High-performance Antimicrobial Surgical Supplies for Preventing Antimicrobial-resistant Surgical Site Infections.

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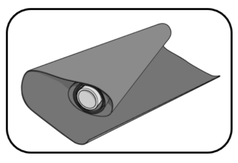
BACKGROUND

- Patients undergoing surgeries in low-resource settings have a high chance of acquiring common antimicrobial-resistant pathogens like MRSA & VRE from the environment via direct and cross contaminations.
- It has been reported that antimicrobial-resistant ESKAPE bacteria, viruses, and fungi commonly available in the environment get deposited on fabric surfaces during surgeries in low-resource settings.
- A proper sterilized environment is needed to enhance the surgical outcome by reducing the chances of infections, mortality, and long-term usage of antibiotics to prevent Surgical Site Infections (SSIs).
- One of the cheapest ways to provide a sterilized environment during surgery is the use of high-performance antimicrobial surgical supplies like surgical drapes, patient wear, bedsheets, and other medical consumables.

METHODS

- The commonly used hospital grade cotton, poly-cotton, and polypropylene textile substrates are taken and chemically processed with a metal-free proprietary antimicrobial formulation to provide High-performance Antimicrobial functionality to the fabric, while also making the fabric wash-friendly, comfortable, non-cytotoxic, and biocompatible for human skin.



Input fabric

⬇

Required: Arrangement of Textile machineries in a sequence.
Control parameters:
- Temperature
- pH
- Fabric specifications
- Chemical concentrations (optimized)
- Additional Electronic Controls.

Processing Technology

⬇

Output fabric

“Patients have a high chance of catching infections during surgeries.”

Source: AO Foundation: AO surgery reference.

RESULTS

- The fabric is rigorously tested for its Antibacterial, Antiviral & Antifungal properties in accordance with AATCC 100, ISO 18184 & AATCC 30 Standards respectively. It is found that >99.9% of the bacteria, viruses, and fungi got destroyed within 30 minutes of contact with fabric.

Test Organisms used	Described by the customer : **Fabric: Fabiosys Antimicrobial fabric**	
	No.of Swatches Result	**Bacterial Reduction(%)**
Klebsiella pneumoniae ATCC 4352 - 30 min	5	99.99
Staphylococcus aureus ATCC 6538 - 30 min	5	99.99

Result : : The sample showed 99.99 % antibacterial activity against *Staphylococcus aureus* ATCC 6538 and 99.99 % antibacterial activity against *Klebsiella pneumoniae* ATCC 4352 when tested according to AATCC 100-2019 test method.

Results:

Test Virus: Human Coronavirus HCoV-229E (Surrogate of SARS-CoV-2)

1: Test Sample: Surface Disinfectant; Fabric: PV: 40/60 45 Gsm Embossed

Virus	**Replicates**	**Log of Infectivity titre value Log (Va)** (Immediately after Inoculation of Control)	**Log of Infectivity titre value Log (Vb)** (After 30 minutes of contact with Control)	**Log of Infectivity titre value Log (Vc)** (After 30 minutes of contact with Test Specimen)
Influenza virus suspension: (1.70×10^8 PFU / ml)	**Set I**	5.90	5.86	2.78
	Set II	5.92	5.88	2.85
	Set III	5.82	5.80	2.88
lgTCID$_{50}$/ Average		5.88	5.85	2.84
Reduction value **M = Log (Va – Vb)**		0.03		-
Log of **Antiviral Efficacy Value *Mv***		**3.01**		
Percentage **Antiviral Efficacy Value *Mv***		**99.90**		

Test Organism Used	Described by the customer : **Fabric: Fabiosys Antimicrobial fabric**
	Aspergillus niger ATCC 6275
Zone of inhibition in mm	0 mm
Growth under fabric	Absent

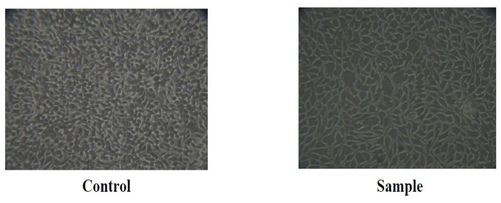
Result : : The sample showed presence of antifungal activity against *Aspergillus niger* ATCC 6275 when tested according to AATCC 30 Part 3 method.

- The microbes taken are gram-positive & gram-negative bacteria including MRSA & VRE, enveloped viruses: HCoV-229E and H3N2, and fungi: *Aspergillus Niger*.

Test Organisms used	**M2300015-3** Described by the customer : **Fabric: Fabiosys Antimicrobial fabric**	
	No.of Swatches Result	**Bacterial Reduction(%)**
Methicillin Resistant *Staphylococcus aureus*-24 hours	5	99.99
Vancomycin Resistant Enterococci - 24 hours	5	99.99

- The fabric is also tested for its Cytotoxicity via MTT Test method as per ISO 10993-5 which revealed non-toxicity after an exposure of 48 hours, and no skin sensitization or irritation is observed over a duration of 72 hours when tested on New Zealand White Rabbits as per ISO 10993-23 Standard.

Invitro Cytotoxicity- Direct method. Cell line used: L929. Experiment done by: SITRA.



Control | Sample

CONCLUSION

High-performance Antimicrobial surgical supplies can act as an infection control tool against AMR infections.

Use Anti-AMR surgical drapes to prevent SSIs.

Make surgeries safer

LAB TO CLINICS

Surgical Site Infections (SSIs) increase patient mortality, and damage surgeon’s, hospital’s & medical camp’s reputation.

Drape packs are available for every surgery. Contact **partner@fabiosys.com** for a complimentary sample.

Media Coverage:

Acknowledgements

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