

Infectious disease control

PHOTOCATALYST COATING

Inviroshield® M5

Registered product of

The United Nations Industrial Development Organization(UNIDO) ITPO Tokyo





What's Photocatalyst?



A photocatalyst is one of the types of *catalysts.

(*Catalyst: It is the substance that speeds up chemical reactions. It helps to change one substance into another.

We have many benefits from Catalyst reaction. Ex: Heat reaction catalyst is using for a vehicle as exhaust cleaning.)

The photocatalyst promotes a chemical reaction under the sunlight, a fluorescent light and LED lamp.

We are using the titanium dioxide (TiO2) as photocatalyst material.

Titanium oxide is safety material registered on the U.S. Food and Drug Administration (FDA) as food additive of white pigment (FDA Sec. 73.575 Titanium dioxide).



TiO2 powder

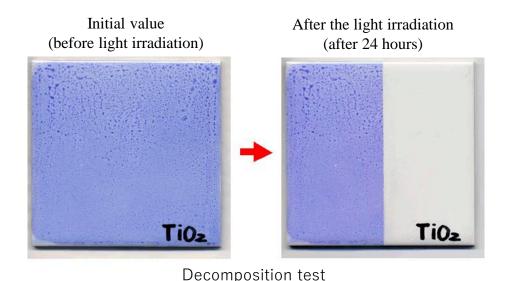
Photocatalyst decomposition effect



The Inviroshield®M5's TiO2 is visible light reaction type of photocatalyst.

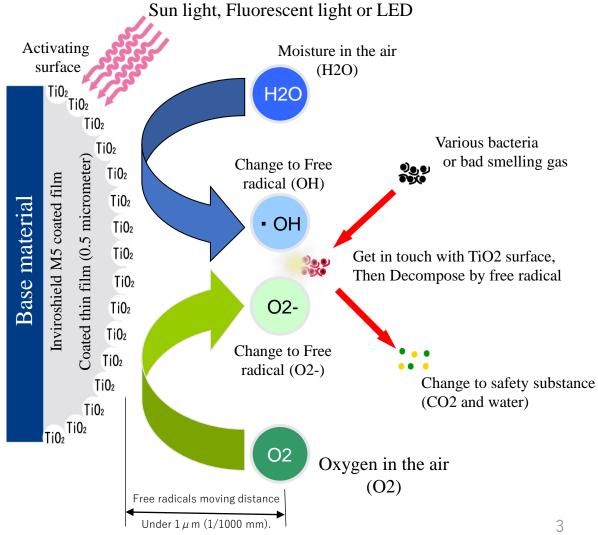
The Inviroshield®M5 photocatalysis effect is shown under the fluorescent light or LED lamp and it has high oxidation decomposition effect. This capability can be decomposed many organic substances such as bacteria or virus and change to safety substance. Therefore, the Inviroshield®M5 is also helpful against Antimicrobial-resistance. The Inviroshield®M5 has high performance of antiviral, antibacterial and it is also effective against odor-eliminating.

(see following photograph, decomposed blue substance by photocatalysis effect).



Change to Free TiO₂ radical (O2-)





What's Inviroshield®M5?



- The Inviroshield®M5 is a visible light responsive photocatalytic coating technology that is developed for preventing the infections.
- Our photocatalyst coating technology was used in the city halls and ambulances of Hong Kong and Taiwan to prevent the spread of "Severe Acute Respiratory Syndrome" (abbr: SARS) which was popular in 2003.
- The Inviroshield®M5 was developed in 2005 as a visible light responsive coating liquid that can exert a photocatalytic effect with the light of indoor fluorescent lamps.
- Currently, we are supplying The Inviroshield®M5 mainly in Asia such as Japan, China, Hong Kong, India, Singapore and Malaysia.
- In October 2019, it was registered with the United Nations Industrial Development Organization (UNIDO) ITPO Tokyo as a photocatalytic coating agent that can control infectious diseases at hospitals in developing countries.

URL: http://www.unido.or.jp/en/technology_db/6450/)

• We have conducted the test to confirm the safety. According the test result, the Inviroshield M5 is certified that it is not elute any toxic substances after the coating application. (Test method: Standards for appliances / containers / packaging or these raw materials according to the Food Sanitation Law in Japan).



Test result table.



			質品衛生法で	での器具・容器包装またはこれらの原材料の材	資別規格(乳及び乳製品を除く 平成21年1月
試験検査成	績 書	18 AA14-13-03915 VI VF NC 28 PF S FL 30 EI	公益社団法人	人日本食品衛生協会ホームページより抜粋	
丸品產業株式会社	類 空資和用法人 日本食品	545 E	一般合成樹脂		
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			MALAN	# Q	100 M E/E ELT
MESS M-21-2 M-				重金属	1 pp/mL DAT
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Test result table										
Inspection item	Result	Standard value	Outcome							
[Material test]										
Cadmium	Under 1μg/g	Under $100\mu\mathrm{g/g}$	Pass							
lead	Under 5 μ g/g	Under $100\mu\mathrm{g/g}$	Pass							
[Dissolution test]										
Heavy metal (as Pb)	Under $1\mu\mathrm{g/ml}$	Under 1μ g/ml	Pass							
Permanganate	1.6 μ g/ml	Under 10 μ g/ml	Pass							

Safety confirmed by Toxic substance eluted test result

Infectious disease control usage place















Inviroshield®M5 Application advantage



- Does not require daily / regular disinfection work.
- The cost can be reduced compared to daily disinfection work.
- It is safe for all as it does not make drug resistant bacteria.
- No human or external energy is required after the coating process.
- We always maintain a high hygiene environment without running costs.
- After the treatment of infectious diseases, you can make a notification with a special sticker.
- Processing facilities and products will be announced on the dedicated website.
- (Sites scheduled to be posted at processing facilities: https://Inviroshield.net)
- By taking a picture of the QR code on the sticker, the processing facility allows the user to check the processing work scenery of the facility and the state of bacterial reduction on the spot.

INFECTIOUS DISEASE TREATMENT CERTIFICATION

Target of infectious diseases Viruses and Bacteria



The Inviroshield*M5 is registered as a coating material for infectious disease control with the Sustainable Technology Dissemination Platform (STePP) of the United Nations Industrial Development Organization (UNIDO), Tokyo Investment and Technology Transfer Promotion Office (Tokyo Office). This facility is protected against infections diseases by this technorogy.



UNIDO Tokyo website Inviroshield*
Infection system
Processing facility number

2020-122501

Date of issue: 25.Dec.2020



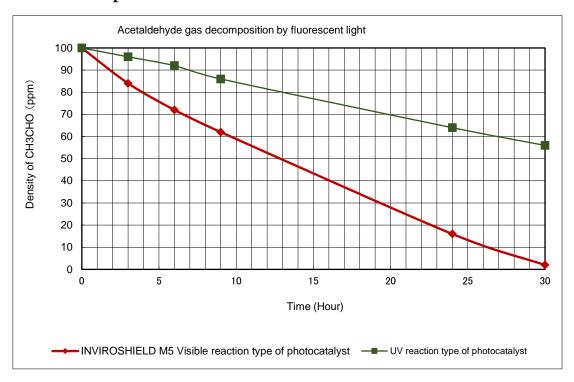
Confirmation of preventive treatment

Treatment certification display sticker

Test data



Gas decomposed effect



It shows the removal performance of aldehyde-based gas contained in indoor building materials.

This gas decomposition function makes it possible to take measures against indoor sick building syndrome.

Decomposed effect

CONDITION	Initial state	Irradiation by fluorescent light					
TYPE	Initial state	After 48 hours	After 80 hours				
Normal Photocatalyst decompsition		: 5:					
Altimate Inviroshield M5 photocatalyst decomposition	:::						

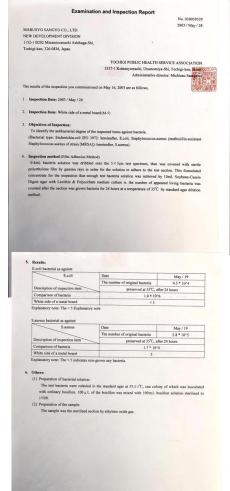
The dirt decomposition test confirms the decomposition performance of organic matter by indoor light.

This function makes it possible to remove bacteria, viruses, mold bacteria, etc. that live indoors by the decomposition function.

Anti-bacteria/Antiviral test result



We are confirming the effects of various bacteria and viruse.

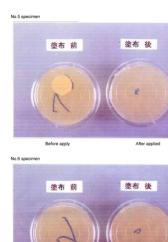




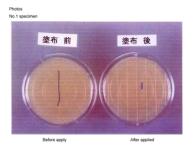
Procedure: File pottion of Test material Stainless steel square (5 cm x 5 cm) (Starritzed by UV expousn) costed with "NAMIDORIELD" (Name Tatarium Docode) surface costing distinctions were inconsisted with best bearing here; 14-14 to "CUT unit. 14 minumidating recented with UP. DET lies and sail puris plan here) impossible page within glass basis as stand. The sample is further layor covered with glass is balen before further and a distance of 8 cm others for a warping the intensis but to 4 cm. 2, 1 m and 2 ft x th, but requisite exposure by Globat via surface for a warping the intensis but to 4 cm. 2, 1 m and 2 ft x th, but requisite exposure by Globat via surface. It is not to the control of th

eluted, diluted serially and subjected to standard plate count. Similarly one set is kept not exposed to light an

No	Date	location	cultivation test result	remarks
Before No.1	20/June	Wall 1	(-) cultivate three days	agar medium stamp method same as above
After No.1	22/July	YVon 1	(-) cultivate three days	
Before No.2	20/June	Wall 2	B.subtilis fungus S.aureus S.epidermidis	
After No.2	22/July	Trui L	(-) cultivate three days	
Before No.3	20/June		B.subtilis S.epidermidis	
After No.3	lo.3 22/July	(-) cultivate three days		
Before No.4	20/June	Window inside	B.subtilis S.aureus S.epidermidis	
After No.4	22/July	vvindow inside	(-) cultivate three days	
Before No.5	20/June	Wall 3	B.subtilis S.epidermidis	
After No.5	22/July		S.epidermidis	
Before No.6	20/June	Wall 3	(-) cultivate three days	
After No.6	22/July	vvdII 3	(-) cultivate three days	







2090E 1 5.33

201101 3

USMI 2

\$435H1 3

< 0.50 < 0.50

参照《消毒技术规范》(卫生部 2002 年版) 第二部分(2.1.1.10.7)的评价规定,试验重复3次,如样品对所测病

Antiviral test Influenza A virus H1N1

毒的平均灭活对数值≥4.00。可认为该样品对所测病毒消毒的实验室试验合格。Refer to Technical Standard for Disinfection (Ministry of Health, Edition 2002), section 2-2.1.1.10.7 and the test repeated 3 times, if the average inactivation log value of the

551 (\$) MDCK 细胞系

virus HINI cells Test group I

Control group 1 对照组 2 5.50 5.44

2.8×105

< 3.16

英格尔检测技术服务(上海)有限公司 NCA0417601





Bacteriophage MS2







Performance continuity of infection control



	INSTITUTES	LOCATION	PLACE	c fu COUNTS							
SR. NO.				PRE	POST-1 24 HRS POST		POST-2 7/15/30/ 60 DAYS POST		6 MONT HS POST	12 MONT HS POST	36 MONT HS POST
1	AIIMS	NEW DELHI	ORTHOPEDIC OT	2120	330	84.43%	46	97.83%			
2	MAX 9PECIALITY HO 9PITAL	NEW DELHI	CVTSOT	257	20	92.22%	30	88.33%	0	0	
3	SAFDARJANG HOSPITAL	NEW DELHI	GEN. 9JRGERY OT	2240	640	71.43%	90	95.98%			
4	SAFDARJUNG HOSPITAL - 2	NEW DELHI	LABOUR ROOM	5550	40	99.28%	0	100.00%	0	0	
5	RML HO \$PITAL	NEW DELHI	CVTSOT	204680	420	99.79%	350	99.83%		0	
6	RML HO 9PITAL-2	NEW DELHI	OPTHALOT	175	0	100.00%	0	100.00%			
7	NANAVATI HOSPITAL, (OT)	MUMBAI	SEPTIC OT	715	170	76.22%	0	100.00%			
8	NANAVATI HO SPITAL, (IC U)	MUMBAI	iccu	546	266	51.28%	0	100.00%			
9	C ENTRAL RAILW AY HO SPITAL	MUMBAI	NON CRITICAL AREAS	2210	30	98.64%	0	100.00%			
10	WESTERN RAILW AY HO SPITAL	MUMBAI	CVTSOT	1900	46	97.58%	0	100.00%			
11	90N HO9PITAL	MUMBAI	SEPTIC OT	460	20	95.65%	0	100.00%			
12	K.J. SO MAIYA MEDICAL COLLEGE HOSPITAL	MUMBAI	ORTHOPEDIC OT	88	0	100.00%	3	96.59%	0	0	0
13	SAIFEE HOSPITAL	MUMBAI	ISOLATION ROOM	717	122	82.98%	100	86.05%			
14	ŒVEN HILLSHO 9PITAL	MUMBAI	CVTSOT	220	30	86.36%	6	97.27%			
15	GANESH DASHOSPITAL	9HILLONG	ECLAMPSIA LABOUR ROOM	2820	0	100.00%	0	100.00%			
16	ST. J O SEPHS HO SPITAL	MYSORE	от	1487	12	99.19%					
17	GMERS Medical College Hospital	Gujarat	LABOUR ROOM	13800	0	100.00%	0	100.00%			
18	CIVIL HO SPITAL, KURUD	RAIPUR	LABOUR ROOM	230	0	100.00%					
19	LADY HARDING E MEDIC AL COLLEGE HO SPITAL	NEW DELHI	OPHTHAL OT	390	0	100.00%	0	100.00%			
20	RAO TULARAM HOSPITAL	NEW DELHI	DENTAL OPD	5180	30	99.42%	0	100.00%			
21	DEEN DAYAL HO SPITAL	NEW DELHI	от	3940	10	99.75%	0	100.00%	0		
22	AIIMS	RISHIKESH	ORTHOPEDIC OT	220	0	100.00%	0	100.00%			
23	KAMLA NEHRU HO SPITAL	PUNE	O PHTHAL OT	12420	0	100.00%					
24	9JTAR MATERNITY HOME	PUNE	LABOUR ROOM	6030	0	100.00%	140	97.68%			
25	KAMLA NEHRU STATE HO SPITAL FOR MOTHER & CHILD	9-IMLA	GYNAECOLOGY OT	2880	0	100.00%	30	98.96%			
26	KAMLA NEHRU STATE HO SPITAL FOR MOTHER & CHILD	9-IMLA	LABOUR ROOM	3910	30	99.23%	33	99.16%			
27	COMMAND HO SPITAL, WESTERN COMMAND	CHANDIGARH	ORTHOPEDIC OT	2550	17	99.33%	0	100.00%			
28	KALPNA CHAW LA GOVT.MEDICAL COLLEGE & HO SPITAL	KARNAL	ORTHOPEDIC OT	17080	0	100.00%	20	99.88%			
29	GUWAHATI MEDICAL COLLEGE HOSPITAL	GUWAHATI	ORTHOPEDIC OT	15363	0	100.00%	0	100.00%			
30	NEIGRIHMS	9HILLONG	GYNAECOLOGY OT	507	0	100.00%					
	TOTAL			310685	2233	99.28%	848	99.73%	0	0	0
	%Reduction				99.28%		99.73%		100%	100%	100%

· Actual field data in India showing reduction of nosocomial microorganisms after application of Inviroshield®M5.

A decrease in bacterial load has been shown even after one year of monitoring.

Application







- •Inviroshield®M5 application are several steps.
- ·Let you can see following application process video.

Sitework process video





Application training video