todylaboratories®

Susceptibility Discs

CE IVD

Susceptibility Discs Instructions For Use

For in-vitro diagnostic use only.

INTENDED PURPOSE

Discs are used for antimicrobial susceptibility testing of bacterial cultures as per Bauer-Kirby Method.

DESCRIPTION

Filter paper disc of 6 mm diameter with the concentration of the antibiotic/antifungic on each side of the disc.

STORAGE

Discs in routine should be stored at 2˚C-8˚C. Longer term storage should be at -20˚C-8˚C.

PRINCIPLE

Antimicrobial Susceptibility Testing (AST) is a laboratory procedure performed by laboratory technician to identify, which antimicrobial regimen is specifically effective for individual patients. The introduction of various antimicrobials for treating variety of infections showed the necessity of performing antimicrobial susceptibility testing as a routine procedure in all microbiology laboratories. antibiotics are generally defined as the substances produced by the microorganism such as Penicillium, which has the ability to kill or inhibit the growth of other microorganisms, mainly bacteria. Antimicrobial Susceptibility Tests (ASTs) basically measures the ability of an antibiotic or other antimicrobial agent to inhibit the *in vitro* microbial growth.

The basic principle of the antibiotic susceptibility testing has been used in microbiology laboratories over 80 years. Till the 1950s, laboratories were lacking in the methodologies and equipment's for the accurate determination of *in vitro* responses of organisms to antimicrobial agents. Bauer et al., began the development of standardized methods for antimicrobial susceptibility testing, using disc diffusion system. Antimicrobial Susceptibility Tests are either quantitative or qualitative.

Clinical laboratories currently employ several methods depending on the laboratory test menu that they provide. These approaches include the disk diffusion and Minimum Inhibitory Concentration (MIC) methods. Disc diffusion test is a qualitative test method. The National Committee for Clinical Laboratory Standards (NCCLS), now known as Clinical Laboratory Standards Institute (CLSI) has published comprehensive documents regarding the disc diffusion systems. The agar disc diffusion test is the most convenient and widely used method for routine Antimicrobial Susceptibility Testing. In subsequent and current practice, antimicrobial impregnated paper discs are applied onto the agar surface.

Various regulatory agencies and standards-writing organizations, published standardized reference procedures based on the Bauer-Kirby method. Standardized reference procedures for the disc systems were published by WHO and FDA and are periodically updated by the CLSI (formerly NCCLS) for any antimicrobial testing, Quality control or clinical testing. However, few precautions are to be maintained while handling of the Sensitivity discs, the latest CLSI documents should be consulted for current recommendations.

INSTRUCTIONS FOR USE

1. ANTIMICROBIAL SUSCEPTIBILITY TESTING

Prepare plates with Mueller Hinton Agar for use in the Bauer-Kirby Method for rapidly growing aerobic organisms. For fastidious organisms such as Streptococci, the agar is supplemented with 5% sterile, defibrinated blood. For *Haemophilus spp.* Haemophilus Test Medium and for *N. gonorrhoeae*, GC Agar Base with 1% defined growth supplement are recommended respectively. The medium in the plates should be sterile and have a depth of about 4 mm.

1. Gram staining is done before starting susceptibility testing to confirm the culture purity and to determine appropriate battery of tests.
2. Select 3-4 colonies from subcultured slant or plate and transfer them into 5 mL of sterile 0.85% saline, vortex the suspension and adjust the turbidity to yield a uniform suspension matching 0.5 McFarland standard (O.D at 630 nm range: 0.08-0.130).

Note: The direct colony suspension method is preferred for *Staphylococcus* spp., *S. pneumoniae* and other streptococci, *Haemophilus* spp. and *N. gonorrhoeae*. OR 3-5 well-isolated colonies should be selected and transferred to 4-5 mL of a suitable broth using an inoculating needle.

3. Incubate the broth (usually 2-6 hours) at 35°C-37°C until it achieves or exceeds the turbidity of the 0.5 McFarland's barium sulphate standard. This results in a suspension containing approximately 1-2 X 10^8 cfu/mL.

Note: Overnight broth cultures should not be used as inoculum.

4. Adjust the turbidity to the barium sulphate standard. For the diluents use sterile broth or sterile saline. The turbidity of the standard and the test inoculums should be compared by holding both tubes in front of a white background with finely divided lines or by use of a photometric device.
5. Within 15 minutes of adjusting the turbidity of the inoculum, immerse a sterile cotton swab into the properly diluted inoculum and rotate it firmly several times against the upper inside wall of the tube to express excess fluid.
6. Inoculate the entire agar surface of the plate three times, rotating the plate 60° between streaking to obtain even inoculation. Swab the rim of the agar bed too.
7. The lid may be left ajar for 3-5 minutes and the plate held at room temperature for not more than 15 minutes to allow the surface moisture to be absorbed before applying the antibiotic discs.
8. Apply discs by means of an antimicrobial disc dispenser, aseptically, at least 24 mm apart. Preferably, deposit Penicillin and Cephalosporin discs not more than 10 mm from the edge of the Petri dish, and their centers at least 30 mm apart. Avoid placing such discs adjacent to one another. Tap the discs with some sterile needle or forceps after placing them on the agar for complete contact with the medium surface.
9. Within 15 minutes of applying the discs, invert the plates and incubate at 35°C-37°C. With non-fastidious organisms the plates should not be incubated under an increased concentration of carbon dioxide.

Note: For *Staphylococcus* spp., testing at temperatures above 35°C may not detect Methicillin-resistant Staphylococci (MRS); for N. gonorrhoeae, incubate at 35°C-37°C [do not exceed 37°C]. *Haemophilus* spp., *N. gonorrhoeae*, *S. pneumoniae* and other streptococci should be incubated in an atmosphere enriched with 5% CO2.

10. Examine plates after 18-24 hours of incubation. (20-24 hours for *N. gonorrhoeae*, *S. pneumoniae* and other streptococci). A full 24 hours of incubation is recommended for *Staphylococcus* spp. to detect methicillin/nafcillin/oxacillin/vancomycin-resistant staphylococci and *Enterococcus* spp. for vancomycin resistance. The diameters of the zones of complete inhibition are measured, as determined by gross visual inspection.

2. ANTIFUNGICAL SUSCEPTIBILITY TESTING

1. Aseptically take a loopfull of culture from subcultured slant or broth and transfer it to the SDA plate for primary, secondary & tertiary streaking.
2. Incubate the freshly inoculated plate for 18-24 hours at 35°C-37°C.
3. Select 3-4 similar colonies of approximately 1mm and transfer them into 5mL of sterile 0.85% saline.
4. Vortex the resulting suspension and adjust the turbidity to yield a uniform suspension matching McFarland standard (O.D at 620nm range: 0.08-0.130)
5. Prepare plates with Mueller Hinton Agar +2% Glucose and 0.5 µg/mL Methylene Blue Dye (GMB) Medium for carrying out susceptibility of antifungal discs. The medium in the plates should be sterile and have a depth of about 4 mm.
6. Inoculate the entire agar surface of the plate three times, rotating the plate 60° between streaking to obtain even inoculation. Swab the rim of the agar bed too.
7. The lid may be left ajar for 3-5 minutes and the plate held at room temperature for not more than 15 minutes to allow the surface moisture to be absorbed before applying the antibiotic discs.
8. Apply discs by means of an antimicrobial disc dispenser, aseptically, at least 24 mm apart.
9. Within 15 minutes of applying the discs, invert the plates and incubate at 35°C-37°C.
10. Examine plates after 24-48 hours of incubation. The diameters of the zones of complete inhibition are measured, as determined by gross visual inspection.

Zones are measured to the nearest whole millimeter. For further details in measuring zones of inhibition, consult the reference. If only isolated colonies grow, the inoculum is too light and the test should be repeated. Zones around discs containing different drugs are not comparable for the purpose of comparing activity of drugs. See the Zone Diameter Interpretive Chart, which gives expected values from testing common aerobes.

INTERPRETATION AND MICROBIOLOGICAL PARAMETERS AS PER CLSI AND EUCAST STANDARDS.

1. ANTIMICROBIAL TESTING

See Table

2. ANTIFUNGAL TESTING

See Table

PRECAUTION

1. Accuracy of the test depends on the disc potency, proper inoculum, functional pretested medium plates (nature of medium and its depth), inoculation technique, incubation temperature and time etc.
2. To maintain the potency of discs, store the stock containers of discs in the freezer at -20°C. The discs when required for use within a week, may be kept in refrigerator (below 8°C) and the remainder should be kept with desiccant and tightly closed container caps in the freezer.
3. Remove the antimicrobial discs from refrigerator to room temperature 1-2 hours before use to avoid moisture condensation. Return unused discs to refrigerator immediately after applications.
4. Once a cartridge is opened it is recommended that it is stored for no more than one week.
5. While reading results:
   (a) Ignore swarming of *Proteus* species if zones of inhibition are clearly defined.
   (b) Measure the sulphonamide zones at the margin of heavy growth since sulphonamide may not inhibit organisms for several generations and
   slight growth may appear within zones of inhibition.
   (c) Subculture, reidentify and retest any large colony growing within a clear zone of inhibition.
6. Control tests using known cultures should be included each time a sensitivity test is performed or weekly if satisfactory performance can be documented according to the CLSI standard. Typical zone sizes of *E. coli* ATCC 25922, *S. aureus* ATCC 25923, *P. aeruginosa* ATCC 27853, *H. influenzae* ATCC 49247, *H. influenzae* ATCC 49766, *N. gonorrhoeae* ATCC 49226, *S. pneumoniae* ATCC 49619, *E. coli* ATCC 35218 (β-lactamase producing strain), *E. faecalis* ATCC 29212 (for quality control testing of gentamicin 120 µg and streptomycin 300 µg discs) and performance of the entire procedure. *E. faecalis* ATCC 29212 (or 33186) is also recommended for evaluating new lots of Mueller Hinton Agar for low thymine and thymidine content. *H. influenzae* ATCC 10211 is recommended as a useful additional quality control strain to verify the growth promotion properties of Haemophilus Test Medium Agar.
7. Antibacterial agents other than those listed in interpretative chart are in current use. Susceptibility tests employing these agents should be interpreted on the basis of presence or absence of a definite zone of inhibition and should be considered as only qualitative until the time interpretative zones have been established.

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NOTE

1. As per CLSI, ampicillin disc is also used for testing susceptibility of amoxicillin discs.
2. Cephalothin disc is used for testing susceptibility to Cephapirin, Cephaloridine, Cephalexin, Cefaclor, Cephoxitin, Cefazolin, Cephradine and Cephadroxil.
3. The Sulfisoxazole (Suphafurazole) disc can be used to represent any of the currently available sulfonamide preparations.
4. The category "Intermediate" should also be reported since infections with bacteria of intermediate susceptibility may be considered moderately susceptible and may respond to antimicrobial agents with a wide safe dosage range.
5. Since certain strains of *Providencia spp.* have been reported to give false susceptible results with Cefprozil discs, strains of this genus should not be tested & reported with this disc.
6. All staphylococcal isolates with zone diameters of 14 mm or less should be tested by an MIC (Minimal Inhibitory Concentration) method.
7. When testing Vancomycin against Enterococci, plates should be incubated for 24 hours & examined using transmitted light. The presence of a haze or any growth within the zone of inhibition indicates resistance.
8. Ofloxacin susceptible *S. pneumoniae* will also be susceptible to Levofloxacin.
9. Susceptibility & resistance to Azithromycin, Clarithromycin & Dirithromycin can be predicted by using Erythromycin for Streptococci.
10. Only ampicillin, a quinolone and trimethoprim / sulfamethoxazole are tested and reported routinely for faecal isolates of *Salmonella* and *Shigella spp.*
11. Chloramphenicol and a third generation cephalosporin should be tested and reported for extraintestinal, isolates of *Salmonella* species.
12. For *Salmonella* and *Shigella spp.*, aminoglycosides and first and second generation cephalosporins and cephamycins may appear active *In vitro* but are not effective clinically and should not be reported as susceptible.
13. *Enterobacter*, *Citrobacter*, and *Serratia* may develop resistance during prolonged therapy with third generation cephalosporins. Therefore, isolates that are initially susceptible may become resistant within 3 to 4 days after initiation of therapy. Hence retesting of isolates is recommended.
14. Strains of *Klebsiella spp.* and *E. coli* that produce ESBLs may be clinically resistant to therapy with penicillins, cephalosporins, or aztreonam. Such strains should be screened for potential ESBL production by using the ESBL screening breakpoints before reporting results for penicillins, extended-spectrum cephalosporins or aztreonam.
15. The decision to perform ESBL screening tests on all urine isolates should be made on an institutional basis, considering prevalence, therapy and infection control issues.
16. *P. aeruginosa* may develop resistance during prolonged therapy with all antibiotics. Isolates that are initially susceptible may become resistant within 3 to 4 days after initiation of therapy and testing of repeat isolates may be warranted. The susceptibility of *Pseudomonas aeruginosa* isolated from patients with cystic fibrosis can be reliably determined by the disc method, but may require extended incubation up to 24 hours before reporting as susceptible.
17. *Staphylococcus spp.* may develop resistance during prolonged therapy with quinolones. Therefore, isolates that are initially susceptible may become resistant within 3 to 4 days after initiation of therapy. Testing of repeat isolates may be warranted.
18. MRSA and methicillin-resistant, coagulase-negative Staphylococci should be reported as resistant (or not reported) to all other penicillins, carbapenems, cephems, and β-lactam/β-lactamase inhibitor combinations, regardless of in vitro test results with those agents. This is because most cases of documented methicillin-resistant infections have responded poorly to β-lactam therapy.
19. For oxacillin-susceptible *S. aureus* and coagulase-negative Staphylococci, results for parenteral and oral cephems, β-lactam/β-lactamase inhibitor combinations, and carbapenems, if tested, should be reported according to the results generated using routine interpretive criteria.
20. For oxacillin-resistant *S. aureus* and coagulase-negative Staphylococci (MRS), other β-lactam agents; i.e., penicillins, β-lactam/β-lactamase inhibitor combinations, cephems, and carbapenems, may appear active in vitro, but are not effective clinically. Results for these drugs should be reported as resistant or should not be reported. This is because most cases of documented MRS infections have responded poorly to β-lactam therapy.
21. Routine testing of urine isolates of *S. saprophyticus* is not advised, because infections respond to concentrations achieved in urine of antimicrobial agents commonly used to treat acute, uncomplicated urinary tract infections (e.g., nitrofurantoin, trimethoprim/ sulfamethoxazole or a fluoroquinolone).
22. Enterococci may be resistant to penicillin and ampicillin because of the production of low affinity, penicillin-binding proteins (PBPs), or the production of β-lactamase. The disc diffusion test can accurately detect isolates with altered PBPs, but it will not reliably detect β-lactamase producing strains. The latter strains are best detected by using a direct β-lactamase test
23. For *Enterococcus spp.*, cephalosporins, aminoglycosides (except for high level resistance screening), clindamycin and trimethoprim/sulfamethoxazole may appear active *In vitro* but are not effective clinically and isolates should not be reported as susceptible.
24. Testing with ampicillin, one of the third-generation cephalosporins, chloramphenicol and meropenem should be reported routinely with cerebrospinal fluid isolates of *H. influenzae*.
25. Amoxicillin/clavulanic acid, azithromycin, clarithromycin, cefaclor, cefprozil, loracarbef, cefdinir, cefixime, cefpodoxime, cefuroxime axetil and telithromycin are oral agents that may be used as empiric therapy for respiratory tract infections caused by *Haemophilus spp.* The results of susceptibility tests with these antimicrobial agents are often not useful for management of individual patients. However, susceptibility testing of *Haemophilus spp.* with these compounds may be appropriate for surveillance or epidemiologic studies.
26. Administration for treatment of *S. pyogenes* or *S. agalactiae* is not necessary for clinical purposes and need not be done routinely, since as with vancomycin, resistant strains have not been recognized.

REFERENCES

1. Method for Antifungal Disk Diffusion Susceptibility Testing of Yeasts; Approved Guidelines-Second edition Vol.29 No.17, August- 2009 CLSI document M44-A2. For more details refer to this volume
2. Zone Diameter Interpretive Standards, Corresponding Minimal Inhibitory Concentration (MIC) Interpretive Breakpoints, and Quality Control Limits for Antifungal Disc Diffusion Susceptibility Testing of Yeasts, Third Informational Supplement CLSI Document- M44- S3- Aug 2009.

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Zone Size Interpretative Chart

(Based on results obtained using Mueller Hinton Agar)

Cat. No.	Antimicrobial Agent	Sym-bol	Disc content	Diameter of zone of inhibition in mm										
				Resis-tant (mm) (≤)	Inter-mediate mm	Sensi-tive (mm) (≥)	Quality Control Limits							
							E. coli ATCC 25922	*S. aureus* ATCC 25923	*P. aerugi-nosa* ATCC 27853	*E. coli* ATCC 35218	*H. influ-enzae* ATCC 49247	*H. influ-enzae* ATCC 49766	*S. pneu-moniae* ATCC 49619	*N. gon-orrhoeae* ATCC 49226
C39SD1002	**Amikacin** *Enterobacteriaceae* *Acinetobacter spp.* *Staphylococci spp.* *Pseudomonas aeruginosa*	AK	30 mcg	 14 14 14 14	 15-16 15-16 15-16 15-16	 17 17 17 17	19-26	20-26	18-26	-	-	-	-	-
C39SD1013	**Ampicillin** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae* *Enterococcus spp.* *Streptococcus spp. β-hemolytic Group*	AMP	10 mcg	 13 18 16 -	 14-16 19-21 - -	 17 17 17 17	15-22	27-35	-	6	13-21	-	30-36	-
C39SD1017	**Ampicillin/Sulbactam** *Enterobacteriaceae* *Acinetobacter spp.* *Haemophilus influenzae & Haemophilus parainfluenzae*	A/S	10/10 mcg	 11 11 19	 12-14 12-14 -	 15 15 20	19-24	29-37	-	13-19	14-22	-	-	-
C39SD1007	**Amoxicillin/Clavulanate** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae*	AMC	20/10 mcg	 13 19	 14-17 -	 18 20	18-24	28-36	-	17-22	15-23b	-	-	-
C39SD1018	**Azithromycin** *Enterobacteriaceae* *Staphylococci spp* *Haemophilus influenzae & Haemophilus parainfluenzae* *Neisseria meningitidis* *Streptococcus pneumoniae* *Streptococcus spp. β-hemolytic Group* *Streptococcus spp. Viridans Group*	AZM	15 mcg	 12 13 - - 13 13 13	 - 14-17 - - 14-17 14-17 14-17	 13 18 12 20 18 18 18	-	21-26	-	-	13-21	-	19-25	30-38
C39SD1020	**Aztreonam** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae* *Pseudomonas aeruginosa*	AT	30 mcg	 17 - 15	 18-20 - 16-21	 21 26 22	28-36	-	23-29	-	30-38	-	-	-
C39SD1025	**Carbenicillin**	CB	100 mcg	-	-	-	23-29	-	18-24	-	-	-	-	-
C39SD1026	**Cefaclor** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae*	CF	30 mcg	 14 16	 15-17 17-19	 18 20	23-27	27-31	-	-	-	25-31	24-32	-
C39SD1029	**Cefazolin** *Enterobacteriaceae*	CZ	30 mcg	 19 (P) 14 (O)	 20-22 (P) -	 23 (P) 15 (O)	21-27	29-35	-	-	-	-	-	-
C39SD1030	**Cefdinir** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae*	CDR	5 mcg	 16 -	 17-19 -	 20 20	24-28	25-32	-	-	-	24-31	26-31	40-49
C39SD1031	**Cefepime** *Enterobacteriaceae* *Acinetobacter spp.* *Pseudomonas aeruginosa* *Haemophilus influenza & Haemophilus parainfluenzae* *Neisseria gonorrhoeae* *Streptococcus spp. β-hemolytic Group* *Streptococcus spp. Viridans Group*	CPM	30 mcg	 18 14 14 - - - 21	 - 15-17 15-17 - - - 22-23	 25 18 18 26 31 24 24	31-37	23-29	25-31	-	25-31	-	28-35	37-46
C39SD1035	**Cefixime** *Enterobacteriaceae* *Haemophilus influenza & Haemophilus parainfluenzae* *Neisseria gonorrhoeae*	CFM	5 mcg	 15 - -	 16-18 - -	 19 21 31	20-26	-	-	-	25-33	-	16-23	37-45
C39SD1037	**Cefoperazone** *Enterobacteriaceae*	CPZ	75 mcg	15	16-20	21	28-34	24-33	23-29	-	-	-	-	-
C39SD1043	**Cefotaxime (Cephotaxime)** *Enterobacteriaceae* *Acinetobacter spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Streptococcus spp. β hemolytic Group* *Neisseria gonorrhoeae* *Neisseria meningitidis* *Streptococcus spp. Viridans Group*	CTX	30 mcg	 22 14 - - - - 25	 23-25 15-22 - - - - 26-27	 26 23 26 24 31 34 28	29-35	25-31	18-22	-	31-39	-	31-39	38-48
C39SD1045	**Cefoxitin** *Enterobacteriaceae* *Neisseria gonorrhoeae*	CX	30 mcg	 14 23	 15-17 24-27	 18 28	23-29	23-29	-	-	-	-	-	33-41
C39SD1047	**Cefpodoxime** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae* *Neisseria gonorrhoeae*	CPD	10 mcg	 17 - -	 18-20 - -	 21 21 29	23-28	19-25	-	-	25-31	-	28-34	35-43
C39SD1049	**Cefprozil** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae*	CPR	30 mcg	 14 14	 15-17 15-17	 18 18	21-27	27-33	-	-	-	20-27	25-32	-
C39SD1050	**Ceftazidime** *Enterobacteriaceae* *Acinetobacter spp.* *Burkholderia cepacia complex* *Neisseria gonorrhoeae* *Haemophilus influenzae & Haemophilus parainfluenzae* *Pseudomonas aeruginosa*	CAZ	30 mcg	 17 14 17 - - 14	 18-20 15-17 18-20 - - 15-17	 21 18 21 - 26 18	25-32	16-20	22-29	-	27-35	-	-	35-43
C39SD1054	**Ceftizoxime** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae* *Neisseria gonorrhoeae*	CZX	30 mcg	 21 - -	 22-24 - -	 25 26 38	30-36	27-35	12-17	-	29-39	-	28-34	42-51
C39SD1055	**Ceftriaxone** *Enterobacteriaceae* *Acinetobacter spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Neisseria gonorrhoeae* *Neisseria meningitidis* *Streptococcus spp. β-hemolytic Group* *Streptococcus spp. Viridans Group*	CTR	30 mcg	 19 13 - - - - 24	 20-22 14-20 - - - - 25-26	 23 21 26 35 34 24 27	29-35	22-28	17-23	-	31-39	-	30-35	39-51

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(Based on results obtained using Mueller Hinton Agar)

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C39SD1060	**Cefuroxime** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae* *Neisseria gonorrhoeae*	CXM	30 mcg	 14 16 -	 15-17 17-19 -	 18 (P) 23 (O) 20 (P) 20 (O)	20-26	27-35	-	-	-	28-36	-	33-41
C39SD1061	**Cephalothin** *Enterobacteriaceae*	CEP	30 mcg	 14	 15-17	 18	15-21	29-37	-	-	-	-	26-32	-
C39SD1062	**Chloramphenicol** *Enterobacteriaceae 10* *Staphylococci spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Streptococcus pneumoniae* *Streptococcus spp. β-hemolytic Group* *Streptococcus spp. Viridans Group* *Enterococcus spp.* *Neisseria meningitidis*	C	30 mcg	 12 25 20 17 17 12 19	 13-17 26-28 - 18-20 18-20 13-17 20-25	 18 29 21 21 21 18 26	21-27	19-26	-	-	31-40	-	23-27	-
C39SD1066	**Ciprofloxacin** *Enterobacteriaceae* *Acinetobacter spp.* *Staphylococci spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Neisseria gonorrhoeae* *Neisseria meningitidis* *Enterococcus spp.* *Pseudomonas aeruginosa* *Salmonella spp.*	CIP	5 mcg	 21 15 15 - 2 7 32 15 18 20	 22-25 16-20 16-20 - 28-40 33-34 16-20 19-24 21-30	 26 21 21 21 41 35 21 25 31	29-38	22-30	25-33	-	34-42	-	-	48-58
C39SD1070	**Clarithromycin** *Staphylococci spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Streptococcus pneumoniae* *Streptococcus spp. β-hemolytic Group* *Streptococcus spp. Viridans Group*	CLR	15 mcg	 13 10 16 16 16	 14-17 11-12 17-20 17-20 17-20	 18 13 21 21 21	-	26-32	-	-	11-17	-	25-31	-
C39SD1071	**Clindamycin** *Staphylococci spp.* *Streptococcus pneumoniae* *Streptococcus spp. β-hemolytic Group* *Streptococcus spp. Viridans Group*	CD	2 mcg	 14 15 15 15	 15-20 16-18 16-18 16-18	 21 19 19 19	-	24-30	-	-	-	-	19-25	-
C39SD1078	**Colistin (Methane Sulponhate)** *Pseudomonas aeruginosa*	CL	10 mcg	 10	 -	 11	11-17	-	11-17	-	-	-	-	-
C39SD1081	**Doripenem** *Enterobacteriacea* *Pseudomonas aeruginosa* *Staphylococcus spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Acinetobacter spp.*	DOR	10 mcg	 19 15 - - 14	 20-22 16-18 - - 15-17	 23 19 30 16 18	27-35	33-42	28-35	-	-	-	-	-
C39SD1082	**Doxycycline** *Enterobacteriaceae* *Acinetobacter spp.* *Staphylococci spp.* *Streptococcus pneumoniae* *Enterococcus spp.*	DOX	30 mcg	 10 9 12 24 12	 11-13 10-12 13-15 25-27 13-15	 14 13 16 28 16	18-24	23-29	-	-	-	-	25-34	-
C39SD1084	**Ertapenem** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae*	ETP	10 mcg	 18 -	 19-21 -	 22 19	29-36	24-31	13-21	-	20-28	27-33	28-35	-
C39SD1085	**Erythromycin** *Staphylococci spp.* *Streptococcus pneumoniae* *Streptococcus spp. β-hemolytic Group* *Streptococcus spp. Viridans Group* *Enterococcus spp.*	E	15 mcg	 13 15 15 15 13	 14-22 16-20 16-20 16-20 14-22	 23 21 21 21 23	-	22-30	-	-	-	-	25-30	-
C39SD1088	**Faropenem**	FAR	5 mcg	-	-	-	20-26	27-34	-	-	15-22	-	27-35	-
C39SD1091	**Fosfomycin** *Enterobacteriaceae* *Enterococcus spp.*	FO	200 mcg	 12 12	 13-15 13-15	 16 16	22-30	25-33	-	-	-	-	-	-
C39SD1095	**Gatifloxacin** *Enterobacteriaceae* *Acinetobacter spp.* *Staphylococci spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *S.pneumoniae* *Streptococcus spp. β-hemolytic Group S* *treptococcus spp. Viridans Group* *Enterococcus spp.* *Pseudomonas aeruginosa*	GAT	5 mcg	 14 14 19 - 17 17 17 14 14	 15-17 15-17 20-22 - 18-20 18-20 18-20 15-17 15-17	 18 18 23 18 21 21 21 18 18	30-37	27-33	20-28	-	33-41	-	24-31	45-56
C39SD1098	**Gemifloxacin** *Enterobacteriaceae* *Haemophilus influenzae & Haemophilus parainfluenzae* *S.pneumoniae*	GEM	5 mcg	 15 - 19	 16-19 - 20-22	 20 18 23	29-36	27-33	19-25	-	30-37	-	28-34	-
C39SD1099	**Gentamicin** *Enterobacteriaceae* *Acinetobacter spp.* *Staphylococci spp.* *Pseudomonas aeruginosa*	GEN	10 mcg	 12 12 12 12	 13-14 13-14 13-14 13-14	 15 15 15 15	19-26	19-27	17-23	-	-	-	-	-
C39SD1103	**Imipenem** *Enterobacteriaceae* *Acinetobacter spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Pseudomonas aeruginosa*	IPM	10 mcg	 19 18 - 15	 20-22 19-21 - 16-18	 23 22 16 19	26-32	-	20-28	-	21-29	-	-	-
C39SD1107	**Kanamycin** *Enterobacteriaceae* *Staphylococci spp.*	K	30 mcg	 13 13	 14-17 14-17	 18 18	17-25	19-26	-	-	-	-	-	-

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Susceptibility Discs

CE IVD

Zone Size Interpretative Chart

(Based on results obtained using Mueller Hinton Agar)

Cat. No.	Antimicrobial Agent	Symbol	Disc content	Diameter of zone of inhibition in mm										
				Resistant (mm) (≤)	Intermediate mm	Sensitive (mm) (≥)	Quality Control Limits							
							E. coli ATCC 25922	*S. aureus* ATCC 25923	*P. aeruginosa* ATCC 27853	*E. coli* ATCC 35218	*H. influenzae* ATCC 49247	*H. influenzae* ATCC 49766	*S. pneumoniae* ATCC 49619	*N. gonorrhoeae* ATCC 49226
C39SD1112	**Levofloxacin**	LE	5 mcg				29-37	25-30	19-26	-	32-40	-	20-25	-
	Enterobacteriaceae			16	17-20	21								
	Acinetobacter spp.			13	14-16	17								
	Stenotrophomonas maltophilia			13	14-16	17								
	Pseudomonas aeruginosa			14	15-21	22								
	Staphylococci spp.			15	16-18	19								
	Enterococcus spp.			13	14-16	17								
	Haemophilus influenzae & Haemophilus parainfluenzae			-	-	17								
	Streptococcus pneumoniae			13	14-16	17								
	Streptococcus spp. β-hemolytic Group			13	14-16	17								
	Streptococcus spp. Viridans Group			13	14-16	17								
C39SD1116	**Linezolid**	LZ	30 mcg				-	25-32	-	-	-	-	25-34	-
	Staphylococci spp.			20	-	21								
	Enterococcus spp.			20	21-22	23								
	Streptococcus pneumoniae			-	-	21								
	Streptococcus spp. β-hemolytic Group			-	-	21								
	Streptococcus spp. Viridans Group			-	-	21								
C39SD1117	**Lomefloxacin**	LOM	10 mcg				27-33	23-29	22-28	-	33-41	-	-	45-54
	Enterobacteriaceae			18	19-21	22								
	Pseudomonas aeruginosa			18	19-21	22								
	Staphylococci spp.			18	19-21	22								
	Haemophilus influenzae & Haemophilus parainfluenzae			-	-	22								
	Neisseria gonorrhoeae			-	-	-								
C39SD1120	**Meropenem**	MRP	10 mcg				28-35	29-37	27-33	-	20-28	-	28-35	-
	Enterobacteriaceae			19	20-22	23								
	Acinetobacter spp.			14	15-17	18								
	Burkholderia cepacia complex			15	16-19	20								
	Pseudomonas aeruginosa			15	16-18	19								
	Haemophilus influenzae & Haemophilus parainfluenzae			-	-	20								
	Neisseria meningitidis			-	-	30								
C39SD1123	**Minocycline**	MI	30 mcg				19-25	25-30	-	-	-	-	-	-
	Enterobacteriaceae			12	13-15	16								
	Acinetobacter spp.			12	13-15	16								
	Burkholderia cepacia complex			14	15-18	19								
	Stenotrophomonas maltophilia			14	15-18	19								
	Staphylococci spp.			14	15-18	19								
	Enterococcus spp.			14	15-18	19								
	Neisseria meningitidis			-	-	26								
C39SD1124	**Moxifloxacin**	MXF	5 mcg				28-35	28-35	17-25	-	31-39	-	25-31	-
	Staphylococci spp.			20	21-23	24								
	Haemophilus influenzae & Haemophilus parainfluenzae			-	-	18								
	Streptococcus pneumoniae			14	15-17	18								
C39SD1125	**Nalidixic Acid**	NA	30 mcg				22-28	-	-	-	-	-	-	-
	Enterobacteriaceae			13	14-18	19								
C39SD1127	**Netilmicin**	NET	30 mcg				22-30	22-31	17-23	-	-	-	-	-
	Enterobacteriaceae			12	13-14	15								
	Pseudomonas aeruginosa			12	13-14	15								
	Staphylococci spp.			12	13-14	15								
C39SD1129	**Nitrofurantoin**	NIT	300 mcg				20-25	18-22	-	-	-	-	23-29	-
	Enterobacteriaceae			14	15-16	17								
	Staphylococci spp.			14	15-16	17								
	Enterococcus spp.			14	15-16	17								
C39SD1132	**Norfloxacin**	NX	10 mcg				28-35	17-28	22-29	-	-	-	15-21	-
	Enterobacteriaceae			12	13-16	17								
	Pseudomonas aeruginosa			12	13-16	17								
	Staphylococci spp.			12	13-16	17								
	Enterococcus spp.			12	13-16	17								
C39SD1137	**Ofloxacin**	OF	5 mcg				29-33	24-28	17-21	-	31-40	-	16-21	43-51
	Enterobacteriaceae			12	13-15	16								
	Pseudomonas aeruginosa			12	13-15	16								
	Staphylococci spp.			14	15-17	18								
	Haemophilus influenzae & Haemophilus parainfluenzae			-	-	16								
	Neisseria gonorrhoeae			-	-	-								
	Streptococcus pneumoniae			12	13-15	16								
	Streptococcus spp. β-hemolytic Group			12	13-15	16								
	Streptococcus spp. Viridans Group			12	13-15	16								
C39SD1139	**Oxacillin**	OX	1 mcg	-	-	-	-	18-24	-	-	-	-	≤12k	-
C39SD1142	**Pefloxacin**	PF	5 mcg	-	-	-	25-33	-	-	-	-	-	-	-
C39SD1143	**Penicillin**	P	10 units				-	26-37	-	-	-	-	24-30	26-34
	Staphylococci spp.			28	-	29								
	Enterococcus spp.			14	-	15								
	Neisseria gonorrhoeae			26	27-46	47								
	Streptococcus spp. β-hemolytic Group			-	-	24								
C39SD1145	**Piperacillin**	PI	100 mcg				24-30	-	25-33	12-18	-	-	-	-
	Enterobacteriaceae			17	18-20	21								
	Acinetobacter spp.			17	18-20	21								
	Pseudomonas aeruginosa			14	15-20	21								
C39SD1146	**Piperacillin/Tazobactam**	PTZ	100/10 mcg				24-30	27-36	25-33	24-30	33-38	-	-	-
	Enterobacteriaceae			17	18-20	21								
	Acinetobacter spp.			17	18-20	21								
	Pseudomonas aeruginosa			14	15-20	21								
	Haemophilus influenzae & Haemophilus parainfluenzae			-	-	21								
C39SD1147	**Polymyxin B**	PB	300 units				13-19	-	14-18	-	-	-	-	-
	Pseudomonas aeruginosa			11	-	12								
C39SD1150	**Prulifloxacin (Ulifloxacin)**	PRU	5 mcg	-	-	-	32-38	20-26	27-33	-	-	-	-	-
C39SD1152	**Rifampin**	RIF	5 mcg				8-10	26-34	-	-	22-30	-	25-30	-
	Staphylococci spp.			16	17-19	20								
	Enterococcus spp.			16	17-19	20								
	Haemophilus influenzae & Haemophilus parainfluenzae			16	17-19	20								
	Neisseria meningitidis			19	20-24	25								
	Streptococcus pneumoniae			16	17-18	19								
C39SD1157	**Sparfloxacin**	SPX	5 mcg				30-38	27-33	21-29	-	32-40	-	21-27	43-51
	Staphylococci spp.			15	16-18	19								
	Streptococcus pneumoniae			15	16-18	19								

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Susceptibility Discs

CE IVD

Zone Size Interpretative Chart
(Based on results obtained using Mueller Hinton Agar)

Cat. No.	Antimicrobial Agent	Sym-bol	Disc content	Diameter of zone of inhibition in mm										
				Resis-tant (mm) (≤)	Inter-mediate mm	Sensi-tive (mm) (≥)	Quality Control Limits							
							E. coli ATCC 25922	*S. aureus* ATCC 25923	*P. aerugi-nosa* ATCC 27853	*E. coli* ATCC 35218	*H. influ-enzae* ATCC 49247	*H. influ-enzae* ATCC 49766	*S. pneu-moniae* ATCC 49619	*N. gon-orrhoeae* ATCC 49226
C39SD1158	**Spectinomycin** *Neisseria gonorrhoeae*	SPT	100 mcg	 14	 15-17	 18	-	-	-	-	-	-	-	23-29
C39SD116	**Streptomycin** *Enterobacteriaceae*	S	10 mcg	 11	 12-14	 15	12-20	14-22	-	-	-	-	-	-
C39SD1165	**Teicoplanin** *Staphylococci spp.* *Enterococcus spp.*	TEI	30 mcg	 10 10	 11-13 11-13	 14 14	-	15-21	-	-	-	-	-	-
C39SD1166	**Tetracycline** *Enterobacteriaceae* *Acinetobacter spp.* *Staphylococci spp.* *Enterococcus spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Neisseria gonorrhoeae* *Streptococcus pneumoniae* *Streptococcus spp. β hemolytic Group* *Streptococcus spp. Viridans Group*	TE	30 mcg	 11 11 14 14 25 30 24 18 18	 12-14 12-14 15-18 15-18 26-28 31-37 25-27 19-22 19-22	 15 15 19 19 29 38 28 23 23	18-25	24-30	-	-	14-22	-	27-31	30-42
C39SD1168	**Ticarcillin** *Enterobacteriaceae* *Acinetobacter spp.* *Pseudomonas aeruginosa*	TI	75 mcg	 14 14 15	 15-19 15-19 16-23	 20 20 24	24-30	-	21-27	6	-	-	-	-
C39SD1169	**Ticarcillin / Clavulanate** *Enterobacteriaceae* *Acinetobacter spp.* *Pseudomonas aeruginosa*	TCC	75/10 mcg	 14 14 15	 15-19 15-19 16-23	 20 20 24	24-30	29-37	20-28	21-25	-	-	-	-
C39SD1170	**Tigecycline**	TGC	15 mcg	-	-	-	20-27	20-25	9-13	-	23-31	-	23-29	30-40
C39SD1171	**Tobramycin** *Enterobacteriaceae* *Acinetobacter spp.* *Pseudomonas aeruginosa* *Staphylococci spp.*	TOB	10 mcg	 12 12 12 12	 13-14 13-14 13-14 13-14	 15 15 15 15	18-26	19-29	20-26	-	-	-	-	-
C39SD1177	**Trimethoprime/Sulfamethoxazole** *Enterobacteriaceae* *Acinetobacter spp.* *Burkholderia cepacia complex* *Stenotrophomonas maltophilia* *Staphylococci spp.* *Haemophilus influenzae & Haemophilus parainfluenzae* *Streptococcus pneumoniae* *Neisseria meningitidis*	COT	1.25/23.75 mcg	 10 10 10 10 10 10 15 25	 11-15 11-15 11-15 11-15 11-15 11-15 16-18 26-29	 16 16 16 16 16 16 19 30	23-29	24-32	-	-	24-32	-	20-28	-
C39SD1173	**Trimethoprim** *Enterobacteriaceae* *Staphylococci spp.*	TR	5 mcg	 10 10	 11-15 11-15	 16 16	21-28	19-26	-	-	-	-	-	-
C39SD1179	**Vancomycin** *Enterococcus spp.* *Streptococcus pneumoniae* *Streptococcus spp. β-hemolytic Group* *Streptococcus spp. Viridans Group*	VA	30 mcg	 14 - - -	 15-16 - - -	 17 17 17 17	-	17-21	-	-	-	-	20-27	-

Note: 1. For control limits of Gentamycin 120 mcg use *Enterococcus faecalis* ATCC 29212, standard 16-23 mm (HLG).
2. For control limits of Streptomycin 300 mcg use *Enterococcus faecalis* ATCC 29212, standard 14-20 mm (HLS).

Δ : For *E. coli, S. aureus, P. aeruginosa* : Muller Hinton Agar. For *Haemophilus* spp: Haemophilus Test Medium; For *S. pneumoniae* : Muller Hinton Agar with 5% sheep blood; For *N. gonorrhoeae* : G C Agar Base with 1% defined growth supplement.

•• : Deterioration in Oxacillin disc content is best assessed with QC organism *S. aureus* ATCC 25923, with an acceptable zone diameter of 18-24 mm.

Zone Size Interpretative Chart for Antifungal Agent
(Based on results obtained on Mueller Hinton Agar + 2% Glucose + 0.5 mcg/mL Methylene Blue Dye Medium)

Cat. No.	Antimicrobial Agent	Symbol	Disc Content	Zone Diameter, Nearest Whole (mm)			Quality Control Limits					
				Resistant mm or less	S-DD*	Sensitive mm or less	*C. albicans* ATCC 90028	*C. parapsilosis* ATCC 22019	*C. tropicalis* ATCC 750	*C. krusei* ATCC 6258	*C. albicans* ATCC 10231	*S. cerevisiae* ATCC 9763
C39SD1089	Fluconazole	FLC	25 mcg	14	15-18	19	28-39	22-33	26-37	-	25-30	-
C39SD1182	Voriconazole	VRC	1 mcg	13	14-16	17	31-42	28-37	-	16-25	30-40	29-38

* : S - DD - Susceptible - Dose Dependent

Reference:

1. Bauer, Kirby, Sherris and Turck, 1966, Am. J. Clin. Path., 45:493.
2. Method for Antifungal Disk Diffusion Susceptibility Testing of Yeasts; Approved Guidelines Vol.24 No. 15, May 2004 NCCLS document M44-A. For more details refer to this volume.
3. Performance Standards for Antimicrobial Disk susceptibility Tests, CLSI M100 30 Edition, Jan. 2020. For more details refer to this volume.

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Susceptibility Discs

CE IVD

Quality Control Limits for Antibiotics not as per CLSI

(Based on results obtained using Mueller Hinton Agar)

Antibiotics concentration of these products are as per customer requirements. These codes do not have concentration of antibiotics as per CLSI (Formerly NCCLS) standards.

Cat. No.	Antimicrobial Agent	Symbol	Disc Content	Diameter of zone of inhibition in mm		
				Quality Control Limits*		
				E. coli ATCC 25922	*S. aureus* ATCC 25923	*P. aeruginosa* ATCC 27853
C39SD1003	Amikacin	AK	10 mcg	16-23	18-24	15-23
C39SD1014	Ampicillin	AMP	2 mcg	14-21	27-35	-
C39SD1015	Ampicillin	AMP	25 mcg	20-30	32-40	-
C39SD1016	Ampicillin/Cloxacillin	AX	10 mcg	16-22	35-37	-
C39SD1004	Amoxycillin	AMX	10 mcg	19-25	28-36	-
C39SD1005	Amoxycillin	AMX	25 mcg	19-25	28-36	-
C39SD1006	Amoxycillin	AMX	30 mcg	19-25	28-36	-
C39SD1001	(Amoxycillin/Clavulanate) Amoxyclav	AMC	50/10 mcg	24-30	30-38	-
C39SD1009	Amoxyclav	AMC	10 mcg	19-25	28-36	-
C39SD1008	Amoxycillin/Sulbactam	AMS	30/15 mcg	28-38	32-43	-
C39SD1019	Azithromycin	AZM	30 mcg	-	24-30	-
C39SD1021	Aztreonam	AT	50 mcg	29-37	-	24-33
C39SD1022	Bacitracin	B	10 units	-	12-22	-
C39SD1023	Bacitracin	B	8 units	-	12-22	-
C39SD1024	Bacitracin	B	0.04 units	*S.pyogen* (19615) = ≥15 *S.aureus* (25923) = 00 *M.luteus* (9341) =≥ 10		
C39SD1037	Cefadroxil (Cephadroxil)	CFR	30 mcg	12-18	26-32	-
C39SD1028	Cefalexin (Cephalexin)	CN	30 mcg	17-22	29-37	-
C39SD1032	Cefepime	CPM	50 mcg	32-40	26-34	27-35
C39SD1033	Cefepime/Tazobactam	CPT	80/10 mcg	31-39	30-35	27-34
C39SD1034	Cefepime/Tazobactam	CPT	30/10 mcg	33-39	24-30	26-32
C39SD1036	Cefixime/ Clavulanic acid	CMC	5/10 mcg	24-32	-	-
C39SD1038	Cefoperazone/Sulbactam	CFS	75/30 mcg	27-33	23-30	22-28
C39SD1039	Cefoperazone/Sulbactam	CFS	75/10 mcg	27-33	23-30	20-25
C39SD1040	Cefoperazone/Sulbactam	CFS	50/50 mcg	28-36	24-33	22-29
C39SD1041	Cefoperazone/Tazobactam	CST	75/10 mcg	27-32	23-30	22-28
C39SD1044	Cefotaxime(Cephotaxime)	CTX	10 mcg	29-35	25-31	18-22
C39SD1042	Cefotaxime / Clavulanic acid	CEC	30/10 mcg	30-37	29-36	*K.pneumoniae* (700603) = ≥23
C39SD1046	Cefpirome	CFP	30 mcg	28-34	29-37	23-29
C39SD1048	Cefpodoxime/Clavulanic acid	CCL	10/5 mcg	17-23	13-19	-
C39SD1051	Ceftazidime/Clavulanic acid	CAC	30/10 mcg	27-34	18-22	*K.pneumoniae* (700603) = ≥23
C39SD1052	Ceftazidime/Tazobactam	CAT	80/10 mcg	25-32	19-28	23-30
C39SD1053	Ceftazidime/Tazobactam	CAT	30/10 mcg	25-32	17-24	22-29
C39SD1056	Ceftriaxone	CTR	10 mcg	29-35	22-28	17-23

Cat. No.	Antimicrobial Agent	Symbol	Disc Content	Diameter of zone of inhibition in mm		
				Quality Control Limits*		
				E. coli ATCC 25922	*S. aureus* ATCC 25923	*P. aeruginosa* ATCC 27853
C39SD1058	Ceftriaxone/Sulbactam	CIS	30/15 mcg	31-37	24-30	16-21
C39SD1057	Ceftriaxone/ Tazobactam	CIT	80/10 mcg	29-35	24-32	17-24
C39SD1059	Ceftriaxone/Tazobactam	CIT	30/10 mcg	29-35	24-32	17-24
C39SD1063	Chloramphenicol	C	10 mcg	17-25	19-26	-
C39SD1064	Chloramphenicol	C	50 mcg	23-29	25-32	-
C39SD1065	Chloramphenicol	C	25 mcg	21-27	23-30	-
C39SD1067	Ciprofloxacin	CIP	1 mcg	26-36	20-28	22-30
C39SD1068	Ciprofloxacin	CIP	10 mcg	30-40	27-35	28-35
C39SD1069	Ciprofloxacin	CIP	30 mcg	30-40	27-35	28-35
C39SD1072	Clindamycin	CD	10 mcg	-	28-34	-
C39SD1074	Cloxacillin	COX	1 mcg	-	18-24	-
C39SD1075	Cloxacillin	COX	5 mcg	-	18-30	-
C39SD1076	Cloxacillin	COX	10 mcg	-	23-34	-
C39SD1077	Cloxacillin	COX	30 mcg	-	30-40	-
C39SD1079	Colistin (Methane Sulponhate)	CL	25 mcg	11-15	-	11-15
C39SD1080	Colistin (Methane Sulponhate)	CL	50 mcg	11-15	-	11-15
C39SD1083	Doxycycline	DOX	10 mcg	12-18	23-29	-
C39SD1086	Erythromycin	E	10 mcg	-	22-30	-
C39SD1087	Erythromycin	E	5 mcg		22-30	-
C39SD1092	Fosfomycin	FO	50 mcg	19-25	25-33	-
C39SD1093	Furazolidone	FR	50 mcg	20-25	18-22	-
C39SD1096	Gatifloxacin	GAT	10 mcg	30-37	27-33	20-28
C39SD1097	Gatifloxacin	GAT	30 mcg	32-40	31-37	24-32
C39SD1101	Gentamicin	GEN	30 mcg	21-28	24-32	19-24
C39SD1102	Gentamicin	GEN	50 mcg	21-28	25-33	20-25
C39SD1104	Imipenem/Cilastatin	IC	10/10 mcg	28-35	-	24-31
C39SD1108	Kanamycin	K	5 mcg	16-22	19-26	-
C39SD1113	Lincomycin	L	2 mcg	-	15-22	-
C39SD1114	Lincomycin	L	10 mcg	-	15-22	-
C39SD1115	Lincomycin	L	15 mcg	-	22-32	-
C39SD1118	Lomefloxacin	LOM	15 mcg	28-36	24-32	22-30
C39SD1119	Lomefloxacin	LOM	30 mcg	27-33	23-29	22-28
C39SD1126	Neomycin	N	30 mcg	17-23	18-26	-

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Susceptibility Discs

CE IVD

Cat. No.	Antimicrobial Agent	Symbol	Disc Content	Diameter of zone of inhibition in mm		
				Quality Control Limits*		
				E. coli ATCC 25922	*S. aureus* ATCC 25923	*P. aeruginosa* ATCC 27853
C39SD1128	Netilmicin	NET	10 mcg	18-24	-	15-21
C39SD1130	Nitrofurantoin	NIT	200 mcg	20-25	18-22	-
C39SD1131	Nitrofurantoin	NIT	100 mcg	17-23	-	-
C39SD1133	Novobiocin	NV	30 mcg	-	22-31	-
C39SD1134	Novobiocin	NV	5 mcg	-	22-31	-
C39SD1138	Ofloxacin	OF	2 mcg	29-33	24-28	17-21
C39SD1140	Oxacillin	OX	5 mcg	-	27-35	-
C39SD1141	Oxytetracycline	O	30 mcg	18-25	19-28	-
C39SD1144	Penicillin	P	2 units	-	26-37	-
C39SD1148	Polymyxin B	PB	100 units	12-16	-	11-17
C39SD1149	Polymyxin B	PB	50 units	12-16	-	11-17
C39SD1151	Prulifloxacin (Ulifloxacin)	PRU	10 mcg	28-34	19-27	24-32
C39SD1153	Rifampin	RIF	2 mcg	8-10	26-34	-
C39SD1154	Rifampin	RIF	15 mcg	8-10	26-34	-
C39SD1155	Rifampin	RIF	30 mcg	9-12	32-40	-
C39SD1156	Roxithromycin	RO	30 mcg	-	22-30	-

Cat. No.	Antimicrobial Agent	Symbol	Disc Content	Diameter of zone of inhibition in mm		
				Quality Control Limits*		
				E. coli ATCC 25922	*S. aureus* ATCC 25923	*P. aeruginosa* ATCC 27853
C39SD1159	Spiramycin	SR	30 mcg	-	22-29	-
C39SD1160	Spiramycin	SR	100 mcg	-	22-29	-
C39SD1161	Sterile Discs	SD	-	-	-	-
C39SD1164	Streptomycin	S	25 mcg	15-23	17-25	-
C39SD1167	Tetracycline	TE	10 mcg	18-25	24-30	-
C39SD1172	Tobramycin	TOB	30 mcg	18-26	19-29	19-25
C39SD1174	Trimethoprim	TR	10 mcg	21-28	19-26	-
C39SD1175	Trimethoprim	TR	25 mcg	21-28	19-26	-
C39SD1176	Trimethoprim	TR	30 mcg	21-28	19-26	-
C39SD1178	Tylosine	TL	15 mcg	-	22-30	-
C39SD1180	Vancomycin	VA	5 mcg	-	15-19	-
C39SD1181	Vancomycin	VA	10 mcg	-	17-21	-

* : Expected diameter of zone of inhibition.

Cat. No.	Antimicrobial Agent	Symbol	Disc Content
C39SD1121	Metronidazole	MTZ	5 mcg
C39SD1122	Metronidazole	MTZ	4 mcg

Cultural Response: Antimicrobial susceptibility testing of Metronidazole discs is carried out by incorporating it into 5 mL Fluid Thioglycollate Medium and incubated at 30°C-35°C for 24 hours. Results are recorded on basis on appearance of *Clostridium perfringens* (ATCC 12924) growth as a test organism.

No. of Discs*	Growth	No. of Discs*	Growth
0	luxuriant	5	poor
1	good	7	none
3	poor to good		

* addition to 5 mL medium

Quality Control Limit for Antifungal Agent not as per CLSI

(Based on result obtained on Mueller Hinton Agar + 2% Glucose + 0.5 mcg/mL Methylene Blue Dye Medium)

Cat. No.	Antimicrobial Agent	Symbol	Disc Content	Quality Control Limits					
				C.albicans ATCC 90028	*C.parapsilosis* ATCC 22019	*C.tropicalis* ATCC 750	*C. krusei* ATCC 6258	*C.albicans* ATCC 10231	*S.cerevisiae* ATCC 9763
C39SD1010	Amphotericin- B	100 units	AP	10-17	11-20	8-12	9-14	10-18	11-18
C39SD1011	Amphotericin- B	20 mcg	AP	10-15	10-17	8-10	8-12	10-16	8-12
C39SD1012	Amphotericin- B	50 mcg	AP	12-15	13-17	13-17	14-20	15-23	16-25
C39SD1073	Clotrimazole	10 mcg	CC	18-32	16-30	10-20	14-24	12-18	17-25
C39SD1090	Fluconazole	10 mcg	FLC	27-38	22-33	16-25	-	18-22	-
C39SD1105	Itraconazole	10 mcg	IT	16-20	11-18	8-13	8-15	18-22	-
C39SD1106	Itraconazole	30 mcg	IT	18-22	20-24	11-18	8-15	18-22	-
C39SD1109	Ketoconazole	10 mcg	KT	20-32	14-29	17-28	10-14	18-22	-
C39SD1110	Ketoconazole	30 mcg	KT	32-36	26-32	26-32	19-26	31-40	-
C39SD1111	Ketoconazole	50 mcg	KT	37-45	36-44	27-34	19-26	31-40	-
C39SD1135	Nystatin	100 Units	NS	19-27	16-25	16-21	15-20	15-23	17-25
C39SD1136	Nystatin	50 mcg	NS	19-23	19-23	13-17	19-26	16-25	22-27

Temperature Limit	Manufacturer	LOT Lot Number	Hygroscopic keep container tightly closed	Date of Manufacture	REF Catalogue Number	Consult Instructions for use	Use-by Date	IVD *In vitro* Diagnostic Medical Device	RO Received on	OO Opened on

todylaboratories®

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