



QUICOLOR® ES AGAR DEHYDRATED

RAPID ANTIBACTERIAL SUSCEPTIBILITY TESTING MEDIUM
FOR ENTEROBACTERIACEAE AND STAPHYLOCOCCI



Catalogue #: MD240

Instructions for Use

For In Vitro Use Only

Product's name:

QUICOLOR® ES AGAR DEHYDRATED

Product's intended use:

QUICOLOR® ES is a rapid antibacterial susceptibility-testing medium for *Enterobacteriaceae* and *Staphylococci*. It is intended for **in vitro use only**.

General information:

Methods of disk diffusion and dilution in liquid or solid media are widely used to determine the susceptibility of bacteria to antibacterials. These methods are time consuming and require overnight incubation.¹

Early determination of antibacterial susceptibility of bacteria, isolated from patients with meningitis, bacteremia and sepsis, is very important for the selection of convenient therapy as soon as possible. Even when there is no such urgent need, determination of antibacterial susceptibility on the same day the culture results are obtained, has many advantages such as choosing the appropriate treatment regimen early, lowering the number of side effects, decreasing the duration of stays in hospital and the amount of expensive antibacterials used and thus total health care costs.²⁻⁵ The color of **QUICOLOR® ES** which is red, is changed to yellow by the metabolic activity of bacteria growing on the agar surface. Inhibition zones appear in 4 to 6 hours, long before the bacterial layer forms.

Limitations of the method:

Some slow growing species of *Staphylococci* (like *S. epidermidis*) may infrequently require more than 6 hours for the completion of the test.

Principles of the procedure:

In classical Kirby Bauer disk diffusion antibacterial susceptibility testing, the inhibition zones are visualized when a bacterial layer on the surface of agar forms usually at 18 to 24 hours.⁵ **QUICOLOR® ES** changes its color due to metabolic products of bacteria growing on the surface, which occurs within 4 to 6 hours, long before the bacterial layer forms. The inhibition zones around the disks containing antibacterials stay at the original color of the media. Thus inhibition zones appear as red zones in yellow areas where bacteria grow.

Ingredients:

Peptones; carbohydrates; salts; vitamins, color dye indicators.

Cautions and warnings:

Always use freshly cultured bacteria to obtain susceptibility results within 4 to 6 hours.

Be sure that the tested strain is obtained as pure culture.

General safety precautions:

FOR IN VITRO USE ONLY.

Always wear gloves when working with potential biohazard material.

Never use mouth pipetting.

If spills of the contaminated material occur, disinfect with 2.5% hypo-chlorite solution.

All contaminated material should be discarded according to biosafety rules.

At a minimum, universal precautions should be employed.

Storage instructions:

Dehydrated powder: Store at room temperature, in a dry place, in tightly sealed containers.

QUICOLOR® Enrichment Supplement: Store at 2-8°C protected from direct light.

Prepared media: Store at 2-8°C protected from direct light.

Store at 2-8°C, protected from direct light.

Indications of instability or deterioration:

Do not use dehydrated media if it is petrified. Prepared media should not be used if there are signs of contamination or deterioration (discoloration, drying, shrinking, cracking).

List of materials provided:

QUICOLOR® ES AGAR DEHYDRATED in plastic bottle with screw cap.

QUICOLOR® Enrichment Supplement in glass ampoules, sterile.

Additional material required:

- Balance
- pH-meter
- Autoclave
- 1N NaOH solution
- 1N HCl solution
- Sterile petri-dishes

Instructions for use:

Media preparation:

To rehydrate medium, dissolve 34gr in 1L of deionized water. Adjust pH to 7.8±0.1 by adding sufficient amount of 1N NaOH (use 1N HCl to lower the pH if it goes above 7.8±0.1). Sterilize in autoclave for 15 minutes at 121°C. Cool to 50°C and add 0.4mL **QUICOLOR® Enrichment Supplement** in sterile conditions and mix. Check the pH to be 7.8±0.1. Readjust if necessary as described above being careful about sterility. Distribute to petri dishes to obtain an approximately 3mm thick medium (15mL for a 90mm petri dish; pouring more media into the

plates will increase the duration of time required for visualisation of inhibition zones.)

QUICOLOR® Enrichment Supplement should be added after cooling to 50°C using the same procedure and precautions described above. Poured plates have a shelf life of six months if stored in plastic bags to prevent drying and at 4-8°C.

Test preparation:

1. Prior to inoculation, the media should be brought to room temperature.
2. Prepare a bacterial suspension of 0.5 to 1.0 Mc Farland from a fresh culture.
3. Spread the suspension onto **QUICOLOR® ES** using a sterile swab.
4. Place the paper disks containing the antibacterials to be tested on the surface of **QUICOLOR® ES**. Incubate at 35-37°C.
5. The colored inhibition zones appear within 4 to 6 hours.
6. Susceptibility is determined by measuring the diameter of the inhibition zone.

Evaluation of the results:

The evaluation of the results should be done according "QUICOLOR® disk diffusion, inhibition zone interpretive standards" provided together with this package insert. These standards are obtained by comparison of the susceptibility results of a large number of bacterial isolates obtained from clinical samples and studied by Kirby-Bauer disk diffusion method.⁵

Quality control:

Positive control: *Escherichia coli* ATCC 25922; *Staphylococcus aureus* ATCC 25923.

Negative control: Uninoculated plates.

Time restrictions:

The colored inhibition zones should be evaluated when they form at 4 to 6 hours. If the zones cannot be evaluated within 8 hours then the color zones will disappear. However inhibition zones will reappear after overnight incubation in the form of bacterial layer on the surface as in the classical disk diffusion method.

The following may impede the visualization of inhibition zones within 4 to 6 hours:

- 1- Preparation of the inoculum from an old culture plate (the inoculum should be prepared from one day old culture that is not refrigerated).
- 2- Preparation of the inoculum with turbidity less than 0.5 Mc Farland.
- 3- Leaving uninoculated parts on the medium when spreading the inoculum by the swab.

Limitations of the procedure:

Antibacterial susceptibility results may not be obtained within 4 to 6 hours if bacteria to be tested are not obtained from fresh culture plates.

Performance characteristics:

When susceptibility test using **QUICOLOR®** is performed according to instructions, over 95% overall agreement should be expected between the results

of Kirby Bauer and **QUICOLOR®** disk diffusion methods.⁶

Bibliography:

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4. Granato, P. A. 1993. Impact of same day tests versus traditional overnight testing. *Diagn. Microbiol. Infect. Dis.* 16:237-243
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Manufacturer:

SALUBRIS, INC.

One Boston Place, suite 2600

Boston, MA 02108, U.S.A.

Tel: (800) 326-1484, Fax: (617) 249-0803

EUROPE Tel: +33 683 00 84 77

Website: www.salubrisinc.com

Authorised representative:

SALUBRIS

2, Clos de Toussue

27300 Menneval - FRANCE

Tel: +33 683 00 84 77

Catalogue number:

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QUICOLOR® DISK DIFFUSION
INHIBITION ZONE INTERPRETIVE STANDARDS

Measured inhibition zone borders for resistance and susceptibility (x-y) in mm

Measured value $\leq x$: Resistant;

Measured value $> x$ and $< y$: Intermediate;

Measured value $\geq y$: Sensitive

		Staphylococci		Enterobacteriaceae		Pseudomonadaceae (and other non-fermentative Gram (-) bacteria)	
Antibacterial Agent	Disk content (μg)	Mueller Hinton x-y (mm)	QUICOLOR x-y (mm)	Mueller Hinton x-y (mm)	QUICOLOR x-y (mm)	Mueller Hinton x-y (mm)	QUICOLOR x-y (mm)
Amikacin	30	14-17	16-19	14-17	14-17	14-17	10-12
Amoxicillin/Clavulanate	20/10	19-20	19-20	13-18	13-17		
Ampicillin	10	28-29	22-23	13-17	14-16		
Ampicillin/Sulbactam	10/10	11-15	12-15	11-15	12-14		
Azlocillin	75					17-18	16-17
Aztreonam	30			15-22	12-17	15-22	12-17
Carbenicillin	100			19-23	15-20	13-17	13-15
Cefaclor	30	14-18	14-18	14-18	17-19		
Cefazolin	30	14-18	13-17	14-18	16-18		
Cefepime	30	14-18	15-17	14-18	16-18	14-18	14-16
Cefoperazone/ Sulbactam	75/30			15-21	15-18	15-21	15-18
Ceftazidime	30	14-18	12-15	14-18	15-17	14-18	13-15
Ceftriaxone	30	13-21	13-17	13-21	15-21	13-21	12-14
Cefuroxime	30	14-23	14-18	14-23	15-20		
Ciprofloxacin	5	15-21	13-16	15-21	15-19	15-21	13-16
Clindamycin	2	14-21	14-20				
Erythromycin	15	13-23	17-20				
Fusidic acid	10	15-22	13-15				
Gentamicin	10	12-15	11-13	12-15	12-14	12-15	9-10
Imipenem	10			13-16	13-15	13-16	20-23
Meropenem	10			13-16	13-15	13-16	17-20
Netilmicin	30	12-15	11-13	12-15	13-15	12-15	9-11
Norfloxacin	10	12-17	12-15	12-17	13-15	12-17	11-13
Ofloxacin	5	12-16	14-16	12-16	13-16	12-16	11-14
Oxacillin	1	10-13	12-13				
Penicillin	10units	28-29	23-24				
Piperacillin	100			17-21	15-17	17-18	15-16
Rifampin		16-20	16-20				
Teicoplanin	30	10-14	10-12				
Tetracycline	30	14-19	17-19	14-19	14-16		
Trimethoprim/ Sulfamethoxazole	1.25/ 23.75	10-16	13-14	10-16	9-12		
Tobramycin	10	12-15	13-15	12-15	13-15	12-15	10-12
Vancomycin	30	9-12	9-12				