Ezy MIC® strips provide in vitro MIC values, which provide only a possible insinuation of pathogens potential in in vivo susceptibility. These values can be considered as a guide to therapy selection only after taking into consideration several other factors, and must be the sole decision and responsibility of the physician along with the clinical experience in treating the infection. These tests are comparable to the standards as per the given specifications and set of experiment standards as far as possible. Please refer to CLSI standards for detailed limitation of susceptibility test on the clinical use of an antibiotic in various therapeutic conditions.

References:

Packing:
Each Pack contains following material packed in sealed glass vial with a desiccator capsule.
1) MBL Plus ESBL Ezy MICTm Strip (10/30/60/90/120/150 Strips per pack)
2) Applicator sticks
3) Package insert

Limitation of Test
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ESBL +: Ceftazidine, Cefotaxime, EDTA & Clavulanic acid (0.032 - 4)
ESBL : Ceftazidine, Cefotaxime & EDTA (0.125 -16)

Ezy MIC® & Ezy MIC™ are both trademarks owned by HiMedia Laboratories, pertaining to the product logo of MIC test strips

Ezy MIC™ Strip Features and Advantages
Ezy MIC™ strip exhibits several advantages over existing plastic strip.
1) Ezy MIC™ strip is made up of porous paper material unlike plastic non-porous material
2) Ezy MIC™ strip has MIC values printed on both sides identically.
3) The antimicrobial agent is evenly distributed on either side of the Ezy MIC™ strip and hence it can be placed by any side on the agar surface.
4) For Ezy MIC™ strips, MIC values can be read without opening the lid of the plate as most commonly translucent medium such as Mueller Hinton Agar is employed.
5) Once placed, Ezy MIC strip is adsorbed within 60 seconds and firmly adheres to the agar surface.
6) Unlike the plastic material, it does not form air bubbles underneath and hence there is no need to press the strip once placed.

Introduction
Ezy MIC™ strip is useful for quantitative determination of susceptibility of bacteria to antibacterial agents as well as phenotypic detection of bacteria. The phenotypic detection system comprises of a predefined quantitative gradient which is used to determine the Inhibitory Concentration (IC) of different antimicrobial agents against microorganisms as tested on appropriate agar media, following overnight incubation.

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www.himedialabs.com

Fig. 1: Escherichia coli Clinical isolate
Ratio of ESBL+ = 0.38 = 4.04 = MBL positive
ESBL+ = 0.984

Fig. 2: Klebsiella pneumoniae Clinical isolate
Ratio of ESBL+ = 0.25 = 8 = MBL+ESBL positive

Fig. 3: Clinical isolate
Ratio of ESBL+ = R Non conclusive
R = >8 MBL+ESBL positive= =
Principle and Interpretation

Antimicrobial resistance is a growing threat worldwide. Increasing resistance to third generation cephalosporins has become a cause for concern among Enterobacteriaceae. The prevalence of extended spectrum β-lactamases (ESBLs) and metallo β-lactamases (MBLs) among members of Enterobacteriaceae constitutes a serious threat to current β-lactam therapy leading to treatment failure (1).

ESBLs are enzymes that mediate resistance to extended-spectrum (third generation) cephalosporins (e.g., Cefotaxime, Ceftriaxone, and Cefixime) and monobactams (e.g., Aztreonam) but do not affect cephamycins (e.g., Cefoxitin, Cefotetan, Cefazolin) or carbapenems (e.g., Meropenem, Imipenem, Ertapenem, Doripenem (Etz) (2)). The presence of an ESBL producing organism in a clinical infection can result in treatment failure if one of the above classes of drugs is used. ESBLs can be difficult to detect because they have different levels of activity against various cephalosporins. Thus, the choice of which antimicrobial agents to test is critical. If an ESBL is detected, all penicillins, cephalosporins, and Aztreonam should be regarded as resistant, even if no resistance results indicate susceptibility. Carbapenems represented a great advance for the treatment of serious bacterial infections caused by β-lactam resistant bacteria. Due to their broad spectrum of activity and stability to hydrolysis by most β-lactamase, the carbapenems have been the drugs of choice for treatment of infections caused by penicillin or cephalosporin resistant gram negative bacilli (1).

Metallo β-lactamases (MBLs) are β-lactam enzymes that hydrolyze resistance to β-lactam agents, but are yet inhibited by chelating agents like ethylene-diamine-tetra-acetic acid (EDTA). They are a type of carbapenemase that require zinc ion (Zn2+). As a catalytic enzyme for β-lactam hydrolysis have become a serious public health problem with catastrophic consequences for the treatment of bacterial related infections. Their emergence and uncontrolled spread has put the use of the carbapenems under threat. The carbapenems including imipenem, meropenem, and etrapenam are broad spectrum antibiotics with high stability against most β-lactamase enzymes. They are the drug of choice for the treatment of infections caused by β-lactam resistant bacteria including those that produce extended spectrum enzymes. The unique uncommon susceptibility of bacterial pathogens to MBLs as reported in some quarters is a call for concern. The growing resistance of pathogens to the carbapenems under threat. The carbapenems including imipenem, meropenem, and etrapenam are broad spectrum antibiotics with high stability against most β-lactamase enzymes. They are the drug of choice for the treatment of infections caused by β-lactam resistant bacteria including those that produce extended spectrum enzymes.

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Quality Control (This strip should be tested either on ESBL and AmpC non-conclusive strain or confirmed MBL positive strain. Confirmed clinical isolates may be used as reference positive strain) Quality control of Ezy MIC™ Strip is carried out by testing the strips with standard strains ATCC cultures on suitable medium (if stated same subsequently).

Table:<ref>
<table>
<thead>
<tr>
<th>Organism</th>
<th>Medium Used</th>
<th>Inhibition</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>β-lactamase producers</td>
<td>MBL and ESBL positive</td>
<td>Strain</td>
<td>Strain (ESBL+ value) = ≥ 8, &lt; 16 ≤ 8, &gt; 16</td>
</tr>
<tr>
<td>K. pneumoniae</td>
<td>1. MBL positive</td>
<td>Strain</td>
<td>Strain (MBL+) value ESBL+ is less than or equal to 8.</td>
</tr>
<tr>
<td>MBL+ESBL Positive</td>
<td>ESBL+</td>
<td>Strain</td>
<td>Strain (MBL+) value ESBL+ is more than 8.</td>
</tr>
<tr>
<td>Strain</td>
<td>ESBL+</td>
<td>Strain</td>
<td>Strain (ESBL+ value) ≤ 8, &gt; 8</td>
</tr>
<tr>
<td>Strain</td>
<td>ESBL+</td>
<td>Strain</td>
<td>Strain (ESBL+ value) ≤ 8, &gt; 8</td>
</tr>
</tbody>
</table>

Storage and Shelf-life:

1. Once the consignment is received, store applicators at room temperature and Ezy MIC™ Strip container at 2°C to 8°C or below.
2. Use before expiry date on the label.
3. Ezy MIC™ Strip left over from open package must be kept dry.
4. Moisture should be prevented from penetrating into or forming within the package or the strip.
5. Check whether the batch number and expiry date are marked on the storage container.
6. Product performance is best within stated expiry period if correctly stored and handled.

Disposal:

After use, Ezy MIC™ Strips and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (S, 4).