

European Committee on Antimicrobial Susceptibility Testing

Quality control criteria for the implementation of the RAST method

To be performed when implementing the method, when training new staff or following a change in blood culture system or any other substantial change in the system

Version 7.0, valid from 2024-07-05

This document should be cited as

"The European Committee on Antimicrobial Susceptibility Testing. Quality control criteria for the implementation of the RAST method.
Version 7.0, 2024. <http://www.eucast.org>."

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Changes from previous version

Version 7.0, 2024-07-05	Changes Cells containing a change or an addition from EUCAST RAST QC Tables v. 6.1 are marked yellow.
ATCC 25922	New QC ranges <ul style="list-style-type: none">• Pefloxacin for 4, 6, 8 and 16-20 h• Azithromycin for 4, 6, 8 and 16-20 h

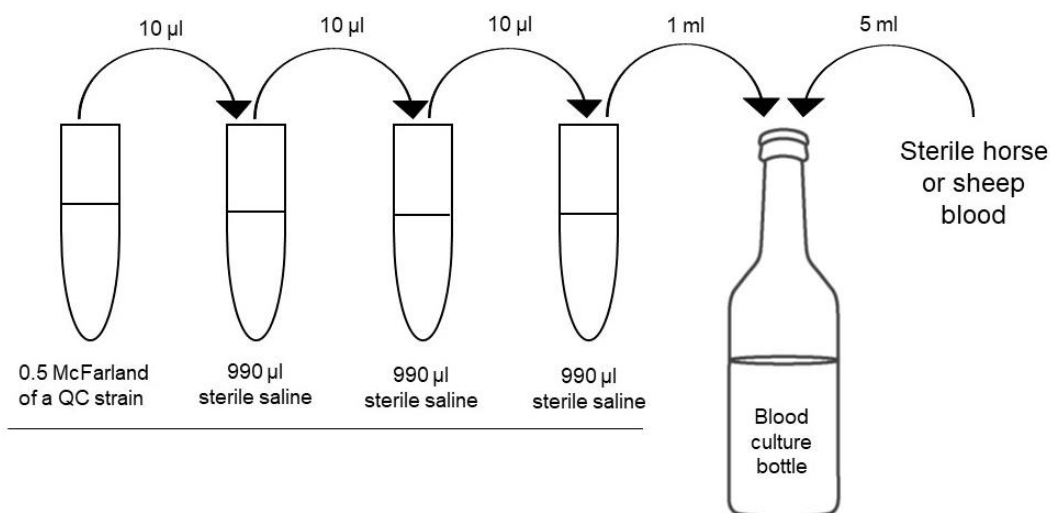
Notes

1. EUCAST recommends that regular QC with standard methodology is performed daily, or at least four times a week. This is to control the quality of AST materials and the standardised disk diffusion AST procedure.

2. The five QC strains in this document are used to check the RAST procedure, i.e. the inoculation of disk diffusion plates directly from blood culture bottles and the 4, 6, 8 and 16-20 hour incubation. This QC is relevant when implementing the method in the laboratory, when training new staff or following a change in blood culture system or any other substantial change in the system.

3. The QC strains are tested by inoculating blood culture bottles with 1 mL of a 100-200 CFU/mL suspension* of the QC strain and with addition of approximately 5 mL sterile defibrinated horse or sheep blood. The inoculated bottles are incubated in the blood culture instrument and processed according to the RAST methodology following a positive signal.

*100-200 CFU/mL = Suspension adjusted to 0.5 McFarland is diluted 1:1 000 000, see example in the graph below.



- Make a 0.5 McFarland dilution of a QC strain.
- Dilute according to dilution series above and add horse or sheep blood to the blood culture bottle.
- Incubate bottle in the blood culture instrument.
- Process the bottles according to the described RAST methodology when the instrument signals positive.
- Use the RAST QC criteria available in the RAST QC document to assess the results.

Escherichia coli ATCC 25922

(NCTC 12241, CIP 76.24, DSM 1103, CCUG 17620,

See EUCAST RAST methods on EUCAST website for description of methodology.

General reading instructions: Thin growth within an inhibition zone with a clear zone edge should be ignored. This occasionally occurs at early reading for *E. coli* ATCC 25922 and most often for β -lactam antibiotics.

Antimicrobial agent	Disk content (μ g)	Inhibition zone diameter (mm)							
		4 hours		6 hours		8 hours		16-20 hours	
		Target	Range	Target	Range	Target	Range	Target	Range
Ampicillin	10	13	10-16	14	11-17	14	11-17	15	12-18
Amoxicillin-clavulanic acid	20-10	15	12-18	17	14-20	17	14-20	18	15-21
Piperacillin-tazobactam	30-6	15	12-18	18	15-21	18	15-21	18	15-21
Temocillin	30	14	11-17	16	13-19	16	13-19	18	15-21
Cefotaxime	5	17	14-20	20	17-23	21	18-24	20	17-23
Ceftazidime	10	16	13-19	18	15-21	19	16-22	21	18-24
Ceftazidime-avibactam	10-4	16	13-19	18	15-21	19	16-22	21	18-24
Ceftolozane-tazobactam	30-10	16	13-19	17	14-20	18	15-21	20	17-23
Imipenem	10	16	13-19	20	17-23	21	18-24	23	20-26
Imipenem-relebactam	10-25	16	13-19	20	17-23	21	18-24	23	20-26
Meropenem	10	17	14-20	21	18-24	23	20-26	23	20-26
Meropenem-vaborbactam	20-10	18	15-21	22	19-25	23	20-26	25	22-28
Ciprofloxacin	5	22	19-25	25	22-28	26	23-29	25	22-28
Pefloxacin	5	20	17-23	22	19-25	22	19-25	24	21-27
Levofloxacin	5	21	18-24	23	20-26	23	20-26	23	20-26
Amikacin	30	16	13-19	17	14-20	18	15-21	17-18 ¹	14-21 ¹
Gentamicin	10	16	13-19	17	14-20	18	15-21	17-18 ¹	14-21 ¹
Tobramycin	10	15	12-18	17	14-20	17	14-20	17 ¹	14-20 ¹
Azithromycin	15	13	10-16	13	10-16	13	10-16	16-17 ²	13-20 ²
Trimethoprim-sulfamethoxazole	1.25-23.75	18	15-21	21	18-24	22	19-25	21	18-24

¹ Due to agar differences aminoglycoside readings may be in the lower or upper part of the interval.

² Due to agar differences readings may be in the lower or upper part of the interval. Take growth appearing as a thin inner zone on some batches of Mueller-Hinton agar into account.

Pseudomonas aeruginosa ATCC 27853

(NCTC 12903, CIP 76.110, DSM 1117, CCUG 17619, CECT 108)

See EUCAST RAST methods on EUCAST website for description of methodology.

Antimicrobial agent	Disk content (µg)	Inhibition zone diameter (mm)					
		6 hours		8 hours		16-20 hours	
		Target	Range	Target	Range	Target	Range
Piperacillin-tazobactam	30-6	17	14-20	20	17-23	22 ¹	19-25 ¹
Cefepime	30	19	16-22	21	18-24	24	21-27
Ceftazidime	10	16	13-19	18	15-21	21	18-24
Ceftazidime-avibactam	10-4	16	13-19	18	15-21	21	18-24
Ceftolozane-tazobactam	30-10	18	15-21	20	17-23	24	21-27
Imipenem	10	19	16-22	21	18-24	21 ¹	18-24 ¹
Imipenem-relebactam	10-25	19	16-22	23	20-26	26 ¹	23-29 ¹
Meropenem	10	20	17-23	23	20-26	26 ¹	23-29 ¹
Meropenem-vaborbactam	20-10	21	18-24	23	20-26	28 ¹	25-31 ¹
Ciprofloxacin	5	20	17-23	23	20-26	25	22-28
Levofloxacin	5	17	14-20	19	16-22	20	17-23
Amikacin	30	19	16-22	21	18-24	21	18-24
Tobramycin	10	19	16-22	20	17-23	21	18-24

¹ Ignore isolated colonies within the inhibition zone.

***Staphylococcus aureus* ATCC 29213**

(NCTC 12973, CIP 103429, DSM 2569, CCUG 15915, CECT 794)

β -lactamase-producing strain (weak)

See EUCAST RAST methods on EUCAST website for description of methodology.

Antimicrobial agent	Disk content (μ g)	Inhibition zone diameter (mm)							
		4 hours		6 hours		8 hours		16-20 hours	
		Target	Range	Target	Range	Target	Range	Target	Range
Cefoxitin	30	17	14-20	20	17-23	22	19-25	25	22-28
Norfloxacin	10	15	12-18	17	14-20	18	15-21	17	14-20
Amikacin	30	16	13-19	18	15-21	19	16-22	18	15-21
Gentamicin	10	16	13-19	18	15-21	18	15-21	19	16-22
Tobramycin	10	17	14-20	19	16-22	20	17-23	19	16-22
Clindamycin	2	18	15-21	20	17-23	21	18-24	21	18-24

***Enterococcus faecalis* ATCC 29212**
(NCTC 12697, CIP 103214, DSM 2570, CCUG 9997, CECT 795)

See EUCAST RAST methods on EUCAST website for description of methodology.

Antimicrobial agent	Disk content (µg)	Inhibition zone diameter (mm)							
		4 hours		6 hours		8 hours		16-20 hours	
		Target	Range	Target	Range	Target	Range	Target	Range
Ampicillin	2	14	11-17	15	12-18	15	12-18	16	13-19
Imipenem	10	20	17-23	21	18-24	22	19-25	23	20-26
Vancomycin	5	11	8-14	12	9-15	12	9-15	12	9-15
Linezolid	10	17	14-20	18	15-21	18	15-21	18	15-21
Gentamicin	30	16	13-19	17	14-20	18	15-21	19	16-22

***Streptococcus pneumoniae* ATCC 49619**

(NCTC 12977, CIP 104340, DSM 11967, CCUG 33638)

Strain with reduced susceptibility to benzylpenicillin

See EUCAST RAST methods on EUCAST website for description of methodology.

Antimicrobial agent	Disk content (µg)	Inhibition zone diameter (mm)							
		4 hours		6 hours		8 hours		16-20 hours	
		Target	Range	Target	Range	Target	Range	Target	Range
Oxacillin	1	10	7-13	11	8-14	11	8-14	10	7-13
Norfloxacin	10	14	11-17	15	12-18	16	13-19	18	15-21
Erythromycin	15	19	16-22	21	18-24	22	19-25	27	24-30
Clindamycin	2	18	15-21	19	16-22	19	16-22	21	18-24
Trimethoprim-sulfamethoxazole	1.25-23.75	16	13-19	17	14-20	17	14-20	20	17-23