Smart Protection

Non-migre

medicaltex™

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

BIOCIDAL ANTI-MICROBIAL BARRIER

- Antimicrobial Application
- Intelligent Protection
- Non-migration feature

Antimicrobial agents

- Capable of destroying or suppressing the growth of micro-organisms.

- Differ in their:

  - Chemical Nature
  - Mode of operation
  - Durability
  - Effectiveness
  - Safety
  - Cost
  - Verification
  - Registrations

Summary

- Patented platform technology that enables poly octadecyl aminodimethyltrihydroxysilylpropyl ammonium chloride to be incorporated into various materials producing permanent bacterial protection of the material.

- Applications include: TEXTILES, Plastics for Packaging, Thin Films, Foams, Activated Carbon, Consumer, Medical, Healthcare, Department of Defense, Homeland Defense and First Response, master batch resins for above applications in addition to building construction materials, industrial surfaces.

- The polymeric antimicrobial technology is a highly effective, permanently bound antimicrobial providing protection from gram positive and gram negative bacteria, fungus, mold, algae, spores and viruses.

TURKISH MINISTRY LICENCE and PERMISSIONS 11-11-2010

Listed and approved under European BPD

- EPAA label Approval June 1, 2010 FDA listed as a modifier to medical devices, 510(k)-able

Benefits of Antimicrobial

medicaltex™

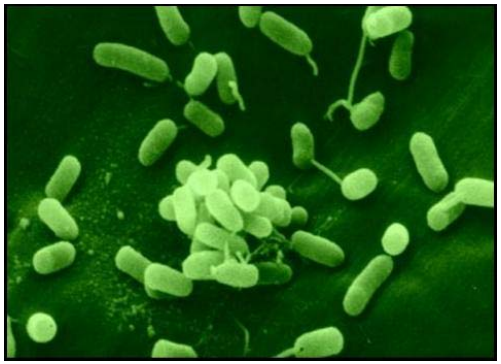
- Fully licensed and registered in Turkey and EEC
- Protected by Patent
- EPA Registered and listed by FDA as a modifier of medical devices under 501K procedure.
- Bound to the Product Controlling Microbes on Contact
- Non- leaching, permanent antimicrobial surface.
- Thermally stable
- Biocide has been proven to be nontoxic, to contain nocarcinogens, teratogens, mutagens or reproductive toxins
- Active kills instantly by disrupting the cell membrane, eliminating any possibility of mutation, adaptation or resistance
- Can be used in wide variety of materials
- Broad kill range.
- Chemically Active, allows covalent bonding
- Unique “Broad Spectrum”; Bacteria (gram positive),Bacteria (gram negative) , Yeast ,Algae, Fungi ,Spores (B. Cereus)Viruses

BAMB® Biyosidal Antimikrobiyal Moleküler Bariyer

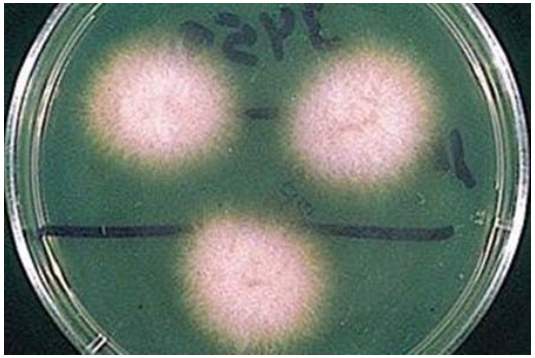
Microbial effects

Microbial growth on textiles can result in:

- Objectionable Odours.
- Unsightly stains.
- Allergenic responses.
- Disease and Infection: Cross Contamination.
- Product deterioration.



Pseudomonas sp.



Fusarium sp.

What is Medicaltex?

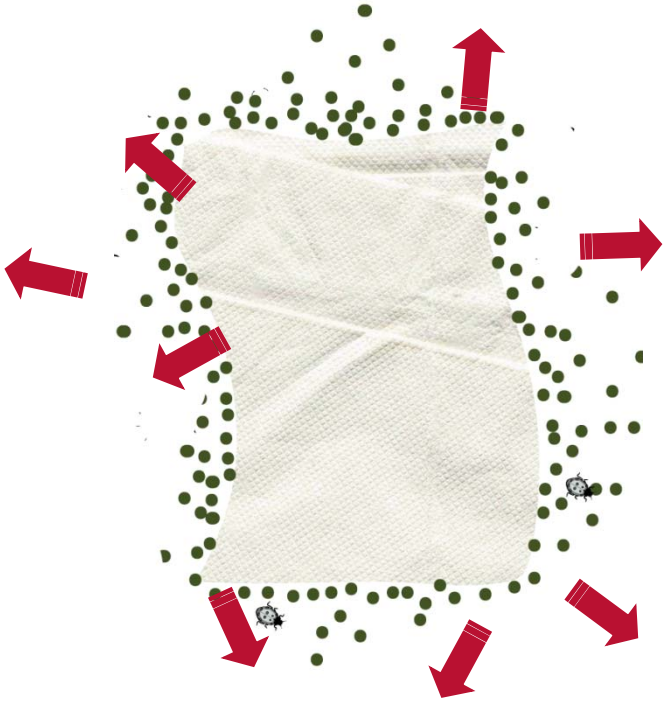
- Antimicrobial sleeping products

- Medicaltex technology; it was designed depending on destroying microorganisms on the fabric by mechanical effect and making this effect permenant by means of non-migre feature.

medicaltex™

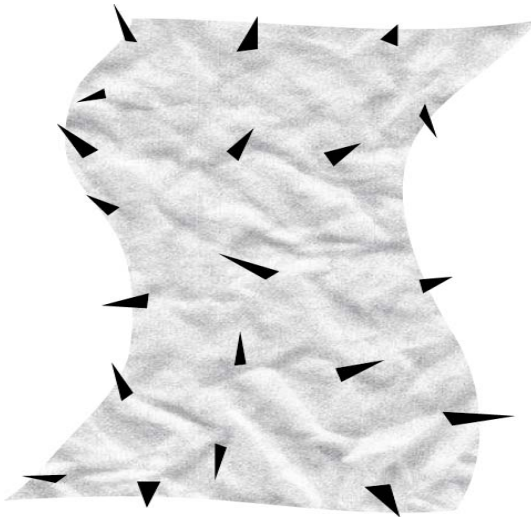
Mode of Action

Migration
from substrate to bacteria
for antimicrobial action



Conventional organic and
inorganic active substances

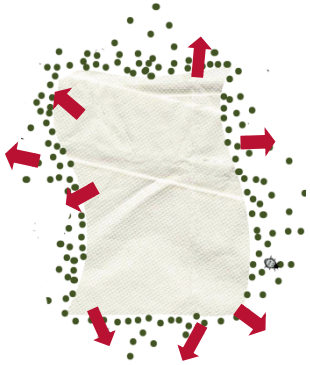
No migration
mechanical process
for antimicrobial action



medicaltex™

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

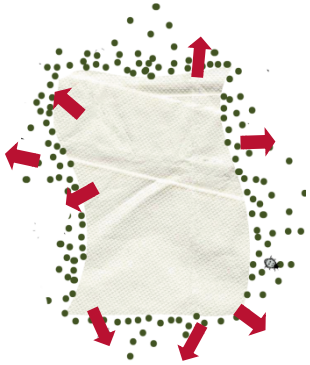
Migrating antimicrobials



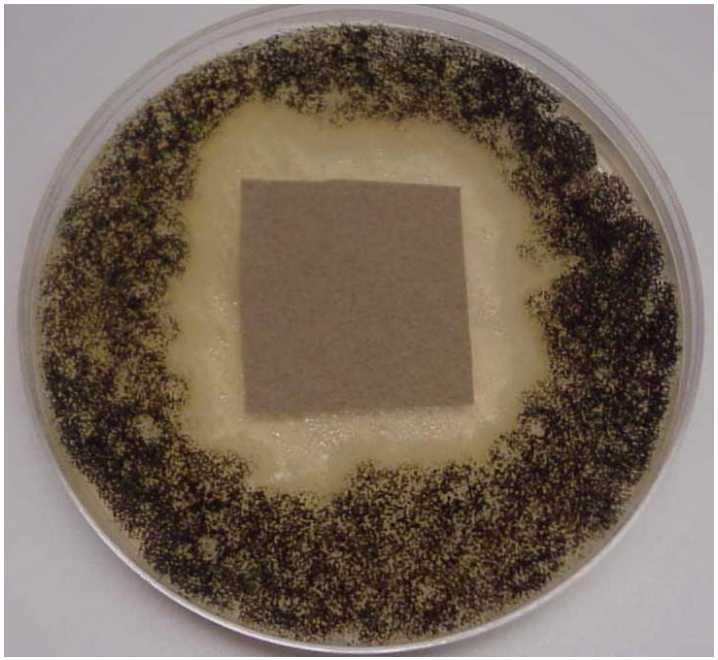
- Diffuse from the substrate to come into contact with the microbe
  - Leach or migrate out of the substrate into the environment when in contact with water or humid conditions
  - Are consumed by micro-organisms
  - Chemically interrupt (poison) the cell
  - May cause adaptive micro-organisms

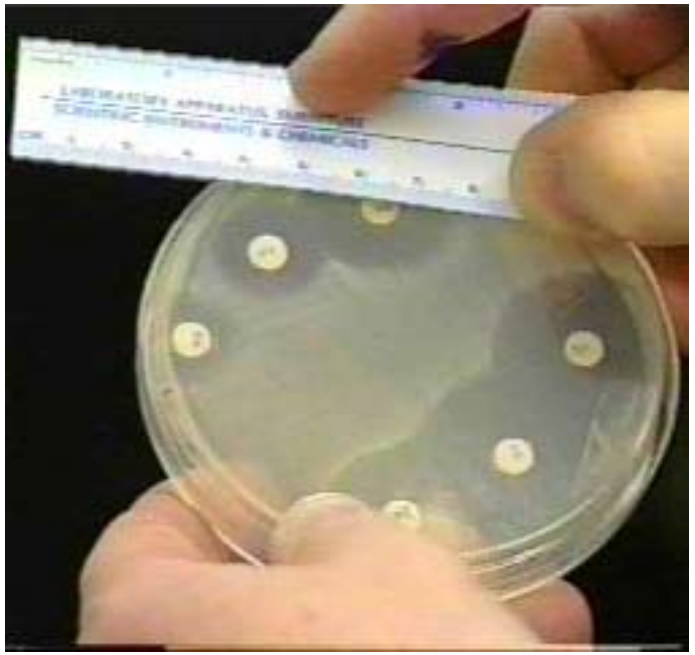
Migrating antimicrobials

medicaltex™



Zone of inhibition in Agar diffusion tests

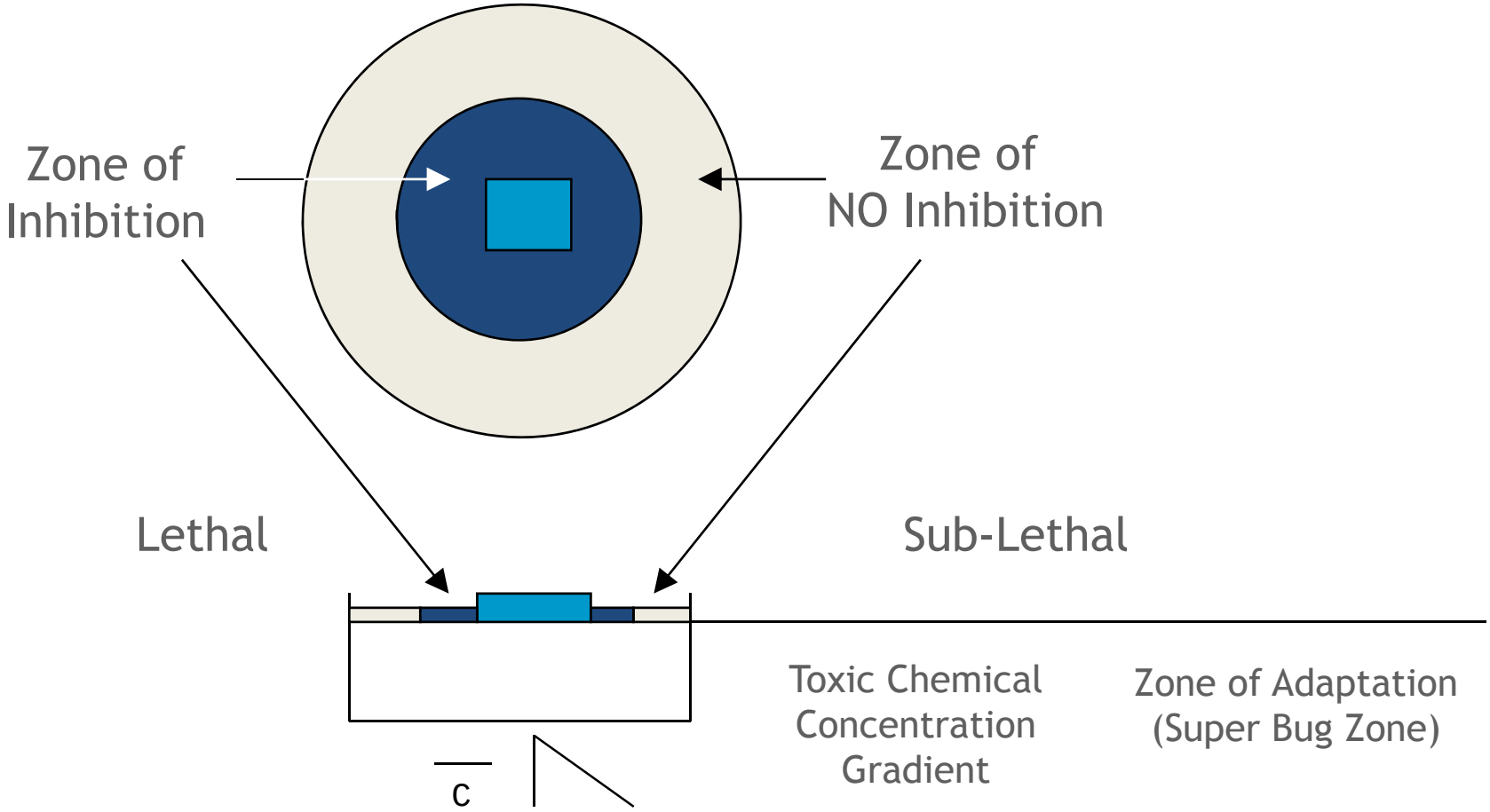




BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

The zone of inhibition

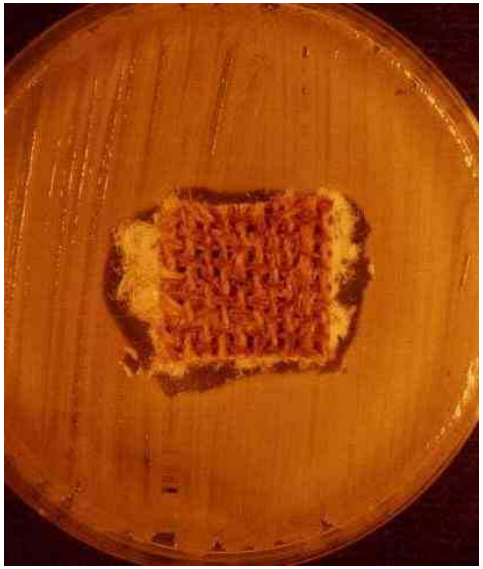
medicaltex™



BAMB
Biyosidal Antimikrobiyal Moleküler Bariyer

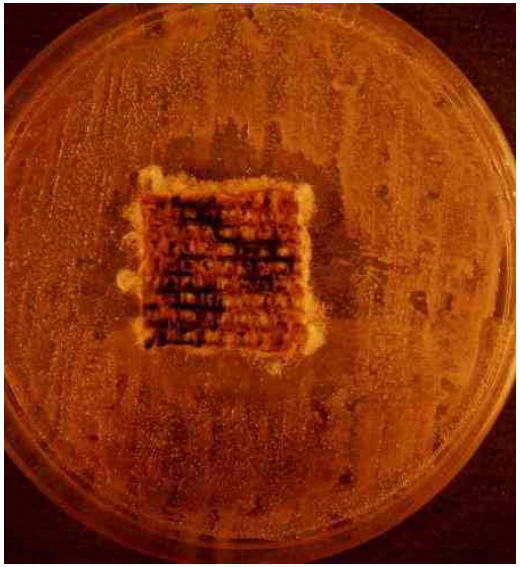
Microbe adaptation

medicaltex™



Initial Zone

Adapting Cells in the Zone

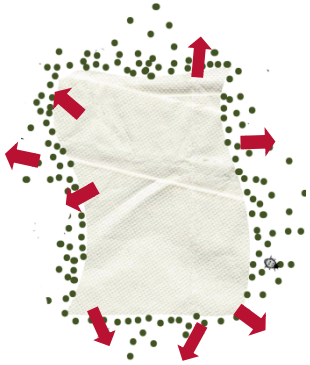


Fully Adapted Cells with Ghost Zone

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Migrating antimicrobials

medicaltex™



Examples of anti-microbially active substances that require migration for their action:

- Bis-chlorinated phenols (Triclosan)
- Organo-tin compounds (i.e.TBT)
- Heavy metal-organo complexes (Pb,Hg,As,…)
- Water Soluble Quaternary compounds
- Ag & Cu absorbed on carrier (zeolite, TiO_2, etc)
- Biguanide
- Chitin (Chitosan)

BAMB® Biyosidal Antimikrobiyal Moleküler Bariyer

BAMB Antimicrobial

medicaltex™

Are bonded to the substrate and require intimate surface contact with the microbe

- Are bonded to the product surface
- Are not consumed by micro-organisms
- Mechanically interrupts (stabs) the cell wall
- Remain functional for the life of the product
- Will not cause adaptive micro-organisms

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Non migrating antimicrobials

medicaltex™

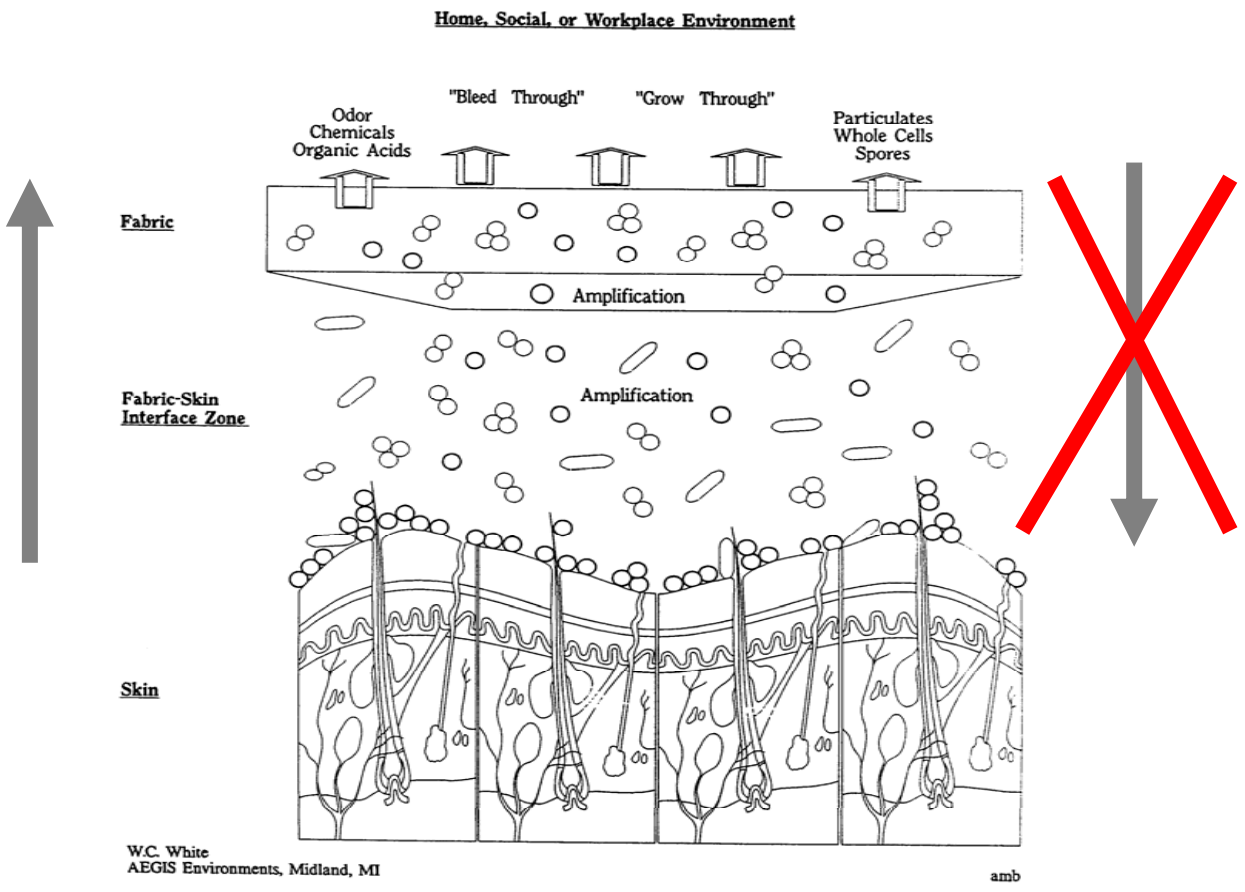
Examples of anti-microbially active substances that **do not migrate** in order to be active are:

- Organo functional silanes
- N-halamines
- Grafting by irradiation

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

The skin/fabric environment

medicaltex™



BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Why Medicaltex?

medicaltex™

- Medicaltex is important in every environment where destruction of odors and protection of health are needed

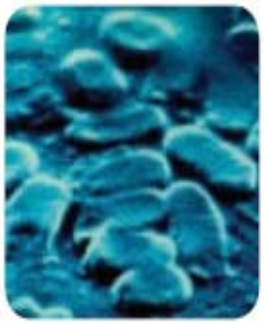
- Its usage in child care and health sector has a vital importance

- It stops bacterial and fungal expansion

- It doesn't included any heavy metal or phenols with poli chlor

- It provides a healthy sleep

- If you are using a classical antibacterial sleeping product, this product protects the health at a certain time at a certain rate. If you are using a product protected by Medicaltex, it means that your product is being protected with most developed antimicrobial in the market today.



BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

MEDICALTEX treated with BAMB A UNIQUE ANTIMICROBIAL

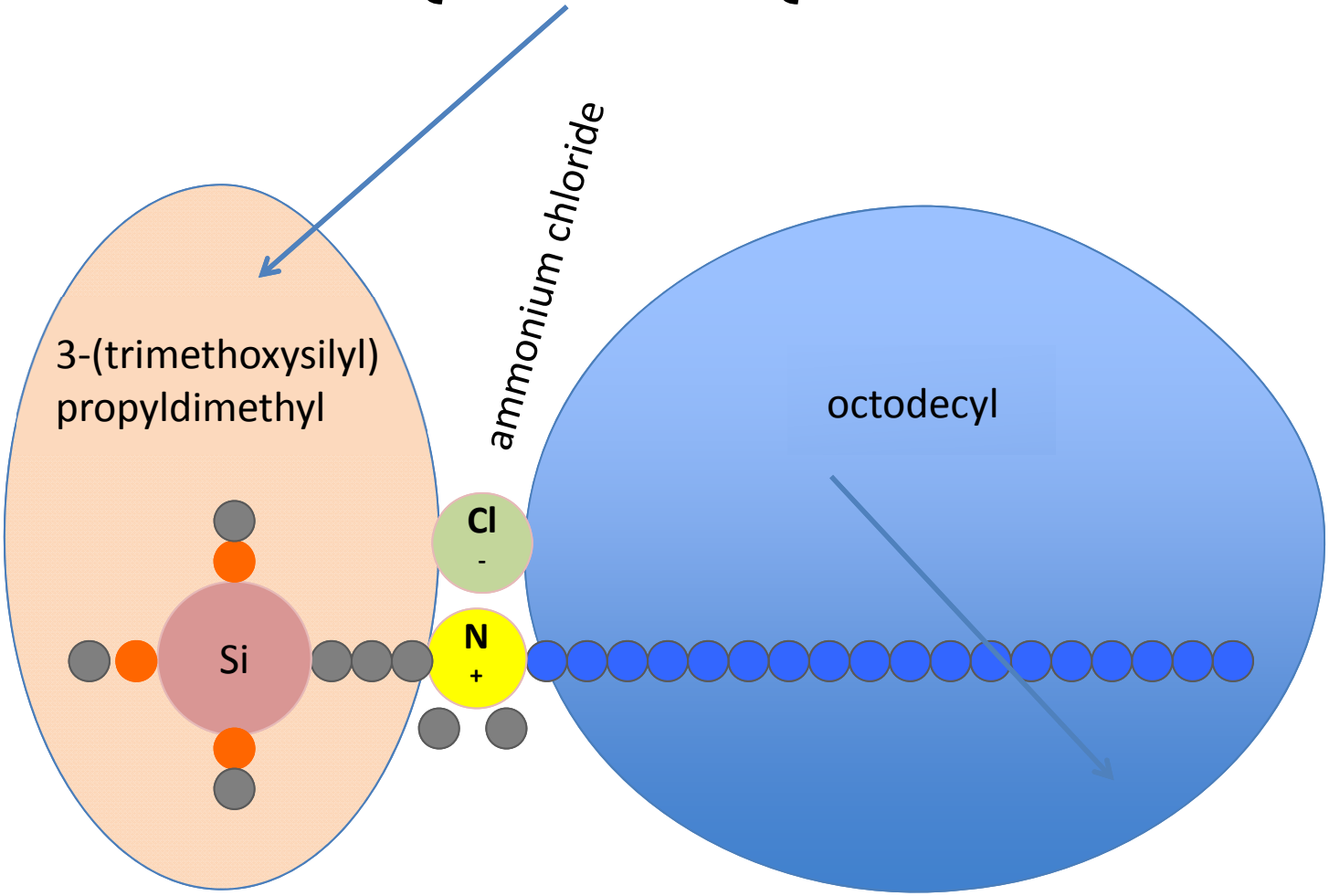
medicaltex™

- Unlike conventional antibacterials that can leach toxic active ingredients into the surrounding environment, BAMB does not leach or dissipate, its active ingredient has the Europe Biocidal Product Directive and EPA's lowest toxicity rating (the same as distilled water) even safer than vitamin C. Once bonded to the surface, BAMB is there to stay.
- In addition, because BAMB has a benign mode of action and does not actively leach or poison microbes for its mode of action, there is no risk of adaptive microorganisms or "superbugs." In laboratory testing the BAMB antimicrobial has never been shown to allow or cause microbial adaption, resistance or mutation.

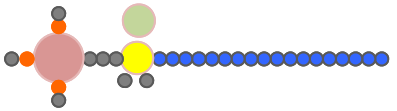
BAMB® Biyosidal Antimikrobiyal Moleküler Bariyer

THE BAMB MOLECULE

SiQUAT = Silane + QUAT



What the various bits do:

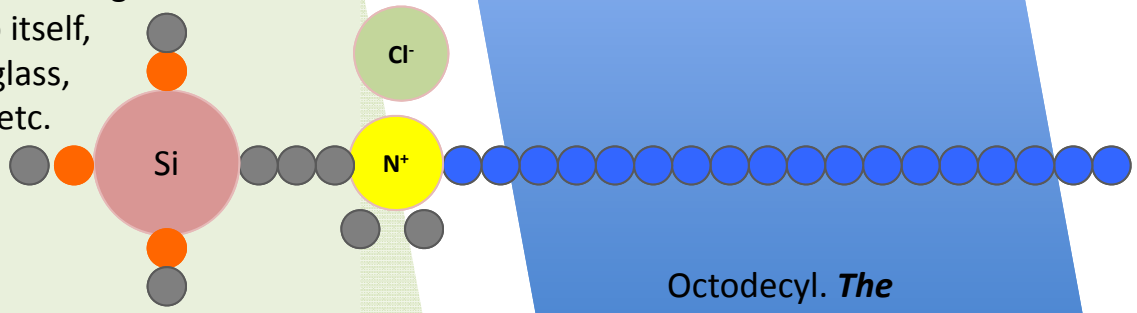


medicaltex™

QAC: Ammonium chloride. ***The charged middle*** – keeps the sword upright, attracts the cell and electrocutes it.

SILANE: 3-(trimethoxy silyl) propyldimethyl.

The base – strong bonds to itself, fabric, glass, wood, etc.



Octodecyl. ***The blade***– pierces the cell wall and destroys it.

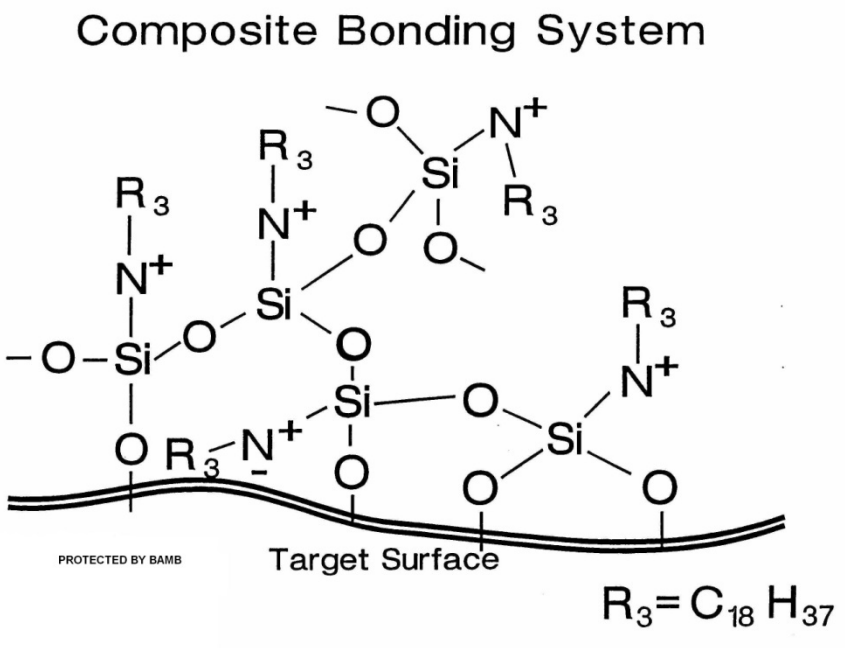
BAMB® Biyosidal Antimikrobiyal Moleküler Bariyer

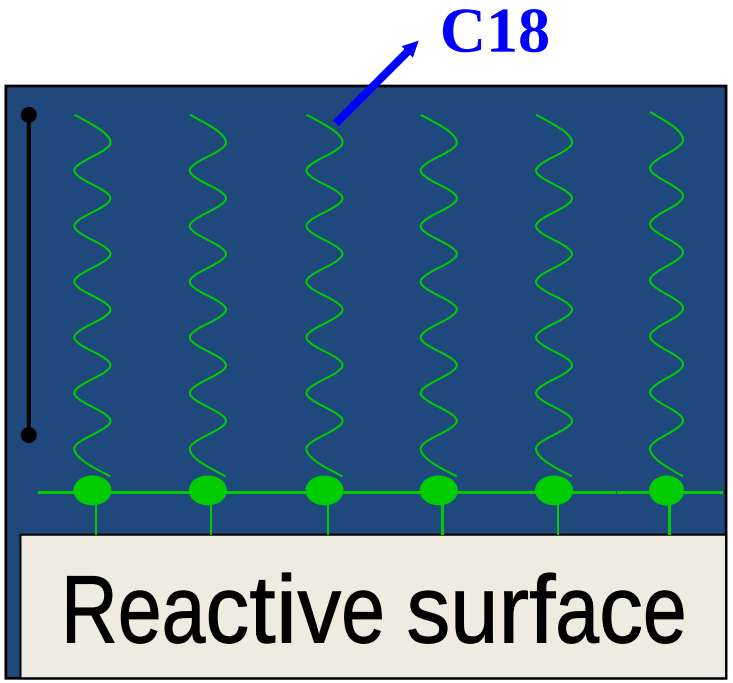
Polymerisation:

medicaltex™

Monomer → Polymer

- **Polymerises not only onto the surface of the fiber, but also to itself**



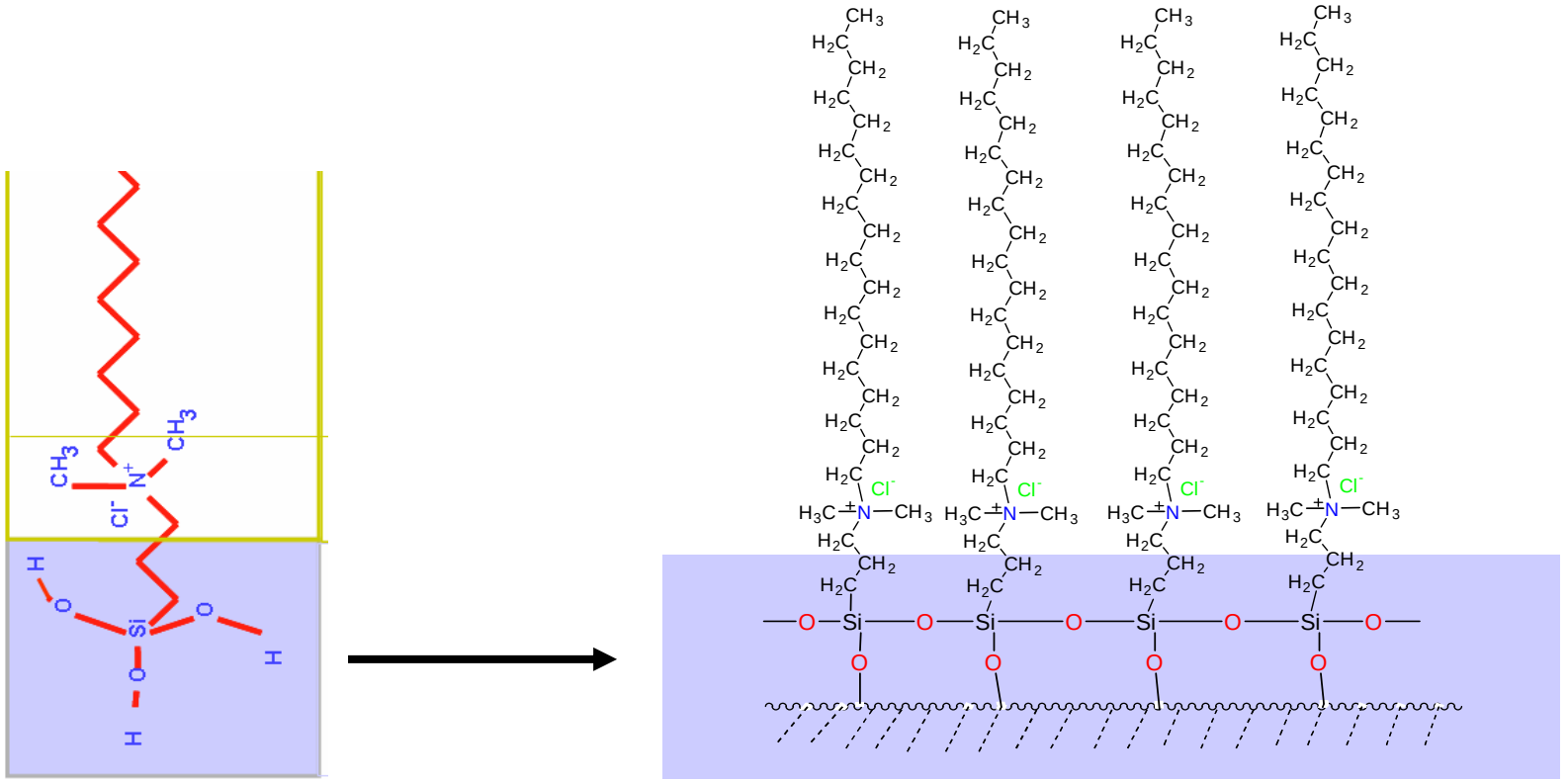


BAMB
Biyosidal Antimikrobiyal Moleküler Bariyer

The Technology

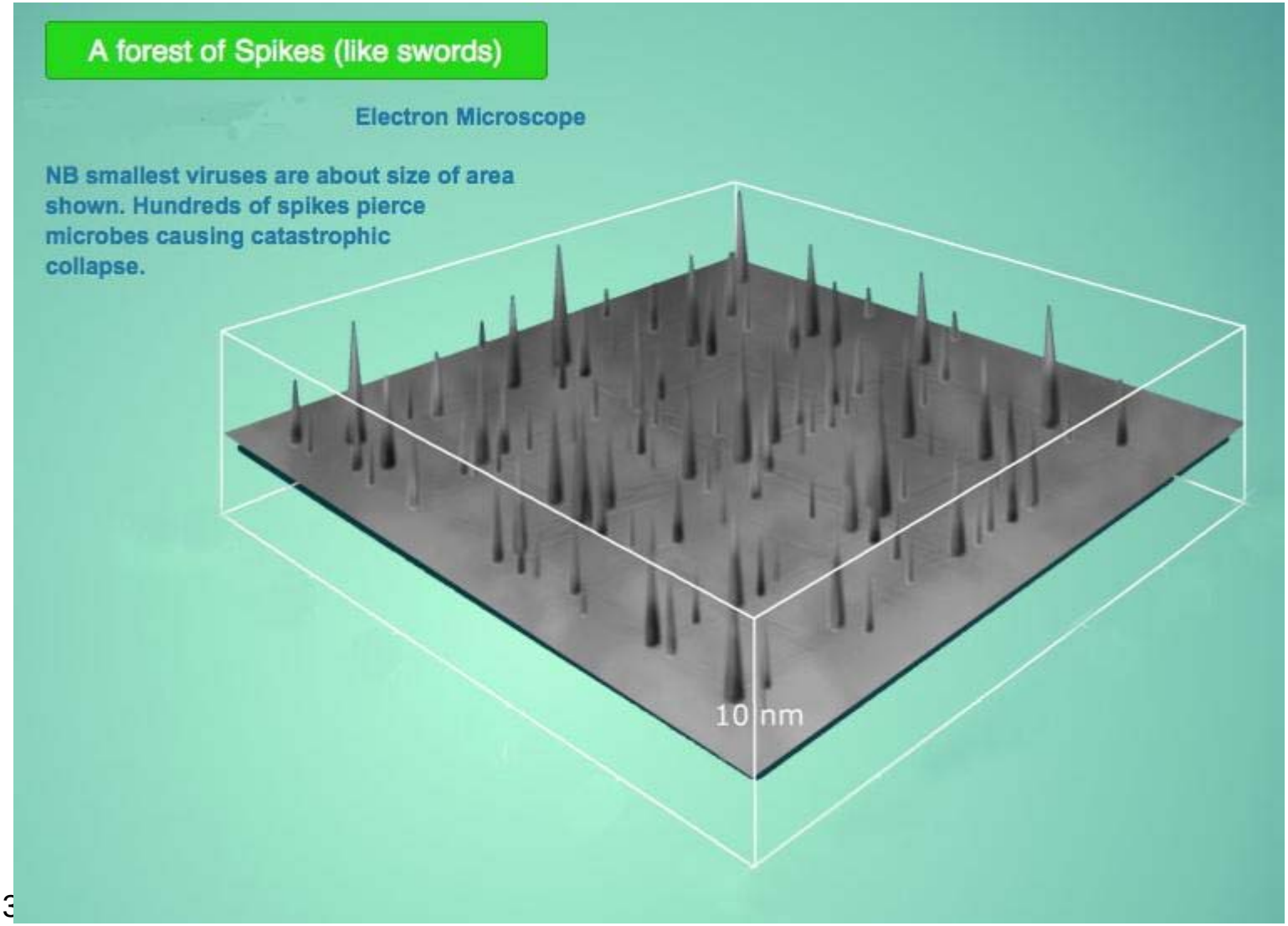
medicaltex™

Bonding to the textile and cross-linking with itself



BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

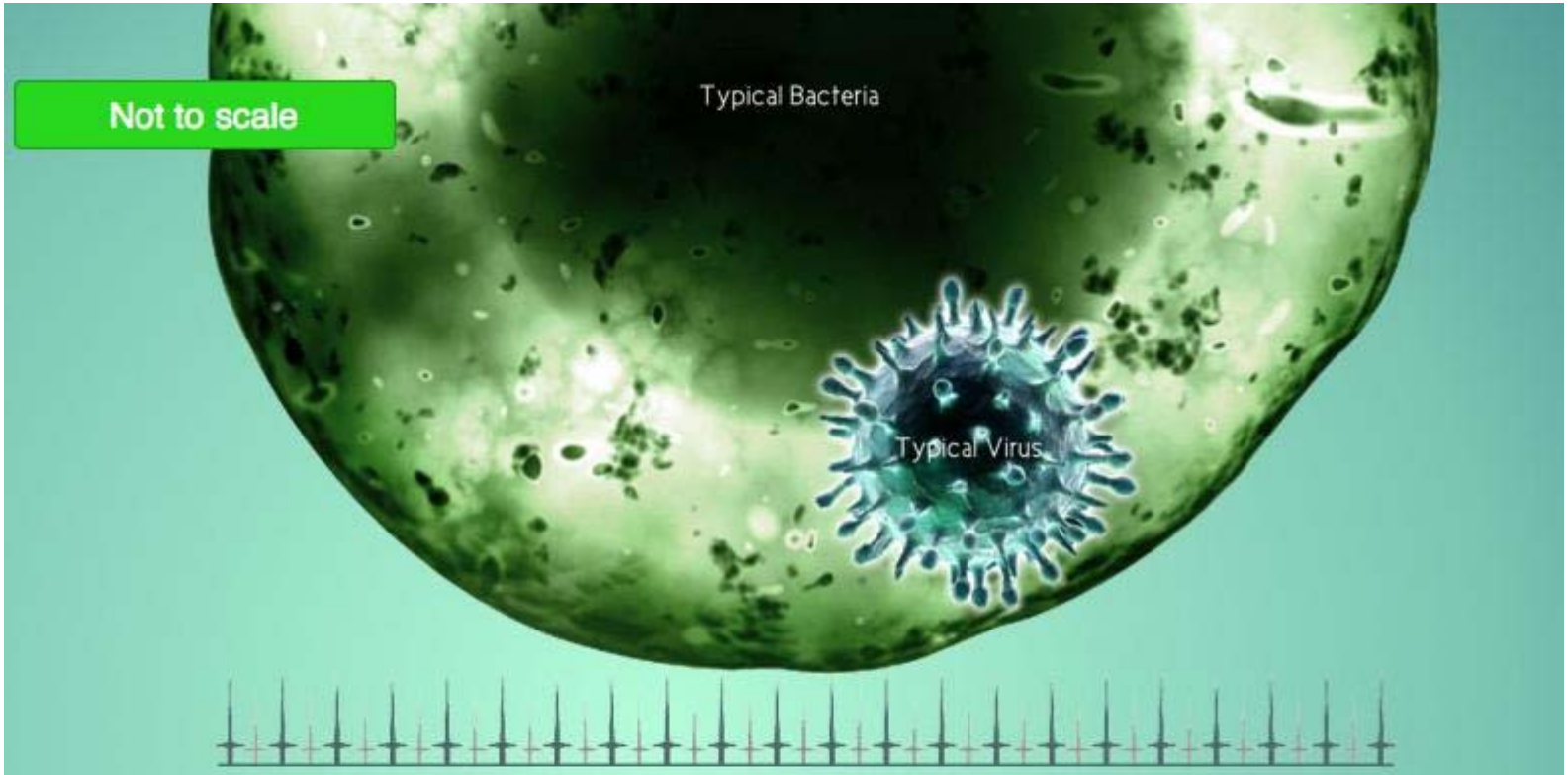
How a BAMB treated surface looks



How does BAMB work? The MICROBES ARE ATTRACTED TO THE SURFACE OF

THE TEXTILE OR SUBSTRATE BY BAMBS POSITIVELY CHARGE NITROGEN ATOM

medicaltex™



Yeasts & Bacteria typically 1 - 6 microns (1,000 - 6,000 nanometers). Viruses typically 100 times smaller but range between 10 - 300 nanometres.

The bacterium in the image should be 25 times larger than shown

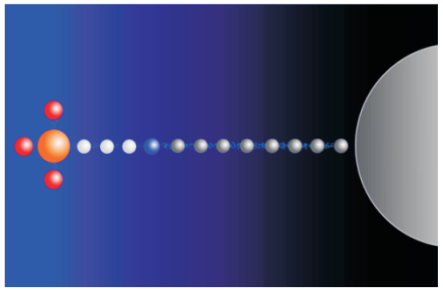
When the cell of a microbe touches the surface it is punctured many times causing catastrophic collapse. This happens extremely quickly.

The Nitrogen ion towards the base of the molecule then electrocutes the cell blowing it apart.

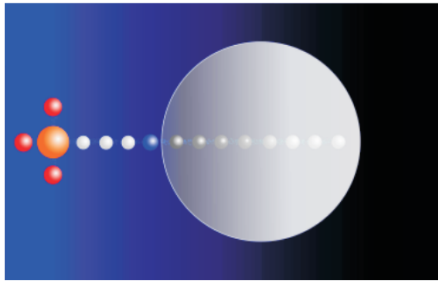
BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

How does the BAMB work?

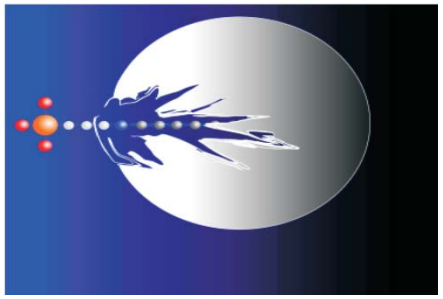
medicaltex™



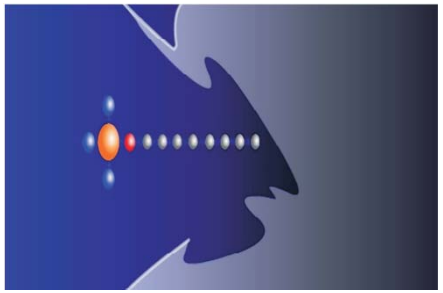
Antimicrobial agent looks like millions of glass swords on the surface of the substrate there are approximately 10,000 of these “glass swords” per mm2.



1. The cell microbe/fungus/Yeast is attracted to the Antimicrobial sword on the surface of the substrate.



2. The cell is then impaled by the Antimicrobial sword by a “physical action”

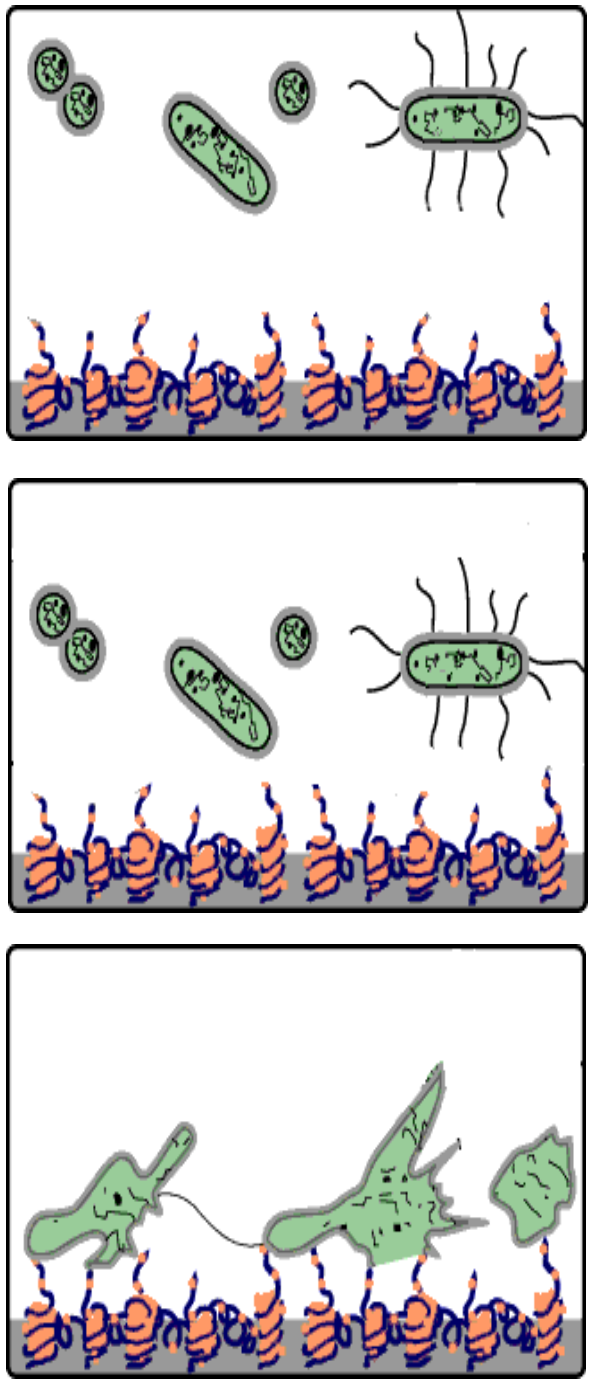


3. The cell is punctured by a “physical action” like being stabbed with a knife. This in itself is enough to kill the cell/microbe/fungus/yeast/mold, etc.

4. The cell/microbe/fungus/yeast/mold, etc. is drawn further down the sword to a positive nitrogen atom so contact with the positively charged nitrogen atom will unbalance the electrical equilibrium within the porin channels and on the outer protein layers such that the cells can no longer function correctly and the microbes will die

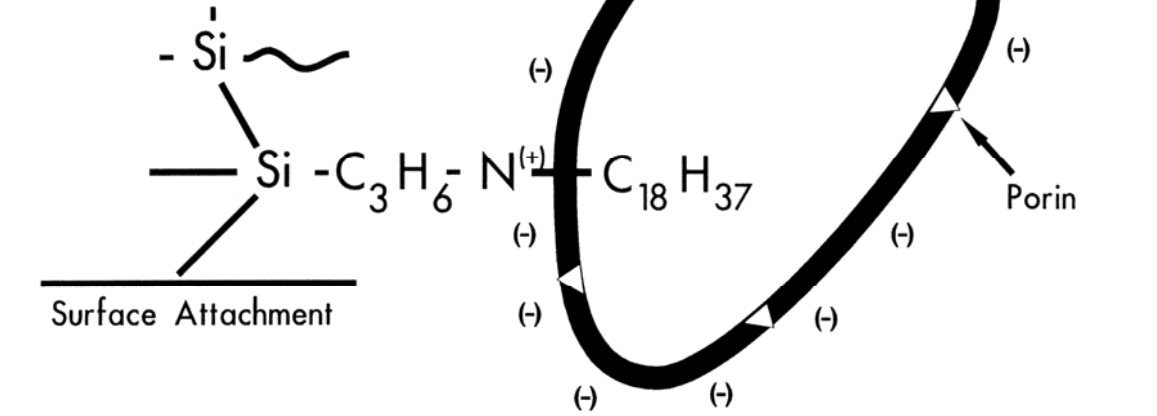
BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

medicaltex™

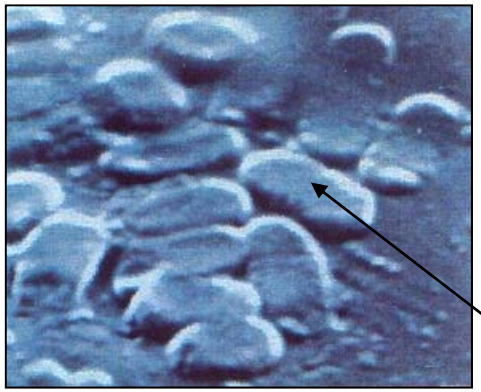


Only the microorganism who are in contact with the substrate will be killed, not the needed microorganism living on our skin

Disrupts the Cell Membrane Through Physical and Ionic Phenomena

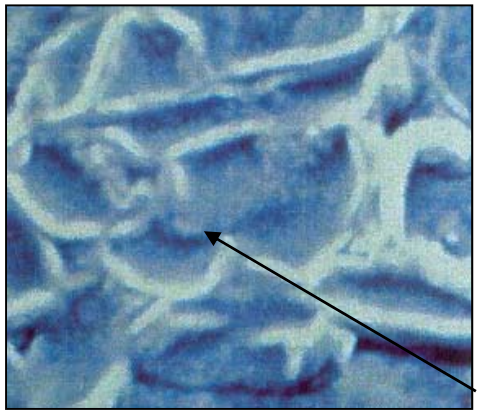


BAMB
Biyosidal Antimikrobiyal Moleküler Bariyer



Untreated
Control
Material

Living Bacteria

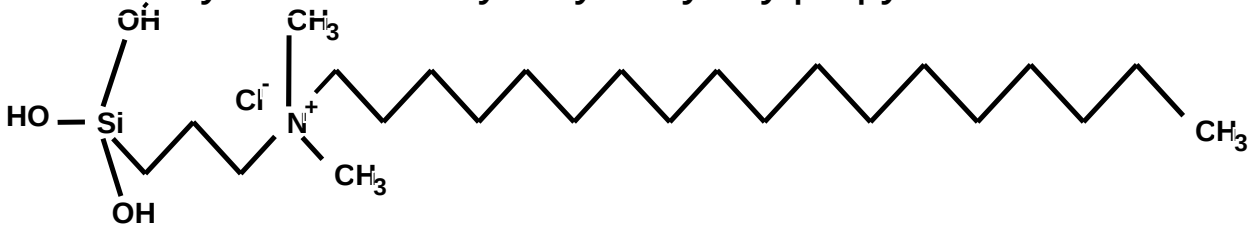


medicaltex™

Antimicrobial
treated Material

Dead Bacteria

Octadecylaminodimethyltrihydroxy-silylpropyl Ammonium Chloride



Polymer Network

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

BAMB
Non toxic and safe for the environment

The chemical bonding causes the surface of the substrate to become antimicrobially active

No migration on the skin

No migration to the environment

Approval of Turkish Health Ministry

medicaltex™

T.C.
SAĞLIK BAKANLIĞI
Temel Sağlık Hizmetleri Genel Müdürlüğü

BİYOSİDAL ÜRÜN RUHSATNAMESİ

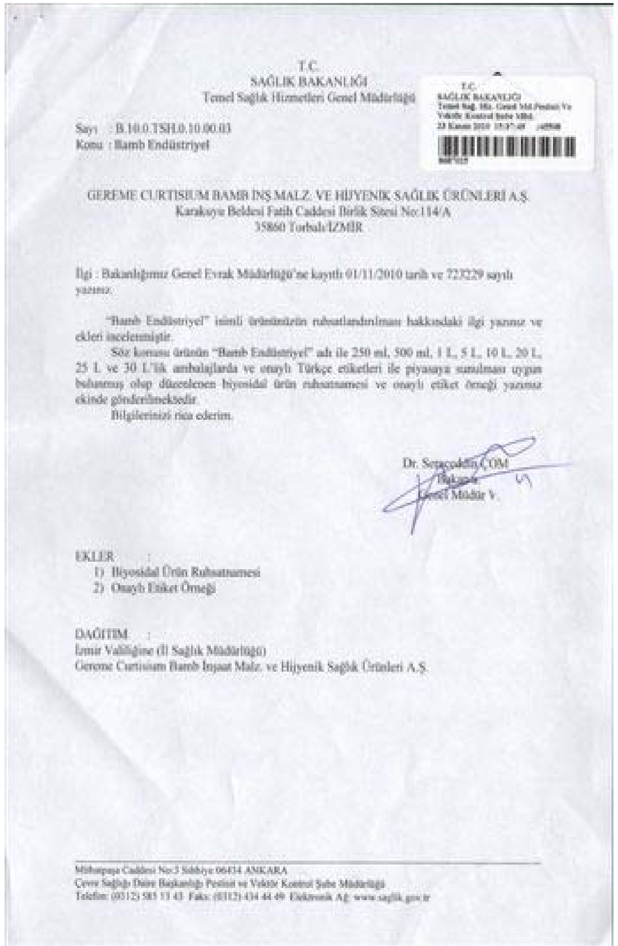
(İMAL)

Ruhsat No	2010 / 222
Ruhsat Tarihi	11.11.2010
Ürünün ticari adı	BAMB ENDÜSTRİYEL
Aktif madde/ler isimleri	Dimetiloktadesil[3-(trimetoksisilil)propil]amonyum klorür
Aktif madde/ler CAS numaraları	27668-52-6
Aktif madde/ler ve oran/ları	Dimetiloktadesil[3-(trimetoksisilil)propil]amonyum klorür %0,5
Hedef canlı/canlılar	Staphylococcus aureus, Escherichia coli
Fiziki hâli (Toz, Brikel, Granül vb.)	Sıvı
Uygulama dozu	Uygulanacak alanın tamamını kaplayacak kadar
Ambalaj miktarı/ları	250 ml, 500 ml, 1 L, 2,5 L, 5 L, 10 L, 20 L, 25 L, 30 L
Antidotu	Bilinen bir antidotu yoktur
Risk ibareleri	S1/2, S25, S26
Raf ömrü	2 (İki) yıl
Ruhsat sahibinin adı ve adresi	Gereme Curtisium Bamb İnş.Malz. ve Hijyenik Sağlık Ürünleri A.Ş. Karakuyu Beldesi Fatih Caddesi Birlik Sitesi No:114/A Torbalı/İZMİR
Fabrika veya imalathanenin adresi	Süperkim Kimya Pazarlama San.Tic.Ltd.Şti. Bornova Caddesi İzelmaş Galeria Çarşısı 1. Kısım No:4/5 Işıkkent/İZMİR
Ruhsatın geçerli olduğu süre	11.11.2012
Veriliş tarihi ve nedeni	11.11.2010 İlk İmal İzni

31 / 12 / 2009 tarihli ve 27449 sayılı 4. mükerrer Resmî Gazete'de yayımlanan "Biyosidal Ürünler Yönetmeliği"nin 14 üncü maddesi uyarınca yukarıda adı geçen biyosidal ürünün imaline ve kullanılmasına müsaade edilmiştir.

Dr. Seraceddin ÇOM
Bakan a.
Genel Müdür

Not: 24 Aylık Stabilite Testleri tamamlandığında ruhsat süresi uzatılacaktır.



T.C.
SAĞLIK BAKANLIĞI
Temel Sağlık Hizmetleri Genel Müdürlüğü

Sayı : B.10.0.TSH.0.10.00.03
Konu : Bamb Endüstriyel

GEREME CURTISIUM BAMB İNŞ.MALZ. VE HİJYENİK SAĞLIK ÜRÜNLERİ A.Ş.
Karakuyu Beldesi Fatih Caddesi Birlik Sitesi No:114/A
35860 Torbalı/İZMİR

İlgi : Bakanlığımız Genel Evrak Müdürlüğü'ne kayıtlı 01/11/2010 tarih ve 723229 sayılı yazınız.

"Bamb Endüstriyel" isimli ürününüzün ruhsatlandırılması hakkındaki ilgi yazınız ve ekleri incelenmiştir.

Söz konusu ürünün "Bamb Endüstriyel" adı ile 250 ml, 500 ml, 1 L, 5 L, 10 L, 20 L, 25 L ve 30 L'lik ambalajlarda ve onaylı Türkçe etiketleri ile piyasaya sunulması uygun bulunmuş olup düzenlenen biyosidal ürün ruhsatnamesi ve onaylı etiket örneği yazınız ekinde gönderilmektedir.

Bilgilerinizi rica ederim.

Dr. Seraceddin ÇOM
Bakan a.
Genel Müdür V.

EKLER :
1) Biyosidal Ürün Ruhsatnamesi
2) Onaylı Etiket Örneği

DAĞITIM :
İzmir Valiliğine (İl Sağlık Müdürlüğü)
Gereme Curtisium Bamb İnşaat Malz. ve Hijyenik Sağlık Ürünleri A.Ş.

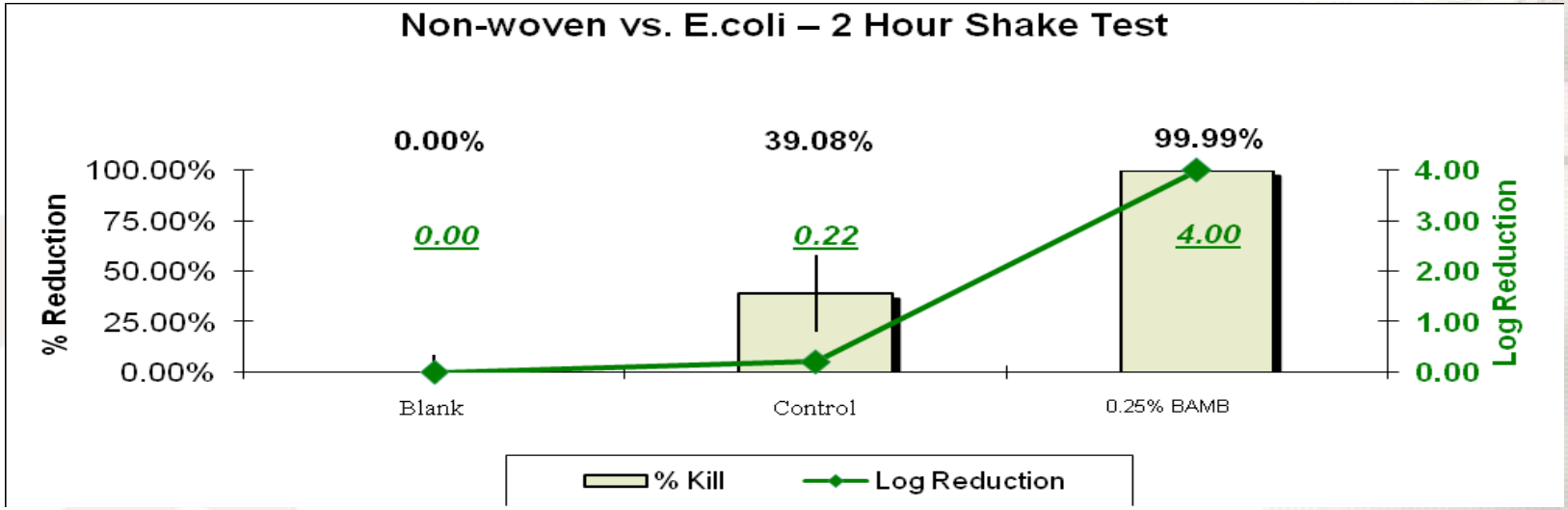
Mithatpaşa Caddesi No:3 Sıhhiye 06434 ANKARA
Çevre Sağlığı Daire Başkanlığı Pestisit ve Vektör Kontrol Şube Müdürlüğü
Telefon: (0312) 585 13 43 Faks: (0312) 434 44 49 Elektronik Ağ: www.saglik.gov.tr

BAMB
Biyosidal Antimikrobiyal Moleküler Bariyer

medicaltex™

Non-woven vs. E.coli - 2 Hour Shake Test

Sample	Avg Surviving/mL	Avg Kill/mL	Log Kill	% Kill	Log Reduction	St Dev	St Dev(%)	N
Blank	9.47E+06	0.00E+00	0.00	0.00%	0.00	8.45E+05	8.93%	6
Control	5.77E+06	3.70E+06	6.57	39.08%	0.22	1.10E+06	19.05%	6
BAMB	0.00E+00	9.47E+06	6.98	99.99%	4.00	0.00E+00	0.00%	4

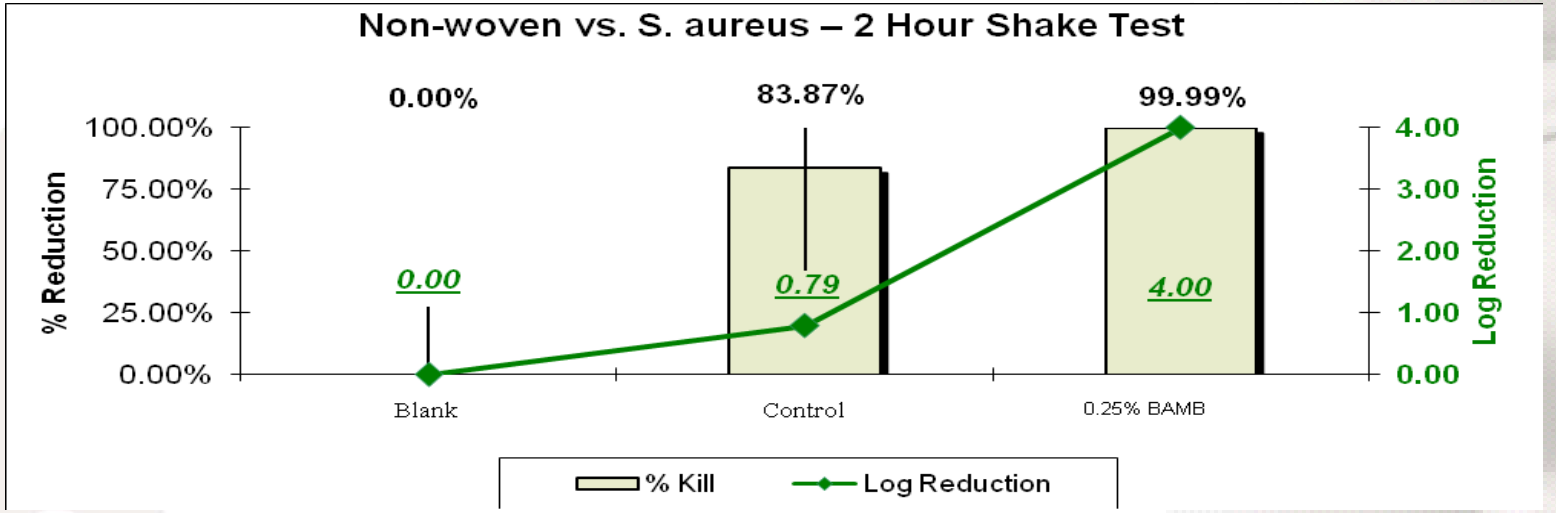


*ASTM E 2149 Shake Test (modified to 1:25 scale)
*t0=6.40E6 E. coli CFU/mL
*2 hour test @ 37C, 300rpm
*outliers eliminated by Grubbs' Test method

medicaltex™

Non-woven vs. S. aureus – 2 Hour Shake Test

Samples	Avg Surviving/mL	Avg Kill	Log Kill	% Kill	Log Reduction	St Dev	St Dev (%)	N
Blank	5.21E+05	0.00E+00	0.00	0.00%	0.00	1.44E+05	27.68%	6
Control	8.40E+04	4.37E+05	5.64	83.87%	0.79	3.49E+04	41.51%	6
0.25% BAMB	0.00E+00	5.21E+05	5.72	99.99%	4.00	0.00E+00	0.00%	6

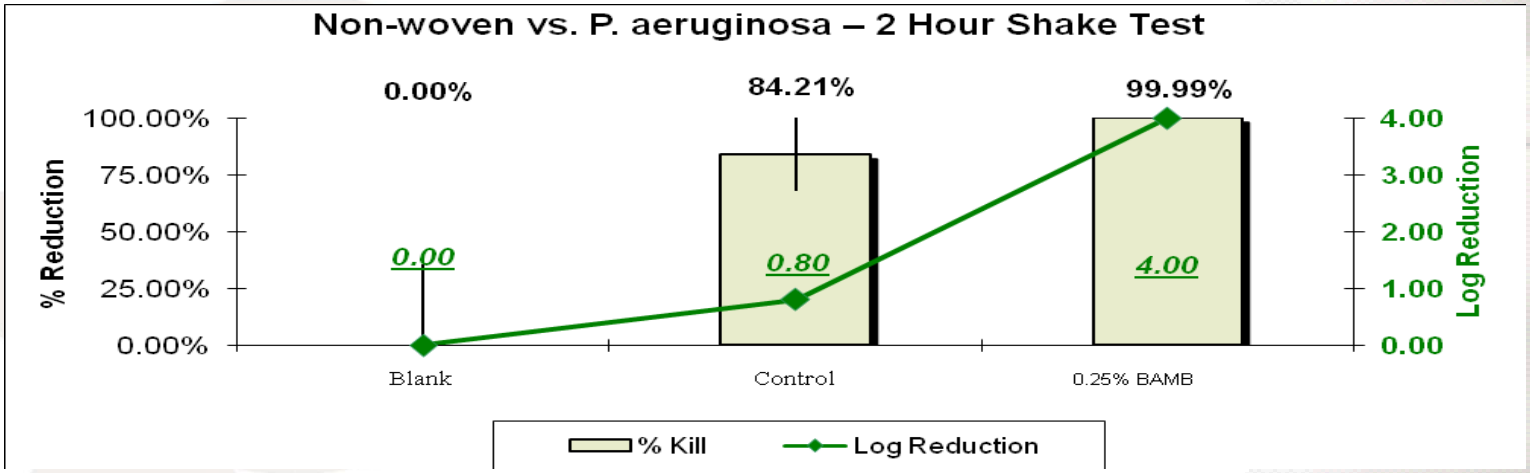


*ASTM E 2149 Shake Test (modified to 1:25 scale)		
*t_0=5.48E5 S. aureus CFU/mL		
*2 hour test @ 37C, 300rpm		

medicaltex™

Non-woven vs. P. aeruginosa – 2 Hour Shake Test

Sample	Avg Suviving/mL	Avg Kill/mL	Log Kill	% Kill	Log Reduction	St Dev	St Dev (%)	N
Blank	3.57E+05	N/A	N/A	N/A	N/A	1.27E+05	35.54%	6
Control	5.63E+04	3.00E+05	5.48	84.21%	0.80	9.33E+03	16.56%	6
0.25% BAMB	0.00E+00	3.57E+05	5.55	99.99%	4.00	0.00E+00	0.00%	6

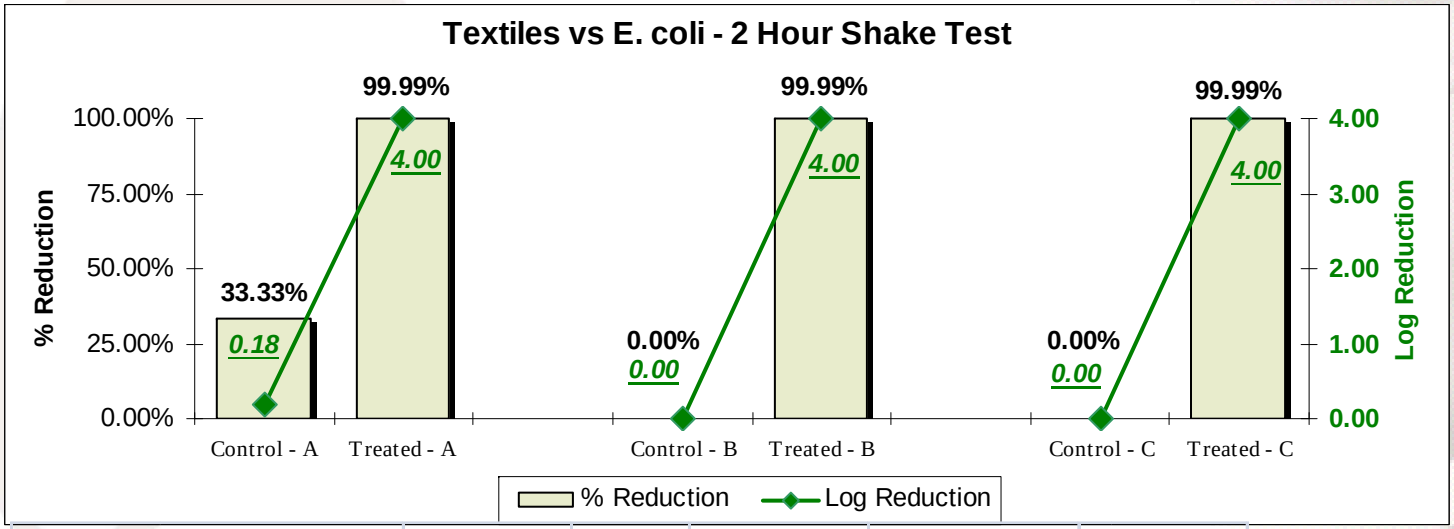


*ASTM E 2149 Shake Test (modified to 1:25 scale)		
*t_0=3.80E5 P. aeruginosa CFU/mL		
*2 hour test @ 37C, 300rpm		

medicaltex™

Textiles vs E. coli – 2 Hour Shake Test

Sample	Avg Suviving/mL	Avg Kill/mL	Log Kill	% Reduction	Log Reduction	N
Blank	6.60E+05	0.00E+00	0.00	0.00%	0.00	1
Control - A	3.20E+05	1.60E+05	5.20	33.33%	0.18	1
Treated - A	0.00E+00	4.80E+05	5.68	99.99%	4.00	1
Control - B	6.80E+05	0.00E+00	0.00	0.00%	0.00	1
Treated - B	0.00E+00	4.80E+05	5.68	99.99%	4.00	1
Control - C	5.20E+05	0.00E+00	0.00	0.00%	0.00	1
Treated - C	0.00E+00	4.80E+05	5.68	99.99%	4.00	1



t_0=4.80E5 E. coli CFU/mL

*0.01% Q2-5211

*Samples diluted in D/E Neutralizing Broth

***Sample preparation: 60% DI H2O, 20% BA-900, 20% HM4005

*Treated at 1% BAMB

DWT180-1

Key:	
A	Narrow
B	Thin
C	Thick

medicaltex™

Pathogen Testing on Face Masks

Shake flask assay of HIV-1 (SF162) - ASTM E2149-01

% reduction in viral load

	Time post treatment (hr)				
	0	10min	0.5	1	2
No treatment (PBS)	0	0	0	0	0
Face Mask		0	(-52)	(-27)	(-27)
Face Mask +BAMB		93	99	99.999*	99.999*

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Health and Safety

medicaltex™

- C.A.S. Number 27668-52-6
- Turkish Registration 2010 222
- Listed and approved by European BPD
- European Notification: NR 605
- Chemical Accepted on the Oeko Tex list of active chemicals
- BAMB GIDAYA BULAŞMAZLIK TESTİ (EGE University-ARGE-FAR R&D Laboratoriesà Report Number: AR 11006)
- BAMB DERMAL İRRİTASYON TESTİ (EGE University-ARGE-FAR R&D Laboratoriesà Report Number: BP 11035)
- BAMB TEKSTİLDE YAPILAN ETKİNLİK TESTİ (EKOTEKS Laboratories à Report number: 0960887)
- BAMB FARKLI YÜZEY NUMUNELERİ ÜZERİNDE YAPILAN ETKİNLİK TESTİ (Ege University Laboratories Report Number: B.30.2.EGE 0.11.00. 02/Biy. 1842)
- BAMB SERT YÜZEYLER ÜZERİNDE YAPILAN ETKİNLİK TESTİ (TUBİTAK Laboratories à Report number: B.02.1.TBT.5.12.181.02)
- BAMB MİKROBİYOLOJİK KARBON & KUARTZ TESTİ(EGE University-ARGE-FAR R&D Laboratoriesà Report Number: BP 11042)

- FDA (Biocompatibility)
- Cytotoxicity: Agar Diffusion Assay ISO 10993-5
- Intracutaneous Study: Extract ISO 10993-10
- Systemic Toxicity: Extract ISO 10993-11
- EPA (Acute Toxicity)
- Acuter Dermal Toxicity in Rabbits OPPTS No. 870.1200
- Acute Dermal Irritation in Rabbits OPPTS No. 870.2500
- Acute Eye Irritation in Rabbits OPPTS 870.240
- Acute Oral Toxicity Study (UDP) in Rats OPPTS 870.1100
- Acute Inhalation Toxicity Study in Rabbits OPPTS 870.130
- Skin Sensitation: Local Lymph Node Assay in Mice OPPTS 870.260

medicaltex™

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM SEP 29 1982

TO: John Lee, PM #31
DB/Registration Division (TS-767)

THRU: Robert B. Jaeger, Section Head
Review Section #1
Toxicology Branch/HED (TS-769)

SUBJECT: 3 Trimethoxysilylpropyldimethyl ocatdecyl ammonium
Dow Corning 5700 Antimicrobial Agent
EPA Reg. No. 34292-1
Leaching study on 100% cotton
CASWELL No. 892-B

Recommendations and Conclusions:

1. Toxicology Branch concludes that the data presented from the refined testing methods indicates that DC 5700 does not leach from 100% cotton at pH 4.0 under extreme conditons.

2. Toxicology Branch has no objection to the application of DC 5700 as previously requested on 100% cotton or cotton containing articles with the exception of articles to be worn internally (FDA jurisdiction).

Procedure:

medicaltex™

After a 15 second exposure the cotton samples 6"x6" (3.2-3.4 g) were rinsed in tap water and dried at 135° C for 1/2 hr. in a hot air oven.

One gram samples were placed in 60 ml of synthetic sweat at pH 4 and shaken at 40-50 oscillations/min. for 24 hr. at 37° C.

A sweat sample of a control and from the treated cotton was then passed through a 1 micron membrane filter, and analyzed for quaternary ammonium. The remaining filtrate from the 1 micron filtering was further filtered with a 0.1 micron membrane, that final filtrate was also analyzed for quaternary ammonium.

Electron micrographs were made of the micron filter membranes to determine non filtered material.

BAMB® Biyosidal Antimikrobiyal Moleküler Bariyer

medicaltex™

Competition

- Triclosan (Microban)
  - Structurally similar to Dioxin and unstable when exposed to heat or UV light. Drug resistance identified by CDC
- Silver Ion (Agion)
  - Silver changes product color, not fast acting, environmental concerns over heavy metals, is very expensive

•MEDICALTEX treated with BAMB
-Thermally stable, safe and non-toxic, superior efficacy, excellent color and clarity, competitively priced

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Germ spectrum

medicaltex™

Bacteria

Micrococcus sp.
Staphylococcus epidermidis
Enterobacter agglomerans
Acinetobacter calcoaceticus
Staphylococcus aureus (pigmented)
Staphylococcus aureus (non-pigmented)
Klebsiella pneumoniae ATCC 4352
Pseudomonas aeruginosa
Pseudomonas aeruginosa
Pseudomonas aeruginosa PDR-10
Streptococcus faecalis
Escherichia coli ATCC 23266
Escherichia coli
Proteus mirabillis
Proteus mirabillis
Citrobacter diversus
Salmonella typhosa
Salmonella choleraesuis
Corynebacterium bovis
Vancomycin Resistant *Enterococcus*
Methicillin-resistant *Staphylococcus aureus*
Mycobacterium smegmatis
Mycobacterium tuberculosis
Brucella cania
Brucella abortus
Brucella suis
Streptococcus mutans
Bacillus subtilis
Bacillus cereus
Clostridium perfringens
Haemophilus influenzae
Haemophilus suis
Lactobacillus casei
Leuconostoc lactis
Listeria monocytogenes
Propionibacterium acnes
Proteus vulgaris
Pseudomonas cepacia
Pseudomonas fluorescens
Xanthomonas campestris
Clostridium difficile

Fungi

Aspergillus niger
Aspergillus fumigatus
Aspergillus versicolor
Aspergillus flavus
Aspergillus terreus
Penicillium chrysogenum
Penicillium albicans
Penicillium citrinum
Penicillium elegans
Penicillium funiculosum
Penicillium humicola
Penicillium notatum
Penicillium variabile
Mucor sp.
Tricophyton mentagrophytes
Tricophyton interdigitalie
Trichoderma flavus
Chaetomium globusum
Rhizopus nigricans
Cladosporium herbarum
Aerobasidium pullulans
Fusarium nigrum
Fusarium solani
Gliocladium roseum
Oospora lactis
Stachybotrys atra

Yeast

Saccharomyces cerevisiae
Candida albicans 1

Algae

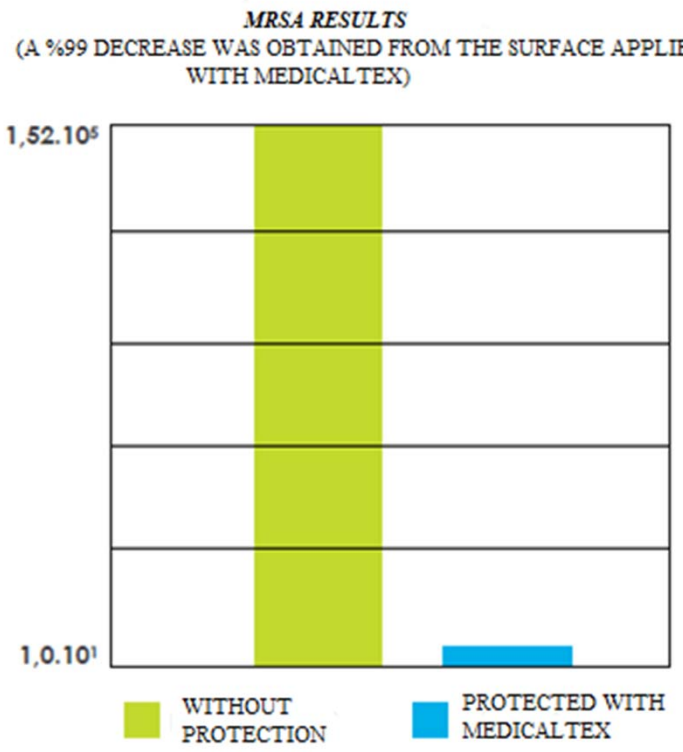
Oscillatoria borneti LB143
Anabaena cylindrica B-1446-1C
Selenastrum gracile B-325
Pleurococcus sp. LB11
Schenedesmus quadricauda
Gonium sp. LB 9c
Volvox sp. LB 9
Chlorella vulgarus

Medicine and Health

medicaltex™

- According to the results obtained in different universities and independent laboratories, medicaltex technology has been matchless in microbial expansion and even in providing control in MRSA bacterium

- Table at the side shows that medicaltex provides 99% reduction in MRSA bacterium



BAMB
Biyosidal Antimikrobiyal Moleküler Bariyer

Wound healing: silk bandages

medicaltex™

Treated silk for the treatment of atopic dermatitis

Dr. G. RICCI
Department of Paediatrics
University of Bologna

BAMB
Biyosidal Antimikrobiyal Moleküler Bariyer

British Journal of Dermatology 2004; **150:** 127–131.

medicaltex™

Therapeutics

Clinical effectiveness of a silk fabric in the treatment of atopic dermatitis

G.RICCI, A.PATRIZI,* B.BENDANDI, G.MENNA, E.VAROTTI* AND M.MASI

*Department of Paediatrics, University of Bologna, Via Massarenti 11, 40138 Bologna, Italy, and *Department of Clinical and Experimental Medicine, Division of Dermatology, University of Bologna, Via Massarenti 1, 40138 Bologna, Italy*

Accepted for publication 22 June 2003

Summary

Background In children with atopic dermatitis (AD), eczema is easily aggravated by contact with irritant factors (e.g. aggressive detergents, synthetic and woollen clothes, climatic factors).
Objectives To evaluate the effectiveness of a special silk fabric (MICROAIR Derma*Silk*®) in the treatment of young children affected by AD with acute lesions at the time of examination.
Methods Forty-six children (mean age 2 years) affected by AD in an acute phase were recruited: 31 received special silk clothes (group A) which they were instructed to wear for a week; the other 15 served as a control group (group B) and wore cotton clothing. Topical moisturizing creams or emulsions were the only topical treatment prescribed in both groups. The overall severity of the disease was evaluated using the SCORAD index. In addition, the local score of an area covered by

BAMB® Biyosidal Antimikrobiyal Moleküler Bariyer

Wound healing: silk bandages

medicaltex™

Treated silk for the treatment of
diabetic ulcer

Prof. Vinci Bonollo
Centro Antidiabetico Osp.
Jesolo (Venice-Italy)

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Clinical effectiveness of Dermasilk in the treatment of diabetic ulcers

medicaltex™

Vinci C., Bonollo V.
Centro Antidiabetico Osp. Civile Jesolo – USL 10 Veneto
V. Levantina 104 Jesolo Lido (Ve)
Correspondence can be sent to: Dott.ssa C. Vinci Centro Antidiabetico Osp. Civile Jesolo
V. Levantina 104 Jesolo Lido (Ve) E-mail: Milena.Vinci@VirgiIio.it Tel. 0421-388553

INTRODUCTION

The diabetic foot is linked to the presence of chronic complications of diabetes (vasculopathy and neuropaty) at the level of the lower limbs, aggravated by increased susceptibility to infections present in the diabetic and by metabolic decompensation. The wound tends to become chronic and thus remain more exposed to the risk of infection. Treatment of the ulcer prevents this resulting in amputation (1).

The purpose of our study is that of evaluating the effectiveness of the medication effected with Dermasilk in the treatment of ulcers which are difficult to heal and ulcers which have not responded to other treatment.

METHODOLOGY

Dermasilk (www.alpretec.com) is a material which for some years has been utilized for atopic dermatits in children (2). It is a natural silk polymerized with AEM5772/5 AEGIS (antibacterical aminoquaternary of wide spectrum), able to have in vitro a bactericidal capability of 92-95% within 1 hour.

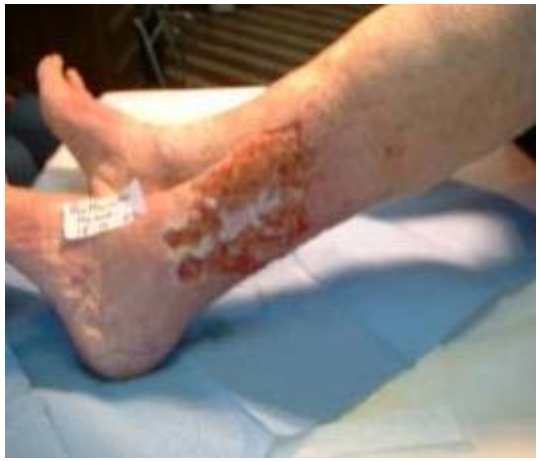
We have utilized this material in 18 patient in our surgery affected by diabetic foot in the period from 12-2002 to 8-2003. Of this patient the type of ulcer varied : 3 venous, 4 arterial, 3 arterial-venous, 5 neuropathic, 2

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

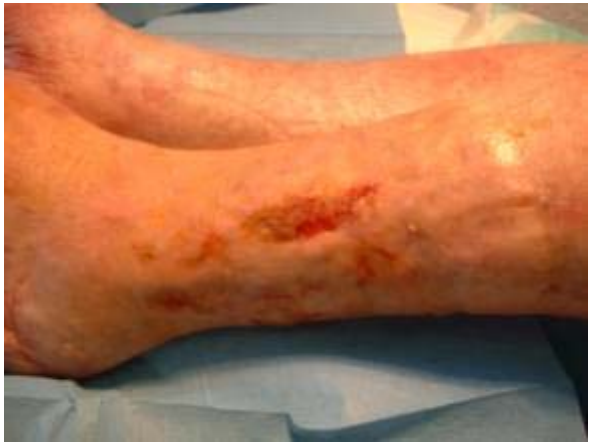
Wound healing: silk bandages

medicaltex™

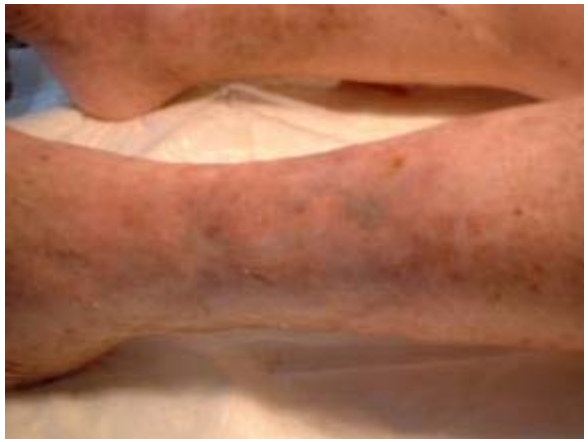
18/12/2002



05/03/2003



25/08/2003

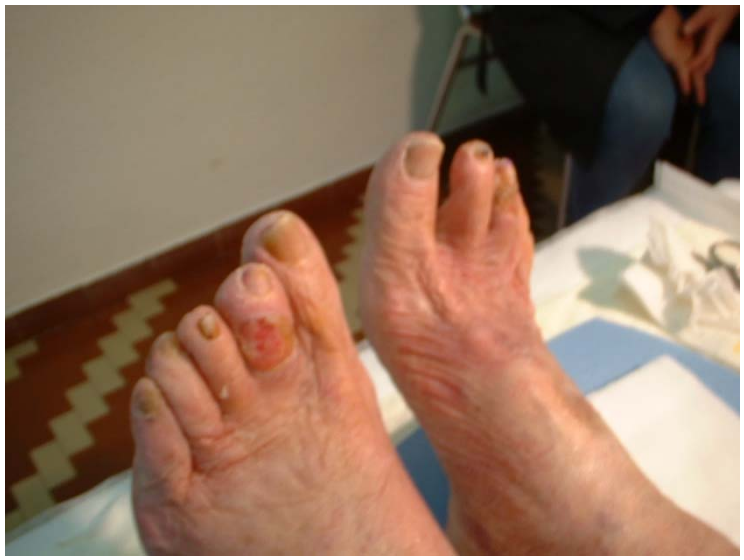


BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

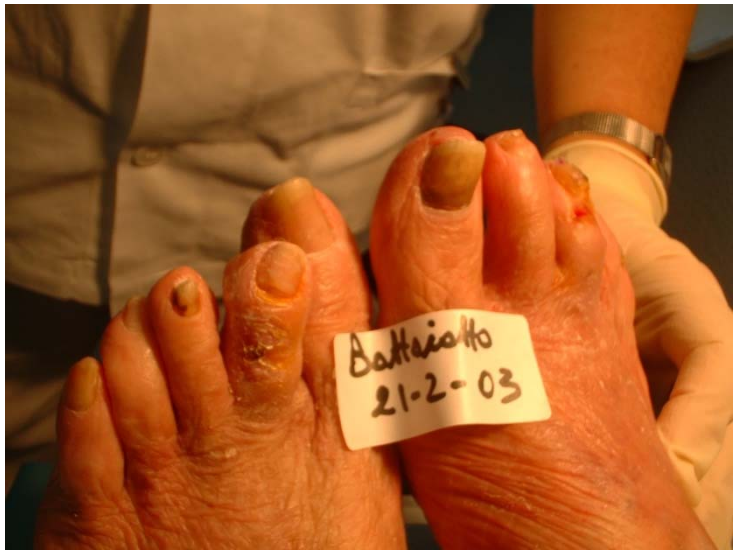
Wound healing: silk bandages

medicaltex™

04/12/2002



21/02/2003

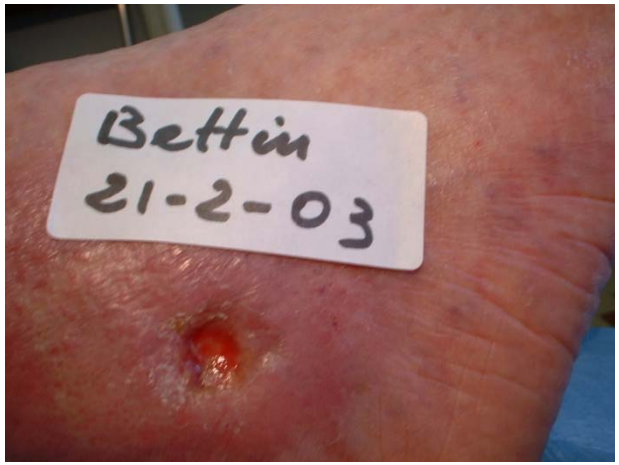


BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

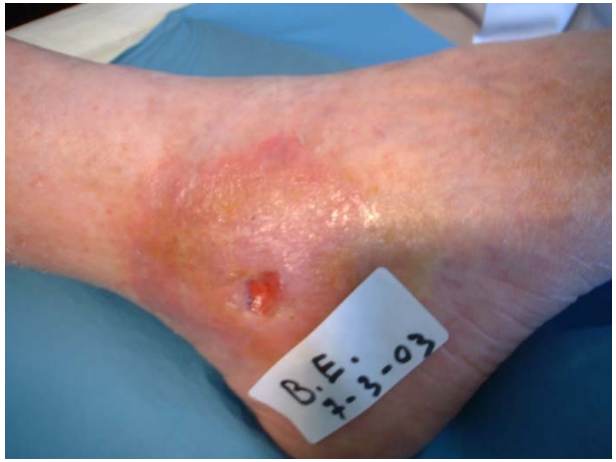
Wound healing: silk bandages

medicaltex™

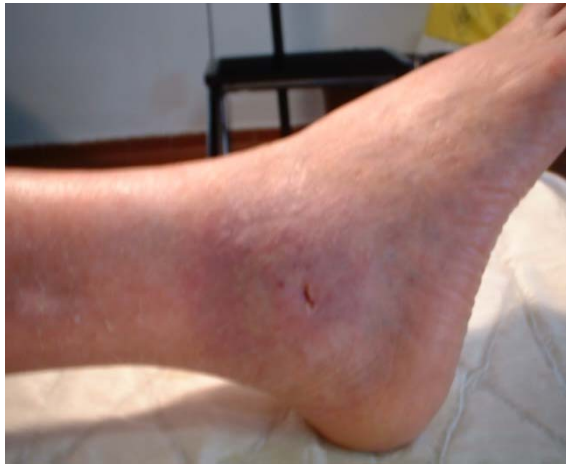
21/02/2003



07/03/2003



29/08/2003

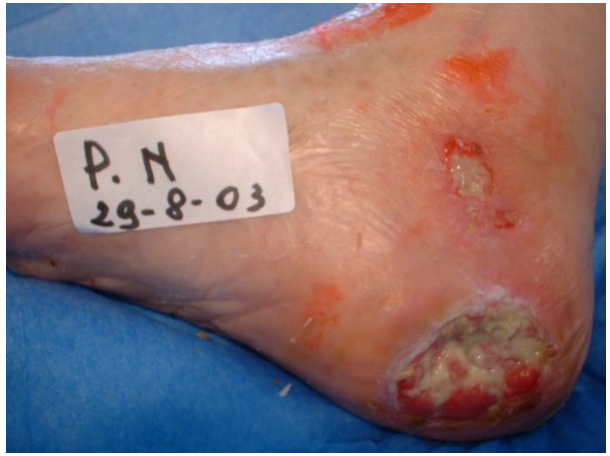


BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

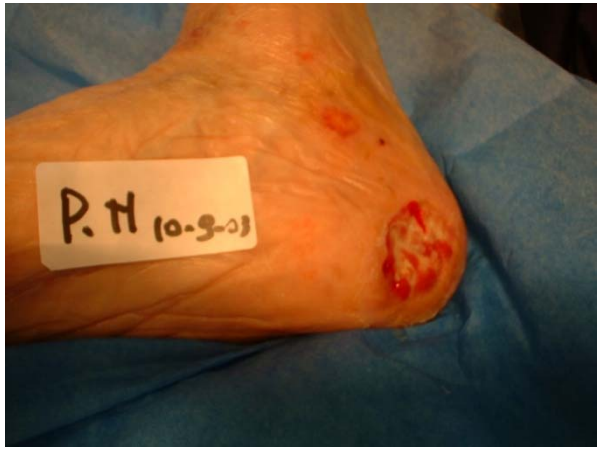
Wound healing: silk bandages

medicaltex™

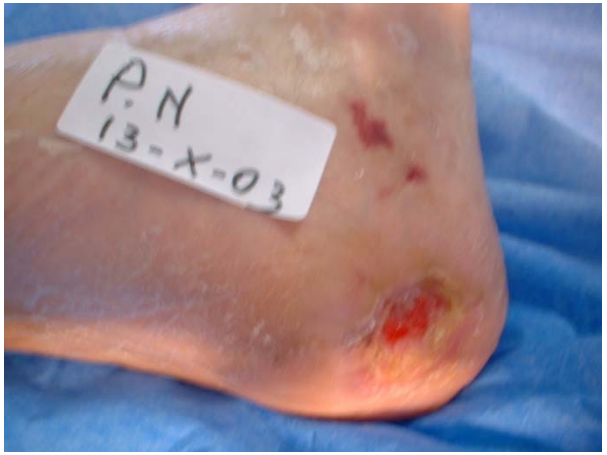
29/08/2003



10/09/2003



13/10/2003



BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Wound healing: silk bandages

medicaltex™

Treated underwear for gynaecologic infections

Prof. G. Marcellini Hercolani,
“La Sapienza”
University of Roma

Kangaroo bag
for premature babies
University of Roma

BAMB
Biyosidal Antimikrobiyal Moleküler Bariyer

medicaltex™

How does DermaSilkIntimo Help?

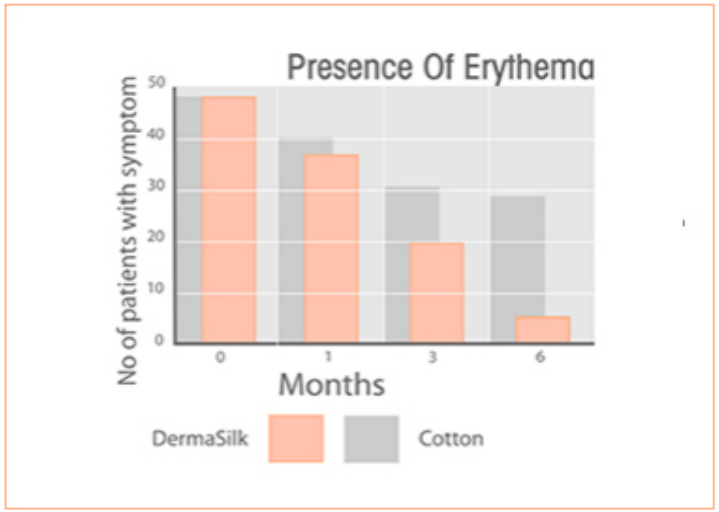
The effectiveness of DermaSilkIntimo in recurrent thrush has been demonstrated in clinical trials. In one study the effect of DermaSilk underwear was assessed in the treatment of a group of patients who suffered from a particularly persistent and resistant form of recurrent vaginal thrush. All the patients recruited had been suffering from recurrent vulvovaginal thrush for an average of 2.4 years and had in the 6 months prior to the start of the study been treated with standard preventative antifungal therapy but despite this had continued to suffer relapses and vulvar irritation.

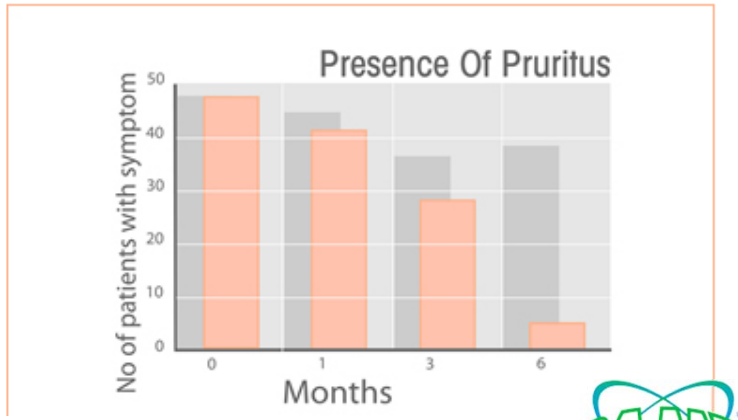
The 96 patients involved in the study were divided into two groups: Half wore DermaSilk underwear and the other half pure cotton underwear. **All continued the standard antifungal therapy for the entire observation period of 6 months.** Neither the patients nor the doctors knew which group they were in.

RESULTS:
At all stages of the study, the women in the DermaSilk group reported a much more marked and progressive improvement in terms of itching, burning, redness (erythema), vulvar irritation and swelling (oedema) than the women in the cotton group. The improvements in those who used DermaSilk continued for the entire duration of the study, whereas in some of the women who wore cotton underwear the symptoms returned after 3 months..

The study showed that the use of DermaSilk also helped to reduce the number of recurrences experienced during the 6 month study period.

Number of Recurrences	DermaSilk Group	Cotton Group





BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

medicaltex™

Number of Recurrences	DermaSilk Group	Cotton Group
No Recurrences	11 (22.9%)	4 (8.3%)
1 Recurrence	21 (43.8%)	15 (31.3%)
2 Recurrences	14 (29.2%)	20 (41.7%)
3 Recurrences	2 (4.2%)	9 (18.8%)

32/48 (66.7%) of the DermaSilk patients had none or one recurrence during the 6 month study compared with only 17/48 (35.4%) of the patients wearing cotton.

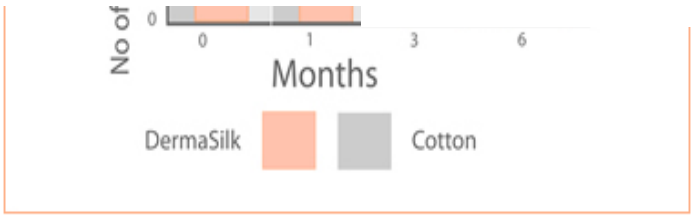
Please note: The use of these briefs are recommended as an additional treatment option and are not intended to replace any medication prescribed by your Medical Practitioner.

"Use of Dermasilk Briefs in recurrent Vulvovaginal Candidosis" A. D'Antuono, S. Bellavista, N. Banzola, V. Gaspari, A. Patrizi, Dermatological Clinic - University of Bologna - (poster presented at the 86th SIGO Congress - 51st AOGOI Congress; Milan 2010).

Other studies have also reported the benefits of DermaSilk in other areas of feminine health.

"Alternative therapy of recurrent vulval pathologies"
P. Betto, To. Beard. Belloni Fortina ET Al. - Women Dermatologhe Italy - Poster introduced to 81° the National Conference SIDeMaST; Turin 2006.

"Clinical Study on the effectiveness of intimate underclothes made up of medicated silk DermaSilk® in some gynecological affections"
M.M. Anceschi, G. Marcellini Hercolani-Gaddi, Dip. of Gynecological Sciences, Perinatologia and Puericultura, University of the Studies of Rome "the Wisdom"



Over 6 months DermaSilk removed the symptoms of redness and itching in nearly all patients in the study.

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Anche in patologie gravi DermaSilk®
accelera i tempi di guarigione

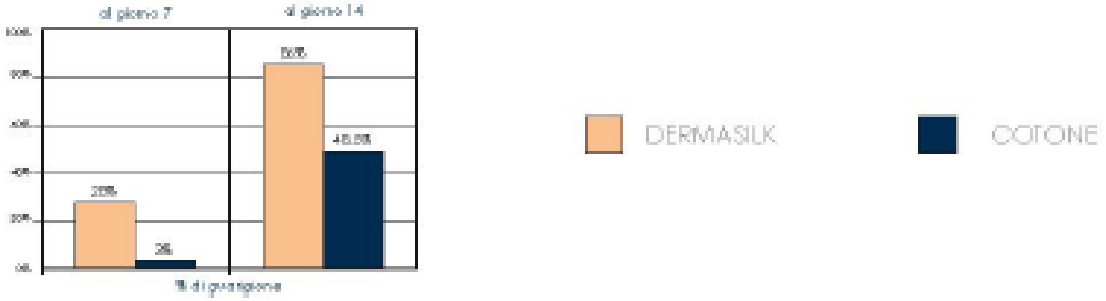
medicaltex™

Lo studio ha sperimentato l'uso di DermaSilk® in patologie severe, come vulvovaginiti croniche, lesioni erpetiche vulvari e perineali, vestibuliti, esiti di enucleazione di cisti di Bartolini.

DermaSilk® è molto efficace nell'alleviare la sintomatologia a breve termine e produce **un'alta percentuale di guarigioni più precoci** rispetto a quelle verificatesi in chi ha indossato indumenti intimi di cotone (a parità di età e di gravità della malattia).

*"Le pazienti hanno riferito **un immediato senso di benessere** nella fase iniziale dell'applicazione, già nelle prime 12 ore, **(...) con una diminuzione del senso pruriginoso entro un'ora**".*

"Alcune pazienti, avendo ottenuto effetti benefici fino alla guarigione, hanno deciso spontaneamente di indossarlo nuovamente al sorgere dei primi sintomi di recidiva. Alcune pazienti lo usano di norma quando praticano attività sportiva come forma di prevenzione".



"Studio clinico sull'efficacia di indumenti intimi a base di seta medicata DermaSilk® in alcune affezioni ginecologiche" M. M. Anoesohi, G. Marcellini Heroolani-Gaddi, Dip. di Scienze Ginecologiche, Perinatologia e Puericultura, Università degli Studi di Roma "La Sapienza".

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

Wound healing: silk bandages

- Children with atopic dermatitis (AD)
- Proved effective in the treatment of childhood AD and was comparable to the efficacy of modern corticosteroid in combination with cotton cloth

- B. Fischer, L. Steinmann, R. Kurmann,
- B. Wüthrich, P. Schmid-Grendelmeier,
- T. Kündig, G. Senti
- University Hospital, Zurich, CH & Hospital Zollikerberg, CH

Dermatology

medicaltex™

Vol. 213, No. 3, 2006

Article (Fulltext) Article (PDF 319 KB)

Pharmacology and Treatment

Antimicrobial Silk Clothing in the Treatment of Atopic Dermatitis Proves Comparable to Topical Corticosteroid Treatment

G. Senti, L.S. Steinmann, B. Fischer, R. Kurmann, T. Storni, P. Johansen, P. Schmid-Grendelmeier, B. Wüthrich, T.M. Kündig

Unit for Experimental Immunotherapy, Department of Dermatology, University of Zurich, Zurich, Switzerland

Address of Corresponding Author

Building treatment

medicaltex™

Arthur G. James
Cancer Hospital & Research Centre
Ohio State University

Flooding of the 12 floors with 1,750,000 litres water caused by a major water pipe rupture at the roof level

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

medicaltex™

AEROMICROBIAL CONTROL IN AN EXTENSIVELY DAMAGED HOSPITAL USING A LONG LASTING, SURFACE ACTIVE, SILANE ANTIMICROBIAL [1]

L. Ayers, MD; B. Fox, MD; C. Jacobson, RN*, C. Smith, PhD; R. Kemper and C. White

The Ohio State University, Columbus Ohio
The Kemper Research Foundation, Cincinnati, Ohio

ABSTRACT

Just prior to the opening of a cancer hospital and research institute, a major water pipe froze and ruptured at the roof level of the building, flooding all twelve floors with an estimated 500,000 gallons of water. Ceilings, walls, carpeted floors and upholstered furniture were either directly wet or exposed to high humidity. Localized odors began to develop in the building and sampling of wet carpet showed heavy growth of water associated bacteria.

Aeromicrobial sampling produced >2800 CFUs of fungus per cubic meter of air on most floors despite traditional techniques of surface disinfection and high efficiency air filtration. The lower floors, which had greater water damage and a longer delay in moisture control, developed visible colonies of fungi on damaged surfaces.

Restoration of this building to its intended use as a cancer treatment center required the elimination of microbial reservoirs and the control of fungi on all exposed surfaces. A long-active silane modified organofunctional antimicrobial (ÆGIS™, 3-trimethoxysilyl propyldimethyloctadecyl ammonium chloride by ÆGIS Environmental Management, Milford, Ohio) was selected to treat all surfaces throughout reconstruction. This product is odorless, colorless, non-volatile and may be applied to all environmental surfaces. Antimicrobial activity continues for several years.

Re-evaluation of the facility at 7 months following restoration showed 45% of the facility environment to be free of airborne fungi; 36% with fewer than 5 CFUs per cubic meter of air, 8% with fewer than 10 CFUs, 5% with fewer than 15 CFUs and 6% with over 15 CFUs.

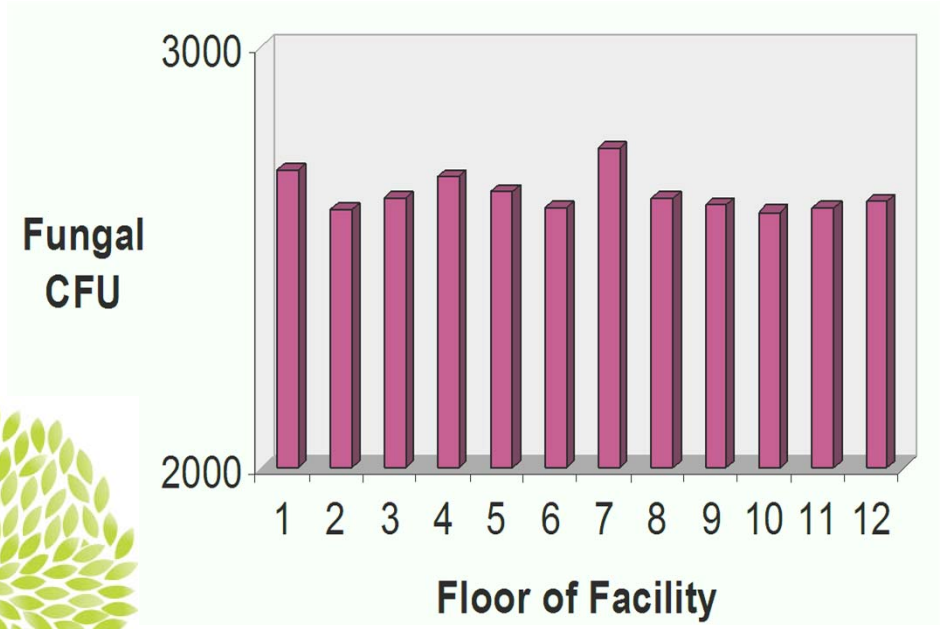
Presently the facility is free of odor and has the appearance of a new building. These data show that this surface-active antimicrobial can be used successfully for Aeromicrobial control of a water damaged building without harm to the building environment or furnishings or health risks to patients or personnel.

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

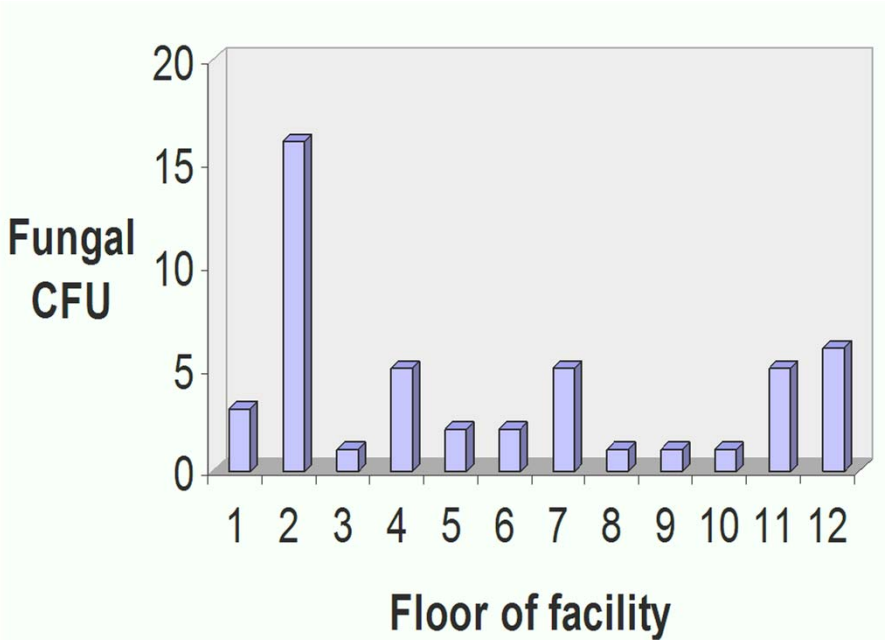
Building treatment

medicaltex™

Retrieval levels
before treatment



Retrieval levels
7 months after treatment



BAMB
Biyosidal Antimikrobiyal Moleküler Bariyer

Conclusion

medicaltex™

Feature and benefits

- Active antimicrobial protection: reduces bacterial and fungal contamination
- Permanent: durable throughout industrial laundry process
- Not a chemical poison: no arsenic, heavy metals, or polychlorinated phenols,
- Unmatched safety profile: not harmful for human or environment
- No Migration: won't leach into the environment or transfer to the skin
- Mechanical deactivation: does not induce microbial mutation or bio- accumulation
- Proven real live performance: through independent clinical trials
- Restricted licensed technology: strict quality control criteria and traceability
- Global registrations and worldwide available

BAMB®
Biyosidal Antimikrobiyal Moleküler Bariyer

medicaltex™

Pathogens Killed and Inactivated by BAMB™

Viruses	**Reference**
Adenovirus Type II & IV	17, 18, 21
Bovine Adenovirus Type I & IV	17, 18, 21
Feline pneumonitis	21
Herpes Simplex Type I	16, 17, 18
Herpes Simplex Type II	21
HIV-1 (AIDS)	21
Influenza A2 (Aichi)	17, 18, 21
Influenza A2 (Asian)	17, 18
Influenza B	17, 18
Mumps	17, 18
Parinfluenza (Sendai)	21
Rous Sarcoma	17, 18
Reovirus Type I	17, 18
Simian Virus 40	17, 18
Vaccinia	17, 18
MS2	9
PRD1	19

3-5-2012

BAMB® Biyosidal Antimikrobiyal Moleküler Bariyer

medicaltex™

Gram Positive Bacteria	**Reference**
Bacillus sp. (vegetative cell)	5, 6, 11
Corynebacterium diptheriae	1, 13
Micrococcus lutea	5, 6, 1
Micrococcus sp.	2, 5, 15
Mycobacterium tuberculosis	14
Mycobacterium smegmatis	14
Propionibacterium acnes	5
Staphylococcus aureus	2, 3, 5, 6, 10, 11, 13, 24, 15, 21
Staphylococcus epidermidis	2, 5, 6, 7, 11, 13, 14, 15
Streptococcus faecalis	2, 5, 6, 7, 11, 13, 14
Streptococcus mutans	5, 6, 7, 11
Streptococcus pneumonia	1
Streptococcus pyogenes	5, 6, 7, 11

BAMB® Biyosidal Antimikrobiyal Moleküler Bariyer

Gram Negative Bacteria	**Reference**
Serratia marcescens	5, 6, 7, 11
anthomonas campestris	5, 6, 7, 11
Acinetobacter calcoaceticus	2, 5, 6, 11, 14, 15
Aeromonas hydrophilia	5, 6, 11
Citrobacter deversus	5, 6, 11
Citrobacter freundi	5, 6, 11
Enterobacter aerogenes	5, 6, 7, 11
Enterobacter aglomerans	2, 5, 14, 15
Enterobacter cloacae	5, 6, 7, 11
Enterococcus	10
Escherichia coli	1, 2, 3, 5, 6, 7, 10, 11, 13, 14
Klebsiella oxytoca	5, 6, 11, 14

• Klebsiella pneumoniae	3, 5, 6, 7, 9, 10, 11, 13, 14
• Klebsiella terriena	19
• Legionella pneumophila	1
• Morganella morganii	5, 6, 7, 11
• Proteus mirabilis	5, 6, 7, 11
• Proteus vulgaris	5, 6, 7, 11
• Pseudomonas aeruginosa	2, 3, 5, 6, 7, 11, 13, 14
• Pseudomonas fluorscens	5, 6, 7, 10, 11
• Salmonella cholera suis	5, 6, 7, 11, 14
• Salmonella typhi	5, 6, 7, 11, 14
• Salmonella typhimurium	1, 5, 6, 7, 11
• Serratia liquifaciens	5, 6, 7, 11

• **Fungi, Algae, Mold, Yeast, Spores**	**Reference**
• Alterania alternate	8,12
• Aphanizomenon sp.	22
• Aspergillus flavus	2, 5, 6, 7, 11, 14
• Aspergillus niger	2, 5, 6, 7, 8, 11, 12, 13, 14
• Aspergillus sydowi	5, 6, 7, 11
• Aspergillus terreus	5, 6, 7, 11, 14
• Aspergillus versicolor	2, 5, 6, 7, 11
• Aspergillus verrucaria	14
• Aureobasidium pullans	5, 6, 7, 8, 11, 12
• Candida albicans	1, 2, 5, 6, 7, 14
• Candida pseudotropocalis	5, 6, 7, 11
• Chaetomium globsum	1
• Cladosporium cladosporioides	8, 12
• Chlorella vulgaris	19
• Dreschslera australiensis	8, 12
• Epidermophyton sp.	9
• Gliomastix cerealis	8, 12
• Gloeophyllum trabeum	5, 6, 7, 11

• Microsporum sp.	9
• Microsporum audouinii	21
• Monilia grisea	8, 12
• Oscillatoria	20
• Penicillium chrysogenum	5, 6, 7, 11
• Pencillium commune	8, 12
• Penicillium funiculosum	1, 2, 5, 6, 7, 11, 14
• Penicillium pinophilium	5, 6, 7, 11
• Penicillium variable	5, 6, 7, 11, 14
• Phoma fimeti	8, 12
• Pithomyces chartarum	8, 12
• Poria placenta	5, 6, 7, 11
• Scenedesmus	20
• Saccharonyces cerevisiae	5, 6, 7, 11, 13, 14
• Scolecobasidium humicola	8, 12
• Selenastrum sp.	22
• Trichoderma viride	5, 6, 7, 11
• Trichophyton interdigitale	2, 14
• Trichophyton maidson	14
• Trichophyton mentogrophytes	5, 6, 7, 9, 11
• Trichophyton sp.	5, 6, 7, 9, 11

REFERENCES

- 1. Y. Hsiao, Chinese Pat. Appl., PCT/CN98/00207 (1998)
- 2. James Malek, John Speir, “Method of Reducing the Number of Microorganisms in a Method of Preservation”; U.S. Pat. 4,259,103 (1981)
- 3. Stewart Klein, “3-(trimethoxysilyl)propyldidecylmethyl Ammonium Salts and Method of Inhibiting growth of Microorganisms Therewith”; U.S. Pat. 4,394,378 (1983).
- 4. William Eudy, “Organosilicon Quaternary Ammonium Antimicrobial Compounds”; U.S. Pat. 4,406892 (1983).
- 5. Richard Gettings, William White, “Skin Treatment Method”; U.S. Pat. 4,908,355.(1990)
- 6. Lynne Blank, William White, “Antimicrobial Rinse Cycle Additive”; U.S. Pat. 5,145,596 (1992)
- 7. Richard Gettings, William White, “Opthalmic fluid Dispensing Method”; U.S. Pat. 5,013,459 (1991).
- 8. Richard Avery, Frederick Martin, Sean Dwyer, “Production of Stable Hydrolyzable Organosilane Solutions”; U.S. Pat. 5,411,585 (1995).
- 9. Lynne Blank, Richard Gettings, William White, “Method of Treating Tinea Pedis and Related
- Dermatophytic Infections”; U.S. Pat. 4,865,844 (1989).
- 10. David Battice, Michael Hale, “Antimicrobially Effective Organic Foams and Methods for their
- Preparation”; U.S. Pat. 4,631,297 (1986).
- 11. Bruce Higgs, William White, “Solid Antimicrobial”; U.S. Pat. 5,359,104 (1994). This patent also
- describes the method of antimicrobial activity.
- 12. Richard Avery, Frederick Martin, Sean Dwyer, Colin Brown, “Production of Stable Hydrolyzable
- Organosilane Solutions”; U.S. Pat. 5,411,585 (1995).
- 13. William White, Jerry Olderman, “Anitimicrobial Techniques for Medical Nonwovens: A Case
- Study”; Book of Papers, 1984, 12th Annual Nonwovens Tech. Symposium, pp. 13-46. No bacterial
- adaption (no increased bacterial resistance to Zoonocide) reported.
- 14. J. McGee, J. Malek, W. White, “New Antimicrobial Treatment for Carpet Applications”, Am.
- Dyestuff Rep., 1983, (6), pp.56-59. Dow corning Technical Brochure; 22-994-83 (1983).
- 15. Richard Gettings, Benny Triplett, “A New Durable Antimicrobial Finish for Textiles”; Book of
- Papers, 1978, American Association of Textile Chemists and Colorists National Technical
- Conference, pp. 259-261. Dow Corning Technical Brochure; 24-095-85 (1985).

- 16. I-Fu Tsao, Henry Wang, Charles Shipman, “Interaction of Infectious Viral Particles with a
- Quaternary Ammonium Chloride Surface”; Biotechnol. Bioeng., 34, (5), pp. 639-46 (1989).
- 17. I-Fu Tsao, Henry Wang, “Removal and Inactivation of Viruses by a Surface Bonded Quaternary
- Ammonium Chloride”, ACS Synp.Ser. (1990), Volume Date 1988, 419, pp. 250-67. Reaction with
- Lipidophilic Viruses.
- 18. M. Klein, A. DeForest, “Principles of Viral Inactivation”, Disinfection, Sterilization and
- Preservation. 3rd Ed., S. Block, Ed., (Lea & Febiger, Philadelphia, PA) 1983, pp.422-434.
- 19. M. Abbaszadegan, et.al., “Evaluation of Proprietary Treated Zeolite in Point of Use Devices for
- Removalof Microorganisims”, NSF Water Quality Center, Arizona State University, Tempe, AZ
- 85257; 12/03. W. Peterson & R. Berman, U.S. Pat.Pending, 60/472,429 (7/03).
- 20. P. Westerhoff, D. Bruce, “Biocide Coating Experiment”, Arizona State University, Tempe, AZ
- 85257; 8/00.