OXA-23 *K*-SeT

Manufacturer:

Coris BioConcept
Science Park CREALYS
Rue Jean Sonet 4A
B – 5032 GEMBLOUX
BELGIUM
Tel.: +32(0)81.719.917
Fax: +32(0)81.719.919
info@corisbio.com

Produced in BELGIUM

www.corisbio.com
IFU-58R7/EN/02

***In vitro* rapid diagnostic test for the detection of OXA-23 carbapenemase in bacterial culture**

FOR IN VITRO DIAGNOSTIC USE **EN**
FOR PROFESSIONAL USE ONLY
References: K-15R7, 20 cassettes, buffer, 20 tubes and droppers

I. INTRODUCTION

Acinetobacter baumannii is an important opportunistic and multidrug-resistant Gram-negative bacterium responsible for nosocomial infections in health facilities. If left untreated, this infection can lead to septicemia and death. The carbapenem-hydrolysing oxacillinases (OXAs) are the most commonly reported carbapenem-resistance determinants in *Acinetobacter* spp., particularly in *A. baumannii*. Among the OXAs, OXA-23 is the most prevalent carbapenem-resistance determinant in *A. baumannii* isolates.
OXA-23 has been detected in other bacterial species as chromosomal (*P. mirabilis,* Bonnet et al 2002 and Osterblad et al 2016; *A. radioresistans*) or plasmidic gene (*E. coli*, La et al, 2014), which can constitute reservoirs for horizontal transmission of this resistance factor (Poirel et al 2016). The detection of this resistance factor OXA-23, not only in resistant species but also in carrier species, is therefore of paramount importance in the control of antibiotic resistance in the hospital.
Nowadays, definitive confirmation of OXA-23 relies on molecular amplification analysis and DNA sequencing. These tests are expensive and can only be performed in dedicated environment and by skilled staff, hence limiting their more generalized usage.
The development of new rapid diagnostic tests to track antimicrobial resistance patterns is considered as one of the priority core action by international experts and health authorities.
The OXA-23 K-SeT test aimed at a rapid identification of the OXA-23 carbapenemase (and variants of the OXA-23 group) ensures effective treatment of patients and prevention of spread of OXA-23 *Acinetobacter* spp. carrier, especially in hospitals.

II. PRINCIPLE OF THE TEST

This test is ready to use and is based on a membrane technology with colloidal gold nanoparticles. A nitrocellulose membrane is sensitized with a monoclonal antibody directed against one epitope of the OXA-23 carbapenemase. Another monoclonal antibody directed against a second epitope of the OXA-23 carbapenemase is conjugated to colloidal gold particles. This conjugate is dried on a membrane.
This test is aimed at the detection of OXA-23 like carbapenemases in a single bacterial colony growing on agar plate. The sample must be diluted in the dilution buffer supplied with the test. When the provided buffer containing the resuspended bacteria comes into contact with the strip, the solubilized conjugate migrates with the sample by passive diffusion and both the conjugate and sample material come into contact with the anti-OXA-23 antibody that it is adsorbed onto the nitrocellulose strip. If the sample contains the OXA-23 carbapenemase, the conjugate–OXA-23 complex will remain bound to the anti-OXA-23 antibody adsorbed onto the nitrocellulose and a red line will develop. Solution continues to migrate to reach a second reagent (control reagent) that binds the migration control conjugate, thereby producing a red control line that confirms that the test is valid. Result is visible within 15 minutes.

III. REAGENTS AND MATERIALS

1. OXA-23 *K*-SeT (20)
20 sealed pouches containing one device and one desiccant. Each device contains one sensitized strip.
2. LY-A buffer vial (15 mL)
Saline solution buffered to pH 7.5 containing TRIS, NaN_3 (<0,1%) and a detergent.
3. Instruction for use (1)
4. Semi-rigid disposable collection tubes with droppers (20)
5.

IV. SPECIAL PRECAUTIONS

- All operations linked to the use of the test must be performed in accordance with Good Laboratory Practices (GLP).
- All reagents are for *in vitro* diagnostic use only.
- Pouch must be opened with care.
- Avoid touching nitrocellulose with your fingers.
- Wear gloves when handling samples.
- Never use reagents from another kit.
- Green lines indicate immunoreagents adsorption sites. Green colour disappears during the test.
- Reagents' quality cannot be guaranteed beyond their shelf-life dates or if reagents are not stored under required conditions as indicated in the insert.

V. WASTE DISPOSAL

- Dispose of gloves, swabs, test tubes and used devices in accordance with GLP.
- Each user is responsible for the management of any waste produced, and must ensure that it is disposed of in accordance with the applicable legislation.

VI. STORAGE

- An unopened pouch may be kept at between 4 and 30°C and used until the shelf-life date indicated on the packaging. Once the pouch is opened, run the test immediately.
- Avoid freezing devices and buffer.

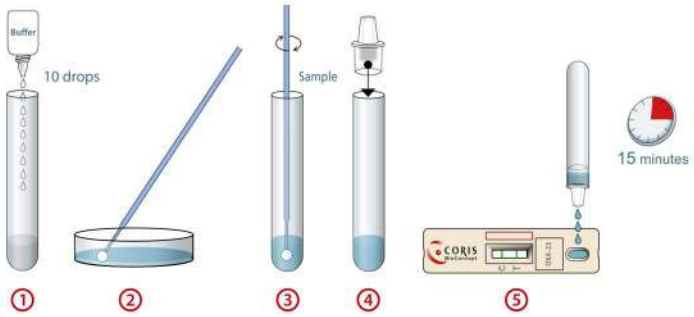
VII. SPECIMEN HANDLING AND COLLECTION

Specimens to be tested should be obtained and handled by standard microbiological methods.
Make sure that the specimens are not treated with solutions containing formaldehyde or its derivatives.
Culture media tested and validated with Coris BioConcept RESIT kits are listed on the website: https://www.corisbio.com/Products/Human-Field/OXA-23/FAQ.php

VIII. PROCEDURE

PREPARATIONS OF THE TEST:
Allow kit components, in unopened packaging, and specimens (in case the plate containing colony to be tested was kept at 4°C) to reach room temperature (15-30°C) before performing a test.
Open the pouch and remove the device. Once opened, run the test immediately. Indicate the patient's name or specimen number on the device (one device per sample).
SPECIMEN PREPARATION PROCEDURE:
We recommend the use of fresh bacterial colonies for optimal test performance.

1. Prepare one semi-rigid tube provided in the kit and add **10** drops of LY-A buffer in the tube.
2. Harvest bacteria by taking one colony with a disposable bacteriological loop and dip the loop in the bottom of the semi-rigid tube containing the buffer.
3. Stir thoroughly before removing the loop
4. Insert tightly the dropper on the semi-rigid tube.
5. Vortex the preparation to homogenize. The entire bacterial colony must be suspended into the buffer.
6. Invert the test tube and add slowly **3** drops of diluted sample into the sample well of the cassette. Alternatively, add 100µl with a micropipette into the sample well of the cassette.
7. Allow to react for 15 min max and read the result.



Positive results may be reported as soon as the test and control lines become visible.
Do not take the appearance of new lines into account after the reaction time is passed.
The result must be read on still wet strip.

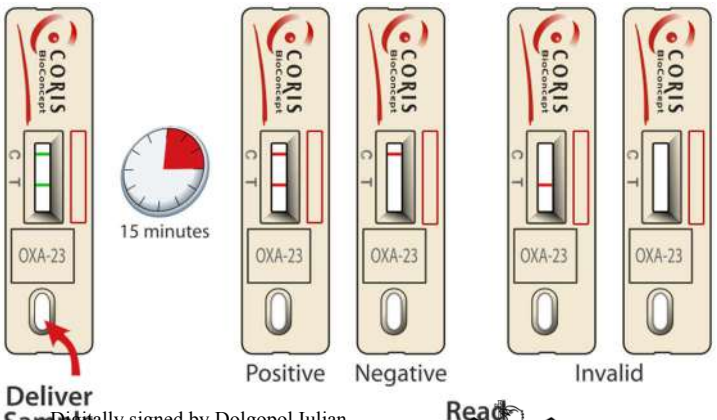
IX. INTERPRETING RESULTS

The results are to be interpreted as follows:

Negative test result: a reddish-purple line appears across the central reading window at the Control line (C) position. No other band is present.

Positive test result: in addition to a reddish-purple band at the Control line (C), a visible reddish-purple band appears at the Test line position (T). Intensity of the test line may vary according to the quantity of antigens present in the sample. Any reddish-purple line (T), even weak, should be considered as a positive result.

Invalid test result: The absence of a Control line indicates a failure in the test procedure. Repeat invalid tests with a new test device.
Note: during the drying process, a very faint shadow may appear at the Test line position. It should not be regarded as a positive result.



X. PERFORMANCE

A. Detection Limit

The detection limit was determined with a purified recombinant OXA-23 protein and has been evaluated at 0,156 ng/mL.

B. Validation on collection of reference strains

The OXA-23 *K*-SeT was evaluated on a collection of 108 clinical isolates of carbapenem-resistant *Acinetobacter* spp. fully characterized resistance mechanisms to beta-lactams by phenotypic and molecular tests (Germany).

108 strains	**35 strains** tested positive with the OXA-23 *K*-SeT	**35 strains** carrying OXA-23 carbapenemase	*Acinetobacter baumannii, Acinetobacter pittii, Acinetobacter nosocomialis, Acinetobacter radioresistens*
	73 strains tested negative with the OXA-23 *K*-SeT	**68 strains** carrying a non-OXA-23 carbapenemase	OXA-40, OXA-51, OXA-58, OXA-143, OXA-235
		5 strains carrying class B carbapenemases	Including VIM-2, NDM-1, NDM-2

A second evaluation was retrospectively performed on 448 clinical strains of *Acinetobacter spp*. and 14 oxacillinase-producing Gram-negative bacteria collected in Belgium and in Italy between 2008 and 2018 with an agreement of 100 % versus real-time PCR and molecular sequencing. see Riccobono, 2019

	Italy	Belgium	Total	Test OXA-23 K-SeT
$bla_{\text{OXA-23-like}}$	170	137	307	307 +
$bla_{\text{OXA-24-like}}$	5	25	30	negative
$bla_{\text{OXA-58-like}}$	1	30	31	negative
IS*Aba1* $bla_{\text{OXA-51-like}}$	11	0	11	negative
$bla_{\text{OXA-23-like}}$ + $bla_{\text{OXA-58-like}}$	5	2	7	7 +
$bla_{\text{OXA-23-like}}$ + IS*Aba1* $bla_{\text{OXA-51-like}}$	4	0	4	4 +
$bla_{\text{OXA-23-like}}$ + bla_{NDM}	0	3	3	3 +
$bla_{\text{OXA-58-like}}$ + bla_{VIM}	0	1	1	negative
bla_{NDM}	0	13	13	negative
$bla_{\text{OXA-143-like}}$	0	1	1	negative
bla_{IMP}	0	3	3	negative
bla_{VIM}	0	1	1	negative
bla_{GES}	0	1	1	negative
$bla_{\text{OXA-48-like}}$	0	2	2	negative
$bla_{\text{OXA-198-like}}$	0	1	1	negative
non-carbapenemase producer	0	46	46	negative
Total	196	266	462	321 +

C. Repeatability and reproducibility

To check intra-batch accuracy (repeatability), the same positive samples and a buffer solution were processed 15 times on kits of the same production batch in the same experimental conditions. All observed results were confirmed as expected.
To check inter-batch accuracy (reproducibility), some samples (positive and buffer) were processed on kits from three different production batches. All results were confirmed as expected.

XI. LIMITS OF THE KIT

The test is qualitative and cannot predict the quantity of antigens present in the sample. Clinical presentation and other test results must be taken into consideration to establish diagnosis.
A positive test does not rule out the possibility that other antibiotic resistance mechanisms may be present.

XII. TECHNICAL PROBLEMS/COMPLAINTS

If you encounter a technical problem or if performances do not correspond with those indicated in this package insert:

1. Record the kit batch number
2. If possible, keep the sample in the appropriate storage condition during the complaint management
3. Contact Coris BioConcept (client.care@corisbio.com) or your local distributor

XIII. BIBLIOGRAPHIC REFERENCES

A. **E. Riccobono, P. Bogaerts, A. Antonelli, S. Evrard, T. Giani, G. M. Rossolini and Y. Glupczynski.** Evaluation of the OXA-23 K-SeT immunochromatographic assay for the rapid detection of OXA-23-like carbapenemase-producing Acinetobacter spp. **J Antimicrob Chemother. 2019 Jan 25. doi: 10.1093**

B. **DW. Wareham, LM. Phee, MHF. Abdul Momin.** Direct detection of carbapenem resistance determinants in clinical specimens using immunochromatographic lateral flow devices. J Antimicrob Chemother. 2018 Mar 22. doi: 10.1093

C. **A. Saleh, S. Göttig and A. Hamprecht.** Multiplex immunochromatographic detection of OXA-48, KPC and NDM carbapenemases: impact of the inoculum, antibiotics and agar. J Clin Microbiol. 2018 Feb 14. pii: JCM.00050-18.

D. **G. L. Vanstone, S. Woodhead, K. Roulston, H. Sharma, E. Wey, E. R. Smith, D. Mack and I. Balakrishna.** Improving the detection of carbapenemase-producing organisms (CPO) in a low-prevalence setting: evaluation of four commercial methods and implementation of an algorithm of testing. Journal of Medical Microbiology 2018;67: 208–214

E. **P. Bogaerts, S. Evrard, L. Denorme, Q. Gilleman, P. Mertens, T.-D. Huang, and Y. Glupczynski**. Evaluation of a new lateral flow assay for the detection of VIM-producing bacteria. 37th RICAI, Paris, December, 18-19, 2017, Abstract # P066.

F. **Y. Glupczynski, A. Jousset, S. Evrard, R. Bonnin, T. Huang, L. Dortet, P. Bogaerts and T. Naas.** Prospective evaluation of the OKN K-SeT assay, a new multiplex immunochromatographic test for the rapid detection of OXA-48-like, KPC and NDM carbapenemases. J Antimicrob Chemother. 2017 Jul 1 ;72(7):1955-1960

G. **CS. Nodari, AC. Gales, AL. Barth, CM. Magagnin, AP. Zavascki, CG. Carvalhaes.** Detection of OXA-370 Directly from Rectal Swabs and Blood Culture Vials Using an Immunochromatographic Assay. J Microbiol Methods. 2017 May 5. pii: S0167-7012 : 30113-6

H. **Y. Glupczynski, A. Jousset, S. Evrard, R. Bonnin, TD Huang, L. Dortet, P. Bogaerts and T. Naas.** Evaluation of a new multiplex immunochromatographic assay OKN K-SeT for the rapid detection of OXA-48, KPC and NDM carbapenemases from cultured bacteria. 27th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Diseases April 22 – 25, 2017

I. **C. Trouvé, R. De Smedt and E. De Laer.** Evaluation of five commercial confirmation tests for Carbapenemase-Producing Enterobacteriaceaein an OXA-48 endemic geographic region. 27th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Diseases April 22 – 25, 2017

J. **E. Riccobono, A. Antonelli, P. Pecile, P. Bogaerts, MM. D'Andrea, GM. Rossolini.** Evaluation of the KPC K-SeTVR immunochromatographic assay for the rapid detection of KPC carbapenemase producers from positive blood cultures. J Antimicrob Chemother. 2017 Nov 8. doi: 10.109

K. **AC. Ramos, AC. Gales, J. Monteiro, S. Silbert, T. Chagas-Neto, AMO. Machado, CG. Carvalhaes.** Evaluation of a rapid immunochromatographic test for detection of distinct variants of Klebsiella pneumoniae carbapenemase (KPC) in Enterobacteriaceae. J Microbiol Methods. 2017 Nov;142:1-3

L. **F. Erdem, A. Abulaila, Z. Aktas, O. Oncul.** Comparison of the Novel Oxa-48 and Kpc K-SeT Assay, and Blue-Carba Test for the Detection of Carbapenemase-Producing Enterobacteriaceae Using PCR as a Reference Method. Clin Lab. 2017 Mar 1;63(3):515-522.

M. **DW Wareham and MH Abdul Momin.** Rapid Detection of Carbapenemases in Enterobacteriaceae: Evaluation of the RESIST-3 O.K.N (OXA-48, KPC, NDM) Multiplexed Lateral Flow Assay. J Clin Microbiol. 2017 Feb 1. pii: JCM.02471-16

N. **E Rubio, Y Zboromyrska, C Pitart, I Campo, I Alejo-Cancho, A Fasanella, A Vergara, F Marco, J Vila.** Evaluation of a rapid immunochromatographic test for the detection of OXA-48 carbapenemase. Diagn Microbiol Infect Dis. 2017 Mar;87(3):266-267

O. **F Koroska, S Göttig, M Kaase, J Steinmann, S Gatermann, J Sommer, T Wille, G Plum, A Hamprecht.** Comparison of phenotypic tests and an immunochromatographic assay and development of a new algorithm for OXA-48-like detection. J Clin Microbiol. 2016 Dec 28. Pii: JCM.01929-16

P. **F Pasteran, L Denorme, I Ote, S Gomez, D De Belder, Y Glupczynski, P Bogaerts, B Ghiglione, P Power, P Mertens, A Corso.** Rapid identification of OXA-48 and OXA-163 subfamily in carbapenem resistant gram-negative bacilli with a novel immunochromatographic lateral flow assay. J Clin Microbiol. 2016 Aug; 54(11):2832-2836

Q. **D. Meunier, A. Vickers, R. Pike, R.L. Hill, N. Woodford and K.L. Hopkins**. Evaluation of the K-SeT R.E.S.I.S.T. immunochromatographic assay for the rapid detection of KPC and OXA-48-like carbapenemases. J Antimicrob Chemother. 2016 Aug; 71 (8):2357-9

R. **Wareham DW, Shah R, Betts JW, Phee LM, Abdul Momin MH.** Evaluation of an Immunochromatographic Lateral Flow Assay (OXA-48 K-SeT) for the Rapid Detection of OXA-48-like Carbapenemases in Enterobacteriaceae. . J Clin Microbiol. 2016 Feb;54 (2):471-3

S. **Fernández J, Fleites A, Rodcio MR, Vazquez F.** Evaluation of OXA-48 K-Se T: an immunochromatographic assay for rapid detection of OXA-48-producing Enterobacteriaceae. Diagn Microbiol Infect Dis. 2016 May;85 (1):12-5

T. **Dortet L, Jousset A, Sainte-Rose V, Cuzon G, Naas T.** Prospective evaluation of the OXA-48 K-SeT assay, an immunochromatographic test for the rapid detection of OXA-48-type carbapenemases. J Antimicrob Chemother. 2016 Jul;71 (7):1834-40

U. **Glupczynski Y, Evrard S, Ote I, Mertens P, Huang TD, Leclipteux T, Bogaerts P.** Evaluation of two new commercial immunochromatographic assays for the rapid detection of OXA-48 and KPC carbapenemases from cultured bacteria. J Antimicrob Chemother. 2016 May;71(5):1217-22

V. **B.M. Willey, X. Trimi, R. Ioboni, D.A. Boyd, G. Ricci, D.N. Grohn, D. Terenzi, A. Mazzulli, L. Mataseje, M. Mulvey, P. Lo, T. Mazzulli, S.M. Poutanen**. The Coris BioConcept OXA48 K-SeT Immuno-Chromatographic Assay Detects OXA48-type Carbapenemases with High Sensitivity and Specificity. 26th European Congress of Clinical Microbiology and Infectious Diseases, Amsterdam April 9-12, 2016

W. **P. Bogaerts, S. Evrard, G. Cuzon, TD. Huang, T. Naas and Y. Glupczynski** Specificity of the OXA-48 immunochromatographic K-SeT for the detection of OXA-48 like in Shewanella spp. 26th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Amsterdam April 09 – 12, 2016

Last update: 27 NOVEMBER 2019

REF	Catalogue number		Manufacturer
IVD	*In vitro* diagnostic medical device		Temperature limits
	Contains sufficient for <n> tests	LOT	Lot number
	Consult instructions for use		Do not reuse
	Keep dry		Use by
DIL SPE	Diluent specimen	CONT NaN_3	Contains Sodium azide

OXA-23 *K*-SeT

Manufacturer:

Coris BioConcept
Science Park CREALYS
Rue Jean Sonet 4A
B – 5032 GEMBLOUX
BELGIUM
Tel.: +32(0)81.719.917
Fax: +32(0)81.719.919
info@corisbio.com

Produced in BELGIUM

www.corisbio.com
IFU-58R7/EN/02

***In vitro* rapid diagnostic test for the detection of OXA-23 carbapenemase in bacterial culture**

FOR IN VITRO DIAGNOSTIC USE **EN**
FOR PROFESSIONAL USE ONLY
References: K-15R7, 20 cassettes, buffer, 20 tubes and droppers

I. INTRODUCTION

Acinetobacter baumannii is an important opportunistic and multidrug-resistant Gram-negative bacterium responsible for nosocomial infections in health facilities. If left untreated, this infection can lead to septicemia and death. The carbapenem-hydrolysing oxacillinases (OXAs) are the most commonly reported carbapenem-resistance determinants in *Acinetobacter* spp., particularly in *A. baumannii*. Among the OXAs, OXA-23 is the most prevalent carbapenem-resistance determinant in *A. baumannii* isolates.
OXA-23 has been detected in other bacterial species as chromosomal (*P. mirabilis,* Bonnet et al 2002 and Osterblad et al 2016; *A. radioresistans*) or plasmidic gene (*E. coli*, La et al, 2014), which can constitute reservoirs for horizontal transmission of this resistance factor (Poirel et al 2016). The detection of this resistance factor OXA-23, not only in resistant species but also in carrier species, is therefore of paramount importance in the control of antibiotic resistance in the hospital.
Nowadays, definitive confirmation of OXA-23 relies on molecular amplification analysis and DNA sequencing. These tests are expensive and can only be performed in dedicated environment and by skilled staff, hence limiting their more generalized usage.
The development of new rapid diagnostic tests to track antimicrobial resistance patterns is considered as one of the priority core action by international experts and health authorities.
The OXA-23 K-SeT test aimed at a rapid identification of the OXA-23 carbapenemase (and variants of the OXA-23 group) ensures effective treatment of patients and prevention of spread of OXA-23 *Acinetobacter* spp. carrier, especially in hospitals.

II. PRINCIPLE OF THE TEST

This test is ready to use and is based on a membrane technology with colloidal gold nanoparticles. A nitrocellulose membrane is sensitized with a monoclonal antibody directed against one epitope of the OXA-23 carbapenemase. Another monoclonal antibody directed against a second epitope of the OXA-23 carbapenemase is conjugated to colloidal gold particles. This conjugate is dried on a membrane.
This test is aimed at the detection of OXA-23 like carbapenemases in a single bacterial colony growing on agar plate. The sample must be diluted in the dilution buffer supplied with the test. When the provided buffer containing the resuspended bacteria comes into contact with the strip, the solubilized conjugate migrates with the sample by passive diffusion and both the conjugate and sample material come into contact with the anti-OXA-23 antibody that it is adsorbed onto the nitrocellulose strip. If the sample contains the OXA-23 carbapenemase, the conjugate–OXA-23 complex will remain bound to the anti-OXA-23 antibody adsorbed onto the nitrocellulose and a red line will develop. Solution continues to migrate to reach a second reagent (control reagent) that binds the migration control conjugate, thereby producing a red control line that confirms that the test is valid. Result is visible within 15 minutes.

III. REAGENTS AND MATERIALS

1. OXA-23 *K*-SeT (20)
20 sealed pouches containing one device and one desiccant. Each device contains one sensitized strip.
2. LY-A buffer vial (15 mL)
Saline solution buffered to pH 7.5 containing TRIS, NaN_3 (<0,1%) and a detergent.
3. Instruction for use (1)
4. Semi-rigid disposable collection tubes with droppers (20)
5.

IV. SPECIAL PRECAUTIONS

- All operations linked to the use of the test must be performed in accordance with Good Laboratory Practices (GLP).
- All reagents are for *in vitro* diagnostic use only.
- Pouch must be opened with care.
- Avoid touching nitrocellulose with your fingers.
- Wear gloves when handling samples.
- Never use reagents from another kit.
- Green lines indicate immunoreagents adsorption sites. Green colour disappears during the test.
- Reagents' quality cannot be guaranteed beyond their shelf-life dates or if reagents are not stored under required conditions as indicated in the insert.

V. WASTE DISPOSAL

- Dispose of gloves, swabs, test tubes and used devices in accordance with GLP.
- Each user is responsible for the management of any waste produced, and must ensure that it is disposed of in accordance with the applicable legislation.

VI. STORAGE

- An unopened pouch may be kept at between 4 and 30°C and used until the shelf-life date indicated on the packaging. Once the pouch is opened, run the test immediately.
- Avoid freezing devices and buffer.

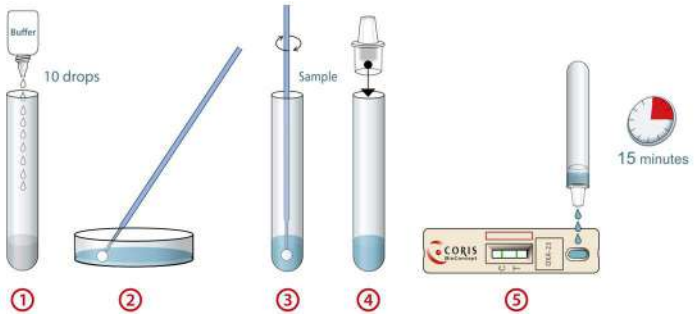
VII. SPECIMEN HANDLING AND COLLECTION

Specimens to be tested should be obtained and handled by standard microbiological methods.
Make sure that the specimens are not treated with solutions containing formaldehyde or its derivatives.
Culture media tested and validated with Coris BioConcept RESIT kits are listed on the website: https://www.corisbio.com/Products/Human-Field/OXA-23/FAQ.php

VIII. PROCEDURE

PREPARATIONS OF THE TEST:
Allow kit components, in unopened packaging, and specimens (in case the plate containing colony to be tested was kept at 4°C) to reach room temperature (15-30°C) before performing a test.
Open the pouch and remove the device. Once opened, run the test immediately. Indicate the patient's name or specimen number on the device (one device per sample).
SPECIMEN PREPARATION PROCEDURE:
We recommend the use of fresh bacterial colonies for optimal test performance.

1. Prepare one semi-rigid tube provided in the kit and add **10** drops of LY-A buffer in the tube.
2. Harvest bacteria by taking one colony with a disposable bacteriological loop and dip the loop in the bottom of the semi-rigid tube containing the buffer.
3. Stir thoroughly before removing the loop
4. Insert tightly the dropper on the semi-rigid tube.
5. Vortex the preparation to homogenize. The entire bacterial colony must be suspended into the buffer.
6. Invert the test tube and add slowly **3** drops of diluted sample into the sample well of the cassette. Alternatively, add 100µl with a micropipette into the sample well of the cassette.
7. Allow to react for 15 min max and read the result.



Positive results may be reported as soon as the test and control lines become visible.
Do not take the appearance of new lines into account after the reaction time is passed.
The result must be read on still wet strip.

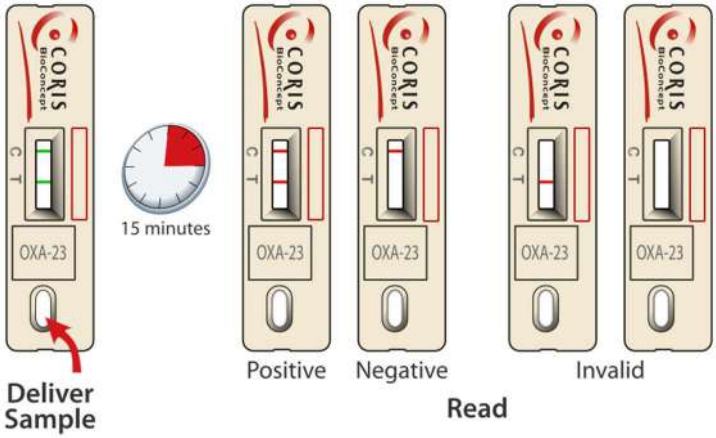
IX. INTERPRETING RESULTS

The results are to be interpreted as follows:

Negative test result: a reddish-purple line appears across the central reading window at the Control line (C) position. No other band is present.

Positive test result: in addition to a reddish-purple band at the Control line (C), a visible reddish-purple band appears at the Test line position (T). Intensity of the test line may vary according to the quantity of antigens present in the sample. Any reddish-purple line (T), even weak, should be considered as a positive result.

Invalid test result: The absence of a Control line indicates a failure in the test procedure. Repeat invalid tests with a new test device.
Note: during the drying process, a very faint shadow may appear at the Test line position. It should not be regarded as a positive result.



X. PERFORMANCE

A. Detection Limit

The detection limit was determined with a purified recombinant OXA-23 protein and has been evaluated at 0,156 ng/mL.

B. Validation on collection of reference strains

The OXA-23 *K*-SeT was evaluated on a collection of 108 clinical isolates of carbapenem-resistant *Acinetobacter* spp. fully characterized resistance mechanisms to beta-lactams by phenotypic and molecular tests (Germany).

108 strains	**35 strains** tested positive with the OXA-23 *K*-SeT	**35 strains** carrying OXA-23 carbapenemase	*Acinetobacter baumannii, Acinetobacter pittii, Acinetobacter nosocomialis, Acinetobacter radioresistens*
	73 strains tested negative with the OXA-23 *K*-SeT	**68 strains** carrying a non-OXA-23 carbapenemase	OXA-40, OXA-51, OXA-58, OXA-143, OXA-235
		5 strains carrying class B carbapenemases	Including VIM-2, NDM-1, NDM-2

A second evaluation was retrospectively performed on 448 clinical strains of *Acinetobacter spp*. and 14 oxacillinase-producing Gram-negative bacteria collected in Belgium and in Italy between 2008 and 2018 with an agreement of 100 % versus real-time PCR and molecular sequencing. see Riccobono, 2019

	Italy	Belgium	Total	Test OXA-23 K-SeT
$bla_{\text{OXA-23-like}}$	170	137	307	307 +
$bla_{\text{OXA-24-like}}$	5	25	30	negative
$bla_{\text{OXA-58-like}}$	1	30	31	negative
IS*Aba1* $bla_{\text{OXA-51-like}}$	11	0	11	negative
$bla_{\text{OXA-23-like}}$ + $bla_{\text{OXA-58-like}}$	5	2	7	7 +
$bla_{\text{OXA-23-like}}$ + IS*Aba1* $bla_{\text{OXA-51-like}}$	4	0	4	4 +
$bla_{\text{OXA-23-like}}$ + bla_{NDM}	0	3	3	3 +
$bla_{\text{OXA-58-like}}$ + bla_{VIM}	0	1	1	negative
bla_{NDM}	0	13	13	negative
$bla_{\text{OXA-143-like}}$	0	1	1	negative
bla_{IMP}	0	3	3	negative
bla_{VIM}	0	1	1	negative
bla_{GES}	0	1	1	negative
$bla_{\text{OXA-48-like}}$	0	2	2	negative
$bla_{\text{OXA-198-like}}$	0	1	1	negative
non-carbapenemase producer	0	46	46	negative
Total	196	266	462	321 +

C. Repeatability and reproducibility

To check intra-batch accuracy (repeatability), the same positive samples and a buffer solution were processed 15 times on kits of the same production batch in the same experimental conditions. All observed results were confirmed as expected.
To check inter-batch accuracy (reproducibility), some samples (positive and buffer) were processed on kits from three different production batches. All results were confirmed as expected.

XI. LIMITS OF THE KIT

The test is qualitative and cannot predict the quantity of antigens present in the sample. Clinical presentation and other test results must be taken into consideration to establish diagnosis.
A positive test does not rule out the possibility that other antibiotic resistance mechanisms may be present.

XII. TECHNICAL PROBLEMS/COMPLAINTS

If you encounter a technical problem or if performances do not correspond with those indicated in this package insert:

1. Record the kit batch number
2. If possible, keep the sample in the appropriate storage condition during the complaint management
3. Contact Coris BioConcept (client.care@corisbio.com) or your local distributor

XIII. BIBLIOGRAPHIC REFERENCES

A. **E. Riccobono, P. Bogaerts, A. Antonelli, S. Evrard, T. Giani, G. M. Rossolini and Y. Glupczynski.** Evaluation of the OXA-23 K-SeT immunochromatographic assay for the rapid detection of OXA-23-like carbapenemase-producing Acinetobacter spp. **J Antimicrob Chemother. 2019 Jan 25. doi: 10.1093**

B. **DW. Wareham, LM. Phee, MHF. Abdul Momin.** Direct detection of carbapenem resistance determinants in clinical specimens using immunochromatographic lateral flow devices. J Antimicrob Chemother. 2018 Mar 22. doi: 10.1093

C. **A. Saleh, S. Göttig and A. Hamprecht.** Multiplex immunochromatographic detection of OXA-48, KPC and NDM carbapenemases: impact of the inoculum, antibiotics and agar. J Clin Microbiol. 2018 Feb 14. pii: JCM.00050-18.

D. **G. L. Vanstone, S. Woodhead, K. Roulston, H. Sharma, E. Wey, E. R. Smith, D. Mack and I. Balakrishna.** Improving the detection of carbapenemase-producing organisms (CPO) in a low-prevalence setting: evaluation of four commercial methods and implementation of an algorithm of testing. Journal of Medical Microbiology 2018;67: 208–214

E. **P. Bogaerts, S. Evrard, L. Denorme, Q. Gilleman, P. Mertens, T.-D. Huang, and Y. Glupczynski**. Evaluation of a new lateral flow assay for the detection of VIM-producing bacteria. 37th RICAI, Paris, December, 18-19, 2017, Abstract # P066.

F. **Y. Glupczynski, A. Jousset, S. Evrard, R. Bonnin, T. Huang, L. Dortet, P. Bogaerts and T. Naas.** Prospective evaluation of the OKN K-SeT assay, a new multiplex immunochromatographic test for the rapid detection of OXA-48-like, KPC and NDM carbapenemases. J Antimicrob Chemother. 2017 Jul 1 ;72(7):1955-1960

G. **CS. Nodari, AC. Gales, AL. Barth, CM. Magagnin, AP. Zavascki, CG. Carvalhaes.** Detection of OXA-370 Directly from Rectal Swabs and Blood Culture Vials Using an Immunochromatographic Assay. J Microbiol Methods. 2017 May 5. pii: S0167-7012 : 30113-6

H. **Y. Glupczynski, A. Jousset, S. Evrard, R. Bonnin, TD Huang, L. Dortet, P. Bogaerts and T. Naas.** Evaluation of a new multiplex immunochromatographic assay OKN K-SeT for the rapid detection of OXA-48, KPC and NDM carbapenemases from cultured bacteria. 27th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Diseases April 22 – 25, 2017

I. **C. Trouvé, R. De Smedt and E. De Laer.** Evaluation of five commercial confirmation tests for Carbapenemase-Producing Enterobacteriaceaein an OXA-48 endemic geographic region. 27th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Diseases April 22 – 25, 2017

J. **E. Riccobono, A. Antonelli, P. Pecile, P. Bogaerts, MM. D'Andrea, GM. Rossolini.** Evaluation of the KPC K-SeTVR immunochromatographic assay for the rapid detection of KPC carbapenemase producers from positive blood cultures. J Antimicrob Chemother. 2017 Nov 8. doi: 10.109

K. **AC. Ramos, AC. Gales, J. Monteiro, S. Silbert, T. Chagas-Neto, AMO. Machado, CG. Carvalhaes.** Evaluation of a rapid immunochromatographic test for detection of distinct variants of Klebsiella pneumoniae carbapenemase (KPC) in Enterobacteriaceae. J Microbiol Methods. 2017 Nov;142:1-3

L. **F. Erdem, A. Abulaila, Z. Aktas, O. Oncul.** Comparison of the Novel Oxa-48 and Kpc K-SeT Assay, and Blue-Carba Test for the Detection of Carbapenemase-Producing Enterobacteriaceae Using PCR as a Reference Method. Clin Lab. 2017 Mar 1;63(3):515-522.

M. **DW Wareham and MH Abdul Momin.** Rapid Detection of Carbapenemases in Enterobacteriaceae: Evaluation of the RESIST-3 O.K.N (OXA-48, KPC, NDM) Multiplexed Lateral Flow Assay. J Clin Microbiol. 2017 Feb 1. pii: JCM.02471-16

N. **E Rubio, Y Zboromyrska, C Pitart, I Campo, I Alejo-Cancho, A Fasanella, A Vergara, F Marco, J Vila.** Evaluation of a rapid immunochromatographic test for the detection of OXA-48 carbapenemase. Diagn Microbiol Infect Dis. 2017 Mar;87(3):266-267

O. **F Koroska, S Göttig, M Kaase, J Steinmann, S Gatermann, J Sommer, T Wille, G Plum, A Hamprecht.** Comparison of phenotypic tests and an immunochromatographic assay and development of a new algorithm for OXA-48-like detection. J Clin Microbiol. 2016 Dec 28. Pii: JCM.01929-16

P. **F Pasteran, L Denorme, I Ote, S Gomez, D De Belder, Y Glupczynski, P Bogaerts, B Ghiglione, P Power, P Mertens, A Corso.** Rapid identification of OXA-48 and OXA-163 subfamily in carbapenem resistant gram-negative bacilli with a novel immunochromatographic lateral flow assay. J Clin Microbiol. 2016 Aug; 54(11):2832-2836

Q. **D. Meunier, A. Vickers, R. Pike, R.L. Hill, N. Woodford and K.L. Hopkins**. Evaluation of the K-SeT R.E.S.I.S.T. immunochromatographic assay for the rapid detection of KPC and OXA-48-like carbapenemases. J Antimicrob Chemother. 2016 Aug; 71 (8):2357-9

R. **Wareham DW, Shah R, Betts JW, Phee LM, Abdul Momin MH.** Evaluation of an Immunochromatographic Lateral Flow Assay (OXA-48 K-SeT) for the Rapid Detection of OXA-48-like Carbapenemases in Enterobacteriaceae. . J Clin Microbiol. 2016 Feb;54 (2):471-3

S. **Fernández J, Fleites A, Rodcio MR, Vazquez F.** Evaluation of OXA-48 K-Se T: an immunochromatographic assay for rapid detection of OXA-48-producing Enterobacteriaceae. Diagn Microbiol Infect Dis. 2016 May;85 (1):12-5

T. **Dortet L, Jousset A, Sainte-Rose V, Cuzon G, Naas T.** Prospective evaluation of the OXA-48 K-SeT assay, an immunochromatographic test for the rapid detection of OXA-48-type carbapenemases. J Antimicrob Chemother. 2016 Jul;71 (7):1834-40

U. **Glupczynski Y, Evrard S, Ote I, Mertens P, Huang TD, Leclipteux T, Bogaerts P.** Evaluation of two new commercial immunochromatographic assays for the rapid detection of OXA-48 and KPC carbapenemases from cultured bacteria. J Antimicrob Chemother. 2016 May;71(5):1217-22

V. **B.M. Willey, X. Trimi, R. Ioboni, D.A. Boyd, G. Ricci, D.N. Grohn, D. Terenzi, A. Mazzulli, L. Mataseje, M. Mulvey, P. Lo, T. Mazzulli, S.M. Poutanen**. The Coris BioConcept OXA48 K-SeT Immuno-Chromatographic Assay Detects OXA48-type Carbapenemases with High Sensitivity and Specificity. 26th European Congress of Clinical Microbiology and Infectious Diseases, Amsterdam April 9-12, 2016

W. **P. Bogaerts, S. Evrard, G. Cuzon, TD. Huang, T. Naas and Y. Glupczynski** Specificity of the OXA-48 immunochromatographic K-SeT for the detection of OXA-48 like in Shewanella spp. 26th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Amsterdam April 09 – 12, 2016

Last update: 27 NOVEMBER 2019

REF	Catalogue number		Manufacturer
IVD	*In vitro* diagnostic medical device		Temperature limits
	Contains sufficient for <n> tests	LOT	Lot number
	Consult instructions for use		Do not reuse
	Keep dry		Use by
DIL SPE	Diluent specimen	CONT NaN_3	Contains Sodium azide

OXA-23 *K*-SeT

Manufacturer:

Coris BioConcept
Science Park CREALYS
Rue Jean Sonet 4A
B – 5032 GEMBLOUX
BELGIUM
Tel.: +32(0)81.719.917
Fax: +32(0)81.719.919
info@corisbio.com

Produced in BELGIUM

www.corisbio.com
IFU-58R7/EN/02

***In vitro* rapid diagnostic test for the detection of OXA-23 carbapenemase in bacterial culture**

FOR IN VITRO DIAGNOSTIC USE **EN**
FOR PROFESSIONAL USE ONLY
References: K-15R7, 20 cassettes, buffer, 20 tubes and droppers

I. INTRODUCTION

Acinetobacter baumannii is an important opportunistic and multidrug-resistant Gram-negative bacterium responsible for nosocomial infections in health facilities. If left untreated, this infection can lead to septicemia and death. The carbapenem-hydrolysing oxacillinases (OXAs) are the most commonly reported carbapenem-resistance determinants in *Acinetobacter* spp., particularly in *A. baumannii*. Among the OXAs, OXA-23 is the most prevalent carbapenem-resistance determinant in *A. baumannii* isolates.
OXA-23 has been detected in other bacterial species as chromosomal (*P. mirabilis,* Bonnet et al 2002 and Osterblad et al 2016; *A. radioresistans*) or plasmidic gene (*E. coli*, La et al, 2014), which can constitute reservoirs for horizontal transmission of this resistance factor (Poirel et al 2016). The detection of this resistance factor OXA-23, not only in resistant species but also in carrier species, is therefore of paramount importance in the control of antibiotic resistance in the hospital.
Nowadays, definitive confirmation of OXA-23 relies on molecular amplification analysis and DNA sequencing. These tests are expensive and can only be performed in dedicated environment and by skilled staff, hence limiting their more generalized usage.
The development of new rapid diagnostic tests to track antimicrobial resistance patterns is considered as one of the priority core action by international experts and health authorities.
The OXA-23 K-SeT test aimed at a rapid identification of the OXA-23 carbapenemase (and variants of the OXA-23 group) ensures effective treatment of patients and prevention of spread of OXA-23 *Acinetobacter* spp. carrier, especially in hospitals.

II. PRINCIPLE OF THE TEST

This test is ready to use and is based on a membrane technology with colloidal gold nanoparticles. A nitrocellulose membrane is sensitized with a monoclonal antibody directed against one epitope of the OXA-23 carbapenemase. Another monoclonal antibody directed against a second epitope of the OXA-23 carbapenemase is conjugated to colloidal gold particles. This conjugate is dried on a membrane.
This test is aimed at the detection of OXA-23 like carbapenemases in a single bacterial colony growing on agar plate. The sample must be diluted in the dilution buffer supplied with the test. When the provided buffer containing the resuspended bacteria comes into contact with the strip, the solubilized conjugate migrates with the sample by passive diffusion and both the conjugate and sample material come into contact with the anti-OXA-23 antibody that it is adsorbed onto the nitrocellulose strip. If the sample contains the OXA-23 carbapenemase, the conjugate–OXA-23 complex will remain bound to the anti-OXA-23 antibody adsorbed onto the nitrocellulose and a red line will develop. Solution continues to migrate to reach a second reagent (control reagent) that binds the migration control conjugate, thereby producing a red control line that confirms that the test is valid. Result is visible within 15 minutes.

III. REAGENTS AND MATERIALS

1. OXA-23 *K*-SeT (20)
20 sealed pouches containing one device and one desiccant. Each device contains one sensitized strip.
2. LY-A buffer vial (15 mL)
Saline solution buffered to pH 7.5 containing TRIS, NaN_3 (<0,1%) and a detergent.
3. Instruction for use (1)
4. Semi-rigid disposable collection tubes with droppers (20)
5.

IV. SPECIAL PRECAUTIONS

- All operations linked to the use of the test must be performed in accordance with Good Laboratory Practices (GLP).
- All reagents are for *in vitro* diagnostic use only.
- Pouch must be opened with care.
- Avoid touching nitrocellulose with your fingers.
- Wear gloves when handling samples.
- Never use reagents from another kit.
- Green lines indicate immunoreagents adsorption sites. Green colour disappears during the test.
- Reagents' quality cannot be guaranteed beyond their shelf-life dates or if reagents are not stored under required conditions as indicated in the insert.

V. WASTE DISPOSAL

- Dispose of gloves, swabs, test tubes and used devices in accordance with GLP.
- Each user is responsible for the management of any waste produced, and must ensure that it is disposed of in accordance with the applicable legislation.

VI. STORAGE

- An unopened pouch may be kept at between 4 and 30°C and used until the shelf-life date indicated on the packaging. Once the pouch is opened, run the test immediately.
- Avoid freezing devices and buffer.

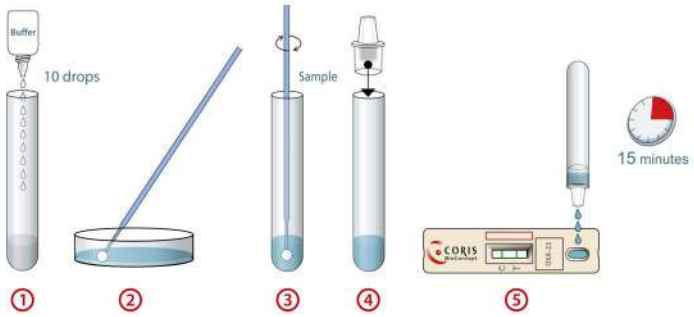
VII. SPECIMEN HANDLING AND COLLECTION

Specimens to be tested should be obtained and handled by standard microbiological methods.
Make sure that the specimens are not treated with solutions containing formaldehyde or its derivatives.
Culture media tested and validated with Coris BioConcept RESIT kits are listed on the website: https://www.corisbio.com/Products/Human-Field/OXA-23/FAQ.php

VIII. PROCEDURE

PREPARATIONS OF THE TEST:
Allow kit components, in unopened packaging, and specimens (in case the plate containing colony to be tested was kept at 4°C) to reach room temperature (15-30°C) before performing a test.
Open the pouch and remove the device. Once opened, run the test immediately. Indicate the patient's name or specimen number on the device (one device per sample).
SPECIMEN PREPARATION PROCEDURE:
We recommend the use of fresh bacterial colonies for optimal test performance.

1. Prepare one semi-rigid tube provided in the kit and add **10** drops of LY-A buffer in the tube.
2. Harvest bacteria by taking one colony with a disposable bacteriological loop and dip the loop in the bottom of the semi-rigid tube containing the buffer.
3. Stir thoroughly before removing the loop
4. Insert tightly the dropper on the semi-rigid tube.
5. Vortex the preparation to homogenize. The entire bacterial colony must be suspended into the buffer.
6. Invert the test tube and add slowly **3** drops of diluted sample into the sample well of the cassette. Alternatively, add 100µl with a micropipette into the sample well of the cassette.
7. Allow to react for 15 min max and read the result.



Positive results may be reported as soon as the test and control lines become visible.
Do not take the appearance of new lines into account after the reaction time is passed.
The result must be read on still wet strip.

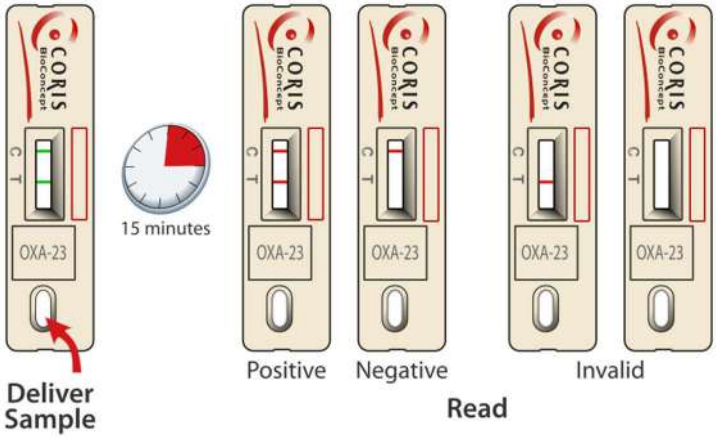
IX. INTERPRETING RESULTS

The results are to be interpreted as follows:

Negative test result: a reddish-purple line appears across the central reading window at the Control line (C) position. No other band is present.

Positive test result: in addition to a reddish-purple band at the Control line (C), a visible reddish-purple band appears at the Test line position (T). Intensity of the test line may vary according to the quantity of antigens present in the sample. Any reddish-purple line (T), even weak, should be considered as a positive result.

Invalid test result: The absence of a Control line indicates a failure in the test procedure. Repeat invalid tests with a new test device.
Note: during the drying process, a very faint shadow may appear at the Test line position. It should not be regarded as a positive result.



X. PERFORMANCE

A. Detection Limit

The detection limit was determined with a purified recombinant OXA-23 protein and has been evaluated at 0,156 ng/mL.

B. Validation on collection of reference strains

The OXA-23 *K*-SeT was evaluated on a collection of 108 clinical isolates of carbapenem-resistant *Acinetobacter* spp. fully characterized resistance mechanisms to beta-lactams by phenotypic and molecular tests (Germany).

108 strains	**35 strains** tested positive with the OXA-23 *K*-SeT	**35 strains** carrying OXA-23 carbapenemase	*Acinetobacter baumannii, Acinetobacter pittii, Acinetobacter nosocomialis, Acinetobacter radioresistens*
	73 strains tested negative with the OXA-23 *K*-SeT	**68 strains** carrying a non-OXA-23 carbapenemase	OXA-40, OXA-51, OXA-58, OXA-143, OXA-235
		5 strains carrying class B carbapenemases	Including VIM-2, NDM-1, NDM-2

A second evaluation was retrospectively performed on 448 clinical strains of *Acinetobacter spp*. and 14 oxacillinase-producing Gram-negative bacteria collected in Belgium and in Italy between 2008 and 2018 with an agreement of 100 % versus real-time PCR and molecular sequencing. see Riccobono, 2019

	Italy	Belgium	Total	Test OXA-23 K-SeT
$bla_{\text{OXA-23-like}}$	170	137	307	307 +
$bla_{\text{OXA-24-like}}$	5	25	30	negative
$bla_{\text{OXA-58-like}}$	1	30	31	negative
IS*Aba1* $bla_{\text{OXA-51-like}}$	11	0	11	negative
$bla_{\text{OXA-23-like}}$ + $bla_{\text{OXA-58-like}}$	5	2	7	7 +
$bla_{\text{OXA-23-like}}$ + IS*Aba1* $bla_{\text{OXA-51-like}}$	4	0	4	4 +
$bla_{\text{OXA-23-like}}$ + bla_{NDM}	0	3	3	3 +
$bla_{\text{OXA-58-like}}$ + bla_{VIM}	0	1	1	negative
bla_{NDM}	0	13	13	negative
$bla_{\text{OXA-143-like}}$	0	1	1	negative
bla_{IMP}	0	3	3	negative
bla_{VIM}	0	1	1	negative
bla_{GES}	0	1	1	negative
$bla_{\text{OXA-48-like}}$	0	2	2	negative
$bla_{\text{OXA-198-like}}$	0	1	1	negative
non-carbapenemase producer	0	46	46	negative
Total	196	266	462	321 +

C. Repeatability and reproducibility

To check intra-batch accuracy (repeatability), the same positive samples and a buffer solution were processed 15 times on kits of the same production batch in the same experimental conditions. All observed results were confirmed as expected.
To check inter-batch accuracy (reproducibility), some samples (positive and buffer) were processed on kits from three different production batches. All results were confirmed as expected.

XI. LIMITS OF THE KIT

The test is qualitative and cannot predict the quantity of antigens present in the sample. Clinical presentation and other test results must be taken into consideration to establish diagnosis.
A positive test does not rule out the possibility that other antibiotic resistance mechanisms may be present.

XII. TECHNICAL PROBLEMS/COMPLAINTS

If you encounter a technical problem or if performances do not correspond with those indicated in this package insert:

1. Record the kit batch number
2. If possible, keep the sample in the appropriate storage condition during the complaint management
3. Contact Coris BioConcept (client.care@corisbio.com) or your local distributor

XIII. BIBLIOGRAPHIC REFERENCES

A. **E. Riccobono, P. Bogaerts, A. Antonelli, S. Evrard, T. Giani, G. M. Rossolini and Y. Glupczynski.** Evaluation of the OXA-23 K-SeT immunochromatographic assay for the rapid detection of OXA-23-like carbapenemase-producing Acinetobacter spp. **J Antimicrob Chemother. 2019 Jan 25. doi: 10.1093**

B. **DW. Wareham, LM. Phee, MHF. Abdul Momin.** Direct detection of carbapenem resistance determinants in clinical specimens using immunochromatographic lateral flow devices. J Antimicrob Chemother. 2018 Mar 22. doi: 10.1093

C. **A. Saleh, S. Göttig and A. Hamprecht.** Multiplex immunochromatographic detection of OXA-48, KPC and NDM carbapenemases: impact of the inoculum, antibiotics and agar. J Clin Microbiol. 2018 Feb 14. pii: JCM.00050-18.

D. **G. L. Vanstone, S. Woodhead, K. Roulston, H. Sharma, E. Wey, E. R. Smith, D. Mack and I. Balakrishna.** Improving the detection of carbapenemase-producing organisms (CPO) in a low-prevalence setting: evaluation of four commercial methods and implementation of an algorithm of testing. Journal of Medical Microbiology 2018;67: 208–214

E. **P. Bogaerts, S. Evrard, L. Denorme, Q. Gilleman, P. Mertens, T.-D. Huang, and Y. Glupczynski**. Evaluation of a new lateral flow assay for the detection of VIM-producing bacteria. 37th RICAI, Paris, December, 18-19, 2017, Abstract # P066.

F. **Y. Glupczynski, A. Jousset, S. Evrard, R. Bonnin, T. Huang, L. Dortet, P. Bogaerts and T. Naas.** Prospective evaluation of the OKN K-SeT assay, a new multiplex immunochromatographic test for the rapid detection of OXA-48-like, KPC and NDM carbapenemases. J Antimicrob Chemother. 2017 Jul 1 ;72(7):1955-1960

G. **CS. Nodari, AC. Gales, AL. Barth, CM. Magagnin, AP. Zavascki, CG. Carvalhaes.** Detection of OXA-370 Directly from Rectal Swabs and Blood Culture Vials Using an Immunochromatographic Assay. J Microbiol Methods. 2017 May 5. pii: S0167-7012 : 30113-6

H. **Y. Glupczynski, A. Jousset, S. Evrard, R. Bonnin, TD Huang, L. Dortet, P. Bogaerts and T. Naas.** Evaluation of a new multiplex immunochromatographic assay OKN K-SeT for the rapid detection of OXA-48, KPC and NDM carbapenemases from cultured bacteria. 27th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Diseases April 22 – 25, 2017

I. **C. Trouvé, R. De Smedt and E. De Laer.** Evaluation of five commercial confirmation tests for Carbapenemase-Producing Enterobacteriaceaein an OXA-48 endemic geographic region. 27th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Diseases April 22 – 25, 2017

J. **E. Riccobono, A. Antonelli, P. Pecile, P. Bogaerts, MM. D'Andrea, GM. Rossolini.** Evaluation of the KPC K-SeTVR immunochromatographic assay for the rapid detection of KPC carbapenemase producers from positive blood cultures. J Antimicrob Chemother. 2017 Nov 8. doi: 10.109

K. **AC. Ramos, AC. Gales, J. Monteiro, S. Silbert, T. Chagas-Neto, AMO. Machado, CG. Carvalhaes.** Evaluation of a rapid immunochromatographic test for detection of distinct variants of Klebsiella pneumoniae carbapenemase (KPC) in Enterobacteriaceae. J Microbiol Methods. 2017 Nov;142:1-3

L. **F. Erdem, A. Abulaila, Z. Aktas, O. Oncul.** Comparison of the Novel Oxa-48 and Kpc K-SeT Assay, and Blue-Carba Test for the Detection of Carbapenemase-Producing Enterobacteriaceae Using PCR as a Reference Method. Clin Lab. 2017 Mar 1;63(3):515-522.

M. **DW Wareham and MH Abdul Momin.** Rapid Detection of Carbapenemases in Enterobacteriaceae: Evaluation of the RESIST-3 O.K.N (OXA-48, KPC, NDM) Multiplexed Lateral Flow Assay. J Clin Microbiol. 2017 Feb 1. pii: JCM.02471-16

N. **E Rubio, Y Zboromyrska, C Pitart, I Campo, I Alejo-Cancho, A Fasanella, A Vergara, F Marco, J Vila.** Evaluation of a rapid immunochromatographic test for the detection of OXA-48 carbapenemase. Diagn Microbiol Infect Dis. 2017 Mar;87(3):266-267

O. **F Koroska, S Göttig, M Kaase, J Steinmann, S Gatermann, J Sommer, T Wille, G Plum, A Hamprecht.** Comparison of phenotypic tests and an immunochromatographic assay and development of a new algorithm for OXA-48-like detection. J Clin Microbiol. 2016 Dec 28. Pii: JCM.01929-16

P. **F Pasteran, L Denorme, I Ote, S Gomez, D De Belder, Y Glupczynski, P Bogaerts, B Ghiglione, P Power, P Mertens, A Corso.** Rapid identification of OXA-48 and OXA-163 subfamily in carbapenem resistant gram-negative bacilli with a novel immunochromatographic lateral flow assay. J Clin Microbiol. 2016 Aug; 54(11):2832-2836

Q. **D. Meunier, A. Vickers, R. Pike, R.L. Hill, N. Woodford and K.L. Hopkins**. Evaluation of the K-SeT R.E.S.I.S.T. immunochromatographic assay for the rapid detection of KPC and OXA-48-like carbapenemases. J Antimicrob Chemother. 2016 Aug; 71 (8):2357-9

R. **Wareham DW, Shah R, Betts JW, Phee LM, Abdul Momin MH.** Evaluation of an Immunochromatographic Lateral Flow Assay (OXA-48 K-SeT) for the Rapid Detection of OXA-48-like Carbapenemases in Enterobacteriaceae. . J Clin Microbiol. 2016 Feb;54 (2):471-3

S. **Fernández J, Fleites A, Rodcio MR, Vazquez F.** Evaluation of OXA-48 K-Se T: an immunochromatographic assay for rapid detection of OXA-48-producing Enterobacteriaceae. Diagn Microbiol Infect Dis. 2016 May;85 (1):12-5

T. **Dortet L, Jousset A, Sainte-Rose V, Cuzon G, Naas T.** Prospective evaluation of the OXA-48 K-SeT assay, an immunochromatographic test for the rapid detection of OXA-48-type carbapenemases. J Antimicrob Chemother. 2016 Jul;71 (7):1834-40

U. **Glupczynski Y, Evrard S, Ote I, Mertens P, Huang TD, Leclipteux T, Bogaerts P.** Evaluation of two new commercial immunochromatographic assays for the rapid detection of OXA-48 and KPC carbapenemases from cultured bacteria. J Antimicrob Chemother. 2016 May;71(5):1217-22

V. **B.M. Willey, X. Trimi, R. Ioboni, D.A. Boyd, G. Ricci, D.N. Grohn, D. Terenzi, A. Mazzulli, L. Mataseje, M. Mulvey, P. Lo, T. Mazzulli, S.M. Poutanen**. The Coris BioConcept OXA48 K-SeT Immuno-Chromatographic Assay Detects OXA48-type Carbapenemases with High Sensitivity and Specificity. 26th European Congress of Clinical Microbiology and Infectious Diseases, Amsterdam April 9-12, 2016

W. **P. Bogaerts, S. Evrard, G. Cuzon, TD. Huang, T. Naas and Y. Glupczynski** Specificity of the OXA-48 immunochromatographic K-SeT for the detection of OXA-48 like in Shewanella spp. 26th European Congress of Clinical Microbiology and Infectious Diseases, Infectious Amsterdam April 09 – 12, 2016

Last update: 27 NOVEMBER 2019

REF	Catalogue number		Manufacturer
IVD	*In vitro* diagnostic medical device		Temperature limits
	Contains sufficient for <n> tests	LOT	Lot number
	Consult instructions for use		Do not reuse
	Keep dry		Use by
DIL SPE	Diluent specimen	CONT NaN_3	Contains Sodium azide

O.K.N.V.I. RESIST-5

Manufacturer:

Coris BioConcept
CREALYS Science Park
Rue Guillaume Fouquet, 11
5032 GEMBLOUX
BELGIUM
Tel.: +32(0)81.719.917
Fax: +32(0)81.719.919
info@corisbio.com
Produced in BELGIUM

www.corisbio.com
IFU-58R11/EN/06

***In vitro* rapid diagnostic test for the detection of OXA-48, KPC, NDM, VIM and IMP carbapenemases in bacterial culture**

FOR IN VITRO DIAGNOSTIC USE **EN**
FOR PROFESSIONAL USE ONLY
References: K-15R11, 2x20 cassettes, buffer, 20 tubes and transfer pipets

I. INTRODUCTION

Carbapenemase-producing Organisms (CPO), and more specifically, Carbapenem-resistant Enterobacteriaceae (CRE) represent a major public health concern worldwide due to their broad spectrum of resistance to antibiotics including, besides carbapenems, most classes of antimicrobial agents, and thus leaving very few options for the management of infected patients. Besides CREs, CPOs also include nonfermenting Gram-negative bacilli (NFGNB), such as *Pseudomonas aeruginosa* and *Acinetobacter baumannii* that exhibit resistance not only to beta lactam and other groups of antibiotics, but also to carbapenems. The rapid spread of CPOs and genes encoding these resistances has led to nosocomial outbreaks and endemic situations worldwide.
Development of new rapid diagnostic tests to track antimicrobial resistance patterns is considered as one of the priority core actions by international experts and health authorities. NDM and KPC represent two of the most increasing and prevalent carbapenemases in many countries. On the other hand, class D OXA-48 type carbapenemases are the most challenging resistance mechanisms to be detected by clinical laboratories. VIM is not only present in Enterobacteriaceae but is also highly prevalent in non-fermenting bacteria. IMP should be regarded as a potential problem since they degrade not only C3G but also carbapenem antimicrobial drug like Imipenem. IMP prevalence is the lowest, apart from Japan where it is more prevalent.
Inhibitor-based phenotypic confirmatory tests exist for the confirmation of class A (KPC) and class B (VIM, IMP, NDM) carbapenemases, Nowadays, definitive confirmation of CPO resistance mechanism relies on molecular assays. These tests are expensive and can only be performed in dedicated environment and by skilled personnel, hence limiting their more generalized usage.
O.K.N.V.I. RESIST-5 test is part of Coris BioConcept RESIST range of antimicrobial resistance diagnostic tests.

II. PRINCIPLE OF THE TESTS

These tests are ready to use and are based on a membrane technology with colloidal gold nanoparticles. Our kit is aimed to detect and identify the carbapenemases from a bacterial colony isolate of Enterobacteriaceae or NFGNB growing on agar plate. Each pouch contains: 2 lateral-flow cassettes for the identification of (i) OXA-48, KPC, NDM and (ii) VIM and IMP.
Identification of OXA-48, KPC and NDM. A nitrocellulose membrane is sensitised with:
(1) a monoclonal antibody directed against OXA-48 carbapenemase and variants (except OXA-163-like enzymes) (“O” line)
(2) a monoclonal antibody directed against KPC carbapenemase (“K” line)
(3) a monoclonal antibody directed against NDM carbapenemase (“N” line)
(4) a control capture reagent (upper “C” line).
Four different colloidal gold nanoparticles conjugates are dried on a membrane: a conjugate directed against a second epitope of the OXA-48 carbapenemase, a conjugate directed against a second epitope of the KPC carbapenemase, a third conjugate specific to NDM carbapenemase and a control conjugate to validate the test conditions.
Identification of VIM and IMP. A nitrocellulose membrane is sensitised with:
(1) a monoclonal antibody directed against VIM carbapenemase (“V” line),
(2) a monoclonal antibody directed against IMP carbapenemase (“I” line)
(3) a control capture reagent (upper “C” line).
Three different colloidal gold nanoparticles conjugates are dried on a membrane: a conjugate directed against VIM carbapenemase, a conjugate directed against IMP carbapenemase and a control conjugate.
When the provided buffer containing the resuspended bacteria comes into contact with the membrane, the solubilised conjugates migrate with the sample by passive diffusion, while conjugates and sample material come into contact with the immobilised respective antibodies that are adsorbed onto the nitrocellulose strip. If the sample contains an OXA-48, KPC, NDM, VIM or IMP carbapenemase, the respective complexes made of the conjugates and either OXA-48, or KPC, or NDM or VIM or IMP will remain bound to their respective specific lines (OXA-48 : “O” line; KPC : “K” line; NDM : “N” line, VIM : “V” line, IMP : “I” line). The migration continues by passive diffusion and both conjugates and sample material come into contact with the (upper) line control reagent that binds a control conjugate (“C” line), thereby producing a red line.
The result is visible within 15 minutes in the form of red lines on the strip.

III. REAGENTS AND MATERIALS

1. O.K.N.V.I. RESIST-5 (2x20 cassettes)
20 sealed pouches containing two lateral-flow cassettes and one desiccant.
Each cassette contains one sensitised strip.
2. LY-D buffer vial (7 mL)
Tris-EDTA solution containing NaN_3 (<0.1%) and a detergent.
3. Instruction for use (1)
4. Disposable collection tubes (20)
5. Disposable transfer pipettes (20)

Materials to be ordered separately:
- RESIST-BC (S-1001): reagents kit for use with blood culture
- ReSCape (S-1002): reagents kits for use with rectal swab

IV. SPECIAL PRECAUTIONS

- All operations linked to the use of the test must be performed in accordance with good laboratory practices.
- All reagents are for *in vitro* diagnostic use only.
- Pouch must be opened with care.
- Avoid touching nitrocellulose with your fingers.
- Wear gloves when handling samples.
- Never use reagents from another kit.
- Green lines indicate immunoreagents adsorption sites. Green colour disappears during the test.
- The quality of the reagents cannot be guaranteed beyond their shelf-life dates or if reagents are not stored under required conditions as indicated in the insert.

V. WASTE DISPOSAL

- Dispose of gloves, swabs, test tubes and used devices in accordance with GLP.
- Each user is responsible for the management of any waste produced, and must ensure that it is disposed of in accordance with the applicable legislation.

VI. STORAGE

- An unopened pouch may be kept at between 4 and 30°C and used until the shelf-life date indicated on the packaging. Once the pouch is opened, run the test immediately.
- Avoid freezing devices and buffer.

VII. SPECIMEN HANDLING AND COLLECTION

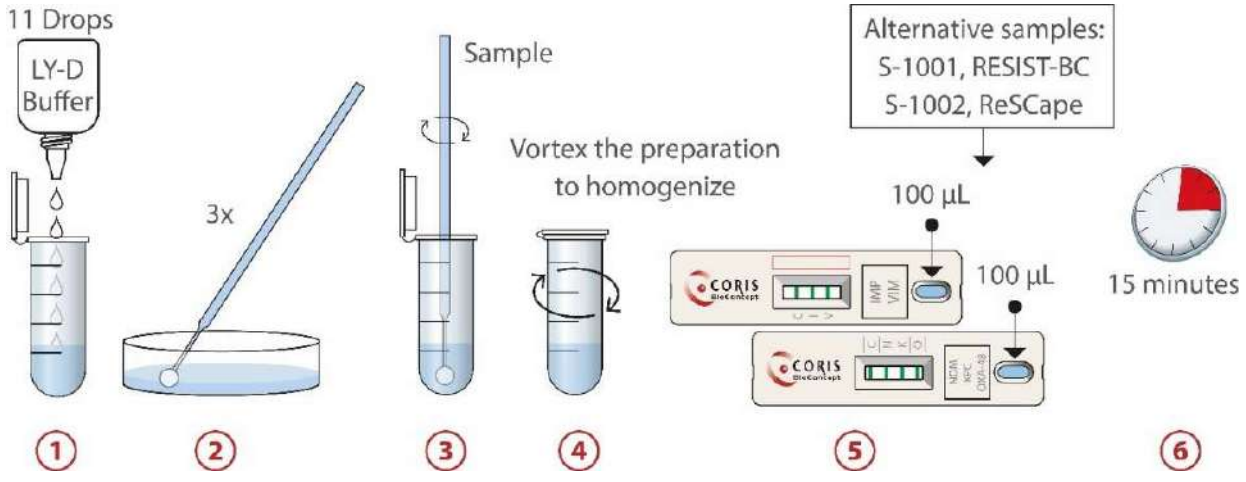
Specimens to be tested should be obtained and handled by standard microbiological methods.
Make sure that the specimens are not treated with solutions containing formaldehyde or its derivatives.
Culture media tested and validated with Coris BioConcept RESIST kits are listed on the website: https://www.corisbio.com/products/oknvi-resist-5/faq

VIII. PROCEDURE

PREPARATIONS OF THE TEST:
Allow kit components, in unopened packaging, and specimens (in the event that the plate containing colony to be tested was kept at 4°C) to equilibrate at room temperature (15-30°C) before performing a test.
Open the pouch and remove the device. Once opened, run the test immediately. Indicate the patient’s name or specimen number on the device (one device per sample).

SPECIMEN PREPARATION PROCEDURE:
Performance claims with regard to sample types other than bacterial colonies have been established for rectal swabs and blood cultures.
With rectal swabs and blood cultures, the preparation procedure has to be followed as described in the respective kits (S-1002, ReSCape and S-1001, RESIST-BC)
With bacterial colonies, we recommend the use of fresh agar cultures for optimal test performance and as followed:

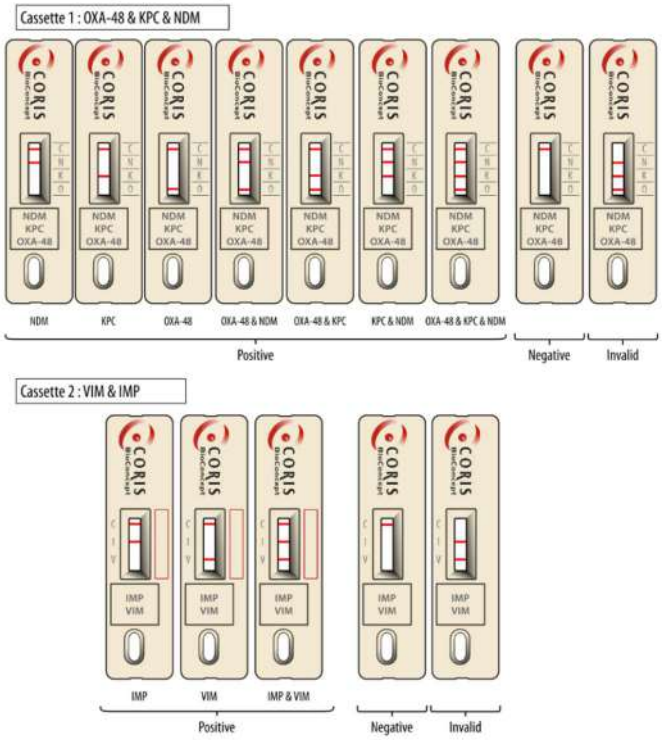
1. Prepare one collection tube and add **11 drops** of LY-D buffer in the tube
2. Harvest bacteria by taking **3 colonies** with a disposable bacteriological loop and dip the loop in the bottom of the tube containing the buffer. The same bacteriological loop can be used to collect the 3 colonies.
3. Stir thoroughly before removing the loop.
4. Close de tube and vortex the preparation to homogenize.
5. Use the transfer pipette provided in the kit and add 100 µL of diluted sample into the sample well of each of the two cassettes labelled (i) NDM, KPC and OXA-48 and (ii) IMP and VIM (**diluted sample must reach the black line indicated on the transfer pipette to accurately aspirate 100 µL**).
6. Allow to react for 15 minutes and read the result.



Positive results may be reported as soon as the test and control lines become visible.
Do not take the appearance of new lines into account after the reaction time has passed.
The result must be read on still wet strip.

IX. INTERPRETING RESULTS

The results are to be interpreted as follows for each of the two cassettes:
Negative test result: a reddish-purple line appears across the central reading window at the Control line (C) position. No other line is present.
Positive test result: in addition to a reddish-purple line at the Control line (C), a visible reddish-purple line appears at one of the Test lines position ("N" or "K" or "O") on cassette labelled (i) NDM, KPC, OXA-48 or at one of the Test lines position ("I" or "V") on cassette labelled (ii) IMP and VIM. Intensity of the test line may vary according to the quantity of antigens as well as of the variant type present in the sample. Any reddish-purple test line (OXA-48, KPC, NDM, VIM and IMP), even weak, should be considered as a positive result.
If a positive test line appears beside of the "O" mark, the sample contains OXA-48 or OXA-48-like variants. If it appears beside the "K" mark, the sample contains KPC variants; beside the "N" mark, the sample contains NDM; the "V" mark, the sample contains VIM; and beside of the "I" mark, IMP is present in the sample. Combinations of positive test lines can occur.
In this case the sample contains several carbapenemases.
Invalid test result: The absence of a Control line indicates a failure in the test procedure. Repeat invalid tests with a new test device.
Note: during the drying process, a very faint shadow may appear at the Test line positions. It should not be regarded as a positive result.



X. PERFORMANCE

A. Detection Limit

The detection limit determined with purified recombinant proteins of OXA-48, KPC, NDM, VIM and IMP have been evaluated at 0.25 ng/mL, 0.5 ng/mL, 0.0625 ng/mL, 0.23 ng/mL and 0.781 ng/mL, respectively.

B. Retrospective study

The test cassettes were validated by comparison with reference molecular method (validated in house multiplex PCR including sequencing) in a retrospective study performed on 180 non duplicated, consecutive suspected CPE clinical isolates collected between 2012 and 2021 from Belgian hospitals.

Molecular method / OXA-48 test	Positive	Negative	Total
Positive	41	0	41
Negative	0	139	139
Total	41	139	180

95 % Confidence Interval [1]

Sensitivity:	100 %	(89.3 to 100 %)
Specificity:	100 %	(96.6 to 100 %)
Positive Predictive value:	100 %	(89.3 to 100 %)
Negative predictive value:	100 %	(96.7 to 100 %)
Agreement:	100 %	(180/180)

Molecular method / KPC test	Positive	Negative	Total
Positive	24	0	24
Negative	0	156	156
Total	24	156	180

95 % Confidence Interval [1]

Sensitivity:	100 %	(82.8 to 100 %)
Specificity:	100 %	(97.0 to 100 %)
Positive Predictive value:	100 %	(82.8 to 100 %)
Negative predictive value:	100 %	(97.0 to 100 %)
Agreement:	100 %	(180/180)

Molecular method / NDM test	Positive	Negative	Total
Positive	40	0	40
Negative	0	140	140
Total	40	140	180

95 % Confidence Interval [1]

Sensitivity:	100 %	(89.1 to 100 %)
Specificity:	100 %	(96.7 to 100 %)
Positive Predictive value:	100 %	(89.1 to 100 %)
Negative predictive value:	100 %	(96.7 to 100 %)
Agreement:	100 %	(180/180)

Molecular method / VIM test	Positive	Negative	Total
Positive	43	0	43
Negative	3	134	137
Total	46	134	180

95 % Confidence Interval [1]

Sensitivity:	93.5 %	(81.1 to 98.3 %)
Specificity:	100 %	(96.5 to 100 %)
Positive Predictive value:	100 %	(89.8 to 100 %)
Negative predictive value:	97.8 %	(93.2 to 99.4 %)
Agreement:	98.3 %	(177/180)

Molecular method / IMP test	Positive	Negative	Total
Positive	19	0	19
Negative	0	161	161
Total	19	161	180

95 % Confidence Interval [1]

Sensitivity:	100 %	(79.1 to 100 %)
Specificity:	100 %	(97.1 to 100 %)
Positive Predictive value:	100 %	(79.1 to 100 %)
Negative predictive value:	100 %	(97.1 to 100 %)
Agreement:	100 %	(180/180)

The O.K.N.V.I. RESIST-5 kit was also validated with rectal swabs and blood cultures.

C. Repeatability and reproducibility

To check intra-batch accuracy (repeatability), the same positive samples and a buffer solution were processed 15 times on kits of the same production batch in the same experimental conditions. All observed results were confirmed as expected.
To check inter-batch accuracy (reproducibility), some samples (positive and buffer) were processed on kits from three different production batches. All results were confirmed as expected.

XI. LIMITS OF THE KIT

The test is qualitative and cannot predict the quantity of antigens present in the sample. Clinical presentation and other test results must be taken into consideration to establish diagnosis. A positive test does not rule out the possibility that other antibiotic resistance mechanisms may be present.

XII. TECHNICAL PROBLEMS / COMPLAINTS

If you face a technical problem or if performances do not correspond with those indicated in this package insert:

1. Record the lot number of the kit concerned.
2. If possible, keep the sample in the appropriate storage condition during the complaint management.
3. Contact Coris BioConcept (client.care@corisbio.com) or your local distributor.

Any serious incident that has occurred in relation to the device shall be reported to the manufacturer and the competent authority of the Member State in which the user and/or the patient is established.

XIII. BIBLIOGRAPHIC REFERENCES

A. **J. Wesley MacDonald and V. Chibabhai Evaluation of the RESIST-4 O.K.N.V immunochromatographic lateral flow assay for the rapid detection of OXA-48, KPC, NDM and VIM carbapenemases from cultured isolates** Access Microbiology 2019;1
B. T. Pilate, S. Desmet Detection of carbapenemase production in pseudomonas aeruginosa in a tertiary care centre Annual Meeting of the Royal Belgian Society of Laboratory Medicine November 15th, 2019 Belgium
C. **Oueslati S, Iorga BI, Tlili L, Exilie C, Zavala A, Dortet L, Jousset AB, Bernabeu S, Bonnin RA, Naas T.** Unravelling ceftazidime/avibactam resistance of KPC-28, a KPC-2 variant lacking carbapenemase activity. **J Antimicrob Chemother. 2019 Aug 1;74(8):2239-2246**
D. **Brolund A, Lagerqvist N, Byfors S, Struelens MJ, Monnet DL, Albiger B, Kohlenberg A.** Worsening epidemiological situation of carbapenemase-producing Enterobacteriaceae in Europe, **assessment by national experts from 37 countries, July 2018. Euro Surveill. 2019 Feb; 24 (9) 1560-7917**
E. **Oliveira J, Reygaert WC.** Gram Negative Bacteria. **StatPearls Publishing; 2019 Jan-2019**
F. **Baeza LL, Pfennigwerth N, Greissl C, Göttig S, Saleh A, Stelzer Y, Gatermann SG, Hamprecht A.** Comparison of five methods for detection of carbapenemases in Enterobacterales with proposal of a new algorithm. **Clin Microbiol Infect. 2019 Mar 18. pii: S1198-743X(19)30104-1**
G. **Rösner S, Kamalanabhaiah S, Küsters U, Kolbert M, Pfennigwerth N, Mack D.** Evaluation of a novel immunochromatographic lateral flow assay for rapid detection of OXA-48, NDM, KPC and VIM carbapenemases in multidrug-resistant Enterobacteriaceae. **J Med Microbiol. 2019 Mar;68(3):379-381.**
H. **Glupczynski Y, Evrard S, Huang TD, Bogaerts P.** Evaluation of the RESIST-4 K-SeT assay, a multiplex immunochromatographic assay for the rapid detection of OXA-48-like, KPC, VIM and NDM carbapenemases. **J Antimicrob Chemother. 2019 Feb 6. doi: 10.1093**

Last update : 20 FEBRUARY 2023

REF	Catalogue number		Manufacturer
IVD	In vitro diagnostic medical device		Temperature limits
Σ	Contains sufficient for <n> tests	LOT	Batch code
	Consult instructions for use		Do not reuse
	Keep dry		Use by
DIL SPE	Diluent specimen	CONT NaN_3	Contains Sodium azide
UDI	Unique device identifier		

[1] Newcombe, Robert G. "Two-Sided Confidence Intervals for the Single Proportion: Comparison of Seven Methods," *Statistics in Medicine,* **17**, 857-872 (1998).

Optochin Discs

DD009

Optochin Discs are used for identification and differentiation of *Streptococcus pneumoniae* and Viridans Streptococci.

Directions

Prepare Soyabean Casein Digest Agar (M290) w/blood or Blood Agar Base (M073) plates and streak pure culture of organism to be tested across one half of the plate. Streak a known Pneumococcus culture across the other half of the plate as positive control. Immediately place Optochin discs in the centre of the two halves of the plate and incubate at 35-37°C for 18-24 hours. Observe for zone of inhibition around the discs.

Principle And Interpretation

Alpha haemolytic (viridans) streptococci and Pneumococcus (*Streptococcus pneumoniae*) cannot be easily distinguished on Blood Agar plates as pneumococci strain shows partial clearing of blood and greenish discolouration (a-hemolysis). Optochin is inhibitory for pneumococcal growth whereas other streptococci strains show good growth or a very small zone of inhibition. Bowers and Jeffries have shown a correlation between bile solubility and full Optochin susceptibility for the differentiation of Streptococcus pneumoniae from other streptococci (1).

Hence optochin test is a useful diagnostic aid for identification / differentiation of pneumococci and viridans Streptococci.

Optochin discs are filter paper discs impregnated with optochin. The test is based on the property of viridans streptococci to grow in the presence of Optochin (ethyl hydrocuprein hydrochloride) which inhibits pneumococci. This test is performed for the diagnosis of penumococcal infections. Specimens of sputum, lung aspirate, pleural fluid, CSF, urine or blood are first examined by Gram's stain, cultured and the isolates are then subjected to Optochin Sensitivity Test.

Quality Control

Appearance

Filter paper discs of 6 mm diameter bearing letters "Op" in continuous printing style.

Cultural response

Cultural response observed after an incubation at 35-37°C for 18-24 hours at on seeded Soyabean Casein Digest Agar (M290) with added sterile defibrinated blood, using Optochin discs.

Organism	**Zone of inhibition**
Streptococcus pneumoniae *ATCC 6303*	More than or equal to 15mm

Storage and Shelf Life

Store at 2 - 8°C. Use before expiry date on the label.

Reference

1.Bowers E.F. and Jeffries L.R., 1995, J. Clin. Path., 8:58.

Revision : 1 / 2011

CE

Oxidase Discs

DD018

Oxidase Discs are used for detection of oxidase production by microorganisms like Neisseria, Alcaligenes, Aeromonas, Vibrio's, Campylobacter and Pseudomonas, which give positive reactions and for excluding Enterobacteriaceae, which give negative reactions.

Directions

Oxidase reaction is carried out by touching and spreading a well isolated colony on the oxidase disc. The reaction is observed within 5-10 seconds at 25-30°C. A change later than 10 seconds or no change at all is considered negative reaction.

Precautions

1. ,,Do not use stainless steel or nichrome inoculating wires, as false positive reaction may result from surface oxidation products formed during flame sterilization.

2. ,,Growth from media containing dyes is not suitable for testing.

3. ,,Timing is critical (5-10 sec) for interpretation of results.

4. ,,Perform oxidase test on all gram-negative bacilli.

5. ,,Cytochrome oxidase production may be inhibited byacid production. False negative reactions may be exhibited by Vibrio, Aeromonas and Plesiomonas species when grown on a medium containing fermentable carbohydrate e.g. MacConkey Agar (M081). Colonies taken from media containing nitrate may give unreliable results. The loss of activity of the oxidase reagent is caused by auto-oxidation which may be avoided by adding 0.1% ascorbic acid (3).

Principle And Interpretation

Certain bacteria posses either cytochrome oxidase or indophenol oxidase (an iron-containing haemoprotein), which catalyzes the transport of electrons from donor compounds (NADH) to electron acceptors (usually oxygen). In the oxidase test, a colourless dye such as N, N-dimethy-p-phenylenediamine serves as an artificial electron acceptor for the enzyme oxidase. The dye is oxidized to form indophenol blue, a coloured compound. The test is useful in the initial characterization of aerobic gram-negative bacteria of the genera Aeromonas, Plesiomonas, Pseudomonas, Campylobacter and Pasteurella.

Oxidase discs are sterile filter paper discs impregnated with N, N-dimethyl-p-phenylenediamine oxalate, ascorbic acid and a-naphthol. These discs overcome the neccessity of daily preparation of fresh reagent. Gordon and McLeod (1) introduced oxidase test for identifying gonococci based upon the ability of certain bacteria to produce indophenol blue from the oxidation of dimethyl-p-phenylenediamine and a-naphthol. Gaby and Hadley (2) introduced a more sensitive method by using N, N-dimethyl-p-phenylenediamine oxalate where all staphylococci were oxidase negative. In a positive reaction the enzyme cytochrome oxidase combines with N,N-dimethyl-p-phenylenediamine oxalate and a-naphthol to form the dye, indophenol blue.

Quality Control

Appearance

Filter paper discs of 10 mm diameter

Cultural response

Typical oxidase reaction given by 18-48 hour culture observed within 5-10 seconds at 25-30°C.

Organism	Reaction Observed
Pseudomonas aeruginosa ATCC 27853	positive : deep purplish blue colouration of disc

Neisseria gonorrhoeae ATCC 19424	positive : deep purplish blue colouration of disc
Escherichia coli ATCC 25922	negative : purplish blue colouration after 10 sec/ no colour change
Staphylococcus aureus ATCC 25923	negative : no colour change

Storage and Shelf Life

Store at 2 - 8°C. Use before expiry date on the label.

Reference

1.Gordon J. and Mcleod J.W., 1928, J. Path. Bact., 31:185
2.Gaby W.L and Hadley C., 1957. J. Bact., 74:356
3.Steel. K.J. 1962. J. Appl. Bact. 25:445

Revision : 1 / 2011

Ch250 Selective Supplement

FD283R

An antibiotic supplement recommended for the selective isolation of *Candida* species.

Composition

Per vial sufficient for 500 ml medium

*Ingredients	Concentration
Chloramphenicol	250mg

Directions:

Rehydrate the contents of 1 vial aseptically with 2 ml of 95% queoua ethanol. Mix well and aseptically add to 500 ml of sterile, molten cooled (45-50ºC) HiCrome™ Candida Differential Agar Base M1297AR. Mix well and pour into sterile Petri plates.

Type of specimen

Clinical samples - Blood; Food and dairy samples

Specimen Collection and Handling

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (1,2). For food and dairy samples follow appropriate techniques for handling specimens as per established guidelines (3,4). After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning & Precautions

In Vitro diagnostic use. For professional use only. Read the label before opening the container. Wear protective gloves/ protective clothing/eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling specimens. Safety guidelines may be referred in individual safety data sheets.

Storage and Shelf Life

Store at 2 - 8°C. Use before expiry date on the label.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with sample must be decontaminated and disposed of in accordance with current laboratory techniques (1,2).

Reference

1.Isenberg (Ed.),2004, Clinical Microbiology Procedures Handbook, Vol.3, American Society for Microbiology, Washington. D.C.

2.Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology,11th Edition. Vol. 1.

3.American Public Health Association, Standard Methods for the Examination of Dairy Products, 1978, 14th Ed., Washington D.C.

4.Salfinger Y., and Tortorello M.L., 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.

*** Not For Medicinal Use**

Revision : 02/2023

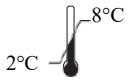
HiMedia Laboratories Pvt. Limited, Plot No.C-40, Road No.21Y, MIDC, Wagle Industrial Area, Thane (W) -400604, MS, India

EC REP

CEpartner4U, Esdoornlaan 13, 3951DB Maarn, NL www.cepartner4u.eu

IVD ***In vitro*** **diagnostic medical device**

CE Marking



Storage temperature

Do not use if package is damaged

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory,diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

Xylose-Lysine Deoxycholate Agar (XLD Agar)

M031

Intended use

Recommended for the isolation and enumeration of *Salmonella* Typhi and other *Salmonella* species from clinical and non-clinical samples.

Composition**

Ingredients	Gms / Litre
Yeast extract	3.000
L-Lysine	5.000
Lactose	7.500
Sucrose	7.500
Xylose	3.500
Sodium chloride	5.000
Sodium deoxycholate	2.500
Sodium thiosulphate	6.800
Ferric ammonium citrate	0.800
Phenol red	0.080
Agar	15.000
Final pH (at 25°C)	7.4±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 56.68 grams in 1000 ml purified / distilled water. Heat with frequent agitation until the medium boils. **DO NOT AUTOCLAVE OR OVERHEAT**. Transfer immediately to a water bath at 50°C. After cooling, pour into sterile Petri plates. It is advisable not to prepare large volumes that will require prolonged heating, thereby producing precipitate. ***Note :*** *Slight precipitation in the medium may occur,which is inheritant property of the medium,and does not affect the performance of the medium.*

Principle And Interpretation

XLD Agar has been recommended for the identification of *Enterobacteriaceae* (1) and for the microbiological testing. XLD Agar was formulated by Taylor (2-6) for the isolation and differentiation of enteric pathogens including *Salmonella* Typhi from other *Salmonella* species of foods, water and dairy products (7-11). XLD Agar exhibits increased selectivity and sensitivity as compared to other plating media e.g. SS Agar (M108), EMB Agar (M022) and Bismuth Sulphite Agar (M027) (3,5,7,12-15). The media formulation does not allow the overgrowth of other organisms over *Salmonella* and *Shigella* (16). Samples suspected of containing enteric pathogens, along with other mixed flora, are initially enriched in Modified Semisolid RV Medium Base (M1482) (17). It is also recommended by FDA (18).

The medium contains yeast extract, which provides nitrogen and vitamins required for growth. Though the sugars xylose, lactose and sucrose provide sources of fermentable carbohydrates, xylose is mainly incorporated into the medium since it is not fermented by Shigellae but practically by all enterics. This helps in the differentiation of *Shigella* species. Sodium chloride maintains the osmotic balance of the medium. Lysine is included to differentiate the *Salmonella* group from the non-pathogens. Salmonellae rapidly ferment xylose and exhaust the supply. Subsequently lysine is decarboxylate by the enzyme lysine decarboxylase to form amines with reversion to an alkaline pH that mimics the *Shigella* reaction. However, to prevent this reaction by lysine-positive coliforms, lactose and sucrose are added to produce acid in excess. Degradation of xylose, lactose and sucrose to acid causes phenol red indicator to change its colour to yellow. Bacteria that decarboxylate lysine to cadaverine can be recognized by the appearance of a red colouration around the colonies due to an increase in pH. These reactions can proceed simultaneously or successively, and this may cause the pH indicator to exhibit various shades of colour or it may change its colour from yellow to red on prolonged incubation. To add to the differentiating ability of the formulation, an H_2S indicator system, consisting of sodium thiosulphate and ferric ammonium citrate, is included for the visualization of hydrogen sulphide produced, resulting in the formation of colonies with black centers. The non-pathogenic H_2S producers do not decarboxylase lysine; therefore, the acid reaction produced by them prevents the blackening of the colonies (2).

XLD Agar is both selective and differential medium. It utilizes sodium deoxycholate as the selective agent and therefore it is inhibitory to gram-positive microorganisms.

Type of specimen

Clinical samples - Faeces; Food and dairy samples; Water samples.

Specimen Collection and Handling:

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (19,20). For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (9,10). For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards (8). After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions :

In Vitro diagnostic Use. For professional use only. Read the label before opening the container. Wear protective gloves/ protective clothing/eye protection/ face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations :

1. Slight precipitation in the medium may occur,which is inheritant property of the medium,and does not affect the performance of the medium.
2. This medium is general purpose medium and may not support the growth of fastidious organisms.
3. Some *Proteus* strains may give red to yellow colouration with most colonies developing black centers, giving rise to false positive reactions.
4. Non-enterics like *Pseudomonas* and *Providencia* may exhibit red colonies.
5. *S.* Paratyphi A, *S.*Choleraesuis, *S.* Pullorum and *S.* Gallinarum may form red colonies without H_2S, thus resembling *Shigella* species.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance

Light yellow to pink homogeneous free flowing powder

Gelling

Firm, comparable with 1.5% Agar gel

Colour and Clarity of prepared medium

Red coloured clear to slightly opalescent gel forms in Petri plates

Reaction

Reaction of 5.67% w/v aqueous solution at 25°C . pH : 7.4±0.2

pH

7.20-7.60

Cultural Response

Cultural response was observed after an incubation at 35-37°C for specified time. Recovery rate is considered as 100% for bacteria growth on Soyabean Casein Digest Agar.

Organism	Inoculum (CFU)	Growth	Observed Lot value (CFU)	Recovery	Colour of Colony	Incubation period
Salmonella Typhimurium ATCC 14028 (00031*)	50 -100	luxuriant	25 -100	>=50 %	red with black centres	18 -72 hrs
Salmonella Abony NCTC 6017 (00029*)	50 -100	good-luxuriant	25 -100	>=50 %	red with black centres	18 -72 hrs
Escherichia coli ATCC 8739 (00012*)	50 -100	fair	10 -30	20 -30 %	yellow	18 -72 hrs
Escherichia coli ATCC 25922 (00013*)	50 -100	fair	10 -30	20 -30 %	yellow	18 -72 hrs

Escherichia coli NCTC 9002	50 -100	fair	10 -30	20 -30 %	yellow	18 -72 hrs
Proteus vulgaris ATCC 13315	50 -100	good-luxuriant	25 -100	>=50 %	grey with black centres	18 -72 hrs
Salmonella Paratyphi A ATCC 9150	50 -100	good-luxuriant	25 -100	>=50 %	red	18 -72 hrs
Salmonella Paratyphi B ATCC 8759	50 -100	good-luxuriant	25 -100	>=50 %	red with black centres	18 -72 hrs
Salmonella Enteritidis ATCC 13076 (00030*)	50 -100	good-luxuriant	25 -100	>=50 %	red with black centres	18 -72 hrs
Salmonella Typhi ATCC 6539	50 -100	good-luxuriant	25 -100	>=50 %	red with black centres	18 -72 hrs
Shigella dysenteriae ATCC 13313	50 -100	good-luxuriant	25 -100	>=50 %	red	18 -72 hrs
Shigella flexneri ATCC 12022 (00126*)	50 -100	fair-good	15 -40	30 -40 %	red	18 -72 hrs
Shigella sonnei ATCC 25931	50 -100	fair-good	15 -40	30 -40 %	red	18 -72 hrs
# *Klebsiella aerogenes* ATCC 13048 (00175*)	50 -100	fair	10 -30	20 -30 %	yellow	18 -72 hrs
Enterobacter cloacae ATCC 13047 (00083*)	50 -100	fair	10 -30	20 -30 %	yellow	18 -72 hrs
Staphylococcus aureus subsp. *aureus* ATCC 25923 (00034*)	>=10^4	inhibited	0	0%		>=72 hrs
Staphylococcus aureus subsp. *aureus* ATCC 6538 (00032*)	>=10^4	inhibited	0	0%		>=72 hrs
Enterococcus faecalis ATCC 29212 (00087*)	>=10^4	inhibited	0	0%		>=72 hrs

Key : *Corresponding WDCM numbers.
(#) Formerly known as *Enterobacter aerogenes*

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 20-30°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use.

Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (19,20).

Reference

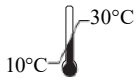
1.Chadwick P., Delisle G. H and Byer M., 1974, Can. J. Microbiol., 20, 1653-1664.
2.Taylor W. L., 1965, Am. J. Clin. Pathol., 44:471-475.
3.Taylor W. L. and Harris B., 1965, Am. J. Clin. Pathol., 44:476.
4.Taylor W. L. and Harris B., 1967, Am. J. Clin. Pathol., 48:350.
5.Taylor W. L. and Schelhart B., 1967, Am. J. Clin. Pathol., 48:356.
6.Taylor W. L. and Schelhart B., 1968, Am. J. Clin. Pathol., 16:1387.
7.Taylor W. L. and Schelhart B., 1969, Appl. Microbiol., 18.393-395.
8.Lipps WC, Braun-Howland EB, Baxter TE,eds. Standard methods for the Examination of Water and Wastewater, 24th ed. Washington DC:APHA Press; 2023.

9.Salfinger Y., and Tortorello M.L. Fifth (Ed.), 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.
10.Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.
11.Williams H., (Ed.), 2005, Official Methods of Analysis of the Association of Official Analytical Chemists, 19th Ed., AOAC, Washington, D.C.
12.Dunn C. and Martin W. J., 1971, Appl. Microbiol., 22, 17-22.
14 MacCarthy M. D., 1966, N. Z. J. Med. Lab. Technol., 20, 127-131.
15. Rollender M. A., Beckford O., Belsky R. D and Kostroff B. 1969, Am. J. Clin. Pathol., 51, 284-286.
16.Taylor W. L. and Schelhart B., 1969, Appl. Micro. 18, 1387-1392.
17.Isenberg H. D., Kominos S., and Sigeal M., 1969, Appl Microbiol., 18, 656-659.
18.FDA Bacteriological Analytical Manual, 2005, 18th Ed., AOAC, Washington, D.C.
19.Isenberg, H.D. Clinical Microbiology Procedures Handbook. 2nd Edition.
20.Jorgensen,J.H., Pfaller , M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.

Revision: 05/2022

HiMedia Laboratories Pvt. Limited,
Plot No.C-40, Road No.21Y,
MIDC, Wagle Industrial Area,
Thane (W) -400604, MS, India

IVD ***In vitro* diagnostic medical device**



Storage temperature

EC REP CEpartner4U, Esdoornlaan 13,
3951DB Maarn, NL
www.cepartner4u.eu

CE Marking

Do not use if package is damaged

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory,diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

Kligler Iron Agar

M078

Intended Use:

Recommended for differential identification of gram-negative enteric bacilli from clinical and non-clinical samples on the basis of the fermentation of glucose (dextrose), lactose and hydrogen sulphide production.

Composition**

Ingredients	Gms / Litre
Peptone	15.000
HM Peptone B #	3.000
Yeast extract	3.000
Proteose peptone	5.000
Lactose	10.000
Dextrose	1.000
Ferrous sulphate	0.200
Sodium chloride	5.000
Sodium thiosulphate	0.300
Phenol red	0.024
Agar	15.000
Final pH (at 25°C)	7.4±0.2

**Formula adjusted, standardized to suit performance parameters

- Equivalent to Beef extract

Directions

Suspend 57.52 grams in 1000 ml purified/distilled water. Heat to boiling to dissolve the medium completely. Mix well and distribute into tubes. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Allow the tubes to cool in slanted position to form slopes with about 1 inch butts. Best reactions are obtained on freshly prepared medium. Do not use screw capped tubes or bottles.

Note: *Avoid overheating otherwise it may produce precipitate in the medium.*

Principle And Interpretation

Kligler Iron Agar is a combination of the lead acetate medium described by Kligler (1,2) and Russels Double Sugar Agar (3) and is used as a differentiation medium for typhoid, dysentery and allied bacilli (4). Bailey and Lacey substituted phenol red for andrade indicator previously used as pH indicator (4). Kligler Iron Agar differentiates lactose fermenters from the non-fermenters. It differentiates *Salmonella* Typhi from other Salmonellae and also *Salmonella* Paratyphi A from *Salmonella* Scottmuelleri and *Salmonella* Enteritidis (5). Fermentation of dextrose results in production of acid, which turns the indicator from red to yellow. Since there is little sugar i.e. dextrose, acid production is very limited and therefore a reoxidation of the indicator is produced on the surface of the medium, and the indicator remains red. However, when lactose is fermented, the large amount of acid produced, avoids reoxidation and therefore the entire medium turns yellow. Kligler Iron Agar, in addition to Peptone, HM peptone B and yeast extract, contains lactose and glucose (dextrose), which enables the differentiation of species of enteric bacilli. Phenol red is the pH indicator, which exhibits a colour change in response to acid produced during the fermentation of sugars. The combination of ferrous sulphate and sodium thiosulphate enables the detection of hydrogen sulfide production, which is evidenced by a black color either throughout the butt, or in a ring formation near the top of the butt. Lactose non-fermenters (e.g., *Salmonella* and *Shigella*) initially produce a yellow slant due to acid produced by the fermentation of the small amount of glucose (dextrose). When glucose (dextrose) supply is exhausted in the aerobic environment of the slant, the reaction reverts to alkaline (red slant) due to oxidation of the acids produced. The reversion does not occur in the anaerobic environment of the butt, which therefore remains acidic (yellow butt). Lactose fermenters produce yellow slants and butts because of lactose fermentation. The high amount of acids thus produced helps to maintain an acidic pH under aerobic conditions. Tubes showing original colour of the medium indicates the fermentation of neither glucose (dextrose) nor lactose. Gas production (aerogenic reaction) is detected as individual bubbles or by splitting or displacement of the agar by the formation of cracks in the butt of the medium.

Pure cultures of suspected organisms from plating media such as MacConkey Agar (M081), Bismuth Sulphite Agar (M027) or Deoxycholate Citrate Agar (M065), SS Agar (M108) etc. are inoculated on Kligler Iron Agar for identification.

Type of specimen

Isolated microorganism from clinical, food, dairy and water samples.

Specimen Collection and Handling

For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards (6). For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (7,8,9). For clinical samples follow appropriate techniques for handling specimens as per established guidelines (10,11). After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

In Vitro diagnostic use. For professional use only. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations

1. Results should be noted after 18-24 hours to avoid erroneous results.
2. Straight wire loop should be used for inoculation.
3. Pure isolates should be used to avoid erroneous results.
4. Other biochemical and serological tests must be performed for complete identification

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance
Light yellow to pink homogeneous free flowing powder
Gelling
Firm, comparable with 1.5% Agar gel
Colour and Clarity of prepared medium
Red coloured, clear to slightly opalescent gel forms in tubes as slants
Reaction
Reaction of 5.75% w/v aqueous solution at 25°C. pH : 7.4±0.2
pH
7.20-7.60
Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for 18 - 48 hours.

Organism	Inoculum (CFU)	Growth	Gas	H2S	Slant	Butt
Escherichia coli ATCC 25922 (00013*)	50-100	luxuriant	positive reaction	negative reaction, no blackening of medium	acidic reaction, yellowing of the medium	acidic reaction, yellowing of the medium
#*Klebsiella aerogenes* ATCC 13048 (00175*)	50-100	luxuriant	positive reaction	negative reaction, no blackening of medium	acidic reaction, yellowing of the medium	acidic reaction, yellowing of the medium
Citrobacter freundii ATCC 8090	50-100	luxuriant	positive reaction	positive reaction, blackening of medium	acidic reaction, yellowing of the medium	acidic reaction, yellowing of the medium
Proteus vulgaris ATCC 6380	50-100	luxuriant	negative reaction	positive reaction, blackening of medium	alkaline reaction, red colour of the medium	acidic reaction, yellowing of the medium
Klebsiella pneumoniae ATCC 13883 (00087*)	50-100	luxuriant	positive reaction	negative reaction,no blackening of medium	acidic reaction, yellowing of the medium	acidic reaction, yellowing of the medium
Salmonella Paratyphi A ATCC 9150	50-100	luxuriant	positive reaction	negative reaction,no blackening of medium	alkaline reaction, red colour of the medium	acidic reaction, yellowing of the medium

Salmonella Schottmuelleri ATCC 10719	50-100	luxuriant	positive reaction	positive reaction, blackening of medium	alkaline reaction, red colour of the medium	acidic reaction, yellowing of the medium
Salmonella Typhi ATCC 6539	50-100	luxuriant	negative reaction	positive reaction, blackening of medium	alkaline reaction, red colour of the medium	acidic reaction, yellowing of the medium
Salmonella Enteritidis ATCC 13076 (00030*)	50-100	luxuriant	positive reaction	positive reaction, blackening of medium	alkaline reaction, red colour of the medium	acidic reaction, yellowing of the medium
Shigella flexneri ATCC 12022 (00126*)	50-100	luxuriant	negative reaction	negative reaction,no blackening of medium	alkaline reaction, red colour of the medium	acidic reaction, yellowing of the medium
Pseudomonas aeruginosa ATCC 27853 (00025*)	50-100	luxuriant	negative reaction	negative reaction, blackening of medium	alkaline reaction, red colour of the medium	alkaline reaction,red colour of the medium
Yersinia enterocolitica ATCC 27729	50-100	luxuriant	variable reaction	negative reaction,no blackening of medium	alkaline reaction,red colour of the medium	acidic reaction, yellowing of the medium
Enterobacter cloacae ATCC 13047 (00083*)	50-100	luxuriant	positive reaction	negative reaction,no blackening of medium	acidic reaction, yellowing of the medium	acidic reaction, yellowing of the medium

Key :* Corresponding WDCM numbers

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 2-8°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (10,11).

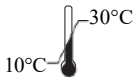
Reference

1.Kligler I. J., 1917, Am. J. Publ. Health, 7:1041.
2.Kligler I. J., 1918, J. Exp. Med., 28:319.
3.Russell F. F., 1911, J. Med. Res., 25:217.
4.Bailey S. F. and Lacey G. R., 1927, J. Bacteriol., 13:183.
5.Ewing, 1986, Edwards and Ewings Identification of the Enterobacteriaceae, 4th Ed., Elsevier Science Publishing Co., Inc., N.Y.
6.Lipps WC, Braun-Howland EB, Baxter TE,eds. Standard methods for the Examination of Water and Wastewater, 24th ed. Washington DC:APHA Press; 2023.
7.American Public Health Association, Standard Methods for the Examination of Dairy Products, 1978, 14th Ed., Washington D.C.
8.Salfinger Y., and Tortorello M.L., 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.
9.Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed.,APHA Inc., Washington, D.C.
10.Isenberg, H.D. Clinical Microbiology Procedures Handbook. 2nd Edition.
11.Jorgensen,J.H., Pfaller , M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1

Revision : 04/2023

HiMedia Laboratories Pvt. Limited,
Plot No.C-40, Road No.21Y,
MIDC, Wagle Industrial Area,
Thane (W) -400604, MS, India

IVD ***In vitro* diagnostic medical device**



Storage temperature

EC REP CEpartner4U, Esdoornlaan 13,
3951DB Maarn, NL
www.cepartner4u.eu

CE **CE Marking**

Do not use if package is damaged

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory,diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

SS Agar (Salmonella Shigella Agar) M108

Intended Use:

Recommended for the isolation of *Salmonella* and some *Shigella* species from pathological specimens, suspected foodstuffs etc.

Composition**

Ingredients	g / L
Peptone	5.000
HM peptone B #	5.000
Lactose	10.000
Bile salts mixture	8.500
Sodium citrate	10.000
Sodium thiosulphate	8.500
Ferric citrate	1.000
Brilliant green	0.00033
Neutral red	0.025
Agar	15.000
Final pH (at 25°C)	7.0±0.2

**Formula adjusted, standardized to suit performance parameters
- Equivalent to Beef extract

Directions

Suspend 63.02 grams in 1000 ml purified /distilled water. Boil with frequent agitation to dissolve the medium completely. DO NOT AUTOCLAVE OR OVERHEAT. Overheating may destroy selectivity of the medium. Cool to about 50°C. Mix and pour into sterile Petri plates.

Principle And Interpretation

SS Agar medium is recommended as differential and selective medium for the isolation of *Salmonella* and *Shigella* species from pathological specimens (1) and suspected foodstuffs (2,3,4,5) and for microbial limit test (6). SS Agar is a moderately selective medium in which gram-positive bacteria are inhibited by bile salts, brilliant green and sodium citrate.

Peptone, HM peptone B provides nitrogen and carbon source, long chain amino acids, vitamins and essential growth nutrients. Lactose is the fermentable carbohydrate. Brilliant green, bile salts and thiosulphate selectively inhibit gram-positive and coliform organisms. Sodium thiosulphate is reduced by certain species of enteric organisms to sulphite and H_2S gas and this reductive enzyme process is attributed by thiosulphate reductase. Production of H_2S gas is detected as an insoluble black precipitate of ferrous sulphide, formed upon reaction of H_2S with ferric ions or ferric citrate, indicated in the center of the colonies.

The high selectivity of Salmonella Shigella Agar allows the use of large inocula directly from faeces, rectal swabs or other materials suspected of containing pathogenic enteric bacilli. On fermentation of lactose by few lactose-fermenting normal intestinal flora, acid is produced which is indicated by change of colour from yellow to red by the pH indicator-neutral red. Thus these organisms grow as red pigmented colonies. Lactose non-fermenting organisms grow as translucent colourless colonies with or without black centers. Growth of *Salmonella* species appears as colourless colonies with black centers resulting from H_2S production. *Shigella* species also grow as colourless colonies which do not produce H_2S.

Type of specimen

Clinical: faeces, rectal swabs; Suspected food stuffs.

Specimen Collection and Handling

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (8,9).
For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (2,3,4,5).
After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

In Vitro diagnostic use. For professional use only. Read the label before opening the container. Wear protective gloves/ protective clothing/eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations

1.The medium is highly selective and may be toxic to certain *Salmonella* or *Shigella* species. Hence it is recommended to use to inoculate plates of less inhibitory media parallel to SS Agar, such as Hektoen Enteric Agar (M467) or Deoxycholate Citrate Agar (M065) for easier isolation of *Shigella* species (9).

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance

Light yellow to pink coloured homogeneous free flowing powder

Gelling

Firm, comparable with 1.5% Agar gel

Colour and Clarity of prepared medium

Reddish orange coloured clear to slightly opalescent gel forms in Petri plates

Reaction

Reaction of 6.3% w/v aqueous solution at 25°C. pH : 7.0±0.2

pH

6.80-7.20

Cultural Response

Cultural characteristics observed after an incubation at 35-37°C for 18-24 hours.

Organism	Inoculum (CFU)	Growth	Recovery	Colour of colony
# *Klebsiella aerogenes* ATCC 13048 (00175*)	50-100	fair	20-30%	cream pink
Escherichia coli ATCC 25922 (00013*)	50-100	fair	20-30%	pink with bile precipitate
Salmonella Choleraesuis ATCC 12011	50-100	good-luxuriant	>=50%	colourless with black centre
Salmonella Typhi ATCC 6539	50-100	good-luxuriant	>=50%	colourless with black centre
Enterococcus faecalis ATCC 29212 (00087*)	50-100	none-poor	<=10%	colourless
Proteus mirabilis ATCC 25933	50-100	fair-good	30-40%	colourless, may have black centre
Shigella flexneri ATCC 12022 (00126*)	50-100	good	40-50%	colourless
Salmonella Typhimurium ATCC 14028 (00031*)	50-100	good-luxuriant	>=50%	colourless with black centre
Salmonella Enteritidis ATCC 13076 (00030*)	50-100	good-luxuriant	>=50%	colourless with black centre

Key : *Corresponding WDCM numbers. # Formerly known as *Enterobacter aerogenes*

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 20-30°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (8,9).

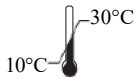
Reference

1. Lennette and others (Eds.), 1985, Manual of Clinical Microbiology, 4th ed., ASM, Washington, D.C.
2. Lipps WC, Braun-Howland EB, Baxter TE,eds. Standard methods for the Examination of Water and Wastewater, 24th ed. Washington DC:APHA Press; 2023.
3. Salfinger Y., and Tortorello M.L. Fifth (Ed.), 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.
4. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed.,APHA Inc., Washington, D.C.
5. Williams S., (Ed.), 2005, Official Methods of Analysis of the Association of Official Analytical Chemists, 19th Ed.,AOAC,Washington, D.C.
6. The United States Pharmacopoeia-National Formulatory (USP-NF), 2022.
7. MacFaddin J., 1985, Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria, Vol. I, Williams and Wilkins, Baltimore.
8. Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
9. Jorgensen,J.H., Pfaller , M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.

Revision : 05/2024

HiMedia Laboratories Pvt. Limited,
Plot No.C-40, Road No.21Y,
MIDC, Wagle Industrial Area,
Thane (W) -400604, MS, India

IVD *In vitro* diagnostic medical device



Storage temperature

EC REP

CEpartner4U, Esdoornlaan 13,
3951DB Maarn, NL
www.cepartner4u.eu

CE **CE Marking**

Do not use if package is damaged

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory,diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

Columbia Blood Agar Base

M144

Intended Use:

For preparation of blood agar, chocolate agar and for preparation of various selective and identification media and isolation of organisms from clinical and non clinical samples.

Composition**

Ingredients	g / L
Peptone, special	23.000
Corn starch	1.000
Sodium chloride	5.000
Agar	15.000
Final pH (at 25°C)	7.3±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 44.0 grams of in 1000 ml purified/ distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C before adding heat sensitive compounds.
For Blood Agar: Add 5% v/v sterile defibrinated sheep blood to sterile cool base.
For Chocolate Agar: Add 10% v/v sterile defibrinated sheep blood to sterile cool base. Heat to 80°C for 10 minutes with constant agitation.
The medium can be made selective by adding different antimicrobials to sterile base.
For *Brucella* species: Add rehydrated contents of 1 vial of NPBCVN Selective Supplement (FD005) to 500 ml sterile molten base.
For *Campylobacter* species: Add rehydrated contents of 1 vial of Blaser-Wang Selective Supplement (FD006) or Butzler Selective Supplement (FD007) or Skirrow Selective Supplement (FD008) or VTCA Selective Supplement (FD090) or Butzler VI Selective Supplement (FD106) to 500 ml sterile molten base along with rehydrated contents of 1 vial of Minerals Growth Supplement (FD009) and 5-7% v/v horse or sheep blood.
For *Gardnerella* species: Add rehydrated contents of 1 vial of GNA Selective Supplement (FD056) to 500 ml sterile molten base.
For Cocci: Add rehydrated contents of 1 vial of NC Selective Supplement (FD030) or NNP Selective Supplement (FD031) or CO Selective Supplement (FD119) to 500 ml sterile molten base.

Principle And Interpretation

Columbia Blood Agar Base was devised by Ellner et al (1). This medium contains special peptone which supports rapid and luxuriant growth of fastidious and non-fastidious organisms. Also, this medium promotes typical colonial morphology; better pigment production and more sharply defined haemolytic reactions. Fildes found that Nutrient Agar supplemented with a digest of sheep blood supplied both of these factors and the medium would support the growth of *H. influenzae* (2,3). The inclusion of bacitracin makes the enriched Columbia Agar Medium selective for the isolation of *Haemophilus* species from clinical specimens, especially from upper respiratory tract (4). Columbia Agar Base is used as the base for the media containing blood and for selective media formulations in which different combinations of antimicrobial agents are used as additives.
Corn starch serves as an energy source and also neutralizes toxic metabolites. Sheep blood permits the detection of haemolysis and also provides heme (X factor) which is required for the growth of many bacteria. However it is devoid of V factor (Nicotinamide adenine dinucleotide) and hence *Haemophilus influenzae* which needs both the X and V factors, will not grow on this medium.
Columbia Agar Base with added sterile serum provides an efficient medium for *Corynebacterium diphtheriae* virulence test medium. After following the established technique for *C. diphtheriae,* lines of toxin-antitoxin precipitation are clearly visible in 48 hours. Many pathogens require carbon dioxide; therefore, plates may be incubated in an atmosphere containing approximately 3-10% CO_2.
Precaution: Brucella cultures are highly infective and must be handled carefully; incubate in 5-10% CO_2. Campylobacter species are best grown at 42°C in a micro aerophillic atmosphere. Plates with Gardenerella supplements plates should be incubated at 35°C for 48 hours containing 7% CO_2 (2).

Type of specimen

Clinical samples : throat swabs, pus.

Specimen Collection and Handling

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (5,6).
After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

In Vitro diagnostic use only. For professional use only. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations

1. Certain fastidious organisms like *Haemophilus influenzae* may not grow on the medium, blood supplementation may be required.
2. As this medium have a relatively high carbohydrate content, beta-hemolytic *Streptococci* may exhibit a greenish hemolytic reaction which may be mistaken for the alpha haemolysis.
3. Biochemical characterization is required on colonies of pure culture for complete identification.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance

Cream to yellow homogeneous free flowing powder.

Gelling

Firm, comparable with 1.5% Agar gel.

Colour and Clarity of prepared medium

Basal medium: Light amber coloured clear to slightly opalescent gel.
After addition of 5%w/v sterile defibrinated blood : Cherry red coloured opaque gel forms in Petri plates.

Reaction

Reaction of 4.4% w/v aqueous solution at 25°C. pH : 7.3±0.2

pH

7.10-7.50

Cultural Response

Cultural characteristics observed with added 5% w/v sterile defibrinatedblood, after an incubation at 35-37°C for 24-48 hours.

Organism	Inoculum (CFU)	Growth	Recovery	Haemolysis
Neisseria meningitidis ATCC 13090	50-100	luxuriant	>=70%	none
Staphylococcus aureus subsp. *aureus* ATCC 25923 (00034*)	50-100	luxuriant	>=70%	beta / gamma
Staphylococcus epidermidis ATCC 12228 (00036*)	50-100	luxuriant	>=70%	gamma
Staphylococcus aureus subsp. *aureus* ATCC 6538 (00032*)	50-100	luxuriant	>=70%	beta / gamma
Streptococcus pneumoniae ATCC 6303	50-100	luxuriant	>=70%	alpha
Streptococcus pyogenes ATCC 19615	50-100	luxuriant	>=70%	beta
Clostridium sporogenes ATCC 19404 (00008*)	50-100	luxuriant	>=50 %	
Clostridium sporogenes ATCC 11437	50-100	luxuriant	>=50 %	
Clostridium perfringens ATCC 13124 (00007*)	50-100	luxuriant	>=50 %	
Clostridium perfringens ATCC 12934	50-100	luxuriant	>=50 %	

Key : (*) Corresponding WDCM numbers.

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 2-8°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (5,6).

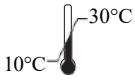
Reference

1. Ellner P. P., Stoessel C. J., Drakeford E. and Vasi F., 1966, Am. J. Clin. Pathol., 45:502.
2. Fildes P., 1920, Br. J. Exp. Pathol., 1:129.
3. Fildes P., 1921, Br. J. Exp. Pathol., 2:16.
4. Chapin K. C. and Doern G. V., 1983, J. Clin. Microbiol., 17:1163.
5. Isenberg, H.D. Clinical Microbiology Procedures Handbook. 2nd Edition.
6. Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.

Revision : 05/2024

HiMedia Laboratories Pvt. Limited,
Plot No.C-40, Road No.21Y,
MIDC, Wagle Industrial Area,
Thane (W) -400604, MS, India

IVD ***In vitro* diagnostic medical device**



Storage temperature

EC REP CEpartner4U, Esdoornlaan 13,
3951DB Maarn, NL
www.cepartner4u.eu

CE **CE Marking**

Do not use if package is damaged

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory,diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

Soyabean Casein Digest Agar (Tryptone Soya Agar) (Casein Soyabean Digest Agar)

M290

Intended use

For cultivation of a wide variety of microorganisms from clinical and non-clinical samples and for sterility testing in pharmaceutical procedures.

Composition**

Ingredients	g/ L
Tryptone #	15.000
Soya peptone	5.000
Sodium chloride	5.000
Agar	15.000
Final pH (at 25°C)	7.3±0.2

**Formula adjusted, standardized to suit performance parameters
Equivalent to Pancreatic digest of casein

Directions

Suspend 40.00 gram in 1000 ml purified/distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. If desired, aseptically add 5% v/v defibrinated blood in previously cooled medium to 45-50°C for cultivation. Mix well and pour into sterile Petri plates.

Principle And Interpretation

Soyabean Casein Digest Agar is a widely used medium, which supports the growth of wide variety of organisms even that of fastidious ones such as *Neisseria, Listeria*, and *Brucella* etc. The medium with addition of blood provides perfectly defined haemolysis zones, while preventing the lysis of erythrocytes due to its sodium chloride content. It has been frequently used in the health industry to produce antigens, toxins etc. It's simple and inhibitor-free composition makes it suitable for the detection of antimicrobial agents in the food and other products. Tryptone Soya Agar is recommended by various pharmacopoeias as sterility testing medium (1,2). Tryptone Soya Agar conforms as per USP (1) and is used in microbial limit test and antimicrobial preservative - effective test. Gunn et al (3) used this medium for the growth of fastidious organisms and study of haemolytic reaction after addition of 5%v/v blood. The combination of tryptone and soya peptone makes this media nutritious by providing amino acids and long chain peptides for the growth of microorganisms. Sodium chloride maintains the osmotic balance. Soyabean Casein Digest Agar does not contains X and V growth factors. It can be conveniently used in determining the requirements of these growth factors by isolates of *Haemophilus* by the addition of X-factor (DD020), V-factor (DD021), and X+V factor discs (DD022) factor to inoculated TSA plates (4).

Type of specimen

Pharmaceutical samples, Clinical samples- urine, faeces, abscess etc.

Specimen Collection and Handling:

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (5,6). For Pharmaceutical samples follow appropriate techniques for sample collection, handling and processing as per pharmacopoeias (1,2). After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

In Vitro diagnostic Use. For professional use only. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/ face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations :

1.Individual organisms differ in their growth requirement and may show variable growth patterns on the medium.
2.Each lot of the medium has been tested for the organisms specified on the COA. It is recommended to users to validate the medium for any specific microorganism other than mentioned in the COA based on the user's unique requirement.
3.Further biochemical and serological tests must be carried out for confirmation.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance

Cream to yellow homogeneous free flowing powder

Gelling

Firm, comparable with 1.5% Agar gel

Colour and Clarity of prepared medium

Basal Medium : Light yellow coloured clear to slightly opalescent gel. After addition of 5-7%w/v sterile defibrinated blood : Cherry red coloured opaque gel forms in Petri plates

Reaction

pH of 4.0% w/v aqueous solution at 25°C .

pH

7.10-7.50

Cultural response

Productivity : Cultural characteristics was observed after an incubation for Bacterial at 30-35°C 18-24 hours and for Fungal at 30-35°C <=5days.

Organism	Inoculum (CFU)	Observed Lot value (CFU)	Recovery	Observed Lot value (CFU) w/blood	Recovery w/ blood	Haemolysis
Productivity						
****Bacillus spizizenii* ATCC 6633 (00003)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	none
Staphylococcus aureus subsp. aureus ATCC 25923 (00034)*	50 -100	35 -100	>=70 %	35 -100	>=70%	beta
Staphylococcus aureus subsp. aureus ATCC 6538 (00032)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	beta
Escherichia coli ATCC 25922 (00013)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	none
Escherichia coli ATCC 8739 (00012)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	none
Escherichia coli ATCC 11775 (00090)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	none
Escherichia coli NCTC 13167 (00179)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	none
Pseudomonas aeruginosa ATCC 27853 (00025)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
^ *Pseudomonas paraeruginosa* ATCC 9027 (00026)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
Pseudomonas aeruginosa ATCC 10145 (00024)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	-

Salmonella Abony NCTC 6017 (00029)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
$ Kokuria rhizophila ATCC 9341	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
Streptococcus pneumoniae ATCC 6305	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
Salmonella Typhimurium ATCC 14028 (00031)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
Enterococcus faecalis ATCC 29212 (00087)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
Candida albicans ATCC 10231 (00054)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
Candida albicans ATCC 2091 (00055)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	-
# Aspergillus brasiliensis ATCC 16404 (00053)*	50 -100	25 -70	50-70%			-
Clostridium sporogenes ATCC 19404 (00008)*	50 -100	35 -100	>=70 %	35 -100	>=70 %	none

Key : (*)- Corresponding WDCM numbers, (**) Formerly known as *Bacillus subtilis* subsp. *spizizenii* , (^) Formerly known as *Pseudomonas aeruginosa*, ($) Formerly known as *Micrococcus luteus* , (*) Formerly known as *Aspergillus niger*

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 20-30°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (5,6).

Reference

1.The United States Pharmacopoeia-National Formulatory (USP-NF), 2022.

2.Indian Pharmacopoeia, 2022, Indian Pharmacopoeia Commission, Ministry of Health and Family Welfare Government of India

3.Gunn B. A., Ohashi D K., Gaydos C. A., Holt E. S., 1977, J. Clin. Microbiol., 5(6) : 650.

4.Forbes B. A., Sahm A. S. and Weissfeld D. F., 1998, Bailey and Scotts Diagnostic Microbiology, 10th Ed., Mosby Inc. St. Louis, Mo

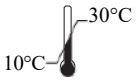
5.Isenberg, H.D. Clinical Microbiology Procedures Handbook. 2nd Edition.

6.Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.

Revision : 04/2024

HiMedia Laboratories Pvt. Limited,
Plot No.C-40, Road No.21Y,
MIDC, Wagle Industrial Area,
Thane (W) -400604, MS, India

IVD ***In vitro*** **diagnostic medical device**



Storage temperature

EC REP CEpartner4U, Esdoornlaan 13,
3951DB Maarn, NL
www.cepartner4u.eu

CE Marking

Do not use if package is damaged

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory,diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

HIMEDIA®

Technical Data

HiCrome™ Candida Differential Agar Base M1297AR

Intended use

HiCrome™ Candida Differential Agar Base is selective and differential medium for rapid isolation and identification of *Candida* species from mixed cultures from clinical and non-clinical samples.

Composition**

Ingredients	g / L
Peptone	4.000
Chromogenic mixture	13.600
Agar	13.600
Final pH (at 25°C)	6.0±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 15.6 gram in 500 ml purified / distilled water. Add the rehydrated contents of one vial of CH250 Selective Supplement (FD283R). Heat to boiling with frequent agitation to dissolve the medium completely. **DO NOT AUTOCLAVE**. Cool to 45-50°C. Mix well and pour into sterile Petri plates.

Principle And Interpretation

Perry and Miller (1) reported that *Candida albicans* produces an enzyme b -N-acetyl- galactosaminidase and according to Rousselle et al (2) incorporation of chromogenic or fluorogenic hexosaminidase substrates into the growth medium helps in identification of *C. albicans* isolates directly on primary isolation. HiCrome™ Candida Differential Agar Base incorporates two chromogens X-NAG which detects the activity of hexosaminidase and BCIP which detects phosphatase activity. HiCrome™ Candida Differential Agar Base is a selective and differential medium, which facilitates rapid isolation of yeasts from mixed cultures and allows differentiation of *Candida* species namely *C.albicans, C.krusei, C.tropicalis* and *C.glabrata* on the basis of colouration and colony morphology. On this medium results are obtained within 48 hours and it is useful for the rapid and presumptive identification of common yeasts in Mycology and Clinical Microbiology Laboratory. Peptone provides nitrogenous, carbonaceous compounds and other essential growth nutrients. Chloramphenicol from the supplement suppresses the accompanying bacterial flora. *C.albicans* appear as light green coloured smooth colonies, *C.tropicalis* appear as blue to metallic blue coloured raised colonies. *C.glabrata, C.kefyr, C.parapsilosis* colonies appear as cream to white, beige/yellow due to natural pigmentation and some alkaline phosphatase activity, while *C.krusei* appear as pink-purple, fuzzy, dry colonies.

Type of specimen

Clinical samples - skin scrapings, urine, Food & dairy samples

Specimen Collection and Handling:

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (3,4).
For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (5,6). After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions :

In Vitro diagnostic Use. For professional use only. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/ face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations :

1.Variations in colour intensity may be observed for *Candida* isolates depending on the presence of enzymes.
2.Other *Candida* species may produce light mauve coloured colonies which is also produced by other yeast cells. This must be confirmed by further biochemical tests.
3.Other filamentous fungi also exhibit colour on this medium.

Performance and evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance

Cream to beige homogeneous free flowing powder

Gelling

Firm, comparable with 1.36% Agar gel

Colour and Clarity of prepared medium

Light amber coloured, opaque gel forms in Petri plates

Reaction

Reaction of 3.12% w/v aqueous solution at 25°C. pH : 6.0±0.2

pH

5.80-6.20

Cultural Response

Cultural characteristics observed with added HiCrome Candida Differential Selective Supplement (FD283R) after an incubation at 30-35°C for 40-48 hours.

Organism	Inoculum (CFU)	Growth	Recovery	Colour of Colony
Candida albicans ATCC 10231 (00054*)	50-100	good-luxuriant	>=50%	light green
Candida glabrata ATCC 15126	50-100	good-luxuriant	>=50%	cream to white
#Teunomyces krusei ATCC 24408	50-100	good-luxuriant	>=50%	purple, fuzzy
Candida tropicalis ATCC 750	50-100	good-luxuriant	>=50%	blue to purple
Candida kefyr ATCC 66058	50-100	good-luxuriant	>=50%	cream to white with slight purple centre
Candida utilis ATCC 9950	50-100	good-luxuriant	>=50%	pale pink to pinkish purple
Candida parapsilosis ATCC 22019	50-100	good-luxuriant	>=50%	white to cream
Candida membranifaciens ATCC 20137	50-100	good-luxuriant	>=50%	white to cream
Candida dubliensis NCPF 3949	50-100	good-luxuriant	>=50%	pale green
Escherichia coli ATCC 25922 (00013*)	>=10^4	inhibited	0%	
Staphylococcus aureus subsp *aureus* ATCC 25923 (00034*)	>=10^4	inhibited	0%	

Key : *Corresponding WDCM numbers. # - Formerly known as *Candida krusei*

Storage and Shelf Life

Store between 15-25°C in a tightly closed container and the prepared medium at 2-8°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (3,4).

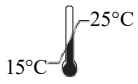
Reference

1.Perry J. L. and Miller G. R., 1987, J. Clin. Microbiol., 25: 2424 -2425.
2.Rousselle P., Freydiere A., Couillerot P., de Montclos H. and GilleY., 1994, J. Clin. Microbiol. 32:3034-3036.
3.Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
4.Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
5 American Public Health Association, Standard Methods for the Examination of Dairy Products, 1978, 14th Ed., Washington D.C.
6.Salfinger Y., and Tortorello M.L., 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.

Revision : 05/2024

HiMedia Laboratories Pvt. Limited,
Plot No.C-40, Road No.21Y,
MIDC, Wagle Industrial Area,
Thane (W) -400604, MS, India

IVD *In vitro* diagnostic medical device



Storage temperature

EC REP CEpartner4U, Esdoornlaan 13,
3951DB Maarn, NL
www.cepartner4u.eu

CE **CE Marking**

Do not use if package is damaged

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory,diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

HiCrome™ UTI Agar

M1353

Intended use

Recommended for presumptive identification and confirmation of microorganisms mainly causing urinary tract infections, can also be used for testing water, food, environmental and other clinical samples.

Composition**

Ingredients	g / L
Peptone, special	15.000
Chromogenic mixture	2.450
Agar	15.000
Final pH (at 25°C)	6.8±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 32.45 gram in 1000 ml purified /distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Cool to 45-50°C. Mix well and pour into sterile Petri plates.

Principle And Interpretation

Urinary tract infections are bacterial infections affecting parts of urinary tract. The common symptoms of urinary tract infection are urgency and frequency of micturition, with associated discomfort or pain. The common condition is cystitis, due to infection of the bladder with a uropathogenic bacterium, which most frequently is *Escherichia coli,* but sometimes *Staphylococcus saprophyticus* or especially in hospital-acquired infections, *Klebsiella* species, *Proteus mirabilis*, other coliforms, *Pseudomonas aeruginosa* or *Enterococcus faecalis* (1). HiCrome™ UTI Agar is formulated on basis of work carried out by Pezzlo (2) Wilkie et al (3), Friedman et al (4), Murray et al (5), Soriano and Ponte (6) and Merlino et al (7). These media are recommended for the detection of urinary tract pathogens where HiCrome™ UTI Agar has broader application as a general nutrient agar for isolation of various microorganisms. It facilitates and expedites the identification of some gram-negative bacteria and some gram-positive bacteria on the basis of different contrasted colony colours produced by reactions of genus or species specific enzymes with two chromogenic substrates. The chromogenic substrates are specifically cleaved by enzymes produced by *Enterococcus* species, *E.coli* and coliforms. Presence of amino acids like phenylalanine and tryptophan from peptones helps for detection of tryptophan deaminase activity, indicating the presence of *Proteus* species, *Morganella* species and *Providencia* species.

One of the chromogenic substrate is cleaved by ß-glucosidase possessed by Enterococci resulting in formation of blue colonies. *E.coli* produce pink colonies due to the enzyme ß-D-galactosidase that cleaves the other chromogenic substrate. Further confirmation of *E.coli* can be done by performing the indole test. Coliforms produce purple coloured colonies due to cleavage of both the chromogenic substrate. Colonies of *Proteus, Morganella* and *Providencia* species appear brown because of tryptophan deaminase activity. Peptone special provides nitrogenous, carbonaceous compounds, long chain amino acids, vitamins and other essential growth nutrients. This medium can be made selective by supplementation with antibiotics for detecting microorganisms associated with hospital borne infections.

Type of specimen

Clinical samples : urine, faeces, etc.; Food samples, Water samples.

Specimen Collection and Handling

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (8,9).

For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (10,11). For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards (12).

After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

In Vitro diagnostic use. For professional use only. Read the label before opening the container. Wear protective gloves/ protective clothing/eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations

1. Since it is an enzyme-substrate based reaction, the intensity of colour may vary with isolates.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance
Cream to yellow homogeneous free flowing powder
Gelling
Firm, comparable with 1.5% Agar gel
Colour and Clarity of prepared medium
Light amber coloured, clear to slightly opalescent gel forms in Petri plates
Reaction
Reaction of 3.24% w/v aqueous solution at 25°C. pH : 6.8±0.2
pH
6.60-7.20
Cultural Response
Cultural characteristics observed after an incubation at 35-37°C for 16-24 hours.

Organism	Inoculum (CFU)	Growth	Recovery	Colour of Colony
Escherichia coli ATCC 25922 (00013*)	50-100	luxuriant	>=70%	Purple to magenta
Enterococcus faecalis ATCC 29212 (00087*)	50-100	luxuriant	>=70%	blue-green (small)
Klebsiella pneumoniae ATCC 13883 (00097*)	50-100	luxuriant	>=70%	blue to purple, mucoid
Proteus mirabilis ATCC 12453	50-100	luxuriant	>=70%	light brown
Pseudomonas aeruginosa ATCC 27853 (00025*)	50-100	luxuriant	>=70%	colourless (greenish pigment may be observed)
Staphylococcus aureus subsp. *aureus* ATCC 25923 (00034*)	50-100	luxuriant	>=70%	golden yellow

Key : *Corresponding WDCM numbers.

Storage and Shelf Life

Store between 15-25°C in a tightly closed container and the prepared medium at 2-8°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use. Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (8,9).

Reference

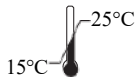
1. Collee J. G., Fraser A. G., Marmion B. P., Simmons A., (Eds.), Mackie and McCartney, Practical Medical Microbiology, 1996, 14th Edition, Churchill Livingstone.
2. Pezzlo M., 1998, Clin. Microbiol. Rev., 1:268-280.
3. Wilkie M. E., Almond M. K., Marsh F. P., 1992, British Medical Journal 305:1137-1141.
4. Friedman M. P. et al, 1991, J. Clin. Microbiol., 29:2385-2389.

5. Murray P., Traynor P. Hopson D., 1992, J. Clin. Microbiol., 30:1600- 1601.
6. Soriano F., Ponte C., 1992, J. Clin. Microbiol., 30:3033-3034.
7. Merlino et al, 1995, Abstr. Austr. Microbiol. 16(4):17-3.
8. Isenberg, H.D. Clinical Microbiology Procedures Handbook 2nd Edition.
9. Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
10. Salfinger Y., and Tortorello M.L., 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.
11. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.
12. Lipps WC, Braun-Howland EB, Baxter TE,eds. Standard methods for the Examination of Water and Wastewater, 24th ed. Washington DC:APHA Press; 2023.

Revision : 07/2024

HiMedia Laboratories Pvt. Limited,
Plot No.C-40, Road No.21Y,
MIDC, Wagle Industrial Area,
Thane (W) -400604, MS, India

IVD *In vitro* diagnostic medical device



Storage temperature

EC REP CEpartner4U, Esdoornlaan 13,
3951DB Maarn, NL
www.cepartner4u.eu

CE CE Marking

Do not use if package is damaged

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal or therapeutic use but for laboratory,diagnostic, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

Cefoxitin (Cephoxitin) CX 30 mcg SD041

Cefoxitin (Cephoxitin) CX 30 mcg discs are used for antimicrobial susceptibility testing of bacterial cultures as per Kirby- Bauer Method

Composition

***Ingredients**

	Concentration
Cefoxitin (Cephoxitin)	30 mcg/disc

Susceptibility Test Procedure:

1. Prepare plates with Mueller Hinton Agar (M173/M1084) for rapidly growing aerobic organisms as per Kirby- Bauer Method. The medium in the plates should be sterile and should have a depth of about 4 mm.
2. Inoculate 4-5 similar colonies with a wire, needle or loop to 5 ml Tryptone Soya Broth (M011) and incubate at 35-37°C for2-8 hours until light to moderate turbidity develops. Compare the inoculum turbidity with that of standard 0.5 McFarland (prepared by mixing 0.5 ml of 1.175% barium chloride and 99.5 ml of 0.36N sulfuric acid). Dilute the inoculum or incubate further as necessary to attain comparative turbidity. Alternatively, the inoculum can be standardized by other appropriate optical method (0.08 - 0.13 OD turbid suspension at 625 nm)
3. Dip a sterile non-toxic cotton swab on a wooden applicator into the standardized inoculum and rotate the soaked swab firmly against the upper inside wall of the tube to express excess fluid. Streak the entire agar surface of the plate with the swab three times, turning the plate at 60° angle between each streaking. Allow the inoculum to dry for 5 - 15 minutes with lid in place.
4. Apply the discs using aseptic technique. When using cartridges, the discs can be applied using the specially designed applicator. When the vials are used, apply the discs using sterile forceps.
5. Deposit the discs with centers at least 24 mm apart. For fastidious organisms and for Penicillins and Cephalosporins, the discs should preferably be deposited with centers 30 mm apart.
6. Incubate immediately at 35 ± 2°C and examine after 16-18 hours or longer, if necessary. For fastidious organisms incubate at appropriate temperature and time.
7. Measure the zones showing complete inhibition and record the diameters of the zones to the nearest millimeter using a calibrated instrument like zone scales (PW096/PW297)

Principle:

Antimicrobial susceptibility testing (AST) of bacterial and fungal isolates is a common and important technique in most clinical laboratories. The results of these tests are used for selection of the most appropriate antimicrobial agent(s) for treatment against the infectious organisms. Till the 1950s, laboratories were lacking in the methodologies and equipments for the accurate determination of in vitro responses of organisms to antimicrobial agents. Bauer et al (1) began the development of standardized methods for antimicrobial susceptibility testing, using disc diffusion system. However the susceptibility results may not always correlate with the patient's response to therapy. The response of an infected patient to antimicrobial agent(s) is a complex interrelationship of host responses, drug dynamics and microbial activity. Antimicrobial susceptibility tests are either quantitative or qualitative. Disc diffusion test is a qualitative test method. The National Committee for Clinical Laboratory Standards (NCCLS), now known as Clinical Laboratory Standards Institute (CLSI) has published comprehensive documents regarding the disc diffusion systems. The agar disc diffusion test is the most convenient and widely used method for routine antimicrobial susceptibility testing. In subsequent and current practice, antimicrobial impregnated paper discs are applied onto the agar surface. Based on the Kirby- Bauer Method, standardized reference procedures for the disc systems were published by WHO and FDA and are periodically updated by the CLSI (formerly NCCLS)(2). For any antimicrobial testing, Quality control or clinical testing, the method to be followed is the same as mentioned above.

However few precautions are to be maintained while handling of the Sensitivity discs,

- On receipt the discs are to be immediately stored at the recommended temperature.
- Medium preparation, Inoculum preparation and incubation to be done as specified.

Interpretation:

Use following interpretive criteria for susceptibility categorization*

Antimicrobial agent	Interpretative criteria for	Sensitive mm or more	Intermediate mm	Resistant mm or less
Cefoxitin (Cephoxitin) 30 mcg	*Enterobacterales*	16	13-15	14
	For S.aureus & S.lugdunensis	22	-	21
	For Coagulase- negative Staphylococci except S.lugdunensis & S.pseudintermedius	25	-	24
	Neisseria gonorhoeae	28	24-27	23

Quality Control:

Appearance: Filter paper discs of 6mm diameter with printed "CX 30" on centre of each side of the disc.

Cultural response: Average diameter of zone of inhibition observed on Mueller Hinton Agar (M173) after 18 hours incubation at 35-37°C for standard cultures.

Organisms (ATCC)	Std. zone of diameter (mm)*
E.coli (25922)	23-29
S.aureus (25923)	23-29

* = Interpretive criteria & QC ranges as per CLSI & EUCAST standards.

Storage and Shelf-life:

On receipt discs should always be stored at -20°C under dry conditions, along with the dessicator provided in individual pack. Use before expiry date on the label.

References:

1. Bauer, Kirby, Sherris and Turck, 1966, Am. J. Clin. Path., 45: 493
2. Performance standards of Antimicrobial Disc Susceptibility Tests, M100S, 32nd Ed., CLSI Vol. 42 No.2, Feb-2022.
3. EUCAST, Breakpoint tables for interpretation of MIC's & zone diameters, version 12.0, valid from 01.01.2022.

Note :
Use following media to carry out susceptibility test
For rapidly growing aerobic organisms : Mueller Hinton Agar (M173/M1084)
For *Haemophilus* spps : Haemophilus Test Agar (M1259 + FD117)
For *S.pneumoniae* : Muller Hinton Agar supplemented with 5% Sheep Blood
For Neisseria spps : G.C.Agar +1% defined growth supplement (M434 + FD025)

*** Not for Medicinal Use**

IVD — In vitro diagnostic medical device

CE Marking

Storage temperature

Do not use if package is damaged

HiMedia Laboratories Pvt. Limited,
C-40, Road No.21Y, MIDC, Wagle Industrial Area, Thane (W)
-400604, MS, India

EC REP — CE Partner 4U ,Esdoornlaan 13, 3951 DB Maarn The Netherlands,
www.cepartner 4u.eu

Revision : 03 / 2022

Disclaimer :

User must ensure suitability of the product(s) in their application prior to use. Products conform solely to the information contained in this and other related HiMedia™ publications. The information contained in this publication is based on our research and development work and is to the best of our knowledge true and accurate. HiMedia™ Laboratories Pvt Ltd reserves the right to make changes to specifications and information related to the products at any time. Products are not intended for human or animal diagnostic or therapeutic use but for laboratory, research or further manufacturing use only, unless otherwise specified. Statements contained herein should not be considered as a warranty of any kind, expressed or implied, and no liability is accepted for infringement of any patents.

Ceftazidime CAZ 30 mcg SD062

Ceftazidime CAZ 30 mcg discs are used for antimicrobial susceptibility testing of bacterial cultures as per Bauer-Kirby Method

Composition

*Ingredients	Concentration
Ceftazidime	30 mcg/disc

Susceptibility Test Procedure:

1. Prepare plates with Mueller Hinton Agar (M173/M1084) for rapidly growing aerobic organisms as per Bauer-Kirby Method. The medium in the plates should be sterile and should have a depth of about 4 mm.
2. Inoculate 4-5 similar colonies with a wire, needle or loop to 5 ml Tryptone Soya Broth (M011) and incubate at 35-37°C for2-8 hours until light to moderate turbidity develops. Compare the inoculum turbidity with that of standard 0.5 McFarland (prepared by mixing 0.5 ml of 1.175% barium chloride and 99.5 ml of 0.36N sulfuric acid). Dilute the inoculum or incubate further as necessary to attain comparative turbidity. Alternatively, the inoculum can be standardized by other appropriate optical method (0.08 - 0.13 OD turbid suspension at 625 nm)
3. Dip a sterile non-toxic cotton swab on a wooden applicator into the standardized inoculum and rotate the soaked swab firmly against the upper inside wall of the tube to express excess fluid. Streak the entire agar surface of the plate with the swab three times, turning the plate at 60° angle between each streaking. Allow the inoculum to dry for 5 - 15 minutes with lid in place.
4. Apply the discs using aseptic technique. When using cartridges, the discs can be applied using the specially designed applicator. When the vials are used, apply the discs using sterile forceps.
5. Deposit the discs with centers at least 24 mm apart. For fastidious organisms and for Penicillins and Cephalosporins, the discs should preferably be deposited with centers 30 mm apart.
6. Incubate immediately at 35 ± 2°C and examine after 16-18 hours or longer, if necessary. For fastidious organisms incubate at appropriate temperature and time.
7. Measure the zones showing complete inhibition and record the diameters of the zones to the nearest millimeter using a calibrated instrument like zone scales (PW096/PW297)

Principle:

Antimicrobial susceptibility testing (AST) of bacterial and fungal isolates is a common and important technique in most clinical laboratories. The results of these tests are used for selection of the most appropriate antimicrobial agent(s) for treatment against the infectious organisms. Till the 1950s, laboratories were lacking in the methodologies and equipments for the accurate determination of in vitro responses of organisms to antimicrobial agents. Bauer et al (1) began the development of standardized methods for antimicrobial susceptibility testing, using disc diffusion system. However the susceptibility results may not always correlate with the patient's response to therapy. The response of an infected patient to antimicrobial agent(s) is a complex interrelationship of host responses, drug dynamics and microbial activity. Antimicrobial susceptibility tests are either quantitative or qualitative. Disc diffusion test is a qualitative test method. The National Committee for Clinical Laboratory Standards (NCCLS), now known as Clinical Laboratory Standards Institute (CLSI) has published comprehensive documents regarding the disc diffusion systems. The agar disc diffusion test is the most convenient and widely used method for routine antimicrobial susceptibility testing. In subsequent and current practice, antimicrobial impregnated paper discs are applied onto the agar surface. Based on the Bauer-Kirby Method, standardized reference procedures for the disc systems were published by WHO and FDA and are periodically updated by the CLSI (formerly NCCLS)(2). For any antimicrobial testing, Quality control or clinical testing, the method to be followed is the same as mentioned above.

However few precautions are to be maintained while handling of the Sensitivity discs,

- On receipt the discs are to be immediately stored at the recommended temperature.
- Medium preparation, Inoculum preparation and incubation to be done as specified.

Interpretation:

Use following interpretive criteria for susceptibility categorization*

Antimicrobial agent	Interpretative criteria for	Sensitive mm or more	Intermediate mm	Resistant mm or less
Ceftazidime 30 mcg	*Enterobacteriaceae, B.cepacia*	21	18-20	17
	P.aeruginosa, Acientobacter & Staphylococcus	18	15-17	14
	Haemophilus influenzae & Haemophilus parainfluenzae	26	-	-
	Neisseria gonorhoeae	31	-	-

Quality Control:

Appearance: Filter paper discs of 6mm diameter with printed "CAZ 30" on centre of each side of the disc.

Cultural response: Average diameter of zone of inhibition observed on Mueller Hinton Agar (M173) after 18 hours incubation at 35-37°C for standard cultures.

Organisms (ATCC)	Std. zone of diameter (mm)*
E.coli (25922)	25-32
S.aureus (25923)	16-20
P.aeruginosa (27853)	22-29
K.pneumonaie (700603)	10-18

* = Interpretive criteria & QC ranges as per CLSI standards.

Storage and Shelf-life:

On receipt discs should always be stored at -20°C under dry conditions, along with the dessicator provided in individual pack. Use before expiry date on the label.

References:

1. Bauer, Kirby, Sherris and Turck, 1966, Am. J. Clin. Path., 45: 493
2. Performance standards of Antimicrobial Disc Susceptibility Tests, M100S, 32nd Ed., CLSI Vol. 42 No.2, Feb-2022.
3. EUCAST, Breakpoint tables for interpretation of MIC's & zone diameters, version 12.0, valid from 01.01.2022.

Note :
Use following media to carry out susceptibility test
For rapidly growing aerobic organisms : Mueller Hinton Agar (M173/M1084)
For *Haemophilus* spps : Haemophilus Test Agar (M1259 + FD117)
For *S.pneumoniae* : Muller Hinton Agar supplemented with 5% Sheep Blood
For Neisseria spps : G.C.Agar +1% defined growth supplement (M434 + FD025)

*** Not for Medicinal Use**

IVD — In vitro diagnostic medical device

CE Marking

Storage temperature

Do not use if package is damaged

HiMedia Laboratories Pvt. Limited,
C-40, Road No.21Y, MIDC, Wagle Industrial Area, Thane (W)
-400604, MS, India

EC REP

CE Partner 4U ,Esdoornlaan 13, 3951 DB Maarn The Netherlands,
www.cepartner 4u.eu

Revision : 03 / 2022

Amoxyclav AMC 30 mcg (Amoxycillin/Clavulanic acid) (20/10mcg) SD063

Amoxyclav (Amoxycillin/Clavulanic acid) AMC 30mcg (20/10mcg) discs are used for antimicrobial susceptibility testing of bacterial cultures as per Bauer-Kirby Method

Composition

*Ingredients	Concentration
Amoxyclav (Amoxycillin/Clavulanic acid)	30mcg/disc

Susceptibility Test Procedure:

1. Prepare plates with Mueller Hinton Agar (M173/M1084) for rapidly growing aerobic organisms as per Bauer-Kirby Method. The medium in the plates should be sterile and should have a depth of about 4 mm.
2. Inoculate 4-5 similar colonies with a wire, needle or loop to 5 ml Tryptone Soya Broth (M011) and incubate at 35-37°C for2-8 hours until light to moderate turbidity develops. Compare the inoculum turbidity with that of standard 0.5 McFarland (prepared by mixing 0.5 ml of 1.175% barium chloride and 99.5 ml of 0.36N sulfuric acid). Dilute the inoculum or incubate further as necessary to attain comparative turbidity. Alternatively, the inoculum can be standardized by other appropriate optical method (0.08 - 0.13 OD turbid suspension at 625 nm)
3. Dip a sterile non-toxic cotton swab on a wooden applicator into the standardized inoculum and rotate the soaked swab firmly against the upper inside wall of the tube to express excess fluid. Streak the entire agar surface of the plate with the swab three times, turning the plate at 60° angle between each streaking. Allow the inoculum to dry for 5 - 15 minutes with lid in place.
4. Apply the discs using aseptic technique. When using cartridges, the discs can be applied using the specially designed applicator. When the vials are used, apply the discs using sterile forceps.
5. Deposit the discs with centers at least 24 mm apart. For fastidious organisms and for Penicillins and Cephalosporins, the discs should preferably be deposited with centers 30 mm apart.
6. Incubate immediately at 35 ± 2°C and examine after 16-18 hours or longer, if necessary. For fastidious organisms incubate at appropriate temperature and time.
7. Measure the zones showing complete inhibition and record the diameters of the zones to the nearest millimeter using a calibrated instrument like zone scales (PW096/PW297)

Principle:

Antimicrobial susceptibility testing (AST) of bacterial and fungal isolates is a common and important technique in most clinical laboratories. The results of these tests are used for selection of the most appropriate antimicrobial agent(s) for treatment against the infectious organisms. Till the 1950s, laboratories were lacking in the methodologies and equipments for the accurate determination of in vitro responses of organisms to antimicrobial agents. Bauer et al (1) began the development of standardized methods for antimicrobial susceptibility testing, using disc diffusion system. However the susceptibility results may not always correlate with the patient's response to therapy. The response of an infected patient to antimicrobial agent(s) is a complex interrelationship of host responses, drug dynamics and microbial activity. Antimicrobial susceptibility tests are either quantitative or qualitative. Disc diffusion test is a qualitative test method. The National Committee for Clinical Laboratory Standards (NCCLS), now known as Clinical Laboratory Standards Institute (CLSI) has published comprehensive documents regarding the disc diffusion systems. The agar disc diffusion test is the most convenient and widely used method for routine antimicrobial susceptibility testing. In subsequent and current practice, antimicrobial impregnated paper discs are applied onto the agar surface. Based on the Bauer-Kirby Method, standardized reference procedures for the disc systems were published by WHO and FDA and are periodically updated by the CLSI (formerly NCCLS)(2). For any antimicrobial testing, Quality control or clinical testing, the method to be followed is the same as mentioned above.

However few precautions are to be maintained while handling of the Sensitivity discs,

- On receipt the discs are to be immediately stored at the recommended temperature.
- Medium preparation, Inoculum preparation and incubation to be done as specified.

Interpretation:

Use following interpretive criteria for susceptibility categorization*

Antimicrobial agent	Interpretative criteria for	Sensitive mm or more	Intermediate mm	Resistant mm or less
Amoxyclav (Amoxycillin/Clavulanic acid) 30mcg (20/10mcg)	*Enterobacteriaceae*	18	14-17	13
	Haemophilus influenzae & *Haemophilus parainfluenzae*	20	-	19

Quality Control:

Appearance: Filter paper discs of 6mm diameter with printed "AMC 30" on centre of each side of the disc.

Cultural response: Average diameter of zone of inhibition observed on Mueller Hinton Agar (M173) after 18 hours incubation at 35-37°C for standard cultures.

Organisms (ATCC)	Std. zone of diameter (mm)*
E. coli (25922)	18-24
S.aureus (25923)	28-36
E.coli (35218)	17-22

* = Interpretive criteria & QC ranges as per CLSI standards.

Storage and Shelf-life:

On receipt discs should always be stored at -20°C under dry conditions, along with the dessicator provided in individual pack. Use before expiry date on the label.

References:

1. Bauer, Kirby, Sherris and Turck, 1966, Am. J. Clin. Path., 45: 493
2. Performance standards of Antimicrobial Disc Susceptibility Tests, M100S, 32nd Ed., CLSI Vol. 42 No.2, Feb-2022.
3. EUCAST, Breakpoint tables for interpretation of MIC's & zone diameters, version 12.0, valid from 01.01.2022.

Note :
Use following media to carry out susceptibility test
For rapidly growing aerobic organisms : Mueller Hinton Agar (M173/M1084)
For *Haemophilus* spps : Haemophilus Test Agar (M1259 + FD117)
For *S.pneumoniae* : Muller Hinton Agar supplemented with 5% Sheep Blood
For Neisseria spps : G.C.Agar +1% defined growth supplement (M434 + FD025)

*** Not for Medicinal Use**

IVD — In vitro diagnostic medical device

CE Marking

Storage temperature

Do not use if package is damaged

HiMedia Laboratories Pvt. Limited,
C-40, Road No.21Y, MIDC, Wagle
Industrial Area, Thane (W)
-400604, MS, India

EC REP — CE Partner 4U ,Esdoornlaan 13, 3951 DB Maarn The Netherlands,
www.cepartner 4u.eu

Revision : 03 / 2022

Ceftriaxone CTR 30 mcg SD065

Ceftriaxone CTR 30 mcg discs are used for antimicrobial susceptibility testing of bacterial cultures as per Bauer-Kirby Method

Composition

*Ingredients	Concentration
Ceftriaxone	30 mcg/disc

Susceptibility Test Procedure:

1. Prepare plates with Mueller Hinton Agar (M173/M1084) for rapidly growing aerobic organisms as per Bauer-Kirby Method. The medium in the plates should be sterile and should have a depth of about 4 mm.
2. Inoculate 4-5 similar colonies with a wire, needle or loop to 5 ml Tryptone Soya Broth (M011) and incubate at 35-37°C for2-8 hours until light to moderate turbidity develops. Compare the inoculum turbidity with that of standard 0.5 McFarland (prepared by mixing 0.5 ml of 1.175% barium chloride and 99.5 ml of 0.36N sulfuric acid). Dilute the inoculum or incubate further as necessary to attain comparative turbidity. Alternatively, the inoculum can be standardized by other appropriate optical method (0.08 - 0.13 OD turbid suspension at 625 nm)
3. Dip a sterile non-toxic cotton swab on a wooden applicator into the standardized inoculum and rotate the soaked swab firmly against the upper inside wall of the tube to express excess fluid. Streak the entire agar surface of the plate with the swab three times, turning the plate at 60° angle between each streaking. Allow the inoculum to dry for 5 - 15 minutes with lid in place.
4. Apply the discs using aseptic technique. When using cartridges, the discs can be applied using the specially designed applicator. When the vials are used, apply the discs using sterile forceps.
5. Deposit the discs with centers at least 24 mm apart. For fastidious organisms and for Penicillins and Cephalosporins, the discs should preferably be deposited with centers 30 mm apart.
6. Incubate immediately at 35 ± 2°C and examine after 16-18 hours or longer, if necessary. For fastidious organisms incubate at appropriate temperature and time.
7. Measure the zones showing complete inhibition and record the diameters of the zones to the nearest millimeter using a calibrated instrument like zone scales (PW096/PW297)

Principle:

Antimicrobial susceptibility testing (AST) of bacterial and fungal isolates is a common and important technique in most clinical laboratories. The results of these tests are used for selection of the most appropriate antimicrobial agent(s) for treatment against the infectious organisms. Till the 1950s, laboratories were lacking in the methodologies and equipments for the accurate determination of in vitro responses of organisms to antimicrobial agents. Bauer et al (1) began the development of standardized methods for antimicrobial susceptibility testing, using disc diffusion system. However the susceptibility results may not always correlate with the patient's response to therapy. The response of an infected patient to antimicrobial agent(s) is a complex interrelationship of host responses, drug dynamics and microbial activity. Antimicrobial susceptibility tests are either quantitative or qualitative. Disc diffusion test is a qualitative test method. The National Committee for Clinical Laboratory Standards (NCCLS), now known as Clinical Laboratory Standards Institute (CLSI) has published comprehensive documents regarding the disc diffusion systems. The agar disc diffusion test is the most convenient and widely used method for routine antimicrobial susceptibility testing. In subsequent and current practice, antimicrobial impregnated paper discs are applied onto the agar surface. Based on the Bauer-Kirby Method, standardized reference procedures for the disc systems were published by WHO and FDA and are periodically updated by the CLSI (formerly NCCLS)(2). For any antimicrobial testing, Quality control or clinical testing, the method to be followed is the same as mentioned above.

However few precautions are to be maintained while handling of the Sensitivity discs,

- On receipt the discs are to be immediately stored at the recommended temperature.
- Medium preparation, Inoculum preparation and incubation to be done as specified.

Interpretation:

Use following interpretive criteria for susceptibility categorization*

Antimicrobial agent	Interpretative criteria for	Sensitive mm or more	Intermediate mm	Resistant mm or less
Ceftriaxone 30 mcg	*Enterobacteriaceae*	23	20-22	19
	P.aeruginosa, Acientobacter & Staphylococcus	21	14-20	13
	Haemophilus influenzae & Haemophilus parainfluenzae	26	-	-
	Neisseria meningitidis	34	-	-
	Neisseria gonorhoeae	35	-	-
	Streptococcus spp. Viridians group	27	25-26	24
	Streptococcus spp. beta haemolytic gruop	24	-	-

Quality Control:

Appearance: Filter paper discs of 6mm diameter with printed "CTR 30" on centre of each side of the disc.

Cultural response: Average diameter of zone of inhibition observed on Mueller Hinton Agar (M173) after 18 hours incubation at 35-37°C for standard cultures.

Organisms (ATCC)	Std. zone of diameter (mm)*
E.coli (25922)	29-35
S.aureus (25923)	22-28
P.aeruginosa (27853)	17-23
K.pneumoniae (700603)	16-24

* = Interpretive criteria & QC ranges as per CLSI standards.

Storage and Shelf-life:

On receipt discs should always be stored at -20°Cunder dry conditions, along with the dessicator provided in individual pack. Use before expiry date on the label.

References:

1. Bauer, Kirby, Sherris and Turck, 1966, Am. J. Clin. Path., 45: 493
2. Performance standards of Antimicrobial Disc Susceptibility Tests, M100S, 32nd Ed., CLSI Vol. 42 No.2, Feb-2022.
3. EUCAST, Breakpoint tables for interpretation of MIC's & zone diameters, version 12.0, valid from 01.01.2022.

Note :
Use following media to carry out susceptibility test
For rapidly growing aerobic organisms : Mueller Hinton Agar (M173/M1084)
For *Haemophilus* spps : Haemophilus Test Agar (M1259 + FD117)
For *S.pneumoniae* : Muller Hinton Agar supplemented with 5% Sheep Blood
For Neisseria spps : G.C.Agar +1% defined growth supplement (M434 + FD025)

*** Not for Medicinal Use**

IVD — In vitro diagnostic medical device

CE Marking

Storage temperature

Do not use if package is damaged

HiMedia Laboratories Pvt. Limited,
C-40, Road No.21Y, MIDC, Wagle
Industrial Area, Thane (W)
-400604, MS, India

EC REP

CE Partner 4U ,Esdoornlaan 13, 3951
DB Maarn The Netherlands,
www.cepartner 4u.eu

Revision : 03 / 2022

Pefloxacin PF 5 mcg SD070

Pefloxacin PF 5 mcg discs are used for antimicrobial susceptibility testing of bacterial cultures as per Bauer-Kirby Method

Composition

*Ingredients	Concentration
Pefloxacin	5 mcg/disc

Susceptibility Test Procedure:

1. Prepare plates with Mueller Hinton Agar (M173/M1084) for rapidly growing aerobic organisms as per Bauer-Kirby Method. The medium in the plates should be sterile and should have a depth of about 4 mm.
2. Inoculate 4-5 similar colonies with a wire, needle or loop to 5 ml Tryptone Soya Broth (M011) and incubate at 35-37°C for2-8 hours until light to moderate turbidity develops. Compare the inoculum turbidity with that of standard 0.5 McFarland (prepared by mixing 0.5 ml of 1.175% barium chloride and 99.5 ml of 0.36N sulfuric acid). Dilute the inoculum or incubate further as necessary to attain comparative turbidity. Alternatively, the inoculum can be standardized by other appropriate optical method (0.08 - 0.13 OD turbid suspension at 625 nm)
3. Dip a sterile non-toxic cotton swab on a wooden applicator into the standardized inoculum and rotate the soaked swab firmly against the upper inside wall of the tube to express excess fluid. Streak the entire agar surface of the plate with the swab three times, turning the plate at 60° angle between each streaking. Allow the inoculum to dry for 5 - 15 minutes with lid in place.
4. Apply the discs using aseptic technique. When using cartridges, the discs can be applied using the specially designed applicator. When the vials are used, apply the discs using sterile forceps.
5. Deposit the discs with centers at least 24 mm apart. For fastidious organisms and for Penicillins and Cephalosporins, the discs should preferably be deposited with centers 30 mm apart.
6. Incubate immediately at 35 ± 2°C and examine after 16-18 hours or longer, if necessary. For fastidious organisms incubate at appropriate temperature and time.
7. Measure the zones showing complete inhibition and record the diameters of the zones to the nearest millimeter using a calibrated instrument like zone scales (PW096/PW297)

Principle:

Antimicrobial susceptibility testing (AST) of bacterial and fungal isolates is a common and important technique in most clinical laboratories. The results of these tests are used for selection of the most appropriate antimicrobial agent(s) for treatment against the infectious organisms. Till the 1950s, laboratories were lacking in the methodologies and equipments for the accurate determination of in vitro responses of organisms to antimicrobial agents. Bauer et al (1) began the development of standardized methods for antimicrobial susceptibility testing, using disc diffusion system. However the susceptibility results may not always correlate with the patient's response to therapy. The response of an infected patient to antimicrobial agent(s) is a complex interrelationship of host responses, drug dynamics and microbial activity. Antimicrobial susceptibility tests are either quantitative or qualitative. Disc diffusion test is a qualitative test method. The National Committee for Clinical Laboratory Standards (NCCLS), now known as Clinical Laboratory Standards Institute (CLSI) has published comprehensive documents regarding the disc diffusion systems. The agar disc diffusion test is the most convenient and widely used method for routine antimicrobial susceptibility testing. In subsequent and current practice, antimicrobial impregnated paper discs are applied onto the agar surface. Based on the Bauer-Kirby Method, standardized reference procedures for the disc systems were published by WHO and FDA and are periodically updated by the CLSI (formerly NCCLS)(2). For any antimicrobial testing, Quality control or clinical testing, the method to be followed is the same as mentioned above.

However few precautions are to be maintained while handling of the Sensitivity discs,

- On receipt the discs are to be immediately stored at the recommended temperature.
- Medium preparation, Inoculum preparation and incubation to be done as specified.

Quality Control:

Appearance: Filter paper discs of 6mm diameter with printed "PF 5" on centre of each side of the disc.

Cultural response: Average diameter of zone of inhibition observed on Mueller Hinton Agar (M173) after 18 hours incubation at 35-37°C for standard cultures.

Organisms (ATCC)	Std. zone of diameter (mm)
E. coli (25922)	29-33
S.aureus (25923)	24-28
P.aeruginosa (27853)	17-21

Storage and Shelf-life:

Discs should always be stored at -20°C to +8°C under dry conditions, along with the dessicator provided in individual pack. Use before expiry date on the label.

References:

1. Bauer, Kirby, Sherris and Turck, 1966, Am. J. Clin. Path., 45: 493
2. Performance standards of Antimicrobial Disc Susceptibility Tests, M100S, 32nd Ed., CLSI Vol. 42 No.2, Feb-2022.
3. EUCAST, Breakpoint tables for interpretation of MIC's & zone diameters, version 12.0, valid from 01.01.2022.

Note :
Use following media to carry out susceptibility test
For rapidly growing aerobic organisms : Mueller Hinton Agar (M173/M1084)
For *Haemophilus* spps : Haemophilus Test Agar (M1259 + FD117)
For *S.pneumoniae* : Muller Hinton Agar supplemented with 5% Sheep Blood
For Neisseria spps : G.C.Agar +1% defined growth supplement (M434 + FD025)

*** Not for Medicinal Use**

IVD — In vitro diagnostic medical device

CE — CE Marking

On receipt store at -20°C 8°C — Storage temperature

Do not use if package is damaged

HiMedia Laboratories Pvt. Limited,
C-40, Road No.21Y, MIDC, Wagle Industrial Area, Thane (W)
-400604, MS, India

EC REP — CE Partner 4U ,Esdoornlaan 13, 3951 DB Maarn The Netherlands,
www.cepartner 4u.eu

Revision : 03 / 2022

Mast Group Ltd.
Mast House, Derby Road,
Bootle, Merseyside, L20 1EA
United Kingdom
Tel: + 44 (0) 151 472 1444
Fax: + 44 (0) 151 944 1332
email: sales@mast-group.com
Web: www.mast-group.com

Mast Diagnostica GmbH
Feldstrasse 20
DE-23858 Reinfeld
Germany
Tel: + 49 (0) 4533 2007 0
Fax: + 49 (0) 4533 2007 68
email: mast@mast-diagnostica.de
Web: www.mast-group.com

Mast Diagnostic
12 rue Jean-Jacques Mention
CS91106, 80011 Amiens, CEDEX 1
France
Tél: + 33 (0) 3 22 80 80 67
Fax: + 33 (0) 3 22 80 99 22
email: info@mast-diagnostic.fr
Web: www.mast-group.com

Mueller Hinton Agar

DM170

Intended Use
A standardised medium for susceptibility testing.

Contents
See pack label.

Formulation*

Material:	Concentration in medium:
Casein hydrolysate	17.5g/litre
Beef infusion from 300g	2.0g/litre
Starch	1.5g/litre
Agar	17.0g/litre
Final pH at 25°C: 7.3 ± 0.1	

Storage and shelf life
All dehydrated culture media containers should be kept tightly closed and stored in a dry place at 10 to 25°C until the expiry date shown on the pack label.

Precautions
For *in vitro* diagnostic use only. Observe approved hazard precautions and aseptic techniques. To be used only by adequately trained and qualified laboratory personnel. Sterilise all biohazard waste before disposal. Refer to Product Safety Data sheet (available on request or via MAST® website).

Materials required but not provided
Standard microbiological supplies and equipment such as loops, MAST® selective supplements, swabs, applicator sticks, incinerators and incubators, etc., as well as serological and biochemical reagents and additives such as blood.

Procedure
1. Refer to pack label for quantities and volumes required. Prepare MAST® Mueller Hinton Agar (DM170D) by suspending the powder in distilled or deionised water. For sachet packs, dissolve the entire contents of the sachet in the volume shown on the label.
2. Autoclave at 121°C (15 p.s.i.) for 15 minutes.
3. If required cool to 50 to 55°C and hold at this temperature in a water bath. If required add 5 to 7% sterile defibrinated blood to enhance the growth of fastidious organisms or antibiotics (MAST® ADATAB) for dilution susceptibility test methods.
4. Alternative growth supplements can be used.
5. Pour culture plates (25ml per plate) and allow to set.
6. Prepared culture plates may be used immediately or stored in plastic bags at 2 to 8°C for up to one week before use.
7. Antimicrobial Susceptibility Testing should be performed in accordance with standards set down by regulatory bodies such as CLSI® (Clinical and Laboratory Standards Institute) and EUCAST (The European Committee on Antimicrobial Susceptibility Testing).

Interpretation of results
After incubation record diameter of zones of inhibition or Minimum Inhibitory Concentration (MIC). Interpret results as sensitive, intermediate or resistant according to the criteria laid down in the method of use.

Quality control
Check for signs of deterioration. Quality control must be performed with at least one organism to demonstrate expected performance. Do not use the product if the result with the control organism is incorrect. The list below illustrates a range of performance control strains which the end user can easily obtain.

Test Organisms	
Enterococcus faecalis ATCC® 29212	Growth and correct susceptibility pattern
Escherichia coli ATCC® 25922	Growth and correct susceptibility pattern
Pseudomonas aeruginosa ATCC® 27853	Growth and correct susceptibility pattern
Staphylococcus aureus ATCC® 25923	Growth and correct susceptibility pattern

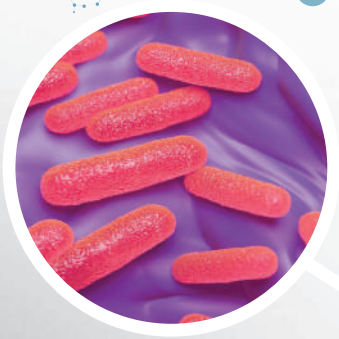
References
Bibliography available on request.

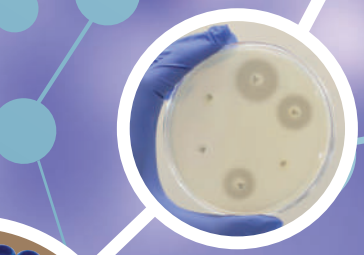
IFU335 GB 08/20 V6

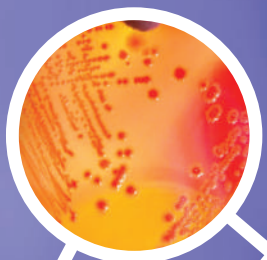
*Formulation may change to meet performance criteria

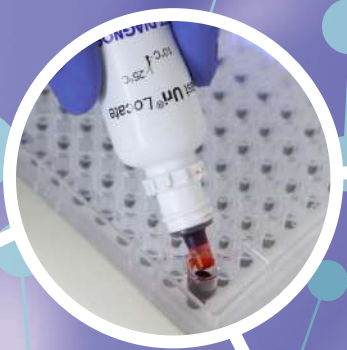
IVD solutions through partnership

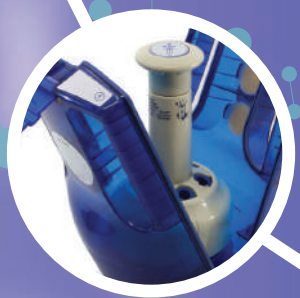
Mast Group











PRODUCT CATALOGUE
2023-2024

Mast Group

Welcome

Welcome to the Mast Group Ltd product catalogue effective from January 1st 2023. The catalogue comprises ordering information on Mast Group Ltd's extensive portfolio of products available internationally and includes details of our revised Custom Manufacturing Policy (Page vi). This states the lead times and minimum order quantities for special order custom manufactured goods.

With an easy to use contents included, the product groups are categorised into application specific sections, and any new additions are highlighted to assist customers in finding products of interest.

Quality

Mast Group Ltd is currently certified to ISO9001:2015 ‘Quality management systems - Requirements’, ISO13485:2016 ‘Medical devices – Quality management systems – Requirements for regulatory purposes’, European Directive 98/79/EC ‘on in vitro diagnostic medical devices’ for Annex II list B products and for ISO13485:2016 for the Canadian Medical Device Requirements (CMDCAS).

Ethical Statement

Mast Group Ltd operates its business legally and ethically and complies with the British In Vitro Diagnostic Association (BIVDA) Code of Conduct. Mast Group Ltd is also dedicated to ensuring full compliance with the UK Bribery Act 2010, and this policy extends to all business associates, dealings and transactions. For more information go to www.mast-group.com

Website

This Catalogue is available electronically from our website:
www.mast-group.com

Ordering Information | 2023

We are pleased to accept International orders by telephone, post, fax and e-mail.
Please have the following information available when ordering:

1. **A valid order number for an approved Credit Account**
2. **Delivery address**
3. **Invoice address**
4. **Product code, description, packsize and quantity required**

Please direct all orders to:

Mast Group Ltd
Mast House
Derby Road
Bootle
Merseyside
UK
L20 1EA

Tel: +44 151 472 1444 Customer Services
Tel: +44 151 933 7277 Main Switchboard

e-mail: orders@mast-group.com
Website: www.mast-group.com

PRICING

Outside the UK Mast Group Ltd sells and distributes products via its Subsidiary Companies in Germany and France and an associate company in South Africa. The rest of the world is serviced by a network of Distributors.

Please contact your nearest Subsidiary or Distributor for pricing information.

Any prices quotes direct from Mast House are ex-works and exclude freight unless otherwise stated in a specific quotation.

Please note VAT at the current rate will be applied to all orders from UK based purchasers. This will also apply to other EU customers unless a VAT number is provided.

Products designated as Hazardous Goods will be subject to an additional handling charge dependent on destination and mode of transport.

RETURNS

Should you need to return any items to Mast Group Ltd, please contact Mast Customer Services as detailed above.

Goods supplied correctly may not be returned without prior written agreement and authorisation number, which may be obtained from Customer Services.

Goods so returned must be consigned carriage paid, and a restocking and handling charge of 15% will be made on all goods returned for credit.

Credit will only be awarded once a full assessment of re-saleable condition has been made.

Goods may not be returned if the packaging has been defaced in any way.

CANCELLATIONS

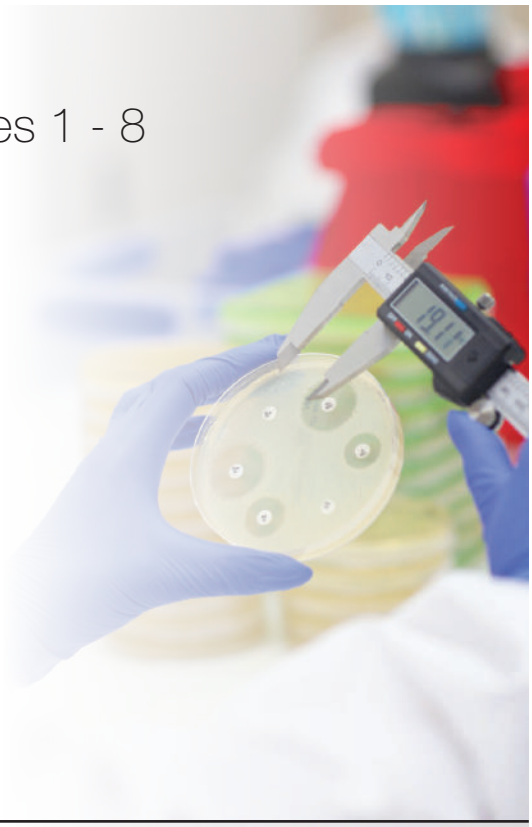
An order for products available from stock may be cancelled at any time prior to the despatch of the order without incurring any additional charges. Cancellation of an order which has been despatched will incur a 15% restocking fee.

Cancellation of products for Special order will be subject to a charge equivalent to 100% of the value of the Special order products if the order has been processed.

CONDITIONS OF SALE

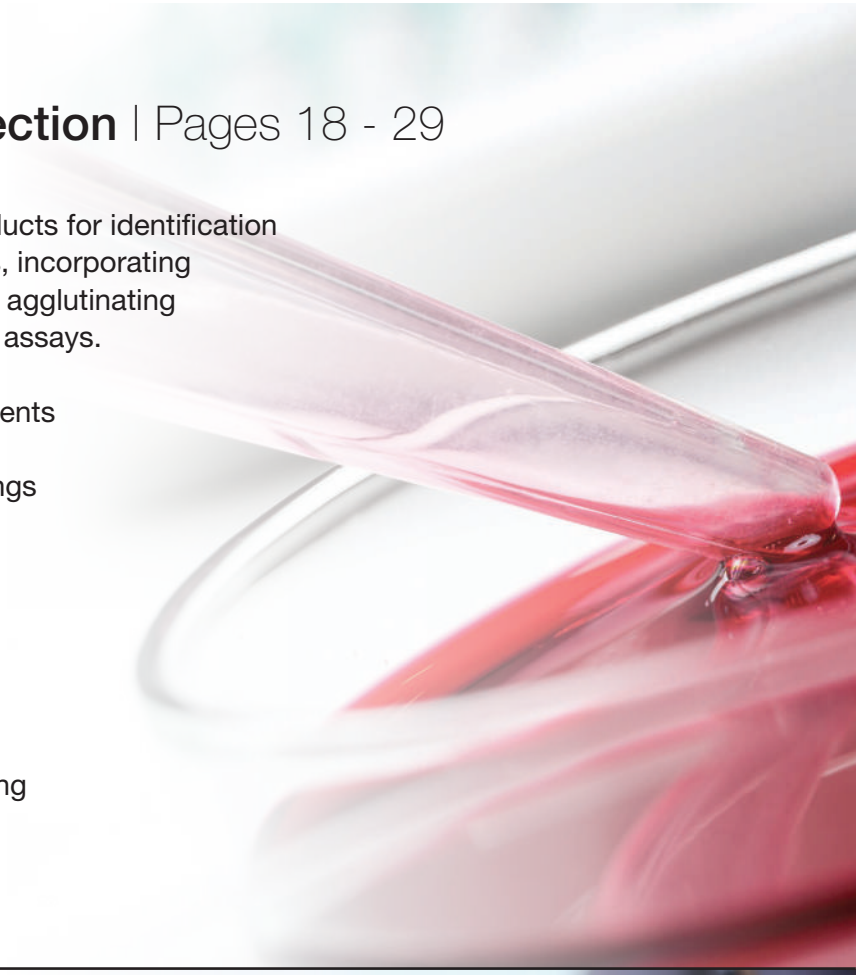
Mast Group Ltd's standard Terms and Conditions for Supply of Goods and/or Services apply to all transactions. A copy can be found on pages 43-44 of this publication and at www.mast-group.com

Contents



Contents

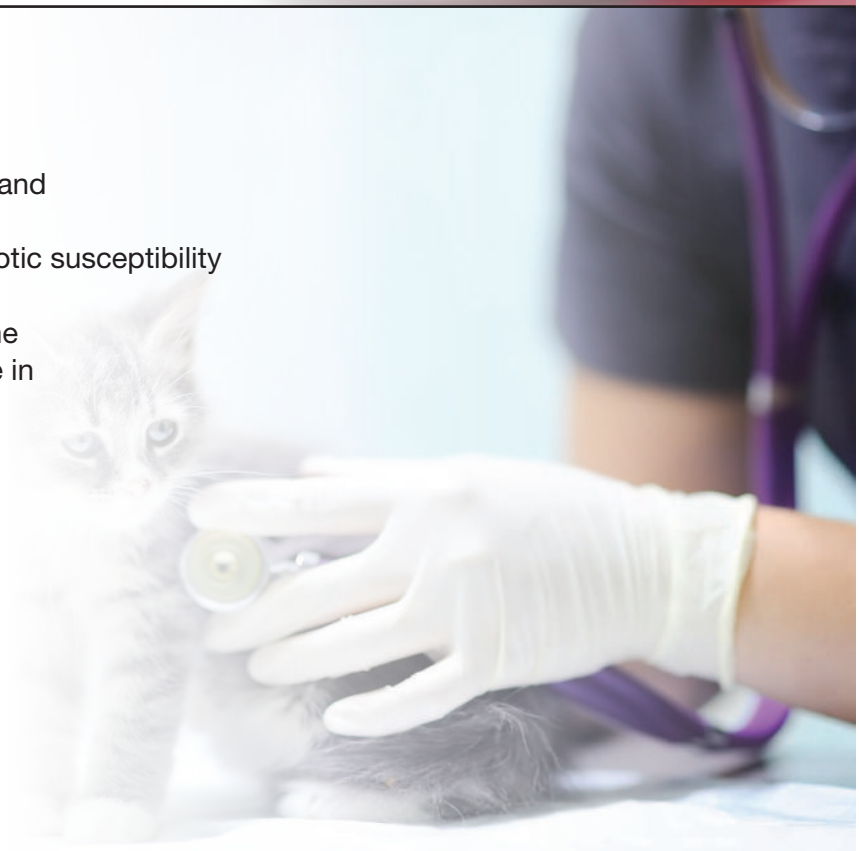
Contents



Identification and Detection | Pages 18 - 29

Mast Group Ltd offers a range of products for identification and detection by a variety of methods, incorporating biochemical tests, latex agglutination, agglutinating antisera and molecular biology based assays.

MAST® ID Biochemical tests and reagents
MAST® Rapid Slide Latex Kits
MAST® ID Identification Strips and Rings
Identification of *Haemophilus* spp.
Identification of *Staphylococcus* spp.
MAST® ID Discs
Detection of ESβL & AmpC
Detection of Carbapenemase
Identification of MRSA
Identification of *Candida* spp.
MAST® ASSURE Bacterial Agglutinating Antisera



Veterinary | Page 30

A range of products for the detection and identification of veterinary pathogens.
This includes Mast Group Ltd's antibiotic susceptibility testing portfolio which offers custom manufacture to specifically address the causative agents of infectious disease in animals.

Eiken SAA Reagents
Toxoplasma Detection
Veterinary Pathogen EIA
Antibiotic Susceptibility Testing Discs and Rings

Contents

Mast Group Ltd's molecular portfolio offers laboratories the ability to achieve rapid and reliable diagnosis by nucleic acid amplification.

MAST ISOPLEX®
A range of rapid Isothermal nucleic acid amplification tests.

Contents

Mast Group Ltd Custom Manufacturing Policy

MAST aims to provide customers with a high standard of product quality and customer service, and is an ISO9001 and ISO13485 certified company. Mast has an extensive range of products available from stock. Mast offers a custom manufacturing service to make products to customer specification, with minimum order requirements whilst complying with international regulatory requirements.

All customer requests for a customised product will be coded /NCE and labelled 'Not for clinical diagnostic use'. For veterinary or research use only', unless the antibiotic strengths requested are in line with the current EUCAST/CLSI requirements and the full technical file is available in which case they may be CE marked.

It is important that every customer understands the terms and conditions of this service, a summary of which covering the most popular products is provided in the table below. One important issue is that we specify the minimum order quantity for each type of product and, whilst every attempt is made to achieve this actual number (or a higher quantity if ordered), the nature of the processes involved means the target quantity cannot be guaranteed – our commitment is to supply between 80 and 100% of the quantity ordered. The final quantity may also comprise of more than one batch number. Exceptions may be made for specific tenders if agreed in advance.

Mast Group Ltd. can only manufacture in certain increments above the minimum quantity due to the nature of the manufacturing processes, and this is considered in the pricing.

Product	Min. order (packs)	Increments (packs)	Optimum (packs)	Lead time (weeks)
Cartridge discs	18	10	98	6*
Discs in vials	22	25	97	6*
Mastrings (number coded)	Initial order 10	10	100	6*
	Subsequent 10			
Mastrings (letter coded)	Initial order 20	10	100	6*
	Subsequent 10			
Adatab	14	15	44	6*
Selectavial/Selectatab	A	A	A	6*
Mast Assure	1	1	50	8
Media Stock Formulae (5kg packs)	1	N.A.	20	6
Media Non-Stock Formulae	25Kg	N.A.	75Kg	~12*

N.A. = not applicable
* / A see notes below

* Please note 6 weeks lead time refers to new strengths of currently used antibiotics or slight modifications of existing products. For products containing new antibiotics/materials which we have never worked with before, or there is a special cartridge variant, there is an evaluation process and review which has to be performed leading to a minimum 12 week lead time. Pricing will be on application and specific delivery dates will be provided by quotation for such new products.

A Minimum order, increments and optimum quantities for MAST® SELECTAVIAL and MAST® SELECTATAB products are dependent on customer specifications and pack size. Minimum order quantity and prices will be confirmed by quotation

Disc Diffusion Susceptibility Testing

Order No	Product	Packsize

MAST® DISCMASTER 5 DISPENSER

A robust and reliable antimicrobial cartridge disc dispenser designed for use with MAST Antimicrobial Susceptibility Test Cartridges.

MDD65	MAST® DISCMASTER 5 Dispenser - 6 place	1
SILICA63	Silica Gel Capsule For MDD63/MDD64/MDD65	1
SHD5	Single Cartridge Hand Dispenser	5
CANISTER	MAST® DISCMASTER Canister for MDD64 models and below	1
CANISTER65	MAST® DISCMASTER Canister for MDD65	1

MASTDISCS® AST ANTIBIOTIC SUSCEPTIBILITY DISCS IN CARTRIDGES AND VIALS

MASTDISCS® in Cartridges (5 × 50 discs per pack)

STOCKCART	Stock Susceptibility Cartridge Discs of a single type	1 pack
FUNGCART	Stock Antifungal Cartridge Discs of a single type	1 pack
SPECIALCART	Cartridge Discs made to special order*	Min 18 packs

MASTDISCS® (99+/- 2 discs per vial)

STOCKDISC	Stock Susceptibility Discs of a single type	1 vial
SPECIALDISC	Discs made to special order*	Min 22 packs
TOOL/C	*Set up charge for Special Discs in vials or cartridges A one off charge for customisation of each new specification	per new specification

MASTDISCS® AST
ANTIBIOTIC SUSCEPTIBILITY DISCS IN CARTRIDGES

STOCK RANGE

Description **Antibiotic & Content µg per disc** (unless otherwise stated)	**STANDARD**		**Order Code** **Cartridges** **5 × 50 discs**
	CLSI	**EUCAST**	
Amikacin 30	✓	✓	AK30C
Amoxicillin/clavulanic acid 2-1	-	✓	AUG3C
Amoxicillin/clavulanic acid 20-10	✓	✓	AUG30C
Ampicillin 2	-	✓	AP2C
Ampicillin 10	✓	✓	AP10C
Ampicillin/Sulbactam 10-10	✓	✓	SAM20C
Azithromycin 15	✓	-	ATH15C
Aztreonam 30	✓	✓	ATM30C
Bacitracin 10 units	-	-	BA10C
Cefaclor 30	✓	✓	CFC30C
Cefadroxil 30	-	✓	CDX30C
Cefalexin 30	-	✓	CFX30C
Cefalothin 30	✓	-	KF30C
Cefazolin 30	✓	-	CZ30C
Cefepime 30	✓	✓	CPM30C
Cefiderocol 30	✓	✓	FDC30C
Cefixime 5	✓	✓	CFM5C
Cefotaxime 5	-	✓	CTX5C
Cefotaxime 30	✓	-	CTX30C
Cefoxitin 30	✓	✓	FOX30C

Disc Diffusion Susceptibility Testing

MASTDISCS® AST

ANTIBIOTIC SUSCEPTIBILITY DISCS IN CARTRIDGES

STOCK RANGE

Description Antibiotic & Content µg per disc (unless otherwise stated)	STANDARD CLSI	 EUCAST EUCAST Compliant	Order Code Cartridges 5 × 50 discs
Cefpodoxime 10	✓	✓	CPD10C
Ceftaroline 5	-	✓	CPT5C
Ceftaroline 30	✓	-	CPT30C
Ceftazidime 10	-	✓	CAZ10C
Ceftazidime 30	✓	-	CAZ30C
Ceftazidime/avibactam 10-4	-	✓	CZA14C
Ceftazidime/avibactam 30-20	✓	-	CZA50C
Ceftibuten 30	✓	✓	CFB30C
Ceftobiprole 5 NEW	-	✓	BPR5C
Ceftolozane/tazobactam 30-10	✓	✓	C/T40C
Ceftriaxone 5	✓	-	CRO5C
Ceftriaxone 30	✓	✓	CRO30C
Cefuroxime 30	✓	✓	CXM30C
Chloramphenicol 30	✓	✓	C30C
Ciprofloxacin 5	✓	✓	CIP5C
Clarithromycin 15	✓	-	CLA15C
Clindamycin 2	✓	✓	CD2C
Delafloxacin 5	✓	-	DLX5C
Doripenem 10	✓	✓	DOR10C
Doxycycline 30	✓	-	DXT30C
Eravacycline 20	✓	✓	ERV20C
Ertapenem 10	✓	✓	ETP10C
Erythromycin 15	✓	✓	E15C
Fosfomycin/Glucose-6-Phosphate 200	✓	✓	FOT200C
Fusidic Acid 10	-	✓	FC10C
Gentamicin 10	✓	✓	GM10C
Gentamicin 30	-	✓	GM30C
Gentamicin 120	✓	-	GM120C
Imipenem 10	✓	✓	IMI10C
Imipenem/relebactam 10-25	✓	-	IMR35C
Kanamycin 30	✓	-	K30C
Lefamulin 20	✓	-	LMU20C
Levofloxacin 5	✓	✓	LEV5C
Linezolid 10	-	✓	LZD10C
Linezolid 30	✓	-	LZD30C
Mecillinam 10	✓	✓	MEC10C
Meropenem 10	✓	✓	MEM10C
Meropenem/Vaborbactam 20-10	✓	✓	MEV30C
Minocycline 30	✓	-	MN30C
Moxifloxacin 5	✓	✓	MFX5C
Mupirocin 200	-	✓	MUP200C
Metronidazole 5	-	✓	MZ5C
Nalidixic Acid 30	✓	✓	NA30C
Neomycin 10	-	✓	NE10C
Netilmicon 10	-	✓	NET10C
Netilmicin 30	-	✓	NET30C
Nitrofurantoin 100	-	✓	NI100C
Nitrofurantoin 300	✓	-	NI300C
Nitroxoline 30	-	✓	NIB30C
Norfloxacin 10	✓	✓	NOR10C
Novobiocin 5	-	-	NO5C
Ofloxacin 5	✓	✓	OFX5C
Oxacillin 1	✓	✓	OX1C
Pefloxacin 5	-	✓	PEF5C
Penicillin G 1 unit	-	✓	PG1C
Penicillin G 10 units	✓	-	PG10C
Piperacillin 30	-	✓	PRL30C

Disc Diffusion Susceptibility Testing

MASTDISCS® AST

ANTIBIOTIC SUSCEPTIBILITY DISCS IN CARTRIDGES

STOCK RANGE

Description Antibiotic & Content µg per disc (unless otherwise stated)	STANDARD CLSI	 EUCAST	Order Code Cartridges 5 × 50 discs
		EUCAST Compliant	
Piperacillin 100	✓	-	PRL100C
Piperacillin/tazobactam 30-6	-	✓	PTZ36C
Piperacillin/tazobactam 100-10	✓	-	PTZ110C
Rifampicin 5	✓	✓	RP5C
Streptomycin 10	✓	-	S10C
Streptomycin 300	✓	✓	S300C
Tedizolid 2	✓	✓	TZD2C
Teicoplanin 30	✓	✓	TEC30C
Temocillin 30	-	✓	TEM30C
Tetracycline 30	✓	✓	T30C
Ticarcillin 75	✓	✓	TC75C
Ticarcillin/clavulanic acid 75-10	✓	✓	TIM85C
Tigecycline 15	✓	✓	TGC15C
Tobramycin 10	✓	✓	TN10C
Trimethoprim 5	✓	✓	TM5C
Trimethoprim/sulfamethoxazole 1.25/23.75	✓	✓	TS25C
Vancomycin 5	-	✓	VA5C
Vancomycin 30	✓	-	VA30C
Blank discs	-	-	BD0680W/C/NCE

MASTDISCS® AST

ANTIBIOTIC SUSCEPTIBILITY DISCS IN CARTRIDGES - SPECIALIST STOCK RANGE

Description Antibiotic & Content µg per disc (unless otherwise stated)	STANDARD CLSI	 EUCAST	Order Code Cartridges 5 × 50 discs
		EUCAST Compliant	
Amoxicillin 25	-	-	A25C/NCE
Carbenicillin 100	-	✓	PY100C
Colistin Sulphate	-	-	CO10C/NCE
Colistin Sulphate	-	-	CO25C/NCE
Polymyxin B 300	-	-	PB300C/NCE

SPECIALIST VETERINARY SUSCEPTIBILITY DISCS - STOCK RANGE

Antibiotic & Strength (unless otherwise stated)	Veterinary Cartridges 5 × 50 discs
Cefquinome 30	CEQ30C/NCE
Cefoperazone 30	CPZ30C/NCE
Enrofloxacin 5	ENF5C/NCE
Florenfenicol 30	FFC30C/NCE
Gamithromycin 15	GAM15C/NCE
Marbofloxacin 5	MAR5C/NCE
Neomycin 30	NE30C/NCE
Pradofloxacin 5	PRA5C/NCE
Tildipirison 60	TIP60C/NCE
Tylosin 30	TY30C/NCE

Disc Diffusion Susceptibility Testing

MASTDISCS® AST

ANTIBIOTIC SUSCEPTIBILITY DISCS IN CARTRIDGES - STOCK RANGE

Description Antibiotic & Content µg per disc (unless otherwise stated)	STANDARD CLSI	 EUCAST	Order Code Vials 99+/- 2 discs
Bacitracin 10	-	-	BA10
Cefpodoxime 10	✓	✓	CPD10
Chloramphenicol 30	✓	✓	C30
Gentamicin 10	✓	✓	GM10
Metronidazole 5	-	-	MZ5
Nalidixic Acid 30	✓	✓	NA30
Oxacillin 1	✓	-	OX1
Penicillin G 1 unit	-	✓	PG1
Vancomycin 5	-	✓	VA5
Blank discs	-	-	BD0638W/NCE

MASTDISCS® AST

ANTIFUNGAL SUSCEPTIBILITY DISCS IN CARTRIDGES - STOCK RANGE

Description Antibiotic & Content µg per disc (unless otherwise stated)	Order Code Cartridges 5 × 50 discs
Amphotericin B 20	AMB20C/NCE
Clotrimazole 10	CTM10C/NCE
Econazole 10	ECN10C/NCE
Fluconazole 10	FCN10C/NCE
Fluconazole 25	FCN25C/NCE
Flucytosine 1	FY1C/NCE
Ketoconazole 10	KCA10C/NCE
Miconazole 10	MCL10C/NCE
Nystatin 100	NY100C/NCE

Disc Diffusion Susceptibility Testing

Order No	Product	Mechanism	Packsize (tests)

MASTDISCS® *Combi*

COMBINATION DISC SETS FOR THE DETECTION OF ANTIBIOTIC RESISTANCE

D52C	Extended Spectrum ß Lactamase Set (CPD 30)	ESßL	50 tests
D62C	Cefotaxime 30 & Cefotaxime 30/Clavulanic Acid 10	ESßL	150 tests
D63C	Cefepime 30 & Cefepime 30/Clavulanic Acid 10	ESßL	150 tests
D64C	Ceftazidime 30 & Ceftazidime 30/Clavulanic Acid 10	ESßL	150 tests
D66C	Cefpodoxime 10 & Cefpodoxime 10/Clavulanic Acid 1	ESßL	150 tests
D67C	Extended Spectrum ß Lactamase Set (CPD10)	ESßL	50 tests
D68C	AmpC & ESßL Detection Set	AmpC/ESßL	50 tests
D69C	AmpC Detection Set	AmpCs	50 tests
D72C	AmpC, ESßL & Carbapenemase Detection Disc Set	AmpC/ESßLs/Carba	50 tests
D73C	MAST® *Carba plus*	MBL/KPC/OXA	50 tests
D76C	ESßL Detection Set (EUCAST)	ESßL	50 tests

Additional carbapenemase screening and identification tests

D71C	MAST® CAT-ID - For presumptive identification of carbapenemase production	250 tests
D74	MAST® ICT - screening test for the detection of carbapenemase production in Enterobacterales, *Pseudomonas* and *Acinetobacter* spp.	25 tests
TEM30C	To aid presumptive identification of OXA-48	5 × 50 discs

RAPID CARBAPENEMASE DETECTION

DNA/LYO5	Rapid molecular carbapenemase detection in Enterobacterales, *Pseudomonas* spp. and *Acinetobacter* spp.	10 tests
PACE-ID	Colorimetric test for the rapid detection of carbapenemase producing *Pseudomonas* spp., *Acinetobacter* spp.and Enterobacterales.	48 tests

MASTDISCS® *AST*

LOW CONTENT PENICILLIN DISCS

For detecting the emergence of penicillin resistance. (vials of 99+/- 2 discs or 5 × 50 discs in cartridges)

PG1	Penicillin G (vials)	1 unit	1 vial
PG1C	Penicillin G (cartridges)	1 unit	1 pack

OXACILLIN STRIPS

STOX	Oxacillin Strips for the detection of MRSA (this product is a direct replacement for STMT methicillin strips)	50 Strips

Disc Diffusion Susceptibility Testing

MASTRING-S®

The same price applies to 6 and 8 antimicrobial rings.
(100 rings per tin)

Systemic Gram Positive Rings

M13/NCE 8 tips 1 tin 55.23

C Chloramphenicol	25µg
E Erythromycin	5µg
FC Fusidic acid	10µg
OX Oxacillin	5µg
NO Novobiocin	5µg
PG Penicillin G	1 unit
S Streptomycin	10µg
T Tetracycline	25µg

M43/NCE 8 tips 1 tin 55.23

PG Penicillin G	1 unit
CD Clindamycin	2µg
GM Gentamicin	10µg
FC Fusidic acid	10µg
E Erythromycin	5µg
TM Trimethoprim	1.25µg
SMX Sulphamethoxazole	25µg
T Tetracycline	10µg

Systemic Gram Negative Rings

M14/NCE 8 tips 1 tin 55.23

AP Ampicillin	10µg
KF Cephalothin	5µg
CO Colistin Sulphate	25µg
GM Gentamicin	10µg
S Streptomycin	10µg
ST Sulphatriad	200µg
T Tetracycline	25µg
TS Cotrimoxazole	25µg

Urine Rings

M26/NCE 8 tips 1 tin 55.23

AP	Ampicillin	25µg
C	Chloramphenicol	50µg
CO	Colistin Sulphate	100µg
K	Kanamycin	30µg
NA	Nalidixic acid	30µg
NI	Nitrofurantoin	50µg
S	Streptomycin	25µg
T	Tetracycline	100µg

Special order rings are subject to 4-6 weeks lead time.

TOOL/M	*Set up charge for MASTRING SPECIAL: a one off charge for customisation of each new MASTRING SPECIAL (letter coded)	Per new specification
MASTRING SPECIAL	MASTRING-S® to individual specification. Minimum order 10 tins of 100 rings	

New Specification NUMBER coded MASTRING-S® are subject to an initial minimum order of 10 tins.

New Specification LETTER coded MASTRING-S® are subject to an initial minimum order of 20 tins.

Subsequent orders: minimums of 10 tins.

Multipoint Technology

ADATAB®

For agar dilution antibiotic susceptibility testing. Each tablet for addition to 100ml medium.

STOCK ADATAB®

Order No	Product	Usage	Packsize
TAB/AK3.2	AMIKACIN 3.2mg	1 tablet per 100ml	25 tablets
TAB/A3.2	AMOXICILLIN 3.2mg	1 tablet per 100ml	25 tablets
TAB/AP0.8	AMPICILLIN 0.8mg	1 tablet per 100ml	25 tablets
TAB/AP3.2	AMPICILLIN 3.2mg	1 tablet per 100ml	25 tablets
TAB/AUG3.2	AMOXICILLIN/CLAVULANIC ACID 3.2mg	1 tablet per 100ml	25 tablets
TAB/CPD0.1	CEFPODOXIME 0.1mg	1 tablet per 100ml	25 tablets
TAB/CTX0.2	CEFOTAXIME 0.2mg	1 tablet per 100ml	25 tablets
TAB/CTX1.6	CEFOTAXIME 1.6mg	1 tablet per 100ml	25 tablets
TAB/FOX0.4	CEFOXITIN 0.4mg	1 tablet per 100ml	25 tablets
TAB/CAZ0.8	CEFTAZIDIME 0.8mg	1 tablet per 100ml	25 tablets
TAB/CAZ3.2	CEFTAZIDIME 3.2mg	1 tablet per 100ml	25 tablets
TAB/CXM3.2	CEFUROXIME 3.2mg	1 tablet per 100ml	25 tablets
TAB/CFX3.2	CEFALEXIN 3.2mg	1 tablet per 100ml	25 tablets
TAB/C0.8	CHLORAMPHENICOL 0.8mg	1 tablet per 100ml	25 tablets
TAB/CIP0.2	CIPROFLOXACIN 0.2mg	1 tablet per 100ml	25 tablets
TAB/CIP0.8	CIPROFLOXACIN 0.8mg	1 tablet per 100ml	25 tablets
TAB/CD0.1	CLINDAMYCIN 0.1mg	1 tablet per 100ml	25 tablets
TAB/CO0.8	COLISTIN 0.8mg	1 tablet per 100ml	25 tablets
TAB/E0.2	ERYTHROMYCIN 0.2mg	1 tablet per 100ml	25 tablets
TAB/FOT12.8	FOSFOMYCIN TROMETAMOL 12.8mg	1 tablet per 100ml	25 tablets
TAB/FC0.2	FUSIDIC ACID 0.2mg	1 tablet per 100ml	25 tablets
TAB/GM0.1	GENTAMICIN 0.1mg	1 tablet per 100ml	25 tablets
TAB/GM0.4	GENTAMICIN 0.4mg	1 tablet per 100ml	25 tablets
TAB/GM0.8	GENTAMICIN 0.8mg	1 tablet per 100ml	25 tablets
TAB/LZD0.4	LINEZOLID 0.4mg	1 tablet per 100ml	25 tablets
TAB/MEM0.4	MEROPENEM 0.4mg	1 tablet per 100ml	25 tablets
TAB/MEM1.6	MEROPENEM 1.6mg	1 tablet per 100ml	25 tablets
TAB/MUP0.4	MUPIROCIN 0.4mg	1 tablet per 100ml	25 tablets
TAB/NA3.2	NALIDIXIC ACID 3.2mg	1 tablet per 100ml	25 tablets
TAB/NI3.2	NITROFURANTOIN 3.2mg	1 tablet per 100ml	25 tablets
TAB/NI6.4	NITROFURANTOIN 6.4mg	1 tablet per 100ml	25 tablets
TAB/OX0.1	OXACILLIN 0.1mg	1 tablet per 100ml	25 tablets
TAB/OX0.2	OXACILLIN 0.2mg	1 tablet per 100ml	25 tablets
TAB/PG0.006	PENICILLIN G 0.006mg	1 tablet per 100ml	25 tablets
TAB/PG0.025	PENICILLIN G 0.025mg	1 tablet per 100ml	25 tablets
TAB/RP0.006	RIFAMPICIN 0.006mg	1 tablet per 100ml	25 tablets
TAB/RP0.2	RIFAMPICIN 0.2mg	1 tablet per 100ml	25 tablets
TAB/PTZ0.8	PIPERACILLIN /TAZOBACTAM 0.8mg	1 tablet per 100ml	25 tablets
TAB/PTZ1.6	PIPERACILLIN /TAZOBACTAM 1.6mg	1 tablet per 100ml	25 tablets
TAB/TEC0.8	TEICOPLANIN 0.8mg	1 tablet per 100ml	25 tablets
TAB/T0.4	TETRACYCLINE 0.4mg	1 tablet per 100ml	25 tablets
TAB/TN0.2	TOBRAMYCIN 0.2mg	1 tablet per 100ml	25 tablets
TAB/TM0.05	TRIMETHOPRIM 0.05mg	1 tablet per 100ml	25 tablets
TAB/TM0.2	TRIMETHOPRIM 0.2mg	1 tablet per 100ml	25 tablets
TAB/TM0.8	TRIMETHOPRIM 0.8mg	1 tablet per 100ml	25 tablets
TAB/VA0.4	VANCOMYCIN 0.4mg	1 tablet per 100ml	25 tablets

ADATAB®S TO SPECIAL ORDER

Please contact your Mast Technical Representative for special order requests and pricing.
Please also refer to Mast Group Ltd's Custom Manufacturing Policy for more information.

Any ADATAB® may be made to custom manufacture dependent on the characteristics and availability of the antibiotic	1 tablet per 100ml	25 tablets

Multipoint Technology

Order No	Product	Packsize

MAST ID®

MAST ID® Biochemical tests in agar for microbial identification using multipoint inoculation. Each pack contains 10 × 200ml preweighed sachets.

IDM1/A/NCE	Amygdalin Agar	1 pack
IDM25/A/NCE	H2S Agar	1 pack
IDM26/A/NCE	LDC Agar	1 pack
IDM9/A/NCE	Sorbitol Agar	1 pack

MAST ID® REAGENTS

DM228S	Urea Solution (40% w/v) for use with Urea Agar Base (Multipoint) (DM228D)	10 × 10ml

Order No	Product	Packsize

MASTURI® DOT

AUTOMATIC MULTIPOINT INOCULATOR

Subject to a lead time of 8 weeks

SCANURIDOT	Mast Uri®Dot Automatic multipoint inoculator with footswitch and spares N.B. Appropriate equipment sets for 19, 36 or 96 point inoculation must also be ordered separately from the accessories list below.	1 unit
	Accessories (must be ordered separately)	
SCANES019	Equipment set for 19 point inoculation - Stainless steel inoculum pot and head, with 19 x 1.6mm inoculum pins	1 Set
SCANES019N	Equipment set for 19 point inoculation - Stainless steel inoculum pot and head, with 19 × 2.4mm inoculum pins	1 Set
SCANES036	Equipment set for 36 point inoculation - Stainless steel pot and head, with 36 × 1.6mm inoculum pins	1 Set
SCANES036N	Equipment set for 36 point inoculation - Stainless steel pot and head, with 36 × 2.4mm inoculum pins	1 Set
SCANES096	Equipment set for 96 point inoculation - stainless steel inoculum head & 96 × 1.6mm pins	1 Set
SCANES096N	Equipment set for 96 point inoculation - stainless steel inoculum head & 96 × 2.4mm pins	1 Set
SCAN 110	1.6mm Inoculum pin, stainless steel	1
SCAN 110N	2.4mm Inoculum pin, stainless steel	1
SCAN 111SS	Inoculum head, 19 pin (1.6mm), stainless steel	1
SCAN 112SS	Inoculum head, 36 pin (1.6mm), stainless steel	1
SCAN 113SS	Inoculum pot, 19 well, stainless steel	1
SCAN 114SS	Inoculum pot, 36 well, stainless steel	1
SCAN 496	Inoculum head, 96 pin (1.6mm), stainless steel	1
SCAN 496N	Inoculum head, 96 pin (2.4mm), stainless steel	1
SCAN 120	Marker Assembly	1
SCANURICADDY	Mast **Uri**®Caddy for sterilisation of pin heads used with the Mast **Uri**®Dot automatic multipoint inoculator	1

Multipoint Technology

Order No	Product	Packsize

MASTURI® SYSTEM

Subject to a lead time of 8 weeks

The Mast **Uri**®System is a group of instrumentation, software and consumables that facilitates the rapid microbiological examination of urine samples to differentiate infected urines from those that are sterile or contaminated. The system will subsequently report bacterial identification and antibiotic susceptibility results on those specimens considered to be significant.

Comprising the Mast **Uri**®*Plus* analyser; Mast **Uri**®*Well* dispensing aid; Mast **Uri**®*Plates* and Mast **Uri**®*Dot* inoculator with 96 well head and pins, the Mast **Uri**®System is designed to deliver results in a fast and cost-effective manner.

Testing is divided into four phases:
Inoculation of urine samples onto Mast **Uri**®*Plates*
18-24 hours incubation
Next day reading and analysis
Validation of results

This means that >95% of antibiotic and identification results can be reported the day after receipt

Software Modules and Accessories

SCANURIPLUS	Mast **Uri**®*Plus* Analyser	1
SCANURIWELL	Mast **Uri**®*Well* Dispensing aid	1
SCANURIDOT	Mast **Uri**®*Dot* Inoculator	1
URIINTER	Mast **Uri**®*Plus* Interface Module	1
URIMAIN	Mast **Uri**®*Plus* Maintenance contract	1
SCANURILOCATE	Mast **Uri**®locator orientation marker pin 1.6mm	1
SCANURILOCATEN	Mast **Uri**®locator orientation marker pin 2.4mm	1
URILOCATE	Mast **Uri**®*Locate* reagent	14 ml
SCANURIRACK	Mast **Uri**®*Rack* storage accessory	1
SCANURIPREP	Mast **Uri**®*Prep* (includes **Uri**®*Prep* tablet and barcode reader)	1
SCANURICADDY	Mast **Uri**®*Caddy* for sterilisation of pin heads used with the Mast **Uri**®*Dot* automatic multipoint inoculator	1

MASTURI® PLATES

CONSUMABLES

A standard range of antibiotic and identification media in 96-well microtitre plates for urine screening. Plates manufactured to customer specification depending on Mast's ability to produce.

Antibiotic and identification plates can be combined to constitute individual plate sets according to specific laboratory requirements. Price by quotation.

Culture Media & Supplements

Order No	Product	

CLINICAL & INDUSTRIAL CULTURE MEDIA

Stock range pack size 500g unless otherwise stated

DM100D	Blood Agar Base	
DM104D	Brain Heart Infusion Agar	
DM106D	Brain Heart Infusion Broth	
DM494D	Buffered Peptone Water	
DM253D	Burkholderia cepacia Medium	
DM470D/NCE	C.E.M.O. Agar	
DM110D	C.L.E.D. Medium	
DM111D	C.L.E.D. with Andrade's Indicator	
DM115D	Columbia Agar	
DM130D	D.C.A. (Hynes)	
DM132D	DNase Agar	
DM133D	Eosin Methylene Blue Agar	
DM136D	G.C. Agar Base	
DM134D	Hektoen Enteric Agar	
DM137D	Kligler's Iron Agar	
DM258D	Legionella BCYE Agar Base	
DM440D	M.S.R.V. (Salmonella) Medium	
DM141D	MacConkey Agar	
DM140D	MacConkey Agar (without salt)	
DM142D	MacConkey Agar No.2	
DM143D	MacConkey Agar No.3	
DM150D	MacConkey Broth	
DM160D	Mannitol Salt Agar	
DM170D	Mueller Hinton Agar	
DM179D	Nutrient Agar	
DM195D	Plate Count Agar	
DM251D	Preston Blood Free Campylobacter Agar Base	
DM205D	S.S. Agar	
DM200D	Sabouraud Dextrose Agar	
DM211D	Simmons Citrate Agar	
DM218D	T.C.B.S. Cholera Medium	
DM219S	Tetrathionate Broth	
DM224D	Triple Sugar Iron Agar (TSI)	
DM225D	Tryptone Soy Agar	
DM226D	Tryptone Soy Broth	
DM228D	Urea Agar Base	
DM228S	Urea Solution (40% v/v)	10 × 10 ml
DM235D	Wilkins Chalgren Agar	
DM230D	X.L.D. Agar	
DM252D	Yersinia Agar Base	

5 Kg packs of media are available to Special order
Please refer to Mast Group Ltd's Custom Manufacturing Policy for more information

Culture Media & Supplements

Order No	Product	Packsize

The following products are available to Special Order
Lead time 4-6 weeks. Minimum order 1 pack.

BASIC MEDIA RAW MATERIALS

RM10A	Agar A	100g
RM10B	Agar A	500g
RM10E	Agar A	5Kg
RM20A	Beef Extract, Neutralised Powder	100g
RM20B	Beef Extract, Neutralised Powder	500g
RM20E	Beef Extract, Neutralised Powder	5Kg
RM25A	Bile Salts	100g
RM25Q	Bile Salts	250g
RM25E	Bile Salts	5Kg
RM30A	Casein Hydrolysate, Acidic	100g
RM30Q	Casein Hydrolysate Acidic	250g
RM30E	Casein Hydrolysate, Acidic	5Kg
RM31A	Casein Hydrolysate, Enzymic	100g
RM31Q	Casein Hydroylsate, Enzymic	250g
RM31E	Casein Hydrolysate, Enzymic	5Kg
RM50A	Peptone, A, Neutralised	100g
RM50Q	Peptone A, Neutralised	250g
RM50E	Peptone, A, Neutralised	5Kg
RM51A	Peptone, B	100g
RM51Q	Peptone B	250g
RM51E	Peptone, B	5Kg
RM52A	Bacteriological Peptone	100g
RM52Q	Bacteriological Peptone	250g
RM52E	Bacteriological Peptone	5Kg
RM60A	Sodium Desoxycholate	100g
RM70A	Yeast Extract	100g
RM70B	Yeast Extract	500g
RM70E	Yeast Extract	5Kg
RM71A	Yeast Extract Special	100g
RM71B	Yeast Extract Special	500g
RM71E	Yeast Extract Special	5Kg

Quotations for bulk orders obtainable on request.

Culture Media & Supplements

Order No	Product	Usage	Packsize
SELECTIVE SUPPLEMENTS			
	MAST® SELECTATAB and MAST® SELECTAVIAL **Lyophilised supplements in tablets and vials for the preparation of selective, differential or enrichment media.**		
	MAST® SELECTATAB, MAST® SELECTAVIAL and 500g packs of media are available from stock.		
	5Kg packs of media are available to Special order **Please refer to MAST Custom Manufacturing Policy for more information**		
	***Anaerobe* Isolation**		
MS8A	Neomycin Selectatab	1 tab per 500ml	10 tablets
SV8	Neomycin Selectavial	1 vial per litre	10 vials
SV9	Nalidixic Acid Selectavial	1 vial per litre	10 vials
DM115D	Columbia Agar		500g
	***Burkholderia* cepacia Selection**		
MS22	Burkholderia cepacia Selectatab	1 tab per 100ml	25 tablets
SV22	Burkholderia cepacia Selectavial	1 vial per 500ml	10 vials
DM253D	Burkholderia cepacia Medium		500g
	***Campylobacter* Selection**		
MS18	Camp Selectatab (Preston Blood Free)	1 tab per 250ml	25 tablets
MS26	Camp Selectatab (Modified Butzler Medium Virion)	1 tab per 500ml	10 tablets
DM115D	Columbia Agar		500g
DM251D	Preston Blood Free Campylobacter Agar Base		500g
	***Campylobacter* Selective Enrichment**		
SV59	Campylobacter Selective Supplement (Exeter)	1 vial per 1.125 litre	10 vials
SV61	Campylobacter Growth Supplement (FBP)	1 vial per 1.125 litre	10 vials
	***C.E.M.O* Selection (*T equigenitalis*)**		
MS31/NCE	C.E.M.O. 1 Selectatab	1 tab per 100ml	25 tablets
MS32/NCE	C.E.M.O. 2 Selectatab	1 tab per 100ml	25 tablets
MS60/NCE	C.E.M.O. Supplement Selectatab	1 tab per 500ml	10 tablets
DM470D/NCE	C.E.M.O Agar		500g
	***E.coli* O157 Selection**		
DM491D	Sorbitol MacConkey Agar		500g

Culture Media & Supplements

Order No	Product	Usage	Packsize
	***E.coli* O157 Enrichment**		
DM494D	Buffered Peptone water		500g
SV30	Novobiocin Selectavial	1 vial per 2.25 litre	10 vials
DM115D	Columbia Agar		500g
	***Gardnerella* Selection**		
MS15	Gardnerella Selectatab	1 tab per 250ml	25 tablets
DM115D	Columbia Agar		500g
	***G.C.* Selection**		
SV5	G.C. Selectavial (V.C.T.)	1 vial per litre	10 vials
SV6	G.C. Selectavial (V.C.N.T.)	1 vial per litre	10 vials
SV16	G.C. Growth Selectavial	1 vial per litre	10 vials
SV20	G.C. Selectavial (L.C.A.T.)	1 vial per litre	10 vials
DM136D	G.C.Agar Base		500g
	***Haemophilus* Selection**		
MS27	Haemophilus Selectatab (Bacitracin)	1 tab per 100ml	25 tablets
SV27	Haemophilus Selectavial (Bacitracin)	1 vial per litre	10 vials
SV82	NAD Selectavial EUCAST Compliant	1 vial per litre	10 vials
DM115D	Columbia Agar		500g
	***Legionella* Selection**		
SV36	Legionella Selectavial (MWY)	1 vial per 500ml	10 vials
SV37	Legionella Selectavial (PNV)	1 vial per 500ml	10 vials
DM258D	Legionella B.C.Y.E Agar Base		500g
	***Legionella* Enrichment**		
SV35	Legionella Growth Supplement (L-CYS)	1 vial per 500ml	10 vials
DM258D	Legionella B.Y.C.E Agar Base		500g
	Listeria Selection		
SV33	Listeria Selectavial (Oxford) Formula	1 vial per 500ml	10 vials
DM256D	Listeria Selective Agar Base (Oxford)		500g
	***Listeria* Enrichment**		
SV34	Listeria Selectavial (Selective Enrichment)	1 vial per 500ml	10 vials
	***Mycobacteria* Selection**		
MS24	Mycobacteria Selectatab (Kirchner)	1 tab per 500mls	10 tablets
SV40	Sputagest Selectavial	1 vial per 100ml	10 vials
	Salmonella Selection		
DM440D	M.S.R.V. (Salmonella) Medium		500g
DM160D	Mannitol Salt Agar		500g

Culture Media & Supplements

Order No	Product	Usage	Packsize
	***Yersinia* Selection**		
MS19	Yersinia Selectatab	1 tab per 250ml	25 tablets
DM252D	Yersinia Agar Base		500g
	Yeast & Mould Isolation		
SV54	Chloramphenicol Selectavial	1 vial per 500ml	10 vials
DM200D	Sabouraud Dextrose Agar		500g
DM702D	Yeast Glucose Chloramphenicol Agar		500g

Supplements not listed here may be available to Special Order in either MAST® SELECTATAB or MAST® SELECTAVIAL format.
Please refer to MAST Custom Manufacturing Policy for more information

MAST® POURITE™

Anti-bubble Agent for Agar Based Media.

MP1A	MAST® POURITE™	60ml

Culture Media & Supplements

SELECTIVE SUPPLEMENTS

MAST® SELECTATAB and MAST® SELECTAVIAL lyophilised supplements in tablets and vials for the preparation of selective, differential or enrichment media.

Order No	Product	Usage	Packsize
MS22	Burkholderia cepacia Selectatab	1 tab per 100ml	25 tablets
SV22	Burkholderia cepacia Selectavial	1 vial per 500ml	10 vials
MS31/NCE	C.E.M.O. 1 Selectatab	1 tab per 100ml	25 tablets
MS32/NCE	C.E.M.O. 2 Selectatab	1 tab per 100ml	25 tablets
MS60/NCE	C.E.M.O Supplement Selectatab	1 tab per 500ml	10 tablets
MS26	Camp Selectatab (Modified Butzler)	1 tab per 500ml	10 tablets
MS18	Camp Selectatab (Preston Blood Free)	1 tab per 250ml	25 tablets
SV61	Campylobacter Growth Supplement	1 vial per 1.125 litres	10 vials
SV59	Campylobacter Selective Supplement	1 vial per 1.125 litre	10 vials
SV54	Chloramphenicol Selectavial	1 vial per 500ml	10 vials
SV16	G.C. Growth Selectavial	1 vial per litre	10 vials
SV20	G.C. Selectavial (L.C.A.T.)	1 vial per litre	10 vials
SV6	G.C. Selectavial (V.C.N.T.)	1 vial per litre	10 vials
SV5	G.C. Selectavial (V.C.T.)	1 vial per litre	10 vials
MS15	Gardnerella Selectatab	1 tab per 250ml	25 tablets
MS27	Haemophilus Selectatab (Bacitracin)	1 tab per 100ml	25 tablets
SV27	Haemophilus Selectavial (Bacitracin)	1 vial per litre	10 vials
SV35	Legionella Growth Supplement (L-CYS)	1 vial per 500ml	10 vials
SV36	Legionella Selectavial (MWY)	1 vial per 500ml	10 vials
SV37	Legionella Selectavial (PNV)	1 vial per 500ml	10 vials
MS24	Mycobacteria Selectatab (Kirchner)	1 tab per 500ml	10 tablets
SV82	NAD Selectavial	1 vial per litre	10 vials
SV9	Nalidixic Acid Selectavial	1 vial per litre	10 vials
MS8A	Neomycin Selectatab	1 tab per 500ml	10 tablets
SV40	Sputagest Selectavial	1 vial per 100ml	10 vials
SV8	Neomycin Selectavial	1 vial per 100ml	10 vials

Supplements not listed here may be available to custom manufacture in either MAST® SELECTATAB or MAST® SELECTAVIAL format. Please refer to MAST Custom Manufacturing Policy for more information

Miscellaneous Laboratory Products

Order No	Product	Packsize
DETECTION OF BACTERIURIA		
BTR1	MAST® BACTERURITEST Strips (5 × 200 sterile strips/pack)	1 pack
DM110D	C.L.E.D. Medium	500g
DM111D	C.L.E.D. Medium with Andrade's Indicator	500g
PRESERVATION & STORAGE OF BACTERIA		
CRYOBANK®		
Bacterial Preservation and Storage System		
CRYO80/R	80 vials of red beads	1 box
CRYO80/B	80 vials of blue beads	1 box
CRYO80/Y	80 vials of yellow beads	1 box
CRYO80/G	80 vials of green beads	1 box
CRYO80/M	80 vials of mixed beads (16 of each colour)	1 box
CRYO80/BOX	Cryobank Box	1 box
CRYO/Z	18 well CRYOBLOCK	1

Identification Products

Order No	Product	Packsize
IDENTIFICATION OF CAMPYLOBACTER SPP.		
CAMP-ID	MAST® ID CAMP IDENTIFICATION SYSTEM A 3 test system for the presumptive identification of thermophilic *Campylobacter spp.* **Available to Special Order. Lead time 6-8 weeks**	10 tests
LATEX TESTS AND ASSOCIATED PRODUCTS		
RST7001	MAST Toxoreagent- Toxoplasma test Complete kit for detection of Toxoplasma antibody comprising latex suspension, buffer and positive control serum.	50 tests
RAPID DETECTION OF ß-LACTAMASE PRODUCTION		
ETO/1	MAST® ID Intralactam Strips	25 strips
D59	Nitrocefin Discs	50
MAST® ID IDENTIFICATION STRIPS		
ETO4	MAST® ID Oxidase Strips - for the performance of the oxidase reaction	25 strips
IDENTIFICATION OF HAEMOPHILUS SPP.		
MID/XV	MAST® ID XV Mirror ring. MASTRING-S® containing X+V factor tips.	50 rings
D43	X Factor Discs in vials	100 tests
D43C	X Factor Discs in cartridges	250 tests
D44	V Factor Discs in vials	100 tests
D44C	V Factor Discs in cartridges	250 tests
D45	X+V Factor Discs in vials	100 tests
D45C	X+V Factor Discs in cartridges	250 tests
DM184D	Peptone Agar	500g
IDENTIFICATION OF NON-SPORING ANAEROBES		
MID8	MASTRING® for identification of Gram negative non-sporing anaerobes.	50 rings
IDENTIFICATION OF STAPHYLOCOCCUS SPP.		
SV78/3ML	Plasma Coagulase-EDTA	10 × 3ml
SV78/20ML	Plasma Coagulase-EDTA	6 × 20ml
IDENTIFICATION OF MRSA		
RST501	MAST® ALEX-MRSA Rapid Latex Test for the detection of Methicillin resistant *Staphylococcus aureus*	48 Tests

Identification Products

Order No	Product		Packsize
MASTDISCS® IDENTIFICATION DISCS IN VIALS	**Identification of:**	**For presumptive**	Tests/Pack
D40	Bacitracin Discs (0.04i.u.)	Group A streptococci	100
D41	Bacitracin Discs (0.1i.u.)	Group A streptococci	100
D42	Optochin Discs	*Strep. pneumoniae*	100
D43	X Factor Discs	*Haemophilus* spp.	100
D44	V Factor Discs	*Haemophilus* spp.	100
D45	X+V Factor Discs	*Haemophilus* spp.	100
D46	Metronidazole Discs	*Gardnerella vaginalis*	100
D48	Lysostaphin Discs	Staphylococci/micrococci	50
D57	Oxidase Discs	*Pseudomonas* spp.	100
D59	Nitrocefin Discs	ß lactamase Detection	50

MASTDISCS® ID IDENTIFICATION DISCS IN CARTRIDGES		**For presumptive Identification of:**	Tests/Pack
D40C	Bacitracin Discs (0.04i.u.)	Group A streptococci	250
D41C	Bacitracin Discs (0.1i.u.)	Group A streptococci	250
D42C	Optochin Discs	*Strep.pneumoniae*	250
D43C	X Factor Discs	*Haemophilus* spp.	250
D44C	V Factor Discs	*Haemophilus* spp.	250
D45C	X+V Factor Discs	*Haemophilus* spp.	250
D46C	Metronidazole Discs	*Gardnerella vaginalis*	250
D47C	Sulphathiazole Discs	*Gardnerella vaginalis*	250
D51C	Nitrate Discs	Nitrate Reductase in anaerobes	250
D57C	Oxidase Discs	*Pseudomonas* spp.	250
D71C	MAST® CAT-ID	Carbapenemase producers	250

MASTDISCS® *Combi*

COMBINATION DISC SETS FOR THE DETECTION OF ANTIBIOTIC RESISTANCE

D52C	Extended Spectrum ß Lactamase Set (CPD 30)	ESßL	50 tests
D62C	Cefotaxime 30 & Cefotaxime 30/Clavulanic Acid 10	ESßL	150 tests
D63C	Cefepime 30 & Cefepime 30/Clavulanic Acid 10	ESßL	150 tests
D64C	Ceftazidime 30 & Ceftazidime 30/Clavulanic Acid 10	ESßL	150 tests
D66C	Cefpodoxime 10 & Cefpodoxime 10/Clavulanic Acid 1	ESßL	150 tests
D67C	Extended Spectrum ß Lactamase Set (CPD10)	ESßL	50 tests
D68C	AmpC & ESßL Detection Set	AmpC/ESßL	50 tests
D69C	AmpC Detection Set	AmpCs	50 tests
D72C	AmpC, ESßL & Carbapenemase Detection Disc Set	AmpC/ESßLs/Carba	50 tests
D73C	MAST® *Carba plus*	MBL/KPC/OXA	50 tests
D76C	ESßL Detection Set (EUCAST)	ESßL	50 tests

Additional carbapenemase screening and identification tests

D71C	MAST® CAT-ID - For presumptive identification of carbapenemase production	250 tests
D74	MAST® ICT - screening test for the detection of carbapenemase production in Enterobacterales, *Pseudomonas* and *Acinetobacter* spp.	25 tests
TEM30C	To aid presumptive identification of OXA-48	5 × 50 discs

RAPID CARBAPENEMASE DETECTION

DNA/LYO5	Rapid molecular carbapenemase detection in Enterobacterales, *Pseudomonas* spp. and *Acinetobacter* spp.	10 tests
PACE-ID	Colorimetric test for the rapid detection of carbapenemase producing *Pseudomonas* spp., *Acinetobacter* spp.and Enterobacterales.	48 tests

Identification Products

Order No	Product	Mechanism	Tests/Pack
IDENTIFICATION OF MRSA			
STOX	Oxacillin Strips (50 per tin) (this product is a direct replacement for STMT methicillin strips)		1 tin
MS29	MRSA (Oxacillin) Selectatab™		25 × 100ml tabs
OX1	Oxacillin Susceptibility Discs in Vials		99+/- 2 discs/vial
OX1C	Oxacillin Susceptibility Discs in Cartridges		5 × 50 discs
FOX10	Cefoxitin Susceptibility Discs in Vials		99+/- 2 discs/vial
FOX10C	Cefoxitin Susceptibility Discs in Cartridges		5 × 50 discs
TAB/OX0.2	Oxacillin 0.4 ADATAB®		25 × 100ml tabs
TAB/FOX0.4	Cefoxitin 0.4 ADATAB®		25 × 100ml tabs
DM160D	Mannitol Salt Agar		500g
DM170D	Mueller Hinton Agar		500g
DM115D	Columbia Agar		500g

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

E.COLI O ANTISERA - MONOVALENT

Stock items

M12014	*Escherichia coli* O26		2ml
M12017	*Escherichia coli* O119		2ml
M12030	*Escherichia coli* O157		2ml
M12013	*Escherichia coli* O1		2ml
M12020	*Escherichia coli* O44		2ml
M12034	*Escherichia coli* O78		2ml
M12035	*Escherichia coli* O148		2ml
M12036	*Escherichia coli* O159		2ml
M12039	*Escherichia coli* O25		2ml
M12041	*Escherichia coli* O153		2ml
M12043	*Escherichia coli* O8		2ml
M12047	*Escherichia coli* O28ac		2ml
M12048	*Escherichia coli* O112ac		2ml
M12049	*Escherichia coli* O124		2ml
M12050	*Escherichia coli* O136		2ml
M12051	*Escherichia coli* O144		2ml
M12053	*Escherichia coli* O143		2ml
M12054	*Escherichia coli* O152		2ml
M12055	*Escherichia coli* O164		2ml
M15772/NCE	*Escherichia coli* O103		2ml
M15796/NCE	*Escherichia coli* O145		2ml

E.COLI O ANTISERA MONOVALENT

Lead time 8 weeks

M12022	*Escherichia coli* O125		2ml
M12023	*Escherichia coli* O126		2ml
M12025	*Escherichia coli* O166		2ml
M12029	*Escherichia coli* O151		2ml
M12031	*Escherichia coli* O158		2ml
M12045	*Escherichia coli* O115		2ml
M12052	*Escherichia coli* O29		2ml
M12024	*Escherichia coli* O146		2ml
M12033	*Escherichia coli* O27		2ml
M12037	*Escherichia coli* O168		2ml
M12038	*Escherichia coli* O20		2ml
M12040	*Escherichia coli* O63		2ml
M12042	*Escherichia coli* O167		2ml
M12044	*Escherichia coli* O15		2ml
M12046	*Escherichia coli* O169		2ml
M12015	*Escherichia coli* O86a		2ml
M12016	*Escherichia coli* O111		2ml
M12018	*Escherichia coli* O127a		2ml
M12019	*Escherichia coli* O128		2ml
M12021	*Escherichia coli* O55		2ml
M12026	*Escherichia coli* O18		2ml
M12027	*Escherichia coli* O114		2ml
M12028	*Escherichia coli* O142		2ml
M12032	*Escherichia coli* O6		2ml
M15789/NCE	*Escherichia coli* O121	NO CE MARK	2ml
M15802/NCE	*Escherichia coli* O161	NO CE MARK	2ml
M15819/NCE	*Escherichia coli* O165	NO CE MARK	2ml
M15758/NCE	*Escherichia coli* O74	NO CE MARK	2ml
M15765/NCE	*Escherichia coli* O91	NO CE MARK	2ml

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

ESCHERICHIA COLI O ANTISERA - POLYVALENT

Stock items

M14263	*Escherichia coli* POLY 2 Factors O26, O55, O111, 0119, O126		2ml
M14270	*Escherichia coli* POLY 3 Factors O86, O114, O125, O127, O128		2ml
M14287	*Escherichia coli* POLY 4 Factors O44, O112, O124, O142		2ml
M12005	*Escherichia coli* POLY D1 (O1, O26, O86a, O111, O119,O127a, O128)		2ml
M12006	*Escherichia coli* POLY D2 (O44, O55, O125, O126, O146,O166)		2ml
M12007	*Escherichia coli* POLY D3 (O18, O114, O142, O151, O157,O158)		2ml
M12008	*Escherichia coli* POLY D4 (O6, O27, O78, O148, O159, O168)		2ml
M12009	*Escherichia coli* POLY D5 (O20, O25, O63, O153, O167)		2ml
M12010	*Escherichia coli* POLY D6 (O8, O15, O115, O169)		2ml
M12011	*Escherichia coli* POLY D7 (O28ac, O112ac, O124, O136,O144)		2ml
M12012	*Escherichia coli* POLY D8 (O29, O143, O152, O164)		2ml

ESCHERICHIA COLI O ANTISERA - POLYVALENT

Lead time 8 weeks

M15741/NCE	*E.coli* POLY D9 (O74, O91, O103, O121, O145, O161, O165)	NO CE MARK	2ml

E.COLI H ANTISERA MONOVALENT

Stock items

M12060	*Escherichia coli* H-7		5ml

ESCHERICHIA COLI H ANTISERA MONOVALENT

Lead time 8 weeks

M12056	*Escherichia coli* H-2		5ml
M12057	*Escherichia coli* H-4		5ml
M12058	*Escherichia coli* H-5		5ml
M12059	*Escherichia coli* H-6		5ml
M12061	*Escherichia coli* H-9		5ml
M12062	*Escherichia coli* H-10		5ml
M12063	*Escherichia coli* H-11		5ml
M12064	*Escherichia coli* H-12		5ml
M12065	*Escherichia coli* H-16		5ml
M12066	*Escherichia coli* H-18		5ml
M12067	*Escherichia coli* H-19		5ml
M12068	*Escherichia coli* H-20		5ml
M12069	*Escherichia coli* H-21		5ml
M12070	*Escherichia coli* As H-27		5ml
M12071	*Escherichia coli* As H-28		5ml
M12072	*Escherichia coli* As H-34		5ml
M12073	*Escherichia coli* As H-40		5ml
M12074	*Escherichia coli* As H-41		5ml
M12075	*Escherichia coli* AS H-42		5ml
M12076	*Escherichia coli* As H-45		5ml
M12077	*Escherichia coli* As H-51		5ml

TOXIGENIC ESCHERICHIA COLI PILI ANTISERA

Lead time 8 weeks

M11601/NCE	Toxigenic *Escherichia coli* Pili Antisera Set This set consists of the following K88, K99 and 987P	NO CE MARK	5ml × 3
M11602/NCE	*Escherichia coli* K88	NO CE MARK	5ml
M11603/NCE	*Escherichia coli* K99	NO CE MARK	5ml
M11604/NCE	*Escherichia coli* 987P	NO CE MARK	5ml

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

HAEMOPHILUS INFLUENZAE ANTISERA

Lead time 8 weeks
Haemophilus influenzae type listed below

M11302	*Haemophilus influenzae* Type a		2ml
M11303	*Haemophilus influenzae* Type b		2ml
M11304	*Haemophilus influenzae* Type c		2ml
M11305	*Haemophilus influenzae* Type d		2ml
M11306	*Haemophilus influenzae* Type e		2ml
M11307	*Haemophilus influenzae* Type f		2ml

SALMONELLA O ANTISERA - MONOVALENT

Stock items

M10310	*Salmonella* O Factor O 2		2ml
M10311	*Salmonella* O Factor O 4		2ml
M10321	*Salmonella* O Factor O 6,14		2ml
M10312	*Salmonella* O Factor O 7		2ml
M10313	*Salmonella* O Factor O 8		2ml
M10314	*Salmonella* O Factor O 9		2ml
M10326	*Salmonella* O Factor Vi		2ml
M10315	*Salmonella* O Factor O9,46		2ml
M10316	*Salmonella* O Factor O1, 3,10		2ml
M10318	*Salmonella* O Factor O1,3,19		2ml
M10319	*Salmonella* O Factor O11		2ml
M10320	*Salmonella* O Factor O13		2ml
M10323	*Salmonella* O Factor O18		2ml
M10324	*Salmonella* O Factor O21		2ml

SALMONELLA O ANTISERA - MONOVALENT

Lead time 8 weeks

M10322	*Salmonella* O Factor O16		2ml
M92575/NCE	*Salmonella* O Factor O17	NO CE MARK	2ml
M92582/NCE	*Salmonella* O Factor O28	NO CE MARK	2ml
M10325	*Salmonella* O Factor O35		2ml
M92599/NCE	*Salmonella* O Factor O39	NO CE MARK	2ml

SALMONELLA O ANTISERA - POLYVALENT

Stock items

M10308	POLY O Factor O2, O4, O7, O8, O9, O9, 46, O3, 10 and O1,3,19	2ml
M10309	POLY O1 Factor O11, O13, O6, 14, O16, O18, O21 and O35	2ml
M14294	POLY O A-G	2ml
M14300	POLY O A-S	2ml
M92537	Omnivalent (Kauffmann-White group A-067)	2ml

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

SALMONELLA H ANTISERA - MONOVALENT

Stock items

M10327	*Salmonella* H Factor a		2ml
M10328	*Salmonella* H Factor b		2ml
M10329	*Salmonella* H Factor c		2ml
M10330	*Salmonella* H Factor d		2ml
M10331	*Salmonella* H Factor e, h		2ml
M10332	*Salmonella* H Factor G		2ml
M14335	*Salmonella* H Factor E		2ml
M10333	*Salmonella* H Factor i		2ml
M10344	*Salmonella* H Factor 2		2ml
M10345	*Salmonella* H Factor 5		2ml
M10346	*Salmonella* H Factor 6		2ml
M10364	*Salmonella* H Factor f		2ml
M10365	*Salmonella* H Factor m		2ml
M10366	*Salmonella* H Factor p		2ml
M10367	*Salmonella* H Factor q		2ml
M10368	*Salmonella* H Factor s		2ml
M10369	*Salmonella* H Factor t		2ml
M10335	*Salmonella* H Factor L		2ml
M10337	*Salmonella* H Factor y		2ml
M10340	*Salmonella* H Factor v		2ml
M10341	*Salmonella* H Factor w		2ml
M10342	*Salmonella* H Factor z13		2ml
M10343	*Salmonella* H Factor z28		2ml
M10347	*Salmonella* H Factor 7		2ml
M10348	*Salmonella* H Factor z6		2ml
M10370	*Salmonella* H Factor u		2ml
M10372	*Salmonella* H Factor z23		2ml
M10373	*Salmonella* H Factor z24		2ml
M10376	*Salmonella* H Factor x		2ml
M10377	*Salmonella* H Factor a		2ml
M10379	*Salmonella* H Factor z4		2ml
M10334	*Salmonella* H Factor k		2ml
M10336	*Salmonella* H Factor r		2ml

SALMONELLA H ANTISERA - MONOVALENT

Lead time 8 weeks

M91882/NCE	*Salmonella* H Factor g, p	NO CE MARK	5ml
M10338	*Salmonella* H Factor e, n		2ml
M10378	*Salmonella* H Factor z		2ml
M10380	*Salmonella* H Factor z10		2ml
M10374	*Salmonella* H Factor z32		2ml
M10381	*Salmonella* H Factor z29		2ml

SALMONELLA H ANTISERA - POLYVALENT

Stock items

M14317	POLYVALENT PHASE 1 & 2 (a-z29)	2ml
M10339	POLYVALENT PHASE 2 (H-1)	2ml
M14324	RAPID DIAGNOSTIC 1 Factors b, d, E, r	2ml
M14331	RAPID DIAGNOSTIC 2 Factors b, E, k, l	2ml
M14348	RAPID DIAGNOSTIC 3 Factors d, E, G, k	2ml

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

SALMONELLA H GROUP PHASE INDUCTION

Lead time 8 weeks

M10361/NCE	*Salmonella* Phase H 1	NO CE MARK	5ml
M10352/NCE	*Salmonella* Phase H d	NO CE MARK	5ml
M10353/NCE	*Salmonella* Phase H e, h	NO CE MARK	5ml
M10360/NCE	*Salmonella* Phase H e, n	NO CE MARK	5ml
M10355/NCE	*Salmonella* Phase H i	NO CE MARK	5ml
M10357/NCE	*Salmonella* Phase H L	NO CE MARK	5ml
M10358/NCE	*Salmonella* Phase H r	NO CE MARK	5ml
M10359/NCE	*Salmonella* Phase H y	NO CE MARK	5ml
M10350/NCE	*Salmonella* Phase H b	NO CE MARK	5ml
M10356/NCE	*Salmonella* Phase H k	NO CE MARK	5ml
M10383/NCE	*Salmonella* Phase H z4	NO CE MARK	5ml
M10391/NCE	***Salmonella* Phase Induction Set** This set consists of a, b, c, d, eh, G, I, k, L, r, y, en, 1, z, z4, z10, z29	NO CE MARK	5ml × 17

SHIGELLA ANTISERA - MONOVALENT

Stock items

M10116	*Shigella dysenteriae*	Type 1	2ml
M10126	*Shigella flexneri*	Type I	2ml
M10127	*Shigella flexneri*	Type II	2ml
M10128	*Shigella flexneri*	Type III	2ml
M10129	*Shigella flexneri*	Type IV	2ml
M10130	*Shigella flexneri*	Type V	2ml
M10131	*Shigella flexneri*	Type VI	2ml
M10132	*Shigella flexneri*	Group (3) 4	2ml
M10133	*Shigella flexneri*	Group 6	2ml
M10134	*Shigella flexneri*	Group 7 (8)	2ml
M10136	*Shigella boydii*	Type 2	2ml
M10150	*Shigella sonnei*	Phase I	2ml
M10151	*Shigella sonnei*	Phase II	2ml
M10137	*Shigella boydii*	Type 3	2ml

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

SHIGELLA ANTISERA - MONOVALENT

Lead time 8 weeks

M10117	*Shigella dysenteriae*	Type 2	2ml
M10119	*Shigella dysenteriae*	Type 4	2ml
M10118	*Shigella dysenteriae*	Type 3	2ml
M10120	*Shigella dysenteriae*	Type 5	2ml
M10121	*Shigella dysenteriae*	Type 6	2ml
M10122	*Shigella dysenteriae*	Type 7	2ml
M10123	*Shigella dysenteriae*	Type 8	2ml
M10124	*Shigella dysenteriae*	Type 9	2ml
M10125	*Shigella dysenteriae*	Type 10	2ml
M10152	*Shigella dysenteriae*	Type 11	2ml
M10153	*Shigella dysenteriae*	Type 12	2ml
M10135	*Shigella boydii*	Type 1	2ml
M10138	*Shigella boydii*	Type 4	2ml
M10139	*Shigella boydii*	Type 5	2ml
M10140	*Shigella boydii*	Type 6	2ml
M10141	*Shigella boydii*	Type 7	2ml
M10142	*Shigella boydii*	Type 8	2ml
M10143	*Shigella boydii*	Type 9	2ml
M10144	*Shigella boydii*	Type 10	2ml
M10145	*Shigella boydii*	Type 11	2ml
M10146	*Shigella boydii*	Type 12	2ml
M10147	*Shigella boydii*	Type 13	2ml
M10148	*Shigella boydii*	Type 14	2ml
M10149	*Shigella boydii*	Type 15	2ml
M10155	*Shigella boydii*	Type 16	2ml
M10156	*Shigella boydii*	Type 17	2ml
M10157	*Shigella boydii*	Type 18	2ml

SHIGELLA ANTISERA - POLYVALENT

Stock item

M10109	*S.dysenteriae* POLY A	Types 1, 2, 3, 4, 5, 6, 7	2ml
M10110	*S.dysenteriae* POLY A1	Types 8, 9, 10, 11, 12	2ml
M10111	*S.flexneri* POLY B	Types I, II, III, IV, V, VI, Groups (3) 4, 6, 7 (8)	2ml
M10112	*S.boydii* POLY C	Types 1, 2, 3, 4, 5, 6, 7	2ml
M10113	*S.boydii* POLY C1	Types 8, 9, 10, 11	2ml
M10114	*S.boydii* POLY C2	Types 12, 13, 14, 15	2ml
M10154	*S.boydii* POLY C3	Types 16, 17, 18	2ml
M10115	*S.sonnei* POLY D	Phase I & II	2ml

VIBRIO ANTISERA

Stock items

M11002	*Vibrio cholerae* POLY (INABA, OGAWA)	2ml
M11003	*Vibrio cholerae* INABA	2ml
M11004	*Vibrio cholerae* OGAWA	2ml
M15001	*Vibrio cholerae* O139 (Bengal)	2ml

BORDETELLA ANTISERA

Lead time 8 weeks

M11501/NCE	BORDETELLA PERTUSSIS ANTISERA This antiserum agglutinates Phase I *B.pertussis* but does not agglutinate Phase III *B.pertussis*, *B.parapertussis*, nor *B.bronchiseptica*.	NO CE MARK	2ml

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

LEGIONELLA ANTISERA

Stock items

M11702	*Legionella pneumophila* Group. 1		2ml
M11703	*Legionella pneumophila* Group. 2		2ml
M11704	*Legionella pneumophila* Group. 3		2ml
M11705	*Legionella pneumophila* Group. 4		2ml
M11706	*Legionella pneumophila* Group. 5		2ml
M11707	*Legionella pneumophila* Group. 6		2ml
M15727/NCE	*Legionella pneumophila* Group. 7	NO CE MARK	2ml
M15734/NCE	*Legionella pneumophila* Group. 8	NO CE MARK	2ml
M93572/NCE	*Legionella pneumophila* Group.9	NO CE MARK	2ml
M93589/NCE	*Legionella pneumophila* Group. 10	NO CE MARK	2ml
M93626/NCE	*Legionella pneumophila* Group. 11	NO CE MARK	2ml
M93633/NCE	*Legionella pneumophila* Group. 12	NO CE MARK	2ml
M93640/NCE	*Legionella pneumophila* Group. 13	NO CE MARK	2ml
M93657/NCE	*Legionella pneumophila* Group. 14	NO CE MARK	2ml
M93664/NCE	*Legionella pneumophila* Group. 15	NO CE MARK	2ml
M11708	*Legionella bozemanii* Antisera		2ml
M11711	*Legionella micdadei* Antisera		2ml
M11710	*Legionella gormanii* Antisera		2ml
M11709	*Legionella dumoffii* Antisera		2ml

LISTERIA ANTISERA

Stock items

M14379	Listeria O I/II antiserum	2ml
M14386	Listeria O I antiserum	2ml
M14393	Listeria O IV antiserum	2ml
M14409	Listeria O V/VI antiserum	2ml
M14416	Listeria O VI antiserum	2ml
M14423	Listeria O VII antiserum	2ml
M14430	Listeria O VIII antiserum	2ml
M14447	Listeria O IX antiserum	2ml
M14454	Listeria H-A antiserum	5ml
M14461	Listeria H-AB antiserum	5ml
M14478	Listeria H-C antiserum	5ml
M14485	Listeria H-D antiserum	5ml

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

HAEMOLYTIC STREPTOCOCCUS GROUP-A TYPING ANTISERA

Lead time 8 weeks

M10510/NCE	Group-A Strept. Poly T: 1, 3, 13, B3264	NO CE MARK	2ml
M10511/NCE	Group-A Strept. Poly U: 2,4,6, 28	NO CE MARK	2ml
M10512/NCE	Group-A Strept. Poly W: 5/27/44, 11, 12	NO CE MARK	2ml
M10513/NCE	Group-A Strept. Poly X: 8, 14/49, 25, Imp19	NO CE MARK	2ml
M10514/NCE	Group-A Strept. Poly Y	NO CE MARK	2ml
M10515/NCE	Group-A Strept. T 1	NO CE MARK	2ml
M10516/NCE	Group-A Strept. T 2	NO CE MARK	2ml
M10523/NCE	Group-A Strept. T 11	NO CE MARK	2ml
M10524/NCE	Group-A Strept. T 12	NO CE MARK	2ml
M10525/NCE	Group-A Strept. T 13	NO CE MARK	2ml
M10526/NCE	Group-A Strept. T 14/49	NO CE MARK	2ml
M10527/NCE	Group-A Strept. T 18	NO CE MARK	2ml
M10528/NCE	Group-A Strept. T 22	NO CE MARK	2ml
M10529/NCE	Group-A Strept. T 23	NO CE MARK	2ml
M10530/NCE	Group-A Strept. T 25	NO CE MARK	2ml
M10531/NCE	Group-A Strept. T 28	NO CE MARK	2ml
M10517/NCE	Group-A Strept. T 3	NO CE MARK	2ml
M10518/NCE	Group-A Strept. T 4	NO CE MARK	2ml
M10519/NCE	Group-A Strept. T 5/27/44	NO CE MARK	2ml
M10520/NCE	Group-A Strept. T 6	NO CE MARK	2ml
M10521/NCE	Group-A Strept. T 8	NO CE MARK	2ml
M10522/NCE	Group-A Strept. T 9	NO CE MARK	2ml
M10532/NCE	Group-A Strept. T B3264	NO CE MARK	2ml
M10533/NCE	Group-A Strept. T Imp19	NO CE MARK	2ml

YERSINIA ENTEROCOLITICA O-GROUPING ANTISERA

Stock items

M11102	*Yersinia enterocolitica* Polyvalent Group O1, O2 Mixture	2ml
M11103	*Yersinia enterocolitica* Polyvalent Group O3	2ml
M11104	*Yersinia enterocolitica* Polyvalent Group O5	2ml
M11105	*Yersinia enterocolitica* Polyvalent Group O9	2ml
M11106	*Yersinia enterocolitica* Polyvalent Group O8	2ml

Bacterial Agglutinating Antisera

Order No	Product		Packsize

MAST® ASSURE

YERSINIA PSEUDOTUBERCULOSIS ANTISERA

Lead time 8 weeks

M11801/NCE	*Yersinia pseudotuberculosis* Grouping Antisera Set This set consists of: Group 1~6 *Yersinia pseudotuberculosis* Group listed below	No CE Mark	2ml × 6
M11802/NCE	*Yersinia pseudotuberculosis* Group 1	No CE Mark	2ml
M11803/NCE	*Yersinia pseudotuberculosis* Group 2	No CE Mark	2ml
M11804/NCE	*Yersinia pseudotuberculosis* Group 3	No CE Mark	2ml
M11805/NCE	*Yersinia pseudotuberculosis* Group 4	No CE Mark	2ml

RDE (II) RECEPTOR DESTROYING ENZYME

370013	RDE (II) Receptor Destroying Enzyme For use in the serodiagnosis test of Influenza virus	20ml × 5

Veterinary Tests

Order No	Product	Packsize
EIKEN TESTS	**Available from stock**	
V-SZ11/NCE	RUO LZ TEST EIKEN SAA	4 × 20ml
V-SZ12/NCE	RUO LZ-SAA Calibrator EIKEN	6 × 1ml
V-SZ13/NCE	RUO QC-SAA L EIKEN	5 × 2ml
V-SZ14/NCE	RUO QC-SAA H EIKEN	5 × 2ml
V-SZ51/NCE	VET-SAA "Eiken" Reagent	
	R1	2 × 20mL
	R2	2 × 20mL
V-SZ90/NC	VET-SAA Calibrator Set	
	Calibrator	5 × 1mL
	Lysis buffer	1 × 12m
V-SZ91/NCE	VET-SAA-QC-Low	
	Low Calibrator	5 × 1mL
	Lysis buffer	1 × 12m
V-SZ92/NCE	VET-SAA-QC-High	
	High Calibrator	5 × 1mL
	Lysis buffer	1 × 12m

MAST VETERINARY PATHOGEN IDENTIFICATION PRODUCTS

RST7001	MAST TOXOREAGENT - Toxoplasma test, Complete kit for detection of Toxoplasma antibody comprising latex suspension, buffer and positive control serum.	50 tests

MASTDISCS® AST ANTIBIOTIC SUSCEPTIBILITY DISCS IN CARTRIDGES AND VIALS

SPECIALIST VETERINARY SUSCEPTIBILITY DISCS

Antibiotic & Strength µg per disc (unless otherwise stated)

CEQ30C/NCE	Cefquinome 30	5 × 50 discs
CPZ30C/NCE	Cefoperazone 30	5 × 50 discs
ENF5C/NCE	Enrofloxacin 5	5 × 50 discs
FFC30C/NCE	Florenfenicol 30	5 × 50 discs
GAM15C/NCE	Gamithromycin 15	5 × 50 discs
MAR5C/NCE	Marbofloxacin 5	5 × 50 discs
NE30C/NCE	Neomycin 30	5 × 50 discs
PRA5C/NCE	Pradofloxacin 5	5 × 50 discs
TIP60C/NCE	Tildipirison 60	5 × 50 discs
TY30C/NCE	Tylosin 30	5 × 50 discs

MASTDISCS® in Cartridges (5 × 50 discs per pack)

STOCKCART	Stock Susceptibility Cartridge Discs of a single type	1 pack
FUNGCART	Stock Antifungal Cartridge Discs of a single type	1 pack
SPECIALCART	Cartridge Discs made to special order*	Min 18 packs

MASTDISCS® in vials (100 discs per vial)

STOCKDISC	Stock Susceptibility Discs of a single type	1 vial
SPECIALDISC	Discs made to special order*	Min 22 packs
TOOL/C	*Set up charge for Special Discs in vials or cartridges A one off charge for customisation of each new specification	per new specification

MASTRING-S® (6 or 8 tipped, 100 rings per tin)

MASTRING SPECIAL	MASTRING-S® to individual specification. Minimum order 10 tins of 100 rings	10-19 tins
TOOL/M	*Set up charge for MASTRING SPECIAL: a one off charge for customisation of each new letter coded ring	per new

New Specification NUMBER coded MASTRING-S® are subject to an initial minimum order of 10 tins.
New Specification LETTER coded MASTRING-S® are subject to an initial minimum order of 20 tins.
Subsequent orders: minimums of 10 tins.

Molecular Biology Tests

Order No	Product	Packsize

MASTISOPLEX®

NUCLEIC ACID DETECTION PRODUCTS

Available to Special Order Lead time 6 weeks

DNA/LYO5	MAST ISOPLEX® CRE ART kit - LAMP kit for molecular detection and characterisation of different strains of Carbapenem-resistant Enterobacterales	10 tests
DNA/LYO1	MAST ISOPLEX® *DNA* Lyo kit	100 tests
DNA/LYO2	MAST ISOPLEX® *DNA* Lyo Plus kit	100 tests
DNA/LYO3	MAST ISOPLEX® *VTEC* kit	20 tests
DNA/LYO4	MAST ISOPLEX® *E.coli* O157 kit	20 tests

Immunodiagnostic Tests

Order No	Product	Packsize
EIKEN TESTS		
Available from stock		
V-SZ11/NCE	RUO LZ TEST EIKEN SAA	4 x 20ml
V-SZ12/NCE	RUO LZ-SAA Calibrator EIKEN	6 x 1ml
V-SZ13/NCE	RUO QC-SAA L EIKEN	5 x 2ml
V-SZ14/NCE	RUO QC-SAA H EIKEN	5 x 2ml
V-SZ51/NCE	VET-SAA “Eiken” Reagent	
	R1	2 × 20mL
	R2	2 × 20mL
V-SZ90/NC	VET-SAA Calibrator Set	
	Calibrator	5 × 1mL
	Lysis buffer	1 × 12m
V-SZ91/NCE	VET-SAA-QC-Low	
	Low Calibrator	5 × 1mL
	Lysis buffer	1 × 12m
V-SZ92/NCE	VET-SAA-QC-High	
	High Calibrator	5 × 1mL
	Lysis buffer	1 × 12m

Order No	Product	Packsize

MASTAFLUOR® IMMUNOFLUORESCENCE TESTS

All products available to Special Order - Lead time 2-3 weeks

630522	FTA-ABS-IgG Treponema pallidum complete test kit	10 × 10 tests
630525	FTA-ABS IgM Treponema pallIdum complete test kit	10 × 10 tests
640522	FTA-ABS Treponema pallidum slides	10 × 10 wells
620521	FTA-ABS-Antibodies controls IgG positive	0.5 ml
620525	FTA-ABS-Antibodies controls IgM positive	0.5 ml
636325	Mumps-IgM-complete test kit	10 × 5 tests

Complete test kits contain slides, buffers, controls, mounting medium, conjugate & cover slips

MASTAFLUOR® IMMUNOFLUORESCENCE TESTS

All products available to Special Order - Lead time 2-3 weeks

631181	Toxoplasma Screen	10 × 5 tests
631182	Toxoplasma Screen	10 × 10 tests
631183	Toxoplasma-IgG-complete test kit	10 × 5 tests
641181	Toxoplasma slides	10 × 5 wells
641182	Toxoplasma slides	10 × 10 wells
621181	Toxoplasma controls IgG positive	0.5 ml
636332	Varicella Zoster-IgG(Herpes Zoster) complete test kit	10 × 5 tests
626256	Varicella Zoster (Herpes Zoster) controls IgM positive	0.5 ml

Complete test kits contain slides, buffers, controls, mounting medium, conjugate & cover slips

MASTAFLUOR® IF ADDITIONAL REAGENTS

All products available to Special Order- Lead time 2-3 weeks

	Conjugates FITC labeled (ready for use)	
626291	Anti-Human IgG	2.0 ml
626284	Anti-Human IgG	3.0 ml
626283	Anti-Human IgG	10.0 ml
626292	Anti-Human IgM (µ-chain)	2.0 ml
626285	Anti-Human IgM (µ-chain)	3.0 ml
626290	Anti-Human IgG, IgA, IgM	2.0 ml
626286	Anti-Human IgG, IgA, IgM	3.0 ml
	Other Reagents	
620100	IFT Serumdiluent	2 × 10 ml
626298	Evans Blue (ready to use)	3.0 ml
626281SO	Sorbent for FTA-ABS	2 × 5ml
626280	Cover Slides (24 × 60 mm)	100 pc
	Rheumatic factor IgG absorbent for IgM tests	
651003	MASTSORB	2 ml
	Chlamydia Antigen	
695010	Mastazyme Chlamydia Ag	12 x 8 tests
695020	Mastazyme Chlamydia Ag Transport Media	95 tubes
695030	Mastazyme Chlamydia Ag Swabs	100 pc.

Special prices are available for bulk purchase.

Mast Immunodiagnostic Tests | Infectious Disease

Order No	Product	Packsize

MASTABLOT® LINEBLOT ASSAYS

All products available to Special Order- Lead time 2-3 weeks

A range of highly specific confirmatory tests to detect antibodies against Treponema pallidum

6653G08	MASTABLOT TP (*Treponema pallidum*) IgG	8 tests
6653M08	MASTABLOT TP (*Treponema pallidum*)IgM	8 tests

MASTABLOT® WESTERN BLOT ASSAYS

All products available to Special Order- Lead time 2-3 weeks

Antibody detection for *Borrelia bergdorferi*

665101	MASTABLOT *Borellia burgdorferi* IgG	8 tests
665102	MASTABLOT *Borellia burgdorferi* IgM	8 tests

Order No	Product	Packsize

MASTAFLUOR® IMMUNOFLUORESCENCE TESTS

All products available to Special Order. Lead time 2-3 weeks.

COMPLETE TEST KITS

contains slides, controls, conjugate, mounting medium and buffer

	HEp-2-Cells	
	Tissue Sections	
606023	ANA/AMA/ASMA/APCA/LKM	10 × 10 tests
606080	ASA/Rabbit Tongue	10 × 5 tests
606064	SKMA	10 × 5 tests
	TISSUE SECTIONS	
	Single Tissues	
	Rabbit Tissue Sections	
616180	Rabbit Tongue	10 × 5 wells
	Rat Tissue Sections	
616175	Rat Striated Muscle	10 × 5 wells
	Combined Tissue Sections	
	Rat Tissue	
616123	Rat Liver/-Kidney/-Stomach	10 × 10 wells

Mast Immunodiagnostic Tests | Autoimmune

MASTAFLUOR® IF CONTROLS

All products available to Special Order. Lead time 2-3 weeks

Order No	Product	Packsize
	HEp-2	
626202	HEp-2 pos. speckled	0.5 ml
626203	HEp-2 pos. nucleolar	0.5 ml
626204	HEp-2 pos. centromere	0.5 ml
	Crithidia luciliae	
626210	nDNA (dsDNA) positive	0.5 ml
	controls	
626220	ANA/AMA/ASMA/APCA (ASMA-positive)	0.5 ml
626221	ANA/AMA/ASMA/APCA (APCA-positive)	0.5 ml
626215	ANA/AMA/ASMA/APCA (AMA-positive)	0.5 ml
626201	ANA/AMA/ASMA/APCA (ANA-pos. homogeneous)	0.5 ml
626271	EmA negative	0.5 ml
626264	SKMA positive	0.5 ml

MASTAFLUOR® REAGENTS AND BUFFERS

All products available to Special Order. Lead time 2-3 weeks

CONJUGATES

	Conjugates FITC labeled (ready for use)	
626291	Anti-Human IgG	2.0 ml
626284	Anti-Human IgG	3.0 ml
626283	Anti-Human IgG	10.0 ml
626292	Anti-Human IgM	2.0 ml
626285	Anti-Human IgM	3.0 ml
626290	Anti-Human IgG, IgA, IgM	2.0 ml
626293	Anti-Human IgA	2.0 ml
626287	Anti-Human IgA	3.0 ml

OTHER REAGENTS

620100	IFT Serumdiluent	100 ml
626297	PBS-buffer (supplied as a powder - reconstitute in 1 litre H_20)	1 bag
626298	Evans Blue	3.0 ml
626280	Cover Slides (24 × 60 mm)	100 pc.
	Rheumatic factor, IgG absorbent for IgM tests	
651003	MASTSORB	2 ml

Order No	Product	Packsize
	MASTAZYME® ENZYME IMMUNOASSAY	
	All products available to Special Order. Lead time 2-3 weeks	
	ANA	
732020	Anti-dsDNA	12 × 8 tests
733026	ANA Profile 8	12 × 8 tests
733018	ANA Profile HJS	12 × 8 tests
	ENA	
733023	Anti-ENA Screen 7	12 × 8 tests
733010	Anti-Jo 1	12 × 8 tests
733012	Anti-Scl-70	12 × 8 tests
733013	Anti-Sm	12 × 8 tests
733014	Anti-Sm/RNP	12 × 8 tests
733015	Anti-SS-A (Ro)	12 × 8 tests
733016	Anti-SS-B (La)	12 × 8 tests
	AMA	
733017	Anti-Mitochondrial M2	12 × 8 tests
	Thyroid-Autoantibodies	
731010	Anti-TG	12 × 8 tests
731011	Anti-Thyroid-Peroxidase (Anti-TPO)	12 × 8 tests
	ANCA	
735013	Anti-Proteinase 3	12 × 8 tests
735012	Anti-Myeloperoxidase	12 × 8 tests
	Others	
733011	Anti-Rib-P (ribosomal protein)	12 × 8 tests
	Special prices are available for bulk purchase	

Terms and Conditions for Supply of Goods and/or Services

1. INTERPRETATION

1.1 In these Terms and Conditions the following words have the following meanings:
"Buyer": means the person(s), firm or company who accepts MAST's written quotation for the sale of the Goods and/or supply of the Services or whose written order for the Goods or Services is accepted by MAST;
"Contract": means any contract between MAST and the Buyer for the sale and purchase of Goods, incorporating these Terms;
"**Goods":** means any products and, test results and all documents and information arising from services agreed in the Contract to be supplied to the Buyer by MAST (including any part or parts thereof);
"MAST": means Mast Group Limited;
"Services" means the services which MAST is to supply in accordance with these Terms; and Terms, means the standard terms and conditions of sale set out in this document and (unless the context otherwise requires) includes any special terms agreed in writing between the Buyer and MAST pursuant to condition 2.3.
1.2 A reference in these Terms to a provision of a statute shall be construed as a reference to that provision as amended, re-enacted or extended at the relevant time.
1.3 In these Terms references to the masculine include the feminine and to the singular include the plural and vice versa as the context admits or requires.
1.4 In these Terms, the headings will not affect the construction of these Terms.

2. GENERAL

2.1 Subject to any variation under condition 2.3, the Contract will be subject to these Terms to the exclusion of all other terms and conditions (including any terms or conditions which the Buyer purports to apply under any purchase order, confirmation of order, specification or other document) and any course of dealing, and the acceptance of the supply of Goods or provision of Services shall be deemed conclusive evidence of the Buyer's acceptance of these Terms.
2.2 MAST's employees or agents are not authorised to make any representations concerning the Goods/Services unless confirmed by MAST in accordance with condition 2.3. In entering into the Contract the Buyer acknowledges that it does not rely on any such representations, which are not so confirmed, but nothing in these Terms affect the liability of either party for fraudulent misrepresentation.
2.3 Any variation to these Terms and representations about the Goods or Services shall have no effect unless expressly agreed in writing and signed by the Managing Director of MAST.
2.4 Any typographical, clerical or other error or omission in any sales literature, quotation, price list, acceptance of offer, invoice or other document or information issued by MAST shall be subject to correction without any liability on the part of MAST.

3 ORDERS AND SPECIFICATIONS

3.1 Orders may be made by post, telephone, fax or e-mail and shall be deemed to be in accordance with MAST's custom manufacturing policy as set out in MAST's price list from time to time available at www.mast-group.com. Each order for Goods or Services by the Buyer shall be deemed to be an offer by the Buyer to purchase Goods or Services subject to these conditions. Please order by catalogue number and product description. A Buyer order number is required for every order.
3.2 No order submitted by the Customer shall be deemed to be accepted by MAST unless and until confirmed in writing by MAST's authorised representative.
3.3 The Buyer shall be responsible to MAST for ensuring the accuracy of the terms of any order including where applicable, catalogue number and any applicable specification or design submitted by the Buyer. Buyer should note the provisions of condition 11.7.
3.4 Goods should be used in accordance with the manufacturer's instructions. MAST accepts no liability for the performance of Goods if used outside the manufacturer's instructions or where Goods are found to be faulty yet continue to be used.
3.5 MAST does not guarantee results arising from test/research Services provided by MAST will meet Buyer expectations and shall not be liable to the Buyer for such results. Any retesting required as a result of the Buyer providing incorrect or incomplete information or unsuitable material will be the subject of additional charges unless the retest is required solely as a result of MAST gross negligence.
3.6 An order for Goods available from stock may be cancelled at any time prior to the despatch of the order without incurring any additional charges. Cancellation of an order which has already been despatched will incur a 15% restocking fee. Goods returned in an unsaleable condition (e.g. damage to or defacing of packaging, contents etc.) or where content has not been kept at the correct temperatures, whether or not performance is affected, will be charged in full. Cancellation of Goods for special order will be subject to a charge equivalent to 100% of the value of the special order Goods, once the order has been entered onto Mast's computer system.
3.7 Where an order confirmation is despatched from MAST to the Buyer, the Buyer should confirm the contents and is presumed to have accepted that confirmation as an accurate description of Goods, quantities and prices to be delivered.

4. NEW ACCOUNTS

Prospective customers wishing to open a credit account are requested to furnish two trade references and one banker's reference. Until the opening of a credit account has been confirmed, a remittance should accompany payment effected by cheque, banker's draft or electronic transfer; commencement of the services or production/delivery of the Goods will not be made until cleared funds have been credited to MAST's account. MAST reserves the right to make an additional charge to cover transaction costs in proportion to the costs associated with the chosen method of payment both before and after the references have proved satisfactory.

5. DESCRIPTION

5.1 The description of the Goods shall be as set out in MAST's quotation or price list.
5.2 All drawings, descriptive matter, specifications and advertising issued by MAST and any descriptions or illustrations contained in MAST's catalogues or brochures are issued or published for the sole purpose of giving an approximate idea of the Goods described in them. They will not form part of the Contract.

6. TERMS OF PAYMENT

6.1 Unless otherwise agreed in writing terms of payment shall be net cash due, together with Value Added Tax where applicable, according to the terms printed on the invoice in respect of the Goods. Payment of the price shall be due within thirty (30) days of date of the invoice, unless otherwise agreed in writing.
6.2 Time for payment shall be of the essence.
6.3 MAST may submit its invoice either with its delivery note or as requested.
6.4 Invoices may be raised prior to Services being undertaken or dispatch of Goods for new accounts or in accordance with condition 6.5 as otherwise required by MAST.
6.5 Invoices may be raised in respect of a particular batch, consignment or part orders being delivered. MAST reserves the right to require payment in advance where the Buyer has a previous history of late payment or in the opinion of MAST represents a credit risk.
6.6 The Buyer shall make all payments due under the Contract without any deduction whether by way of set-off, counterclaim, discount, abatement or otherwise unless the Buyer has a valid court order requiring an amount equal to such deduction to be paid by MAST to the Buyer.
6.7 Where the Contract is to be or may be fulfilled in separate deliveries or instalments payment for each such delivery or instalment will be as if the same constituted a separate Contract.
6.8 If the Buyer fails to make any payment on the due date then, without limiting any other right or remedy available to MAST, MAST may:
(a) cancel the Contract or suspend any further deliveries/Services to the Buyer;
(b) appropriate any payment made by the Buyer to such of the Goods or Services (or the goods/services supplied under any other Contract between the Buyer and MAST) as MAST may think fit (notwithstanding any purported appropriation by the Buyer);
(c) withhold and/or offset amounts due from MAST to the Buyer under any other contract against amounts due from the Buyer to MAST (notwithstanding any terms of the Buyer to the contrary); and
(d) charge interest on amounts outstanding beyond the time specified in condition 6.1. The rate of interest shall be 5% per annum over the National Westminster Bank plc base-lending rate accruing on a daily basis from the payment due date and compounded quarterly. MAST may exercise this right in addition to any other rights it may have in respect of the Goods, Services or the non-payment, until payment in full is made (a part of a month being treated as a full month for the purpose of calculating interest). The parties agree that this constitutes a substantial remedy in terms of the Late Payment of Commercial Debts (Interest) Act 1998.
6.9 MAST may withdraw credit facilities at any time and without notice.

7. PRICES

7.1 Unless otherwise agreed in writing, all orders are executed subject to prices and any relevant discounts running at the date of despatch. Any price list of MAST whether published or not shall not affect the right of MAST to charge for Goods in accordance with this condition 7.
7.2 Prices quoted in a particular currency shall be invoiced and payable in that currency. The Buyer will be liable to MAST for any shortfall in the price payable or loss arising including conversion costs) from payment being received in a different currency or which is converted on receipt.
7.3 All prices unless otherwise stated are ex-works (Incoterms 2010) and exclusive of Value Added Tax.
7.4 Where any form of international delivery is agreed, the Buyer shall remain liable for any customs or excise duties or tariffs imposed on export or import whether or not such duties were known to the parties at the time of contract.
7.5 Any special negotiated prices will only be applied if MAST has received written acceptance of a quotation or the order states a valid quote reference. If no acceptance has been received list prices will be applied. Quotations, unless specifically stated otherwise shall remain valid for ninety (90) days from the date of the quotation, unless earlier withdrawn or varied by MAST.
7.6 Special prices for volume breaks apply to individual orders received on the same day for planned delivery as one order and are not cumulative. Special prices for volume breaks will similarly not apply when the order is planned to be delivered on more than one delivery date.
7.7 MAST reserves the right to adjust quoted prices if the Buyer does not fulfil its obligation of purchasing the required quantities indicated in the quotation.
7.8 MAST reserves the right, by giving written notice to the Buyer at any time before delivery of the Goods or provision of the Services, to increase the price of the Goods/Services to reflect any increase in the cost to MAST which is due to any factor beyond the control of MAST (such as, without limitation, any foreign exchange fluctuation, currency regulation, alteration or introduction of duties or tariffs, significant increase in the costs of labour, materials or other costs of manufacture (utilities)), any change in delivery dates, quantities or specifications for the Goods/Services which is requested by the Buyer, or any delay caused by any instructions of the Buyer or failure of the Buyer to give MAST adequate information or instructions.
7.9 If, by mistake, MAST has under priced any Goods, it will not be liable to supply those Goods to the Buyer at the stated price, provided that it notifies the Buyer before despatch of the Goods. In those circumstances, MAST will notify the correct price to the Buyer so the Buyer can decide whether or not it wishes to order the Goods at that price.

8. CARRIAGE AND DELIVERY

8.1 Unless otherwise agreed, prices quoted exclude delivery and insurance charges. Where any alternative arrangement is agreed in writing by MAST, the Buyer shall be liable to pay MAST charges for transport, packaging, insurance, duties and tariffs and other costs where applicable.
8.2 An order comprising both stock and specially manufactured Goods will be subject to separate charges for each delivery.
8.3 Any dates quoted for delivery of the Goods or provision of the Services are approximate only and MAST shall not be liable for a delay however caused. Any dates specified for delivery of the Goods are intended to be an estimate only and time for delivery shall not be made "of the essence". If no dates are so specified, delivery will be in a reasonable time. The Goods may be delivered/Services performed by MAST in advance of the quoted delivery date on giving reasonable notice to the Buyer.
8.4 Where the Goods are to be delivered in instalments, or Service to be carried out in phases, each delivery date or phase completion shall constitute a separate Contract and failure by MAST to deliver or complete any one or more of the instalments in accordance with these Terms or any claim by the Buyer in respect of any one or more instalments shall not entitle the Buyer to treat the Contract as a whole as repudiated.
8.5 Where delivery of the Goods is to be made to the Buyer's specified address, the Buyer shall make all arrangements necessary to take delivery of the Goods (including offloading) whenever they are tendered for delivery. The Buyer shall be liable, on a full indemnity basis, for any costs incurred by MAST, arising from undelivered Goods being returned, stored and re-delivered.
8.6 A handling charge will apply on all orders in the UK mainland. An additional charge applies to Northern Ireland, and the Isle of Man, and the Scottish Islands. MAST reserves the right to apply a small order supplement. Products designated as "Hazardous Goods" will be shipped separately and subject to an additional charge per delivery. Any such charges shall be published on MAST's website from time to time, or otherwise notified to the Buyer.

9. RISK AND TITLE

9.1 The Goods shall be at the Buyer's risk as from delivery (including any attempted delivery by MAST).
9.2 Title in the results from the provision of any research or test Service shall belong to the Buyer but all other intellectual property rights, including know how, in how those results are achieved will remain with MAST and the Buyer shall not be entitled to such information or to any licence to use such intellectual property or know how.
9.3 Where any Goods require the use of integral software, such Goods are provided with a licence to use such software for the life of the Goods and subject to any specific restrictions on such use. The Buyer solely shall be liable for ensuring interfacing with its own software and that of the Goods. Title to software will remain with MAST. The Buyer shall be responsible for maintaining software security, regardless of whether it uses its own security software or that issued by the manufacturer, and shall install all software updates when issued by the manufacturer and otherwise maintain security in keeping with good industry practice.
9.4 MAST and the Buyer expressly agree that, in spite of delivery having been made, property in the Goods shall not pass from MAST until the Buyer shall have paid the invoice in full and no other sums whatsoever shall be due from the Buyer to MAST.
9.5 Until property in the Goods passes to the Buyer in accordance with condition 8.2 the Buyer shall hold the Goods as bailee for MAST. The Buyer shall store the Goods in accordance with MAST's instructions (at no cost to MAST) and good industry practice separately from all other goods in its possession and so that they are clearly identified as MAST's property.
9.6 Notwithstanding that the Goods (or any part thereof) remain the property of MAST, the Buyer has the right to dispose of the Goods or such other products in the normal course of its business for the account of MAST and to pass title to the Goods or products to his customer being a bona fide purchaser for value without notice of MAST's rights. Any such dealings shall be a sale or use of MAST's property by the Buyer on the Buyer's own behalf and the Buyer shall deal as principal when making such sales or dealings. MAST shall be entitled to recover the invoice value notwithstanding the property and any of the Goods have not passed from MAST.
9.7 Until such time as property in the Goods passes from MAST the Buyer shall upon request deliver up such of the Goods that are still in existence or resold to MAST. If the Buyer fails to do so MAST or its appointed representative may enter the premises owned, occupied or controlled by the Buyer where the Goods are situated and repossess the Goods. On the making of such request the rights of the Buyer under condition 9.6 shall cease.
9.8 The Buyer shall insure and keep insured the goods to their full value against "all risks" to the reasonable satisfaction of MAST until the date that property in the Goods passes from MAST and indemnifies MAST against any cost claim or loss howsoever suffered or incurred.

Continued

10. DAMAGE IN TRANSIT AND SHORTAGES

10.1 MAST will, when the price quoted includes delivery, repair or replace free of charge goods damaged in transit provided that the Buyer adheres to the provisions of this condition 10. The obligation to repair or replace, shall be MAST's entire liability for shortfall, faulty, damaged or undelivered Goods.

10.2 It is the Buyer's responsibility to inspect the Goods on receipt and to report to the delivery driver and to MAST promptly any damage to, or shortfall in the Goods which is apparent from reasonable inspection. Where appropriate, photo evidence should be taken and provided to MAST upon request. Goods received in a damaged or unsatisfactory condition must be signed for as such and must not be used.

10.3 The Buyer shall be deemed to have accepted the Goods three (3) days after delivery to the Buyer and after acceptance, the Buyer shall not be entitled to reject Goods which are not in accordance with the Contract.

10.4 MAST shall be entitled on reasonable notice to the Buyer to arrange an inspection of any damaged Goods at the Buyers premises and the Buyer shall afford the inspector all reasonable assistance.

10.5 Goods should not be returned to MAST without a valid returns material authorisation number. If authorisation is received the Buyer shall return goods, packaging and a copy of the delivery note. Goods must be returned in accordance with manufacturer instructions and good industry practice.

10.6 Any liability of MAST for non-delivery of the Goods shall be limited to replacing the Goods within a reasonable time or issuing a credit note at the pro rata Contract rate against any invoice raised for such Goods.

11. WARRANTY

11.1 MAST warrants that subject to the other provisions of these Conditions upon delivery, the Goods will comply with the written specification and on provision of the Services, the Services shall have been undertaken in accordance with any Statement of Works.

11.2 MAST shall not be liable for any breach of the warranty in condition 11.1 unless:

(a) the Buyer gives written notice of the defect to MAST and (if the defect is as a result of damage in transit) to the carrier within 3 days of the time when the Buyer discovers or ought reasonably to have discovered the defect; or in respect of services, MAST has failed to comply with the Statement of Works;

(b) MAST is given a reasonable opportunity after receiving notice of examining such Goods at the Buyers premises or the Buyer (if asked to do so by MAST) returns such Goods and products of any Services to MAST's place of business at the Buyer's cost for such examination to take place.

11.3 MAST shall not be liable for a breach of warranty if:

(a) the Buyer makes any further use of the Goods after giving such notice; or

(b) the defect arises because the Buyer failed to follow MAST's oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Goods or (if there are none) good industry practice; or

(c) the Buyer alters or repairs such Goods without the written consent of MAST.

11.4 Subject to conditions 11.2 and 11.3, if any of the Services do not conform with the warranty contained in condition 11.1 as a result of MAST's default, MAST may at its entire discretion re-perform Services which do not conform to condition 11.1.

11.5 Subject to conditions 11.2 and 11.3, if any of the Goods do not conform with the warranty in condition 11.1, MAST shall at its option repair or replace such Goods (or the defective part) provided that the Buyer shall return the Goods (or the defective part), if MAST so requests, to MAST at the Buyer's expense.

11.6 Where MAST re-performs the services or repairs or replaces the defective Goods, MAST shall have no further liability for a breach of warranty in condition 11.1 in respect of such Goods or Services.

11.7 The Buyer warrants and represents that where Goods are made to Buyer's design or specification, or where the Buyer provides material from which MAST is to work, the Buyer holds all necessary rights and licenses to authorise MAST to produce the Goods using such specification or materials. The Buyer will indemnity and keep indemnified MAST on demand against all costs claims and liabilities arising out of any third party claim that in producing the Goods MAST has infringed a third party's intellectual property rights.

12. LIMITATION OF LIABILITY

12.1 Subject to condition 11, the following provisions set out the entire financial liability of MAST (including any liability for the acts or omissions of its employees, agents and sub-contractors) to the Buyer in respect of:

(a) any breach of these Terms; and

(b) any representation, statement or tortious act or omission including negligence arising under or in connection with the Contract.

12.2 All warranties, conditions and other terms implied by statute or common law (save for the conditions implied by section 12 of the Sale of Goods Act 1979) are, to the fullest extent permitted by law, excluded from the Contract.

12.3 Nothing in these Terms excludes or limits the liability of MAST for death or personal injury caused by MAST's negligence or for fraudulent misrepresentation.

12.4 Subject to conditions 12.2 and 12.3 MAST's total liability in contract, tort (including negligence or breach of statutory duty), misrepresentation, restitution or otherwise, arising in connection with the performance or contemplated performance of the Contract shall be limited to the refund of the price of the Goods and Services plus up to ten percent (10%) of the price.

12.5 MAST shall not be liable to the Buyer for any pure economic loss, loss of profit, loss of business opportunity, depletion of goodwill or otherwise, in each case whether direct, indirect or consequential, or any claims for consequential compensation whatsoever (howsoever caused) which arise out of or in connection with the Contract.

12.6 MAST shall not be liable for any loss or liability arising from virus, Trojans, ransomware, malware, scanners, spyware or other similar attacks on equipment or software.

13. CONFIDENTIALITY AND DATA PROTECTION

13.1 A party (Receiving Party) shall keep in strict confidence all technical or commercial know-how, specifications, inventions, processes or initiatives which are of a confidential nature and have been disclosed to the Receiving Party by the other party (Disclosing Party), its employees, agents or subcontractors, and any other confidential information concerning the Disclosing Party's business or its products or its services which the Receiving Party may obtain. The Receiving Party shall restrict disclosure of such confidential information to such of its employees, agents or subcontractors as need to know it for the purpose of discharging the Receiving Party's obligations under the Contract, and shall ensure that such employees, agents or subcontractors are subject to obligations of confidentiality corresponding to those which bind the Receiving Party. This condition 13 shall survive termination of the Contract.

13.2 The Buyer may not without the prior written approval of MAST issue or cause to be issued any press release or publish any journal publication or notice regarding the Products, or details relating to the supply by MAST to the Buyer.

13.3 The Buyer hereby warrants and represents that it has and where applicable for future persons involved in the purchase of MAST Goods or Services, will obtain written consent from such persons whose personal details are provided to (or independently obtained by) MAST for the purposes of this supply of Goods or Services (including all officers, employees, agents and contractors of Buyer) "Buyer Personnel" that allows MAST to hold and process "Personal Data" (as defined in applicable data protection Law), relating to such Buyer Personnel, anywhere in the world, both manually and electronically, for all purposes relating to:

(a) the supply of the Goods and/or performance of the Services;

(b) administering and managing the business activities of MAST; and

(c) compliance with applicable policies and procedures and laws, rules and regulations.

13.4 Where personal data is supplied solely for the purpose of fulfilment of the contract, the parties shall rely on "legitimate purpose" in order to hold personal data relating to individuals involved in the contract.

13.5 Subject to condition 13.4, MAST shall only hold Personal Data for the limited purpose of the supply (and any continuing supplies), and for so long as is reasonably necessary. MAST may share such personal Data with its officers and employees who have a need to know the Personal Data for the performance of the contract but shall not otherwise share the Personal Data with any third parties.

13.6 MAST hereby confirms that any provision by MAST of any officer and employees Personal Data is obtained and provided in compliance with the terms of the applicable data protection Law.

13.7 Mast's full Privacy and Data Protection Policy, which is hereby incorporated, is available at www.mast-group.com.

14. TERMINATION

14.1 MAST shall be entitled to cancel the Contract or suspend any further deliveries under the Contract without any liability to the Buyer if any of the following occur (without prejudice to any other right or remedy available to MAST):

(a) the Buyer being in material breach of an obligation under the Contract (including an obligation to make payment) which (if capable of remedy) it fails to remedy within 30 days starting on the day after receipt of notice from MAST giving particulars of the breach;

(b) the Buyer passing a resolution for its winding-up or a court of competent jurisdiction making an order for the Buyer's winding-up or dissolution;

(c) the making of an administration order in relation to the Buyer or the appointment of a receiver over, or the taking possession or sale by an encumbrance taking possession of or selling an asset of the Buyer; or

(d) the Buyer making an arrangement or composition with its creditors generally or making an application to a court of competent jurisdiction for protection from its creditors generally; or

(e) the buyer being unable to pay its debts as they fall due.

14.2 If MAST cancels or suspends any further deliveries under the Contract under condition 14.1 and if the Goods have been delivered but not paid for the price shall become immediately due and payable regardless of previous agreement or arrangement to the contrary.

15. FORCE MAJEURE

MAST reserves the right to defer the delivery or to cancel the Contract or reduce the volume of the Goods ordered, or Services requested by the Buyer (without liability to the Buyer) if it is prevented from or delayed in the carrying on of its business due to circumstances beyond the reasonable control of MAST.

16. MISCELLANEOUS

16.1 Each right or remedy of MAST under the Contract is without prejudice to any other right or remedy of MAST whether under the Contract or not.

16.2 If any provision of the Contract is found by any court, tribunal or administrative body of competent jurisdiction to be wholly or partly illegal, invalid, void, voidable, unenforceable or unreasonable it shall to the extent of such illegality, invalidity, voidness, voidability, unenforceability or unreasonableness be deemed severable and the remaining provisions of the Contract and the remainder of such provision shall continue in full force and effect.

16.3 Failure to delay by MAST in enforcing any provision of the Contract will not be construed as a waiver of any of its rights under the Contract.

16.4 Any waiver by MAST of any breach of, or any default under, any provision of the Contract by the Buyer will not be deemed a waiver of any subsequent breach or default and will in no way affect the other terms of the Contract.

16.5 The parties to this Contract do not intend that any term of this Contract will be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 by any person that is not a party to it.

16.6 The formation, existence, construction, performance, validity and all aspects of the Contract shall be governed by English law and the parties submit to the exclusive jurisdiction of the English courts.

Issue 22.08.18

Mast Group

IVD solutions through partnership

Mast House
Derby Road, Bootle
Merseyside L20 1EA UK

Tel: + 44 (0) 151 933 7277
e-mail: sales@mast-group.com

www.mast-group.com

accuracy and quality as a science

tcs biosciences

Selectrol® Technical Guide

Selectrol® : Manufactured under licence from Public Health England Culture Collections

SELECTROL® - FREEZE-DRIED ORGANISMS IN A DISC

Quality control of microbial characterisation tests, culture media and antimicrobial susceptibility determinations is best accomplished by the use of microorganisms with well-documented and stable phenotypic and genotypic characteristics.

Bacterial and fungal strains have been selected and recommended by expert bodies, such as EUCAST, CLSI and the European Pharmacopoeia, on the basis of their suitability for monitoring test performance and ensuring the validity of results for testing used in clinical, food, pharmaceutical, water and veterinary laboratories.

Products derived from the cultures in the collections should be manufactured using the minimum number of sub-cultures, to minimise the possibility of alterations to the phenotype due to mutations. See also page 14.

Selectrol strains are manufactured exclusively from Public Health England Culture Collections (NCTC® and NCPF®) and are first generation subcultures, unlike many products on the market which are 2nd, 3rd or 4th generation subcultures. They are preserved by long-term storage as freeze-dried cells in order to minimise any alterations to the phenotype caused by mutations.

Passages

A Selectrol® disc is a first generation subculture from a **master culture** sourced from Public Health England Culture Collections, and is designed to be used to obtain **working stock** cultures for use in testing. It is generally accepted that no more than a total of five passages should be made from the **master culture**, in order to avoid genetic drift and mutant selection. Therefore, no more than four passages (fresh cultures) from the **working stock** should be made.

Shelf life

For most strains, Selectrol® discs are guaranteed to contain at least 10^6 organisms at the time of purchase; this number is sufficient to ensure that when the discs are used and stored as directed there will be viable organisms cultivable up to the stated end of the shelf life, which is usually 9 months from the time the vial is first opened.

Quality Control

Selectrol® batches are tested in our UKAS accredited testing laboratory number 2496. A test report for each batch of Selectrol® can be accessed via our website. The reporting of Selectrol® test results via the website comes under our UKAS accreditation.

Selectrol® cultures are rigorously tested to confirm identity, to confirm the possession of essential phenotypic characteristics and to exclude contamination with other organisms. Photographic evidence of the test results is retained for each batch, along with retained appropriately stored samples.

Glossary

AMRHAI: Antimicrobial Resistance and Healthcare Associated Infections reference unit

ATCC®: American Type Culture Collection. ATCC® strains are listed for reference only. ATCC® is a registered trademark of the American Type Culture Collection.

BSAC: British Society for Antimicrobial Chemotherapy - Now superseded by EUCAST

CLSI: Clinical Laboratory Standards Institute. (USA)

CPE: Carbapenemase Producing Enterobacteriaceae

CRE: Carbapenem Resistant Enterobacteriaceae

Culture collection: Cultures of fully characterised organisms maintained in such a way as to minimise sub-culturing. See page 14.

ESBL: Extended Spectrum Beta-Lactamase-producing organism.

EUCAST: European Committee on Antimicrobial Susceptibility Testing.

First generation derivative: A single passage from a master culture, for example a Selectrol® disc.

Master culture: Culture derived from a reference culture vial.

NCPF®: National Collection of Pathogenic Fungi. NCPF® is a registered trademark of Public Health England.

NCTC®: National Collection of Type Cultures. NCTC® is a registered trademark of Public Health England.

Passage: An equivalent term for a subculture.

PHE: Public Health England.

Reference cultures: Quality control strains selected on the basis of their phenotypic biochemical and antimicrobial susceptibility characteristics to be used as controls in microbiological testing. These are obtained as freeze-dried vials from culture collections.

Stock culture: Cultures derived from a Selectrol® disc, which can be stored for up to a week, usually on agar slants.

Working cultures: Stock cultures further sub-cultured to provide 18-24 hour growth for use in testing.

WDCM: World Data Centre for Microorganisms

WFCC: World Federation for Culture Collections

SIGNIFICANT PROPERTIES AND USES OF SELECTROL® ORGANISMS

Aspergillus brasiliensis (formerly *Aspergillus niger*)**:**

MM94 – NCPF® 2275 / ATCC® 16404 / WDCM 00053 – used in pharmaceutical industry for testing media and preservatives. Colonies are initially white or yellowish and on the reverse greyish or greenish-yellow. Sporing heads on the colony surface are initially pale, becoming dark brown to black. Sporulation may be inhibited in sealed plates.

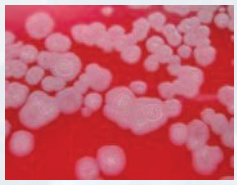
***Bacillus cereus*:**

MM21 – NCTC® 10320 / ATCC® 9634 / WDCM 00001 (recently renamed *Bacillus toyonensis*) – ISO 11133 recommended media and ID test control organism.

MM86 – NCTC® 7464 / ATCC® 10876 – PHE recommended media and ID test control organism.

Bacillus subtilis *(Bacillus subtilis* subsp. *spizizenii)***:**

MM29 – NCTC® 10400 / ATCC® 6633 / WDCM 00003 – used in antibiotic assays (fully sensitive), PHE recommended media and ID test control organism.



***Bacteroides fragilis*:**

MM44 – NCTC® 9343 / ATCC® 25285 – type strain, PHE recommended strain for media and sensitivity test control.

Campylobacter jejuni *(Campylobacter jejuni* subsp. *jejuni)***:**

MM82 – NCTC® 11322 / ATCC® 29428 / WDCM 00156 – PHE recommended strain for media control.

MM36 – NCTC® 11351 / ATCC® 33560 – EUCAST recommended strain for susceptibility testing.

***Candida albicans*:**

MM28 – NCPF® 3255 / ATCC® 2091 / WDCM 00055 – sensitivity control / industrial use.

MM42 – NCPF® 3179 / ATCC® 10231 / WDCM 00054 – pharmaceutical / media testing / PHE recommended strain for media control.

CRE ≡ 'Carbapenem Resistant Enterobacteriaceae' / CPE ≡ 'Carbapenemase Producing Enterobacteriaceae'

There are 5 carbapenemases which are currently a significant problem in the UK – KPC, OXA-48, IMP, NDM and VIM – and PHE recommend that all clinically-significant Gram-negative bacteria should be routinely screened for carbapenemase production, using a recommended carbapenem[2] such as ertapenem or meropenem. Resistant isolates may be investigated further to determine which resistance mechanism is involved using the Modified Hodge Test, MALDI-TOF, PCR or a reference laboratory.

MM55 *Klebsiella pneumoniae* – NCTC® 13440 – produces a Class B VIM-1 Carbapenemase.

MM56 *Klebsiella pneumoniae* – NCTC® 13443 – produces a Class B NDM-1 Carbapenemase.

MM58 *Klebsiella pneumoniae* – NCTC® 13438 – produces a Class A KPC-3 Carbapenemase.

MM59 *Klebsiella pneumoniae* – NCTC® 13442 – produces a Class D OXA-48 Carbapenemase.

MM57 *Escherichia coli* – NCTC® 13476 – produces a Class B IMP Carbapenemase.

MM33 *Escherichia coli* – NCTC® 10418 / ATCC® 10536 – recommended by PHE as a negative control for CRE testing.

***Citrobacter freundii*:**

MM27 – NCTC® 9750 / ATCC® 8090 – type strain.

***Clostridium perfringens*:**

MM45 – NCTC® 8237 / ATCC® 13124 / WDCM 00007 – type strain. PHE recommended strain for food testing (Tryptose Sulphite Cycloserine agar – lactose and gelatin positive) and sensitivity test control. *Clostridium perfringens* is listed in Schedule 5 of the Anti-terrorism, Crime and Security Act 2001, and should be securely stored in accordance with the guidelines of the Act. However, MM45 is a type A strain, which does not produce the lethal epsilon toxin of potential interest to bioterrorists.

***Clostridium sporogenes*:**

MM31 – NCTC® 532 / ATCC® 19404 / WDCM 00008 – used for media control. PHE recommended strain for media QC (lactose gelatin medium for ID of *C. perfringens* lactose negative and gelatin positive).

***Enterobacter aerogenes*:**

MM26 – NCTC® 10006 / ATCC® 13048 / WDCM 00175 – type strain; used in water, paint and adhesive testing.

***Enterobacter cloacae*:**

MM01 – NCTC® 13380 / ATCC® 23355 / WDCM 00082 – disinfectant control, media testing.

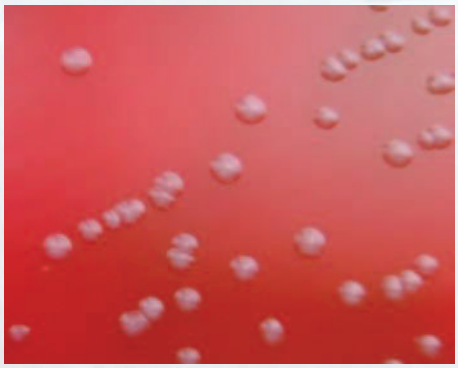
MM51– NCTC® 13406 – PHE recommended strain for QC of AmpC (de-repressed) detection.

***Enterococcus faecalis*:**

MM52 – NCTC® 13379 / ATCC® 51299 / WDCM 00085 – is vancomycin resistant (low-level VanB mediated) and also shows high-level resistance to aminoglycosides. It is used to confirm methodologies used to detect these resistances are working correctly. Lancefield group D.

MM17 – NCTC® 775 / ATCC® 19433 / WDCM 00009 – used in water industry and QC. PHE recommended strain for media control. Fully sensitive. Lancefield group D.

MM18 – NCTC® 12697 / ATCC® 29212 / WDCM 00087 – is fully sensitive to vancomycin and gentamicin. PHE recommended positive control strain for aesculin test. CLSI, EUCAST recommended media control for sulpha / trimethoprim testing and general susceptibility testing control. Lancefield group D.

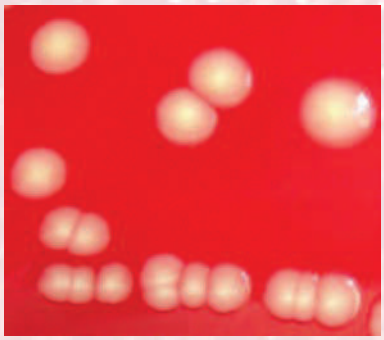


***Enterococcus hirae*:**

MM35 – NCTC® 13383 / ATCC® 10541 / WDCM 00011 – disinfectant control. Used in microbiological assays. Colonies are alpha-haemolytic on sheep blood agar.

***Escherichia coli* strains:**

MM02 – NCTC® 12241 / ATCC® 25922 / WDCM 00013 – EUCAST, CLSI, PHE recommended control strain for susceptibility testing (fully sensitive). Exhibits 2 colony types – the most prevalent type is slightly irregular, smooth and translucent. The secondary type appears more opaque. It is preferable to maintain cultures on agar as passage in broth can result in a change in MIC levels.



MM57 – NCTC® 13476 – CRE testing control; produces a Class B IMP Carbapenemase.

MM33 – NCTC® 10418 / ATCC® 10536 – (PHE recommended alternative to NCTC 12241) fully sensitive control strain. PHE recommended positive control for indole test, ONPG test, negative control for oxidase test, PHE recommended negative control for CRE and ESBL testing.

MM24 – NCTC® 11954 / ATCC® 35218 – beta-lactamase positive strain. CLSI recommended strain for susceptibility testing ONLY for penicillin / beta-lactamase inhibitor combinations. Sensitive to amoxicillin / clavulanic acid.

MM75 – NCTC® 9001 / ATCC® 11775 / WDCM 00090 – used in water / chemical industry. PHE recommended strain for media QC.

MM93 – NCTC® 12900 / ATCC® 700728 / WDCM 00014 – O157 strain (non-toxigenic). PHE recommended strain for media QC.

MM63 – NCTC® 11560 – beta-lactamase positive strain.

MM38 – NCTC® 12923 / ATCC® 8739 / WDCM 00012 – used in pharmaceutical / water industry. Three colony types: A) Entire, glistening, smooth and translucent. B) Entire, glistening smooth and opaque. C) Irregular, rough and translucent. The rough colonies appear after 48 hours incubation.

MM34 – NCTC® 13846 – Possesses the plasmid-mediated mcr-1 colistin resistance mechanism gene and is recommended by PHE and EUCAST as a control for tests to detect this increasingly prevalent resistance, in conjunction with NCTC® 12241 / ATCC® 25922 (Selectrol strain MM02) as a negative control.

***Haemophilus influenzae* strains:**

MM81 - NCTC® 12699 / ATCC® 49247 – is a 'BLNAR' strain – (beta-lactamase non-producing ampicillin / amoxycillin resistant). These strains are important clinically because the susceptibility results obtained using conventional testing procedures maybe misleading in the case cephalosporins. PHE, CLSI recommended QC strain for susceptibility testing media.

MM98 – NCTC® 11931 – a fully sensitive strain. PHE recommended strain for porphyrin synthesis test, chocolate agar control.

MM100 – NCTC® 8468 / ATCC® 9334 / CCUG 23946 – another fully sensitive strain, which reportedly gives results which are easier to interpret when Mueller-Hinton medium is used in preference to Iso-Sensitest medium. MIC for amoxycillin is 0.5 mg/l.

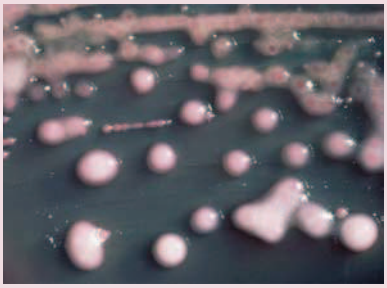
MM37 – NCTC® 12975 / ATCC® 49766 – recommended by EUCAST.

***Klebsiella* strains:**

MM04 *Klebsiella pneumoniae* – NCTC® 9633 / ATCC® 13883 / WDCM 00097 – type strain. Two colony types may be seen. The predominant type is entire and opaque. The secondary type is slightly smaller and translucent.

MM83 *Klebsiella pneumoniae* – NCTC® 13368 / ATCC® 700603 – ESBL-producing strain used as control for ESBL testing. There are two colony types.

MM55 *Klebsiella pneumoniae* – NCTC® 13440 – CRE testing control; produces a Class B VIM-1 Carbapenemase.



MM56 *Klebsiella pneumoniae* – NCTC® 13443 – CRE testing control; produces a Class B NDM-1 Carbapenemase.

MM58 *Klebsiella pneumoniae* – NCTC® 13438 – CRE testing control; produces a Class A KPC-3 Carbapenemase.

MM59 *Klebsiella pneumoniae* – NCTC® 13442 – CRE testing control; produces a Class D OXA-48 Carbapenemase.

MM88 *Klebsiella aerogenes (Raoultella planticola)* – NCTC® 9528 – used in water / pharmaceutical industry. PHE recommended negative control for Tryptone Bile X-Glucuronide agar and Yeast Extract agar.

***Lactobacillus brevis*:**

MM76 – NCTC® 13386 / ATCC® 8287 – used in food industry.

***Legionella pneumophila* serogroup 1:**

MM08 – NCTC® 11192 / ATCC® 33152 / WDCM 00107 – derived from strain isolated from first recognised outbreak of legionellosis in Philadelphia at the Legionnaires' Convention 1976

***Listeria innocua*:**

MM92 – NCTC® 11288 / ATCC® 33090 / WDCM 00017 – type strain. Non-pathogenic.

***Listeria monocytogenes*:**

MM87 – NCTC® 11994 / WDCM 00019 – type strain, PHE recommended positive control strain for Listeria detection in food. Serotype 4b, most common serovar isolated from human infections.

MM48 – NCTC® 7973 / ATCC® 35152 / WDCM 00109 – produces 2 phenotypes, one is beta-haemolytic and virulent, the other non-haemolytic and non-virulent. Serovar 1/2a.

MM77 – NCTC® 13372 / ATCC® 7644 – used in food microbiology Q.C. Colonies exhibit beta-haemolysis on sheep blood agar.

***Neisseria gonorrhoeae*:**

MM96 – NCTC® 12700 / ATCC® 49226 – has low-level, but clinically relevant, resistance to penicillin – MIC of penicillin is 0.5 mg/l. PHE recommended control for susceptibility testing – methodology assesses the ability of testing to detect resistance rather than sensitivity; this strain has low-level, but clinically relevant, resistance to penicillin – MIC of penicillin is 0.5 mg/l. Some variation in size and texture of colonies may be observed. Increased CO_2 is helpful in growth.

MM05 – NCTC® 8375 / ATCC® 19424 – is fully sensitive – MIC of penicillin is 0.06 mg/l. PHE recommended strain for media QC.

***Proteus mirabilis*:**

MM43 – NCTC® 13376 / ATCC® 14153 – pharmaceutical / disinfectant / media control.

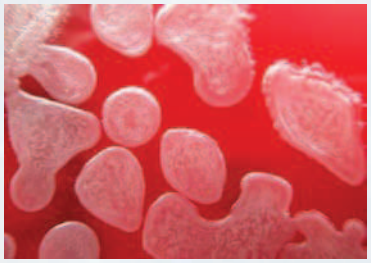
MM68 – NCTC® 10975 – media control. PHE recommended control for motility test.

***Proteus vulgaris*:**

MM09 – NCTC® 4175 / ATCC® 13315 – was the type strain, but is atypical and has been recognised as a separate species – *Proteus hauseri* – it is used for media control. Colonies are glistening with spreading edges.

***Pseudomonas aeruginosa* strains:**

MM10 – NCTC® 12903 / ATCC® 27853 / WDCM 00025 – is fully sensitive to anti-pseudomonal antibiotics (EUCAST susceptibility test control). 2 colony types may be observed: A) predominantly flat, spreading edges and rough surface; B) small and compact. Produces both fluorescein and pyocyanin pigments.



MM65 – NCTC® 10662 / ATCC® 25668 / WDCM 00114 – is fully sensitive. PHE recommended control strain for media control

MM40 – NCTC® 12924 / ATCC® 9027 / WDCM 00026 – used in water industry / disinfectant testing. Colonies on agar plates are entire, glistening and mucoid with a grainy surface. This strain also produces both fluorescein and pyocyanin pigments.

MM41 – NCTC® 13359 / ATCC® 15442 – used in water industry / disinfectant testing. May produce up to 3 different colony types. Pyocyanin is not produced.

***Rhodococcus equi*:**

MM97 – NCTC® 1621 / ATCC® 6939 / WDCM 00028 – type strain.

***Saccharomyces cerevisiae*:**

MM73 – NCPF® 3178 – PHE recommended strain for food testing and enumeration of yeasts and moulds.

MM50 — NCTC® 10716 / WDCM 00058 – used for QC of culture media and for antifungal susceptibility testing.

***Salmonella serotypes*:**

MM11 *Salmonella* Typhimurium – NCTC® 12023 / ATCC® 14028 / WDCM 00031 – (1,4,5,12: i: 1,2) Used for media/test QC. This is a common serotype from animals and from human infections.

The strains listed below are unusual serotypes, used to avoid any chance of confusion with strains commonly found in animals, food, etc, and are used to control media and detection methods in the food industry:

MM89 *Salmonella* Poona – NCTC® 4840 – (13,22: z: 1,6) PHE recommended control strain for food testing.

MM84 *Salmonella* Nottingham – NCTC® 7832 – (16: d: e,n,z15) PHE recommended control for water testing.

***Serratia marcescens*:**

MM12 – NCTC® 13382 / ATCC® 8100 – used for disinfectant testing. PHE recommended negative control for indole test. Colonies are entire, glistening, smooth and translucent. Non-pigmented.

***Staphylococcus aureus*:**

(A) Fully sensitive:

MM85 – NCTC® 6571 / ATCC® 9144 / WDCM 00035 – historically used for susceptibility testing ('Oxford staph'), but largely superseded by MM13 as it has unusually low MIC's and so is unrepresentative of normal range of Staph aureus strains. Sensitive to penicillin and cefoxitin / methicillin / oxacillin. PHE recommended coagulase, DNAse and catalase positive control.

MM13 – NCTC® 12981 / ATCC® 25923 / WDCM 00034 – used in susceptibility and media testing/QC. Fully sensitive to all anti-staphylococcal antibiotics (including penicillin and methicillin / oxacillin). It is preferable to maintain cultures on agar as passage in broth can result in a change in MIC levels. Colonies are circular white to cream, convex to flat in elevation. After 48 hours incubation a few grey/translucent variants may be noted. Beta-haemolytic on sheep blood agar.

B) Penicillin resistant:

MM14 – NCTC® 12973 / ATCC® 29213 / WDCM 00131 – used for susceptibility testing, especially for automated methodology. EUCAST, CLSI strain. Sensitive to cefoxitin / methicillin / oxacillin. Penicillin resistant – weak beta-lactamase producer. Colonies are beta-haemolytic, and a golden-orange colour.

MM30 – NCTC® 7447 / ATCC® 6538P / WDCM 00033 – used for susceptibility testing/antibiotic assay, disinfectant testing. Cefoxitin / methicillin / oxacillin sensitive. Penicillin resistant. Colonies are weakly beta-haemolytic, coagulase positive and beta-lactamase negative.

(C) MRSA (cefoxitin / methicillin / oxacillin resistant):

MM91 – NCTC® 13373 / ATCC® 43300 / WDCM 00211 (MRSA) – Possesses mecA gene but is hetero-resistant, (so as few as one per thousand cells demonstrate the resistance) and consequently has low-level cefoxitin /oxacillin/methicillin resistance (4.0 mg/l MIC of oxacillin, 8.0 mg/l MIC of cefoxitin – methicillin sensitive strains have MIC of 0.12-0.5 for oxacillin and 1-4 for cefoxitin.); it is used to confirm testing procedures for methicillin resistance are working and provides a more stringent test than testing with an MRSA which shows homogeneous resistance and has a much higher MIC. This organism will have a zone of inhibition reduced in size compared to a fully cefoxitin / oxacillin / methicillin sensitive strain (such as MM13). CLSI recommended strain for MRSA testing. There are two colony types: 1) Beta-haemolytic with a slight yellow tint. 2) Non-haemolytic and white.

MM64 – NCTC® 12493 / WDCM 00212 (MRSA) – possesses mecA gene and shows homogeneous resistance with MIC of >64 for methicillin, which produces high-level cefoxitin / methicillin / oxacillin resistance. EUCAST recommended strain. Instances have been reported where loss of the mecA gene has occurred during storage.

D) Other:

MM46 – NCTC® 10788 / ATCC® 6538 / WDCM 00032 – used in pharmaceutical industry for testing disinfectants etc. Usually yellow pigmented colonies, or can produce a white colonial variant. Beta-haemolytic.

***Staphylococcus epidermidis*:**

MM15 – NCTC® 13360 / ATCC® 12228 / WDCM 00036 – used for media control / antibiotic assay. Colonies are small and beta-haemolytic.

***Streptococcus agalactiae*:** (Beta-haemolytic Streptococcus group B)

MM16 – NCTC® 8181 / ATCC® 13813 – type strain, used for QC. PHE recommended negative control for aesculin test.

Streptococcus pneumoniae strains:

MM95 – NCTC® 12977 / ATCC® 49619 – has low-level, but clinically relevant, resistance to penicillin – this organism is used to assess detection of resistance rather than sensitivity. PHE recommended positive control for bile solubility test. CLSI, EUCAST recommended control strain for susceptibility testing. Serotype 19F.

MM19 – NCTC® 12695 / ATCC® 6303 – is fully sensitive. Colonies are mucoid and alpha-haemolytic. A few colonies may have an irregular edge. Serotype 3.

***Streptococcus pyogenes*:**

MM20 – NCTC® 12696 / ATCC® 19615 – used for QC and media testing. Lancefield group A, beta-haemolytic.
PHE recommended blood agar control.

***Vibrio parahaemolyticus*:**

MM06 – NCTC® 10885 / WDCM 00185 – used for QC of media and ID testing. PHE recommended strain used mainly in the food industry.

***Yersinia enterocolitica*:**

MM80 – NCTC® 12982 / ATCC® 9610 / WDCM 00038 – type strain, used for media control. Serotype O:8, which is a pathogenic serotype, commonest in USA.

References:

1 European Committee on Antimicrobial Susceptibility Testing (EUCAST). Routine and Extended Internal Quality Control for MIC Determination and Disc Diffusion. Version 7.0 - 01.01.2017.

2 UK Standards for Microbiology Investigations. Example Reference Strains for Microbiology Investigations Test Procedures: Bacteriology—Test Procedures | TP 1 | Issue No. 2 | 05.01.2015. Public Health England (PHE).

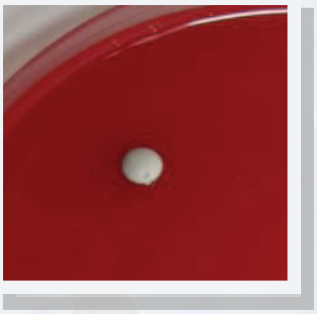
3 Performance Standards for Antimicrobial Disc Susceptibility Tests: Approved Standard—11th Edition. Clinical and Laboratory Standards Institute (CLSI).

How to use Selectrol®

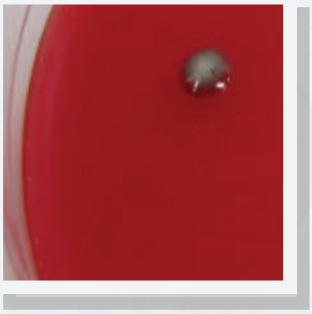
Always warm the vial to ambient temperature before opening.

Be sure to use non-selective culture media to revive the organisms.

For the more fastidious organisms, such as anaerobes, it is generally better to use agar rather than broth for revival.

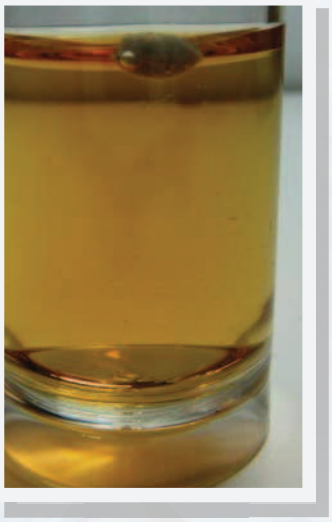


Place disc on suitable growth medium such as blood agar



Leave disc for a few minutes to liquefy, then spread plate and incubate to produce isolated colonies

Obtain a stock culture which can be used to prepare an inoculum for biochemical and antibiotic susceptibility tests



Place disc in a small volume of a suitable broth medium such as brain-heart infusion

Allow disc a few minutes to dissolve, then spread aliquot onto a plate of suitable growth medium

Out-of-specification results

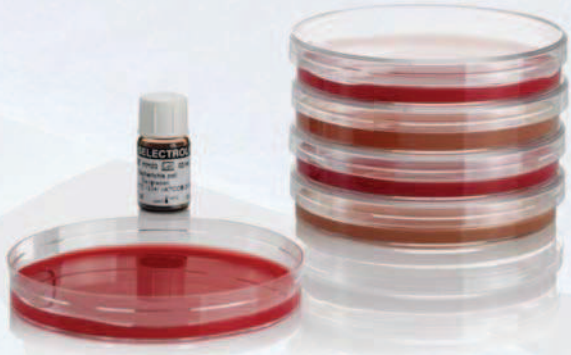
Laboratories use Selectrol® for Quality Control of culture media, biochemical identification tests and antimicrobial susceptibility testing. When a laboratory test result, an MIC or biochemical reaction, is unexpected or out-of-specification, the test should first be repeated to confirm it; an out-of-specification result is an indication that the testing procedure should be reviewed; it is not, in the first instance, a sign of a problem with the control organism.

If incorrect results are obtained on retesting, the explanation could be:

- The test procedure was not followed correctly – check standard operating procedures
- There is an instrumentation error – check calibration, mechanical functioning, etc
- There is a problem with the consumables – out of date, incorrect storage, etc
- The culture of the control organism has become contaminated

Technical Support

If no explanation for out-of-spec results can be found, but repeated tests still give unacceptable results, please contact TCS and / or your relevant reference laboratory or instrument manufacturer for advice. For example, contact AMRHAI at Colindale, London if MIC results are consistently outside the acceptable range. Please retain any remaining discs of organisms about which you have concerns so they can be returned to TCS and investigated alongside retained samples.



Preparing QC and Validation Spikes from Selectrol®

Preparing the spike

- Place a Selectrol® disc in Brain Heart Infusion (BHI) broth* or equivalent, and culture (typically for 18 hours) at the appropriate temperature for the organism (typically 37°C)
- Assume the count in the broth to be 10^8 organisms per ml ---------- (A)
- Mix and transfer 100 µl of (A) to 100 ml of saline or ¼ strength Ringer's solution -- (B)
- Mix and transfer 100 µl of (B) to 10 ml of saline or ¼ strength Ringer's solution --- (C)
- Mix and transfer 100 µl of (C) to your homogenised food sample.

Verifying the inoculum

- Pipette 5 x 10 µl drops from (C) onto each of two agar plates for Miles and Misra counts.

Using the assumptions and dilutions above:

- (A) contains 10^8 organisms per ml
- (B) contains 10^5 organisms per ml
- (C) contains 10^3 organisms per ml

If the Miles and Misra counts indicate that the required count was not achieved:

- If the count was too high by a factor of 10, reduce the volume transferred from (A) to (B) from 100 µl to 10 µl
- If the count was too low by a factor of 10, increase the volume transferred from (A) to (B) from 100 µl to 1 ml.

Keep a record of the correct dilutions for each organism type for future use. You will find that this method is very repeatable.

*Note: BHI broth will work for most of the Selectrol® organisms; however, for fastidious organisms an appropriate culture broth must be selected, e.g. Fastidious Anaerobe Broth for strictly anaerobic organisms.

Culture Collections

Cultures of microorganisms have been deposited and subsequently maintained in 589 collections in 68 countries, and many of the cultures are derived from the same original isolate; the history of each organism, its properties and names of the culture collections which hold it are detailed in the relevant catalogues and websites.

Some of the organisms have been selected and recommended by expert organisations to be supplied as controls for microbiological tests, and when the identical cultures are present in more than one collection they will have a specific designation for each, incorporating the abbreviation for the collection and a reference number.

For example:- *Staphylococcus aureus* NCTC 7447, widely recommended as a control for antimicrobial susceptibility testing, is held in 30 collections, and consequently the phenotypically and genotypically identical organism has 30 different references, such as ATCC 6538P, CIP 53.156, DSM 346 and so on.

In an effort to minimise potential confusion and help users find local sources of reference strains, the WFCC and the WDCM initiated a system that ascribes each recommended QC strain a reference number (WDCM 00001 onwards), cites all collections that contain it and provides contact details and each collection's unique reference. For example, the strain of *Staphylococcus aureus* NCTC 7447 (Selectrol® strain MM33) mentioned above is designated WDCM 00033.

Staphylococcus aureus WDCM 00033

AHU 1142; ATCC™ 6538P; BCRC 10451 ; BTCC 209P; BU 395; CCM 2022; CCTM 596; CCUG 1828; CECT 240; CIP 53.156; CN 3784; CNCTC Mau 28/58; DSM 346; FIRDI 451; IAM 1011; IAM 12082; IEM Mau 28/58; IFO 12732; IFO 3061; IID 671; IMET 10904; JCM 2151; LMG 8195; NCIMB 8625; NCTC 7447; NRRL B-313; OUT 8232; PCI 1209; PZH 8/54; RIMD 3109007; VNIIA 209P;

Products derived from the cultures in the collections should be manufactured using the minimum number of sub-cultures, to minimise the possibility of alterations to the phenotype due to mutations. Ideally, as in the case of **Selectrol®**, a single sub-culture only is used, so the **Selectrol®** product is a 'first generation derivative' of a culture supplied by NCTC, and will be identical with regard to its properties and suitability for use in QC applications to a culture of the particular organism obtained from any of the other WDCM listed culture collections.

Selectrol Strain Index

Strain Name	Designation	Code	WDCM
Aspergillus brasiliensis	NCPF® 2275 / ATCC® 16404	MM94	00053
Bacillus cereus	NCTC® 10320 / ATCC® 9634	MM21	00001
Bacillus cereus	NCTC® 7464 / ATCC® 10876	MM86	
Bacillus subtilis	NCTC® 10400 / ATCC® 6633	MM29	00003
Bacteroides fragilis	NCTC® 9343 / ATCC® 25285	MM44	
Campylobacter jejuni	NCTC® 11351 / ATCC® 33560	MM36	
Campylobacter jejuni	NCTC® 11322 / ATCC® 29428	MM82	00156
Candida albicans	NCPF® 3255 / ATCC® 2091	MM28	00055
Candida albicans	NCPF® 3179 / ATCC® 10231	MM42	00054
Citrobacter freundii	NCTC® 9750 / ATCC® 8090	MM27	
Clostridium perfringens	NCTC® 8237 / ATCC® 13124	MM45	00007
Clostridium sporogenes	NCTC® 532 / ATCC® 19404	MM31	00008
Enterobacter aerogenes	NCTC® 10006 / ATCC® 13048	MM26	00175
Enterobacter cloacae	NCTC® 13380 / ATCC® 23355	MM01	00082
Enterobacter cloacae	NCTC® 13406	MM51	
Enterococcus faecalis	NCTC® 775 / ATCC® 19433	MM17	00009
Enterococcus faecalis	NCTC® 12697 / ATCC® 29212	MM18	00087
Enterococcus faecalis	NCTC® 13379 / ATCC® 51299	MM52	00085
Enterococcus hirae	NCTC® 13383 /ATCC® 10541	MM35	00011
Escherichia coli	NCTC® 12241 / ATCC® 25922	MM02	00013
Escherichia coli	NCTC® 11954 / ATCC® 35218	MM24	
Escherichia coli	NCTC® 10418 / ATCC® 10536	MM33	
Escherichia coli	NCTC® 12923 / ATCC® 8739	MM38	00012
Escherichia coli	NCTC® 11560	MM63	
Escherichia coli	NCTC® 9001 / ATCC® 11775	MM75	00090
Escherichia coli CRE	NCTC® 13476	MM57	
Escherichia coli (mcr-1)	NCTC® 13846	MM34	
Escherichia coli O157 (non-toxigenic)	NCTC® 12900 / ATCC® 700728	MM93	00014
Haemophilus influenzae	NCTC® 8468 / ATCC® 9334	MM100	
Haemophilus influenzae	NCTC® 12975 / ATCC® 49766	MM37	
Haemophilus influenzae	NCTC® 12699 / ATCC® 49247	MM81	
Haemophilus influenzae	NCTC® 11931	MM98	
Klebsiella aerogenes	NCTC® 9528	MM88	
Klebsiella pneumoniae	NCTC® 9633 / ATCC® 13883	MM04	00097
Klebsiella pneumoniae	NCTC® 13368 / ATCC® 700603	MM83	
Klebsiella pneumoniae CRE	NCTC® 13440	MM55	
Klebsiella pneumoniae CRE	NCTC® 13443	MM56	
Klebsiella pneumoniae CRE	NCTC® 13438	MM58	

Selectrol Strain Index

Strain Name	Designation	Code	WDCM
Klebsiella pneumoniae CRE	NCTC® 13442	MM59	
Lactobacillus brevis	NCTC® 13386 / ATCC® 8287	MM76	
Legionella pneumophila serogroup 1	NCTC® 11192 / ATCC® 33152	MM08	00107
Listeria innocua	NCTC® 11288 / ATCC® 33090	MM92	00017
Listeria monocytogenes	NCTC® 7973 / ATCC® 35152	MM48	00109
Listeria monocytogenes	NCTC® 13372 ATCC® 7644	MM77	
Listeria monocytogenes	NCTC® 11994	MM87	00019
Neisseria gonorrhoeae	NCTC® 8375 / ATCC® 19424	MM05	
Neisseria gonorrhoeae	NCTC® 12700 / ATCC® 49226	MM96	
Proteus mirabilis	NCTC® 13376 / ATCC® 14153	MM43	
Proteus mirabilis	NCTC® 10975	MM68	
Proteus vulgaris	NCTC® 4175 / ATCC® 13315	MM09	
Pseudomonas aeruginosa	NCTC® 12903 / ATCC® 27853	MM10	00025
Pseudomonas aeruginosa	NCTC® 12924 / ATCC® 9027	MM40	00026
Pseudomonas aeruginosa	NCTC® 13359 / ATCC® 15442	MM41	
Pseudomonas aeruginosa	NCTC® 10662 / ATCC® 25668	MM65	00114
Rhodococcus equi	NCTC® 1621 / ATCC® 6939	MM97	00028
Saccharomyces cerevisiae	NCTC® 10716/ ATCC® 9763	MM50	00058
Saccharomyces cerevisiae	NCPF® 3178	MM73	
Salmonella Nottingham	NCTC® 7832	MM84	
Salmonella Poona	NCTC® 4840	MM89	
Salmonella Typhimurium	NCTC® 12023/ ATCC® 14028	MM11	00031
Serratia marcescens	NCTC® 13382 / ATCC® 8100	MM12	
Staphylococcus aureus	NCTC®12981 / ATCC® 25923	MM13	00034
Staphylococcus aureus	NCTC® 12973 / ATCC® 29213	MM14	00131
Staphylococcus aureus	NCTC® 7447 / ATCC® 6538P	MM30	00033
Staphylococcus aureus	NCTC® 10788 / ATCC® 6538	MM46	00032
Staphylococcus aureus	NCTC® 6571 / ATCC® 9144	MM85	00035
Staphylococcus aureus (MRSA)	NCTC® 12493	MM64	00212
Staphylococcus aureus (MRSA)	NCTC® 13373 / ATCC® 43300	MM91	00211
Staphylococcus epidermidis	NCTC® 13360 / ATCC® 12228	MM15	00036
Streptococcus agalactiae	NCTC® 8181 / ATCC® 13813	MM16	
Streptococcus pneumoniae	NCTC® 12695 /ATCC® 6303	MM19	
Streptococcus pneumoniae	NCTC® 12977 /ATCC® 49619	MM95	
Streptococcus pyogenes	NCTC® 12696 /ATCC® 19615	MM20	
Vibrio parahaemolyticus	NCTC® 10885	MM06	00185
Yersinia enterocolitica	NCTC® 12982 / ATCC® 9610	MM80	00038

Selectrol Strains Listed by WDCM Number

WDCM	Strain Name	Designation	Code
00001	*Bacillus cereus*	NCTC® 10320 / ATCC® 9634	MM21
00003	*Bacillus subtilis*	NCTC® 10400 / ATCC® 6633	MM29
00007	*Clostridium perfringens*	NCTC® 8237 / ATCC® 13124	MM45
00008	*Clostridium sporogenes*	NCTC® 532 / ATCC® 19404	MM31
00009	*Enterococcus faecalis*	NCTC® 775 / ATCC® 19433	MM17
00011	*Enterococcus hirae*	NCTC® 13383 /ATCC® 10541	MM35
00012	*Escherichia coli*	NCTC® 12923 / ATCC® 8739	MM38
00013	*Escherichia coli*	NCTC® 12241 / ATCC® 25922	MM02
00014	*Escherichia coli* O157 (non-toxigenic)	NCTC® 12900 / ATCC® 700728	MM93
00017	*Listeria innocua*	NCTC® 11288 / ATCC® 33090	MM92
00019	*Listeria monocytogenes*	NCTC® 11994	MM87
00025	*Pseudomonas aeruginosa*	NCTC® 12903 / ATCC® 27853	MM10
00026	*Pseudomonas aeruginosa*	NCTC® 12924 / ATCC® 9027	MM40
00028	*Rhodococcus equi*	NCTC® 1621 / ATCC® 6939	MM97
00031	*Salmonella* Typhimurium	NCTC® 12023/ ATCC® 14028	MM11
00032	*Staphylococcus aureus*	NCTC® 10788 / ATCC® 6538	MM46
00033	*Staphylococcus aureus*	NCTC® 7447 / ATCC® 6538P	MM30
00034	*Staphylococcus aureus*	NCTC® 12981 / ATCC® 25923	MM13
00035	*Staphylococcus aureus*	NCTC® 6571 / ATCC® 9144	MM85
00036	*Staphylococcus epidermidis*	NCTC® 13360 / ATCC® 12228	MM15
00038	*Yersinia enterocolitica*	NCTC® 12982 / ATCC® 9610	MM80
00053	*Aspergillus brasiliensis*	NCPF® 2275 / ATCC® 16404	MM94
00054	*Candida albicans*	NCPF® 3179 / ATCC® 10231	MM42
00055	*Candida albicans*	NCPF® 3255 / ATCC® 2091	MM28
00058	*Saccharomyces cerevisiae*	NCTC® 10716/ ATCC® 9763	MM50
00082	*Enterobacter cloacae*	NCTC® 13380 / ATCC® 23355	MM01
00085	*Enterococcus faecalis*	NCTC® 13379 / ATCC® 51299	MM52
00087	*Enterococcus faecalis*	NCTC® 12697 / ATCC® 29212	MM18
00090	*Escherichia coli*	NCTC® 9001 / ATCC® 11775	MM75
00097	*Klebsiella pneumoniae*	NCTC® 9633 / ATCC® 13883	MM04
00107	*Legionella pneumophila* serogroup 1	NCTC® 11192 / ATCC® 33152	MM08
00109	*Listeria monocytogenes*	NCTC® 7973 / ATCC® 35152	MM48
00114	*Pseudomonas aeruginosa*	NCTC® 10662 / ATCC® 25668	MM65
00131	*Staphylococcus aureus*	NCTC® 12973 / ATCC® 29213	MM14
00156	*Campylobacter jejuni*	NCTC® 11322 / ATCC® 29428	MM82
00175	*Enterobacter aerogenes*	NCTC® 10006 / ATCC® 13048	MM26
00185	*Vibrio parahaemolyticus*	NCTC® 10885	MM06
00211	*Staphylococcus aureus* (MRSA)	NCTC® 13373 / ATCC® 43300	MM91
00212	*Staphylococcus aureus* (MRSA)	NCTC® 12493	MM64

Notes

tcs biosciences

www.tcsbiosciences.co.uk

TCS Biosciences Ltd
Botolph Claydon, Buckingham, MK18 2LR, United Kingdom
t: +44 (0) 1296 714222, f: +44 (0) 1296 714806, e: sales@tcsgroup.co.uk