Consiglio Nazionale delle Ricerche
Istituto di Scienze dell'Atmosfera e del Clima

"ALPRETEC-DERMASILK " SILK FABRIC TREATED WITH AEGIS

CHEMICAL TEST

Director responsible: Prof. Paolo Mandrioli
Laboratory analyses carried out by Dr.ssa Cristina Vitali
Report 15/10/2003

Declared comments on results of the chemical analyses

* DERMASILK fabrics of silk jersey and silk piquet, treated with antimicrobial AEGIS, release into the environment negligible traces of ammonio-quaternary salt.
* The characteristics of insolubility of the antimicrobial in the surrounding means are confirmed even in weakly acid and weakly basic environments.
* The property of the silk fabric thus treated enables use in direct contact with the skin, both dry and moist, without transferring any substance to it.
* The characteristics of insolubility of AEGIS fixed on DERMASILK fabrics enable repeated washing without notable loss of antimicrobial substance.

Bologna, 15 October 2003

Signature

Prof. Paolo Mandrioli

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"ALPRETEC-DERMASILK" SILK FRABRIC TREATED WITH AEGIS

MICRO-BIOLOGICAL TEST

Director responsible: Prof. Paolo Mandrioli
Laboratory analyses carried out by Dr.ssa Cristina Vitali
Report 15/10/2003

Declaration comments on the results of the micro-biological analyses

* The tests effected with DERMASILK silk treated with antimicrobial AEGIS have enabled verification of effectiveness in two different conditions:
    1) put into contact with human derma (forearm)
    2) immersed in a water solution
* The tests effected with AEGIS treated DERMASILk fabric, worn on a healthy forearm show the containment of the microbial flora present on the skin without particular impoverishment of it. In other words the DERMASILK material does not act as a traditional oxidizing disinfectant, totally eliminating the microbial flora present, but MAINTAINS A NECESSARY AND SUFFICIENT LEVEL OF CUTANEOUS MICROBIAL ACTIVITY.
* The tests effected with NON-TREATED SILK FABRIC with antimicrobial AEGIS have shown that even in these conditions the fabric develops, through its characteristics, a FUNCTION OF CONTAINMENT OF MICROBIAL LOAD.
* The reduction of microbial concentration is thus not just linked to AEGIS treatment, but also to the function of physical barrier of the silk which contributes to the containment, if not to the reduction, of the bacterial concentration associated with the skin.
* In conclusion, an insignificant difference was shown between the results concerning to the tests with treated fabric and non-treated fabric.

- In the case of trials with fabric in solution it was possible to establish elimination of 90% of the microbial population present in the solution due to the intimate DERMASILK water-microbe contact. This result initially suggests the possibility of using DERMASILK fabric for purifying processes of non-microbiologically pure waters.

The results may be considered positive and worthy of further examination.

Bologna 15 October 2003

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ACTION OF DERMASILK® (1) SILK FABRIC TREATED WITH ÆGIS™ (2) AGINST FUNGUS Malassezia furfur

MICROBIOLOGICAL TEST

Director: Prof. Paolo Mandrioli
Laboratory analyses carried out by: Dr. Antonio Perfetto
Report 15/04/2004

Test of effectiveness of antimicrobial action of ALPRETEC-DERMASILK® fabric against *Malassezia furfur* (agent of fungus infection on animals and humans)

Biological material used:
Pure CBS 1878 culture, Malassezia furfur
Isolation substratum: human dandruff
Field of growth: LNA, 30-37øC
From: Centraalbureau voor Schimmelcultures, Utrecht, Holland

Materials used:
- DERMASILK® fabric, silk jersey treated with ÆGIS™, rectangles of 5x4 cm;
- silk jersey fabric not treated with ÆGIS™, rectangles of 5x4 cm;
- LNA Culture (Leeming & Notman agar) in the quantity of 14 ml per sheet.

Test effected
The test was carried out preparing a suspension of Malassezia furfur in a sterile physiological solution of concentration around 2000 CFU per millilitre and spreading the solution and relevant dilutions.
The solution was divided in: 1) control solution and 2) solution in which a portion of treated DERMASILK® was immersed;
3) solution in which a portion of non-treated silk fabric was immersed.
The suspensions of Malassezia furfur containing the two silk fabric samples were kept in movement with a magnetic agitator for 4 hours at 37øC.
At the end, quotas of the solutions were spread on a Petri dish containing a solid LNA culture field and incubated at 37øC.

Results
The treated DERMASILK® PRODUCED a knocking down of the microbial load equal to 70% of total microbial load.

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The UNTREATED silk fabric DID NOT PRODUCE a knocking down of the microbial load but recorded an increase in the microbial population (Malassezia) equal to about 20%, compared with the initial control solution;

In the control solution, after 4 hours of agitation, an increase of microbial load was found equal to 5%.

The test was carried out on 25 samples for each type of material treated and not treated with ÆGIS™.

1) silk fabric treated with ÆGIS™ by Al.Pre.Tec.
2) ÆGIS™: brand-name deposited, silane quaternary ammonium.

ACTION OF DERMASILK®(1) SILK FABRIC TREATED WITH ÆGIS™(2) AGAINST FUNGUS Malassezia furfur

MICROBIOLOGICAL TEST

Director: Prof. Paolo Mandrioli
Laboratory analyses carried out by Dr. Antonio Perfetto
Report 15/04/2004

Declaration and comment of results of microbiological analyses

* The tests carried out with DERMASILK® silk fabric, treated with antimicrobial ÆGIS™ in watery contact with a suspension of Malassezia furfur, enabled the verification of biocide action. It is suggested that further laboratory investigations be carried out to verify the effectiveness in conditions of contact of the fabric on the epidermis.

Bologna, 7 maggio 2004

Signed

Prof. Paolo Mandrioli

(1) tessuto di seta trattato con AEGIS
(2) AEGIS: marchio depositato, silano ammonio quaternario

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