U+

The NEW standard for Environmental Monitoring

pharmamedia dr. müller gmbh

Neutralization of disinfectants containing quaternary ammonium compounds by U+ medium

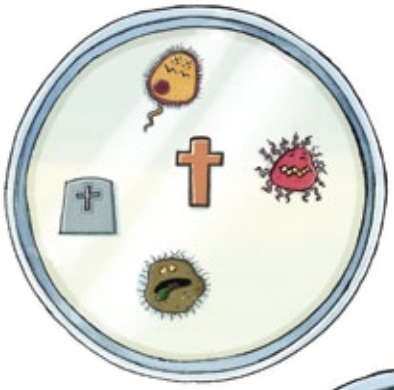
The removal or inactivation of residues of disinfectants is critical for the reliable detection of viable and cultivable microorganisms. If highly active residues remain on surfaces, these will be picked up with contact plates or swabs when performing environmental monitoring tests. These residues can interfere with the growth of potential contaminants and this may result in false negative results.

Inactivation of residuals of disinfectants on TSA+LTHT medium

Whereas residues of disinfectants containing e.g. alcohols, peracetic acid, hydrogenperoxyde, and some aldehydes can be neutralized with the standard neutralizers LTHT (Lecithin, Tween 80, Histidine and Thiosulfate), especially the residues of quaternary ammonium compounds (QAC) as well as biguanides are not sufficiently inactivated.
To investigate the amount of QAC that can be inactivated, several disinfectants containing QAC were tested. Contact plates with TSA+LTHT medium were only able to inactivate a maximum amount of about 15 µg QAC per plate - or be expressed differently: Only disinfectants containing concentrations below 30 mg QAC per 100 ml disinfectant were sufficiently neutralized.
Based on this data, it can be concluded, that surfaces disinfected with disinfectants containing QAC need to be properly rinsed out with sterile water or alcohol to reduce the amount of residuals before surfaces are sampled with TSA+LTHT plates, to avoid getting false-negative results.

Disinfectant	Concentration in mg/100 ml		▼ TEST **TSA+LTHT** ▼ 50 µl disinfectant per TSA+LTHT contact plate		
	QAC	Biguanid	*S. aureus*	*B. subtilis*	*S. epidermidis*
Gigasept AF (4 %)	876		0	0	0
Hexaquart forte (2 %)	558		0	0	0
Klercide Quat/Biguanide	500	200	0	0	0
Microbac forte (2 %)	498		s. Microbac forte (0,5 %)		
Terralin Protect (2 %)	458		s. Terralin protect (0,5 %)		
Gigasept AF (1,5 %)	329		0	0	0
Klercide Sporocidial Chlorine/Quat	290		n.t.	n.t.	0
Microbac forte (2 %)	249		n.t.	5	1
Sterillium classic pur	200		4	0	6
Lysoformin 3000 (2 %)	192		s. Lysoformin 3000 (0,5 %)		
Melsept SF (2 %)	150		n.t.	0	0
Hexaquart forte (0,5 %)	140		0	0	0
Microbac forte (0,5 %)	125		n.t.	5	1
Korsolin FF (2 %)	120		0	0	1
Hexanios G+R	117	12	n.t.	n.t.	0
Terralin Protect (0,5 %)	115		n.t.	7	0
Amphospray 41 IP	109	96	0	0	0
Incidin Rapid (0,75 %)	75		0	1	1
Lysoformin special (0,75 %)	72	22	0	0	3
Lysoformin 3000 (0,5 %)	48		n.t.	1	37
Melsept SF (0,5 %)	38		n.t.	2	64
Korsolin FF (0,5 %)	30		74	52	74
Incidin Rapid (0,25 %)	25		81	59	69

Inactivation of disinfectants on TSA-U+ medium



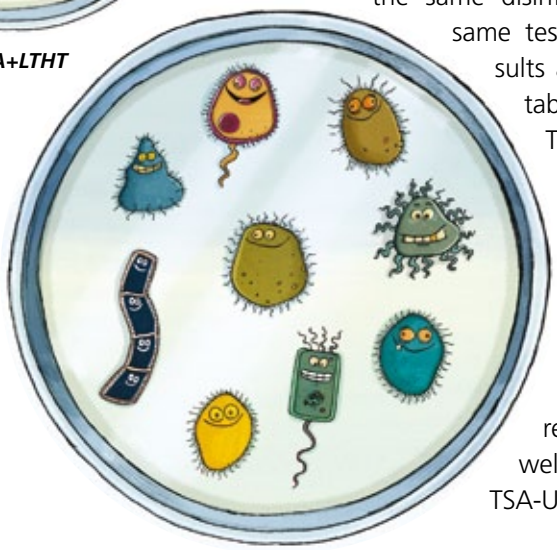
TSA+LTHT

As a consequence of the poor results on TSA+LTHT plates with QACs, PMM decided to develop a new recipe of TSA with neutralizers to overcome this problem, therefore avoiding the risk of getting false-negative results.

The newly developed TSA-U+ contact plate was tested in a second series of tests using the same disinfectants and the same test conditions. Results are shown in the table below.

The tests revealed that the disinfectants with the highest concentration of QAC were inactivated without any problems, resulting in recovery rates of well above 50 %. TSA-U+ contact plates are able to inactivate at least 25 times higher concentrated QACs and Biguanides compared to the commonly used contact plates with TSA+LT or TSA+LTHT. In other words, this means that the TSA-U+ contact plate is able to inactivate more than 400 µg QAC compared to a maximum of approximately 15 µg for a standard TSA-LTHT contact plate.

In the case of disinfectants containing QAC being used and surfaces sampled with standard TSA+U+ contact plates, reliable results can be obtained even if residues of the disinfectants will be picked up during sampling. Therefore, we are confident that our newly developed TSA-U+ contact plate will be widely accepted by users in the pharmaceutical industry, especially as the disadvantages of former neutralizing plates have been almost completely eliminated (shelf-life of up to 9 months, the medium is clear, no precipitates, recovery rates of reference strains are well above 50 %, even for B. subtilis).



TSA-U+

▼ TEST **TSA-U+** ▼						
50 µl disinfectant per TSA-U+ contact plate						
S. aureus	*B. subtilis*	*S. epidermidis*	*E. coli*	*Ps. aeruginosa*	*C. albicans*	*A. brasiliensis*
92	76	83	116	97	123	99
86	106	79	92	101	97	108
111	109	126	105	95	112	89
103	98	104	75	99	90	107
111	122	97	61	103	106	94
s. Gigasept AF 4 %						
89	74	109	65	97	102	92
103	98	104	75	99	90	107
102	106	102	n.t.	n.t.	n.t.	n.t.
116	87	92	86	99	104	104
110	60	131	76	93	106	133
s. Hexaquart forte 2 %						
s. Microbac forte 2 %						
64	94	82	n.t.	n.t.	n.t.	n.t.
105	106	123	99	131	103	72
s. Terralin Protect 2 %						
87	93	89	85	127	127	119
99	95	92	n.t.	n.t.	n.t.	n.t.
85	72	92	n.t.	n.t.	n.t.	n.t.
109	77	107	n.t.	n.t.	n.t.	n.t.
s. Melsept SF 2 %						
s. Korsolin FF 2 %						
s. Incidin Rapid 0,75 %						

*TEST **TSA+LTHT:***
Inactivation of disinfectants on TSA+LTHT contact plates (recovery rate in %). Higher concentrated disinfectants were not tested (n.t.) in case plate did not inactivate lower concentrated solutions of the same disinfectant.

*TEST **TSA-U+:***
Inactivation of disinfectants on TSA-U+ contact plates (recovery rate in %). Lower concentrated disinfectants were not tested (n.t.) in case plate did inactivate higher concentrated solutions of the same disinfectant (e.g. Melesept, Lysoformin 3000).

General Company Information

PMM was founded by Dr. Rolf Müller in January 2013, who has also founded Heipha Dr. Müller GmbH more than 40 years ago. As the focus of the company is exclusively the pharmaceutical industry, PMM is working aligned to the GMP-requirements expected by the pharmaceutical industry. The production is performed in clean rooms which are in accordance with the EC-GMP guidelines, ISO 14644 and FDA Guidance for Industry "Sterile Drug Produced by Aseptic Processing" with respect to air-exchange rates, laminar air-flow, clean-room classification and particle rates at rest.

PMM is certified according ISO 9001:2015 since November 2015.

Our products:

- lockable petridishes
- long shelf-life
- room temperature storage 15-25°C
- long incubations possible
- H_2O_2-impermeable foil
- unique identification assigned by each plate with label and barcode

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