

# The real system of permanent protection

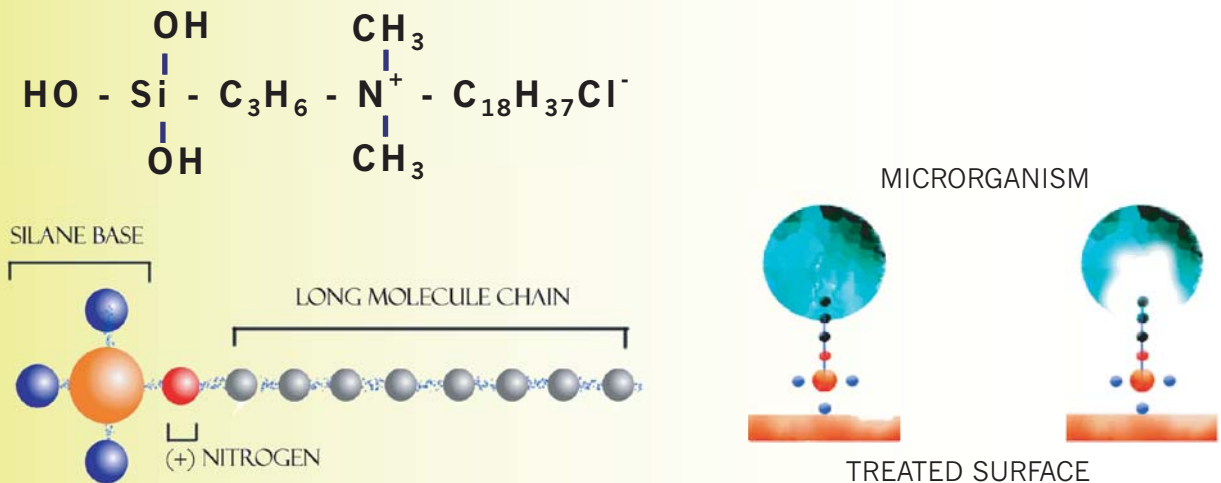




# THE ANTIMICROBIAL AEM 5772/5

is the only non-migrating, durable, odourless, colourless antimicrobial with a broad spectrum of activity that maintains its effectiveness throughout the life of a treated fabric. The product is a water based solution.

This technology is unique: it bonds a silane (silicone by-products that permanently change the property of a surface) to an antimicrobial substance (quaternary ammonium) to obtain an organofunctional silane which is an active molecule against microorganisms.



On direct contact with a microorganism, AEM 5772/5 works by disrupting (or rupturing) the cell membrane, interrupts the normal life processes and destroys the cell. This interruption is caused by two forces: first force is the long chain chemical component, which attracts lipids of the membrane, the second is the positively charged nitrogen component, which attracts the negatively charged microbe. The first can be compared to a **sword**, the second to **electrocution**. Like a **sword**, the strength of the AEM 5772/5 is not used up or diminished when it acts, it is not dissipated or leached by a treated surface so it is continuously effective.

## AEM 5772/5 and other antimicrobials

Antimicrobials can be divided in three classes on the basis of the active agent:

### 1- TRICLOSAN based

### 2- SILVER IONS

### 3- AEM 5772/5

1- Conventional antimicrobials, Triclosan based (ACTIGUARD, SANITIZED, ULTRAFRESH), migrate out of the textile and they must be absorbed by the microorganism: they chemically kill the microorganism, acting as a poison. Because of the migration, the antimicrobial may be used up and loses power over prolonged use and washing. Again it creates the conditions which allow the microorganism to adapt to its environment and to develop resistance. The concerns that environmental and consumer groups have with migrating technologies is that they migrate to the skin and the environment, creating well known problems.

2- Silver Ion acts as an antimicrobial agent by strongly binding to critical biological molecules and disrupting their functions, it must be transported to and diffuse into the target cell so Silver Ion genetically modifies the cell. The mutation is transferred to future generations and they become resistant to Ag<sup>+</sup>. It is not very effective against fungi; because they oxidize, the treated surface may go grey.

## Broad Spectrum Efficacy

### Bacterium

- \* Micrococcus sp.
- \* Staphylococcus epidermidis
- \* Enterobacter agglomerans
- \* Acinetobacter calcoaceticus
- \* Staphylococcus aureus (pigmented)
- \* Staphylococcus aureus (nonpigmented)
- \* Klebsiella pneumoniae
- \* Pseudomonas aeruginosa - PRD - 10
- \* Streptococcus faecalis
- \* Escherichia coli
- \* Proteus mirabilis
- \* Citrobacter diversus
- \* Salmonella typhosa
- \* Salmonella choleraesuis
- \* Corynebacterium bovis
- \* Mycobacterium smegmatis
- \* Mycobacterium tuberculosis
- \* Brucella caris
- \* Brucella abortus
- \* Brucella suis
- \* Streptococcus mutans
- \* Bacillus subtilis
- \* Bacillus cereus
- \* Clostridium perfringens
- \* Haemophilus influenza
- \* Haemophilus suis
- \* Lactobacillus casei
- \* Leuconostoc lactis
- \* Listeria monocytogenes
- \* Propionibacterium acnes
- \* Proteus vulgaris
- \* Pseudomonas cepacia
- \* Pseudomonas fluorescens
- \* Xanthomonas campestris

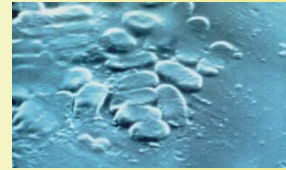
### Fungi

- \* Aspergillus niger
- \* Aspergillus fumigatus
- \* aspergillus versicolor
- \* Aspergillus flavus
- \* Aspergillus terreus
- \* Penicillium albicans
- \* Penicillium citrium
- \* Penicillium elegans
- \* Penicillium funiculosum
- \* Penicillium humicola
- \* Penicillium notatum
- \* Penicillium variabile
- \* Mucor sp.
- \* Tricophyton mentagrophytes
- \* Tricophyton interdigitalie
- \* Trichoderma flavus
- \* Chaetomium globosum
- \* Rhizopus nigricans
- \* Cladosporium herbarum
- \* Aureobasidium pullulans
- \* Fusarium nigrum
- \* Fusarium solani
- \* Gliocladium roseum
- \* Oospora lactis
- \* Stachybotrys chartarum

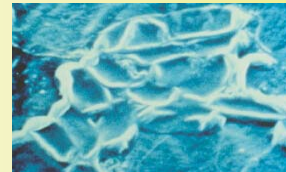
### Yeast

- \* Saccharomyces cerevisiae
- \* Candida albicans
- \* Malassezia Furfur
- \* Oscillatoria borneti LB 143
- \* Anabaena cylindrica
- \* Selenastrum gracile B-325
- \* Pleurococcus sp. LB11
- \* Schenedesmus quadricuada
- \* Gonium sp. LB 9c
- \* Volvox sp. LB 9
- \* Chlorella vulgarus

#### E. coli on untreated fabric



#### E. coli on fabric treated with AEM 5772/5



*This list should be used as a guide for knowing organism have been shown the susceptible to AEM 5772/5*

### REGISTRATION

- C.A.S. number 27668-52-6
- EPA registration Nr. 64881-3
- European Notification: N605
- Lista Oeko Tex of active principle

## AEM 5772/5 and other antimicrobials

The test carried out by Technical & Laboratory Services (USA) estimates the real capacity of antimicrobials not be released by fabric: 4 samples of fabric have been dipped in a solution containing a safe quantity of microorganism. One sample was untreated, the others were treated with Silver Ions, Triclosan, AEM 5772/5 respectively.

100% Cotton sample	Antimicrobial Activity			
	Fabric <sup>1</sup>	Zol <sup>2</sup>	Solution <sup>3</sup>	Zol <sup>4</sup>
Untreated Fabric	0	No	0	No
<b>Silver Ions</b> treated Fabric	99.9%	No	99.6%	No
<b>Triclosan</b> treated Fabric	99.5%	Si	99.5%	Si
<b>AEM 5772/5</b> treated Fabric	99.9%	No	0	No

After 1 hour the samples were taken from the solution and were examined: all treated samples have been demonstrated high effectiveness (1). Then this first analysis: in each solution new test organisms were added and in the solution, with the Silver Ions and Triclosan treated samples, antimicrobial activity has been demonstrated, due to the presence of antimicrobial leached from fabric to solution. In the solution of the untreated sample and of the AEM 5772/5 treated sample, no activity was shown as no antimicrobial was.



Al.Pre.Tec. S.r.l. worked out and tested the treatment of antimicrobial AEM 5772/5 on pure knitted silk, so Dermasilk® was born, A patented product that acts as a second skin restoring the barrier function, due to its effectiveness against bacterium and fungi infections, because it reduces inflammation and it decreases irritations and itching. The active principle AEM 5772/5 is fixed permanently to silk fibre, unlike conventional antimicrobial it does not release drugs or chemical substance and it acts in direct contact with the microorganism. All Dermasilk® products are **Medical Device Class 1**.

**G.Ricci et al: "Clinical effectiveness of a silk fabric in the treatment of atopic dermatitis"; BJD 2004; 150: 127-131.**

*"At the end of the study a significant decrease in AD severity was observed in the children treated with the silk clothes (DERMASILK®)".*

**G. Marcellini et al: "Clinical Study on efficacy of undergarments manufactured with medicated silk (Dermasilk®) in some gynaecological diseases".**

*"The benefits quickly arise (decrease of the itching symptom within an hour) because the reduction of the bacterial over-infection enables the irritated/injured skin to recover, in a short time, its own function as a barrier".*

**DY Koller et al.: "Action of a silk fabric treated with AEGIS in children with atopic dermatitis: A 3-month trial"; Pediatric Allergy Immunology 2007 Mar 7**

*"The use of Dermasilk® has a significant beneficial effect in atopic dermatitis because of the non-irritating properties of silk as well as the antibacterial capacity of AEGIS AEM 5772/5".*

**G. Senti et al: "Antimicrobial Silk Clothing in the Treatment of Atopic Dermatitis Proves Comparable to topical Corticosteroid Treatment"; Dermatology 2006; 213: 228-233.**

*"No significant difference between Dermasilk-treated and corticosteroid-treated skin could be observed... Dermasilk showed potential to become an effective treatment of AD".*

**Sperimental Center of Politecnico of University of Milan**

Test method AATCC 147-1998

Isolation substratum: parallel grazes parallel on agar with Staphylococcus aureus ATCC 6538

Fabric: pure knitted silk samples 3x5 cm untreated and treated with AEM 5772/5

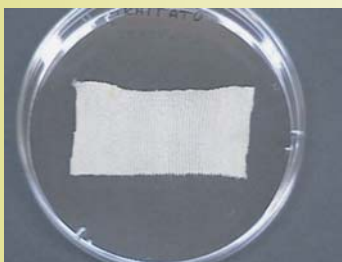
Sterilization of samples: no; Time and temperature of contact: 24 h and 37° C



**327-5 Treated Silk**



**327-4 Untreated Silk**



**327-7 Treated Silk**



**327-6 Untreated Silk**

