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# C. STEAMFIX®LIQUID DYE ADVANCED USAGE PROCEDURE

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## 1. DYE SELECTION

Check to ensure that the colours that you have chosen are applicable on the fibre that you have selected. Then if necessary make the following additions to the liquid STEAMFIX dyes to maximise dye uptake on the fibre of choice.

| ON PROTEIN FIBRES | | ON CELLULOSE FIBRES |
|---|---|---|
| Silk, fine wool, angora, alpaca, mohair, leather, nylon and polyamide | Coarse wool, angora, alpaca and mohair | Cotton, linen, hemp, rayon and wood |
| No addition to the liquid STEAMFIX dyes is necessary | Thicken the liquid dye slightly by adding 15% DYE THICKENER STOCK to 85% liquid STEAMFIX dye. The DYE THICKENER STOCK recipe is found below in a. PROCOLOUR THICKENING OPTIONS. This thickening adheres the dye to the coarse fibres preventing it from draining away. | Two options:<br>1. Either add 5% COTTONFIX to the liquid dye before painting.<br>2. Or prior to painting soak the cellulose fabric in and alkaline solution made as follows:<br>(3.5% SODA ASH plus 96.5% water)<br>Spin off the excess solution moisture. Dry the fabric, then paint or print etc. as usual. This is the favoured method for painting or printing cellulose because the liquid dyes remain free from additions so their lifespan has not been reduced by COTTONFIX addition. |

- When 5% COTTONFIX is added to the liquid STEAMFIX dyes, their life spans are limited from at least one year to at least 10 days.

- Many liquid STEAMFIX dyes are loaded to the maximum with dye powder so after lengthy storage periods, particularly in cold temperatures, some dyes may form a sediment. Do not shake the container to redissolve the sediment back into the liquid dye because when this is painted onto the silk it will result in uneven streaks. Instead do whatever suits best from the following remedies:
    - simply use the dye without disturbing the sediment;
    - redissolove the sediment by heating the dye to 90° C;
    - before redissolving by heating add a little more water to the liquid dye;
    - after redissolving add to the hot dye one or both of the dye dissolving agents supplied by Procolour:

DYESOLVE: add up to 3% to the liquid dye

UREA: add up to 10% to the liquid dye

However, excessive urea in the dye causes 'blow-out' or detail loss during steam fixation. Also not all dyes respond to DYESOLVE.

## 2. DYE APPLICATION

**2.1** When the liquid STEAMFIX dyes are applied to fabric, they usually spread uncontrollably like ink on blotting paper. This **DYE SPREADING AND DIFFUSION CAN BE ENHANCED BY:**

- Adding up to 2% DIFFUSANT to the liquid dye (1% is already in the liquid STEAMFIX dyes when they are made according to the Table III recipes).

For pastel shades, colour eveness can be a problem because the component dyes in a pastel colour mixture may have differing affinities for the fibre causing the mixture to separate into its component colours as it spreads. To remedy this problem 2% LEVELLER can be added to the dye. In practice it's easiest to dilute STEAMFIX dyes with DILUENT: 100g is made as follows:

| | |
|---|---|
| DIFFUSANT | 2g |
| LEVELLER | 2g |
| WATER | 96g |
| | 100g |

This diluent can be added (in any desired amount) to full strength liquid STEAMFIX dyes whenever pastels that spread evenly without separation, are required. However, if colour separation or slow spreading are not problems, then simply plain water can be used for diluting the STEAMFIX dyes.

- A further way to speed up dye spreading is to paint the STEAMFIX dyes onto the fabric warm. (i.e. warm the dyes to approximately 30-40° C before applying them.)

**2.2** Conversely, **TO CONTROL DYE SPREADING AND PRODUCE SHARP DETAILED IMAGES** on the fabric:

a. Add thickener to the liquid STEAMFIX dyes
   (see below a. PROCOLOUR THICKENER OPTIONS)
b. Coat the fabric with antifusant
   (see below a. PROCOLOUR THICKENER OPTIONS or TECH INFO. SH. 7. ANTIFUSANT TECHNIQUES)
c. Outline all design detail with gutta resist (see below b. PROCOLOUR RESISTAD GUTTA SYSTEM)
d. When painting the liquid STEAMFIX dye onto stretched fabric, sharp detail can be conserved to some extent by blowing hot air up through the fabric to rapid-dry the dye (see TECH. INFO. SH. 3 THE BLOWHEATER TABLE).

The detail sharpening measures above (a, b and c) will be discussed in detail below.

**a. PROCOLOUR THICKENING OPTIONS**

Procolour supplies 2 types of thickener:

1. **DYE THICKENER** – a low viscosity alginate thickener which is compatible with all Procolour dyes but is not suitable for discharge.
2. **GUAR GUM** – a low viscosity guar thickener compatible only with Procolour 'P' dyes (see Table II column 6 - 'Dye Usage and Performance Guide' - for compatibility). Guar is compatible with discharge and devoré chemicals.

THICKENING REQUIREMENTS FOR POPULAR APPLICATION METHODS

| **APPLICATION METHOD** | **DYE THICKENER REQUIREMENT IN THE PASTE (for all dyes)** | **GUAR GUM REQUIREMENT IN THE PASTE (for 'P' dyes only)** |
|---|---|---|
| -SCREEN PRINTING<br>-RISO SCREENPRINTING | 5% | 6% |
| -PIPETTE EXTRUSION<br>-BLOCK PRINTING,<br>-STAMPING,SPONGING,<br>RAGGING, etc | 4% | 4% |
| -BRUSH PAINTING | 3% | 3.5% |
| ANTIFUSANT | 2.5-3% | 3%<br>(Guar antifusant is best for all dyes) |

- In practice, thickeners are easiest to use if they are first made into a concentrate paste called a **'STOCK' PASTE**. Thereafter whenever print pastes are required they can be quickly prepared by adding simple proportions of liquid STEAMFIX dye to this stock paste and water. This method of preparing pastes also accommodates the need for reduced dye concentration when in paste form (i.e.for a given shade depth, the liquid STEAMFIX dyes are approximately twice the strength necessary for an equivalent depth print paste).

- THICKENER REQUIREMENTS FOR STOCK PASTES

| | |
|---|---|
| DYE THICKENER | 10% |
| GUAR GUM | 12% |

- To avoid lumps when making stock pastes.
  Pour the required thickener powder slowly down the water vortex while it's being stirred by an electric blender.
- Stock paste can be kept for up to a year in the fridge
  - Whenever thickening is required the stock can be used to make 100g of paste suitable for applying by the following popular methods:

| APPLICATION METHOD | STOCK PASTE (DYE THICKENER OR GUAR GUM) | LIQUID STEAMFIX DYE | WATER |
|---|---|---|---|
| SCREEN PRINTING (full strength colour) | 50g | 50g | - |
| SCREEN PRINTING (1/4 strength colour, i.e. pastel) | 50g | 12.5g | 37.5g |
| PIPETTE EXTRUSION | 40g | 50g | 10g |
| BRUSH PAINTING | 30g | 50g | 20g |
| ANTIFUSANT | 30g | - | 70g |

**b. PROCOLOUR RESISTAD GUTTA SYSTEM**

Gutta resist is yet another tool that silk painters can use to produce sharp definition designs. When gutta is applied and penetrates right through silk, it forms a barrier. So, when liquid STEAMFIX dye is painted onto the silk it cannot spread beyond the gutta outlines.

Procolour supplies gutta in 3 concentrate forms called:

1. THIN RESISTAD 2. MEDIUM RESISTAD 3. THICK RESISTAD

Pricings are found in Table I.

**These 3 RESISTAD concentrates are used as follows to make application strength guttas**:

**1. THIN RESISTAD**

Recipe: (80% TEXTILE PAINT + 20% THIN RESISTAD 80/20)

- NO THICKENING EFFECT
- USED FOR CONVERTING TEXTILE PAINTS INTO GUTTAS

  Most popular are metallic paint guttas and black paint gutta. These guttas are suitable for all application methods. However, screenprinting and pipette extrusion are the most popular.

  Their slight drawback is that if they are applied in such a way that they cover large areas of the silk, then they stiffen it slightly and also impair the natural lustre of the silk. However, they are very good for fine line designs and have an excellent resist performance.

**2. MEDIUM RESISTAD**

Recipe: (50% LIQUID STEAMFIX DYE OR WATER + 50% MEDIUM RESISTAD 50/50)

- MEDIUM THICKENING EFFECT
- USED FOR CONVERTING STEAMFIX LIQUID DYES AND PLAIN WATER INTO GUTTAS (dye-coloured, full strength or pastel, and clear)

Guttas made with medium RESISTAD give a viscosity suitable for: pipette extrusion, block printing, stamping, sponging, ragging etc. and brush painting.
The advantage of this gutta is that coverage of large areas of silk does not result in impairment to the silk's softness or lustre. It has a very good resist performance.

**3. THICK RESISTAD**

Recipe: (50% LIQUID STEAMFIX DYE OR WATER + 50% THICK RESISTAD 50/50)

- THICK THICKENING EFFECT
- USED FOR CONVERTING STEAMFIX LIQUID DYES AND PLAIN WATER INTO GUTTAS (dye-coloured, full strength or pastel, and clear)

Guttas made with thick RESISTAD give a viscosity suitable for screenprinting. When this gutta is applied in big blotches it does not impair the softness, drape or lustre of the silk. It also has a very good resist performance.

As well as the 3 above types of RESISTAD GUTTA CONCENTRATE, Procolour supplies 4 pre-mixed ready-to-use paint based guttas:
METALLIC WHITE PEARL, METALLIC GOLD, METALLIC SILVER, METALLIC AND BLACK. The pricings for these guttas are found in Table III.

**ATTRIBUTES OF PROCOLOUR GUTTAS**

- All are water based so application utensils wash up in water. All gutta designs require heatsetting prior to being coloured in with dye. This is an extra compulsory step not encountered when using other brands of guttas on the market. Heatsetting activates the gutta's water repellency transforming it from water miscible to water resistant.
- Medium and thick resistad guttas do not impair the lustre or softness of the silk, so gutta outlines can be as broad as you like without effecting the silk's natural drape or shine.
- All guttas (of correct viscosity) are screen printable and compatible with the RISO SCREEN PRINTING SYSTEM. Printing the gutta makes it viable to do many copies of even sophisticated designs which would normally be beyond the scope of any hand pipette extrusion techniques. For example,

  - Imagine if you had an order for 100 scarves with a sophisticated full colour company logo on each of them. With screen printable gutta, you can tackle such an order confidently.
  - With this gutta system, you can exactly copy copyright free designs, e.g.clip art and designs from the DOVER books etc.
  - Souvenir apparel usually needs to be decorated with nationally iconic imagery. Now

you can do this in full colour.

- Ponder the possibilities of this tool for your silk painting income as well as the ways it can expand your creativity.

**USAGE PROCEDURE FOR ALL PROCOLOUR GUTTAS:**

1. From the concentrate form that RESISTAD is supplied in, make application strength gutta up according to the RESISTAD recipes given above. Allow 1/2 hour for MEDIUM and THICK RESISTAD guttas to evenly thicken before use.

2. Apply the gutta to the silk ensuring that it penetrates right through to the backside of the fabric throughout the entire length of the gutta outlines.

3. Dry the gutta design naturally or if the detail is losing sharpness then rapid-dry with a blow heater or hairdryer.

4. Heatset the gutta design in any one of the following ways:

- By ironing or baking in the oven or in a commercial textile paint infra-red heat-set tunnel or a heat press etc. (150° C for 2 mins is recommended).
- Or leaving at close range in front of a blow heater on high for 20 mins.
- Or leaving for 24 hrs in the warmest place that you can find.

5. Colour in the gutta design with dye.

6. STEAMFIX the painting.

7. Rinse simply in plenty of warm soapy water or if optimum results are required then follow THE PROFESSIONAL RINSE AND FINISHING PROCEDURE given below on page 9.

**Notes on Resistad Guttas:**

- Though RESISTAD guttas contain much less solvent than solvent-based guttas, they do however contain some solvent. So care should be taken to avoid prolonged exposure to gutta fumes.
  USE RESISTAD GUTTAS IN A WELL VENTILATED AREA. Actual solvent content in RESISTAD guttas is 1.25% 2-Methylpentane-4-diol. Another volatile non solvent ingredient is 1% Acetic Acid.

- Don't mix hot dye, water or textile paint with RESISTAD or it will spoil. Allow additives to cool before mixing with RESISTAD.

- When mixing dyes with medium or thick RESISTAD, if the mixture is not thickening properly usually this is caused by too much methylated spirits or alchohol in the dye. Reduce or eliminate achohol from the dye.

- All RESISTAD guttas can be thinned with up to 10% water. Textile paint-based guttas only can be more efficiently thinned by adding PAINT THINNER (available from PROCOLOUR) little by little, and mixing it in thoroughly.

- Medium and thick RESISTAD guttas can be thickened by adding extra RESISTAD concentrate.

- Textile paint based guttas can be thickened usually by the following procedure:
  -Mix into the gutta up to 1% CLOUDY AMMONIA (available from the supermarket) to increase the pH to about 8;
  -Mix in 0.25-0.5% of PAINT THICKENER (available from Procolour) into the pH 8 paint-based gutta.

- If both dye-coloured and textile paint guttas are to be used in areas on the fabric where these two guttas overlap, then it is important that the textile paint gutta is applied first and therefore can grip clean fabric unobstructed by dye-coloured gutta. This is because textile paints need an a good bonding grip to be permanent.

- The efficiency of the heatsetting of RESISTAD guttas (step 4 above) determines the resistivety of the gutta. If the gutta has been given optimum heatsetting, then it will shrug off dye almost as well as wax does. Overpainted dye will bead up on top of well heatset gutta where it can be dabbed off with a cotton bud. However, if the heatsetting is mediocre, then the gutta can be overpainted with dye and it will behave more like an antifusant towards the dye. So the way that the gutta behaves towards overpainted dye is determined by the amount of heatsetting that the gutta has undergone and this can be controlled to suit one's creative needs.

- For guttas made with MEDIUM or THICK RESISTAD plus dark dye colour, **erosion** can be a problem. Erosion has occurred when the sharp definition of the gutta line edges has become smoky because they have been slightly dissolved by the colouring-in dye.

Erosion only occurs, with dark STEAMFIX dye-coloured gutta lines, in the following circumstances:

- when the colouring-in dye takes a long time to dry
- on thick fabric (for silk more than 14 MM);
- if painting is done during high humidity weather conditions.
- when the gutta design is very spiky or full of fine shading lines or dots that sometimes haven't penetrated right through the fabric;
- when the gutta hasn't been well heat set (i.e. see step 4 just above);
- when the gutta is too thin (causing the lines to spread too much before drying);
- when the dye in the gutta has too much urea in it (urea is a humectant...it attracts moisture and slows drying).

So for dark dye-coloured guttas **<u>erosion can be eliminated by any of the following methods</u>**:

- **steamfixing the gutta design before colouring it in. This is the most popular method of avoiding erosion. It is labour saving for large runs of gutta work because steamfixation simultaneously caters for the heatsetting requirements in a single step. However, the paintings must undergo a second steamfixation after the design has been coloured in and dried.**
- adding fine gutta details like dots, veins and shading on top of the dry colour-in dye, e.g. for a leaf design: gutta the leaf outline and colour this in with dye. Then after the colour-in dye has dried add the fine leaf veins on top.
- using dark pigment-coloured textile paint gutta instead of dark dye-coloured gutta. Paint guttas are not erosion prone; however, their finish is dull and slightly stiffening to the fabric. These drawbacks are difficult to detect if the design is made up of fine lines only.
- ensuring that the gutta is adequately heatset and that the consistency is correct for application (not too thick or thin).
- minimising or eliminating urea from the dark dye used to colour the gutta.

If any further gutta usage info is required, it will probably be covered in:

TECH. INFO. SH. 2: GUTTA PROBLEMS AND SOLUTIONS
TECH. INFO. SH. 5: SCREENPRINTING THICK GUTTAS
TECH. INFO. SH. 6: POLYCHROMATIC GUTTA WORK

## 3.FIXATION

After painting or printing with STEAMFIX dyes, the dye must be allowed to dry and then must be fixed by steamfixation. Though these dyes only require 15 minutes of steaming to fix them, however, because the paintings are rolled up interleaved with paper or cotton fabric, steaming must be prolonged for 3 hrs to guarantee that the steam has fully penetrated right into the core of the roll and therefore all the paintings have been subjected to at least 15 minutes of steaming. Inadequate steaming durations only result in poor colour yields whereas steaming for prolonged durations is not detrimental to paintings or prints.
When you first use a new steamer, it is good to tune it with non-precious test paintings because optimum steaming results are not automatic and may take several trials and adjustments to achieve. The following are signs of **healthy steamfixation**:

- The colours have intensified, making them much brighter than they were prior to steaming.
- There can be some but not too much mark off from the paintings onto the interleaving paper or cloth during steaming. If the mark off is excessive, then there is usually a corresponding blurring of detail on the paintings. This is called '**blow-out**'. If the mark off is heavy, it may also penetrate through fine interleaving paper or cloth and cause unwanted marks on the underlying paintings. Obviously, 'blow-out' is undesirable and a sign of unhealthy steamfixation. It occurs when too much moisture is condensing from the steam onto the painting.

  What are the causes of blow-out?
  - The paintings have been insufficiently wrapped with interleaving paper or cloth. Or this wrapping paper or cloth is too thin.

  - The interleaving paper or cloth is too sweaty. Make sure that you use natural cotton fabric which breathes much better than polyester or synthetics. Similarly with paper, the kind chosen must allow the steam to pass through it without causing excessive condensation.

  - Too much steam is being produced. Turn the heat source down slightly.

  - Too much pressure is being built up inside the steamer. If it's a pressure style steamer

allow the steam to escape more easily.

- If blow-outs have occurred unevenly on some paintings and not others, then your wrapping could be uneven allowing the steam easy access to the paintings in some places but not in others. Usually these easy steam inroads to the paintings occur on the edges at either end of the roll. To avoid this it is always best to tape the interleaving paper or cloth tightly down against the roller rod so that steam cannot find easy access routes at these edges.

- The opposite of blow-out is **insufficient steam reaching the paintings** and this results in poor dye fixation which causes dye to pour off the paintings in the first rinse. The final result is weak dull colour yields. The most common reasons for this scenario are:

  - The steaming period was not long enough so steam for longer.
  - The interleaving paper or cloth was not allowing the steam to pass through properly. Change it or if there is dressing in the cotton cloth, wash it before reusing it.
  - Insufficient steam is being produced, so turn up the heat to generate more steam.

**Healthy steaming** lies between these two unacceptable extremes of **blow-out** and **insufficient steaming**, so your steamer performance must be tuned and noted to guarantee reliable fixation performance. To make a steamer see TECH INFO. SH. 11

## 4. PROFESSIONAL RINSE AND FINISHING PROCEDURE

After fixation, STEAMFIX dye paintings and prints can be simply rinsed in warm soapy water. However, if back-staining problems are encountered when rinsing off dark dye-coloured print paste and gutta residues, then a multi-bath commercial rinse procedure needs to be used as follows:

1. Soak the paintings or prints for 10 minutes in cold water plus 1cc of STAINGUARD per litre of rinse water. STAINGUARD reduces the risk of back-staining and improves dye washfastness. During rinsing its important:
- to have enough rinse water, so that the paintings or prints are not too congested.
- to change the rinse water, if it becomes too contaminated with colour.
- not to pour neat rinse additives directly onto the paintings or prints. Mix them into the rinse water before entering the fabric.
- never wring silk out because it is sensitive to chaffing and damage when its wet.

2. Transfer the painting or prints to a warm water bath (30 – 40° C) plus 1cc/l of STAINGUARD plus a little detergent for 10 mins.

3. Transfer to a cold bath plus 10cc of RINSEFIX per litre of rinse water for 20 mins. RINSEFIX chemically fixes any poorly fixed dye and permanently improves washfastness.

4. Transfer to cold bath plus fabric conditioner for 5 mins. ACETIC ACID 50% 2cc/l can also be used to condition protein fibres. Rinse off the excess conditioner.

5. Spin off excess moisture in the washing machine.

6. Dry. Damp silk is best ironed dry.

7. Optionally, the dyed fabric can be given a water and oil proof finish with AQUAPROOF. Immerse the dry fabric in full strength Aquaproof for 5 minutes. Remove and squeeze off the excess Aquaproof back into the container. Hang the fabric outdoors to air cure/dry for 48 hours after which proofing is complete. This proofing is good for:

- stain resistance, on products like cushions, upholstery, men's ties, women's scarves, etc.
- shower proofing on products like ski jackets, umbrellas, women's scarves, etc.

AQUAPROOF IS SOLVENT-BASED, so:

- care should be taken to minimise exposure to fumes;
- it is FLAMMABLE and fume build-ups should be avoided;
- it CANNOT BE SENT BY AIR MAIL.