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Durable polymer coating ZEFFLE MZ for disinfectants and sterilants of medical devices

PRODUCT INFORMATION

The increased urgency for greater levels of infection control has led to more intensive disinfection and sterilization procedures for medical devices These procedures can result in more severe degradation of materials used in medical devices. To solve this problem, we offer durable antifouling coating materials ZEFFLE MZ that are resistant to a robust range of disinfectants and sterilants.

Features

- Excellent chemical resistance (ex. VHP sterilization). As refer to Table1.
- It's possible to coat on resin parts such as endoscope tube.
- ISO10993 (GLP) biocompatibility test have been passed.
- FDA device masterfile (MAF) has been registered.

Table.1 Chemical resistance of ZEFFLE MZ 100 coating films

Chemical	Condition	ZEFFLE MZ	Acrylic Silicon	Acrylic Urethane
8% BHF	RT 1hr	E	F	P
30-50% HF	RT 1hr	E	P	P
60% Sulfuric Acid	RT 1hr	E	E	E
	60°C 2hr	E	G	F
50% Nitric Acid	RT 2hr	G	P	P
35% Concemtrated HCL	RT 2hr	E	E	E
50% Acetic Acid	RT 2hr	E	G	G
10% Caustic Soda	RT 14days	E	G	G
35% Hydrogen Peroxide mist	RT 60days	E	F	P
500ppm VHP gas	RT 30days	E	F	P
STERRAD ™ 100NX *	100cycle	E	N.D.	P
6% Sodium Hypochlorite	RT 14days	E	F	P
MEK	RT 24hr	E	G	F
Ethyl Acetate	RT 24hr	E	G	F
Chloroform	RT 24hr	E	G	G

E: Excellent	G: Good	F: Fair	P: Poor

*STERRAD™ 100NX: Evaluation results of STERRAD™ 100NX

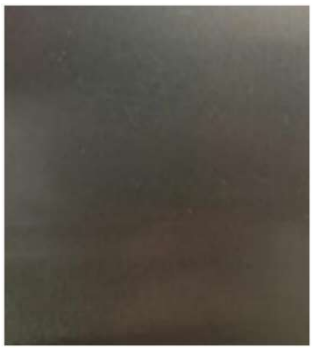
Hydrogen Peroxide gas Plasma Sterilization Evaluation

<Evaluation>

Test was conducted with STERRADTM 100NX. The ZEFFLE MZ coating remained intact under Hydrogen Peroxide gas Plasma exposure, while the Acrylic Urethane coating displayed cracking as shown image 1-2.

- System: STERRAD™ 100NX
- Hardener: STABiO XD-340N by Mitsui Chemical
- Material: ZEFFLE MZ
- Evaluation Cycles: >100 cycles

Image 1 Surface of ZEFFLE MZ Coating



No change after 100 cycles

Image 2 Surface of Acrylic Urethane Coating

Film broken after 5 cycles

Vaporized Hydrogen Peroxide (VHP) Evaluation

<Evaluation>

The ZEFFLE MZ coating remained intact under VHP, while the Acrylic Urethane coating displayed blistering and surface deformation as shown image 3-6.

- Company: Santasalo and Steri-Pro Solution Corporation
- System: M100MIX
- Material: ZEFFLE MZ
- VHP concentration: 500ppm
- Evaluation Time: 35 days (12hr/day)
- Temperature: 25-30℃
- Humidity: 30%RH, 60%RH

Image 3 Surface of Acrylic Urethane Coat

Image 4 SEM of Acrylic Urethane Coating

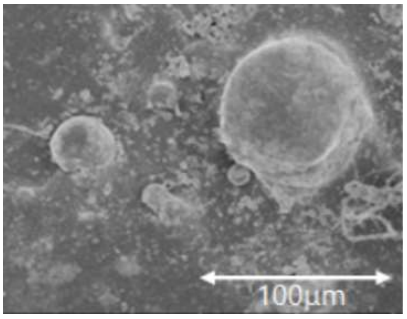
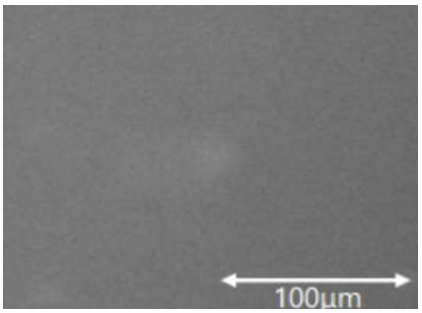


Image 5 Surface of ZEFFLE MZ Coating

Image 6 SEM of ZEFFLE MZ Coating



Customer Benefits

The unique chemical resistance characteristics of ZEFFLE MZ coatings allow for materials not currently resistant to hydrogen peroxide gas sterilization and various disinfectants to exhibit very high levels of resistance, reducing their potential for degradation. In addition, since the ZEFFLE MZ does not need to be raised to a high temperature during curing, it is possible to coat general-purpose resins.

Expected application example

Endoscope, Laparoscope, Medical Robot, Dialysis system, etc.

Note： All the data shown in this report are not guarantee