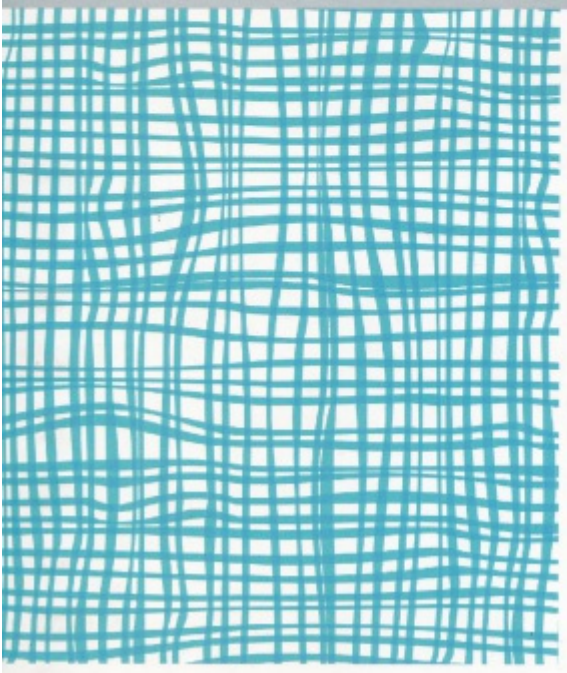
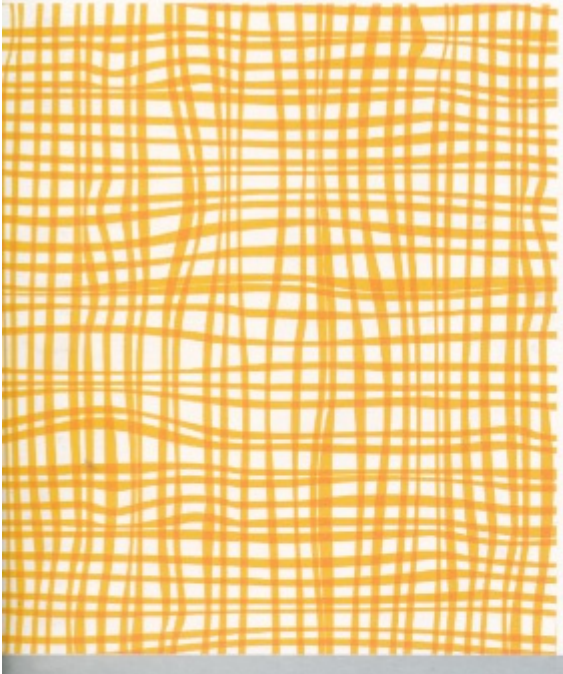
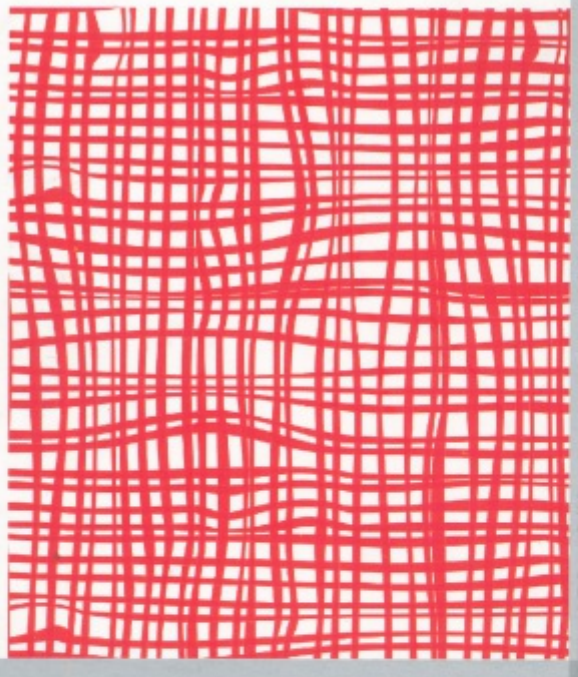
Coravat M/D Dyes

On cotton







- Granular / Speck free vat dyes
- Excellent all round fastness
- Exhaust & continuous application on cellulosic

colourtex®
The Dyestuff Company

ISO 9001 - 2008
ISO 14001 - 2004
OHSAS 18001 - 2007
ETAD Member

Coravat M/D Dyes

On cotton

1.0 INTRODUCTION

Coravat M/D dyes from Colourtex are complete range of superfine, micro particle, speck free vat dyes available in granular form.

Coravat M/D dyes are suitable for exhaust and continuous application on cellulosic fiber, yarn, hank and fabric.

2.0 Classification of Coravat M/D Dyes

Coravat M/D dyes are classified in to three groups depending upon different dyeing characteristics like different vatting and dyeing temperature, concentration of reduction chemical, caustic and addition of electrolyte.

Method (Class)	Optimum Temperature	Bath Alkalinity	Electrolyte addition	Comments
1 (IN)	55 -75°C	High	--	High affinity
2(IN Spl)	60 -75°C	High	--	Blacks
3 (IW)	50°C	Medium	Recommended	Medium/Low affinity

For combination shades the choice of dyestuff should be such that they belong to same class. When dyeing in mixture shades of different classes, the dyeing method of the major component in the recipe should be considered.

3.1 Dye Application - General Procedure

Coravat dyes are water insoluble; therefore for exhaustion on to the fibre, have to be converted into soluble form (leuco) in presence of reducing agent (sodium hydrosulphite) at very high alkaline condition using caustic soda at recommended vatting temperature. Vat dye bath stability depends on the amount of sodium hydrosulphite, caustic soda, vatting temperature and time of exposure to air. The bath decomposition becomes faster at elevated temperature. The leuco forms of Coravat dyes have affinity for cellulose and hence after the dye bath exhaustion the leuco form is converted to original insoluble form by oxidation in side the fibre. The dyed substrate is thoroughly soaped to remove the superficial colour. Please refer pattern card to choose the vatting temperature.

3.2 Substrate Preparation

Substrate should be carefully pre-treated to attain uniform high absorbency and whiteness.

* The yarn in package form, especially when dyeing.

(i) light shades (ii) fine yarns, (iii) short liquor ratios and (iv) heavy packages, should be given good scouring treatment and then bleached to achieve high degree of levelness.

3.3 Quality of Water in Dyeing

It is essential to prepare the stock vat and dye bath with soft water. The leuco compound of some Coravat Dyes form insoluble complexes with calcium, magnesium and Iron ions and precipitate which results in weaker and patchy dyeing. Appropriate dosage of Levocol 2010 (sequestering agent) in dye bath is recommended if hard water is used.

3.4 Electrolyte Addition

Sodium sulphate (Glauber salt) or sodium chloride (common salt) is recommended for Method 3(IW) to improve dye exhaustion.
When using common salt care need be taken to check and avoid contamination of magnesium salt which has adverse effect on dye bath stability.

3.5 Wetting Agents

It is recommended to use suitable 'low foaming' wetting agent in dye bath to give uniform wetting action to the material to be dyed for level dyeing. Any foam in dye bath forms scum and cause surface oxidation of leuco dye.

3.6 Leveling Agent

Vat dyes in leuco state, due to high strike rate, tend to dye unlevel.
0.2 to 5 gpl Levocol LV (leveling agent) owf., assists in level dyeing by decreasing the dye strike rate.
Lower the percentage shade of Coravat M/D to be dyed, higher the Levocol LV proportion and vice versa.
Deeper shades don't need leveling agent.
To improve levelness, pre-pigmentation technique is preferred.

Levocol LV should be added to the dye bath, not to the stock vat, by diluting 10 times with hot water.

3.7 Dyeing Temperature

Higher the dyeing temperature (80°C) better the dye penetration and leveling but Coravat Blue BC M/D being sensitive to over-reduction, temperature above 60°C may lead to dulling and graying of the shade. Sodium nitrite or glucose are preferred dye bath additives to prevent over-reduction.

Caution: Avoid EDTA based sequestering agents when sodium nitrite or glucose are added in the dye bath.

4.0 Dye Application - Yarn Dyeing

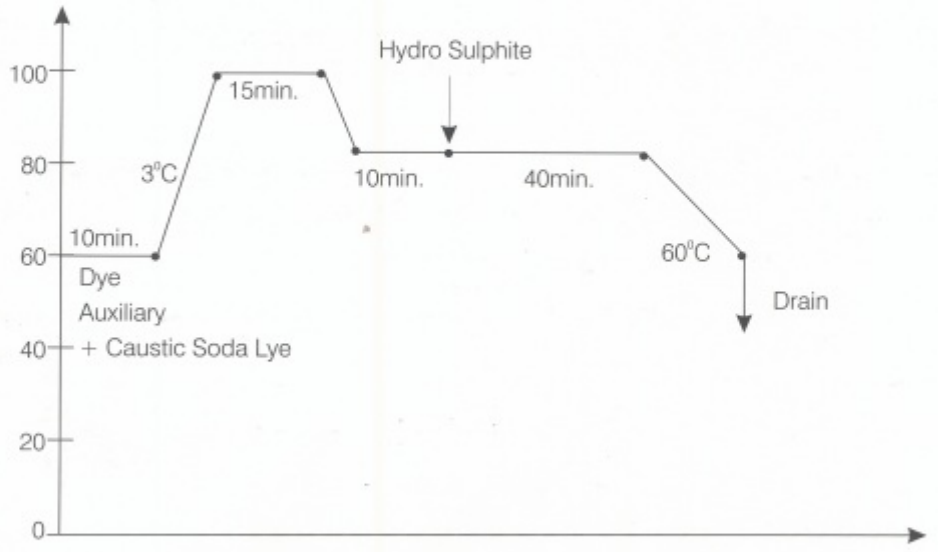
4.1 Leuco Process

Yarn in hanks form is dyed by this method. This process is mainly used for dark shades where the dyes are pre-vatted in along liquor. The vatting process as described in 3.1 is followed for 10 minutes at required temperature before starting dyeing process in side tank. The recommended vatting temperature is given in pattern card. The remaining quantities of caustic and sodium hydrosulphite, calculated from table for total dye bath are then added and transferred to the bath containing prewetted, scoured yarn. The bath is allowed to circulate at dyeing temperature for 10 minutes to remove any entrapped air. The leuco vat dye is filtered and added to the dye bath in two to four portions dyeing is continued for 45-60 minutes. Addition of salt for Method-3 (IW) dyes to the bath should be done 15 minute before the end of the dyeing process. The salt should be predissolved before addition. The after treatment is followed as described in the Section 5.0.

4.2 High Temperature Process

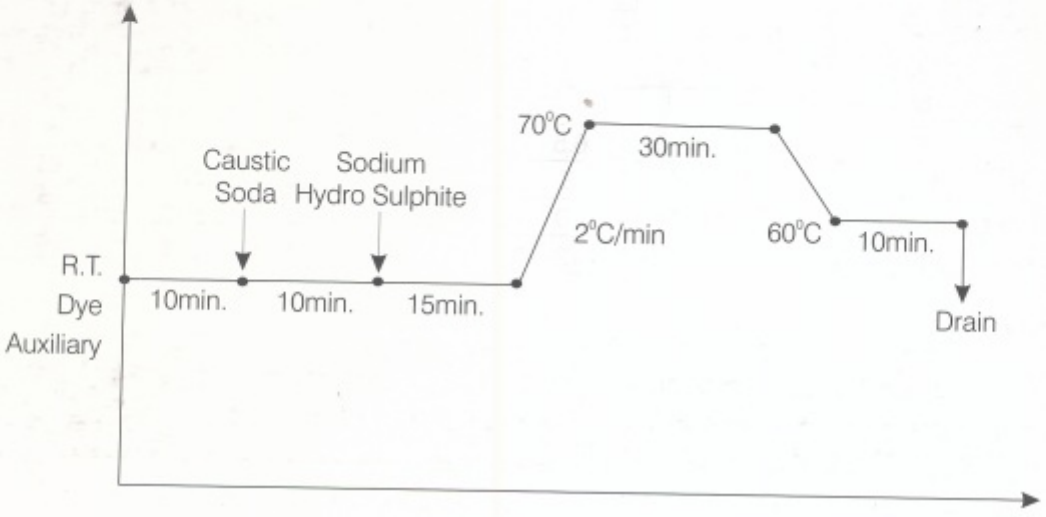
To achieve improved dyeing performance this method is especially recommended for linen, viscose and mercerized cotton. Better dyeing of the yarn cross over points with good levelness is achieved at dyeing temperature above 80°C. For these substrates it is not necessary to bring down the temperature of the bath at the end of the cycle but 50°C is preferred for Method-3 dyes in dark shades on mercerized cotton yarn for better yield. During dyeing of the dyes sensitive to over reduction, addition of sodium nitrite or glucose 80% (2-3 gpl) addition is recommended before raising temperature above 60°C.

The after treatment is followed as described in section 5.0.



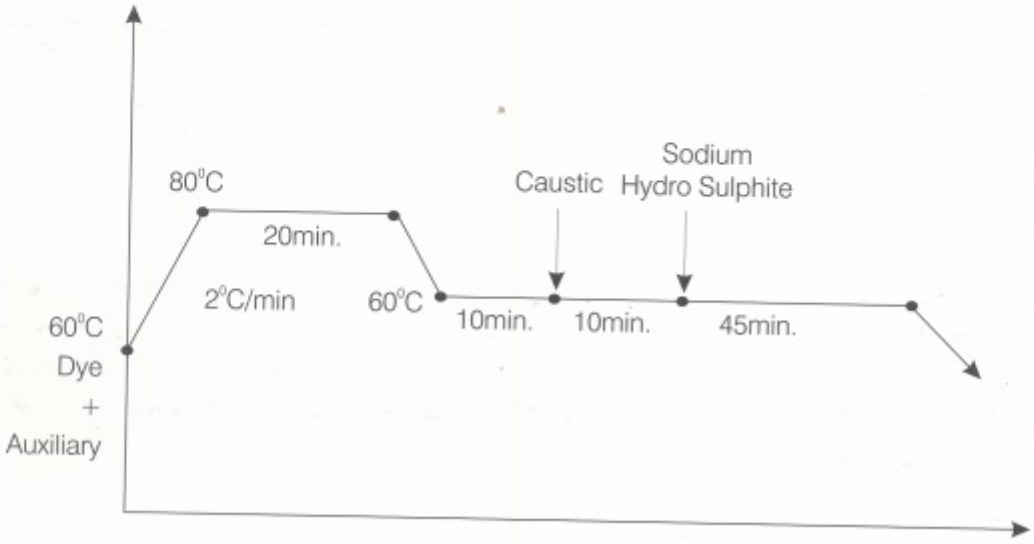
4.3 Semi-pigmentation Process

Semi-pigmentation method is preferred for dyeing of medium shades on pretreated yarn. In this process the advantage being a slow rate of reduction in cold bath and slow rate of exhaustion. The dye dispersion is distributed uniformly over the surface of the yarn before reduction and exhaustion without aggregation.



4.4 High - pigmentation method

High-pigmentation is normally carried out for the hard packages where the liquor flow is hindered at low temperature. During pigmentation stage, without alkali, at 80°C gives an improved rate of flow. The dye dispersion is distributed over the surface of the fibres in the non-affinitive pigment form to ensure the levelness of the dyed package before dye bath exhaustion. At high temperature the dye pigment exhaust slowly and uniformly; care should be taken in addition of caustic soda in order to avoid unleveled exhaustion at this stage. High pigmentation method provides an economical way of dyeing grey yarns.



Chemical requirement

The chemical requirement for achieving optimum result depends upon the depth of shade and the liquor ratio.

Table -3 (MLR 1:5)

Shade % owf	Caustic soda flakes (gpl)			Sodium hydrosulphite (gpl)	Electrolyte for Method -3 (gpl) (IW Class)
	Method-1 (IN Class)	Method-2 (IN spl Class)	Method-3 (IW Class)		
Up to 1.0%	8	12	5	5	6
1-3%	10	15	6.5	8	8
3-5%	12	18	8	10	10
5-7%	15	22	10	13	12
Above 7%	18	24	12	15	15

Table -4 (MLR 1:10)

Shade % owf	Caustic soda flakes (gpl)			Sodium hydrosulphite (gpl)	Electrolyte for Method -3 (gpl) (IW Class)
	Method-1 (IN Class)	Method-2 (IN spl Class)	Method-3 (IW Class)		
Up to 1.0%	5	8	3	4	10
1-3%	7	10	4	6	12
3-5%	8.5	12	5	7	15
5-7%	10	13	7	10	18
Above 7%	12	15	10	12	20

Table -5 (MLR 1:20)

Shade % owf	Caustic soda flakes (gpl)			Sodium hydrosulphite (gpl)	Electrolyte for Method -3 (gpl) (IW Class)
	Method-1 (IN Class)	Method-2 (IN spl Class)	Method-3 (IW Class)		
Up to 1.0%	4	5.5	2.5	3	10
1-3%	5.5	7	3.5	4.5	12
3-5%	6	9	4.5	6	16
5-7%	8	11	5.5	8	18
Above 7%	10	13	6	10	24

5.0 After treatment

5.1 Rinsing

Over flow rinsing with soft water is preferable over standing bath to reduce the bath pH to 9. Light shades can be oxidized directly by dropping the dye bath. In case of the medium and dark shades it is advisable to carry out an intermediate reductive rinsing_treatment, which reduces the concentration of unfixed dyes in the package. A typical reduction-rinsing bath contains 1-2 gpl Caustic and 2-3 gpl Hydros and the treatment is given for 10 minutes at room temperature

5.2 Oxidation

The yarn dyed in hank form is air oxidized by rinsing and squeezing in fresh cold water and exposing to open air.

For package dyeing, the bath is drained after the rinsing and the oxidation process is carried out directly in presence of oxidizing agents like Hydrogen peroxide and sodium perborate etc. For Coravat Black NB M/D the original oxidation colour can be achieved using sodium hypochlorite solution having 2-3 gpl available chlorine for 30 minutes. The quantity and type of oxidizing agent is chosen depending upon liquor ratio, depth of shade, time of treatment, and quality of oxidizing agent. The oxidizing agents affect the brilliancy of shades so the oxidizing agents like potassium dichromate and sodium dichromate are avoided for the oxidation of the Coravat Yellow 5G M/D, Yellow 3R M/D and Blue BC M/D etc. Oxidation with chemicals is carried out for 15-20 minutes at 50-60°C in presence of acetic acid.

5.3 Soaping

The loosely held unfixed dyestuff is removed from the yarn by giving soaping treatment at boil with Levocol 2010 to improve the shade brilliancy and fastness properties. Soaping bath contains 1-2 gpl Levocol 2010 and 2.0 gpl soda ash depending on depth of shade.

Pale shades can be soaped in the oxidation bath.

6.0 Precautions

- Package size should be maintained uniform.
- Soft packages with density of 350 400 gm/lit are preferred depending on count to ensure uniform throughput of the dye liquor. In case of packages wound tightly to improve the liquor flow the pigmentation temperature can be increased to 40 - 45°C.
- Additions should be made during outside to inside liquor flow.
- To avoid over reduction of the sensitive dyes sodium nitrite or glucose (2-3 gpl) should be added before raising temperature 60°C.
- Addition of retarding if used should be made before the addition of sodium hydrosulphite.
- Insufficient quantity of caustic soda and sodium hydrosulphite causes uneven dyeing.
- The state of vat can be checked with vat yellow paper which turn into royal blue colour if the colour changes to greenish shade addition of reducing agent in ratio caustic soda 0.5 kgs to sodium hydro sulphite 1 kgs has made.
- Caustic soda and electrolyte are added in predissolved state.
- Dark shades should be first soaped at 60°C before final soaping at boil.

7.0 Dye Application - Fabric Dyeing

7.1 Jig Dyeing

7.1.1 Leuco Method:

Load the well scoured and pre-wetted fabric on the jigger in a crease free condition with required liquor ratio. Prepare a blank bath at recommended dyeing temperature with requisite caustic soda and sodium hydrosulphite. Run one end, then add stock vat in equal portions over the next two ends. Dyeing is carried out for 6-8 ends. The availability of reducing agent is checked in between the cycle using vat yellow paper. The dye bath is drained, rinsed followed by oxidation and soaping described in Section 6.6.

7.1.2 Pigmentation Method:

The tightly woven, compact fabric hinders the dye penetration, hence is recommended to be dyed by pre-pigmentation method. Well scoured and bleached fabric is entered at 80°C in a bath (70% of the final volume) containing half portion of the required dye dispersion and run for one end. Remaining dye dispersion is added and run for second end maintaining 80°C.

The bath volume is made up to full volume with cold water to bring down the temperature to 60°C.

The dye impregnated goods are run with addition of 2/3rd of the total portion of Caustic soda and sodium hydrosulphite in third end. Remaining 1/3rd quantity of caustic soda and sodium hydrosulphite is added in fourth end.

Salt addition should be made to the bath in last two ends. The fabric is then rinsed in cold followed by oxidation and soaping. For after treatment refer section 6.6.

7.2 Pad-Jig Dye Development

The well absorbent fabric can be padded with Coravat M/D dye dispersion at an expression of 70% and then loaded on the jigger to develop the shade.

The fabric is padded with a dye dispersion containing required quantity of Coravat M/D dyes with 2 gpl anionic wetting agent; squeezed uniformly in a mangle and carefully batched without creases. If dye is not to be developed immediately, the batch must be covered with a polyethylene sheet and rotated slowly.

The padded fabric is then loaded on to a jigger containing appropriate quantity of sodium hydrosulphite and caustic soda at required temperature (refer pattern card) together with an addition of 10% of Coravat dye dispersion pad liquor. 2/3rd portion of caustic and sodium hydrosulphite is added in first end and remaining in the second. For after treatment refer section 6.6.

7.3 Pad-Dry-Jig Dye Development

Advantages of this process are:

(1) Less ending (2) Solidity of shade and (3) Higher production.

The pad liquor contains Coravat M/D dye dispersion with a 2 gpl wetting agent and 10 gpl of suitable anti migrating agent to avoid the migration of dye pigment during drying. IR pre-drying is advisable to reduce the residual moisture content up to 30%. There is no need of addition of pad liquor to the jigger during development as the bleeding is less. For after treatment refer Section 6.6.

7.4 Polyester/ Cellulose Blend Dyeing

Polyester portion is dyed with Coralene Dyes first at high temperature of 130°C and then cellulose part is dyed with Coravat M/D Dyes in separate bath by leuco or pigmentation method

The single bath process is also possible. The temperature of the dye bath containing Coralene dyes, Coravat Dyes and Dispersing agent 1 gpl Levocol WS in acidic pH of 4-5, is raised to 130°C and dyeing is continued for 30-45 minutes. The bath temperature is brought down to the vatting temperature of the Coravat M/D dyes. Pre-dissolved Caustic Soda and Sodium hydrosulphite as per requirement is added to the bath and raise the temperature of bath to the dyeing temperature. The dyeing is continued for 30-45 minutes. The after treatment is given as per the general procedure like rinsing, oxidation and soaping. For after treatment please refer Section 6.6.

Chemical requirement

Following tables show the chemical recommendations for the above dyeing procedures in Jig.

Table -6 (MLR 1:2.5)

Shade % owf	Caustic soda flakes (gpl)			Sodium hydrosulphite (gpl)	Electrolyte for Method -3 (gpl) (IW Class)
	Method-1 (IN Class)	Method-2 (IN spl Class)	Method-3 (IW Class)		
Up to 1.0% (1-10gpl)	10	15	6.5	8	8
1-3% (10-30gpl)	15	18	8	10	10
3-5% (30-50 gpl)	18	20	9	12	12
5-7% (50-70 gpl)	20	22	12	14	15
Above 7% (Above 70 gpl)	23	25	15	18	15

Table 7 (MLR 1:5)

Shade % owf	Caustic soda flakes (gpl)			Sodium hydrosulphite (gpl)	Electrolyte for Method -3 (gpl) Dyes (IW Class)
	Method-1 (IN Class)	Method-2 (IN spl Class)	Method-3 (IW Class)		
Up to 1.0% (1-10gpl)	7.5	9	4.5	7	8
1-3% (10-30gpl)	9	13	6	9	10
3-5% (30-50gpl)	10	15	7.5	12	12
5-7% (50-70 gpl)	13	18	9	15	15
Above 7% (Above 70 gpl)	16	20	11	18	15

8.0 Winch Dyeing

The dye bath is set with requisite quantity of soft water, caustic soda and sodium hydrosulphite at room temperature. The substrate is run for 10 minutes. Vatted dyestuff solution is added to the bath after filtration. The bath temperature is raised to dyeing temperature and continued for 30-60 minutes. Goods are after treated in a fresh bath. For after treatment refer Section 6.6.

Table 8 (MLR 1:20)

Shade % owf	Caustic soda flakes (gpl)			Sodium hydrosulphite (gpl)	Electrolyte for Method -3 (gpl) (IW Class)
	Method-1 (IN Class)	Method-2 (IN spl Class)	Method-3 (IW Class)		
Up to 1.0%	4.5	5.5	2.5	6	7
1-3%	6	7	3.5	8	9
3-5%	6.5	8.5	4.5	9	13
5-7%	8	10	5.5	10	15

Table - 9 (MLR 1:30)

Shade % owf	Caustic soda flakes (gpl)			Sodium hydrosulphite (gpl)	Electrolyte for Method -3 (gpl) (IW Class)
	Method-1 (IN Class)	Method-2 (IN spl Class)	Method-3 (IW Class)		
Up to 1.0%	3.5	4.5	2	6	10
1-3%	4.5	6	3	7	12
3-5%	5	7	4	8	16
5-7%	6	8	5	9	20

9.0 After treatment

9.1 Rinsing

Overflow rinsing with soft water is preferable over standing bath to reduce the bath pH to 9-10. Light shades can be oxidised directly by running the leuco dyed goods in fresh cold water bath.

In case of the medium and dark shades it is advisable to carry out an intermediate reductive rising treatment to remove unfixed dyes from the dyed material.

A typical reduction rinsing bath contains 1-2 gpl Caustic soda and 2-3 gpl Sodium hydrosulphite and the treatment is given for 10 minutes at room temperature.

9.2 Oxidation

After rinsing, oxidation process is carried out in a fresh bath with oxidising agents like Hydrogen peroxide, sodium perborate etc.

For Coravat Black NB M/D the original oxidation colour can be achieved using sodium hypochlorite solution having 2-3 gpl available chlorine for 30 minutes. The quantity and type of oxidising agent chosen depends upon liquor ratio, depth of shade, time of treatment, quality of oxidising agent. Some oxidising agents affect the brilliancy of shades so the oxidising agents like potassium dichromate and sodium dichromate are avoided for the oxidation of the Coravat Yellow 5G M/D, Yellow 3R M/D and Blue BC M/D etc. Oxidation is carried out for 15-20 minutes at 50-60°C in presence of acetic acid.

9.3 Soaping

The loosely held unfixed dyestuff is removed from the fabric by soaping at boil in a bath containing 1-2 gpl soap and 2.0 gpl soda ash to improve the shade brilliancy and fastness properties particularly for blue shades. Pale shades can be soaped in the oxidation bath.

10.0 Dye Application - Continuous Dyeing

10.1 Pad - Dry - Chemical Pad - Steam

Process sequence: Pad with dye dispersion - Dry - Pad with liquor containing sodium hydrosulphite and caustic soda - Steam at 104°C in super saturated steam - Oxidise - Soap.

The dye dispersion containing Coravat M/D dyes along with 2 gpl of anionic wetting agent and 10-15 gpl of anti migrating agent is padded at an expression of 60-70% and pre dried to residual moisture content 30% in IR dryer. The fabric is passed through dryer. The dried fabric is padded with a chemical solution containing caustic soda and sodium hydrosulphite depending upon depth of shade and expression of padder; steamed in an air free steam atmosphere at 103-105°C for 45-60 seconds followed by rinsing, oxidation and soaping.

After treatment is as described in Section 10.3

10.2 Pad - Dry - Thermosol - Chemical Pad - Steam (Polyester/Cellulosic blend)

Process sequence: Pad with dye dispersion - Dry - Thermosol (200-220 °C) - Pad with liquor containing sodium hydrosulphite and caustic soda - steam at 104°C in super saturated steam - Oxidise - Soap.

For the cellulose/polyester blended fabric the pad liquor containing Coralene dyes and Coravat M/D Dyes with wetting and antimigrating agent applied by padding and one intermediate thermofixation (thermosoling) is given after drying followed by chemical pad steam process.

After treatment is as described in Section 10.3

Requirement of alkali and reducing agent in pad liquor

Table - 10

Shade (gpl)	80% Expression		100% Expression	
	Caustic soda Flakes (gpl)	Sodium hydrosulphite (gpl)	Caustic soda Flakes (gpl)	Sodium hydrosulphite (gpl)
1-10	18	26	13	20
10-20	22	36	16	27
20-30	24	40	18	30
30-40	26	45	20	33
40-50	30	50	23	38
50-60	33	55	25	40
60-80	36	60	28	45
Above 80 gpl	40	65	30	50

* To avoid leaching-out effect, electrolyte is added to the chemical pad liquor bath maintaining bath temperature below 20°C.

10.3 After treatment

10.3.1 Rinsing

Efficient removal of caustic and sodium hydrosulphite ensures the maximum efficiency of subsequent oxidising baths after the fabric coming out from steamer. Normally two bath cold rinsing is given to reduce the fabric pH.

10.3.2 Oxidation

Oxidation with hydrogen peroxide at 50°C in two baths is preferred. With dyes like Coravat Blue BC air oxidation at earlier stage in presence of excess of caustic soda result in greener and duller shade. Sodium dichromate should be avoided for oxidation of Coravat Blue BC M/D, Coravat Yellow 3R M/D and Coravat Yellow 5G M/D etc.

10.3.3 Soaping

Soaping is done at boil to improve the fastness properties and brilliancy. Final rinsing with acetic acid is preferable if the soaping bath contains soda ash.

11.0 Recommended Dye Combinations For Exhaust Dyeing

11.1 Beige, Tan, Khaki

Coravat Yellow 3R M/D
Coravat Brown R M/D
Coravat Brown G M/D
Coravat Olive R M/D
Coravat Red 3B M/D
Coravat Brown 2G M/D
Coravat Brown BR M/D
Coravat Yellow 5G M/D

11.2 Yellowish Brown

Coravat Yellow 3R M/D
Coravat Brown R M/D
Coravat Brown 2G M/D

11.3 Reddish Brown

Coravat Yellow 3R M/D
Coravat Brown R M/D
Coravat Brown BR M/D
Coravat Red 3B M/D
Coravat Brown G M/D

11.4 Bright Green

Coravat Green XBN M/D
Coravat Yellow 5G M/D
Coravat J. Green 2G M/D

11.5 Bottle Green

Coravat Olive Green B M/D
Coravat J. Green XBN M/D
Coravat Yellow 3R M/D
Coravat Blue BC M/D
Coravat Blue CLF M/D
Coravat N. Blue RA M/D

11.6 Dark Brown

Coravat Yellow 3R M/D
Coravat Brown BR M/D
Coravat Direct Black AC or
Coravat Black 7680 M/D
Coravat Red 6B M/D
Coravat Orange RRTN M/D

11.7 Bright Navy

Coravat D. Blue DB M/D
Coravat Navy Blue RA M/D
Coravat Dark Blue 2R M/D
Coravat Blue BC M/D
Coravat J. Green XBN M/D
Coravat Blue CLF M/D

11.8 Dull Navy

Coravat Navy Blue VH M/D
Coravat Olive D M/D
Coravat Olive Green B M/D
Coravat Direct Black AC M/D
Coravat D. Blue DB M/D
Coravat Red 6B M/D

11.9 Olive Green

Coravat Olive Green B M/D
Coravat Olive D M/D
Coravat Olive R M/D
Coravat J. Green XBN M/D
Coravat Brown BR M/D
Coravat Yellow 3R M/D
Coravat Orange RRTN M/D

11.10 Grey

Coravat Black 7680 M/D
Coravat Olive R M/D
Coravat Olive D M/D
Coravat Blue BC M/D
Coravat Red 6B M/D
Coravat Violet BN M/D
Coravat J.Green XBN M/D
Coravat Blue CLF M/D

12.0 Leveling/Partial Stripping

The substrate dyed with Coravat M/D dyes can be partially stripped to a pale ground to re-dye or correct the shade by using leveling agent Levocol LV 2-5 gpl, dispersing agent Levocol WS 2-3 gpl in a blank reducing bath containing caustic and sodium hydrosulphite 2-3 times the quantity of the caustic and sodium hydrosulphite used during dyeing at 80°C for 30-45 minutes. The quantity of caustic and sodium hydrosulphite depends on the shade depth and liquor ratio. Normally several baths are recommended to strip the dye maximum extent and to avoid redeposition of precipitated dye on the substrate. The procedure may be repeated till the desired stripping is attained.

13.0 Fastness Test

Fastness tests displayed in the pattern card are carried out at 1/1 standard depth of Coravat M/D dyes on bleached un-mercerized cotton woven fabric.

- **Washing CO6 C2 /CO6 E2 /ISO 5 :**

  Color change and staining on adjacent fabric is assessed by comparing with AATCC grey scale rating of 1-5 where grade 5 is the highest and grade 1 being the lowest.

- **Light ISO 105 BO2:**

  In three standard depths of 1/10, 1/1, 2/1 were assessed against 1to 8 standard grey scale; grade 8 being the highest & grade 1 being the lowest.

- **Soda boil:**

  Treatment with 10gpl sodium carbonate and 4 gpl resist salt for one hour at boil at 1:30 MLR. Stain on adjacent fabric is assessed with AATCC grey scale.

- **Bleaching:**

  Hypochlorite:

  Treatment with sodium hypo chlorite of 2gpl available chlorine at 20°C for 60 minutes at pH 11 with MLR of 1:50

  Peroxide:

  Treatment with 5 ml/l hydrogen peroxide, 5 m/l sodium silicate for 60 minutes at 95°C at 1:30 MLR.

14.0 Abbreviation

M	- Much	R	- Redder
T	- Trace	Y	- Yellower
L	- Little	Bl	- Bluer
W	- Weaker	G	- Greener
Br	- Brighter	D	- Duller

PATTERNS

Un-mercerised 100% Cotton Yarn	Coravat M/D Dyes		General Properties													
			Dyeing Method		Reducing Temperature	Colour of Vat (Alkaline)	Levocol LV Group	Effect of Soaping on shade		Staining during blend dyeing			Effect of Resin (DMD HEU)	1/10 Pale	Light	
			Recommended	Alternative				½ Min.	30 Min.	P. E. T.	Nylon	Acrylic			1/1 Medium	2/1 Dark
	T-062020173 Yellow 5G M/D C. I. Vat Yellow 2	0.50% 3.00%	1 at 50°C	3 at 50°C	50°C	Red Violet	2	LG L-BR	G L-BR	4	2	4	4R	3	4	4-5
	T-063110173 Yellow 3R M/D C. I. Vat Orange 11	0.50% 3.00%	3 at 50°C	1 at 60°C	50°C	Red Brown	3	LY	TR	4	2	4	4R	6	6-7	7
	T-06302175 Orange RRTN C. I. Vat Orange 2	0.50% 3.00%	1 at 60°C	3 at 50°C	60°C	Red Violet	3	TY	LY	2	1	3	4 D	4	5-6	6-7
	T-064100163 Red 3B M/D C. I. Vat Red 10	0.50% 3.00%	3 at 50°C	1 at 60°C/3 at 30°C	50°C	Dark Brown	1	TY	LY	1	3-4	4	4 Y	5	6-7	7-8
	T-064130173 Red 6B M/D C. I. Vat Red 13	0.25% 2.00%	1 at 60°C	3 at 50°C	60°C	Green Blue	3	BI LD	MBL MD	3-4	1	3-4	4 BIW	4	6	6-7
	T-065130163 Violet XBN M/D C. I. Vat Violet 13	1.00% 5.00%	3 at 50°C	1 at 60°C	50°C	Dull Blue	5	R	MR	3-4	3	3	3-4 R	6	7	7
	T-066200173 D. Blue 2R M/D C. I. Vat Blue 20	0.70% 4.00%	1 at 60°C	3 at 50°C	60°C	Violet	5	R	MR	3-4	1	2	4R	6	7	7-8
	T-066180173 N. Blue RA M/D C. I. Vat Blue 18	0.70% 4.00%	1 at 60°C	3 at 50°C	60°C	Green Blue	2	LR	R LW	3	1	2	4-5 D	6	7	7-8

Fastness Properties																			Special Remarks
Washing						Soda boil (Open kier)		Dry Cleaning		Bleaching			Merc-erising		Dry Hot Pressing		Water Spotting		
CO6 C2		CO6 E2		ISO5							Peroxide								
Effect	Staining	Effect	Staining	Effect	Staining	Effect	Staining	Effect	Staining	Hypochlorite	Effect	Staining	Effect	Staining	Immediately	After 4hrs	Immediately	After 4hrs	
4-5	4-5	4-5	5	4-5	5	4-5	5	4-5	5	5	4-5	5	4 R	5	4 G	5	5	5	* Recommended for laundry fast & post bleaching fastness. * Liable to accelerate fibre tendering on expouser to light
4-5	5	4-5	5	4	5	4-5	5	4-5	5	4-5	4-5	5	5	5	3-4 G	5	4-5	5	* Commonly used reddish yellow for almost all tertiary shades. * Normally used in khakhi and olive shade for military uniforms, as a result of its very good general fastness.
4-5	5	4-5	5	4-5	5	5	5	4-5	5	4-5	4-5	5	4	5	3 Y	5	4 Y	5	* Economical Orange with Light wet fastness, high build up properties Leuco vat should be protected from light suitable for colour bleach qualities
5	4-5	4-5	4-5	4-5	4-5	4	4-5	4-5	5	5	5	5	5	5	4 Y	5	3-4 Y	5	* Widely used and recommended for coloured bleach qualities. Laundered goods & Finishing. * Ideal red for combination & shading.
4-5 Bl	5	2-3 Bl	5	4-5	4-5	2-3 Bl	3	5	5	4-5	5	5	5	5	4-5	5	5	5	* Thorough' soaping treatment is required to get stable shade.
4-5	4-5	4 R	4-5	4R	4-5	4-5	4-5	5	5	5	4-5	4-5	5	5	3Bl	4Bl	3R	5	* Dyeing can be affected by alkaline storage condition. * Re soap to restore the shade.
4-5	3-4	4R	4-5	4R	4-5	4R	4-5	4R	4-5	5	4-5	4-5	4-5 R	5	3G	4-5	3-4 R	4-5	* Economical basis for navy & black shades. * Commonly shade with Coravat J. Green XBN. * Sensitive to heat & moisture. Thorough soap required to give stable shade.
5	4-5	4	5	4-5	4-5	4R	4-5	5	3	5	4-5 R	5	3	5	4R	4-5	4R	5	* Strongly restrained by nonionic levelling agents. * Careful selection is required. * Soap' thoroughly in order to obtain the stable shade.

Un-mercerised 100% Cotton Yarn	Coravat M/D Dyes		General Properties														
			Dyeing Method		Reducing Temperature	Colour of Vat (Alkaline)	Levocol LV Group	Effect of Soaping on shade		Staining during blend dyeing			Effect of Resin (DMD HEU)	1/10 Pale	Light	
			Recommended	Alternative				½ Min.	30 Min.	P. E. T.	Nylon	Acrylic			1/1 Medium	2/1 Dark
	T-066800173 N. Blue VH M/D (Mix)	0.70% 4.00%	1 at 60°C	3 at 50°C	60°C	Violet	5	R	MR	3	1	2	4R	6	7	7-8
	T-066810173 Dark Blue DB M/D (Mix)	0.70% 4.00%	1 at 60°C	3 at 50°C	60°C	Violet	5	R	MR	3-4	1	2	4R	6	7	7-8
	T-066060173 Blue BC M/D C. I. Vat Blue 6	0.70% 4.00%	1 at 50°C	3 at 50°C	50°C	Green Blue	4	LR	R	4	1	3-4	5	6-7	7-8	7-8
	T-066660173 Blue CLF M/D C. I. Vat Blue 66	0.70% 4.00%	3 at 50°C	3 at 30°C	50°C	Olive Brown	2	TR	LR	3-4	1	3	4-5	6-7	7-8	7-8
	T-067010173 J. Green XBN M/D C. I. Vat Green 1	0.25% 2.50%	1 at 60°C	3 at 50°C	50°C	Blue	5	LBI	BI M.BR	4	2	3	5	6	7	7-8
	T-067800173 J. Green 2G M/D (Mix)	0.25% 2.50%	1 at 60°C	3 at 50°C	50°C	Blue	4	LW	LW IBR	4	1	3	4Y	5-6	6	6
	T-067030173 Olive Green B M/D C. I. Vat Green 3	0.50% 4.00%	1 at 60°C	3 at 50°C	60°C	Blue	4	LBI	BI BR.	4-5	1	3	5	7	8	8
	T-068030173 Brown R M/D C. I. Vat Brown 3	0.30% 3.00%	3 at 50°C	3 at 30°C	50°C	Orange Brown	1	LW	LW	3-4	1	3-4	4R	6-7	7	7

Fastness Properties																			Special Remarks
Washing						Soda boil (Open kier)		Dry Cleaning		Bleaching			Merc-erising		Dry Hot Pressing		Water Spotting		
CO6 C2		CO6 E2		ISO5							Peroxide								
Effect	Staining	Effect	Staining	Effect	Staining	Effect	Staining	Effect	Staining	Hypochlorite	Effect	Staining	Effect	Staining	Immediately	After 4hrs	Immediately	After 4hrs	
4	3	4R	4-5	4-5	4-5	4 R	4-5	4-5	5	4R	4R	4-5	4-5	5	3G	5	4R	5	* Suitable for dull navies with excellent build up properties.
4-5	3-4	4R	4-5	4R	4-5	4R	4-5	4R	4-5	3-4 G	4-5 R	4-5	4-5 R	5	3-4 G	3-4 G	4R	5	* Good build up sensitive to over reduction bright navy with high all round fastness properties.
4-5	5	4-5	4-5	4-5	4	4-5	4	5	5	2G	4-5	5	4G	5	4G	5	4-5	5	* Sensitive to over reduction, excess temperature, time over oxidation and hard water - 2-5 gpl sodium nitrate or glucose is recommended. * Soaping with 2 gpl soda Ash is preferable.
4-5	4-5	4-5	4-5	4	4	4-5	4-5	5	5	4-5	4-5	4-5	4	5	4-5	4-5	4-5	5	* Very good levelling dye. * Good chlorine fast & mercerising fast dye. * Useful for combination & shading suitable for colour bleach qualities laundred goods Furnishings.
4-5	4-5	4-5	4-5	4-5	5	4-5	5	4-5	5	4-5	5	5	5	5	3BI	5	4-5 Y	5	* Brilliant green shades for wash, bleach & weather fast styles on yarn & piece dyed goods in dark shades. * very stable at elevated temperature.
4-5	4-5	4-5	4-5	4-5	4-5	4-5	5	4-5	5	4-5	4-5	5	5	5	3BL	5	4-5	5	* Classic green for all fast outlet.
4-5	4-5	4-5	4-5	4	4-5	4	5	5	5	4-5	4-5	5	4-5 Y	5	4Y	5	4-5	5	* Widely accepted for optimum fastness to wash bleach light & weather in yarn & piece dyeing. * Stable shades are developed by thorough soaping.
5	3	5	5	5	5	4	4-5	5	5	4-5	4-5	5	5	5	4-5	4-5	5	5	* Recommended for high wash, bleach & light fast outlets for piece & yarn dyeing.

Un-mercerised 100% Cotton Yarn	Coravat M/D Dyes		General Properties												
			Dyeing Method		Reducing Temperature	Colour of Vat (Alkaline)	Levocol LV Group	Effect of Soaping on shade		Staining during blend dyeing			Effect of Resin (DMD HEU)	1/10 Pale	Light	
			Recommended	Alternative				½ Min.	30 Min.	P. E. T.	Nylon	Acrylic			1/1 Medium	2/1 Dark
	T-068010173 Brown BR M/D C. I. Vat Brown 1	0.30% 3.00%	3 at 50°C	3 at 30°C	50°C	Orange Brown	2	TD	TD	4-5	2	3-4	4D	6-7	7	7-8
	T-068810173 Brown 2G M/D (Mix)	0.30% 3.00%	3 at 50°C	3 at 30°C	50°C	Orange Brown	2	LG	G	4-5	1	3	4BI	6-7	7	7
	T-068800173 Brown G M/D (Mix)	0.30% 3.00%	3 at 50°C	3 at 30°C	50°C	Orange Brown	2	LG	G	4-5	1	3	4 BI	6-7	7	7
	T-069270173 Olive R M/D C. I. Vat Black 27	0.50% 4.00%	3 at 50°C	3 at 30°C	50°C	Red Brown	2	TG	LG	4	2	3	4G	6-7	7	7-8
	T-069250173 Olive D M/D C. I. Vat Black 25	0.50% 3.00%	1 at 60°C	3 at 50°C	50°C	Black Brown	4	TY TG	LY LG	3-4	1	3	5	7	8	8
	T-069850173 Grey 2B M/D (Mix)	1.00% 5.00%	1 at 60°C	3 at 50°C	50°C	Dull Green	5	LR	R LW	4	1	3	4.5 D	6	6-7	6-7
	T-069160173 Grey 3B M/D C. I. Vat Black 16	0.50% 2.00%	1 at 60°C	2 at 60°C	60°C	Violet	4	TR TBI	LR LBI	3-4	1	2	4R	5	6	6-7
	T-069000173 Black NB M/D C. I. Vat Green 9	4.00% 10.0%	2 at 60°C	1 at 60°C	60°C	Blue Black	5	TR TBI	LR LBI	4	1	3	5	–	7	7

Fastness Properties																		Special Remarks
Washing						Soda boil (Open kier)		Dry Cleaning		Bleaching			Merc-erising		Dry Hot Pressing		Water Spotting		
CO6 C2		CO6 E2		ISO5							Peroxide								
Effect	Staining	Effect	Staining	Effect	Staining	Effect	Staining	Effect	Staining	Hypochlorite	Effect	Staining	Effect	Staining	Immediately	After 4hrs	Immediately	After 4hrs	
4-5	4-5	4-5	5	5	5	5	5	5	5	5	5	5	5	5	4-5	5	4BI	5	* Widely used for khaki & olive shades for military uniforms. * Sensitive to low concentration of caustic soda in the dye bath results yellower weaker shades.
5	4	4	5	4	4-5	3-4 G	4-5	5	5	5	5	5	5	5	4-5	45	4-5	5	* Ideal pleasing brown shade with high all-round fastness properties.
5	4	4	5	4	5	4G	4-5	5	5	5	5	5	5	5	4R	5	4-5	5	* Very good popular level dyeing brown for yarn & piece outlets requiring high light, wash & bleach fastness.
4-5	3-4	3-4	4-5	4-5	4-5	4G	4-5	5	5	4-5	4-5	5	4	5	2R	3-4	2-3 G	4	* Very level dyeing; good dulling component on both yarn & piece goods where high standards of all-round fastness are required. * Sensitive to heat and water spotting.
4-5	4-5	4-5	5	4-5	5	4-5	5	5	5	4-5	4-5	4-5	5	4-5	4G	5	5	5	* Recommended where outlet requires optimum light, weathering, bleach & wash fastness.
4-5	4-5	4R	4-5	4R	4-5	4	4-5	4-5	5	4	4-5	5	4-5	4-5	3G	4G	3-4 R	5	* High standard of levelling * Sensitive to heat & water spoting * Soap throughly in order to do taiw the stable shade.
4-5 R	5	4-5 R	4	4R	4	4R	3-4	5	4-5	3R	4R	3	5R	4-5	4-5 G	4-5 G	2-3 R	3R	* Suitable for bluish greys for home furnishing, to water spotting. * Very good coverage on dead cotton.
4-5	3-4	4-5	4	5	3-4	4-5	3-4	5	4-5	4R	5	3-4	4R	4-5	5	5	4	5	* Major bleach, wash & light fast 'rich' black for yarn & piece goods. * Used as a cheap basis for dark greens (without chlorine after treatment) * After dyeing & rinsing develop black shade by treatment in cold hypochlorite solution (2 parts available per 1000 parts of water) * Not recommended for grey shades.

Un-mercerised 100% Cotton Yarn	Coravat M/D Dyes	General Properties													
		Dyeing Method		Reducing Temperature	Colour of Vat (Alkaline)	Levocol LV Group	Effect of Soaping on shade		Staining during blend dyeing			Effect of Resin (DMD HEU)	1/10 Pale	Light	
		Recommended	Alternative				½ Min.	30 Min.	P. E. T.	Nylon	Acrylic			1/1 Medium	2/1 Dark
	T-069810173 Direct Black CH M/D (Mix) 4.00% 10.0%	2 at 60°C	1 at 60°C	60°C	Violet	4	TR TBI	LR LBI	4	1	3	5	–	7	7
	T-069340173 Direct Black AC M/D C. I. Vat Black 34 4.00% 10.0%	2 at 60°C	1 at 60°C	60°C	Violet	5	TR TBI	LR LBI	4	1	2	4-5	5	6-7	7
	T-069800213 Black 7680 M/D (Mix) 4.00% 10.0%	2 at 60°C	1 at 60°C	60°C	Violet	4	LR TBI	LR LBI	4	1	3	4-5	6	6-7	7

Fastness Properties																			Special Remarks
Washing						Soda boil (Open kier)		Dry Cleaning		Bleaching			Merc-erising		Dry Hot Pressing		Water Spotting		
CO6 C2		CO6 E2		ISO5							Peroxide								
Effect	Staining	Effect	Staining	Effect	Staining	Effect	Staining	Effect	Staining	Hypochlorite	Effect	Staining	Effect	Staining	Immediately	After 4hrs	Immediately	After 4hrs	
4-5	4	4-5	4	5	3-4	4-5	3-4	5	4-5	4R	5	3-4	4R	4-5	4G	4-5	4-5	5	* Economical vat black for light bleach and wash fastness. * 50% extra caustic soda & sodium hydrosulphite. * Not recommended for grey shade.
4-5	4-5	4-5	4-5	5	3-4	5	4-5	5	4-5	4R	4-5	5	4-5 R	4-5	4-5	5	4-5	5	* A good vat black of high light, bleach and wash fastness. * Important cost effective dulling component for dark mixture shade.
4-5	3-4	4-5	4-5	5	3-4	4-5	4	5	4-5	4	4-5	4-5	4R	4-5	4-5	5	4R	5	* Economical black suitable for all fastness & colour bleach fast goods. * Can be used for dark grey shades.

Coravat M/D Dyes

Combination shades on cotton yarn

Coravat	%eg
01	
Yellow 5G M/D	0.28%
Yellow 3R M/D	0.05%
Brown G M/D	0.03%
02	
Yellow 5G M/D	0.45%
Yellow 3R M/D	0.015%
Red 3B M/D	0.002%
03	
Yellow 5G M/D	1.17%
Red 3B M/D	0.013%
04	
Yellow 5G M/D	3.38%
Olive R M/D	0.046%
J. Green XBN M/D	0.004%
05	
Yellow 5G M/D	1.96%
Olive R M/D	0.082%
Brown R M/D	0.07%
06	
Yellow 5G M/D	2.35%
Yellow 3R M/D	0.40%
Olive R M/D	0.04%
07	
Yellow 5G M/D	4.20%
Yellow 3R M/D	0.26%
Red 3B M/D	0.08%
08	
Yellow 3R M/D	1.43%
Red 3B M/D	0.025%
Brown R M/D	0.003%

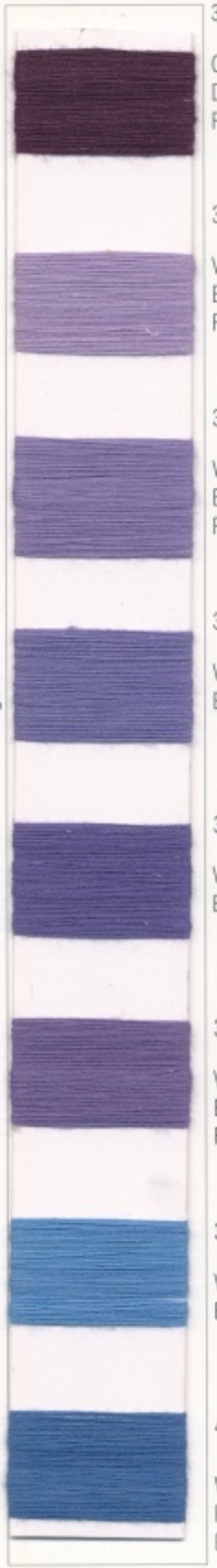
Coravat	%eg
09	
Yellow 3R M/D	0.21%
Brown R M/D	0.003%
10	
Yellow 3R M/D	3.48%
Brown G M/D	0.027%
11	
Yellow 3R M/D	2.37%
Red 3B M/D	0.047%
12	
Yellow 3R M/D	0.86%
Red 3B M/D	0.14%
13	
Yellow 3R M/D	2.76%
Brown R M/D	0.06%
Red 3B M/D	0.35%
14	
Orange RRTN M/D	0.38%
Red 3B M/D	0.022%
15	
Orange RRTN M/D	1.28%
Olive R M/D	0.017%
Red 3B M/D	0.10%
16	
Orange RRTN M/D	2.62%
Yellow 3R M/D	0.34%

Coravat	%eg
17	
Orange RRTN M/D	3.24%
Brown R M/D	0.62%
18	
Yellow 3R M/D	0.10%
Red 3B M/D	0.14%
Blue CLF M/D	0.003%
19	
Yellow 3R M/D	1.08%
Red 3B M/D	1.56%
20	
Orange RRTN M/D	1.50%
Red 3B M/D	1.50%
21	
Orange RRTN M/D	1.10%
Red 3B M/D	2.60%
22	
Orange RRTN M/D	2.20%
Red 3B M/D	4.40%
Blue CLF M/D	0.08%
23	
Yellow 3R M/D	0.025%
Brown R M/D	0.008%
Red 3B M/D	0.35%
24	
Brown R M/D	0.054%
Red 3B M/D	5.00%

Coravat M/D Dyes

Combination shades on cotton yarn

Coravat	%eg
25	
Violet XBN M/D	0.05%
Red 3B M/D	0.20%
26	
Yellow 3R M/D	0.11%
Olive R M/D	0.26%
Red 3B M/D	1.00%
27	
Brown BR M/D	0.35%
Red 3B M/D	0.90%
Blue CLF M/D	0.10%
28	
Orange RRTN M/D	1.93%
Olive D M/D	0.015%
Red 6B M/D	1.79%
29	
Olive R M/D	1.25%
Red 3B M/D	3.00%
30	
Red 3B M/D	2.60%
Blue CLF M/D	0.50%
31	
Olive D M/D	1.43%
Brown R M/D	1.25%
Red 6B M/D	2.05%
32	
Violet XBN M/D	0.53%
Blue CLF M/D	0.78%
Red 3B M/D	1.55%



Coravat	%eg
33	
Olive D M/D	1.43%
D. Blue 2R M/D	1.25%
Red 6B M/D	2.05%
34	
Violet XBN M/D	0.83%
Blue CLF M/D	0.02%
Red 3B M/D	0.08%
35	
Violet XBN M/D	1.57%
Blue CLF M/D	0.18%
Red 3B M/D	0.04%
36	
Violet XBN M/D	1.85%
Blue CLF M/D	0.46%
37	
Violet XBN M/D	3.43%
Blue CLF M/D	0.57%
38	
Violet XBN M/D	4.68%
Blue CLF M/D	0.10%
Red 3B M/D	0.042%
39	
Violet XBN M/D	0.10%
Blue BC M/D	0.90%
40	
Violet XBN M/D	0.40%
Red 3B M/D	0.20%
Blue BC M/D	1.80%

Coravat	%eg
41	
Blue BC M/D	2.50%
Red 6B M/D	0.15%
42	
Violet XBN M/D	0.65%
Blue BC M/D	3.28%
43	
Violet XBN M/D	0.08%
Yellow 3R M/D	0.04%
Blue CLF M/D	0.52%
44	
Blue CLF M/D	1.73%
Olive R M/D	0.05%
45	
J. Green XBN M/D	0.075%
Blue CLF M/D	0.63%
46	
J. Green XBN M/D	0.25%
Blue BC M/D	1.50%
47	
J. Green XBN M/D	0.65%
Blue BC M/D	3.70%
48	
J. Green XBN M/D	0.06%
N. Blue RA M/D	4.20%

Coravat M/D Dyes

Combination shades on cotton yarn

Coravat	%eg
49	
Red 6B M/D	0.10%
N. Blue RA M/D	5.24%
50	
N. Blue VH M/D	3.53%
Olive D M/D	0.20%
J. Green XBN M/D	0.15%
51	
D. Blue 2R M/D	2.80%
N. Blue RA M/D	1.30%
Olive D M/D	1.00%
52	
N. Blue VH M/D	4.73%
Olive D M/D	0.05%
Red 6B M/D	0.05%
53	
D. Blue 2R M/D	4.85%
Olive D M/D	0.50%
Olive Green B M/D	0.20%
54	
D. Blue DB M/D	4.00%
Olive D M/D	0.25%
Orange RRTN M/D	0.60%
55	
D. Blue 2R M/D	2.92%
Olive Green B M/D	1.15%
Black CH M/D	6.37%
56	
Yellow 3R M/D	0.012%
Blue CLF M/D	0.022%
J. Green XBN M/D	0.16%

Coravat	%eg
57	
Blue BC M/D	0.23%
J. Green 2G M/D	2.00%
58	
Yellow 3R M/D	0.15%
J. Green XBN M/D	2.00%
59	
Olive Green B M/D	1.00%
J. Green XBN M/D	4.00%
60	
N. Blue RA M/D	0.66%
J. Green XBN M/D	4.80%
61	
Yellow 5G M/D	0.85%
J. Green 2G M/D	0.25%
62	
Yellow 5G M/D	3.14%
J. Green XBN M/D	0.50%
63	
Yellow 5G M/D	3.45%
J. Green XBN M/D	1.60%
64	
Yellow 5G M/D	0.90%
Brown R M/D	1.00%
J. Green XBN M/D	2.70%

Coravat	%eg
65	
Yellow 5G M/D	4.47%
J. Green XBN M/D	0.039%
66	
Yellow 5G M/D	2.80%
Olive R M/D	0.25%
J. Green XBN M/D	0.06%
67	
Yellow 5G M/D	3.40%
Olive Green B M/D	1.24%
68	
Yellow 3R M/D	2.20%
Blue CLF M/D	0.33%
J. Green XBN M/D	0.32%
69	
Yellow 3R M/D	0.80%
Brown R M/D	0.30%
Olive Green B M/D	1.20%
70	
Yellow 3R M/D	3.80%
Olive Green B M/D	1.46%
71	
Yellow 3R M/D	0.50%
Brown R M/D	0.23%
J. Green XBN M/D	0.71%
72	
Olive Green B M/D	3.50%
J. Green XBN M/D	1.25%

Coravat M/D Dyes

Combination shades on cotton yarn

Coravat	%eg
73	
Yellow 5G M/D	0.63%
Olive Green B M/D	5.15%
74	
Yellow 3R M/D	0.16%
Olive R M/D	0.06%
Brown BR M/D	0.02%
75	
Yellow 3R M/D	0.48%
Olive R M/D	0.11%
76	
Yellow 3R M/D	1.34%
Olive R M/D	0.40%
77	
Yellow 3R M/D	0.78%
Brown R M/D	1.20%
Olive RM/D	1.38%
78	
Olive R M/D	1.60%
Brown R M/D	0.60%
Brown BR M/D	0.05%
79	
Yellow 3R M/D	0.005%
Olive R M/D	0.08%
Brown R M/D	0.07%
80	
Yellow 3R M/D	0.16%
Olive R M/D	0.27%
Brown R M/D	0.32%

Coravat	%eg
81	
Yellow 3R M/D	0.01%
Olive R M/D	0.15%
Brown 2G M/D	0.60%
82	
Red 3B M/D	0.26%
Olive R M/D	0.55%
Brown 2G M/D	3.80%
83	
Brown BR M/D	1.63%
Olive R M/D	1.14%
Brown R M/D	2.28%
84	
Red 3B M/D	0.005%
Brown 2G M/D	0.10%
85	
Brown BR M/D	0.05%
Olive R M/D	0.17%
Brown R M/D	0.84%
86	
Brown R M/D	1.36%
Olive R M/D	0.24%
Red 3B M/D	0.08%
87	
Brown R M/D	3.36%
Olive R M/D	0.54%
Red 3B M/D	0.46%
88	
Yellow 3R M/D	1.50%
Olive R M/D	1.05%
Red 3B M/D	3.00%

Coravat	%eg
89	
Yellow 3R M/D	0.045%
Brown R M/D	0.05%
Brown 2G M/D	0.20%
90	
Yellow 3R M/D	0.84%
Brown R M/D	1.47%
Olive R M/D	0.22%
91	
Red 3B M/D	0.08%
Brown 2G M/D	0.70%
Olive R M/D	0.33%
92	
Brown BR M/D	3.00%
Red 3B M/D	0.06%
Blue CLF M/D	0.80%
93	
Red 3B M/D	0.007%
Brown BR M/D	0.13%
Olive R M/D	0.06%
94	
Red 3B M/D	0.10%
Brown BR M/D	0.75%
Olive R M/D	0.75%
95	
Red 3B M/D	0.28%
Brown BR M/D	1.25%
Olive R M/D	0.63%
96	
Red 3B M/D	0.38%
Brown BR M/D	3.25%

Coravat M/D Dyes

Combination shades on cotton yarn

Coravat	%eg
97	
Yellow 3R M/D	0.25%
Brown BR M/D	4.18%
Blue CLF M/D	0.37%
98	
Brown R M/D	0.25%
Brown BR M/D	0.20%
Olive R M/D	1.00%
99	
Yellow 3R M/D	0.12%
Red 3B M/D	0.16%
Olive D M/D	2.20%
100	
Yellow 3R M/D	0.10%
Brown BR M/D	1.20%
Olive D M/D	2.40%
101	
Red 6B M/D	0.10%
Brown BR M/D	4.40%
Black AC M/D	2.50%
102	
Olive D M/D	4.00%
Red 6B M/D	0.20%
D. Blue DB M/D	0.70%
103	
Olive R M/D	0.60%
Red 3B M/D	0.01%
104	
Olive R M/D	1.30%
Brown R M/D	0.40%
Blue CLF M/D	0.32%

Coravat	%eg
105	
Olive D M/D	1.58%
Olive Green B M/D	1.00%
106	
Olive D M/D	2.16%
Grey 2B M/D	1.28%
J. Green XBN M/D	0.25%
107	
Olive D M/D	1.50%
J.Green XBN M/D	0.15%
Black 7680 M/D	1.50%
108	
Olive R M/D	0.15%
Brown BR M/D	0.10%
Blue CLF M/D	0.07%
109	
Olive D M/D	0.85%
Red 6B M/D	0.018%
D. Blue DB M/D	0.22%
110	
Olive D M/D	1.60%
Red 6B M/D	0.08%
D. Blue DB M/D	0.55%
111	
Olive D M/D	1.73%
Red 6B M/D	0.14%
Grey 3B M/D	1.14%
112	
Olive D M/D	1.50%
J. Green XBN M/D	0.10%
D. Blue DB M/D	2.00%

Coravat	%eg
113	
Olive R M/D	0.35%
Blue CLF M/D	0.17%
114	
Olive D M/D	0.07%
Grey 2B M/D	1.42%
J. Green XBN M/D	0.03%
115	
Olive D M/D	0.22%
Grey 2B M/D	1.92%
N. Blue RA M/D	0.05%
116	
Olive R M/D	0.87%
Blue CLF M/D	0.50%
Violet XBN M/D	0.50%
117	
Olive D M/D	1.20%
Red 6B M/D	0.40%
Black 7680 M/D	7.20%
118	
Orange RRTN M/D	1.25%
D. Blue 2R M/D	1.08%
Black AC M/D	5.68%
119	
Black 7680 M/D	5.93
Brown BR M/D	0.86%
Olive Green B M/D	0.58%
120	
Black AC M/D	7.74%
Olive D M/D	1.86%

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