



# MIC Test Strip Application Guide

MICROORGANISM	SPECIFIC PHENOTYPE	MEDIA	INOCULUM		INCUBATION 36 ± 1°C		SUGGESTED M.I.C. PANEL <sup>1)</sup>
			TURBIDITY	SUSPENSION MEDIUM	TIME	ATMOSPHERE	
<b>AEROBES</b>							
Staphylococci		MULLER HINTON II AGAR (ref. 10031)	0.5 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	24 h	Ambient	Teicoplanin (TEC) Vancomycin (VA) Clindamycin (CD) Amoxicillin/clavulanic acid (AUG) Linezolid (LNZ) Rifampicin (RD)
	ORSA ORCNS	MULLER HINTON II AGAR + 2% NaCl (ref. 11206)	0.5- 1 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	24 h 48 h ORCNS	Ambient	Oxacillin (OX)
	BORSA	MULLER HINTON II AGAR + 2% NaCl (ref. 11206)	0.5- 1 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	24 h	Ambient	Oxacillin (OX) Amoxicillin/clavulanic acid (AUG)
	VISA/hVISA	BRAIN HEART INFUSION AGAR (ref. 10060)	2 Mc FARLAND	MULLER HINTON BROTH (ref. 24107)	24 h confirm 48 h	Ambient	Vancomycin (VA) Teicoplanin (TEC)
	VRSA	MULLER HINTON II AGAR (ref. 10031)	0.5 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	24 h	Ambient	Vancomycin (VA)
	ORSA secondary panel	MULLER HINTON II AGAR (ref. 10031)	0.5 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16 - 20 h (VA 24 h)	Ambient	Clindamycin (CD) Daptomycin (DAP) Linezolid (LNZ) Quinupristin-Dalfopristin (QDA) Vancomycin (VA) Rifampicin (RD)
	Non-ORSA secondary panel	MULLER HINTON II AGAR (ref. 10031)	0.5 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16 - 20 h (VA 24 h)	Ambient	Penicillin G (P) Erytromycin (E) Linezolid (LNZ) Trimethoprim/sulfamethoxazole (SXT) Vancomycin (VA) Ciprofloxacin (CIP)

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			TURBIDITY	SUSPENSION MEDIUM	TIME	ATMOSPHERE	
<b>Enterococci</b>		MULLER HINTON II AGAR (ref. 10031)	0.5 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16 - 20 h	Ambient	Ampicillin (AMP) Ciprofloxacin (CIP) Erythromycin (E) Gentamicin (CN) Tetracycline (TE) Vancomycin (VA)
	VRE	BRAIN HEART INFUSION AGAR (ref. 10060)	2 Mc FARLAND	MULLER HINTON BROTH (ref. 24107)	24 h confirm 48 h	Ambient	Vancomycin (VA) Teicoplanin (TEC) note: Intended for phenotype detection, not intended for M.I.C. determination.
		MULLER HINTON II AGAR (ref. 10031)	0.5 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16 - 20 h (VA 24 h)	Ambient	Ampicillin (AMP) Daptomycin (DAP) Linezolid (LNZ) Quinupristin-Dalfopristin (QDA) Vancomycin (VA) Minocycline (MN)
	HLAR	MULLER HINTON II AGAR (ref. 10031)	0.5-1 Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16-18 h	Ambient	Gentamicin (CN) high range Streptomycin (S) high range
<b>Enterobacteriaceae</b>		MULLER HINTON II AGAR (ref. 10031)	0.5 (1- Mucoid) Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16 - 20 h	Ambient	Gentamicin (CN) Piperacillin/tazobactam (TZP) Cefepime (FEP) Ciprofloxacin (CIP) Imipenem (IMI) Aztreonam (ATM)
	ESBL	MULLER HINTON II AGAR (ref. 10031)	0.5 (1- Mucoid) Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16 - 20 h	Ambient	Cefotaxime/ Cefotaxime + clavulanic acid (CTX/CTL) Ceftazidime/ Ceftazidime + clavulanic acid (CAZ/CAL) Cefepime/cefepime + clavulanic acid (FEP/FEL)
<b>Non-Enterobacteriaceae</b> <i>Pseudomonas</i> spp.		MULLER HINTON II AGAR (ref. 10031)	0.5 (1- Mucoid) Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16 - 20 h 48 for slow growers	Ambient	Ceftazidime (CAZ) Gentamicin (CN) Aztreonam (ATM) Ciprofloxacin (CIP) Imipenem (IMI) Piperacillin/Tazobactam (TZP)
<i>Acinetobacter</i> spp.		MULLER HINTON II AGAR (ref. 10031)	0.5 (1- Mucoid) Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	20-24 h 48 for slow growers	Ambient	Ceftazidime (CAZ) Meropenem (MRP) Amikacin (AK) Ampicillin /Sulbactam (AMS) Levofloxacin (LEV) Minocycline (MN)

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			TURBIDITY	SUSPENSION MEDIUM	TIME	ATMOSPHERE	
<i>Burkholderia cepacia</i>		MULLER HINTON II AGAR (ref. 10031)	0.5 (1- Mucoid) Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	20-24 h 48 for slow growers	Ambient	Trimethoprim/sulfamethoxazole (SXT) Ceftazidime (CAZ) Levofloxacin (LEV) Meropenem (MRP) Minocycline (MN)
<i>Stenotrophomonas maltophilia</i>		MULLER HINTON II AGAR (ref. 10031)	0.5 (1- Mucoid) Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	20-24 h 48 for slow growers	Ambient	Trimethoprim/sulfamethoxazole (SXT) Ceftazidime (CAZ) Levofloxacin (LEV) Minocycline (MN) Ticarcillin-Clav. Acid (TTC)
	MBL	MULLER HINTON II AGAR (ref. 10031)	0.5 (1- Mucoid) Mc FARLAND	PHYSIOLOGICAL SOLUTION (ref. 20095)	16 - 20 h 48 for slow growers	Ambient	Imipemem/Imipenem+EDTA (IMI/IMD)
<b>FASTIDIOUS</b>							
<b>Pneumococci</b>		MULLER HINTON II AGAR + 5% Sheep Blood (ref. 10131) or MH + 20 mg/l β-NAD + 5% horse blood <sup>2</sup> (ref. 10132)	0.5 (1- Mucoid) Mc FARLAND	MULLER HINTON BROTH (ref. 24107)	20 – 24 h	5% CO <sub>2</sub>	Meropenem (MRP) Cefotaxime (CTX) Penicillin G (P) Clindamycin (CD) Vancomycin (VA) Trimethoprim/sulfamethoxazole (SXT)
<b>Streptococci</b>		MULLER HINTON II AGAR + 5% Sheep Blood (ref. 10131) or MH + 20 mg/l β-NAD + 5% horse blood <sup>2</sup> (ref. 10132)	0.5 (1- Mucoid) Mc FARLAND	MULLER HINTON BROTH (ref. 24107)	20 – 24 h	5% CO <sub>2</sub>	Penicillin G (P) Cefotaxime (CTX) Chloramphenicol (C) Ofloxacin (OFX) Linezolid (LNZ) Vancomycin (VA) Daptomycin (DAP)
<i>Haemophilus spp.</i>		HAEMOPHYLUS TEST AGAR (ref. 10080) or MH + 20 mg/l β-NAD + 5% horse blood <sup>2</sup> (ref. 10132)	0.5 (1- Mucoid) Mc FARLAND	MULLER HINTON BROTH (ref. 24107)	20 – 24 h	5% CO <sub>2</sub>	Amoxicillin/ calvulanic acid (AUG) Cefotaxime (CTX) Meropenem (MRP) Trimethoprim/sulfamethoxazole (SXT) Chloramphenicol (C)
<b>Anaerobes</b>		BRUCELLA BLOOD AGAR w HEMIN AND VITAMIN K (ref. 10245)	1 Mc FARLAND	THIOGLYCOLLATE MEDIUM (ref. 24124)	24 – 72 48 h confirmation of CD results	Anaerobic system	Metronidazole (LZ) Clindamycin (CD) Cefoxitin (FOX) Imipenem (IMI) Piperacillin/Tazobactam (TZP) Penicillin G (P)

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<i>Helicobacter pylori</i>		MULLER HINTON II AGAR + 5% Sheep Blood (ref. 10131)	3 Mc FARLAND	MULLER HINTON BROTH (ref. 24107) + 5% serum (ref. 83830)	72 h or longer	Microaerophilic LZ first 24 h anaerobic	Amoxicillin (AML) Clarithromycin (CLR) Metronidazole (LZ) Tetracycline (TE)
<b>Gonococci</b>		GC Agar Base + defined supplements or MULLER HINTON CHOCOLATE AGAR (ref. 10335)	0.5 Mc FARLAND	MULLER HINTON BROTH (ref. 24107)	20-24 h	5% CO <sub>2</sub>	Ciprofloxacin (CIP) Penicillin G (P) Tetracycline (TE) Ceftriaxone (CRO) Spectinomycin (SPC)
<b>Meningococci</b>		MULLER HINTON II AGAR + 5% Sheep Blood (ref. 10131)	0.5 Mc FARLAND	MULLER HINTON BROTH (ref. 24107)	24 h	5% CO <sub>2</sub>	Ciprofloxacin (CIP) Penicillin G (P) Trimethoprim/sulfamethoxazole (SXT) Meropenem (MRP) Ceftriaxone (CRO)
<i>Campylobacter spp.</i>		MULLER HINTON II AGAR + 5% Sheep Blood (ref. 10131)	1 Mc FARLAND	MULLER HINTON BROTH (ref. 24107)	48-72 h	Microaerophilic	Ciprofloxacin (CIP) Gentamicin (CN) Erythromycin (E) Doxycycline (DXT)
<b>FUNGI</b>							
<b>Yeasts</b>		RPMI AGAR (ref. 11509)	0.5 Mc FARLAND (1 <i>Cryptococcus neoformans</i> )	PHYSIOLOGICAL SOLUTION (ref. 20095)	24-48 h (48-72 h <i>Cryptococcus neoformans</i> )	Ambient, moist	Fluconazole (FU) Itraconazole (ITC) Amphotericin B (AMB) Flucytosine (FC) Voriconazole (VO) Caspofungin (CAS)
<b>Moulds</b>		RPMI AGAR (ref. 11509)	0.5 Mc FARLAND <i>Aspergillus</i> spp. (1 <i>Fusarium/Rizopus</i> spp.)	PHYSIOLOGICAL SOLUTION (ref. 20095) + Tween 80 (ref. 80031)	16-72 h depending on genus	Ambient, moist	Itraconazole (ITC) Amphotericin B (AMB) Posaconazole (POS) Voriconazole (VO) Caspofungin (CAS)

1. Examples of M.I.C. panels:

CLSI M100-S23 Performance Standards for Antimicrobial Susceptibility Testing, January 2013.

CLSI M27-A3 Reference method for Broth Dilution Antifungal Susceptibility Testing of Yeasts; Approved Standard - Third Edition.

CLSI M27-S4 Reference method for Broth Dilution Antifungal Susceptibility Testing of Yeasts; Fourth Informational Supplement.

2. EUCAST disk diffusion method, Version 2.1, February 2012.

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