



**BETTER CHEMISTRY,  
BETTER LIFE...**

**Manufacturer & Exporter  
of Reactive Dyes**



## ***Denovo™ 'Y' Series of Reactive Dyes***

To implement Blind Dyeing Concept of Reactive Dyeing, our Denovo™ 'Y' Series Bi-functional Reactive Dyes, being Spray Dried R/O products with minimal salt content, offer prudent solutions for Dye Houses. The performances of the products usually match the specifications set by International Retailers and Buying Houses like – Walmart, Gap, Adidas, Nike, Tommy Hilfiger, J.C. Penny, M & S and so on.

### ***Salient Features of Denovo™ 'Y' Reactive Dyes***

- Highly compatible range over a wide spectrum of shades.
- Higher exhaustion even at lower temperatures.
- Excellent reproducibility and consistency because of better alkali stability and low sensitivity to temperature.
- Least sensitive to minor processing variables when used in combinations.
- Excellent wash-off properties, thereby reducing ecological costs and improving productivity.
- Very good leveling properties due to better fixation yield and excellent migration behavior.
- Good Perspiration, Rubbing Fastness with fairly good Fastness towards Light.
- Satisfies the requirements set by major ecological standards.

## Exhaust Dyeing

The process application adopted for Denovo™ 'Y' Reactive Dyes exhibit level dyeing with excellent reproducibility due to low dependence on dyeing parameters and high fixation behavior, thereby, easy to operate and control in dye house with minimum manual intervention.

The Dyeing Methods adopted depends exclusively on the type of substrate, shade and machinery available.

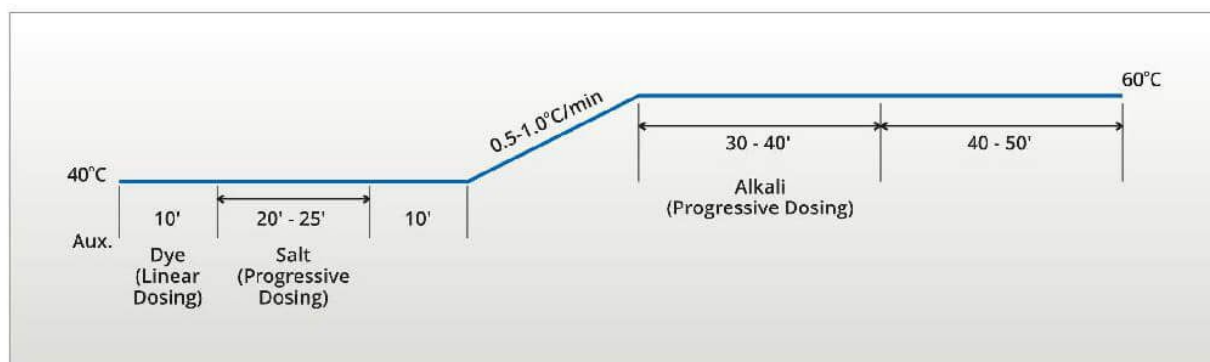
The starting dyebath pH is set between 5.5 and 6.5 by using adequate quantity of Acetic Acid.

**A general recipe for Dyebath Assistants during dyeing process with water of minimum hardness will be:**

Acetic Acid	0.30 to 0.50 gpl
Sequestering Agent	0.50 to 1.00 gpl
Defoaming Agent	0.10 to 0.30 gpl
Lubricating Agent	0.25 to 0.40 gpl
Tri Sodium Phosphate	0.20 to 0.25 gpl

## Dyeing Method

This is a versatile method suitable for any cellulosic substrate.



### **Salt and Alkali Requirement & Fixation Time During Exhaust Dyeing**

<b>Liquor Ratio 10:1</b>						
<b>Depth of Shade (% o.w.f.)</b>		<b>0.01 to 0.5</b>	<b>0.5 to 1.0</b>	<b>1.0 to 2.0</b>	<b>2.0 to 4.0</b>	<b>4.0 &amp; Above</b>
Salt (gpl)	Unmercerized Cotton	30	50	60	70	80
	Mercerized Cotton	20	40	45	50	60
	Soda Ash	10	15	20	20	20
Alkali (gpl)	Mixed Soda Ash	★	★	★	8	10
	Alkali Caustic Soda	★	★	★	1.0	1.5
Fixation Time (Min.)		50	50	60	60	70

★ = Not Recommended

#### **Notes:**

- Glauber's Salt is recommended as electrolyte (Salt) for dyeing.
- Soda Ash is always the preferred alkali, however to reduce the amount of handling, the mixed alkali (Soda Ash & Caustic Soda) can be used especially in dark shades.
- Caustic Soda used in mixed alkali should be originally in the flakes form.
- In case of dyeing of regenerated cellulosic, like-Viscose, Mixed Alkali should always be avoided.

### **Washing Off Process of Denovo™ Y Reactive Dyes During Exhaust Dyeing**

On completion of the Dyeing Cycle, washing off steps to be followed are as:

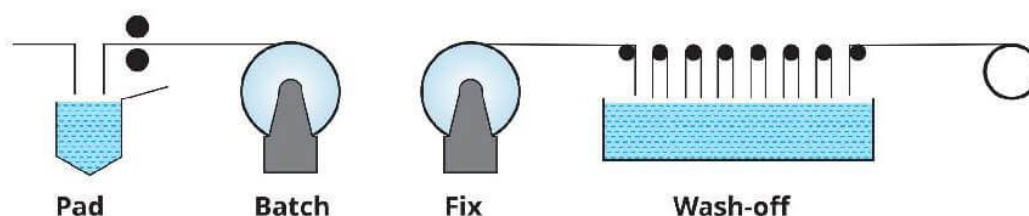
- Cold Wash with Overflow for 10 minutes.
- Hot Wash at 80°C for 10 minutes.
- Neutralization with Acetic Acid.
- Soaping with 1-2 gpl Non-Ionic Soaping Agent and 0.50 gpl of Sequestering Agent at 90°C for 10 minutes.
- Hot Wash for 10 minutes at 80°C.
- Cold Rinse.
- For maximum wet fastness properties for dark to extra dark shades, additional soaping and hot wash may be repeated before final cold rinse.
- Hot or cold rinse is necessary till final clear solution is obtained.



## Cold Pad Batch System

### Introduction

- Cold Pad Batch Dyeing System offers the most economical and most convenient method of applying Denovo™ 'Y' Reactive Dyes with high color yield especially for woven fabric.
- Energy and water consumptions are the lowest and salt addition is totally made redundant, thus rendering it more eco-friendly.
- Primarily applied for woven fabrics but process can be extended to knits as well with specialized features in the pad box and the guiding systems.
- With least inputs in terms of capital outlay, energy, water, manpower and Right First Time(RFT) capabilities, this method is most cost effective option for dyeing substrates that are amenable to padding operation.



### Application Procedure

#### Sodium Silicate Method

##### Description

This is the most commonly adopted method by the Process Houses for applying Denovo™ 'Y' Reactive Dyes. The general approach is to apply the dye at neutral pH and after distribution of the dye on the substrate, the pH is raised for fixation.

##### Economics

The following advantages are achievable:

- Increase the stability of padding liquor by preventing hydrolysis of the dyestuffs in alkaline atmosphere prior to fixation.
- Any antagonistic effect due to variation in the concentration of alkali in the padding liquor is taken care of by Sodium Silicate.
- Assist in avoiding selvedge carbonization due to uneven selvedge edges resulting due to improper weaving and subsequent overlapping of edges on batching.
- Presence of Sodium Silicate provides better fixation yield thereby resulting in better depth of shade.

#### Padding Liquor Recipe

##### (A) Dyestuff Solution

COMPOSITION OF DYESTUFF SOLUTION	QUANTITY (GPL)
Denovo™ 'Y' Reactive Dye	X GPL
Wetting-cum-Penetrating Agent	1-2 GPL
Antimigration Agent	2-4 GPL
Sequestering-cum-Dispersing Agent	1-2 GPL
Urea	30-40 GPL (Upto 20 GPL Shades) 50-80 GPL (Above 20 GPL Shade)

## (B) Silicate / Caustic Solution

Amount of Denovo™ 'Y' Reactive Dyes				
Na <sub>2</sub> SiO <sub>3</sub> (48 - 50° Be)	<20 gpl	20gpl - 40 gpl	40 gpl - 70 gpl	>70 gpl
	Amount of Caustic Soda Solution 35.5% w/w (38° Be) in cc/l required in addition to Sodium Silicate			
100 gpl	15 cc/l	20 cc/l	25 cc/l	30 cc/l

### Notes:

- Only necessary amount of boiling water is used for dissolution of dyestuff. Further dilution is done by cold water.
- Urea is sprinkled in solid form into the cooled liquor and dissolved by stirring. Temperature of dye solution should not be above 40°C at the time of adding urea.
- A/B ratio should be 4:1 in the padding bath and to be added through dosage pump.

### Padding

- Uniformly cooled fabric is padded at about 25-30°C.
- Padding trough should be of smaller capacity of 15-25 litres due to high fabric speed and frequent replenishment.
- Fabric pick-up should be about 60-70% for cotton and 90-100% for viscose fabrics.
- Quantity of ready-to-pad fabric and speed of the Padding Mangle to be kept at a higher speed, so that Denovo™ 'Y' Reactive Dye Solution is used up within 15-20 minutes.

### Fixation





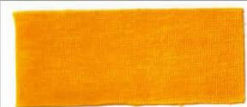









- On padding, fabric roll is covered with plastic sheet to protect the padded goods from partial drying and is made to rotate at around 5-10 rpm.
- Fixation time is 16-18 hours.

### Washing-Off

- Can be carried out on any suitable machine, say, Jigger, Winch or Open-width Soaper.
- For efficient washing off of dyed fabric, 7-8 chamber washing tank is suggestive. In the first 2-3 chambers, excess amount of water is used, to remove Silicate and to drop pH to 8.0-8.5. Temperature in these tanks should not be above 50°C.
- From 4th to 6th chamber, temperature is maintained at 98°C with soaping agent being added in 4th chamber.
- Temperature can be dropped down to 70°C in 7th Chamber and 40°C in the last chamber.

### Important:

The following supersedes the Buyer's documents. This is intended to service as non-binding guidelines. Seller makes no representation or warranty, expressed or implied, including the fitness for a particular purpose. Data and results are based on controlled lab conditions and must be confirmed by Buyer by testing for the intended conditions of use.











			Solubility at 50°C		Applications	
			Salt-Free Neutral Water	30 gpl Common Salt	Exhaust	Pad-Batch
DENOVO™ 'Y' SERIES REACTIVE DYES						
1%	4%	SHADE				
		DENOVO™ LEMON Y2BL	90	80	R	NR
		DENOVO™ YELLOW Y2BL	125	110	R	R
		DENOVO™ CANARY Y2BL	100	90	R	R
		DENOVO™ ORANGE Y2BL	70	20	R	NR
		DENOVO™ CARMINE Y2BL	75	20	R	R
		DENOVO™ RED Y2BL	100	75	R	R
		DENOVO™ RUBY Y2BL	100	75	R	R

Dischargeability (Neutral Discharge)	Fixation Temperature (°C) (Exhaust)	FASTNESS PROPERTIES												
		ISO 105-B02		Chlorinated Water (20 ppm Active Chlorine)	WASHING				CROCKING		PERSPIRATION (ISO 105-E04)			
Light, 1/1 S/D	Light, 1/3 S/D	ISO 105-E03	ISO 105-C06-C2S, @ 60° C		AATCC TM 61-3A, @ 70° C		ISO 105-X12		Acidic		Alkaline			
		Shade Change	Shade Change	Staining Cotton	Shade Change	Staining Cotton	Dry	Wet	Shade Change	Staining Cotton	Shade Change	Staining Cotton		
R	60°C	5-6	5	4	4-5	4-5	4-5	4-5	5	4-5	4-5	4-5	4-5	4-5
NR	60°C	5	5	3-4	4-5	4-5	4-5	4-5	5	4-5	5	4-5	4-5	4-5
NR	60°C	5	5	3-4	4-5	4-5	4-5	4-5	5	4-5	5	4-5	4-5	4-5
NR	60°C	5	4-5	3-4	4-5	4-5	4-5	4-5	4-5	4	5	4-5	4-5	4-5
NR	60°C	5	4-5	3-4	4-5	4-5	4-5	4-5	4	3-4	4-5	4-5	4-5	4-5
NR	60°C	5	4-5	4	4-5	4-5	4-5	4-5	4-5	4	4-5	4	4-5	4
NR	60°C	5	4-5	4	4-5	4-5	4-5	4-5	4-5	4	4-5	4	4-5	4

			Solubility at 50°C		Applications	
			Salt-Free Neutral Water	30 gpl Common Salt	Exhaust	Pad-Batch
DENOVO™ 'Y' SERIES REACTIVE DYES						
1%	4%	SHADE				
		DENOVO™ CRIMSON Y2BL				
		DENOVO™ CARDINAL Y2BL				
		DENOVO™ AZURE Y2BL				
		DENOVO™ CADET Y2BL				
		DENOVO™ BLUE Y2BL				
		DENOVO™ VIOLET Y2BL				
		DENOVO™ ROYAL Y2S				
55	20	R	NR			
75	20	R	R			
85	80	R	R			
75	20	R	NR			
90	80	R	R			
30	15	R	NR			
100	60	R	R			

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		Shade Change	Shade Change	Staining Cotton	Shade Change	Staining Cotton	Dry	Wet	Shade Change	Staining Cotton	Shade Change	Staining Cotton		
NR	60°C	4-5	4	3-4	4-5	4-5	4-5	4-5	4	3-4	4-5	4	4-5	4
R	60°C	5	5	3-4	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
NR	60°C	4	4	3	4-5	4-5	4-5	4-5	4	3-4	4-5	4	4-5	4
R	60°C	4	4	3	4-5	4-5	4-5	4-5	4	3-4	4	4	4	4
R	60°C	4-5	4	3-4	4	4	4	4	4	4	4-5	4	4-5	4
NR	60°C	4	4	3	4	4	4	4	4	3-4	4	4	4	4
NR	60°C	5	4-5	3-4	4-5	4-5	4-5	4-5	4-5	3-4	4-5	4-5	4-5	4-5



			Solubility at 50°C		Applications	
			Salt-Free Neutral Water	30 gpl Common Salt	Exhaust	Pad-Batch
<b>DENOVO™ 'Y' SERIES REACTIVE DYES</b>						
1%	4%	SHADE				
		DENOVO™ ROYAL Y3BR	125	100	R	NR
		DENOVO™ SAPPHIRE Y2BL	125	100	R	NR
		DENOVO™ NAVY Y2BL	120	100	R	R
		DENOVO™ NAVY Y3BL	120	100	R	R
		DENOVO™ BLACK Y2BL	120	100	R	R

Dischargeability (Neutral Discharge)	Fixation Temperature (° C) (Exhaust)	FASTNESS PROPERTIES												
		ISO 105-B02		Chlorinated Water (20 ppm Active Chlorine)	WASHING				CROCKING		PERSPIRATION (ISO 105-E04)			
Light, 1/1 S/D	Light, 1/3 S/D	ISO 105-E03	ISO 105-C06-C2S, @ 60° C		AATCC TM 61-3A, @ 70° C		ISO 105-X12		Acidic		Alkaline			
		Shade Change	Shade Change	Staining Cotton	Shade Change	Staining Cotton	Dry	Wet	Shade Change	Staining Cotton	Shade Change	Staining Cotton		
NR	60°C	5	3	3-4	4-5	4-5	4-5	4-5	4-5	3-4	4-5	4-5	4-5	4-5
NR	60°C	5	4-5	3-4	4-5	4-5	4	4-5	4-5	3-4	4-5	4-5	4-5	4-5
R	60°C	4	3-4	3	4-5	4	4-5	4	4-5	4	4-5	4-5	4-5	4-5
R	60°C	4	3-4	3	4-5	4	4-5	4	4-5	4	4-5	4-5	4-5	4-5
R	60°C	4 (2/1)	--	3	4-5	4-5	4-5	4-5	4-5	3	4-5	4-5	4-5	4-5

Abbreviations : R = Recommended NR = Not Recommended

Pattern Illustration : On R.F.D. Cotton by Exhaust Process



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