



MTS™ Cefepime Technical Sheet

INTRODUCTION

Liofilchem® MTS™ (MIC Test Strip) is a quantitative method intended for the *in vitro* determination of antimicrobial susceptibility of bacteria. MTS™ consists of specialized paper impregnated with a pre-defined concentration gradient of an antimicrobial agent, which is used to determine the minimum inhibitory concentration (MIC) in µg/mL of antimicrobial agents against bacteria as tested on agar media using overnight incubation and manual reading procedures.

Cefepime is a cephalosporin antibiotic with *in vitro* activity against a wide range of gram-positive and gram-negative bacteria.

The **MTS™ Cefepime** generates a stable gradient of antibiotic giving an accurate MIC over the ranges (in µg/mL) 0.002-32 and 0.016-256. Packages of 10, 30 and 100 tests are available:

- The 10-test box contains 10 strips individually packed in desiccant envelopes and an instruction sheet
- The 30-test box contains 30 strips individually packed in desiccant envelopes and an instruction sheet
- The 100-test box contains 10 desiccant envelopes, each containing 10 strips, and an instruction sheet; this pack contains a storage tube as well.

TEST PROCEDURE

Before using MTS™ Cefepime from an unopened package, visually inspect to ensure the package is intact. Do not use the strips if the package has been damaged.

When removed from the refrigerator or freezer, allow the package or storage container to reach room temperature for about 30 minutes.

Moisture condensing on the outer surface must evaporate completely before opening the package.

Materials required but not provided:

- Agar plate medium, the choice depending on the organism under investigation, e.g. MH II agar (ref. 10031), MH II agar with 5% sheep blood (ref. 10131), Haemophilus Test agar (ref. 10080), Mueller Hinton Chocolate Agar (ref. 10335), Mueller Hinton Fastidious Agar (ref. 10132)
- Sterile saline (ref. 20095), Mueller Hinton broth (ref. 24107)
- Sterile loops, swabs (not too tightly spun), test tubes, pipettes and scissors
- Forceps
- 0.5 McFarland turbidity standard (ref. 80400)
- Incubator (35 ± 2°C)
- Quality control organisms
- Additional technical information from www.liofilchem.com

Inoculum preparation

Suspend well-isolated colonies from an overnight agar plate into saline/broth to achieve a 0.5 McFarland standard turbidity.

A confluent or almost confluent lawn of growth will be obtained after incubation, if the inoculum is correct.

In order to verify that your procedure gives the correct inoculum density in terms of CFU/mL, performing regular colony counts is recommended.

Inoculation

Dip a sterile swab in the broth culture or in a diluted form thereof and squeeze it on the wall of the test tube to eliminate excess liquid.

Alternatively, use a rotation plater to efficiently streak the inoculum over the agar surface. Allow excess moisture to be absorbed so that the surface is completely dry before applying MTS™.

Application

Apply the strip to the agar surface with the scale facing upwards and code of the strip to the outside of the plate, pressing it with a sterile forceps on the surface of the agar and ensure that whole length of the antibiotic gradient is in complete contact with the agar surface. Once applied, do not move the strip.

Incubation

Incubate the agar plates in an inverted position at 35 ± 2°C for 16-24 hours, in ambient air (nonfastidious organisms) or CO₂-enriched atmosphere. Extend the incubation for up to 48 hours in case of slow growing organisms.

EVALUATING THE RESULTS

Reading

Observe where the relevant inhibition ellipse intersects the strip and read the MIC at complete inhibition; Growth along the entire gradient i.e. no inhibition ellipse indicates that the value is greater than or equal to (≥) the highest value on the scale. An inhibition ellipse that intersects below the lower end of the scale is read as less than (<) the lowest value.

Interpretation

The susceptibility interpretative criteria recommended by the CLSI and EUCAST are shown below. Always round up MTS™ half dilution values to the next upper two-fold value before categorization. For example a *E. coli* Cefepime MIC of 0.75 µg/mL is reported as 1 µg/mL (see reading guide section for example pictures).

QUALITY CONTROL

Quality control strains recommended by CLSI and EUCAST are used as outlined under TEST PROCEDURE.

Organism	Breakpoint (µg/mL)						Quality Control MIC Range (µg/mL)	
	CLSI				EUCAST			
	S ≤	SDD	I	R ≥	S ≤	R >		
Enterobacteriaceae	2	4-8	-	16	1	4	<i>S. aureus</i> ATCC® 29213	1-4
<i>P. aeruginosa</i>	8		16	32	8	8	<i>E. coli</i> ATCC® 25922	0.016-0.12
<i>Acinetobacter</i> spp	8		16	32			<i>P. aeruginosa</i> ATCC® 27853	0.5-4
Other non-Enterobacteriaceae	8		16	32			<i>K. pneumoniae</i> ATCC® 700603	0.5-2
<i>H. influenzae</i>	2		-	-	0.25	0.25	<i>E. coli</i> NCTC 13353	64-256
<i>N. gonorrhoeae</i>	0.5		-	-	1	2	<i>A. baumannii</i> NCTC 13304	16-128
<i>S. pneumoniae</i>							<i>H. influenzae</i> ATCC® 49247	0.5-2
<i>S. pneumoniae</i> (meningitis)	0.5		1	2			<i>S. pneumoniae</i> ATCC® 49247	0.03-0.25
<i>S. pneumoniae</i> (nonmeningitis)	1		2	4			<i>N. gonorrhoeae</i> ATCC® 49226	0.016-0.06
<i>Streptococcus</i> spp β-Hemolytic Group	0.5		-	-			<i>H. influenzae</i> ATCC® 49766	0.03-0.125*
<i>Streptococcus</i> spp Viridans Group	1		2	4	0.5	0.5		
<i>M. catarrhalis</i>					4	4		
<i>Aeromonas</i> spp					1	4		
PK/PD (Non-species related) breakpoints					4	8		

Susceptible (S), Susceptible-Dose Dependent (SDD), Intermediate (I), Resistant (R)

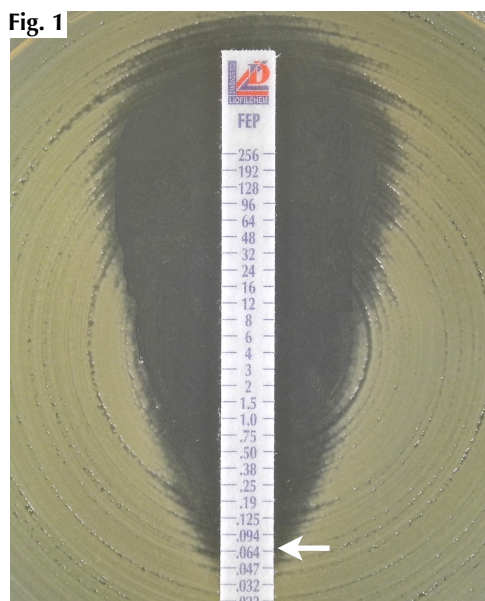
*Established and validated by EUCAST

Disclaimer: The table is intended for general guidance only and may not contain all the necessary information. Also reported interpretive criteria and QC MIC ranges might be out of date. Always current guidelines from CLSI and/or EUCAST should be consulted.

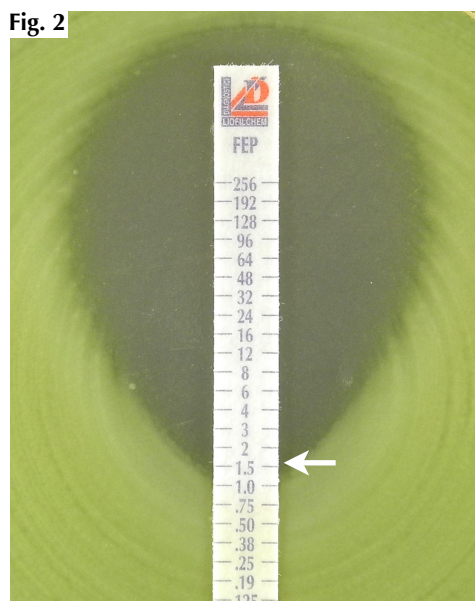
STORAGE

The unopened package of MTS™ Cefepime may be stored at any temperature between -20°C and +8°C until the given expiry date. Leftover MTS™ from an opened package must be stored at 2-8°C in the airtight tube, containing desiccant, provided in the pack for no more than 7 days. Do not store near sources of heat and do not expose to excessive temperature variations.

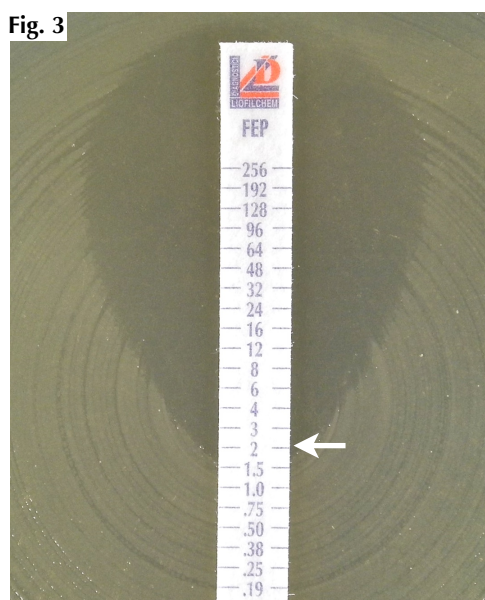
MTS™ Cefepime Reading Guide



MIC 0.064 µg/mL



MIC 1.5 µg/mL, reported as 2 µg/mL



MIC 2 µg/mL



MIC 0.19 µg/mL, reported as 0.25 µg/mL

REFERENCES

- CLSI M100S (2018) Performance Standards for Antimicrobial Susceptibility Testing – 28th Edition.
- EUCAST (2018) Breakpoint tables for interpretation of MICs and zone diameters, version 8.1 <http://www.eucast.org>.
- Routine and extended internal quality control for MIC determination and disk diffusion as recommended by EUCAST, version 8.0, 2018 <http://www.eucast.org>.
- CLSI M07-A11 (2018) Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically. 11th Edition.

PRESENTATION		µg/mL	Code	Packaging	Ref.
MTS™	Cefepime	0.002-32	FEP	10	921271
				30	92127
				100	921270
MTS™	Cefepime	0.016-256	FEP	10	921261
				30	92126
				100	921260

MTS™ (MIC Test Strip), International Patent

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