

Antibacterial Performance (ASTM E2315-16 + ASTM E2783-22)

Concentration	S. Aureus (1min)	K. Pneumoniae (1min)	C. Albicans (1min)	Methicillin-resistant S. Aureus (1min)
20 mg/mL	> 99.99%	> 99.99%	> 99.99%	> 99.99%



Antiviral Performance of (20 mg/mL (2002 Ministry of Health, China, ISO 18184-2019)

Index/Virus	COVID-19 (20min)	H1N1 (1min)	H1N1 (1min)	H3N2 (1min)
Inactivation rate	> 99.99%	> 99.9%	> 99.99%	> 99.9%
Inactivation index	> 4	> 3	> 4	> 3.38

SGS Test Report No. TSD12345678 Date: Oct 01, 2021 Page 1 of 3

Project: POLYU (CAGBIR PROJECT)
11 FOR CHI ROAD, HONG KONG, HONG KONG

The following sample were submitted and identified upon behalf of the client as:
PLA/CLUDONER COATED NYLON/PE/OPP FABRIC

Client Name: CAGBIR
Country of Origin: HONG KONG
Country of Destination: HONG KONG
Sample Received Date: SEP 23, 2021
Testing Period: SEP 23 TO OCT 05, 2021

Test Requested: Determining the Antimicrobial Activity of Antibiotic Agents Under Dynamic Contact Method by Modified ATCC F 14520 Standard Method

FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S) ****

Signed for and on behalf of SGS Hong Kong Ltd.
Au-Yan Chik, QMS Technical Manager

Skin irritation of (ISO 10993-10: 2010, 100mg/mL)

Index/Position	Oral mucosa of hamster	Vagina of white rabbit
Irritation index	0.7	0.7
Irritation reaction	negligible	negligible

IMA CNAS HTW Vaginal Irritation Test Final Report

Report Number: CSTB20194567 Article Name: PHA ecolar Method Standard: ISO 10993-10:2010

Sponsor: The Hong Kong Polytechnic University
Facility: CCC International Inspection Services (Shenzhen) Co., Ltd.

IMA CNAS HTW Oral Mucosa Irritation Test Final Report

Report Number: CSTB20194567 Article Name: PHA ecolar Method Standard: ISO 10993-10:2010

Sponsor: The Hong Kong Polytechnic University
Facility: CCC International Inspection Services (Shenzhen) Co., Ltd.

Competitive analysis of BLESSTAR®

Items	Inorganic	Organic	Natural	BLESSTAR®
Typical products	Ag, CU, Mg and Zn compounds or nanoparticles	quaternary ammonium, Polybiguanides,	chitosan	PHA or its water solution
Antiviral/antimicrobial	excellent	excellent	good	excellent
Toxicity and allergy	high	medium	no	no
Lethal Dose50 (mg/kg)	2000	25.6	1500	4300
Degradation product	residuals of Ag, Cu, Zn	residuals of S, Cl, and N	H ₂ O, CO ₂ , N or others	Only H ₂ O, CO ₂
Emission of CO ₂ (kg CO ₂ eq/kg)	2.91 (ZnO)	1.08 (Cl ₂)	2.11(NH ₃)	0.5
Price as disinfectant	> \$1000/L Nano-silver solution	\$200/kg	> \$480/kg	\$40~200/Kg
Price as finishing agent	> \$1000/L Nano-silver solution	\$180/kg	> \$300/kg	\$40~200/Kg

Traits:

- Fully biodegradable, low carbon emission.
- Broad-spectrum antiviral/antimicrobial property.
- Non-toxic and non-allergenic.
- Simple preparation and cost-effectiveness.
- Stable and durable.

Hodge and Sterner scale for the evaluation of toxicity

Toxicity Rating	Commonly Used Term	Oral LD50 (single dose to rats) mg/kg
1	Extremely Toxic	1 or less
2	Highly Toxic	1-50
3	Moderately Toxic	50-500
4	Slightly Toxic	500-5000
5	Practically Non-toxic	5000-15,000
6	Relatively Harmless	15,000 or more

Notes: Lethal Dose50 (median lethal dose, LD50), higher LD50 means the much safer of the product.