

**510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY ONLY TEMPLATE**

A. 510(k) Number:

k111205

B. Purpose for Submission:

To obtain substantial equivalence determination for the addition of moxifloxacin at concentrations of 0.03-8 µg/mL to the Microscan® MICroSTREP plus Panel.

C. Measurand:

Moxifloxacin 0.03-8 µg/mL

D. Type of Test:

Quantitative growth-based detection algorithm using optics light detection

E. Applicant:

Siemens Healthcare Diagnostics, Inc.

F. Proprietary and Established Names:

MicroScan® MICroSTREP plus Panels

G. Regulatory Information:

1. Regulation section:

866.1640 - Antimicrobial Susceptibility Test Powder

2. Classification:

Class II

3. Product code:

LRG- Instrument for Auto Reader & Interpretation of Overnight Antimicrobial Susceptibility Systems

JWY - Manual Antimicrobial Susceptibility Test Systems

LTW – Susceptibility Test Cards, Antimicrobial

4. Panel:

83 Microbiology

H. Intended Use:

1. Intended use:

MicroScan® Panels are designed for use in determining quantitative and/or qualitative antimicrobial agent susceptibility of colonies grown on solid media of aerobic streptococci including *S. pneumoniae*.

2. Indications for use:

The MicroScan® MICroSTREP plus Panels are used to determine quantitative and/or qualitative antimicrobial agent susceptibility of colonies grown on solid media of aerobic streptococci including *S. pneumoniae*. After inoculation, panels are incubated for 20- 24 hours at 35°C +/- 1°C in a non-CO₂ incubator, and read visually. Alternatively, the panels can be incubated in and read by the MicroScan® WalkAway System, according to the Package insert.

This particular submission is for the addition of antimicrobial Moxifloxacin at concentrations 0.03 to 8µg/mL to the test panel.

The organisms which may be used for susceptibility testing in this panel are:

Streptococcus pneumoniae (including penicillin resistant strains)

Streptococcus pyogenes

Streptococcus agalactiae

Streptococcus constellatus

Streptococcus anginosus

Viridans group *streptococci*

3. Special conditions for use statement(s):

- For prescription use only
- Turbidity inoculation method only

4. Special instrument requirements:

MicroScan® WalkAway® System is the alternate read method for Moxifloxacin

I. Device Description:

The antimicrobial susceptibility tests are miniaturizations of the broth dilution susceptibility test that have been diluted in water and dehydrated. The antimicrobial agent is diluted in water, buffer or minute concentrations of broth to concentrations bridging the range of clinical interest. Panels are rehydrated with 115µl Mueller-Hinton broth supplemented with 3% lysed horse blood (LHB), after inoculation of the broth with a standardized suspension of the organism. After incubation in a non-CO2 incubator for 20-24 hours, the minimum inhibitory concentration (MIC) for the test organism is manually read by observing the lowest antimicrobial concentration showing inhibition of growth. Alternatively, the panel can be incubated in and read by the MicroScan® WalkAway System.

J. Substantial Equivalence Information:

1. Predicate device name(s):
MicroScan MICroStrep Panels- Levofloxacin
2. Predicate 510(k) number(s):
k020556
3. Comparison with predicate:

Similarities		
Item	Device	Predicate
Intended use	MicroScan® panels are designed for use in determining quantitative and/or qualitative antimicrobial agent susceptibility of colonies, grown on solid media of aerobic streptococci including <i>S. pneumoniae</i> .	Same
Inoculum preparation	Inoculum prepared from isolated colonies using the Turbidity method	Same
Technology	Growth based after 20-24 hours	Same
Results	Report results as minimum inhibitory concentration (MIC) and categorical interpretation (SIR)	Same
Differences		
Item	Device	Predicate
Antibiotic	Moxifloxacin at 0.03 - 8µg/mL µg/mL	Levofloxacin at 0.12- 16 µg/mL
Instrument	WalkAway® or Manual visual read	Manual visual read

K. Standard/Guidance Document Referenced (if applicable):

Class II Special Controls Guidance Document: Antimicrobial Susceptibility Test

(AST) Systems; Guidance for Industry and FDA”; Clinical and Laboratory Standards Institute (CLSI) M07-A8 “Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically; Approved Standard”; M100-S19 “Performance Standards for Antimicrobial Susceptibility Testing”

L. Test Principle:

The antimicrobial susceptibility tests are miniaturizations of the broth dilution susceptibility test that have been diluted in water and dehydrated. The antimicrobial agent is diluted in water, buffer or minute concentrations of broth to concentrations bridging the range of clinical interest. Panels are rehydrated with 115 µl Mueller-Hinton broth supplemented with 3% lysed horse blood (LHB), after inoculation of the broth with a standardized suspension of the organism. After incubation in a non-CO2 incubator for 20-24 hours, the minimum inhibitory concentration (MIC) for the test organism is manually read by observing the lowest antimicrobial concentration showing inhibition of growth. Alternatively, the panel can be incubated in and read by the MicroScan® WalkAway System.

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. *Precision/Reproducibility:*

Reproducibility was demonstrated using 10 isolates tested at three sites on three separate days in triplicate. The study included the turbidity inoculum method with reading performed manually, by WalkAway instrument. Both within site and site to site results were >95% reproducible.

Difference in the number of dilutions between the mode of the MicroScan® result and the actual result for between site reproducibility							
Inoculation Method	Read Method	≥Minus 2 dilutions	Minus 1 dilution	Exact	Plus 1 Dilution	≥Plus 2 dilutions	% Reproducible
Turbidity	Manual		13	235	21		99.6%
Turbidity	WalkAway	3	22	232	12		98.9%

There were more results in the minus category (one dilution lower) by the WalkAway; however, there were more results in the plus category by the manual method.

b. *Linearity/assay reportable range:*

Not Applicable

c. *Traceability, Stability, Expected values (controls, calibrators, or methods):*

The recommended QC isolate, *S. pneumoniae* ATCC 49619 was tested a sufficient number of times with acceptable results most of the time with the reference method. Quality control results demonstrated the ability of the different reading parameters (manual, and WalkAway) by Turbidity inoculation methods to produce acceptable results.

The following table provides the frequency of the results in each concentration with the expected range stated.

Moxifloxacin				
Organism	µg/mL			
<i>S. pneumoniae</i> ATCC 49619 Expected range 0.06- 0.25* µg/mL		Reference	Manual	WalkAway
	<=0.03			
	0.06			
	0.12	101	87	104
	0.25	10	24	5

*This quality control range is applicable only to broth microdilution susceptibility tests using cation-adjusted Mueller-Hinton broth with 2 - 5% lysed horse blood.

Inoculum density control: A turbidity meter was used for the turbidity inoculation method. Inoculum density was controlled by monitoring the daily results of the MicroScan® Turbidity Meter to ensure the correct final concentration of the organisms for both the reference and test device.

d. *Detection limit:*

Not Applicable

e. *Analytical specificity:*

Not Applicable

f. *Assay cut-off:*

Not Applicable

2. Comparison studies:

a. *Method comparison with predicate device:*

Clinical efficacy testing was conducted at three external sites using fresh isolates supplemented with stock isolates. The study included a total of 443 *Streptococci* isolates, with a no growth rate of 1.1% (5/448). There were 319 (72%) fresh and 124 (28%) stock isolates. There were 50 challenge isolates

tested at one site and compared to the reference broth dilution result mode that was determined by previous testing of each isolate multiple times in the recommended reference panel. All isolates grew in the MICroStrep panels.

Efficacy testing was performed using the turbidity inoculation method and read manually after incubation for 20- 24 hours at 35°C +/- 1°C in a non-CO₂ incubator. A comparison to the reference method was provided with the following agreement.

Overall Performance Summary- Overnight Manual (Efficacy + Challenge)

	Total	EA	%EA	Total evaluatable	EA of evaluatable	%EA	CA	%CA	#R	min	maj	vmj
Efficacy	443	431	97.3	434	426	98.2	442	99.8	4	1	0	0
Challenge	50	50	100	50	50	100	50	100	0	0	0	0
Combined	493	481	97.6	484	476	98.3	492	99.8	4	1	0	0

EA - Essential Agreement
CA - Category Agreement
R- Resistant

maj – Major Discrepancies
vmj -- Very Major Discrepancies
min – Minor Discrepancies

EA is when there is agreement between the reference method and the new method is within plus or minus one serial two-fold dilution of antibiotic. Category agreement (CA) is when the new method result interpretation agrees exactly with the reference panel result interpretation. Evaluatable EA is when the MIC result is on scale for both the new method and the reference method and have on-scale EA.

The performance of the alternate MicroScan® WalkAway System (incubation and read methods) was demonstrated in challenge, quality control, and reproducibility studies with acceptable results.

b. Matrix comparison:

Not Applicable

3. Clinical studies:

a. Clinical Sensitivity:

Not Applicable

b. Clinical specificity:

Not Applicable

c. Other clinical supportive data (when a. and b. are not applicable):

Not Applicable

4. Clinical cut-off:

Not Applicable

5. Expected values/Reference range:

Streptococcus spp, including *S. pneumoniae*
 ≤ 1 (S), 2 (I), ≥ 4 (R)

CLSI interpretive breakpoints have not been established for *Streptococcus* spp other than *S. pneumoniae* when Moxifloxacin was submitted for review.

N. Proposed Labeling:

The labeling is sufficient and satisfies the requirements of 21 CFR Part 809.10.

O. Conclusion:

The submitted information in this premarket notification is complete and supports a substantial equivalence decision.