

Infectious disease control

PHOTOCATALYST COATING

Inviroshield® M5

Registered product of
The United Nations Industrial Development Organization(UNIDO) ITPO Tokyo



丸昌産業株式会社
MARUSYO SANGYO CO.,LTD.

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 (TiO_2) 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).



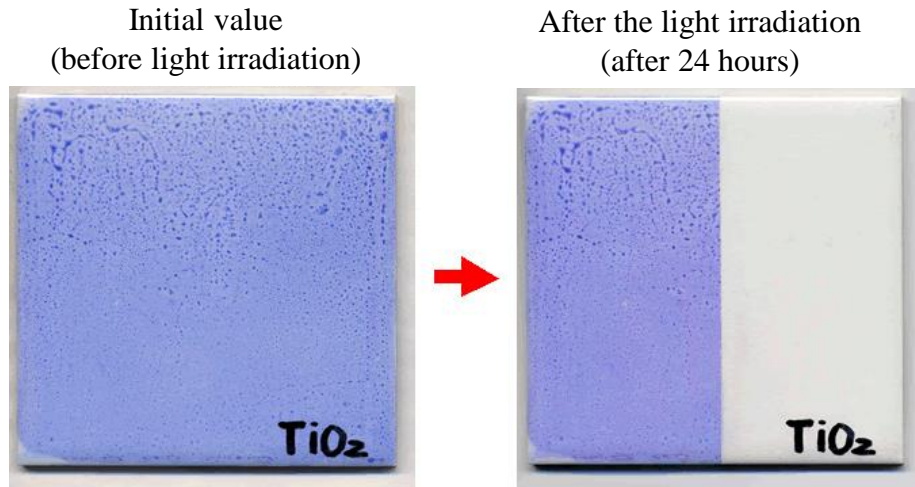
TiO_2 powder

Photocatalyst decomposition effect

The Inviroshield®M5's TiO_2 is visible light reaction type of photocatalyst.

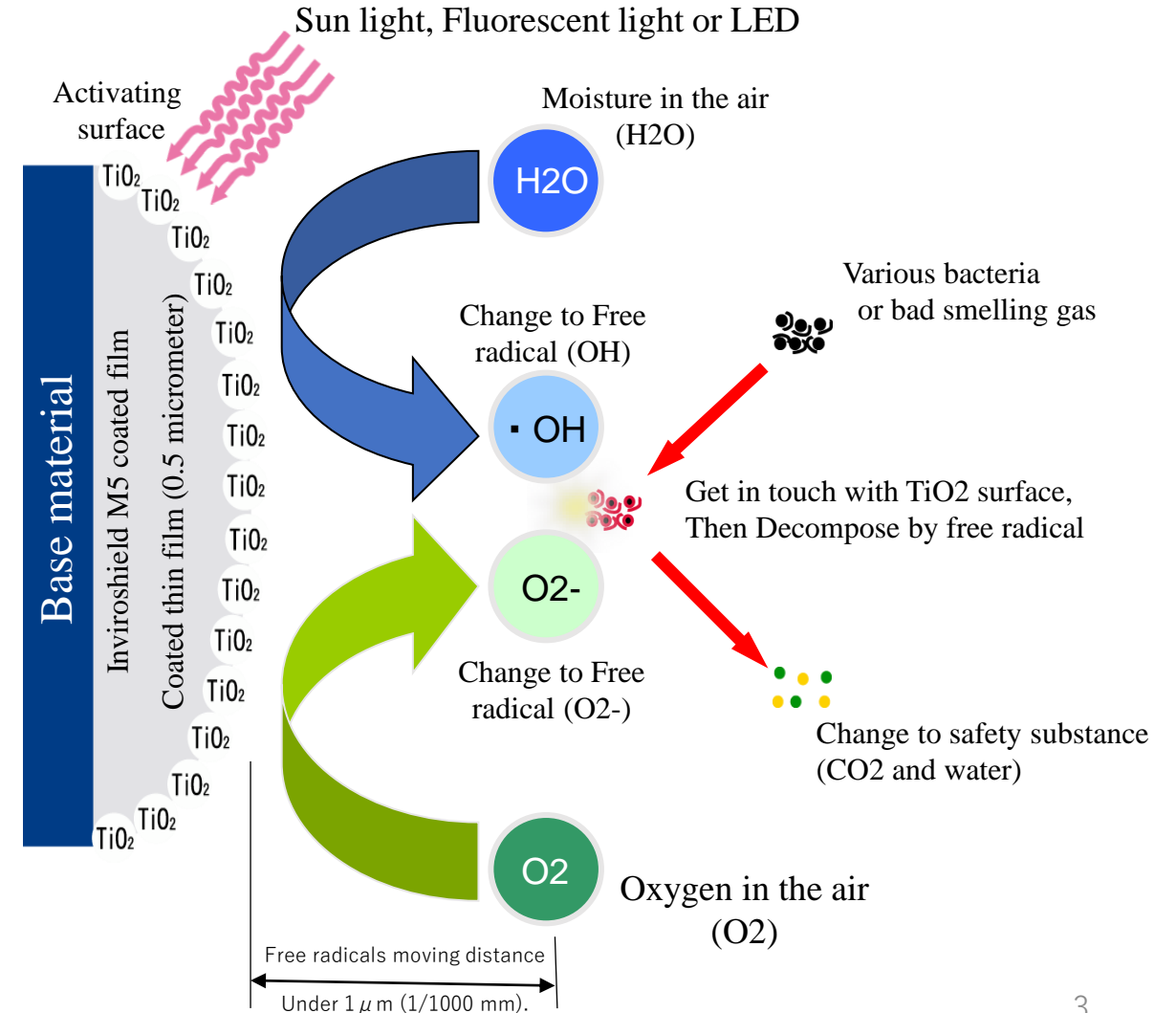
The Inviroshield®M5 photocatalysis effect is shown under the fluorescent light or LED lamp and it has high oxidation decomposition effect. This capability can be decomposed many organic substances such as bacteria or virus and change to safety substance. Therefore, the Inviroshield®M5 is also helpful 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).



Decomposition test

RATIONALE DECOMPOSITION



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).



食品衛生法での器具・容器包装またはこれらの原材料の材質別規格(乳及び乳製品を除く)
平成21年1月1日現在
公益社団法人日本食品衛生協会ホームページより抜粋

一般合成樹脂	
試験項目	規格
材質試験	カドミウム 100 µg/g 以下
	鉛 100 µg/g 以下
抽出試験	重金属 1 µg/g・mL 以下
	過マンガン酸カリウム消費量 10 µg/mL 以下

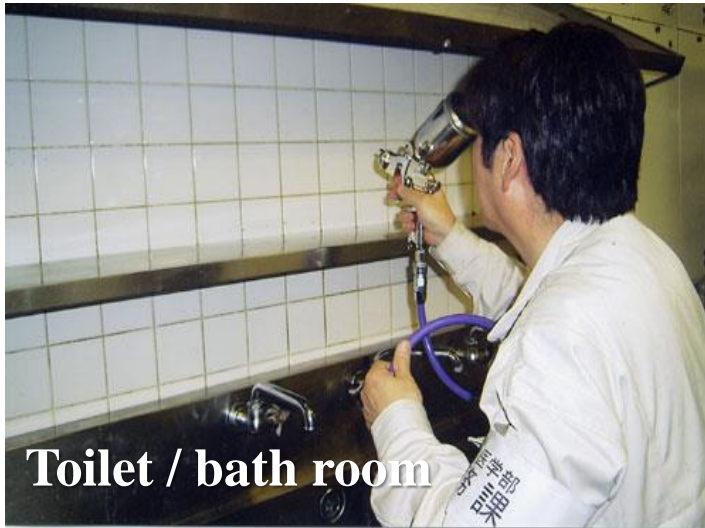
※実験材料試験の単位が µg/g であるため、同様の単位である一般合成樹脂の規格を参考にしております。

Test result table

Inspection item	Result	Standard value	Outcome
[Material test]			
Cadmium	Under 1 µg/g	Under 100 µg/g	Pass
lead	Under 5 µg/g	Under 100 µg/g	Pass
[Dissolution test]			
Heavy metal (as Pb)	Under 1 µg/ml	Under 1 µg/ml	Pass
Permanganate	1.6 µg/ml	Under 10 µg/ml	Pass

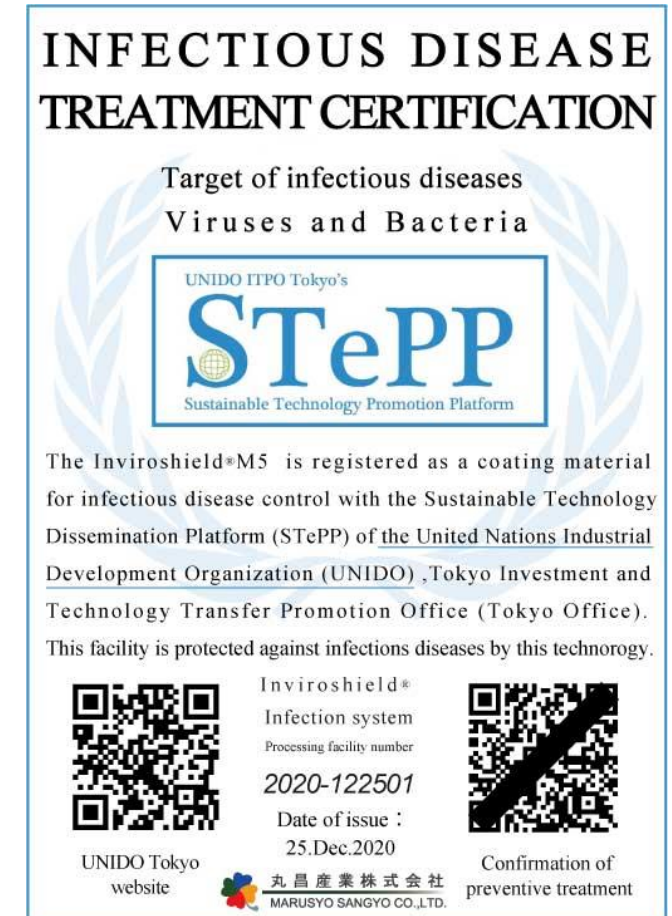
Safety confirmed by Toxic substance eluted test result

Infectious disease control usage place



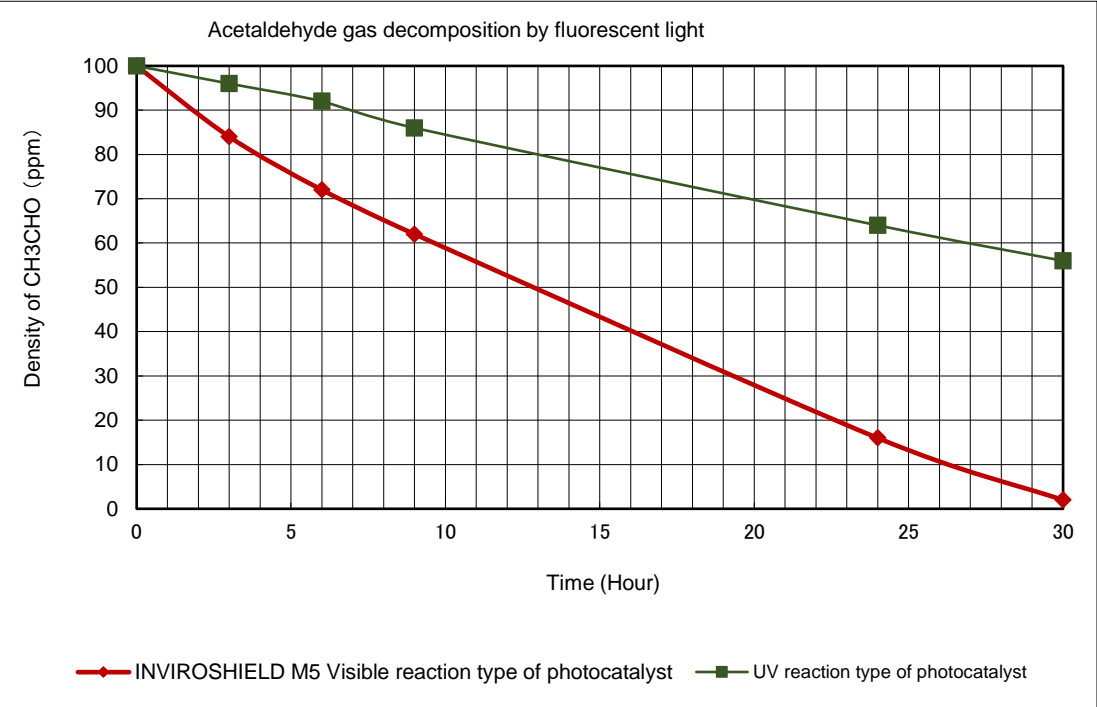
Inviroshield®M5 Application advantage

- 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.









Treatment certification
display sticker

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

TYPE \ CONDITION	Initial state	Irradiation by fluorescent light	
		After 48 hours	After 80 hours
Normal Photocatalyst decomposition			
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.

Performance continuity of infection control

SR. NO.	INSTITUTES	LOCATION	PLACE	cfu COUNTS							
				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 SPECIALITY HOSPITAL	NEW DELHI	CVT SOT	257	20	92.22%	30	88.33%	0	0	
3	SAFDARJANG HOSPITAL	NEW DELHI	GEN. SURGERY OT	2240	640	71.43%	90	95.98%			
4	SAFDARJANG HOSPITAL - 2	NEW DELHI	LABOUR ROOM	5550	40	99.28%	0	100.00%	0	0	
5	RML HOSPITAL	NEW DELHI	CVT SOT	204680	420	99.79%	350	99.83%		0	
6	RML HOSPITAL-2	NEW DELHI	OPHTHAL OT	175	0	100.00%	0	100.00%			
7	NANAVATI HOSPITAL, (OT)	MUMBAI	SEPTIC OT	715	170	76.22%	0	100.00%			
8	NANAVATI HOSPITAL, (ICU)	MUMBAI	ICCU	546	266	51.28%	0	100.00%			
9	CENTRAL RAILWAY HOSPITAL	MUMBAI	NON CRITICAL AREAS	2210	30	98.64%	0	100.00%			
10	WESTERN RAILWAY HOSPITAL	MUMBAI	CVT SOT	1900	46	97.58%	0	100.00%			
11	SON HOSPITAL	MUMBAI	SEPTIC OT	460	20	95.65%	0	100.00%			
12	K.J.SOMAIYA MEDICAL COLLEGE HOSPITAL	MUMBAI	ORTHOPEDIC OT	88	0	100.00%	3	96.59%	0	0	0
13	SAFEE HOSPITAL	MUMBAI	ISOLATION ROOM	717	122	82.98%	100	86.05%			
14	SEVEN HILLS HOSPITAL	MUMBAI	CVT SOT	220	30	86.36%	6	97.27%			
15	GANESH DASH HOSPITAL	SHILLONG	EC LAMPSA LABOUR ROOM	2820	0	100.00%	0	100.00%			
16	ST. JOSEPHS HOSPITAL	MYSORE	OT	1487	12	99.19%					
17	GMERS Medical College Hospital	Gujarat	LABOUR ROOM	13800	0	100.00%	0	100.00%			
18	CIVIL HOSPITAL, KURUD	RAIPUR	LABOUR ROOM	230	0	100.00%					
19	LADY HARDINGE MEDICAL COLLEGE HOSPITAL	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 HOSPITAL	NEW DELHI	OT	3940	10	99.75%	0	100.00%	0		
22	AIIMS	RISHIKESH	ORTHOPEDIC OT	220	0	100.00%	0	100.00%			
23	KAMLA NEHRU HOSPITAL	PUNE	OPHTHAL OT	12420	0	100.00%					
24	SUTAR MATERNITY HOME	PUNE	LABOUR ROOM	6030	0	100.00%	140	97.68%			
25	KAMLA NEHRU STATE HOSPITAL FOR MOTHER & CHILD	SHIMLA	GYNAECOLOGY OT	2880	0	100.00%	30	98.96%			
26	KAMLA NEHRU STATE HOSPITAL FOR MOTHER & CHILD	SHIMLA	LABOUR ROOM	3910	30	99.23%	33	99.16%			
27	COMMAND HOSPITAL, WESTERN COMMAND	CHANDIGARH	ORTHOPEDIC OT	2550	17	99.33%	0	100.00%			
28	KALPNA CHAWLA GOVT.MEDICAL COLLEGE & HOSPITAL	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	SHILLONG	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](#)