

Textile Effects

Gentle Power Bleach™

New high-quality, environmentally friendly peroxide bleaching process



Sustainable bleaching at
low temperature and neutral pH



Perfect preparation • Responsible technology • Soft handle

New high-quality, environmentally friendly peroxide bleaching process

The Gentle Power Bleach™ is the latest innovative pretreatment process from Huntsman Textile Effects. This revolutionary, enzyme-based peroxide bleach allows low temperature bleaching of textiles at a neutral pH range. This outstanding new system excels in its capability to process textiles more sustainably whilst delivering textile goods with an enhanced quality.

Perfect
preparation

Gentle and versatile bleaching at its best

The novel gentle bleaching process is truly innovative. Because gentle bleaching takes place at a low temperature of 65 °C and at almost neutral conditions, it is especially suitable for all fibers that are temperature and pH sensitive.

By applying the latest enzyme technology as a core component of the solution it is now possible, under these mild conditions, to prepare cotton with very good results ready for dyeing.

On regenerated cellulosic fibers, excellent full white levels can be obtained and there is no negative impact on the characteristic property of non-fibrillating lyocell.

Although the technology is completely new, the process flow remains similar to the current state-of-the-art pretreatment system SMART PREP. The Gentle Power Bleach™ is applicable on all closed discontinuous equipments such as jet, jigger, overflow and cheese dyeing machines.

A liquid system is offered suitable for automatic dosing systems.



Gentle Power Bleach™



Q U A L I T Y

Soft handle, brilliant color

Gentle in application, soft and smooth to the touch

In the case of cotton, fabrics pretreated with the Gentle Power Bleach™ have a superior handle compared to conventionally bleached goods.

- Extremely soft, bulky and natural handle
- The effect is fast and permanent
- The crease recovery properties are excellent
- Sewability (needle resistance) and stretch are improved

The very mild process conditions also assure maximum strength of the textile material with the lowest degree of chemical damage on cotton seen in the industry (especially important in case of moist cross linking finish).

Giving you the colors you want to see

The Gentle Power Bleach™ brings the following advantages to the subsequent dyeing process:

- In many cases a better color yield
- Better appearance and brighter shades
- Savings in dyeing costs possible
- Similar or even better wash-, water- and rubbing-fastness properties

The Gentle Power Bleach™, the perfect pretreatment for excellent dyeing results.



E C O N O M Y

Process optimization

Keeping cost conscious customers in mind

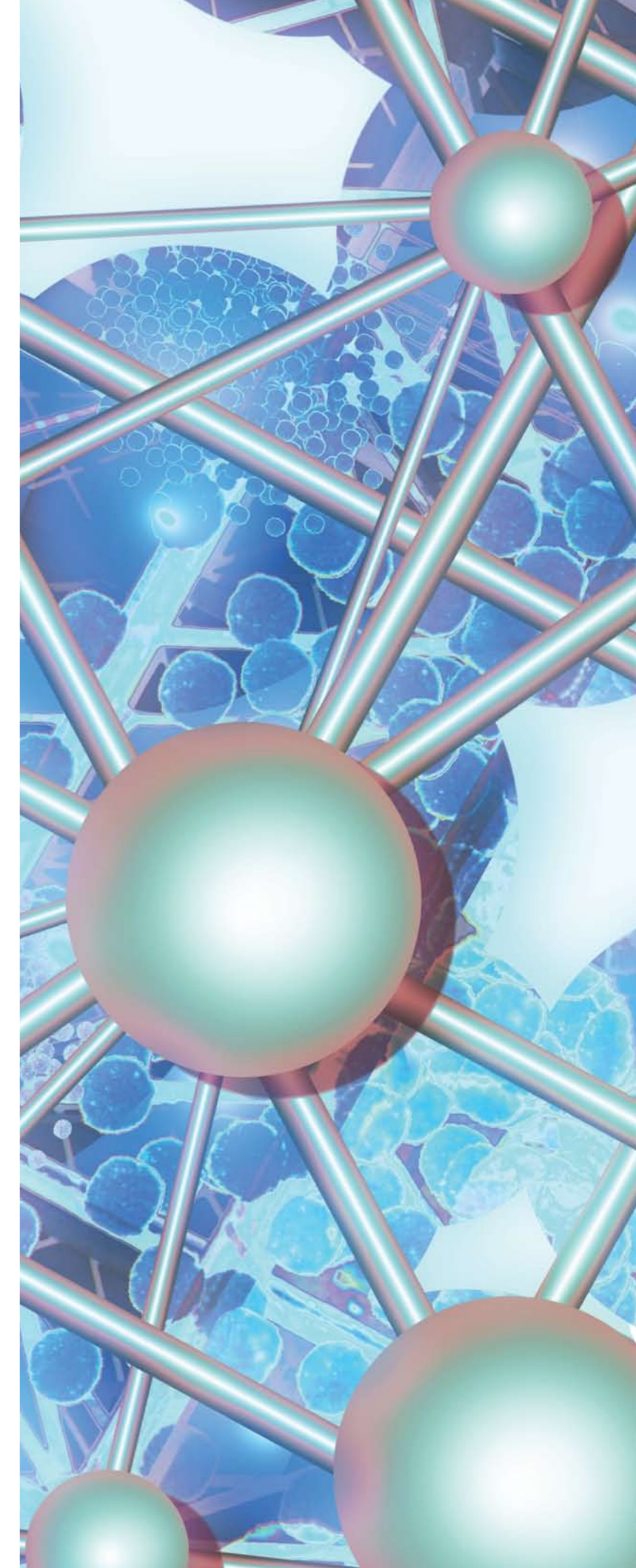
Savings in energy consumption by almost half are possible due to the considerably lower treatment and rinsing temperature.

Compared to conventional bleaching systems no neutralization is required and at least one or two rinsing baths can be omitted leading to a strong reduction in water usage.

When treating cotton, savings over traditional bleaching are attainable thanks to the fact that the weight loss is reduced considerably. As the material remains naturally soft and bulky, possible savings in softening and lubrication can be obtained or new unattained softness levels are reachable.

The Gentle Power Bleach™ further markedly enables improvements in right first time production reducing costly re-works:

- Improved reproducibility in reactive dyeing by avoiding the risk of too high residual alkalinity at the beginning of the dyeing cycle
- Less swelling of the natural fiber and avoidance of 'channeling' effect in yarn cheese dyeing machines leading to more uniform results
- Lower risk for crease marking in piece good and garment processing



S U S T A I N A B I L I T Y

Responsible technology

Saving energy and water resources for future generations

Primarily the low use of water and energy makes this process environmentally friendly.

The Gentle Power Bleach™ is unique in the field of energy reduction by lowering the treatment temperature from the boil down to 65°C. Even the rinsing step is conducted below this temperature.

Additionally, the effluent salt load is reduced by avoiding harsh chemicals such as caustic soda. All auxiliaries used show an excellent bio-elimination, free of APEO and AOX.

The Life Cycle Assessment (LCA) of the Gentle Power Bleach™ process on cotton indicates about 25% lower climate change impact compared to a conventional bleaching process (preliminary results in kg CO₂ eq./per kg bleached cotton).

The Gentle Power Bleach™ is the way forward. With its innovative enzymatic peroxide bleach technology it is paving the way to help the textile industry make better use of scarce natural resources and contributes to a more sustainable environment for future generations.

C O O P E R A T I O N

Towards a sustainable world



Huntsman and Genencor—committed to the future

Both Genencor and Huntsman have a long-standing history in the textile industry. Genencor focuses on discovering, developing, and delivering highly innovative, eco-friendly, efficient enzyme technologies. Huntsman Textile Effects is constantly developing new platforms that will improve fabric performance and reduce energy and water consumption in the textile industry. This joint effort is devoted to contributing towards making the textile industry more sustainable.

Gentle Power Bleach™ exemplifies Huntsman's commitment to innovation and sustainability. By avoiding the use of harsh chemicals and achieving its potential at low treatment temperatures, it meets our promise of delivering environmentally friendly products with lower process costs. All of this with the added value of enhanced quality textiles with brilliant colors and unmatched soft and bulky handle.



FACTS AND FIGURES

Gentle Power Bleach™ on cotton and elastane blends—perfect preparation for colorful dyeing

Sustainable enzymatic peroxide bleaching at low temperature and neutral pH in discontinuous application

Gentle and mild conditions for powerful bleaching

Perfect preparation

Even after bleaching at 65 °C and at neutral pH the cotton is perfectly prepared for dyeing all shades. Additional benefits are extremely good fibre protection, no chemical damage on cotton (especially important in case of moist cross linking finish).

Soft handle

Outstanding soft, bulky and natural handle. Extremely crease recovery and fabric properties such as sewability, burst strength and stretch.

Brilliant colors

Better color yield possible, better appearance with more vivid and intense shades. Excellent fastness properties.

Process optimization: cost savings

Energy and water savings due to very low bleaching and wash-off temperature and less rinsing. Reduced weight loss. No neutralization required. Savings in softening and lubrication.

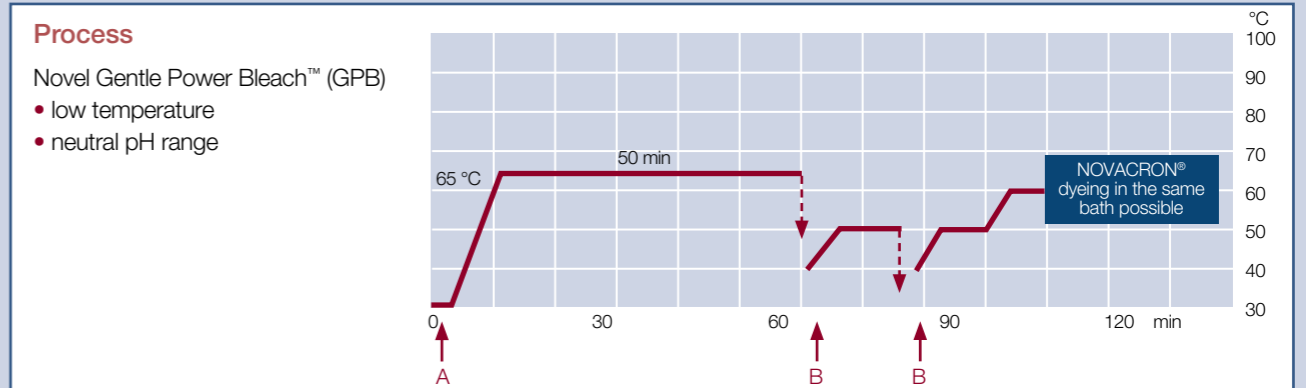
Process optimization: improved reproducibility

No danger of residual alkali, the main cause of faulty dyeings. Less fiber swelling avoids channeling effect in yarn packages. Lower risk of crease marking for piece goods and garments. Improved right first time production.

Responsible technology

No harsh chemicals such as caustic soda applied. Reduced salt load in the effluent. Considerable energy and water savings. All Gentle Power Bleach™ auxiliaries are free of APEO and AOX.

The Life Cycle Assessment (LCA) of the Gentle Power Bleach™ process on cotton indicates about 25% lower climate change impact compared to a conventional bleaching process (preliminary results in kg CO₂ eq./per kg bleached cotton).



Recipe

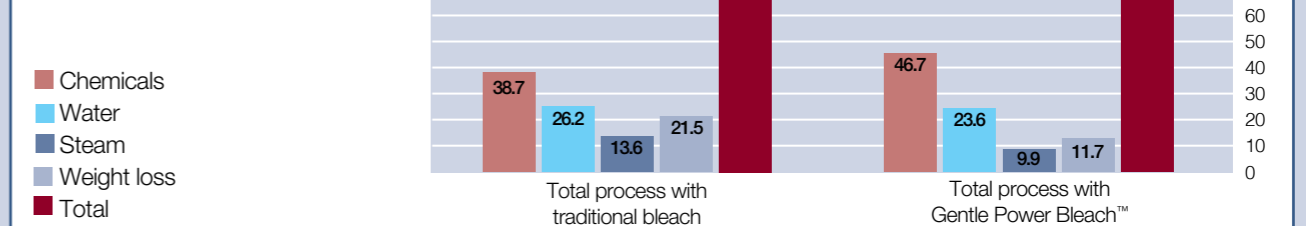
Application: Exhaust
 Material: CO, CO/EL, knitgood, yarn, woven and terry towel
 Machine: Closed equipment e. g.: Jet, overflow, jig, package dyeing machine ...

			Low liquor ratio 4:1 – 6:1	High liquor ratio 8:1 – 12:1
A	CLARITE® LTC	g/l	2.0	1.5
	INVATEX® LAB or soda ash	g/l	7.5 or 3.0	5.0 or 2.0
	INVATEX® LTA	g/l	4.5	3.0
	H ₂ O ₂ 35%	ml/l	9.0	6.0
	INVAZYME® LTE	g/l	1.5	1.0
B	INVAZYME® CAT (2x)	g/l	0.7	0.5

Process condition: bleaching 50 min at 65 °C, draining, rinsing 2x10 min at 50 °C.
 Woven and terry towel preparation: add INVAZYME® ADC for starch desizing.

Cost comparison

Traditional bleach+dyeing+finishing versus GPB+dyeing+finishing



Product overview

CLARITE® LTC Combination product for the low temperature Gentle Power Bleach™ with excellent wetting, detergent and dispersing properties

INVATEX® LTA Agent to assist and boost the peroxide reaction in the Gentle Power Bleach™

INVAZYME® LTE Enzyme for the Gentle Power Bleach™ to catalyse the peroxide bleach in combination with INVATEX® LTA

INVATEX® LAB Liquid buffer system for optimum pH setting and regulating

INVAZYME® CAT Stabilized, liquid catalase-enzyme to remove residual peroxide after discontinuous peroxide bleaching

NOVACRON® Reactive dye ranges NOVACRON® FN and S are recommended for dyeing at 60°C

Gentle Power Bleach™

FACTS AND FIGURES

Gentle Power Bleach™ on regenerated cellulosic fibres and blends sensitive to temperature and pH

Sustainable enzymatic peroxide bleaching at low temperature and neutral pH in discontinuous application

Gentle and mild conditions for powerful bleaching

ONE recipe for all fibres sensitive to temperature and pH

Regenerated cellulosic fibres such as viscose, (micro)-modal, lyocell, bamboo and its blends with cotton, elastane, acetate, acrylic, silk, wool.
Similar bleaching recipe for all fibres and blends resulting in simple recipe management with reduced sources of errors.

Perfect preparation

Even after bleaching at 65 °C and at neutral pH the fibres are perfectly prepared for dyeing all shades.
Excellent full white levels can be obtained on regenerated cellulosic fibres.
Extremely good fibre protection, no chemical damage on cellulosic fibres.
No negative impact on the characteristic property of non-fibrillating lyocell.

Outstanding crease recovery

Extremely good crease recovery and fabric properties such as burst strength and stretch.
Soft and bulky handle.

Brilliant colors

Bright and deep shades with excellent fastness properties.

Process optimization: reduced consumption

Energy and water savings due to very low bleaching and wash-off temperature and less rinsing.
No neutralizing required. Savings in softening and lubrication.

Process optimization: improved reproducibility

Lower risk of crease marking for piece goods and garments.
No danger of residual alkali, the main cause of faulty dyeings. Improved right first time production.

Responsible technology

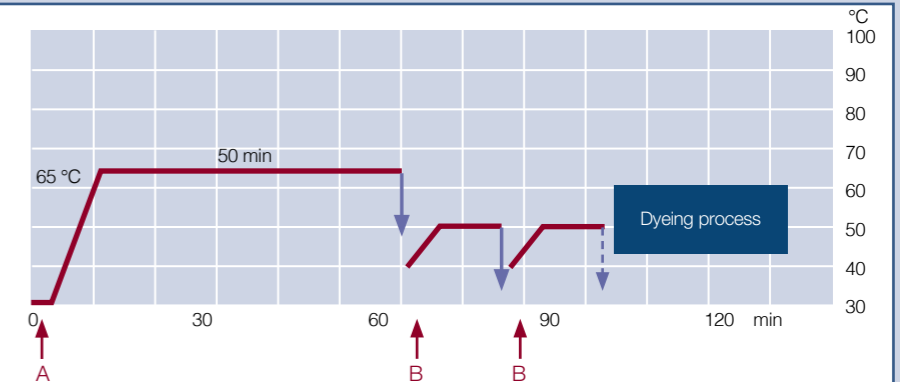
No harsh chemicals such as caustic soda applied. Reduced salt load in the effluent.
Considerable energy and water savings. All Gentle Power Bleach™ auxiliaries are free of APEO and AOX.

Gentle Power Bleach™, our contribution to a more sustainable textile industry.

Process

Novel Gentle Power Bleach™ (GPB)

Chart: preparation for dyeing



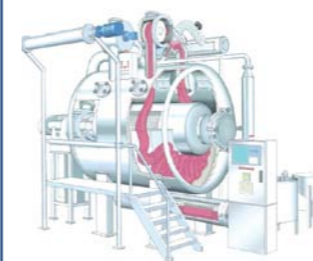
Recipe

Application: Exhaust
Fibres: CV, CMD, CLY, bamboo and its blends with CO, EL, CA, PAN, S, WO
Makeup: knitgood, woven, garment and yarn
Machine: Closed equipment e. g.: Jet, overflow, jig, package dyeing machine ...

		Low liquor ratio 4:1 – 6:1	High liquor ratio 8:1 – 12:1
A	CLARITE® LTC	g/l 2.0	1.5
	INVATEX® LAB or soda ash	g/l 7.5 or 3.0	5.0 or 2.0
	INVATEX® LTA	g/l 4.5	3.0
	H ₂ O ₂ 35%	ml/l 9.0	6.0
	INVAZYME® LTE	g/l 1.5	1.0
B	INVAZYME® CAT (2x)	g/l 0.7	0.5

Process condition: bleaching 50 min at 65 °C, draining, rinsing 2x10 min at 50 °C.
Woven and terry towel preparation: add INVAZYME® ADC for starch desizing.

Bulk example



CV/EL (94/6) knit	Degree of whiteness <i>Berger</i>	Degree of polymetrisation <i>DP value</i>	Highlights
Grey material heatsetting 20 sec 170°C	32.9	386	• Fantastic handle
Gentle Power Bleach™	70.1	371	• Brilliant and intense shades • Great elasticity and stretch

Degree of whiteness also sufficient for full white with UVITEX® brighteners

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INVAZYME® LTE Enzyme for the Gentle Power Bleach™ to catalyse the peroxide bleach in combination with INVATEX® LTA
INVATEX® LAB Liquid buffer system for optimum pH setting and regulating
INVAZYME® CAT Stabilized, liquid catalase-enzyme to remove residual peroxide after discontinuous peroxide bleaching
UVITEX® Range of fluorescent whitening agents for all fibres

Gentle Power Bleach™

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