FUNCTIONAL FIBRES

A NEW CREASELESS AND WRINKLE FREE LINEN FABRIC... THANKS TO A NATURAL TREATMENT !

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BECAUSE OF THEIR STRUCTURE, COMPOSITION AND ARCHITECTURE FLAX FIBERS HAVE SOME OUTSTANDING PROPERTIES. THEY HAVE A HIGH MOISTURE ABSORPTION RATE.LINEN "HOLLOW FIBER" STRUCTURE ADDS A THERMO REGULATION FUNCTION TO THE FABRIC. ITS ABSORBENCY AND CONSTANT COOL WEARING PROPERTIES MAKES IT AN IDEAL MATERIAL THAT CAN BE WORN IN CONTACT WITH THE SKIN. BUT LINEN FABRIC CARE CAN BE LIMITED AND RESULTS CAN BE VERY DISAPPOINTING AND IF NOT OFF-PUTTING WHEN MACHINE WASHED SINCE THE FABRIC CAN SHOW WRINKLES AND CRACKS WHICH DO NOT DISAPPEAR WHEN PRESSED WITH A HOT IRON !

It is possible to improve the crease resistance of a linen fabric and makes it easier to iron thanks to a liquid ammonia treatment; this chemical substance is omnipresent in the living world and is already used in the finishing industry to produce non-iron cotton shirts.

Flax has some hypoallergenic properties that are not altered by the ammonia treatment. And to prove it the process named "Beau Fixe®" developed by Veramtex in Belgium not only it uses a natural product which provides a healthy textile material completely free of this reagent but it also avoids every gas or liquid pollution discharge thanks to successive ammonia recovery, purifying and recycling processes. After this finishing treatment flax fibers still meet eco-friendly requirements.

This process is in conformity with Oeko-Tex standard 100 that is the best certification that the treated linen fabric is free of any harmful products and with Oeko-Tex standard 1000 which guarantees that the process is eco-friendly. Veramtex is the only textile company in Benelux and in France which products are bearing the Oeko-Tex standard 1000 label.

The process is composed of the three major steps :

1- Impregnation of products with liquid ammonia at - 33°c

2- Ammonia removal and recovery

3- Drying

During step 2, ammonia evaporation can be done according to 2 different removal operations using either Evaporator Rollers (ARE) heated with water vapor followed by the removal of the remaining ammonia by water washing or Without Evaporator Rollers (SRE) followed by the removal of the entire impregnation ammonia solution by water washing.

- The first target study on the "Beau-Fixe" SRE treatment on pure linen fabric allowed us to draw the following observations :

When it comes to "Without Evaporator Rolls" treatment the results obtained are better if the cloth was dyed before rather than bleached only Tinctorial affinity has been improved using the "SRE" removal process.

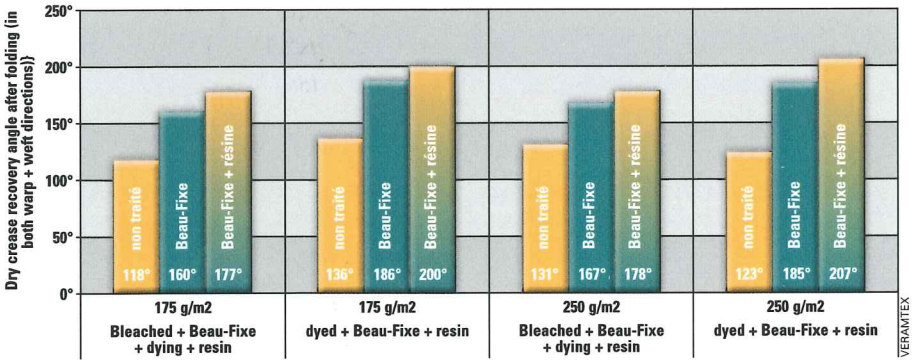
- A second study based on both ammonia removal processes has led to the conclusion that on a dyed cloth the sole Beau-Fixe treatment has given better results with the "SRE" removal process as far as crease recovery angle tests (dry angle) are concerned.
- A final resin treatment applied by dry cross linking right after the Beau-Fixe treatment is not absolutely necessary since the crease resistance increases significantly with the sole Beau-Fixe treatment.

CREASE RECOVERY RESULTS, 1ST STUDY

Beau-Fixe treatment using « Without Evaporator Rollers » process on 100 % linen fabrics :

- Results are better on fabrics previously dyed before undergoing the Beau-Fixe treatment
- Improvement is visible right after the Beau-Fixe treatment

Results of the 1st study : Dry crease resistance
100% linen fabrics
(Bleached +Beau-Fixe + Dying + resin) and (dying + Beau-Fixe +resin)
Beau-Fixe treatment "Without Evaporator Rolls"



RESULTS OF THE 2ND STUDY

Beau-Fixe Treatment "Without Evaporator Rollers" and "With Evaporator Rollers".
To increase crease recovery angles of pure dyed linen fabrics, the sole Beau-Fixe treatment followed by ammonia removal "Without Evaporator Rollers" (SRE) is preferable to the same Beau-Fixe treatment followed by ammonia removal of "With Evaporator Rollers"(ARE) and this no matter what type of resin treatment is used.

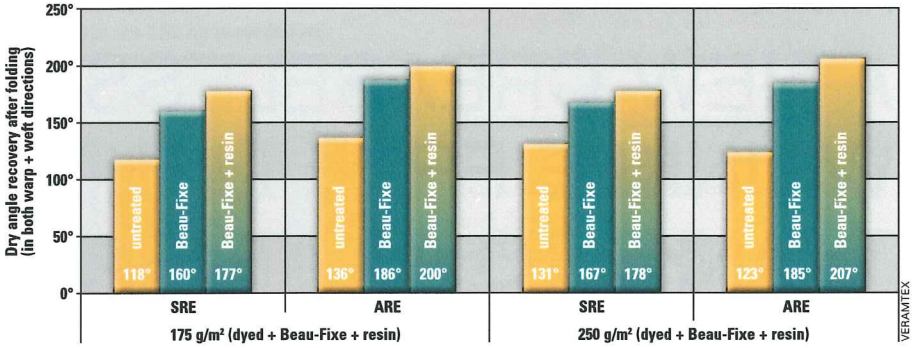
ANALYSIS OF THE AVERAGE RESULTS OF DRY AND WET CREASE RECOVERY

Table of data ratios for dry and wet crease recovery between a pure linen fabric (dyed + Beau-Fixe treatment) and a pure linen fabric (dyed + resin but No Beau-Fixe Treatment) as well as between a pure linen fabric (dyed + Beau-Fixe Treatment + resin) and a pure linen fabric (dyed but No Beau-Fixe Treatment) and according to "SRE" or "ARE" processes.

DRY CREASE RECOVERY

It can be noted that with the ammonia removal process "Without Evaporator Rollers" and after the Beau-Fixe treatment there is a significant improvement of 46 % and an additional increase of 9 % after the resin finishing treatment. It can be noted that with the ammonia removal process "With Evaporator Rollers" and after the Beau-Fixe treatment there is a sharp improvement of 37 % and an additional increase of 7% after the resin finishing treatment.

Results of the 2nd study : Dry Crease recovery
100 % linen fabric (dyed + Beau-Fixe + resin) according to "SRE" or "ARE" processes



WET CREASE RECOVERY

It can be noted that with the ammonia removal process "Without Evaporator Rollers" and after the Beau-Fixe treatment there is an interesting improvement of 17 % and an additional increase of 12 % after the resin finishing treatment.
It can be noted that with the ammonia removal process "With Evaporator Rollers" after the Beau-Fixe treatment there is a 12 % improvement and an additional increase of 14 % after the finishing resin treatment.

CONCLUSION

The effect of the sole Beau-Fixe treatment is more important than that of the resin finishing treatment. The improvement rate that can be noted after the resin finishing treatment on pure linen fabrics treated "Beau-Fixe" is better with the ammonia removal treatment "Without Evaporator Rollers". The applied resin seems to be optimized owing to that removal process. Therefore the application of a finishing resin might not actually be necessary.

Development granted by Brussels-Capital Region

DRY CREASE RECOVERY

	175 g/m²	180 g/m²	250 g/m²	560 g/m²	moyenne	écart (*)
Dyed + Beau-Fixe treatment (SRE)/ dyed but untreated	137%	165%	150%	132%	146%	9%
Dyed + Beau-Fixe treatment (SRE)+ resin / dyed but untreated	147%	177%	168%	147%	160%	
Dyed + Beau-Fixe treatment (ARE)/ dyed but untreated	123%	166%	134%	126%	137%	7%
Dyed + Beau-Fixe treatment (ARE) + resin / dyed but untreated	132%	177%	138%	140%	147%	

(*) Deviation represents the variation between "Beau-Fixe" and "Beau-Fixe" + resin treatment

WET CREASE RECOVERY

	175 g/m²	180 g/m²	250 g/m²	560 g/m²	moyenne	écart (*)
Dyed + Beau-Fixe treatment(SRE) / dyed but untreated	112%	120%	121%	115%	117%	12%
Dyed + Beau-Fixe treatment (SRE) + resin / dyed but untreated	124%	126%	131%	142%	131%	
Dyed + Beau-Fixe treatment (ARE)/ dyed but untreated	108%	104%	109%	127%	112%	4%
Dyed + Beau-Fixe treatment (ARE)+ resin / dyed but untreated	115%	108%	111%	132%	117%	

(*) Deviation represents the variation between "Beau-Fixe" and "Beau-Fixe" + resin treatment

PERSPECTIVES

THIS STUDY HAS LED TO NEW PERSPECTIVES FOR PURE LINEN FABRIC FINISHING DEDICATED TO CLOTHING AND/OR FURNISHING FABRICS WHICH GUARANTEE FORMALDEHYDE FREE PRODUCTS THAT MEET ENVIRONMENTAL REQUIREMENTS AND PROVIDE "NATURAL FEATURE" TO THE MATERIAL TOGETHER WITH EASY-CARE PROPERTIES CURRENTLY DESIRED BY THE CUSTOMER.

Test Results carried out on pure linen samples with the Beau-Fixe treatment in the field of printing confirm the interest of this process which provides wrinkle free and softer handle fabrics with better color rendering and better color fastness results after several washings. Veramtex Company located in Brussels in Belgium is a fully equipped facility, unique in Europe with a reliable and constant industrial production and treats 12 million meters per year of 100% pure cotton fabrics. Consequently, natural-based textiles such as cotton, flax, hemp, treated with the "Beau-Fixe" process are showing sustainable product characteristics that are more and more requested owing to many improved properties that meet eco-friendly requirements.