TR 112 - McFARLAND STANDARD KIT

INTENDED USE

McFarland Standard kit is used to standardize the approximate number of bacteria in a liquid suspension by comparing the turbidity of the test suspension with that of the McFarland Standard.

PRODUCT SUMMARY AND EXPLANATION

A McFarland Standard is a chemical solution of barium chloride and sulfuric acid; the reaction between these two chemicals results in the production of a fine precipitate, barium sulfate. When shaken well, the turbidity of a McFarland Standard is visually comparable to a bacterial suspension of known concentration as indicated below.

McFarland Standard	1% BaCl2 (mL	1% H2SO4 (mL)	Approximate Bacterial Suspension / mL
0.5	0.05	9.95	1.5×10^8
1.0	0.10	9.90	3.0×10^8
2.0	0.20	9.80	6.0×10^8
3.0	0.3	9.7	9.0×10^8
4.0	0.4	9.6	1.2×10^8

PRINCIPLE

McFarland Standard should be shaken up well prior to use and aliquot into test tubes identical to those used to prepare the inoculum suspension. Once aliquoted the tubes should be tightly sealed to prevent evaporation. Shake well to ensure that the barium sulfate is distributed evenly throughout the solution each time before use. The standard most commonly used in the clinical microbiology laboratory is the 0.5 McFarland Standard, which is prescribed for antimicrobial susceptibility testing and culture media performance testing.

INSTRUCTION FOR USE

1. Prior to examination, mix McFarland Standard on a vortex mixture. Ensure that the McFarland Standard is aliquoted into a tube that is the same size and diameter as the tube used to prepare the test suspension.
2. Prepare a test suspension by obtaining a fresh, pure culture of the test organism and inoculating a suitable broth.
3. In the presence of light, visually compare the turbidity of test suspension with McFarland standard by comparing the clarity of the lines on the a Wickerham card.
4. If the test suspension is too light, inoculate with additional organisms or incubate tube until turbidity matches to the standard. If dilution is necessary, use a sterile pipette and add sufficient broth or saline to obtain a turbidity that matches the standard.

QUALITY CONTROL SPECIFICATIONS

The accuracy of the density of McFarland Standards can be checked using a spectrophotometer with a 1-cm light path; a 0.5 McFarland Standard has an absorbance reading of 0.08 to 0.1 at 625-nm.
Alternatively, adjusting a bacterial suspension to the same turbidity and preparing serial 10-fold dilutions can verify the accuracy of a McFarland Standard by performing a plate count of the dilution and ensuring that the suspension gives a representative colony count. Example for 0.5 McFarland Standard:

Dilution	Expected Number of Colonies from 0.1 ml
10^{-1}	TNTC

10^{-2}	TNTC
10^{-3}	TNTC
10^{-4}	TNTC
10^{-5}	TNTC
10^{-6}	150
10^{-7}	15

PRECAUTIONS:

- The level of McFarland standards should be checked occasionally to ensure that evaporation not occurred. Discard if any volume is lost.
- McFarland Standards are sensitive to air and light therefore ensure that the tubes are closed tightly at all times and kept in the dark.
- The McFarland Standards should be vigorously agitated on a mechanical vortex before each use and inspected for a uniform turbid appearance. If large particles appear or if clumping is apparent discard the standard.
- Actual numbers of viable bacteria present in an adjusted suspension depends on the size, viability, and clumping of the particular bacterium used.

STORAGE

Our McFarland Standard kit should be stored in an upright position at 2°C to 8°C and protected from light. Under the specified conditions it has a shelf life of 6 months from the date of manufacture.

REFERENCES

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4. Wickerham LJ. Taxonomy of yeasts. Technical bulletin no. 1029. Washington, DC: US Department of Agriculture, 1951.
5. Baker CN, Thornsberry C, Hawkinson RW. Inoculum standardization in antimicrobial susceptibility tests: evaluation of the overnight agar cultures and the rapid inoculum standardization system. J Clin Micro 1983; 17:450-7.
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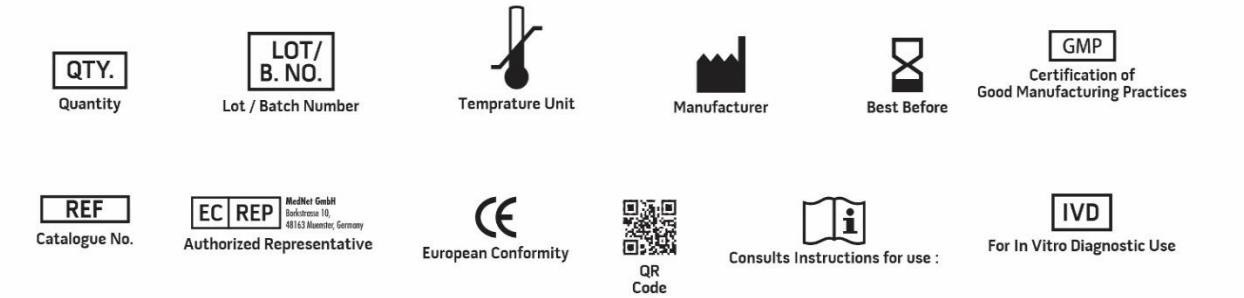
7. Murray PR, Baron EJ, Pfaller MA, Tenover FC, Yolken RH, Eds. Manual of clinical microbiology. 7th ed. Washington, DC: ASM, 1999.



NOTE: Please consult the Material Safety Data Sheet for information regarding hazards and safe handling Practices.

***For Lab Use Only**

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