

REPORT ON THE WASH FASTNESS OF CHITOSAN IN REGENERATIVE SHEETS

**Document compiled by:
The Intelligent and Functional Textile Research Group**

Group leader: José Gisbert (jgisbert@aitex.es)

INDEX

1. OBJECTIVE.....	2
2. THEORETICAL FUNDAMENTALS.....	2
3. METHODOLOGY.....	2
4. RESULTS.....	3
4.1. Sample reference: UNWASHED SHEET.....	3
4.2. Sample reference: SHEET (AFTER 10 WASHES).....	3
4.3. Sample reference: SHEET (AFTER 30 WASHES).....	4
5. CONCLUSIONS.....	4

1. - OBJECTIVE

The objective of this study is to ensure the presence of the regenerative active ingredient, Chitosan, within the textile structure of the sheet developed by Aznar Textil, S.A. after a number of wash cycles to ensure that the functional properties of the sheet are wash and wear-resistant.

2. - THEORETICAL FUNDAMENTALS

Chitosan is the only active ingredient in the Zazen Regeneradora sheet produced by Aznar Textil. Given that AITEX were not able to establish a quantitative testing method for the Chitosan particle, but that said particle possesses bactericidal properties, it was determined that if the bactericidal properties are unaltered in unwashed and washed samples, then the active ingredient must be present within the fibres in sufficient quantities to perform its function.

3. - METHODOLOGY

Aznar Textil supplied AITEX with three samples of the regenerative sheet, one of which had not been washed, another that had, according to Aznar Textil, been through 10 industrial wash cycles using hospital wash programmes, and a third that had, according to Aznar Textil, been through 30 of the same wash cycles.

AITEX performed bactericidal effectiveness tests on the bacteria *Staphylococcus epidermidis* ATCC 1798 on the three samples according to AATCC Test Method 100-2004, which allows a quantitative procedure for the evaluation of the degree of bactericidal activity in treated textile materials. This method must be used when the textile material is known to possess or implies bactericidal or bacteriostatic behaviour.

The test consists of the inoculation of the material with an appropriate microorganism so that, 20 hours after the microorganism has come into contact with the material, the percentage of reduction in the microorganism originated by the antibacterial agent can be determined.

4. - RESULTS

The results obtained after the analysis of the three samples are displayed below:

4.1. Sample reference: UNWASHED SHEET

Microorganism used: *Stahylococcus epidermidis* ATCC 1798.

Results:

Count cfu/ml		% reduction in growth
<i>Staphylococcus epidermidis</i> ATCC 1798		
Time 0 hours	105.690	100
Time 20 hours	<20	

4.2. Sample reference: SHEET (10 WASH CYCLES)

Microorganism used: *Stahylococcus epidermidis* ATCC 1798.

Results:

Count cfu/ml		% reduction in growth
<i>Staphylococcus epidermidis</i> ATCC 1798		
Time 0 hours	145.000	100
Time 20 hours	<20	

4.3. Sample reference: SHEET (30 WASH CYCLES)

Microorganism used: *Staphylococcus epidermidis* ATCC 1798.

Results:

Count cfu/ml		% reduction in growth
<i>Staphylococcus epidermidis</i> ATCC 1798		
Time 0 hours	145.000	100
Time 20 hours	<20	

5. CONCLUSIONS

After the tests were completed it was concluded that the three samples analysed demonstrated antibacterial behaviour after 24 hours of contact with *Staphylococcus epidermidis* with a reduction in growth of 100%.

These results lead to the conclusion that Chitosan remains in the sheet after several wash cycles, according to the information supplied by Aznar Textil, and that Chitosan is the only active ingredient present in the samples. In addition, Chitosan possesses bactericidal properties in addition to others and that these properties are maintained after several wash cycles.