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ROCKSOFT™BioACE PLUS

Product #112

(Considerations in applications to **Biofinishing**.)

I. INTRODUCTION:

ROCKSOFT™BioACE PLUS is a liquid cellulase enzyme that can effectively be used for biofinishing of cellulosic fabrics. **ROCKSOFT™BioACE PLUS** is an acid cellulase that performs best at a pH of 4.5 – 5.0 and a temperature of 45°C – 60°C (113°F – 140°F). **ROCKSOFT™BioACE PLUS** is designed for use in biofinishing of all cellulosic fabrics including, but not limited to, cotton, rayon, linen, flax, ramie, and Tencel™.

II. PHYSICAL PROPERTIES:

Appearance: Medium to dark amber liquid (Note that color does not affect or reflect activity.)
Odor: Slight fermentation odor
pH (as is): 4.8 ± 0.5
Density: 1.15-1.25
Activity: > 1,380 DTU/g

III. PRODUCT CAPABILITIES:

When run as directed in this bulletin, **ROCKSOFT™BioACE PLUS** can be utilized to accomplish the following:

1. Reduce the fuzz and pilling, soften and smooth the hand, and increase the gloss/luster and yield a fuller, deeper color by the biofinishing of garments before or during the garment dyeing cycle.
2. Significantly soften 100% cotton fabrics, both woven and knits.
3. Appreciably remove the fuzz and cotton pill balls from garments, sweaters, socks and others as a result of long wet processing or garment dyeing cycles.
4. Biofinishing may be performed in either semi-continuous or batch process.



ROCKSOFT™ BioACE PLUS (left) versus competitive acid cellulase (right) at equivalent dosage, time, and temperature.

IV. PROCESSING CONDITIONS: GENERAL:

ROCKSOFT™BioACE PLUS will function from a pH of 4.5 to 5.5. We recommend an operating pH range of 4.5 to 5.0 with a 4.8 as an optimum. Acetic acid based pH controls are preferred over citric or phosphate.

ROCKSOFT™BioACE PLUS may be applied at any wet processing step in the garment finishing process. We have found **ROCKSOFT™BioACE PLUS** is best applied after preparation/bleaching, either as a separate process or in connection with garment dyeing. However, **ROCKSOFT™BioACE PLUS** biofinishing may also be processed after dyeing.

When combined with other processes, the treatment conditions should be appropriate for both processes. Note that the amount of **ROCKSOFT™BioACE PLUS** may need to be adjusted for less than ideal processing conditions.

ROCKSOFT™BioACE PLUS will function from 45°C – 60°C (113°F – 140°F).

The closer the operating parameters are kept to the above recommendations, the better the utilization of **ROCKSOFT™BioACE PLUS**. The recommended liquor to good ratio is 8:1 to 15:1 for softening and pill removal.

V. RECOMMENDATIONS FOR USAGE:

Biofinishing

Processing:

1. Follow your normal "desize" and rinse procedures that are currently being utilized. Insure that the bath and garments are pH 7.0 or less before starting the biofinishing cycle

2a. As a separate processing step The loading and machine rotation should be the same used for dyeing. The liquid to goods ratio should be 8:1 to 15:1. The pH should be adjusted to pH 4.5 – 5.0 with an acetic (acetate) based buffer.

Enzyme concentration will depend on fabric type, but should start in the 0.25% to 1.5% owg (5g per kg of fabric to 15g per kg of fabric) range.

The cycle should last from 20 to 45 minutes at a temperature range of 45°C – 60°C (113°F – 140°F). The treatment should be terminated by raising the temperature to 71°C 75°C (160°F – 167°F) for 5 – 10 minutes or raising the pH to 9 – 10 with soda ash (sodium carbonate). The balance of the processing can now be carried out.

2b. Combined with dyeing (bifunctional reactive dye for example.)

The liquid to goods ratio should be 8:1 – 15:1. The initial bath conditions should be 30°C (86°F). Add the dye, salt and **ROCKSOFT™BioACE PLUS**. Adjust pH to 4.5 – 5.0 with an acetic buffer. Raise the temperature 1°C (1.8°F)/minute to 60°C – 80°C (140°F – 176°F). Alkali should be added in the usual manner. Maintain this temperature as would be done for a normal dyeing.

The garments can now be finished in the usual manner or can be treated again using step #1 and #2a.

Note: The very next step after the **ROCKSOFT™BioACE PLUS** process should be the inactivation step accomplished by raising the pH above 8.0 or raising the temperature above 71°C (160°F) for 10 minutes.

Process Control:

The biofinishing process normally is controlled directly or indirectly by monitoring the weight loss of the fabric. A weight loss inevitably will mean some fabric strength loss as well. The strength loss can, however, be kept low by terminating the biofinishing process in time. A weight loss of 3 – 5% usually reflects a proper biofinishing effect without excessive loss of fabric strength.

Special

Processing Notes:

1. Check the weight loss vs. fabric strength loss vs. the "look" you achieve before committing volume goods.
2. The liquor ratio should allow free movement of the goods, but should be low enough to create the mechanical action required to achieve the weight loss or biofinishing. The high impact of mechanical action is necessary in order to achieve the desired biofinishing effect.
3. Any anionic surfactants, or those containing sulfate or sulphonate groups, should not be used with **ROCKSOFT™BioACE PLUS**. We recommend linear alcohol ethoxylates.

100% Cotton Softening:

To soften we recommend the following parameters.

Liquor to goods ratio: 8:1

pH: 4.8 (with acetic acid or buffer)

Temperature: 45°C – 60°C (113°F – 140°F)

ROCKSOFT™BioACE PLUS concentration: 0.25 – 1.5% owg

Time: 20 – 60 minutes depending on desired softness.

To achieve an even softer hand, we suggest the addition of 1% - 3% of an amino functional silicone, like **SPRINGSOFT #104** fabric softener, after running 2/3 of the total cycle time and completing the cycle. Follow this with several neutral rinses, extract and dry.

Fuzz/Pillball Removal:

Using the above process parameters, 0.25% - 0.75% owg **ROCKSOFT™BioACE PLUS** has been found effective in the removal of fuzzballs and fuzziness when run for 15 to 20 minutes.

VI. STORAGE CONDITIONS/ACTIVITY:

ROCKSOFT™BioACE PLUS retains more than 90% activity after four months when stored at 25°C (77°F) out of direct sunlight and in the original, closed container. **ROCKSOFT™BioACE PLUS** also retains more than 90% activity after 1 month when stored at 38°C (100°F). Do not let freeze.

VII. INACTIVATION:

ROCKSOFT™BioACE PLUS can be inactivated by raising the pH above 11 or use **DAD** alkaline detergent at 2.0% OWG or temperature above 71°C (160°F) or a combination of the two. After the desired effect has been achieved, we recommend inactivating **ROCKSOFT™BioACE PLUS** with in the next operating bath.

VIII. PACKAGING:

ROCKSOFT™BioACE PLUS is packaged in 240 kg polyethylene drums.

IX. TECHNICAL SERVICE:

Information covering specific applications for this product is available from your Dyadic International sales/technical representative. We will work with you to enhance processes and solve problems, in addition to assisting you in achieving the end result/look desired. Call your sales/technical representative for any questions, comments, or help that you need!

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