

ecotio₂[®] ultra range

high performance
anti-viral/anti-bacterial
surface coatings



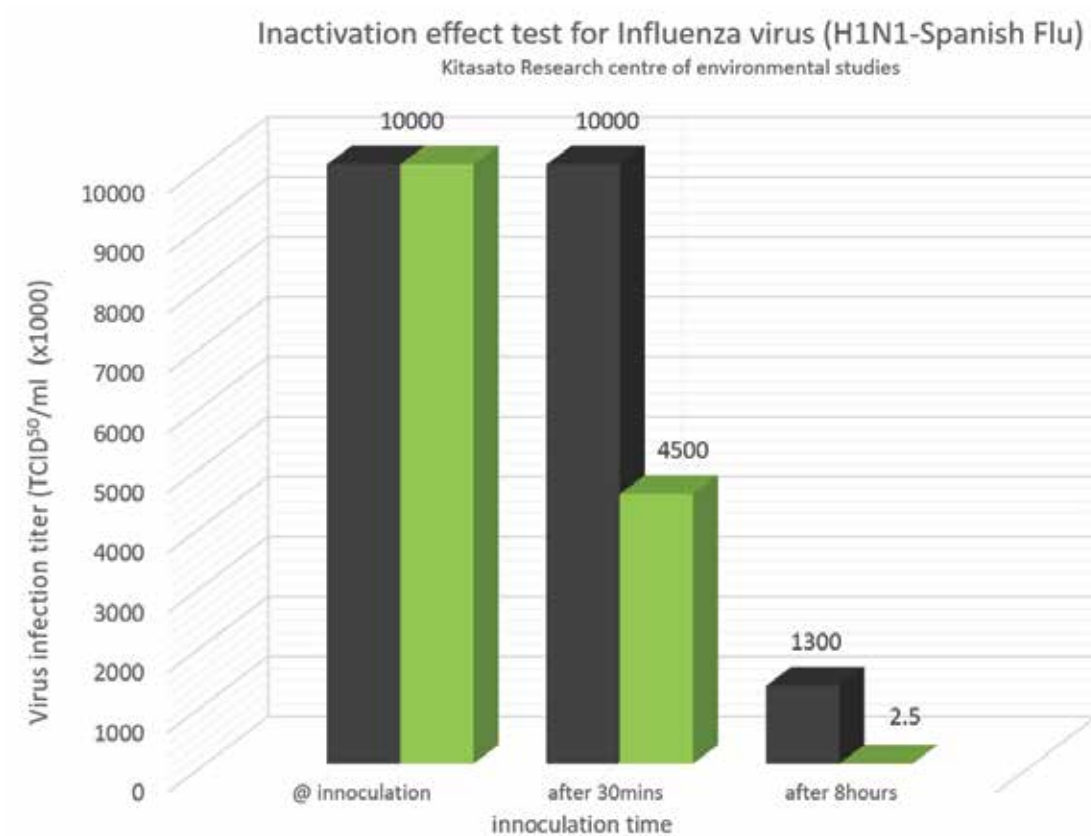
Laboratory test results



Viral Infection is initiated by the attachment of a specialised site on the surface of the protein coat of the virus onto a specific receptor site on the surface of the host cell. Once this binding is complete viruses can release genetic materials into the host cell and take advantage of the machinery of the host cell to reproduce and assemble themselves. These newly produced viruses are now ready to infect other cells. Therefore, one of the key processes to disable viruses is through the control of their surface structure, especially their binding sites, so they can no longer recognize the receptor site on the host cells.

As ecotio₂[®] ultra coatings attack most effectively on the virus's surface, they represent an excellent viable technology to destroy the viruses surface structure. Functionalized nanoparticles can affect the viruses due to chemical interactions between the molecules-functionalisers and molecules-receptors at the virus surface.

Test for Inactivation of A-Type Influenza Virus H1N1 Influenza A Virus H1N1 (Spanish Flu)



Reduction rate 10000000 TCID₅₀/ml to < 2500 TCID₅₀/ml

55% reduction in 30 minutes

99.975% reduction in 8 hours

Continual viral inactivation and anti-bacterial effect

*Antivirus Verification

The antivirus property of ecotio₂[®] ultra was verified by Kitasato Research Centre on Environmental Sciences in December 2009. Ecotio₂[®] ultra was produced based on the verification results that its reduced value of infectivity logarithm concerning A-type influenza virus H1N1 is 2.72log₁₀ (standard for antivirus verification: 2.00log₁₀ or more) and its inactivation effect (virus reduction rate) is 99.975%

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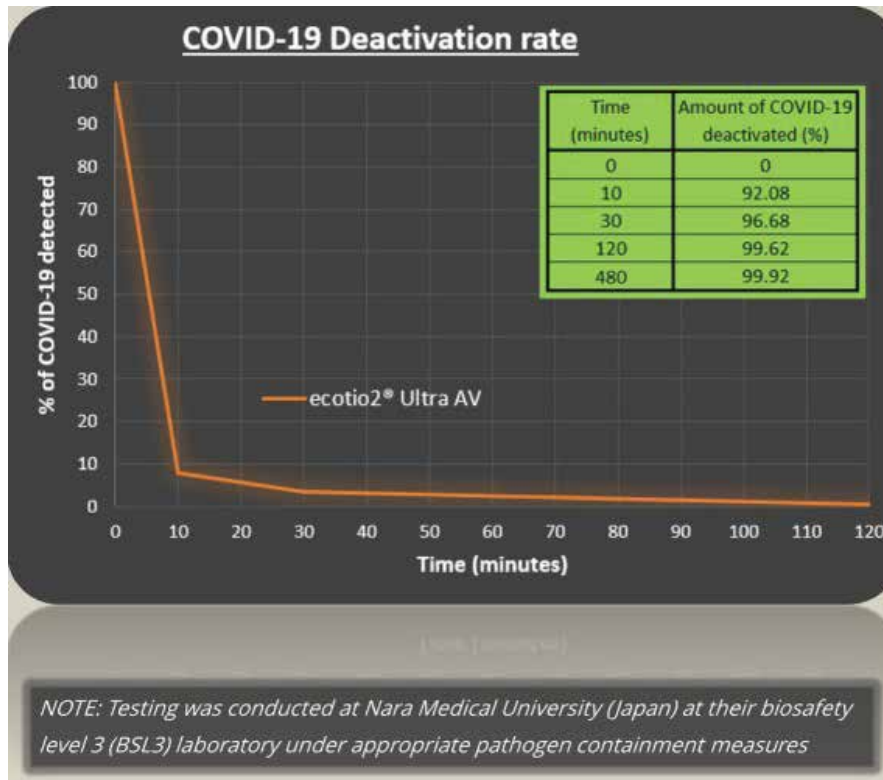


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Test for Inactivation of Sars 2 Covid 19



ecotio₂[®] ultra AV Reduction rate **92%** reduction in 10 minutes

96% reduction in 30 minutes

99.9% reduction in 8 hours

ecotio₂[®] product range has been tested to many established local and global standards including:

- ISO 22196 – Measurement of antibacterial activity on plastics and other non-porous surfaces
- ISO 21702 – Measurement of antiviral activity on plastics and other non-porous surfaces
- JIS Z 2801 – Antibacterial products – Test for antibacterial activity and efficacy
(This procedure was adopted as an ISO procedure- ISO 22196 standard above)
- JIS Z 2911 – Methods of test for fungus resistance
- JIS Z L1902 (ISO 20743) – Testing for antibacterial activity and efficacy on textile products

All ecotio₂[®] anti-viral products are deemed non toxic to humans and animals by Japans SIAA

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ultra range – surface coatings



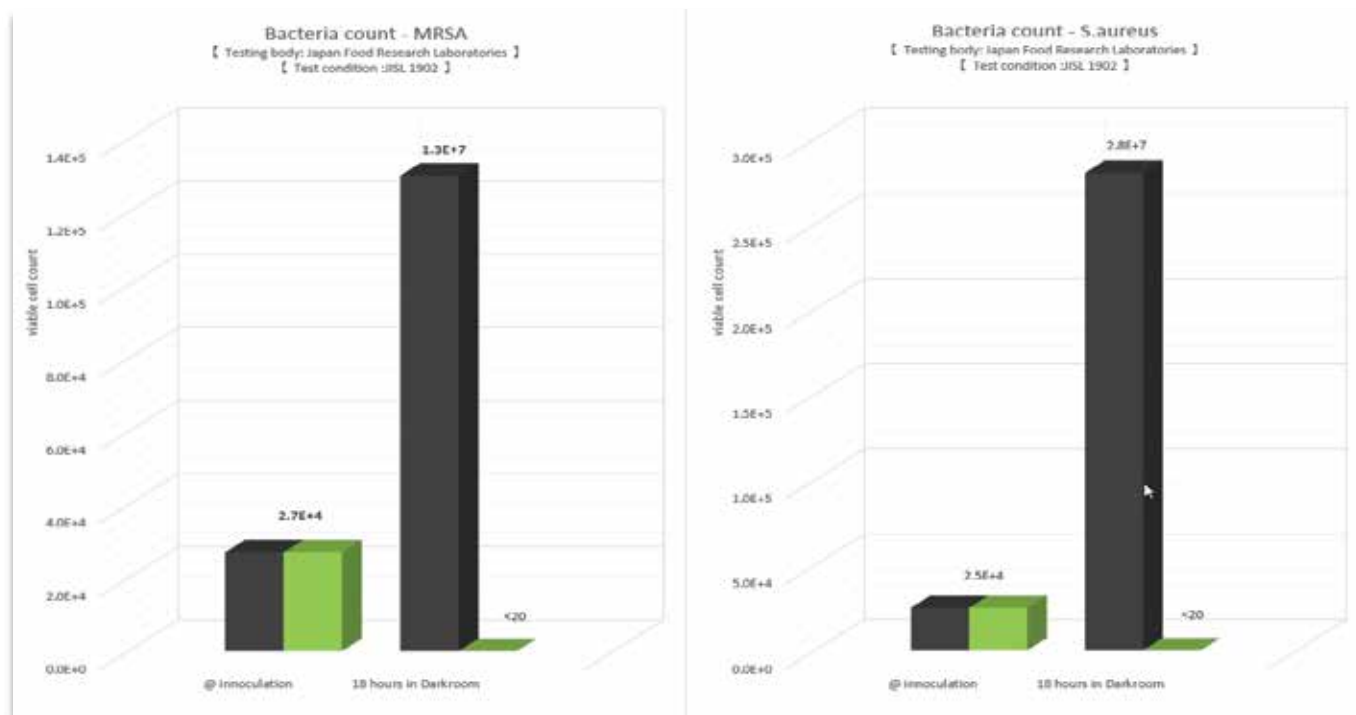
Testing for Antibacterial Activity

Examination Bacterium	Sample	Measurement	Viable cell count	Viable cell count Revitalization value
S.aureus (Cause bacterium of food poisoning and millet)	Uncoated	Immediately after contact	2.5×10^6	
	ecotio² ultra C	37°C darkroom	<20	>6.2
	Uncoated	In 18 hours	2.8×10^7	
K.pneumoniae (Bacilli that originates in pneumonia)	Uncoated	Immediately after contact	1.6×10^6	
	ecotio² ultra C	37°C darkroom	<20	>6.5
	Uncoated	In 18 hours	6.5×10^7	
E.coli (Cause bacterium of food poisoning)	Uncoated	Immediately after contact	6.7×10^7	
	ecotio² ultra C	37°C darkroom	<20	>6.6
	Uncoated	In 18 hours	6.6×10^7	
MRSA (Cause bacterium of nosocomial infection)	Uncoated	Immediately after contact	2.7×10^6	
	ecotio² ultra C	37°C darkroom	<20	>5.7
	Uncoated	In 18 hours	1.3×10^7	
E.coli(O-157:H7) (Cause bacterium of food poisoning)	Uncoated	Immediately after contact	3.2×10^6	
	ecotio² ultra C	37°C darkroom	<20	
	Uncoated	In 18 hours	4.3×10^7	
Pseudomonas ruginosa (Cause bacterium of bedsor and nosocomial infection)	Uncoated	Immediately after contact	6.3×10^5	
	ecotio² ultra C	37°C darkroom	<20	
	ecotio² ultra C	In 18 hours	6.4×10^6	

Viable cell count <20 : not detected Sakin revitalization value >2.2 : There is an anti-bacterium deodorization effect. O-157 and Pseudomonas aeruginosa are unmeasured for JIS non-standard.

Testing body: Japan Food Research Laboratories. Test condition: JISL 1902

Test for Inactivation of - MRSA / S. aureus



Continual viral inactivation and anti-bacterial effect

Bacteria reduction rate **99.99%** reduction in 18 hours

*Data Verification: The antibacterial property of ecotio² ultra was verified by: Japan Food Research Laboratories. Test condition: JISL 1902

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Toxicity report

Test type	Stimulus	Report	Testing institution
Primary skin irritation	No stimulus	Nº306120664-001	Japan Food Research Laboratories
Eye irritation	No stimulus	Nº306110699-002	Japan Food Research Laboratories
Acute toxicity test	96 hours LC50: 10,000mg more	Nº306120203-001	Japan Food Research Laboratories
Acute oral toxicity	LD50:2,000mg/kg more	Nº306110699-003	Japan Food Research Laboratories
Mutagenicity test	Negative	Nº107014412-001	Japan Food Research Laboratories
Patch test	20 people for 48 hours: negative	Nº07-XII-2010	Life science laboratory



SIAA Certified Product SIAA marks are displayed on the products whose quality control and information disclosure are in accordance with the guideline The SIAA mark certifies the compliance of only this product with SIA The SIAA mark certifies the compliance of only this product with SIAA, The SIAA mark certifies the compliance of only this product with SIAA.

Set by the Society of Industrial Technology for Antimicrobial Articles.

Once a surface has been coated with ecotio₂[®] test results prove the coated surface will eradicate microbes and bacteria and unlike disinfectant type products will continue oxidising the virus for as long as the product remains on the surface. ecotio₂[®] coatings are purpose fit and suitable for applying to a wide range of surfaces, touch points – door handles, touch screens, fabric, filter systems, walls, ceilings, stainless steel, office equipment, peripherals etc.

The range is non-hazardous and environmentally friendly. Its application is ideal in work environments and public meeting points such as hospitals, retirement villages, educational institutions, pre-school centres, medical centres, shopping malls, transport hubs, restaurants, public amenities and many other locations.



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