NEW *in vitro* Evidence

What did we find living under some silver dressings?*

Not all silver dressings are created equal.

AQUACEL® Ag dressing. Micro-contouring, bacteria killing*1,2

*As demonstrated *in vitro
Dressing technology can play an important role in helping to manage wound infection. It is critical to consider the following when selecting a silver dressing.

- Does it micro-contour to the wound bed?
- Does it respond to wound conditions, making silver available when it's needed most?

It is important for a dressing to micro-contour to the wound bed to minimise voids where bacteria can grow.

Even when the dressing does contact the wound bed, it is important to make silver available to the bacteria in order to kill the bacteria.

AQUACEL® Ag dressing, powered by Hydrofiber® Technology, provides rapid and sustained antimicrobial activity when needed.*2,11,12

AQUACEL® Ag dressing can play an important role in helping to manage wound infection because it:

- Locks in wound exudate and traps bacteria.*4,5,6
  - Helps protect periwound skin and reduce maceration.7,8
  - May help to minimise wound & cross-infection during removal.3,9

- Micro-Contours
  - Minimises ‘dead space’ where bacteria can grow.1
  - Maintains moisture balance in the wound bed.10

- Responds to wound conditions by providing rapid and sustained anti-microbial activity on demand.*2,11,12
  - Forms a cohesive gel when in contact with exudate.
  - Kills a broad spectrum of pathogens, including MRSA and VRE.2

References
How micro-contouring works

AQUACEL® Ag dressing, powered by Hydrofiber® Technology, micro-contours to the simulated wound bed, helping eliminate voids where bacteria can grow.¹,¹³

Both ALLEVYN™ Ag Adhesive dressing and Mepilex® Ag dressing were observed to not conform as well as AQUACEL® Ag dressing in an in vitro study, and there was evidence of fluid accumulation within the voids between the dressing and the simulated wound surface.¹³

Conformability of ALLEVYN™ Ag dressing to an uneven tissue surface

Conformability of Mepilex® Ag dressing to an uneven tissue surface

In these figures, pieces of dressing were placed on simulated wound tissue (pork belly). A needle containing dyed physiological saline solution was inserted through the base of the tissue. The solution was then inoculated into the ‘wound space’ to simulate an exuding wound. Arrows indicate voids.¹³

References
AQUACEL® Ag & ALLEVYN™ Ag dressings: Antimicrobial activity

It is important for a dressing to micro-contour to the wound bed to minimise voids where bacteria can grow.²

AQUACEL® Ag and various other silver dressings, including ALLEVYN™ Ag dressings, were tested in an in vitro shallow wound model. This model is designed to represent the irregular surfaces of a wound bed.¹³

- AQUACEL® Ag dressing killed more bacteria than ALLEVYN™ Ag dressing in an in vitro study.*¹³
- AQUACEL® Ag dressing was observed to control the spread of bacteria under the dressing better than ALLEVYN™ Ag dressings in an in vitro study.*¹³

AQUACEL® Ag dressing

AQUACEL® Ag dressing covered by Versiva® XC® Adhesive dressing

ALLEVYN™ Ag dressings

<table>
<thead>
<tr>
<th>ALLEVYN™ Ag Gentle Border dressing</th>
<th>ALLEVYN™ Ag Adhesive dressing</th>
<th>ALLEVYN™ Ag Non-Adhesive dressing</th>
<th>ALLEVYN™ Ag Gentle dressing</th>
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* As demonstrated in vitro against ALLEVYN™ Ag Adhesive, ALLEVYN™ Ag Non-Adhesive, ALLEVYN™ Ag Gentle & ALLEVYN™ Ag Gentle Border dressings.

The testing of all products was performed three times. The graph percentages represent the mean of these three tests. The photos are representative of the visually observed results. Ranges of bacterial growth in dressing tests:

- AQUACEL® Ag covered by Versiva® XC® Adhesive (S. aureus 0.0% – 1.2%; P. aeruginosa 2.7% – 20.8%)
- ALLEVYN™ Ag Adhesive (S. aureus 21.0% – 30.8%; P. aeruginosa all 100%) • ALLEVYN™ Ag Non-Adhesive (S. aureus 14.6% – 18.4%; P. aeruginosa 96.1% - 99.4%)
- ALLEVYN™ Ag Gentle Border (S. aureus 31.0% – 37.3%; P. aeruginosa 99.4% - 100%) • ALLEVYN™ Ag Gentle (S. aureus 21.7% – 26.3%; P. aeruginosa 95.1% - 96.6%)
AQUACEL® Ag & ALLEVYN™ Ag dressings: Silver availability

Even when the dressing does contact the wound bed, it is important to maximise exposure of antimicrobials to the wound bioburden. AQUACEL® Ag and various other silver dressings, including ALLEVYN™ Ag dressings, were tested using an in vitro flat wound model, seeded with bacteria. This model was designed to maximise contact between the dressing and the flat wound surface.

In this in vitro study, AQUACEL® Ag dressing, covered with Versiva® XC® Adhesive dressing, killed both Staphylococcus aureus and Pseudomonas aeruginosa on the simulated colonised wound surface, as indicated by a stab culture within the in vitro study.

In the same in vitro study, ALLEVYN™ Ag Adhesive, ALLEVYN™ Ag Gentle dressing and ALLEVYN™ Ag Non-Adhesive dressing did not appear to prevent the growth of bacteria, and bacterial growth was observed beneath the dressings.

ALLEVYN™ Ag Non-Adhesive dressing appeared to prevent the growth of bacteria on the simulated colonised wound surface. However, a stab culture indicated the continued presence of living bacteria.

AQUACEL® Ag dressing

![AQUACEL® Ag dressing covered by Versiva® XC® Adhesive dressing]

ALLEVYN™ Ag dressings

![ALLEVYN™ Ag Gentle Border dressing]

![ALLEVYN™ Ag Adhesive dressing]

![ALLEVYN™ Ag Non-Adhesive dressing]

![ALLEVYN™ Ag Gentle dressing]

The testing of all products was performed three times. These photos are representative of the visually observed results.

* To assess whether the dressings were bactericidal in this in vitro model, a stab culture (i.e. a sterile loop inserted into the bacteria seeded agar) was taken from the center of each seeded agar plate and neutralized to eliminate residual silver activity. All plates, including negative control, were incubated for at least 24 hours prior to visual observation for bacterial growth or no growth.
AQUACEL® Ag & Mepilex® Ag dressings: Antimicrobial activity

It is important for a dressing to micro-contour to the wound bed to minimise voids where bacteria can grow.\(^2\)

AQUACEL\(^\text{®}\) Ag and various other silver dressings, including Mepilex\(^\text{®}\) Ag dressings, were tested in an \textit{in vitro} shallow wound model.\(^{13,17}\) This model is designed to represent the irregular surfaces of a wound bed.

- AQUACEL\(^\text{®}\) Ag dressing killed more bacteria than Mepilex\(^\text{®}\) Ag dressing in an \textit{in vitro} study.\(^{13,17}\)
- AQUACEL\(^\text{®}\) Ag dressing was observed to control the spread of bacteria under the dressing better than Mepilex\(^\text{®}\) Ag dressings in an \textit{in vitro} study.\(^{13,17}\)

### AQUACEL\(^\text{®}\) Ag dressing

AQUACEL\(^\text{®}\) Ag dressing covered by Versiva\(^\text{®}\) XC\(^\text{®}\) Adhesive dressing

- **Staphylococcus aureus**
- **Pseudomonas aeruginosa**

### Mepilex\(^\text{®}\) Ag dressings

- **Mepilex\(^\text{®}\) Ag dressing**
- **Mepilex\(^\text{®}\) Border Ag dressing**

*As demonstrated \textit{in vitro} against Mepilex\(^\text{®}\) Ag and Mepilex\(^\text{®}\) Border Ag dressings.

The testing of all products was performed three times. The graph percentages represent the mean of these three tests. The photos are representative of the visually observed results. Dressing Test Ranges:

- AQUACEL\(^\text{®}\) Ag covered by Versiva\(^\text{®}\) XC\(^\text{®}\) Adhesive (S. aureus 0.0% – 1.2%; P. aeruginosa 2.7% – 20.8%)
- Mepilex\(^\text{®}\) Ag (S. aureus 65.9% – 80.6%; P. aeruginosa all 100%)
- Mepilex\(^\text{®}\) Border Ag (S. aureus 31.8% – 49.9%; P. aeruginosa 89.8% – 100%)
**AQUACEL® Ag & Mepilex® Ag dressings: Silver availability\(^{14}\)**

Even when the dressing does contact the wound bed, it is important to maximise exposure of antimicrobials to the wound bioburden.\(^{2}\)

AQUACEL® Ag and various other silver dressings, including Mepilex® Ag dressings, were tested using an in vitro flat wound model,\(^ {16}\) seeded with bacteria. This model was designed to maximise contact between the dressing and the flat wound surface.

- **In this in vitro study, AQUACEL® Ag dressing, covered with Versiva® XC® Adhesive dressing, killed both Staphylococcus aureus and Pseudomonas aeruginosa on the simulated colonised wound surface, as indicated by a stab culture within the in vitro study.**\(^ {16,17}\)

- **In the same in vitro study, Mepilex® Ag dressings did not appear to prevent the growth of bacteria, and bacterial growth was observed beneath the dressings.**\(^ {16,17}\)

**AQUACEL® Ag dressing**

- AQUACEL® Ag dressing covered by Versiva® XC® Adhesive dressing

**Mepilex® Ag dressings**

- Mepilex® Ag dressing
- Mepilex® Border Ag dressing

As demonstrated in vitro against Mepilex® Ag and Mepilex® Border Ag dressings.

The testing of all products was performed three times. These photos are representative of the visually observed results.

* To assess whether the dressings were bactericidal in this in vitro model, a stab culture (i.e. a sterile loop inserted into the bacteria seeded agar) was taken from the center of each seeded agar plate and neutralized to eliminate residual silver activity. All plates, including negative control, were incubated for at least 24 hours prior to visual observation for bacterial growth or no growth.
A study independent of ConvaTec had observations consistent with ConvaTec’s observations\textsuperscript{14}

**Study Observations**

**Study details**

**Design**
This study compared the activity of some recently available silver-containing dressings, including Mepilex\textsuperscript{®} Ag silver sulphate dressing.

**Results**
- “The wound-contacting surface of [Mepilex\textsuperscript{®} Ag] dressing was hydrophobic...it repelled water droplets – preventing fluid from entering.”
- “Mepilex\textsuperscript{®} Ag was not able to generate any log reduction in 30 minutes or any CZOI (Corrected Zone of Inhibition), with bacteria growing under the wound contacting surface of the dressing.”

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**ConvaTec Observations**

The top, wound contact layer and cut edge of AQUACEL\textsuperscript{®} Ag and Mepilex\textsuperscript{®} Ag dressings were tested for antimicrobial activity against S.aureus and P.aeruginosa. In both cases, the top and edges of Mepilex\textsuperscript{®} Ag dressing appeared to kill more bacteria than the wound contact layer based on visual observation.

ConvaTec’s observations suggest the silicone adhesive on the wound contact layer of Mepilex\textsuperscript{®} Ag dressing may be a physical barrier to the silver contained within the dressing.\textsuperscript{18}

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**Description**

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To find out more about AQUACEL\textsuperscript{®} Ag dressing, visit www.hydrofiber.com

ConvaTec Clinical Support Line: Freephone 0800 289 738 (UK) 1800 946 938 (Republic of Ireland)