



ABRAPA

ASSOCIAÇÃO BRASILEIRA DOS PRODUTORES DE ALGODÃO

Optimizing Dyeing Performance of Brazilian Cotton Knit Fabric

Achieving Consistency and Efficiency



Contents

Preface.....	2
Executive Summary.....	3
1. Introduction.....	4
2. Methodology.....	5
2.1. Baseline Trials.....	5
2.2. Lab-Scale Trials.....	5
2.3. Commercial-Scale Validation Trials.....	6
2.4. Development of Standard Operating Procedures.....	6
3. Baseline Trials.....	7
3.1. Trial Details.....	7
3.2. Conclusion.....	15
4. Lab-Scale Trials.....	16
4.1. Pre-treatment Recipe.....	16
4.2. OBA Application Recipe.....	17
4.3. Results.....	17
4.4. Conclusion.....	18
5. Commercial-Scale Validation Trials.....	19
5.1. Trials with DyStar.....	19
5.2. Trials with Archroma.....	26
5.3. Conclusion.....	33
6. Recommended Standard Operating Procedures.....	34
6.1. White Fabric.....	34
6.2. Dyed Fabric.....	36
7. Conclusion.....	38
8. Limitations to the Study.....	39

Preface

The Brazilian Cotton Growers Association (ABRAPA) has long been committed to strengthening the role of Brazilian cotton in the global textile value chain. Through advanced farming systems and sustainable practices, Brazil has established itself as one of the world's leading cotton producers and exporters. ABRAPA's mission is to ensure that Brazilian cotton not only reaches mills worldwide but also delivers optimal performance at every stage, from spinning to fabric.

In 2024, to better understand how spinners perceive Brazilian cotton, ABRAPA commissioned a perception mapping study in the top six importing countries. The findings revealed key strengths but also pinpointed specific challenges in the downstream processes. In direct response, the Association launched a series of spinning and knit fabric processing trials to develop actionable solutions.

This report ***“Optimizing Dyeing Performance of Brazilian Cotton Knit Fabric”*** is the outcome of the knit fabric processing trial. It also incorporates proven best practices from Brazilian fabric processing facilities with a long history of exclusively using domestic cotton. It presents solutions that enhance the quality and consistency in Brazilian cotton knit fabric processing. It reflects ABRAPA's firm belief that transparency, collaboration, and continuous improvement are essential for maintaining Brazilian cotton as a preferred and trusted choice.

ABRAPA extends its sincere gratitude to DyStar India Private Limited, Archroma India Private Limited, and Gupta Exim (India) Pvt. Ltd. for participating in this initiative. A special thanks also goes to Nanete Mill and Dalila Textile Ltda, Brazil, their invaluable input. Their cooperation was instrumental in developing the practical recommendations set forward in this report.

As the industry evolves, ABRAPA remains dedicated to investing in initiatives that enhance quality, sustainability, and traceability. We are confident that the solutions presented here will empower mills to achieve superior results with Brazilian cotton, thereby reinforcing Brazil's position as a global leader in responsible and reliable cotton supply.


Gustavo Viganó Piccoli
President

Associação Brasileira dos Produtores de Algodão (ABRAPA)

Executive Summary

Brazil is one of the world's largest producers and exporters of cotton, recognized for its large-scale mechanized farming, competitive pricing, and strong commitment to sustainability.

During Brazilian cotton perception mapping study, respondents mentioned two specific challenges while dyeing. The first issue being low whiteness index in white fabrics, and the second issue was inconsistent shade depth. Recognizing the critical importance of addressing these challenges, ABRAPA commissioned comprehensive and systematic technical trials aimed at developing practical solutions for the Brazilian cotton knit fabric processing.

The initiative began with processing Brazilian cotton knit fabric using the standard dyeing process and the results confirmed that Brazilian cotton achieved comparable shade depth. Building on this, lab-scale trials were conducted at DyStar and Archroma's laboratories to develop optimized recipes for Brazilian cotton fabric. Finally, commercial-scale validation trials were conducted to evaluate the practical viability of these recipes.

The results demonstrate that Brazilian cotton can achieve 150+ whiteness index, identical to other origin cotton in white fabrics. Furthermore, it also demonstrates superior color performance across all shades (light, medium, dark), with shade depth stronger by 5 – 25% as compared to other origin cotton. In all three trials, Brazilian cotton consistently maintained excellent visual quality ratings of 4.0+ on a 5-point scale.

The Standard Operating Procedure (SOPs) developed from these trials provide detailed recipes and process parameters for processing Brazilian cotton knit fabric with auxiliaries from DyStar and Archroma. It is recommended that processing facilities adopt these proven procedures to achieve consistent fabric quality that meets international standards.

1. Introduction

Brazil produced 3.7 Mn. tons of cotton in the marketing year 2024/25, accounting for 14% of global production and ranking as the third-largest producer worldwide. It became the largest exporter globally with 30% share of global exports, surpassing the U.S. share of 26%.

During the Brazilian cotton perception mapping study, some respondents mentioned two specific challenges during fabric dyeing: lower whiteness index in white fabrics and inconsistencies in shade depth. Textile processing facilities worldwide require high whiteness index values exceeding 150 in white fabrics and shade depth consistency in dyed fabrics to meet market standards. Variations in these parameters result in quality downgrades and customer dissatisfaction. These processing challenges stem from multiple factors including fiber characteristics, quality of auxiliaries & chemicals, and processing parameters.

Recognizing that processing optimization rather than inherent fiber limitations represents the pathway to enhanced performance, ABRAPA commissioned this comprehensive technical trial. The objective of this trial was:

- Optimize whiteness index
- Enhance shade depth consistency
- Develop Standard Operating Procedures (SOPs) for processing Brazilian cotton knitted fabric

2. Methodology

The overall approach followed was as follows:



The study began with using the standard dyeing process to evaluate initial dyeing results of Brazilian cotton compared with Indian cotton in six shades. Following the baseline results, optimized recipes were developed at a laboratory scale in collaboration with DyStar & Archroma and subsequently validated through commercial-scale trials. This ensured that processing parameters were fine-tuned and verified prior to the development of Standard Operating Procedures (SOPs).

The trials were taken with Brazilian and Indian cotton knit fabric with following parameters:

Table 1: Greige Knit Fabric Specifications

Greige Knit Fabric - Structure and Composition	
Yarn Type	30s single combed compact ring-spun yarn
Fabric Construction	Single jersey knit fabric
Greige Weight	150 GSM

2.1. Baseline Trials

Six shades were processed during the baseline trials using 4.5 kg fabric samples (2.5 kg Brazilian cotton and 2 kg Indian cotton fabric).

2.2. Lab-Scale Trials

Based on the outcomes of baseline trial, lab scale optimization trials were conducted at Dystar and Archroma's in-house laboratories. The primary objective of lab trials was to develop chemical recipes and processing parameters aligned to Brazilian cotton characteristics. Both laboratory trials focused on methodical optimization of pre-treatment parameters for whiteness enhancement and consistent shade depth. The laboratory trials established recipes and processing parameters that were subsequently scaled up in commercial-scale bulk trials.

2.3. Commercial-Scale Validation Trials

Following successful laboratory recipe development, two distinct bulk trials were executed to validate commercial scalability and processing performance. The details are as follows:

Trial	Recipe Provider	Shades and Quantity
A	DyStar	Four shades (one white and three dyed) 17 kg samples each (15 kg Brazilian cotton and 2 kg Indian cotton)
B	Archroma	Four shades (one white and three dyed) 17 kg samples each (15 kg Brazilian cotton and 2 kg Indian cotton)

The trials were concluded with performance evaluation, including whiteness index measurements, comparative analysis of Brazilian and Indian cotton for shade depth consistency, and assessment of physical appearance parameters such as thick and thin places, barre, pilling, and dead cotton.

2.4. Development of Standard Operating Procedures

Following the commercial-scale trial and result assessment, Standard Operating Procedures (SOPs) were established, detailing the recipes and process parameters for processing Brazilian cotton knit fabric.

3. Baseline Trials

Baseline trials were conducted using the standard dyeing process to evaluate initial dyeing results of Brazilian cotton compared with Indian cotton in six shades.

3.1. Trial Details

3.1.1. Trial Configuration and Design

Table 2: Trial Configuration-Gupta Exim

Particular	Details	
Sample Type & Quantity	Brazilian Cotton Fabric	4.5 kg
	Indian Cotton Fabric	2 Kg
Shades	Dyed – Red, Maroon, Light Pink, Blue, Black, and Sky Blue	
Liquor Ratio	1:10	

3.1.2. Processing Workflow

The following processing workflow was followed for conducting the baseline trials:

Step 1: Soft Flow

Machine Make: Krsna/Brazzoli



Step 2: Rope Opening

Machine Make: Blanco



Step 3: Stenter

Machine Make: Bruckner



Step 4: Compacting

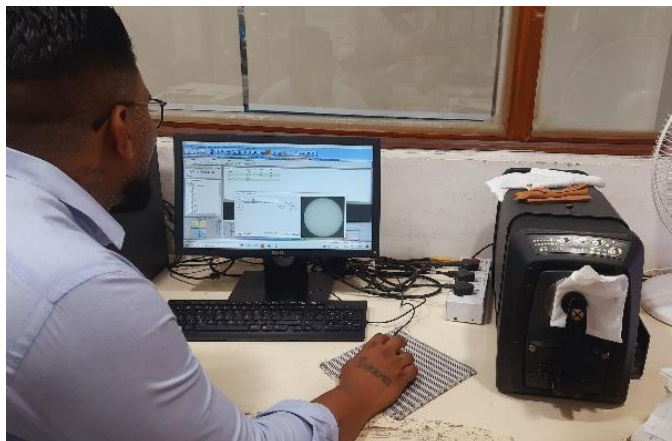
Machine Make: Lafer



Step 5: Inspection

The inspection included both visual assessment and instrumental analysis.

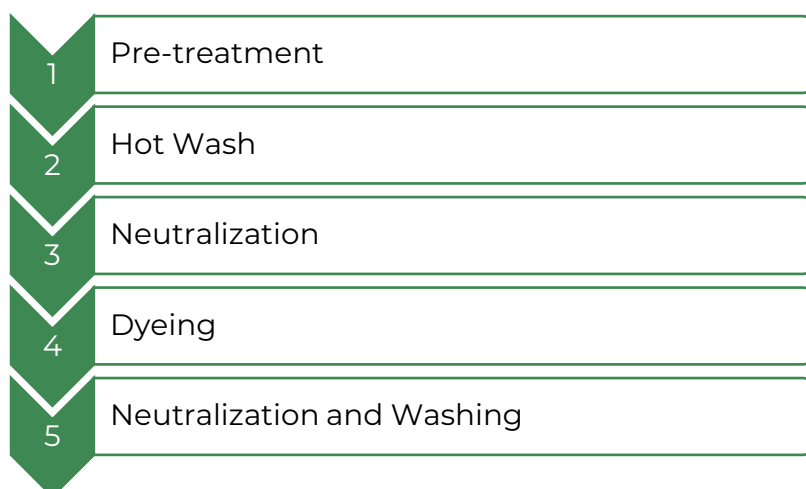
Spectrophotometer measurements provided delta reports and quantitative data for shade strength and whiteness index, while visual assessment analyzed metrics such as thick and thin places, barre, pilling, and dead cotton. This enabled precise comparative analysis between Brazilian and Indian cotton fabric.



The commercial-scale validation trials were also conducted following the same process workflow.

3.1.3. Process, Cycle Graph, and Recipes

Process for Dyed



Stage 1: Pre-treatment

- Time: ~100 minutes
- Procedure:
 - The cycle begins by heating the water bath from an initial temperature of 55°C
 - For Red and Blue shades, Zycol TSA LIQ (wetting agent) and Lenatol DMCP (de-mineralization agent) is added in the bath at 70°C. The bath is held for 30 minutes and then drained.
 - The Maroon, Light Pink, Black, and Sky Blue shades are dyed without de-mineralization process.
 - The bath is then charged with auxiliaries: Bio Clay Paste (sequestering agent), Zycol TSA LIQ (scouring agent), and Rossari LLP (levelling agent), followed by a 5-minute hold
 - Temperature is ramped up at 2.0°C/min to 70°C
 - Caustic (scouring agent) is added, followed by a 5-minute hold
 - H₂O₂ (bleaching agent) is added, followed by a 10-minute hold
 - Temperature is raised to 98°C at 2.0°C/min and held for 40 minutes for complete bleaching action
 - Bath is cooled to 80°C at 2.0°C/min and drained

Stage 2: Hot Wash

- Time: ~30 minutes
- Procedure:
 - Machine is refilled to 55°C and temperature is raised to 80°C at 2.0°C/min
 - Sample is washed for 10 minutes and then drained

Stage 3: Neutralization

- Time: ~25 minutes
- Procedure:
 - After refilling, bath is stabilized at 55°C

- Acetic Acid and Rossari Kleerix N Concentrate (neutralizing agent) dosed for peroxide neutralization, followed by a 10-minute hold
- Ultrox EPN (peroxide killer) is added for bio-polishing and held for 10 minutes
- Bath is then drained

Stage 4: Dyeing

- Time: ~115 minutes
- Procedure:
 - Machine is refilled and bath is stabilized at 60°C
 - Levelling Agent and BOO N55 (bio-polishing agent) are added, followed by a 10-minute hold
 - Dyes are dosed gradually over 30 minutes followed by a 10-minute hold
 - Caustic is gradually added over 20 minutes for dye fixation followed by a 10-minute hold
 - Soda Ash and other alkalis are then gradually added over 20 minutes followed by a 10-minute hold
 - Bath is then drained

Stage 5: Neutralization and Washing

- Time: ~110 minutes
- Procedure:
 - Fabric is rinsed at 55°C with Fabcol DP (soaping agent) and held for 15 minutes. Bath is drained and fresh bath is heated to 55°C.
 - The sample undergoes two consecutive hot washes for 10 minutes by raising the temperature to 90°C at 2.0°C
 - Bath is cooled to 80°C at 2.0°C/min and drained.

Figure 1: Cycle Graph-Dyed-Gupta Exim (Without demineralization)



Figure 2: Cycle Graph-Dyed-Gupta Exim (With demineralization)

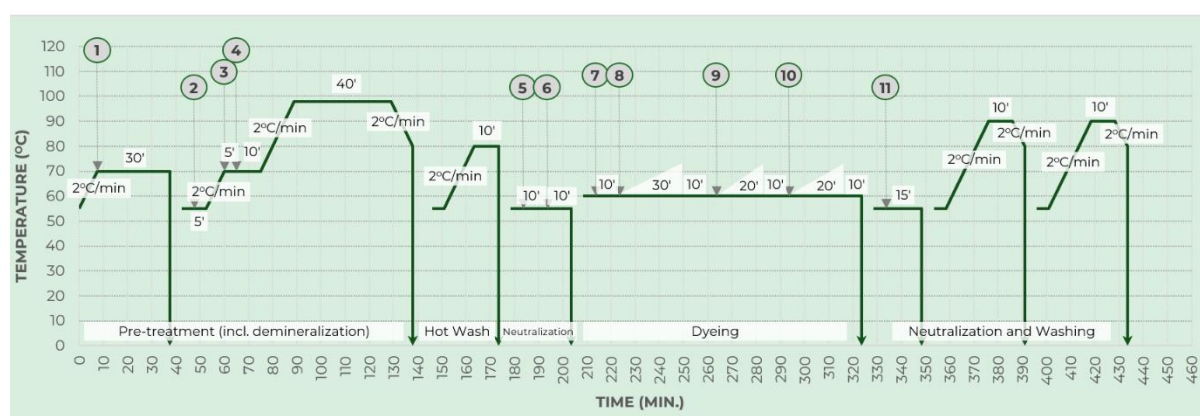


Table 3: Bulk Trial Recipe -Gupta Exim

Red, Maroon, Light Pink, Navy, Black, and Sky Blue

S. No.	Chemical Name	Description	Red		Maroon		Light Pink		Blue		Black		Sky Blue	
			Quantity *	In grams	Quantity *	In grams	Quantity *	In grams	Quantity *	In grams	Quantity *	In grams	Quantity *	In grams
1.	Zycol TSA LIQ	Wetting Agent	1 GPL	45	-	-	-	-	1 GPL	45	-	-	-	-
	Lenatol DMCP	De-mineralization	3 GPL	135	-	-	-	-	3 GPL	135	-	-	-	-
2.	Bio Clay Paste	Sequestering Agent	0.80%	36	0.80%	36	0.80%	36	0.80%	36	0.80%	36	0.80%	36
	Zycol TSA LIQ	Scouring Agent	0.20%	9	0.20%	9.0	0.20%	9	0.20%	9.0	0.20%	9.0	0.20%	9.0
	Rossari LLP	Levelling Agent	1.00%	45	1.00%	45	1.00%	45	1.00%	45	1.00%	45	1.00%	45
3.	Caustic Soda	Scouring Agent	3.00%	135	3.00%	135	3.00%	135	3.00%	135	3.00%	135	3.00%	135
4.	H2O2	Bleaching Agent	2.00%	90	2.00%	90	2.00%	90	2.00%	90	2.00%	90	2.00%	90
5.	Acetic Acid	Neutralizing Agent	0.50%	22	0.50%	22	0.50%	22	0.50%	22	0.50%	22	0.50%	22
	Rossari Klerix N	Neutralizer/ Clearing Agent	0.20%	9.0	0.20%	9.0	0.20%	9.0	0.20%	9.0	0.20%	9.0	0.20%	9.0
6.	Ultrox EPN	Catalyze Enzyme	0.08%	3.6	0.08%	3.6	0.08%	3.6	0.08%	3.6	0.08%	3.6	0.08%	3.6
7.	Boo N55	Bio-polishing Agent	0.30%	13	0.30%	13	0.30%	13	0.30%	13	0.30%	13	0.30%	13
8.	Bold Yellow	Dye	2.24%	101	2.24%	101	-	-	-	-	-	-	-	-
	Bold Red	Dye	3.50%	157.5	2.90%	130	-	-	-	-	-	-	-	-
	Blue ECR	Dye	0.53%	24	0.53%	24	-	-	-	-	-	-	-	-
	Yellow NP	Dye	-	-	-	-	0.02%	0.9	0.40%	18	-	-	-	-

S. No.	Chemical Name	Description	Red		Maroon		Light Pink		Blue		Black		Sky Blue	
			Quantity *	In grams	Quantity *	In grams	Quantity *	In grams	Quantity *	In grams	Quantity *	In grams	Quantity *	In grams
	Red KHL	Dye	-	-	-	-	0.03%	1.3	0.50%	22			-	-
	Blue KHL	Dye	-	-	-	-	0.22%	9.8	2.00%	90			-	-
	Yellow KHC	Dye	-	-	-	-	-	-	-	-			0.05%	2.3
	Red KHC	Dye	-	-	-	-	-	-	-	-			0.11%	5.0
	Blue KHC	Dye	-	-	-	-	-	-	-	-			0.33%	15
	Red SQ	Dye	-	-	-	-	-	-	-	-	1.6%	72.0	-	-
	Black DSG	Dye	-	-	-	-	-	-	-	-	8.6%	387.0	-	-
9.	Caustic	Salt	90 GPL	4,050	80 GPL	3,600	20 GPL	900	118 GPL	5,310	90 GPL	4,050	25 GPL	1,125
10.	Soda Ash	Soda	10 GPL	450	10 GPL	450	6 GPL	270	24 GPL	1,080	10 GPL	450	10 GPL	450
	Green Soda	Soda	36 GPL	1,620	36 GPL	1,620	24 GPL	1,080	36 GPL	1,620	36 GPL	1,620	24 GPL	1,080
	Green Acid	Acid	1.5 GPL	67	1 GPL	45	0.5 GPL	22	0.5 GPL	22	1.5 GPL	67	0.5 GPL	22
11.	Fabcol DP	Soaping Agent	1.20%	54	1.20%	54	1.20%	54	1.20%	54	1.20%	54	1.20%	54

*as % of greige weight

3.1.4. Results

A. Shade Depth Delta Report

The delta values indicate some variability in batch strength across different colors, however, Brazilian cotton consistently achieves comparable or better results across all shades.

Table 4: Dyed Fabric Test Result-Standard Process

Color	Shade Strength Difference of Brazilian Cotton Fabric Compared to Indian Cotton Fabric
Red	106.6
Maroon	98.9
Light Pink	107.5
Blue	102.5
Black	98.9
Sky Blue	104.7

B. Visual Inspection Report

A visual inspection was conducted on fabric samples across five shade categories using a standardized 5-point rating system.

Table 5: Visual Inspection Results-Standard Process

Quality Parameter	Red		Maroon		Light Pink		Blue		Black		Light Blue	
Cotton	BR	IN	BR	IN	BR	IN	BR	IN	BR	BR	BR	IN
Pilling	4	4	4	4	4	4	4	4	4	4	4	4
Thick & Thin Places	4	4	4	4	4	4	4	4	4	4	4	4
Barre	4	4	4	4	4	4	4	4	4	4	4	5
Dead Cotton	3	4	4	4	4	4	4	4	4	4	4	5
Dye Contamination	4	4	4	4	4	4	4	4	4	4	4	4
Average Score	3.8	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.4

Figure 3: Dyed Fabric Samples – Standard Process



3.2. Conclusion

The baseline trials generated the following results:

- Shade Depth Consistency: Across shades, shade depth of Brazilian cotton fabric is at par or better than Indian cotton fabric. However, dyeing with black color will require higher dye dosage of 4–5%, which incurs an extra cost of ~3 – 4 US Cents/Kg of fabric.
- Visual Inspection: Brazilian cotton demonstrated at par or superior visual appearance including pilling, thick & thin places, barre, etc. than Indian cotton fabric.

4. Lab-Scale Trials

Lab scale trials were conducted to develop optimized chemical recipes and processing parameters for Brazilian cotton under controlled conditions. Multiple combinations and concentrations of chemicals and auxiliaries were tested and refined through iterative experimental runs. This enabled the development of tailored recipes, specifically designed to address the unique properties of Brazilian cotton.

4.1. Pre-treatment Recipe

DyStar developed the following recipe:

Table 6: Bleaching Recipe-DyStar

Chemicals	Description	Quantity/Concentration		Process
		Sample 1	Sample 2	
H ₂ O ₂ (50%)	Bleaching agent	6%	8%	L:R – 1:10 98 °C / 40 mins
Caustic flakes	Soda	2%		
Sera Fil SBS 02	Compound Product*	1.5%		
Sera Lube M-LA Eco	Lubricating agent	1%		
Sera Con M-TC Eco	Core Neutralizer	2 GPL		Hot wash, Neutralization & Peroxide killer for 15 min / 55 °C
Sera Zyme C-SX	Peroxide Killer	0.2 GPL		

*(Wetting/Sequestering/Stabilizing Agent)

Archroma developed following single recipe for bleaching:

Table 7: Bleaching Recipe-Archroma

Chemicals	Description	Quantity/Concentration	Process
Imerol NLF	Wetting Agent	0.7 GPL	L.R: 1:10 Temp./Time: 98°C/60min
Lufibrol 2UD	Sequestering Agent	0.3 GPL	
Albafluid C	Lubricant	0.5 GPL	
Prestigen FCB	Peroxide Stabilizer	0.6 GPL	
Caustic Flakes	Salt	3.5 GPL	
H ₂ O ₂	Bleaching Agent	6.0 GPL	80°C/10 min
	Hot Wash		
Lufibrol N	Neutralizer	0.5 GPL	50°C/10 min

4.2.OBA Application Recipe

DyStar developed the following OBA recipe for 8% bleaching agent:

Table 8: OBA Application Recipe-DyStar

Chemicals	Description	Quantity/Concentration	Process
Sera White C-EBN	Neutral Exhaust OBA	0.6% of greige wt.	80 °C / 30 mins
Sera White C-EBB	Blue Shaded Exhaust OBA	0.2% of greige wt.	
Sera Wash C-NEC Eco	Soaping Agent	1.0 GPL	
Glauber's Salt	Salt	5.0 GPL	

Archroma did not develop the recipe for OBA application at lab-scale.

4.3.Results

DyStar compared the bleaching and dyeing results of both Brazilian and Indian cotton fabric and arrived at the following outcome:

Table 9: Pre-treatment Test Results -DyStar

Cotton	Parameter	Greige	RFD Sample 1	RFD Sample 2	Full White
Brazilian Cotton	Whiteness Index	–	67.23	70.01	150.21
	Absorbency by Drop Test	> 2 mins	1–2 secs	1–2 secs	Instant
Indian Cotton	Whiteness Index	–	68.62	70.79	150.21
	Absorbency by Drop Test	> 2 mins	1–2 secs	1–2 secs	Instant

The whiteness index and absorbency levels of Brazilian cotton was found to be comparable at the RFD as well as the full white stage.

Table 10: Dyeing Test Results-DyStar

Color	Sample	Shade Strength of Brazilian Cotton Fabric Compared to Indian Cotton Fabric
Navy	Sample 1	110.40
	Sample 2	108.75
Black	Sample 1	112.41
	Sample 2	104.65

Brazilian cotton fabrics exhibited stronger shade strength than Indian fabrics in both navy and black shades. Among the RFD samples, the second sample with 8% bleaching agent showed better results compared to the first.

The iterative laboratory development successfully established that Brazilian cotton fabric could achieve comparable or superior performance to Indian cotton fabric

across all tested parameters, with specific advantages in color depth while maintaining equivalent whiteness levels in white applications.

Similarly, Archroma compared the bleaching and dyeing results of both Brazilian and Indian cotton fabric and arrived at the following outcome:

Table 11: Pre-Treatment Test Results-Archroma

Cotton	Parameter	RFD Sample
Brazilian Cotton	Whiteness Index	70.4
	Absorbency by Drop Test	Instant
Indian Cotton	Whiteness Index	75.7
	Absorbency by Drop Test	Instant

Indian cotton was found to be a little better in whiteness over Brazilian cotton at the RFD stage.

Table 12: Dyeing Test Results-Archroma

Color	Shade Strength of Brazilian Cotton Fabric Compared to Indian Cotton Fabric
Grey	123
Khaki	110
DK Brown	120
Turquoise	102
Black	108

In dyed samples, the iterative development established that Brazilian cotton achieved superior performance to Indian cotton across all the shades.

4.4. Conclusion

Lab trial by DyStar lead to the following results:

- The whiteness index and absorbency levels of Brazilian cotton was found to be comparable to Indian cotton fabric.
- Brazilian cotton fabrics exhibited stronger shade strength than Indian fabrics in navy and black shades.
- RFD sample with 8% bleaching agent showed better results compared to that with 6% bleaching agent.
- Brazilian cotton could achieve comparable or superior performance across all tested parameters.

Lab trial by Archroma lead to the following results:

- Indian cotton was found to be a little better in whiteness over Brazilian cotton at the RFD stage.
- In dyed samples, the iterative development established that Brazilian cotton achieved superior performance across all the shades.

5. Commercial-Scale Validation Trials

Following successful laboratory recipe development at both DyStar and Archroma inhouse facilities, two bulk validation trials were conducted to assess commercial scalability and processing performance.

5.1. Trials with DyStar

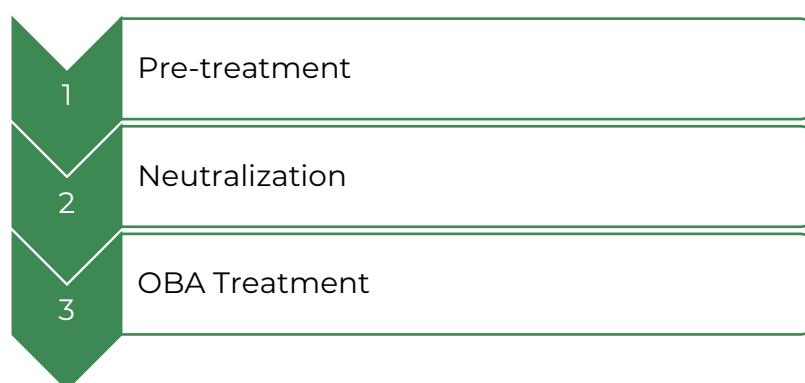
5.1.1. Trial Configuration and Design

Table 13: Trial Configuration-DyStar

Particular	Details	
Sample Type and Quantity	Brazilian Cotton Fabric	15 kg
	Indian Cotton Fabric	2 Kg
Shades	White, Light Grey, Blue, and Navy	
Liquor Ratio (L:R)	1:10	

5.1.2. Process, Cycle Graph, and Recipes

C. Process for White



Stage 1: Pre-treatment

- Time: ~100 minutes
- Procedure:
 - The cycle begins by heating the water bath from an initial temperature of 55°C
 - The bath is charged with auxiliaries: Sera Fil SBS 02 (sequestering/dispersing agent), Sera Lube MLA Eco (lubricant for crease prevention), and Sera Wash CNEC Eco (wetting/washing agent), followed by a 5-minute hold
 - Temperature is ramped up at 2.0°C/min to 70°C
 - Caustic (scouring agent) is added, followed by a 5-minute hold
 - H₂O₂ (bleaching agent) is added, followed by a 10-minute hold
 - Temperature is raised to 98°C at 2.0°C/min and held for 40 minutes for complete bleaching action
 - Bath is cooled to 80°C at 2.0°C/min and drained

Stage 2: Neutralization

- Time: ~70 minutes
- Procedure:
 - After refilling, the new bath is stabilized at 55°C
 - Sera con MTC (neutralizing agent) is added for peroxide neutralization, followed by a 10-minute hold
 - BOO N55 (bio-polishing agent) is added and held for 30 minutes
 - Temperature is ramped to 80°C at 2.0°C/min and held for 10 minutes
 - Bath is drained

Stage 3: OBA Treatment

- Time: ~60 minutes
- Procedure:
 - After refilling, the new bath is stabilized at 55°C
 - Sera White CEBN and Sera White CEBB (OBA) are gradually dosed for over 20 minutes
 - Temperature is increased to 80°C at 2.0°C/min and held for 20 minutes
 - Bath is drained

Figure 4: Cycle Graph-White-DyStar

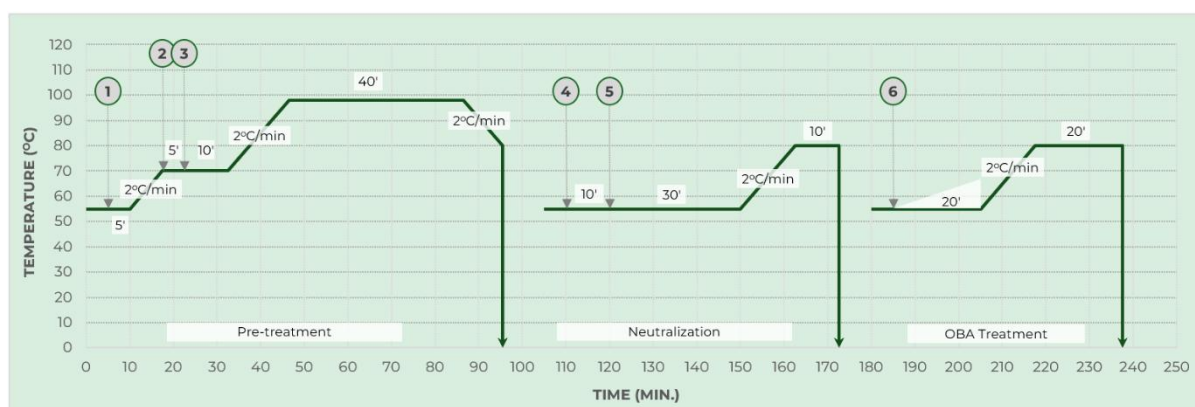
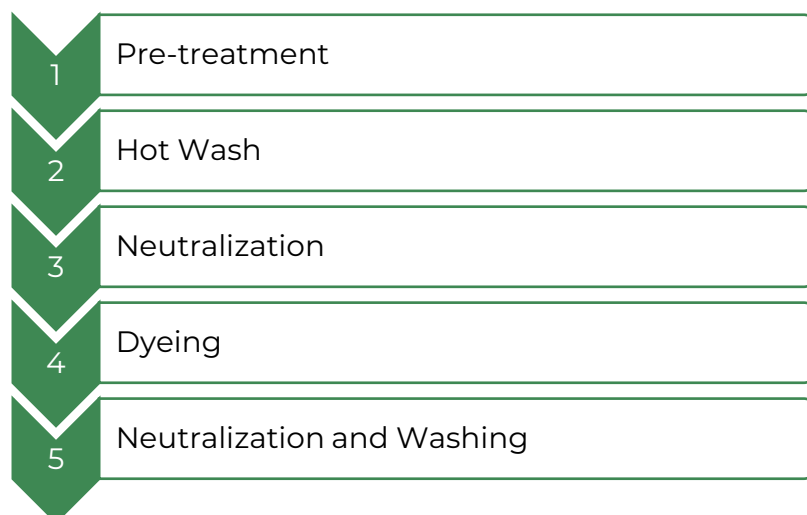


Table 14: Bulk Trial Recipe-White-DyStar

#	Chemical Name	Description	Quantity*	Quantity (grams)
1.	Sera Fil SBS 02	Sequestering Agent	2.00%	340
	Sera Lube MLA Eco	Lubricating Agent	1.00%	170
	Sera Wash CNEC Eco	Wetting Agent	0.30%	51
2.	Caustic	Scouring Agent	2.00%	340
3.	H2O2	Bleaching Agent	8.00%	1,360
4.	Sera con MTC	Neutralizing Agent	0.50%	85
5.	BOO N55	Bio-polishing Agent	0.20%	34
6.	Sera White CEBN	OBA	0.50%	85
	Sera White CEBB	OBA	0.10%	17

*% of Greige Weight

D. Process for Dyed



Stage 1: Pre-treatment

- Time: ~100 minutes
- Procedure:
 - The cycle begins by heating the water bath from an initial temperature of 55°C
 - The bath is charged with auxiliaries: Sera Fil SBS 02 (sequestering/dispersing agent), Sera Lube MLA Eco (lubricant for crease prevention), and Sera Wash CNEC Eco (wetting/washing agent), followed by a 5-minute hold
 - Temperature is ramped up at 2.0°C/min to 70°C
 - Caustic (scouring agent) is added, followed by a 5-minute hold
 - H₂O₂ (bleaching agent) is added, followed by a 10-minute hold
 - Temperature is raised to 98°C at 2.0°C/min and held for 40 minutes for complete bleaching action
 - Bath is cooled to 80°C at 2.0°C/min and drained

Stage 2: Hot Wash

- Time: ~30 minutes
- Procedure:
 - Machine is refilled to 55°C and temperature is raised to 80°C at 2.0°C/min
 - Sample is washed for 10 minutes and then drained

Stage 3: Neutralization

- Time: ~25 minutes
- Procedure:
 - After refilling, bath is stabilized at 55°C
 - Sera con MTC (neutralizing agent) is introduced for peroxide neutralization, followed by a 10-minute hold
 - Sera zyme CSX (peroxide killer) is added for bio-polishing and held for 10 minutes
 - Bath is then drained

Stage 4: Dyeing

- Time: ~115 minutes
- Procedure:
 - Machine is refilled and bath is stabilized at 60°C
 - Levelling Agent and BOO N55 (bio-polishing agent) are added, followed by a 10-minute hold
 - Dyes are dosed gradually over 30 minutes followed by a 10-minute hold
 - Caustic is gradually added over 20 minutes for dye fixation followed by a 10-minute hold
 - Soda Ash and other alkalis are then gradually added over 20 minutes followed by a 10-minute hold
 - Bath is then drained

Stage 5: Neutralization and Washing

- Time: ~110 minutes
- Procedure:
 - Fabric is rinsed at 55°C with Fabcol DP (soaping agent) and held for 15 minutes
 - Bath is drained and fresh bath is heated to 55°C.
 - The sample undergoes two consecutive hot washes for 10 minutes by raising the temperature to 90°C at 2.0°C
 - Bath is cooled to 80°C at 2.0°C/min and drained

Figure 5: Cycle Graph-Dyed-DyStar

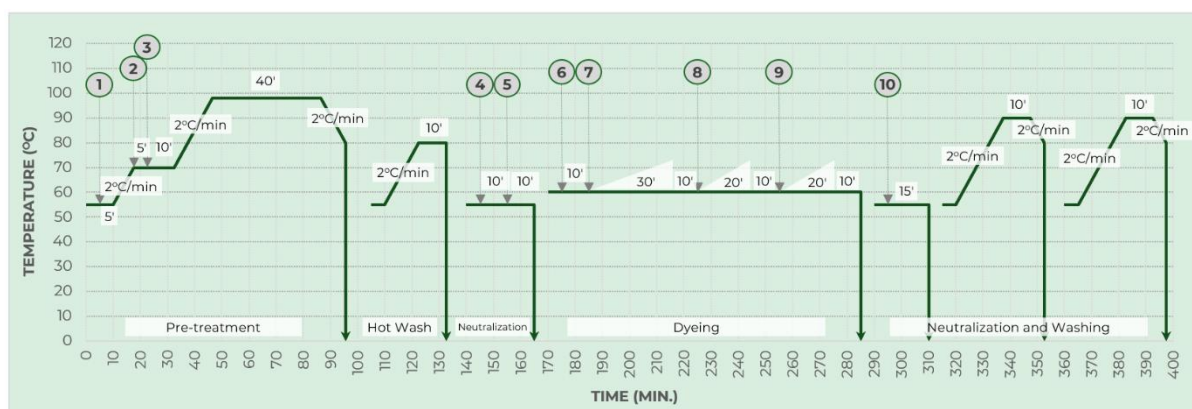


Table 15: Bulk Trial Recipe-Dyed-DyStar

S. No.	Chemical Name	Description	Light Grey		Blue		Navy	
			Quantity*	Quantity (grams)	Quantity*	Quantity (grams)	Quantity*	Quantity (grams)
1.	Sera Fil SBS 02	Sequestering Agent	1.50%	255	1.50%	255	1.50%	255
	Sera Lube MLA Eco	Lubricating Agent	1.00%	170	1.00%	170	1.00%	170
	Sera Wash CNEC Eco	Wetting Agent	0.30%	51	0.30%	51	0.30%	51
2.	Caustic	Scouring Agent	2.00%	340	2.00%	340	2.00%	340
3.	H2O2	Bleaching Agent	4.00%	680	4.00%	680	4.00%	680
4.	Sera con MTC	Neutralizing Agent	0.50%	85	0.50%	85	0.50%	85
5.	Sera zyme CSX	Peroxide Killer	0.30%	51	0.30%	51	0.30%	51
6.	Levelling Agent	Levelling Agent	0.50%	85	0.50%	85	0.50%	85
	BOO N55	Biopolishing Agent	0.30%	51	0.30%	51	0.30%	51
7.	Yellow NP	Dye	0.02%	2.55	0.40%	68	0.44%	74
	Red KHL	Dye	0.01%	2.05	0.50%	85	1.39%	236
	Blue KHL	Dye	0.04%	6.46	2.00%	340	4.07%	692
8.	Caustic	Salt	95 GPL	16,000	118 GPL	20,000	177 GPL	30,000
9.	Soda Ash	Soda	24 GPL	4,000	24 GPL	4,000	24 GPL	4,000
	Green Soda - Lye	Soda	24 GPL	4,000	36 GPL	6,000	36 GPL	6,000
	Green Acid	Acid	2.35%	400	2.35%	400	1.76%	300
10.	Fabcol DP	Soaping Agent	1.20%	204	1.20%	204	1.20%	204

*% of Greige Weight

5.1.3. Results

A. Whiteness Index

The DyStar bulk trial demonstrated excellent whiteness index value for both Brazilian and Indian cotton.

Table 16: White Fabric Test Results-DyStar

Parameter	Indian	Brazilian
Whiteness Index	165.47	162.04
Tint Value	0.35	-0.16

B. Shade Depth Delta Report

The shade depth delta report reveals the relative batch strength of Brazilian cotton versus Indian cotton across shades:

Table 17: Dyed Fabric Test Result -DyStar

Color	Shade Strength Difference of Brazilian Cotton Fabric Compared to Indian Cotton Fabric	Remark
Light Grey	96.7	Slightly lower for Brazilian cotton
Blue	102.4	Brazilian cotton showed superior dye uptake in blue shades
Navy	98.3	Comparable performance between both cottons

These results confirm that Brazilian cotton fabric demonstrates satisfactory shade depth.

Figure 6: Dyed Fabric Samples - DyStar



C. Visual Inspection Report

Comprehensive visual inspection was conducted on fabric samples across four shade categories using a 5-point rating system to evaluate quality parameters critical for commercial acceptance.

Rating Scale: 5=Excellent, 4=Good, 3=Acceptable, 2=Poor, 1=Unacceptable

Table 18: Visual Inspection Results-DyStar

Quality Parameter	White		Light Grey		Blue		Navy	
Cotton	Brazilian	Indian	Brazilian	Indian	Brazilian	Indian	Brazilian	Indian
Pilling	5	4	4	4	4	4	4	3
Thick & Thin Places	3	3	3	2	3	4	4	4
Barre	5	3	4	3	4	4	4	4
Dead Cotton	4	4	4	4	4	5	4	4
Dye Contamination	-	-	5	5	5	5	5	5
Average Score	4.3	3.5	4.0	3.6	4.0	4.4	4.2	4.0

Brazilian cotton achieved superior or equivalent ratings across majority of evaluated parameters with controlled barre and excellent consistency across shade ranges.

5.2. Trials with Archroma

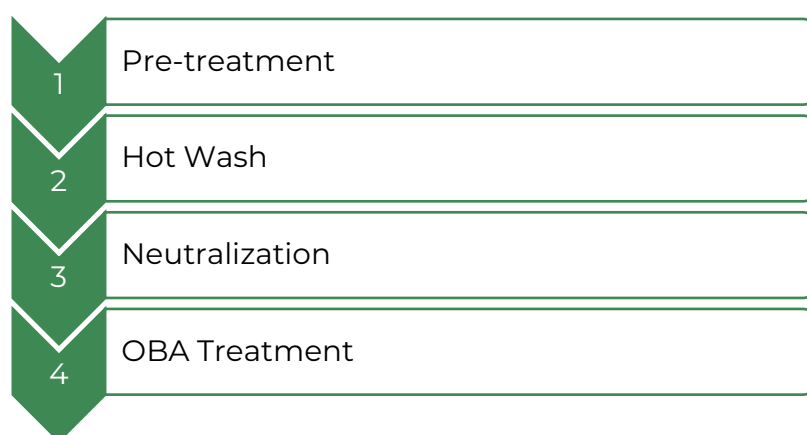
5.2.1. Trial Configuration and Design

Table 19: Trial Configuration-Archroma

Particular	Details	
Sample Type and Quantity	Brazilian Cotton Fabric	15 kg
	Indian Cotton Fabric	2 Kg
Shades	White, Light Grey, Blue, and Navy	
Liquor Ratio (L:R)	1:10	

5.2.2. Process, Cycle Graph, and Recipes

A. Process for White



Stage 1: Pre-treatment

- Time: ~110 minutes
- Procedure:
 - The cycle begins by heating the water bath from 30°C
 - Bath is charged with auxiliaries at 38°C: Imerol NLF (wetting agent), Lufibrol 2UD (sequestering agent), and Albafluid HGL (lubricating agent)
 - Temperature is ramped at 3.0°C/min to 60°C, followed by a 10-minute hold
 - Caustic soda flakes are added for scouring, followed by a 5-minute hold
 - H₂O₂ (bleaching agent) and Clarite G-I (peroxide stabilizer) are dosed together for controlled bleaching
 - After 5 minutes, temperature is increased to 98°C at 3°C/min and held for 60 minutes
 - Bath is cooled to 80°C at 3.0°C/min and drained

Stage 2: Hot Wash

- Time: ~25 minutes
- Procedure:
 - The bath is refilled at 40°C. The temperature increased to 80°C at 3°C/min followed by a 10-minute hold.

- The bath is then drained

Stage 3: Neutralization

- Time: ~15 minutes
- Procedure:
 - At 40°C, Invatex AC (neutralizing agent) is added in a new bath
 - Temperature is raised to 55°C at 3.0°C/min and stabilized
 - After 10 minutes of hold, bath is drained

Stage 4: OBA Treatment

- Time: ~10 minutes
- Procedure:
 - After refilling, new bath is stabilized at 40°C
 - Leucophor BH (Optical Brightening Agent) is dosed into the bath
 - Bath is held for 10 minutes before draining

Figure 7: Cycle Graph-White-Archroma

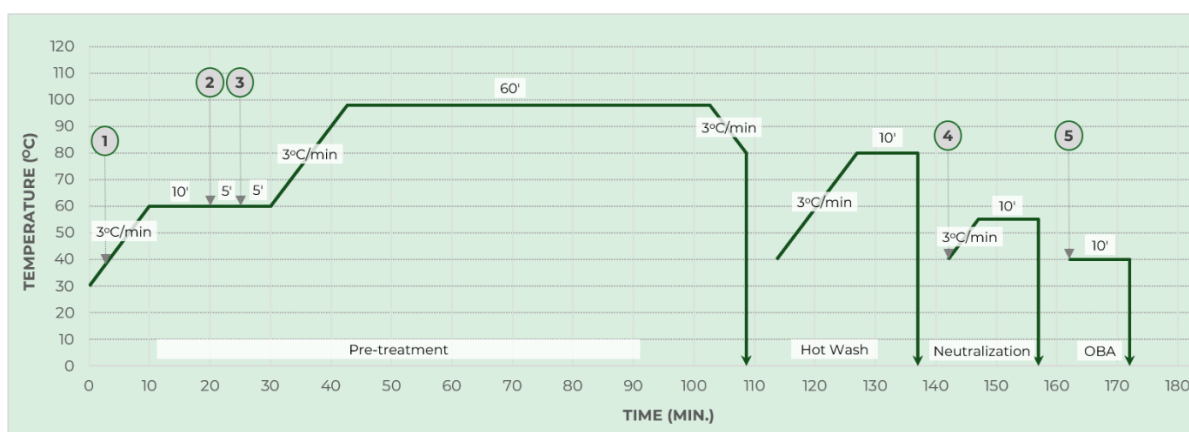
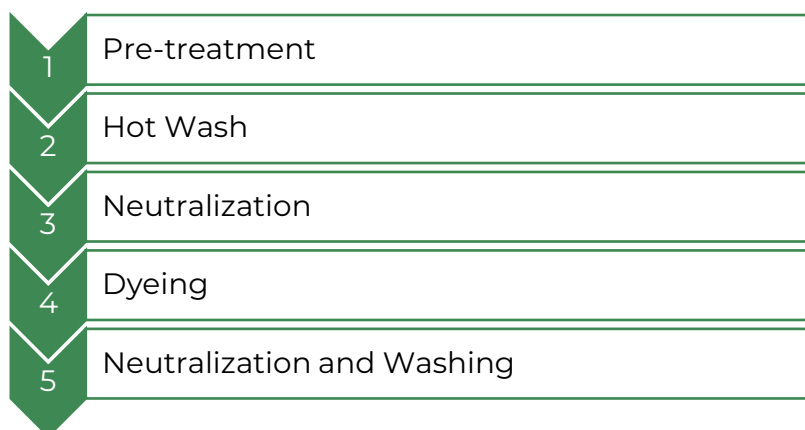


Table 20: Bulk Trial Recipe-White-Archroma

S. No.	Chemical Name	Description	Quantity*	Quantity (grams)
A.	Imerol NLF	Wetting Agent	1.00%	170
	Lufibrol 2UD	Sequestering Agent	0.50%	85
	Albafluid HGL	Lubricating Agent	1.50%	255
B.	Caustic soda flakes	Scouring Agent	3.00%	510
C.	H2O2	Bleaching agent	8.00%	1,360
	Clarite G-I	Peroxide Stabilizer	0.80%	136
D.	Green Acid	Acid	1.20%	204
	Invatex AC	Neutralizing Agent	0.50%	85
E.	Leucophor BH	OBA	0.70%	119

*% of Greige Weight

B. Process for Dyed



Stage 1: Pre-treatment

- Time: ~95 minutes
- Procedure:
 - The cycle begins by heating the water bath from 30°C
 - Temperature is ramped at 3.0°C/min
 - Bath is charged with auxiliaries at 38°C: Imerol NLF (wetting agent), Lufibrol 2UD (sequestering agent), and Albafluid HGL (lubricating agent)
 - The temperature is held at 60°C for 10 minutes
 - Caustic soda flakes are added for scouring, followed by a 5-minute hold
 - H₂O₂ (bleaching agent) and Clarite G-I (peroxide stabilizer) are dosed together for controlled bleaching
 - After 5-minute hold, temperature increased to 98°C at 3.0°C/min and held for 45 minutes
 - Bath is cooled to 80°C at 3°C/min and drained

Stage 2: Hot Wash

- Time: ~30 minutes
- Procedure:
 - The bath is refilled at 40°C. The temperature increased to 80°C at 3°C/min followed by a 10-minute hold.
 - The bath is then drained

Stage 3: Neutralization

- Time: ~20 minutes
- Procedure:
 - At 40°C, Green Acid & Invatex AC (neutralizing agents) is added
 - Temperature is raised to 55°C at 3.0°C/min and stabilized
 - After 5-minute hold, Invazyme CAT-I (peroxide killer) is added
 - After 10-minute of hold, bath is drained

Stage 4: Dyeing

- Time: ~115 minutes
- Procedure:

Table 21: Bulk Trial Recipe-Light Grey-Archroma

S. No.	Chemical Name	Description	Light Grey		Blue		Navy	
			Quantity *	Quantity (grams)	Quantity *	Quantity (grams)	Quantity *	Quantity (grams)
A.	Imerol NLF	Wetting Agent	1.00%	180	1.00%	180	1.00%	180
	Lufibrol 2UD	Sequestering Agent	0.50%	90	0.50%	90	0.50%	90
	Albafluid HGL	Lubricating Agent	1.50%	270	1.50%	270	1.50%	270
B.	Caustic soda lye	Scouring Agent	6.00%	1,080	6.00%	1,080	6.00%	1,080
C.	H2O2	Bleaching agent	5.00%	900	5.00%	900	5.00%	900
	Clarite G-I	Peroxide Stabilizer	0.40%	72	0.40%	72	0.40%	72
D.	Green Acid	Acid	1.20%	216	1.20%	216	1.20%	216
	Invatex AC	Neutralizing Agent	0.50%	90	0.50%	90	0.50%	90
E.	Invazyme CAT-I	Peroxide Killer	0.70%	126	0.70%	126	0.70%	126
F.	Yellow NP	Dye	0.01%	2.55	0.40%	68	0.44%	74
	Red KHL	Dye	0.01%	2.05	0.50%	85	1.39%	236
	Blue KHL	Dye	0.04%	6.46	2.00%	340	4.07%	692
G.	Caustic	Salt	95 GPL	16,000	118 GPL	20,000	177 GPL	30,000
H.	Soda Ash	Soda	24 GPL	4,000	24 GPL	4,000	24 GPL	4,000
	Green Soda - Lye	Soda	24 GPL	4,000	36 GPL	6,000	36 GPL	6,000
	Green Acid	Acid	2.22%	400	2.35%	400	1.76%	300
I.	Fabcol DP	Soaping Agent	1.20%	216	1.20%	204	1.20%	204

*% of Greige Weight

5.2.3. Results

A. Whiteness Index

With Archroma's auxiliaries, Brazilian cotton achieved comparable whiteness index to Indian cotton.

Table 22: White Fabric Test Results-Archroma

Parameter	Indian	Brazilian
Whiteness Index	160.08	158.64
Tint Value	0.29	0.04

B. Shade Depth Delta Report

The delta reports reveal strong results for Brazilian cotton:

Table 23: Dyed Fabric Test Result-Archroma

Color	Shade Strength Difference of Brazilian Cotton Fabric Compared to Indian Cotton Fabric	Remark
Light Grey	106.2	Better than Indian benchmark
Blue	99.2	Comparable performance between both cottons
Navy	106.6	Notably higher shade strength for Brazilian cotton

Brazilian cotton exhibits high shade depth in all color shades.

Figure 9: Dyed Fabric Samples - Archroma



C. Visual Inspection Report

Similar to DyStar, a visual inspection was conducted on fabric samples across four shade categories using a 5-point rating system.

Table 24: Visual Inspection Results-Archroma

Quality Parameter	White		Light Grey		Blue		Navy	
Cotton	Brazilian	Indian	Brazilian	Indian	Brazilian	Indian	Brazilian	Indian
Pilling	4	4	4	4	4	4	4	3
Thick & Thin Places	4	4	4	5	4	4	4	4
Barre	4	4	3	5	4	4	4	4
Dead Cotton	4	4	4	4	4	5	4	4
Dye Contamination	-	-	5	5	5	5	5	5
Average Score	4.0	4.0	4.0	4.6	4.2	4.4	4.2	4.0

Brazilian cotton achieved superior or equivalent ratings across majority of evaluated parameters with controlled barre and excellent consistency across shade ranges.

5.3. Conclusion

The commercial-scale trials generated the following results:

- Whiteness: Brazilian cotton fabric processes to a high degree of whiteness, aligning with market preferences for white fabrics.
- Shade Depth Consistency: Across recipes (DyStar and Archroma), Brazilian cotton fabric is at par or better than Indian cotton fabric.
- Visual Inspection: Brazilian cotton demonstrated at par or superior visual appearance including pilling, thick & thin places, barre, etc. than Indian cotton fabric.

The trials illustrate that, with optimized recipe and process, Brazilian cotton delivers reproducible and commercially acceptable dye uptake across multiple shades.

6. Recommended Standard Operating Procedures

Based on lab-trials and validated results, following are the recommended recipe and process parameters.

6.1. White Fabric

Processing facilities utilizing DyStar's auxiliaries may implement the following optimized recipe and process parameters for white fabric:

Table 25: Recommended Recipe (White)- DyStar

Process Stage	Chemical	Function	Quantity*	Temperature/ Time
Stage 1: Pre-treatment	Sera Fil SBS 02	Sequestering Agent	1.50%	55°C → 5 min → Temp. ramp at 2°C/min to 70°C
	Sera Lube MLA Eco	Lubricating Agent	1.00%	
	Sera Wash CNEC Eco	Wetting Agent	0.30%	
	Caustic	Scouring Agent	2.00%	55°C → 5 min
	H2O2	Bleaching Agent	4.00%	55°C → 10 min → Temp. ramp at 2°C/min to 98°C
	Stabilize at 98°C→ 40 min → Cooled down to 80°C at 2°C/min → Drain			
Stage 2: Neutralization	Sera con MTC	Neutralizer	0.50%	55°C → 10 min
	BOO N55	Bio-polishing Agent	0.50%	55°C → 30 min → Temp. ramp at 2°C/min to 80°C
	Stabilize at 80°C → 10 min → Drain			
Stage 3: OBA Treatment	Sera White CEBN	OBA	0.30%	55°C → 20 min gradual dosing → Temp. ramp at 2°C/min to 80°C
	Sera White CEBB	OBA	0.50%	
		Stabilize at 80°C → 20 min → Drain		

*% of Greige Weight

Processing facilities utilizing Archroma's auxiliaries may implement the following recipe and process parameters for cotton knit fabric (150 GSM) processing:

Table 26: Recommended Recipe (White)-Archroma

Process Stage	Chemical	Function	Quantity*	Temperature/ Time
Stage 1: Pre-treatment	Imerol NLF	Wetting Agent	1.00%	38°C → Temp. ramp at 3°C/min to 60°C → 10 min
	Lufibrol 2UD	Sequestering Agent	0.50%	
	Albafluid HGL	Lubricating Agent	1.50%	
	Caustic soda flakes	Scouring Agent	3.00%	60°C → 5 min
	H2O2	Peroxide	8.00%	60°C → 5 min → Temp. ramp at 3°C/min to 98°C
	Clarite G-I	Peroxide Stabilizer	0.80%	
	Stabilize at 98°C→ 60 min → Cooled down to 80°C at 3°C/min → Drain			
Stage 2: Hot Wash	Fresh water	-	-	40°C → Temp. ramp at 3°C/min to 80°C → 10 min → drain
Stage 3: Neutralization	Green Acid	Acid	1.20%	40°C → Temp. ramp at 3°C/min to 55°C→ 10 min → drain
	Invatex AC	Neutralizing Agent	0.50%	
Stage 4: OBA Treatment	Leucophor BH	OBA	0.70%	40°C → 10 min → drain

*% of Greige Weight

6.2.Dyed Fabric

Processing facilities utilizing DyStar's auxiliaries may implement the following optimized recipe and process parameters for dyed fabric:

Table 27: Recommended Recipe (Dyed)-DyStar

Process Stage	Chemical	Function	Quantity*	Temperature/ Time
Stage 1: Pre-treatment	Sera Fil SBS 02	Sequestering Agent	1.50%	55°C → 5 min → Temp. ramp at 2°C/min to 70°C
	Sera Lube MLA Eco	Lubricating Agent	1.00%	
	Sera Wash CNEC Eco	Wetting Agent	0.30%	
	Caustic	Scouring Agent	2.00%	55°C → 5 min
	H ₂ O ₂ (50%)	Bleaching Agent	4.00%	55°C → 10 min → Temp. ramp at 2°C/min to 98°C
	Stabilize at 98°C → 40 min → Cooled down to 80°C at 2°C/min → Drain			
Stage 2: Hot Wash	Stabilize at 55°C → Temp. ramp at 2°C/min to 80°C → 10 min → drain			
Stage 3: Neutralization	Sera con MTC	Neutralizing Agent	0.50%	55°C → 10 min
	Sera zyme CSX	Peroxide Killer	0.30%	55°C → 10 min → Drain
Stage 4: Dyeing	Levelling Agent	Levelling Agent	0.50%	60°C → 10 min
	BOO N55	Biopolishing Agent	0.30%	
	Dyes	-	As per shade	30 min gradual dosing at 60°C → 10 min
	Caustic	Salt	Light: 95 GPL Med: 118 GPL Dark: 177 GPL	20 min gradual dosing at 60°C → 10 min
	Soda Ash	Soda	24 GPL	20 min gradual dosing at 60°C → 10 min → Drain
	Green Soda-Lye	Soda	Light: 24 GPL Med: 24 GPL Dark: 36 GPL	
Stage 5: Neutralization and Washing	Green Acid	Acid	Light: 2.35% Med: 2.35% Dark: 1.76%	55°C → 15 min → Drain
	Fabcol DP	Soaping Agent	1.20%	[55°C → Temp. ramp at 2°C/min to 90°C → 10min → Drain] x2

*% of Greige Weight

Processing facilities utilizing Archroma's auxiliaries may implement the following recipe and process parameters for cotton knit fabric (150 GSM) processing:

Table 28: Recommended Recipe (Dyed)-Archroma

Process Stage	Chemical	Function	Quantity*	Temperature/Time
Stage 1: Pre-treatment	Imerol NLF	Wetting agent	1.00%	38°C → Temp. ramp at 3°C/min to 60°C → 10 min
	Lufibrol 2UD	Sequestering agent	0.50%	
	Albafluid HGL	Lubricating agent	1.50%	
	Caustic soda lye	Scouring	6.00%	60°C → 5 min
	H2O2	Bleaching agent	5.00%	60°C → 5 min
	Clarite G-I	Peroxide stabilizer	0.40%	→ Temp. ramp at 3°C/min to 98°C
98°C → 45 min → Cooled down to 80°C at 3°C/min → Drain				
Stage 2: Hot Wash	Fresh water	-	-	40°C → Temp. ramp at 3°C/min to 80°C → 10 min → drain
Stage 3: Neutralization	Green Acid	Initial rinse	1.20%	40°C → Temp. ramp at 3°C/min to 55°C → 5 min
	Invatex AC	Neutralization	0.50%	
	Invazyme CAT-I	Neutralizing agent	0.70%	55°C → 10 min → drained
Stage 4: Dyeing	Dyes		As per shade	30 min gradual dosing at 60°C → 10 min
	Caustic (Salt)	Salt	Light: 95 GPL Med: 118 GPL Dark: 177 GPL	20 min gradual dosing at 60°C → 10 min
	Soda Ash	Soda	24 GPL	20 min gradual dosing at 60°C → 10 min → Drain
	Green Soda-Lye	Soda	Light: 24 GPL Med: 24 GPL Dark: 36 GPL	
Stage 5: Neutralization and Washing	Green Acid	Acid	Light: 2.35% Med: 2.35% Dark: 1.76%	55°C → 15 min → Drain
	Fabcol DP	Soaping Agent	1.20%	[55°C → Temp. ramp at 2°C/min to 90°C → 10min → Drain] x2

*% of Greige Weight

7. Conclusion

The comprehensive technical trials undertaken beginning with a Baseline Trial using the standard dyeing process, followed by lab-scale recipe refinement, and commercial-scale validation trials with optimized recipes from DyStar and Archroma confirm that Brazilian cotton knit fabric can achieve dyeing quality at par with other origins. The central finding of this study is the successful development of validated Standard Operating Procedures (SOPs).

Key Performance Outcomes:

1. **Whiteness Index:** Brazilian cotton consistently achieves a high degree of whiteness, matching the performance of Indian cotton. The optimized recipes successfully delivered a 150+ whiteness index, aligning with international standards for white fabrics.
2. **Shade Depth and Consistency:** Across all tested shades (light, medium, and dark), Brazilian cotton fabric demonstrated shade strength that is at par or superior to the Indian cotton benchmark, proving that with optimized processing, excellent dye uptake is achievable and reproducible. However, baseline trials demonstrated that dyeing with black color will require higher dye dosage of 4–5%, which incurs an extra cost of ~3.5–4 US Cents/Kg of fabric.
3. **Visual Quality:** Brazilian cotton achieved consistently strong visual quality ratings (4.0+ average), performing at par or superior to the control fabric across critical parameters such as pilling and barre.

These findings confirm that the perceived processing challenges with Brazilian cotton are largely process-dependent rather than inherent to the fiber. Implementing the recommended Standard Operating Procedures enables facilities to achieve consistent, reproducible, and commercially acceptable dyeing results across a range of shades, establishing Brazilian cotton as a reliable source.

8. Limitations to the Study

The technical trials are subject to certain limitations, which should be considered when interpreting the results and applying them on a larger scale:

1. The trials were performed under controlled conditions using a specific fabric type. Accordingly, the recipe and process parameters may require modifications when applied to fabrics of different compositions or constructions.
2. These trials were carried out on a particular set of machinery and defined process. Change in machine type, configuration, process flow, or operating conditions may require modifications to the recipes and processes defined in the SOPs.
3. The auxiliaries used during the trials were sourced from DyStar and Archroma. If alternatives from other suppliers are used, optimization of process parameters, or concentration levels may be required to achieve desired results.
4. These trials were limited to a controlled production quantity. Scaling up may require adjustments and fine tuning to the recipes and process parameters to maintain consistency, reproducibility, and product quality.

The trials establish a strong technical foundation for processing Brazilian cotton knit fabrics; however, the findings should be viewed in the context of the specific trial conditions. Mills are therefore encouraged to conduct validation runs to adjust parameters based on their machinery setup, fabric characteristics, and operating conditions.

Contact us



Bernardo Sayão Industries
Sector (SIBS) Block 1, Set B, Lot
2, Abrapa Building, 1st floor
Zip Code 71736-102 – Núcleo
Bandeirante, Brasília-DF



61 3028-9700



faleconosco@abrapa.com.br



www.abrapa.com.br

