PHARMACEUTICAL ENVIRONMENTAL MONITORING 3P CULTURE MEDIA WHEN YOUR PRODUCT QUALITY MATTERS MOST

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PERFORMANCES STUDY - TSA 3P, TSA 3P WITH NEUTRALISERS, COUNT-TACT 3P

DESCRIPTION

Accurate Environmental Monitoring data is crucial when making product release decisions. Culture media must be robust enough in term of development and performances to withstand the rigorous conditions in today's pharmaceutical cleanrooms.

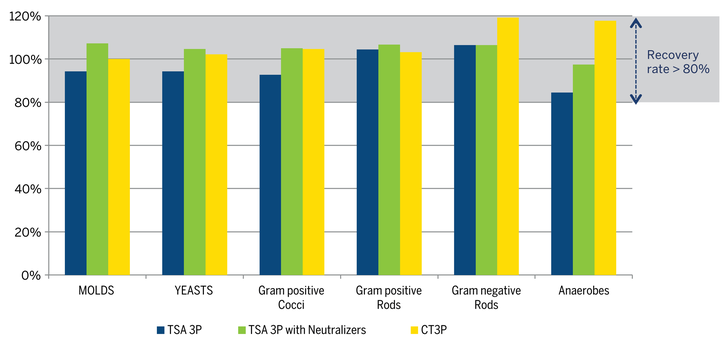
3P™ (Pharmaceutical Proven Performances) culture media in 90mm and 55mm Count-Tact formats are recommended for the environmental monitoring within classified environments of pharmaceutical industries.
They have been developed to satisfy specific requirements encountered in pharmaceutical clean environment and were validated for high performances especially on environmental strains.

This study presents the performances of the 3P culture media allowing them to be the most comprehensive solution for environmental monitoring in classified area

GROWTH PROMOTION

The growth promotion evaluation was performed on 72 microorganisms for TSA 3P and 127 microorganisms for TSA 3P with Neutralizers and Count-Tact 3P, including pharmaceutical strains sourced from ATCC and from clean room wild isolates.

The Recovery Rates were calculated from a standard 'Gold standard' TSA not irradiated. Calibrated inoculum between 10 and 100 CFU was prepared for each organism. The plates were incubated at 20-25°c or 30-35°C according to the growth requirements of the microorganisms for an appropriate culture duration.



Excellent growth promotion characteristics confirmed by testing a wide library of pharmacopoeia and wild-type strains from clean room environments to enhance detection of any contamination during environmental monitoring.

LITERATURE REFERENCES
1. ISO 14698-1 - Cleanrooms and associated controlled environments. Biocontamination control. Part 1: General principles and methods.
2. ISO 18593 - Microbiology of food and animal feeding stuffs - Horizontal methods for sampling techniques from surfaces using contact plates and swabs.
3. USP chapter 1116: Microbiological evaluation of cleanrooms and other controlled environments.
4. EU Guidelines to Good Manufacturing Practice - Medicinal Products for Human and Veterinary Use - Annex I:Manufacture of Sterile Medicinal Products.
5. Guidance for Industry Sterile Drug Products Produced by Aseptic Processing - Current Good Manufacturing Practice.

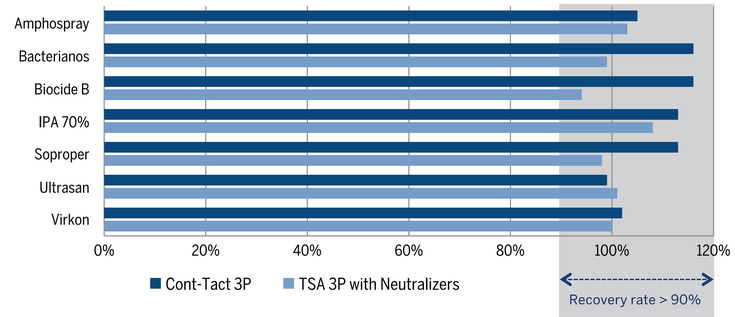
NEUTRALIZATION

TSA3P with Neutralizers and Count-Tact 3P contain neutralizing agents to inactivate any residual disinfectants present on the air, operator glove or surface to be tested.

3P performances were challenged against exposure to a range of typical and representative disinfectants. The recovery was compared to a non-irradiated TSA not exposed to disinfectants. The microorganisms tested are: *A. brasiliensis, C. albicans, P. commune, P. aeruginosa, E. coli, S. aureus, K. rhizophila, S. epidermidis, B. pumilus, B. subtilis and C.striatum.*

Different inhibition concentrations of disinfectants were determined on the media and according to the microorganisms' sensitivity to each product. 200 µL of each disinfectant solution were directly spread by calculating the recovery rate compared to an enumeration on 'Gold standard' TSA.

Incubation conditions: up to 48 hours at 30-35°C for bacteria and up to 7 days at 20 25°C for yeasts and molds.



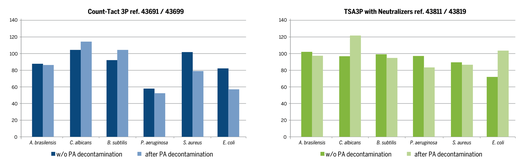
TSA 3P with Neutralizers and Count-Tact 3P provide excellent neutralization for all these disinfectants

ISOLATOR COMPATIBILITY

Specific 3P media packaging has been designed to be resistant to Vaporous Hydrogen Peroxide (VHP) and Peracetic Acid (PA) gassing cycles as part of an isolator decontamination cycle

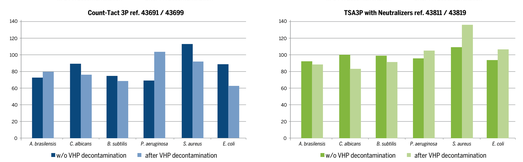
Peracetic Acid Decontamination

Recovery rates (%) observed before (w/o) and after (w/) a PA decontamination cycle for both format (90mm plates and Count-Tact plates)



Vaporous Hydrogen Peroxide Decontamination

Recovery rates (%) observed before (w/o) and after (w/) a VHP decontamination cycle for both format (90mm plates and Count-Tact plates)



The growth properties of the media without and with VHP and PA decontamination are similar. 3P culture media are validated with Vaporous Hydrogen Peroxide and Peracetic Acid gassing cycles for isolator compatibility.

SHELF LIFE VALIDATION

Validated with comprehensive thermal shocks during shelf-life testing to guarantee consistent performance from the beginning of the shelf-life to the date of expiry.

Stability data performed in real time have permitted to determine high product shelf-lives while guaranteeing excellent and consistent performances until their last day.

	Beginning of the shelf life			Last day of the shelf life		
	Count-Tact 3P	TSA 3P	TSA 3P w/ neutralizers	Count-Tact 3P	TSA 3P	TSA 3P w/ neutralizers
Appearance	Conform	Conform	Conform	Conform	Conform	Conform
pH	Conform	Conform	Conform	Conform	Conform	Conform
GROWTH PROMOTION TEST *% Recovery Rate between 50 and 200% compared to a 'Gold Standard' non irradiated TSA*						
Candida albicans ATCC 10231	Conform	Conform	Conform	Conform	Conform	Conform
Aspergillus brasiliensis ATCC 1640	Conform	Conform	Conform	Conform	Conform	Conform
Pseudomonas aeruginosa ATCC 9027	Conform	Conform	Conform	Conform	Conform	Conform
Escherichia coli ATCC 8739	Conform	Conform	Conform	Conform	Conform	Conform
Staphylococcus aureus ATCC 6538	Conform	Conform	Conform	Conform	Conform	Conform
Bacillus subtilis ATCC 6633	Conform	Conform	Conform	Conform	Conform	Conform
NEUTRALISATION ACTIVITY *% Recovery Rate between 50 and 200% compared to a 'Gold Standard' non irradiated TSA without disinfectant*						
Candida albicans ATCC 10231	Conform	N/A (no neutralizers media)	Conform	Conform	N/A (no neutralizers media)	Conform
Staphylococcus aureus ATCC 6538	Conform	N/A (no neutralizers media)	Conform	Conform	N/A (no neutralizers media)	Conform
Bacillus subtilis ATCC 6633	Conform	N/A (no neutralizers media)	Conform	Conform	N/A (no neutralizers media)	Conform

Resistance to laminar flow exposure

90 mm plate formats have a 30 mL fill volume optimized for air sampling applications to reinforce resistance to dehydration effects. The 3P media are tested for both active and passive air sampling followed by worst case incubation conditions to show the media resistance to cracking and shrinkage

For the passive air sampling, plates of 3 trials batches for the TSA3P ref. 43711 / 43169 and TSA 3P with Neutralizers ref. 43811 / 43819 were left to dry for 4h30 under a vertical laminar flow and then incubated 4 days at 20-25°C followed by 3 days at 30-35°C.

No signs of dehydration at the beginning, middle and at the end of the shelf-life.

CONCLUSION

bioMérieux offers to pharmaceutical industry the most comprehensive, robust and reliable solution for environmental monitoring in clean environments.

3P™ culture media represent the state-of-the-art culture media technology from both a formulation and packaging perspective.

In addition to these proven higher performances, bioMérieux guarantees:

- Completely controlled manufacturing process ensuring consistent reliability between all batches
- Unparalleled recovery expectation 75% during routine QC
- Maximum convenience for storage and inventory management thanks to a flexible storage between 2 - 25°C, Long Shelf-life and Large monolot capacity
- Security of your crucial Environmental Monitoring samples during critical transport and incubation steps with bioMérieux's unique LOCKSURE® closure system

List of microorganisms

MOULDS

P. commune 0909600
A.brasiliensis ATCC 16404
P.italicum ATCC 48114
T. mentagrophytes ATCC 9533
A. corymbifera ATCC 46773
P. aurentiogriseum ATCC 16025
Alternaria spp. 0411781
A. fumigatus 0411768
A. fumigatus 1031
E. floccosum 0411793
P. variotii ATCC 22319
Aureobasidium spp. 0411787
Cladosporium spp. 0411782
M. hiemalis 8977A
F. acuminatum 60315
Phoma spp. 0411786
R. pusillus 0411761
S. brevicaulis 0411778
A. terreus 0411763

GRAM POSITIVE COCCI

S. aureus ATCC 6538
S. epidermidis 1009600
K. rhizophila ATCC 9341
A. viridans 0501102
M. spp. 0306755
S. hominis 1009601
S. haemolyticus 9710129
S. aureus 0404752
K. kristinae 0406750
S. pyogenes 7611008
M. spp 0011700
M. luteus 1011600
S. pyogenes 19615
S. saprophyticus 0405751
E. faecium 9710124
E. gallinarum 9812094
M. lisodeikticus 1456
M. luteus 9408011
S. intermedius 8202100
S. epidermidis 9710128
E. durans 545
E. faecalis 29212
S. haemolyticus ATCC 29970
S. lentus 0711215
S. warneri 0405752
S. warneri 9807010

GRAM POSITIVE RODS

B. pulimus 1009602
B. subtilis ATCC 6633
C. striatum 0503059
B. coagulans 0105700
Aureobacterium spp. 0502715
B. cereus ATCC 7064
B. subtilis 1009603
L. mesenteroides ATCC 23386
B. licheniformis 0506752
L. fusiformis 0100566
C. haemolyticum 9602770
B. nesterenkovii 0708021
B. cereus 0012709
B. firmus 0302701
B. megaterium 0506753
B. megaterium 8811015
B. mucoides 0611704
B. pumilus 0310753
B. simplex 0405750
B. brevis 0010703
B. epidermidis 102233
C. jeikeium 8710128
L. lautus 102109
L. acidophilus 1114
V. pantothenticus 8806004

GRAM NEGATIVE RODS

P. aeruginosa ATCC 9027
E. coli ATCC 8739
A. hydrophila 5750
S. maltophila 0409762
C. aquatica 0403078
D. acidivorans 0306750
P. fluorescens 15842
A. faecalis 8750
R. aquatilis 2637704
A. baumanii 21925
E. aerogenes 13048
E. coli 25922
R. pickettii 0306752
A. sobria 43979
B. gladioli 10248
C. brew 7846
C. luteola 0011707
C. braakii 15580
C. freundii 8803065
E. cloacae 9703036
K. oxytoca 13182
P. vulgaris 13315
P. stuartii 1207
S. paucimobilis 8509117
F. oryxihabitans 0012704
L. adecarboxylata 9704751
B. cepacia 25416
B. vesicularis 0306754
K. pneumoniae 13883
L.adecarboxylata 8807096
P. aeruginosa ATCC 14207
P. putida 0310750
R. planticola 9701066
S. enterica 80-39
S. gallinarum 7509059
S. fonticola 9704040
S. liquefaciens 9211054
S. flexneri 7901019
S. paucimobilis 0404755
S. maltophilia 0410754
A. baumanii ATCC 19606

YEAST

C. albicans ATCC 10231
G. candidum 2431
R. mucilaginosa 8506040
C. neoformans ATCC 32045
S. cerevisiae ATCC 9763
C. glabrata 9911601
C. sake 8504058
Z. cerevisiae ATCC 66350
C. tamata 8706852
T. cutaneum LMA 94-256

ANAEROBIC STRAINS

B. fragilis ATCC 25282
B. vulgatus ATCC 8482
C. sporogenes ATCC 11437
P. acnes ATCC 6919
C. perfringens ATCC 13124
P. granulosum 8508092
P. acnes 9910602