ml + C 2.5 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>Yellow toner</td>
<td>B 5 ml + C 2.5 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>Solasation I</td>
<td>B 2 ml + D 2.5 ml + C 2.5 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>Solasation II</td>
<td>D 10 ml + C 2.5 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>Polychrome toner</td>
<td>F 5 ml + B 1 ml + C 2.5 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>Freezing of the greys</td>
<td>F 5 to 50 drops</td>
<td>500 ml</td>
</tr>
<tr>
<td>Sulphuration</td>
<td>G 0.5 to 4 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>Dyes H i or J</td>
<td>20 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>Acetic acid bath</td>
<td>20 to 150 ml</td>
<td>500 ml</td>
</tr>
<tr>
<td>Acetic acid (for washing after dyes H, I or J)</td>
<td>5 to 10 ml + 20 ml acetic acid</td>
<td>500 ml</td>
</tr>
<tr>
<td>Acetic acid (for washing after dyes H, I or J)</td>
<td>10 to 20 ml + 5 ml acetic acid</td>
<td>500 ml</td>
</tr>
</tbody>
</table>

COLORVIR SEPIA TONING KIT

| Bleach bath | product 1 | 20 to 50 ml | 1000 ml |
| Sulphur bath | product 2 | 40 ml | 1000 ml |

HIGHLY IMPORTANT:
- Add products in correct order to the necessary quantity of water
- Working temperature between 16 and 23°C
- During preparation of baths, be careful not to contaminate the contents of the concentrated products. Carefully rinse the graduated cylinder after each measurement

1 millitre (1 ml) = 1 cubic centimeter (1 cm³ or 1 cc)