The Indigosols in Textile Printing

By *Kerth* and *Pfeffer*

The Indigosols, which are water-soluble and stable vat dyes, are easy and simple to apply, and possess good fastness properties; moreover, the printer is enabled to produce with their aid prints of vat colour fastness of various kinds — roller, block, spray and yarn prints — without having to take into account the fact that the unsteamed vat prints are inclined to decompose. It is due to these advantages that the Indigosols have been so readily taken up by textile printers. Other points in their favour are that in addition to print-on styles they may be used with advantage for resist and discharge printing, for which styles they have in many cases displaced or complemented existing processes.

The *steaming process*, which is applicable to all the Indigosols, and which yields reliable results, is the process most widely used for print-on styles on vegetable fibres. As the steam used need not be particularly free from air or saturated, any available steaming appliances, such as are to be found in most print works, may be used. When using the steaming process, sodium chlorate is added to the print paste as oxidizing agent, vanadate of ammonia as oxygen carrier, and in most cases ammonium sulphocyanide or ammonium oxalate as agent for splitting off acid. It is often advisable, in order to increase the stability of the print paste, to add some ammonia, thus keeping the paste slightly alkaline. Some of the Indigosols, viz. Indigosol Orange HR, Indigosol Scarlet HB, Indigosol Pink IR extra, Indigosol Red Violet IRH, Indigosol HB are difficultly soluble, and are therefore best dissolved with the aid of Fibrit D, or Dissolving Salt B.

In certain cases, for example when using Indigosol Golden Yellow IGK and Indigosol Green AB, the use of ammonium sulphocyanide or of ammonium oxalate as acidifying agent is not advisable owing to the risk of the dyestuff being precipitated by the presence of too large quantities of these salts. They are therefore replaced, when using the dyes named, by certain solvents which also possess the property of splitting off acid when steamed. Very efficient solvents of this nature are the Indigosol Developers D and GA, the former effecting the oxidation of the Indigosols by means of sodium chlorate, splitting off acid in steaming. This printing process with the aid of the two Indigosol Developers, may of course be used for all the Indigosols, although it should be noted that it does not always give the same good results, as regards the brilliancy of the shade, as the ammonium sulphocyanide process. The after-treatment of goods printed by the steaming process consists in steaming for at least 5 minutes, washing and soaping at the boil. For the full development of Indigosol Red Violet IRH and several other brands which are difficult to oxidise, a longer steaming is however advisable.

A few examples of print pastes of Indigosols for print-on styles by the chlorate steaming process on cotton or viscose may here follow:

	Orange HR	*Pink IR*	*Blue HB*	*Green AB*
Indigosol Orange HR ..	70 parts	—	—	—
Indigosol Pink IR extra	—	20 parts	—	—
Indigosol HB	—	—	70 parts	—
Indigosol Green AB ...	—	—	—	80 parts
Glycerine or Fibrit D ..	50 ,,	50 ,,	50 ,,	—
Dissolving Salt B	30 ,,	30 ,,	30 ,,	—
Indigosol Developer GA	—	—	—	50 ,,
Indigosol Developer D	—	—	—	40 ,,
Water	240 ,,	290 ,,	255 ,,	260 ,,
Wheat starch-tragacanth thickening	450 ,,	450 ,,	450 ,,	450 ,,
Ammonium sulphocyanide	30 ,,	30 ,,	20 ,,	— ,,
Chlorate of soda	20 ,,	20 ,,	15 ,,	10 ,,
Vanadate of ammonia (1 : 1000)	100 ,,	100 ,,	100 ,,	100 ,,
Ammonia 25 %	10 ,,	10 ,,	10 ,,	10 ,,
	1000 parts (by weigt)			

After printing, the goods are steamed for at least 5 minutes in the rapid ager, well rinsed, at first cold, then warm, and soaped.

Besides the steaming process, the *nitrite process* is also widely used print-on styles, i. e. for cotton piece goods whenever Indigosols are printed alongside and in combination with Rapid Fast Colours. With the nitrite process it is best to print or pad the Indigosol solution mixed with sodium nitrite (30—80 parts per 1000 parts print paste), to which preferably some ammonia is added. After drying, the Indigosol is developed by passing the goods, usually for 15—20 seconds, through a solution of about 20 parts sulphuric acid 168 ° Tw. per 1000, the temperature of the developing bath being 70—85 ° F. for Indigosol O, OR and Indigosol Black IB, and 140—160 ° F. for the other Indigosols. If developing is preceded by a short steaming, the Indigosols will in some cases be more satisfactorily fixed and fuller shades result.

To be continued

Coloured Discharge Process with Anthraquinoid
Dyestuffs on Indigoid Ground

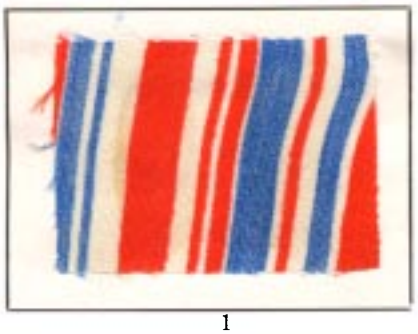
Ground: Ciba Pink B
Print: Cibanone Blue GCDN }
Anthraflavone }
Aniline Black

Ground: Ciba Blue 2B
Print: Cibanone Blue GCDN }
Anthraflavone }
Aniline Black

Ground: Ciba Violet B
Print: Cibanone Orange
Aniline Black

Ground: Ciba Orange G
shaded with Ciba
Blue 2B
Print: Cibanone Blue RSN }
Cibanone Blue GCDN }
Aniline Black

Naphtol A S-Combinations and Rapid-Fast-Colours on Artifical Mixed-Fabrics.



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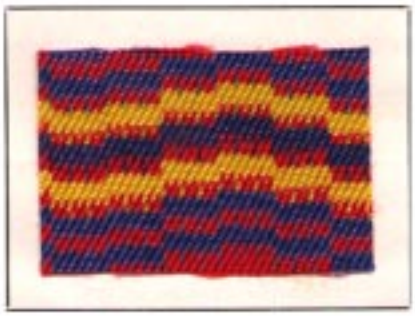

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