



Thermo Scientific Oxoid AST Disks

Ensure EUCAST disk diffusion
methodology compliance

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In 2010, the European Committee on Antimicrobial Susceptibility Testing (EUCAST) launched a standardized disk diffusion method calibrated to EUCAST MIC breakpoints harmonized across Europe.

Since then, CRG (the Netherlands), DIN (Germany), NWGA (Norway), SRGA (Sweden) and CA-SFM (France) have encouraged the use of this standardized method regionally, and EUCAST's efforts to standardize across Europe is almost complete, with BSAC (UK) adopting the method by January 2015.¹

To help ensure a seamless transition for laboratories that adopt the EUCAST methodology, Thermo Fisher Scientific offers a complete range AST Disks that meet the drug concentrations recommended by EUCAST, as well as all the accessories required for AST.

¹ Brown DF, Wootton M and Howe RA. (2015) Antimicrobial susceptibility testing breakpoints and methods for BSAC to EUCAST. *J Antimicrob Chemother.* doi:10.1093/jac/dkv287



Background

EUCAST was formed in 1997 with the aim of achieving a European consensus on susceptibility testing to enable comparability of data and resistance surveillance within the international community.

The development of the EUCAST disk diffusion method was a natural progression of the MIC harmonization, with the following as key stages in the development strategy:

- Close consultation with national breakpoint committees to ensure acceptance of the proposed harmonization
- Subsequent agreement to adopt harmonized, Europe-wide breakpoints, with the disk diffusion test being selected as the most appropriate way to ensure that the European MIC-breakpoints are implemented in European laboratories
- The recognition, by all committees of 'species-specific breakpoints'

Antimicrobial Susceptibility Test Disks

Disk diffusion remains one of the simplest and most widely used methods for susceptibility testing. It is an extremely flexible technique, with a wide variety of antibiotics and concentrations available. The disk diffusion test not only categorizes resistant, intermediate and sensitive organisms through quantitative results, but also provides a visual indication of the following:

- Inoculum level
- Presence of contamination
- Resistant mutants
- Beta-lactamase activity
- Antagonism and synergism between antibiotics

Thermo Scientific™ Oxoid™ Antimicrobial Susceptibility Test Disks are manufactured in accordance with a Quality Management System that meets the requirements of ISO 9001 and ISO 13485. Each cartridge is individually sealed with a desiccant to maintain a moisture level of <2% ensuring the long-term stability of the product. All the antimicrobials recommended by the EUCAST can be found in the standard Oxoid AST Disk range:

Antimicrobial	Symbol	Concentration (µg)	Product Code
Amikacin	AK	30	CT0107B
Amoxicillin/Clavulanic acid	AMC	3	CT0538B
Amoxicillin/Clavulanic acid	AMC	30	CT0223B
Ampicillin	AMP	10	CT0003B
Ampicillin	AMP	2	CT0002B
Ampicillin/Sulbactam	SAM	20	CT0520B
Aztreonam	ATM	30	CT0264B
Cefaclor	CEC	30	CT0149B
Cefadroxil	CFR	30	CT0453B
Cefepime	FEP	30	CT0771B
Cefixime	CFM	5	CT0653B
Cefotaxime	CTX	5	CT0407B
Cefoxitin	FOX	30	CT0119B
Cefpodoxime	CPD	10	CT1612B
Ceftaroline	CPT	5	CT1942B
Ceftazidime	CAZ	10	CT1629B
Ceftibuten	CFT	30	CT1662B
Ceftriaxone	CRO	30	CT0417B
Cefuroxime	CXM	30	CT0127B
Cephalexin	CL	30	CT0007B
Chloramphenicol	C	30	CT0013B
Ciprofloxacin	CIP	5	CT0425B
Clindamycin	DA	2	CT0064B
Doripenem	DOR	10	CT1880B

Proven performance according to EUCAST study

Evaluation of selected Thermo Scientific Oxoid AST Disks by EUCAST Development Laboratory (EDL), Växjö, Sweden, 2014.

Sixteen disks with nominal potencies, as recommended by EUCAST, were selected for evaluation against published quality control (QC) ranges and targets for relevant strains. Disk diffusion was performed as recommended by EUCAST. Each disk type was tested against all QC strains with targets and ranges in the EUCAST QC tables v. 4.0. Mueller-Hinton agar from two manufacturers was used.

Mean values from triplicate tests of each disk type were evaluated against QC targets and ranges and were categorized as green if the mean value was within ± 1 mm of the target value, yellow if the mean value was >1 mm but within ± 2 mm of the target value, orange if the mean value was >2 mm from the target value but still within the QC range and red if the mean value was out of the QC range (see table to the right). For disks with mean values >1 mm from the QC target, it is also shown whether the results were above (high) or below (low) the target value.

Summary of evaluation of selected disks vs. EUCAST QC targets and ranges

For each disk, the mean value from three tests was compared with the EUCAST target. This table shows the combined results for all strains tested for each agent.

These results (and data from other disk manufacturers) were presented as a poster at ECCMID 2015 with manufacturers names made anonymous. The results have subsequently been republished in July 2016 due to a third evaluation request from a manufacturer and the re-evaluation of meropenem's QC limits by EUCAST. The disk performance results below reflect the latest publication.

Antimicrobial Agent	Disk Content (μg)	Range	Oxoid Disk Performance Results
Benzylpenicillin	1 unit	EUCAST	
Amoxicillin-clavulanic acid	20-30	EUCAST/CLSI	
Piperacillin-tazobactam	30-6	EUCAST	
Oxacillin	1	EUCAST	
Mecillinam	10	EUCAST/CLSI	
Cefotaxime	5	EUCAST	
Cefoxitin	30	EUCAST	
Ceftazidime	10	EUCAST	
Meropenem	10	EUCAST/CLSI	
Ciprofloxacin	5	EUCAST/CLSI	
Norfloxacin	10	EUCAST/CLSI	
Pefloxacin	5	EUCAST	
Gentamicin	10	EUCAST/CLSI	
Tobramycin	10	EUCAST/CLSI	
Erythromycin	15	EUCAST	
Tetracycline	30	EUCAST	

- Mean value within ± 1 mm of the target value
 - Mean value >1 mm but within ± 2 mm of the target value
 - Mean value >2 mm from the target value but within the QC range
 - Mean value of the QC range
- H = High, mean value >1 mm above target

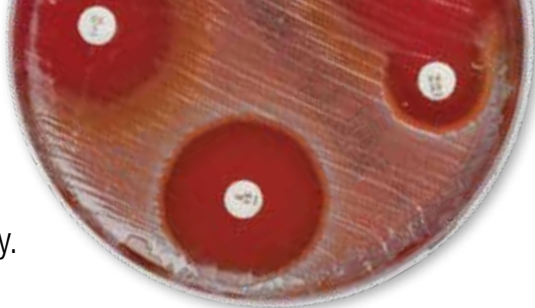
For full details and data produced in this EUCAST evaluation, please go to http://www.eucast.org/ast_of_bacteria/warnings/#c13111

Antimicrobial	Symbol	Concentration (μg)	Product Code
Ertapenem	ETP	10	CT1761B
Erythromycin	E	15	CT0020B
Fusidic acid	FD	10	CT0023B
Gentamicin	CN	10	CT0024B
Gentamicin	CN	30	CT0072B
Imipenem	IPM	10	CT0455B
Levofloxacin	LEV	5	CT1587B
Linezolid	LZD	10	CT1649B
Mecillinam	MEL	10	CT0096B
Meropenem	MEM	10	CT0774B
Minocycline	MH	30	CT0030B
Moxifloxacin	MXF	5	CT1633B
Mupirocin	MUP	200	CT0523B
Nalidixic acid	NA	30	CT0031B
Netilmicin	NET	10	CT0424B
Nitrofurantoin	F	100	CT0034B
Norfloxacin	NOR	10	CT0434B

Antimicrobial	Symbol	Concentration (μg)	Product Code
Ofloxacin	OFX	5	CT0446B
Oxacillin	OX	1	CT0159B
Pefloxacin	PEF	5	CT0661B
Penicillin G (benzylpenicillin)	P	1	CT0152B
Piperacillin	PRL	30	CT1619B
Piperacillin/Tazobactam	TZP	36	CT1616B
Quinupristin/Dalfopristin	QD	15	CT1644B
Rifampicin	RD	5	CT0207B
Teicoplanin	TEC	30	CT0647B
Telithromycin	TEL	15	CT1714B
Tetracycline	TET	30	CT0054B
Ticarcillin	TIC	75	CT0167B
Tigecycline	TGC	15	CT1841B
Tobramycin	TOB	10	CT0056B
Trimethoprim	W	5	CT0076B
Trimethoprim/Sulphamethoxazole	SXT	25	CT0052B
Vancomycin	VA	5	CT0188B



From culture media to quality control, we offer a complete range of Thermo Scientific products to complete your AST workflow while meeting the EUCAST standardized methodology.



Quality Control

Thermo Scientific™ Culti-Loops™ Quality Control Organisms enable the quick, easy and safe preparation of standardized cultures for quality control testing. They are ready to use, disposable bacteriological loops containing stabilized viable microorganisms. Each loop is individually packaged in a foil pouch and each pack contains five loops.

Culti-Loops are recommended for use in the performance testing of culture media, stains, diagnostic kits and reagents, and in the evaluation of bacteriological procedures.

Thermo Scientific Culti-Loops

Product	Pack Size	Code
<i>Escherichia coli</i> ATCC®25922	5	R4607050
<i>Escherichia coli</i> ATCC®35218	5	R4601971
<i>Pseudomonas aeruginosa</i> ATCC®27853	5	R4607060
<i>Staphylococcus aureus</i> ATCC®29213	5	R4607011
<i>Enterococcus faecalis</i> ATCC®29212	5	R4607030
<i>Streptococcus pneumoniae</i> ATCC®49619	5	R4609015
<i>Haemophilus influenzae</i> ATCC®49766	5	R4603806
<i>Campylobacter jejuni</i> ATCC®33560	5	R4609498

Dehydrated Culture Media and Prepared Media

Thermo Scientific™ Oxoid™ Dehydrated Culture Media and Prepared Media are manufactured under controlled conditions in BS EN ISO 9001:2008 and ISO 13485:2003-compliant production facilities. Mueller-Hinton Agar is tested using methods based on the Clinical and Laboratory Standards Institute (CLSI), M6-A2 Protocols. The medium is tested with a range of antimicrobial disks against microorganisms to ensure that the correct zone sizes are produced with every batch.

Thermo Scientific Oxoid Dehydrated Culture Media

Product	Pack Size	Code
Mueller-Hinton Agar	500 g	CM337B
Mueller-Hinton Agar	2.5 kg	CM337R
Mueller-Hinton Agar	5 kg	CM337T
Defibrinated Horse Blood	25 mL	SR0050B
Defibrinated Horse Blood	100 mL	SR0050C

Thermo Scientific Oxoid Prepared Media

Product	Pack Size	Code
Mueller-Hinton Agar	10	P05007A
Mueller-Hinton Agar (UK only)	10	P00152A
Mueller-Hinton Agar with 5% Horse Blood and 20mg/L NAD	10	PB5303A
Mueller-Hinton Agar with 5% Horse Blood and 20mg/L NAD (UK only)	10	PB1229A
Mueller-Hinton Agar*	5	P01191S
0.85% Saline	300x3mL	B01176B

*minimum order quantities apply

Accessories

A range of disk dispensers are available to ensure the accurate placement of the disks onto a variety of sizes of agar plates, including 90mm, 120mm and 140mm diameters, with a simple one-handed operation. The dispensers are height adjustable to allow them to be tailored to individual laboratory requirements, and can be stored in a fully interlocking container to prevent the ingress of moisture, thus helping to maintain the viability of the antibiotics in storage. A desiccant is contained in the base of the container, which again ensures the opened cartridges are stored in a moisture-free environment.

Accessories

Product	Pack Size	Plate diameter	Code
6 place disk dispenser	Each	90 mm	ST6090
8 place disk dispenser	Each	90 mm	ST6080
12 place disk dispenser	Each	140 mm	ST1215
16 place disk dispenser (France only)	Each	120 mm	FR600510
Replacement desiccant (dispenser)	Each	--	ST9100
Cartridge Container (with desiccant)	Each	--	HP0055A
Desiccant sachets	2	--	HP0063A
Ejector for using single cartridges	6	--	HP0053A



For more information on these and other Thermo Scientific microbiology products, visit thermofisher.com/microbiology

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