

## Space dyeing with fibre reactive dyes

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Otherwise called Dylon Cold, or Procion dyes

These dyes react with cellulosic fibres to form a strong chemical bond. They also react with water, so cannot be kept in solution. They can be used for dyeing silk, cotton, ramie, viscose etc. More dye is needed for linen (or paler colours result).

### Fibre reactive dyes- general notes

**Storage** The dye powder has a long shelf life stored under dry, cool airtight conditions. Solutions should be used up within 10 days, though they can be stored for up to 3 months in the freezer.

**Safety** It is wise to treat all dyeing materials as poisonous to some extent. Keep out of reach of children; keep dyeing utensils separate from those used for food; cover the work surface with paper or polythene and wear rubber gloves; wash well after handling. Some people have an allergic reaction to the dry dye powder, so be particularly careful with the dye at that stage.

**Repeatability** It is worth experimenting on a spare piece of fabric/yarn to provide yourself with a reference sample of each (unmixed) dye colour if you are likely to do much dyeing. To repeat a colour exactly, you will need to have the same amount of dry dye and the same volume of water (or salt solution) to weight of fabric. To calculate the dye required for larger quantities of dyeing 3ml of 1% dye solution (1 g dye in 100 ml water/salt solution) per gram of fibre gives an average strength dye.

### Factors affecting the dye reaction:

**salt** acts as a levelling agent, promoting the migration of the dye out of solution and into the fibre. Less important for uneven dyeing, and not necessary for painted warps etc. A salt-and-dye solution can be used for space dyeing (use 20% salt solution- 200 g salt/litre).

**alkali** (washing soda) acts as a fixative; once it is added, the dye molecule reacts with the fibre or water, whichever is closer. For one-colour, level dyeing, add after 30 minutes from the start of the bath, to allow the dye to diffuse evenly into the fibres. For space-dyeing, use more alkali/minimum water, and add alkali to yarn before the dye to produce instant bonding (make up a 10% solution of sodium carbonate - 250 g washing soda/litre water).

**water** for even dyeing use about 20:1 by weight; for space dyeing as little as possible.

**heat** not necessary- helps dye to react with both water and fibre!

**time** after alkali is added affects the depth of colour. Preferably leave the dyebath at least an hour, without stirring if doing space dyeing.

### Process for space dyeing:

First wash or scour the yarn, fabric etc. Yarns can be skeined or wound in balls for different effects, fabric can be crumpled, ironed smooth, carefully pleated, or tied as in tie dyeing.

Rinse article to be dyed in washing soda and squeeze out thoroughly. For different effects, painted warps, etc where little dye migration is wanted, the article can be painted with soda solution and allowed to dry at this stage before dyeing.

Arrange the skeins, fabric etc in a shallow container - plastic/stainless (but not aluminium or chipped enamel).

Mix up small amounts of dye solution – use ¼ teaspoon dye or less to start with, mix first in a few drops, then add 10-20 ml water or salt solution and stir to dissolve. Start with the palest colour, as it is difficult to lighten colours.

Pour the dye on in patches, mixing colours (usually on the article rather than in the dye solution) if required. The colours may not come out quite as expected, particularly on silk. It may be easier to pour on in spoonfuls to control the placing of the dye. Blue tends to be very strong and drown out other colours.

Leave for 15 minutes, then press down over the whole area (wearing rubber gloves, or use a dyeing spoon). More (pre-soaked) fabric can be added on top of the dyebath at this point to give another type of (paler) patchy dyeing.

Add more soda solution so that all the fabric has been wetted, and press down gently over the whole area to make sure that as much as possible of the dye has reacted with fabric/yarn.

Leave for at least ½ hour, for the dye to react. The dye colour will go on strengthening for an hour or so; but it will not matter if the dyebath is left overnight at this stage.

Pour off the dyebath. This will have quite a bit of colour, but the dye will have reacted with the water, and will no longer react with fibre.

Rinse the articles thoroughly in several changes of cold water (keep articles from different dyebaths separate at this stage, or some cross-dyeing may occur, particularly with pale colours). If overdyeing required, dry at this stage and repeat the dyeing process.

Finally boil or wash in **hot** soapy water to remove any remaining dye, and rinse thoroughly. After this the dye in the article should not run. Spin dry and iron.

**Sources:** Dylon cold (from hardware stores) give a range of colours, good for first experiments. For larger quantities, try Fibrecrafts/George Weil – ([www.georgeweil.co.uk](http://www.georgeweil.co.uk)) (basic kit £21) – or look on the Internet!