McFarland Latex Standards

REF PL.2300 REF PL.2301 REF PL.2302 REF PL.2303 REF PL.2304 REF PL.2350

REF PL.2320 REF PL.2325

INSTRUCTIONS FOR USE

INTENDED USE
The McFarland Latex Standards are for use as part of a quality control program for adjusting densities of bacterial suspensions that are used for identification and susceptibility testing.

SUMMARY AND EXPLANATION
The McFarland Latex Standard tubes contain polystyrene particles suspended in an aqueous solution that is adjusted to an acceptable transmittance range using a spectrophotometer at a wavelength of 600 nm. A bacterial suspension, once adjusted to the same turbidity of a McFarland Latex Standard, produces expected bacterial plate counts and can be used in a variety of identification or susceptibility kits and methods.[2]

The McFarland Latex Standards are used for adjusting densities of bacterial suspensions. Each standard is made from different concentrations of polystyrene particles mixed in an aqueous solution. The original McFarland Standards were made from the combination of barium chloride and sulfuric acid that result in a precipitate.[4] Problems were encountered with this technique which included instability, storage, and reproducibility of the resulting suspension. These problems have been overcome by using polystyrene particles in an aqueous solution, resulting in the McFarland Latex Standards used today.[1, 3]

MATERIALS PROVIDED
Each McFarland Latex Standard is packaged with a Wickerham Card. Tube size is 16x100 mm and contains 10 ml of standard. McFarland Latex Standards are supplied ready to use.

Cat. No.	Description
PL.2300	McFarland Latex Standard 0.5
PL.2301	McFarland Latex Standard 1.0
PL.2302	McFarland Latex Standard 2.0
PL.2303	McFarland Latex Standard 3.0
PL.2304	McFarland Latex Standard 4.0
PL.2320	McFarland Latex Standard Blank (0.0)
PL.2325	Wickerham Card (Pkg. of 10)
PL.2350	McFarland Latex Standard Set*

*Contains one of each 0.5, 1.0, 2.0, 3.0 and 4.0 standards and a Wickerham Card.

STABILITY AND STORAGE
Store at 15-30°C. Do not freeze or overheat. Components stored under these conditions will be stable until the expiration date shown on the label.

WARNINGS AND PRECAUTIONS
- Do not use product beyond the expiration date.
- For Laboratory Use only. Carefully read directions prior to use.
- Tubes with the similar diameter should be used in comparing bacterial suspensions to the McFarland Latex Standards.
- Do not use tubes if volume or colour has changed or show microbial contamination or any other signs of deterioration.

- Do not vortex.

TEST PROCEDURE

1. Prior to use, gently invert the McFarland Latex Standard tube several times to assure uniformity of the suspension.
2. Adjust the turbidity of the bacterial suspension to that of a known McFarland Latex Standard.
3. Using adequate light, compare the turbidity of the bacterial suspension to the McFarland Latex Standards against the black bars printed on the Wickerham Card.

INTERPRETATION OF RESULTS

- Bacterial suspension is standardized when distortion of black bars on Wickerham Card is equivalent to that of the McFarland Latex Standard.

QUALITY CONTROL

Each lot of McFarland Latex Standard is tested spectrophotometrically, and passed the quality control range of acceptability.

McFarland Latex Standard	Acceptable Range for Run % T	
	Lowest	Highest
0.5	78.5	84
1.0	54	61
2.0	35	42
3.0	22	28
4.0	14	20

EXPECTED VALUES

McFarland Latex Standard	Approximate Cell Density x 10^8/ml	Absorbance Range at 600 nm	
		Lowest	Highest
0.5	1.5	0.0757	0.105
1.0	3.0	0.215	0.267
2.0	6.0	0.377	0.456
3.0	9.0	0.553	0.658
4.0	12.0	0.669	0.854

LIMITATIONS OF THE PROCEDURE

- Coloured broth media may not provide the proper contrast with McFarland Latex Standards. Incorrect results may occur.
- Bacterial suspensions of older cultures may not compare to expected bacterial counts.
- These standards have been adjusted by a spectrophotometer. Use of any other instrumentation may not give reliable results.

REFERENCES

1. Zapata, A. & Ramirez-Arcos, S. A Comparative study of McFarland turbidity standards and the Densimat photometer to determine bacterial cell density. *Curr. Microbiol.* 2015; Jun:70(6):907-9.
2. Tille P. M. *Bailey & Scott's Diagnostic Microbiology*, *Fifteenth Edition*. St. Louis, Missouri: Elsevier, 2021.
3. CLSI. *Performance Standards for Antimicrobial Disk Susceptibility Tests; Approved Standard -Eleventh Edition.* CLSI document M02-A11. Wayne, PA: Clinical and Laboratory Standards Institute; 2012.
4. McFarland, J. The Nephelometer: An Instrument for estimating the number of bacteria in suspensions used for calculating the opsonic index and for vaccines. *Journ. Amer. Med. Assoc*. (JAMA) 1907; 14:1176-1178.

SYMBOLS GLOSSARY

	Manufacturer
	Use-by date
	Lot number
	Catalogue number
	Temperature limit
	Consult instructions for use or consult electronic instructions for use

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