BREVIOL® DENIM
TECHNOLOGY

Pulcra Chemicals
The solution specialist

THE MOST ECOLOGICAL, SUSTAINABLE, SAFE AND EASY WAY

FROM COTTON TO JEANS

INTRODUCTION OF THE **BREVIOL® DENIM TECHNOLOGY**

The **BREVIOL® DENIM TECHNOLOGY (BDT)** is based on a polymer which react with the dyestuff as well as the fiber, forming a polymer net or chain that creates a ring resin effect, accelerating the exclusive ring dyeing characteristics.

The **BREVIOL® DENIM TECHNOLOGY (BDT)** is used in the Indigo and Sulfur dyeing processes, reducing the amount of water which is used after the dyeing process to remove the unfixed dyes which would normally go to the waste water treatment facilities.

This technology not only cares for the planet, offering a cleaner water-treatment concept, but is a cost-saving solution, using less water in the process and reducing the amount of dyes.

EFFICIENCY

The **BREVIOL® DENIM TECHNOLOGY (BDT)** ensures that almost 100 % of the applied dyestuff remains on the yarn, versus the standard process, where 15 to 25 % of the dye is eliminated by washed-off

ECOLOGY

Due to the reduction of the rinsing water flow and much less water contamination, makes the **BREVIOL® DENIM TECHNOLOGY (BDT)** a more ecological and sustainable process compared to the current technologies.

FASTNESS

Using the **BREVIOL® DENIM TECHNOLOGY (BDT)**, even without rinsing the dye, the washing fastness is much better than usual.

SHADE

The **BREVIOL® DENIM TECHNOLOGY (BDT)** gives the possibility – even only with indigo – to obtain shades differentiating from more "reddish-clean" to more "greenish-greyish"

CONTRAST

Thanks to the **BREVIOL® DENIM TECHNOLOGY (BDT)** performance, the generated effects are very unique, distinctive and contrasting/fashionable.

The fastness is improved.

SUSTAINABILITY

All mentioned characteristics make the **BREVIOL® DENIM TECHNOLOGY (BDT)** in pure indigo, topping, bottoming, black-denim and color-denim a more sustainable process with good fastness, more ecological due to their advantages of water savings and a much more cleaner process.

PROCESSES

PURE INDIGO

Process Bottoming, reddish and clean shade, more ring dyeing, intensity and good wash fastness properties. Effects in garments such as sand-paper or mechanical effects are easy to be applied. Process Topping, slightly greenish shade, high intensity and good wash fastness, better wash-down results.

BOTTOMING

BDT blocks the solubility of the sulfur dye during the indigo dyeing. Due to physical bonding and effects on the yarn, better ring effect is achieved (indigo is more superficial). More darker shades and not contamination. Not loss of the sulfur dye during the indigo dyeing.

TOPPING

Practically 100 % of the dyestuff remains on the surface of the yarn, and is not eliminated during the rinsing process, more safe and differentiated than the traditional topping process. Excellent contrast in stone-washed garments.

BLACK-DENIM

BDT provides a very dark shade and good fastness, without metallic aspect and neither bronzed appearance. Tendering effect practically disappears Very low contamination of the waste water enables to work non stop.

COLOR-DENIM

BDT is an easy way that gives very good uniformity of the dyes among different lots with a guaranty of a total dyestuff shade development.

BENEFITS:

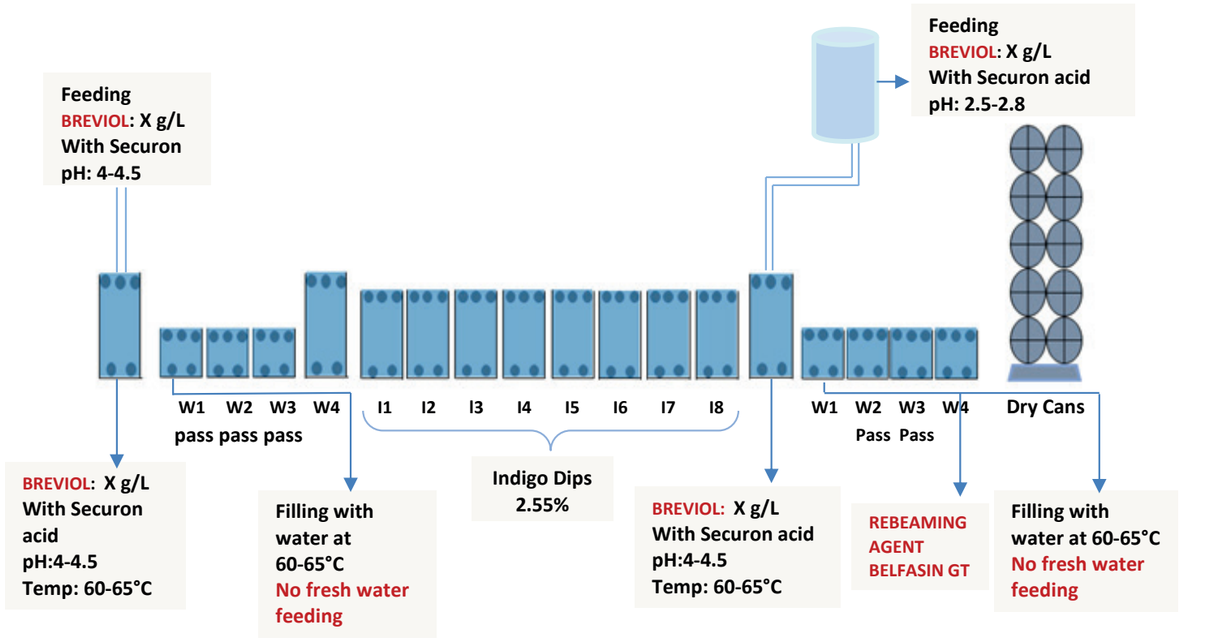
- Water Savings advantages
- Control of Indigo shade
- Less Waste Water Contamination, including water color
- Less energy and water consumption
- Provide Reduced Indigo and Sulfur Dye Usage & Cost Savings
- Less & Even Zero Dye Bleeding during Re-beaming, Sizing & Finishing Processes
- Provide an Ecological Overdyeing Process with / without a Steamer
- Reduce Fabric Back Staining
- Topping use less sulfur dyes, better fastness and clean weft in.
- Improve Dye Fastness properties & the ability to produce darker Dye shades
- Produce Special and better Ring Dyeing Effects
- Total elimination of bronzing effect

BREVIOL® DENIM TECHNOLOGY SAVINGS

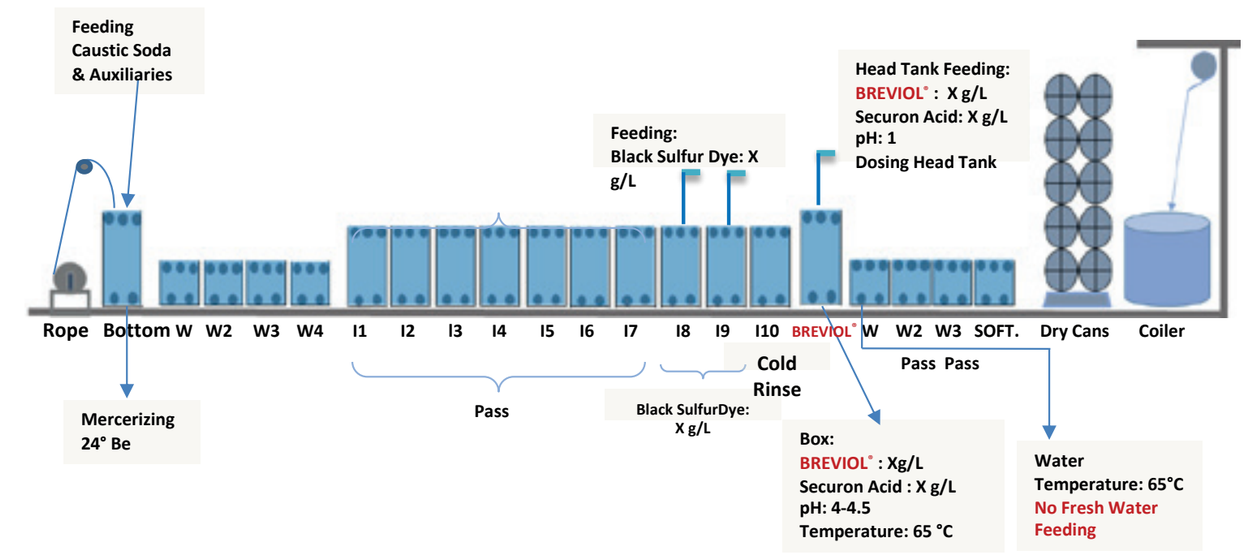
INDIGO DYESTUFF SAVINGS	SULFUR DYESTUFF SAVINGS	PURE INDIGO PROCESS	SULFUR BOTTOM + INDIGO TOP PROCESS	SULFUR BLACK PROCESS
20 - 25 %	20 - 30 %	75 - 95 % (WATER SAVINGS)	70 - 90 % (WATER SAVINGS)	40 - 50 % (WATER SAVINGS)

BREVIOL® DENIM TECHNOLOGY
EXAMPLE OF PROCESSES

BREVIOL WATERLESS CONCEPT



BREVIOL® SULFUR BLACK
WATERLESS ROPE DYEING PROCESS



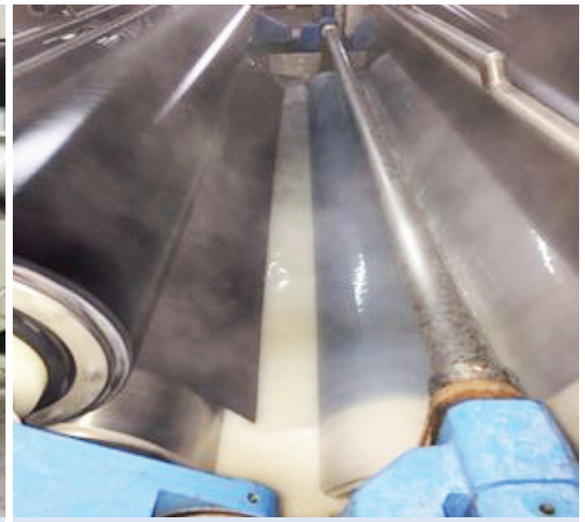
BREVIOL® DENIM TECHNOLOGY
EXAMPLE OF PROCESSES

- Breviol Waterless Concept / Indigo Dyeing
- Breviol Sulfur Black Waterless Rope Dyeing Process
- Breviol Sulfur Bottom & Indigo Top Rope Dyeing Waterless Process
- Breviol Sulfur Black Slasher Dyeing Waterless Process with Sulfur Dye reduction
- Waterless Sulfur Overdyeing Process
- Breviol Sulfur Bottom & Indigo Top Slasher Dyeing Waterless Process with Indigo Dye reduction
- Bottoming Waterless Process

WASTE WATER		**PH**	**BOD SPECIFIC (M G/L)**	**COD SPECIFIC (M G/L)**	**COLOUR GRADES PT-CO**	**FLOW (M^3/H)**
DYEING PROCESS CAUSTIFICATION + INDIGO DYEING						
1	**Standard Process 2,04 % Indigo o.w.y.**	12,13	3780,00	5780,00	12100,00	5,4
2	**BREVIOL® DENIM TECHNOLOGY Process 2,04 % Indigo o.w.y.**	13,47	740,00	2540,00	1140,00	4,4
DYEING PROCESS PRE-WETTING + INDIGO DYEING						
3	**Standard Process 2,3 % Indigo o.w.y.**	9,78	2600,00	3200,00	19350,00	5,4
4	**BREVIOL® DENIM TECHNOLOGY Process 2,3 % Indigo o.w.y.**	10,02	1360,00	2360,00	1980,00	4,4
5	**BREVIOL® DENIM TECHNOLOGY Process 3,58 % Indigo o.w.y.**	10,95	1220,00	2800,00	2260,00	4,4
6	**BREVIOL® DENIM TECHNOLOGY Process 5,76 % Indigo o.w.y.**	10,98	1980,00	3640,00	3500,00	4,4

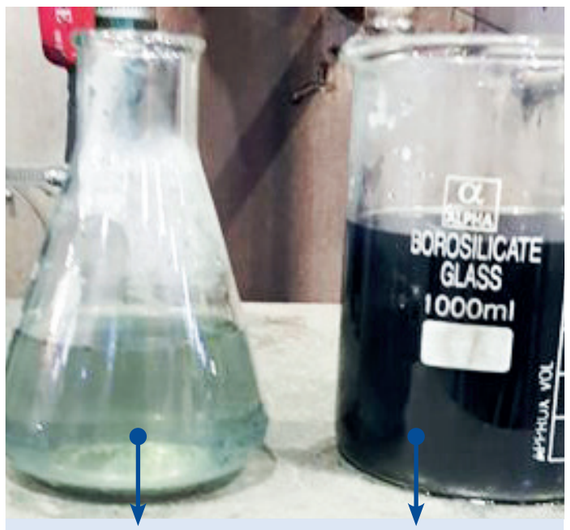
SLASHER DYEING PROCESS USING **BREVIOL® TECHNOLOGY**

Sample of Waste Water Collected at Waste Drain after 15,000 Meters of Dyed Yarn



Sizing Box after 15,000 Meters of Dyed Yarn

NORMAL PROCESS / **BREVIOL® PROCESS**



Waste Water from Indigo Wash Water Discharge after **BREVIOL® PROCESS**

Waste Water from Indigo Wash Water Discharge after NORMAL PROCESS

SIZING BOX from BREVIOL® PROCESS
No Black or Blue Color Contamination

SULFUR BLACK BOTTOMING DYEING

BREVIOL® WILL PREVENT BLEEDİNG / REDUCTİON OF SULFUR DYESTUFF INTO INDIGO DYE BATH DURING THE BOTTOMING PROCESS

DEGRADATION OF NORMAL SULFUR BOTTOM DYE BECAUSE OF REDUCTION

Normal sulfur bottom dyed shade

Reduced sulfur color after a reductive clearing process using the normal dyeing process

CONSTANCY OF SULPHUR BOTTOM DYE WITH BREVIOL® DENIM TECHNOLOGY

BREVIOL® DENIM TECHNOLOGY provides a darker sulfur dyed shade

BREVIOL® DENIM TECHNOLOGY process provides practically the same color strength after the reduction process

FABRIC DESCRIPTIONS

1. Normal Sulfur Bottom Dyed Shade
2. Reduced Sulfur Color after a Reductive Clearing Process using the Normal Dyeing Process
3. Breviol® Denim Technology Provides a Darker Sulfur Dyed Shade
4. Breviol® Denim Technology Process provides practically the same Color Strength after the reduction process

REMARKS

Breviol® Denim Technology provides a darker sulfur dyed shade and provides protection against chemical and environmental conditions including dye reduction which causes loss of color and shade change.

INNOVATION FOR
A SUSTAINABLE FUTURE

FOCUS ON **NATURAL** AND **SUSTAINABLE**

Pulcra Chemicals has a long history of using renewable resources to produce biodegradable and environmentally friendly products. For many years, we have produced sizing products based on natural polymers with film-forming properties. These polymers ensure trouble-free production in the weaving mill – 24 h a day, with maximum efficiency.

A large number of our formulations are based on components obtained predominantly from renewable raw materials. We are represented with these products in many application areas in the fiber, textile and leather industries for a wide range of articles and markets. The focus is not only on the products themselves, but also on carrying out processes that consume less time, water and energy and leave a smaller CO_2 footprint. We are always striving to optimize and simplify these processes, and to develop more environmentally friendly and efficient products that offer a good cost-benefit ratio for sustainable production.

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Pulcra Chemicals
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