

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}



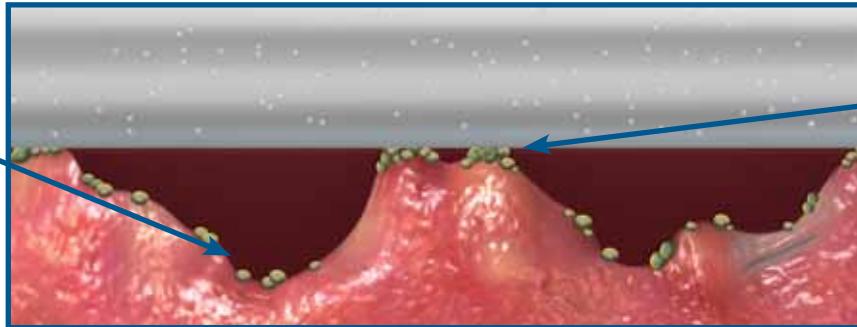
*As demonstrated *in vitro*



Dressing technology can play an important role in helping to manage wound infection.³ 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 minimize 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:

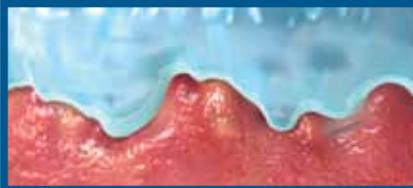
Locks in



Locks in wound exudate and traps bacteria.^{*4,5,6}

- Helps protect periwound skin and reduce maceration.^{7,8}
- May help to minimize wound & cross-infection during removal.^{5,9}

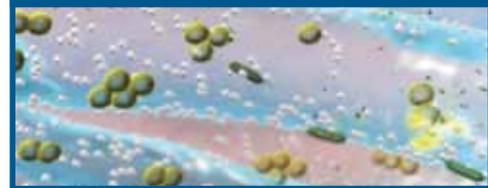
Micro-Contours



Micro-Contours to the wound bed.^{*1}

- Minimizes 'dead space' where bacteria can grow.¹
- Maintains moisture balance in the wound bed.¹⁰

Responds



Responds to wound conditions by providing rapid and sustained anti-microbial activity on demand.^{*2,11,12}

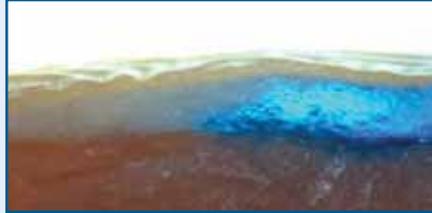
- Forms a cohesive gel when in contact with exudate.
- Kills a broad spectrum of pathogens, including MRSA and VRE.²

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}



AQUACEL[®] Ag dressing covered by DuoDERM[®] Extra Thin dressing, applied to the simulated wound surface



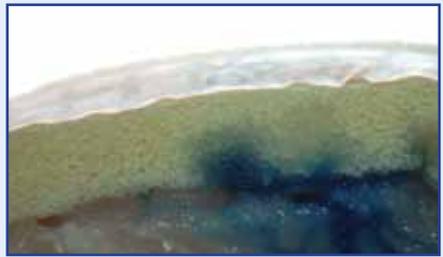
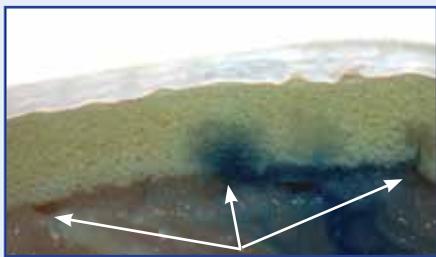
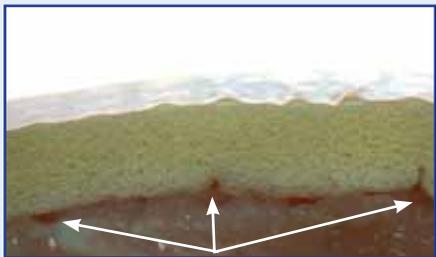
Gelling commences as AQUACEL[®] Ag dressing absorbs exudate



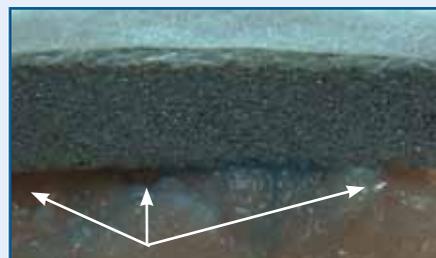
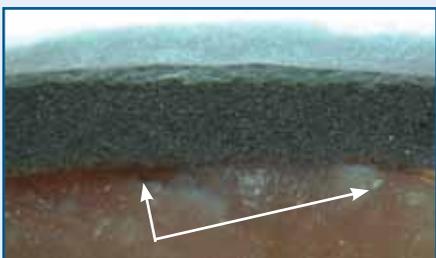
AQUACEL[®] Ag dressing forms intimate contact with the simulated wound surface, limiting spaces where bacteria can thrive

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

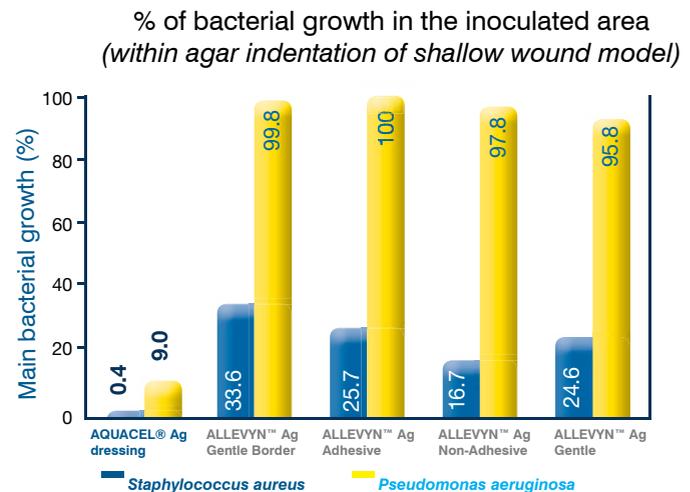
AQUACEL[®] Ag & ALLEVYN[™] Ag dressings: Antimicrobial activity

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

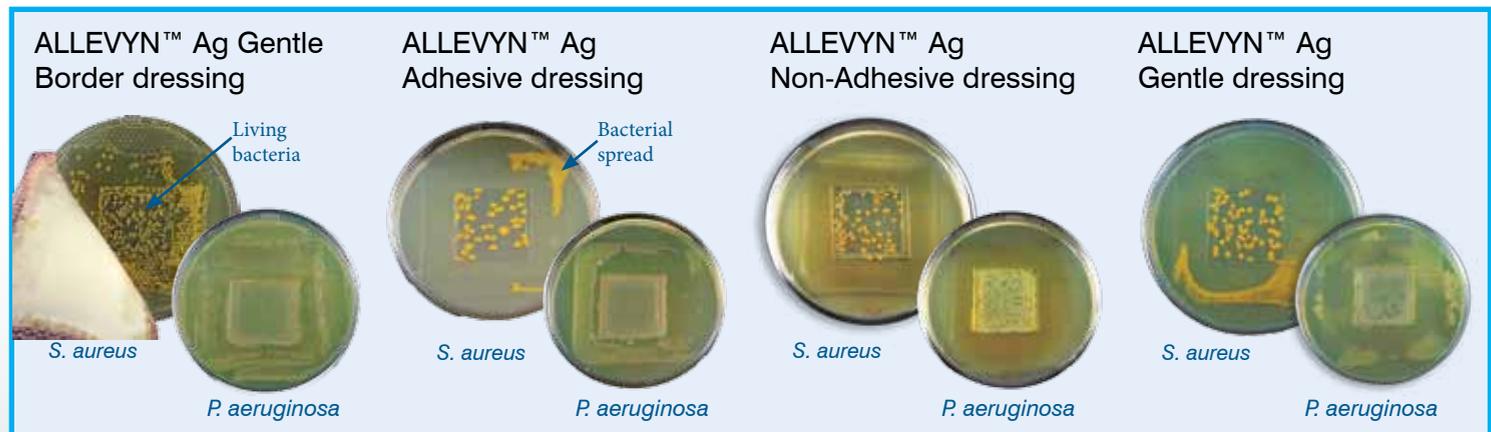
AQUACEL[®] Ag and various other silver dressings, including ALLEVYN[™] Ag dressings, were tested in an in vitro shallow wound model. This model is designed to represent the irregular surfaces of a wound bed.¹³

- 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



ALLEVYN[™] Ag dressings



* 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 availability¹⁴

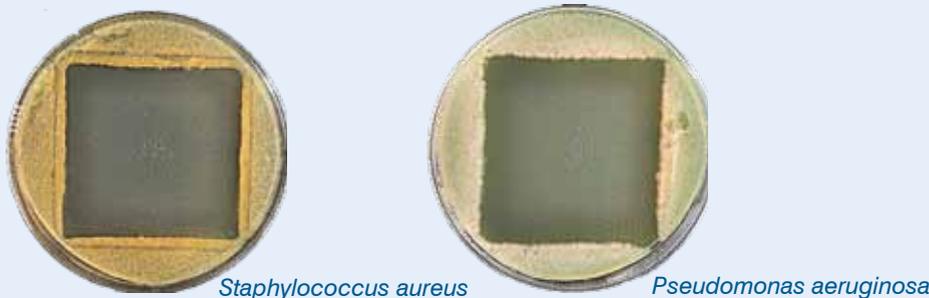
Even when the dressing does contact the wound bed, it is important to maximize exposure of antimicrobials to the superficial bioburden.²

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 maximize contact between the dressing and the flat wound surface.¹⁶

- In this in vitro study, AQUACEL® Ag dressing, covered with Versiva® XC® Adhesive dressing, killed both *Staphylococcus aureus* and *Pseudomonas aeruginosa* on the simulated colonized wound surface, as indicated by a stab culture within the *in vitro* study.*¹⁶
- In the same in vitro study, ALLEVYN™ Ag Adhesive, ALLEVYN™ Ag Gentle dressing and ALLEVYN™ Ag Gentle Border dressings did not appear to prevent the growth of bacteria, and bacterial growth was observed beneath the dressings.¹⁶
- ALLEVYN™ Ag Non-Adhesive dressing appeared to prevent the growth of bacteria on the simulated colonized wound surface. However, a stab culture indicated the continued presence of living bacteria.*¹⁶

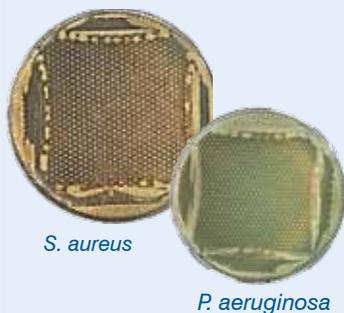
AQUACEL® Ag dressing

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

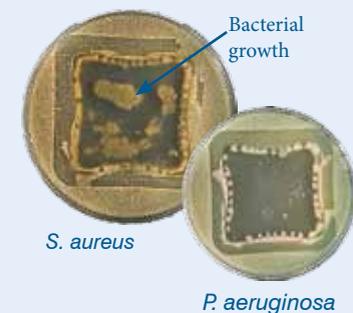


ALLEVYN™ Ag dressings

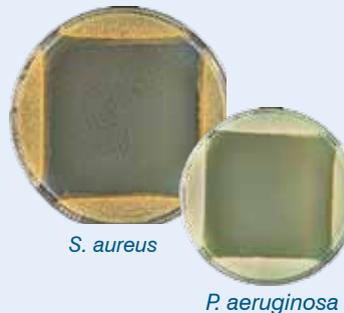
ALLEVYN™ Ag Gentle Border dressing



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.

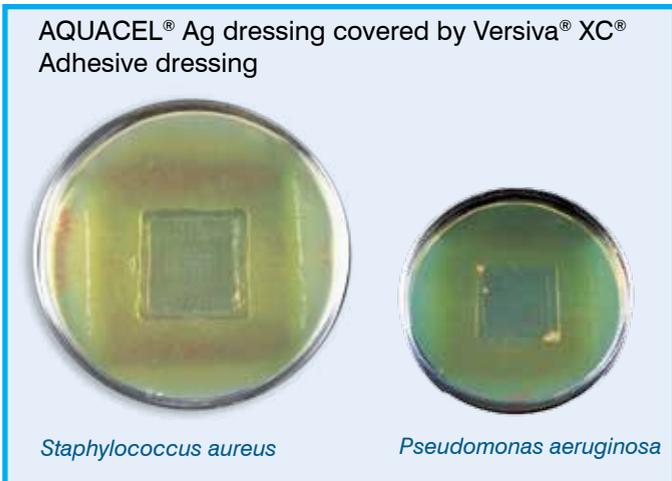
AQUACEL[®] Ag & Mepilex[®] Ag dressings: Antimicrobial activity

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

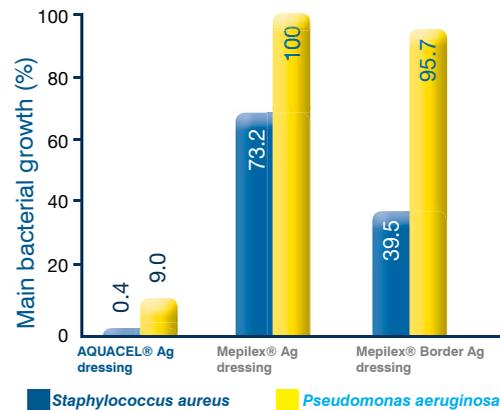
AQUACEL[®] Ag and various other silver dressings, including Mepilex[®] Ag dressings, were tested in an in vitro shallow wound model.^{13,17} This model is designed to represent the **irregular surfaces of a wound bed**.

- **AQUACEL[®] Ag dressing killed more bacteria than Mepilex[®] Ag dressing in an in vitro study.**^{*13,17}
- **AQUACEL[®] Ag dressing was observed to control the spread of bacteria under the dressing better than Mepilex[®] Ag dressings in an in vitro study.**^{*13,17}

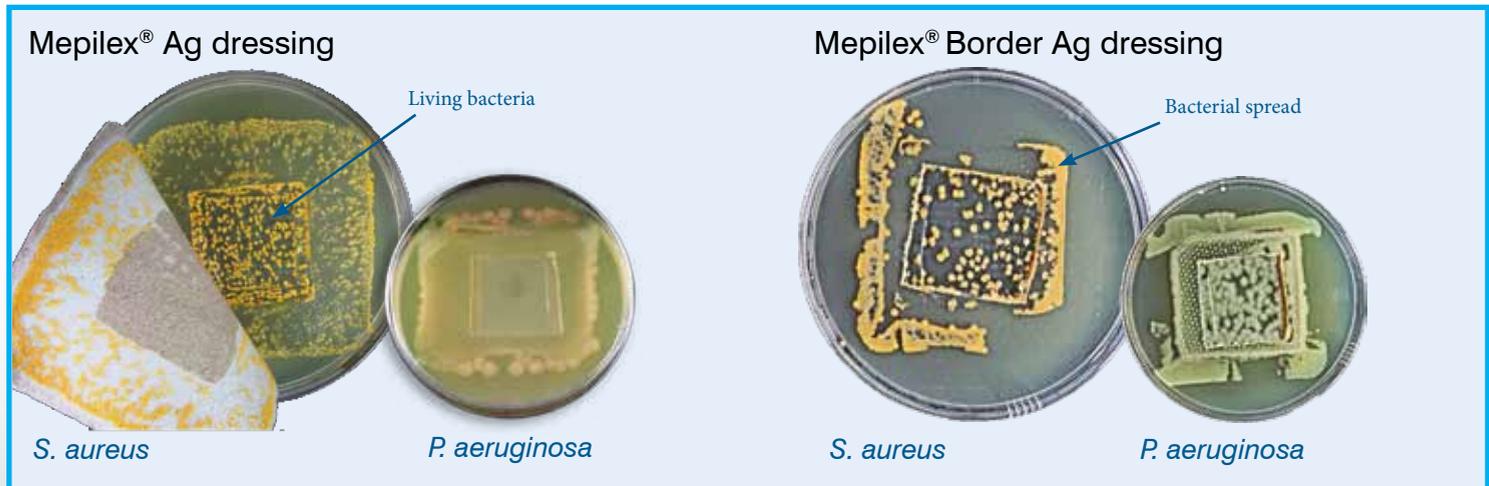
AQUACEL[®] Ag dressing



% of bacterial growth in the inoculated area (within agar indentation of shallow wound model)



Mepilex[®] Ag dressings



* As demonstrated in vitro against Mepilex[®] Ag and Mepilex[®] 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[®] Ag covered by Versiva[®] XC[®] Adhesive (*S. aureus* 0.0% – 1.2%; *P. aeruginosa* 2.7% – 20.8%) • Mepilex[®] Ag (*S. aureus* 65.9% – 80.6%; *P. aeruginosa* all 100%) • Mepilex[®] Border Ag (*S. aureus* 31.8% – 49.9%; *P. aeruginosa* 89.8% – 100%)

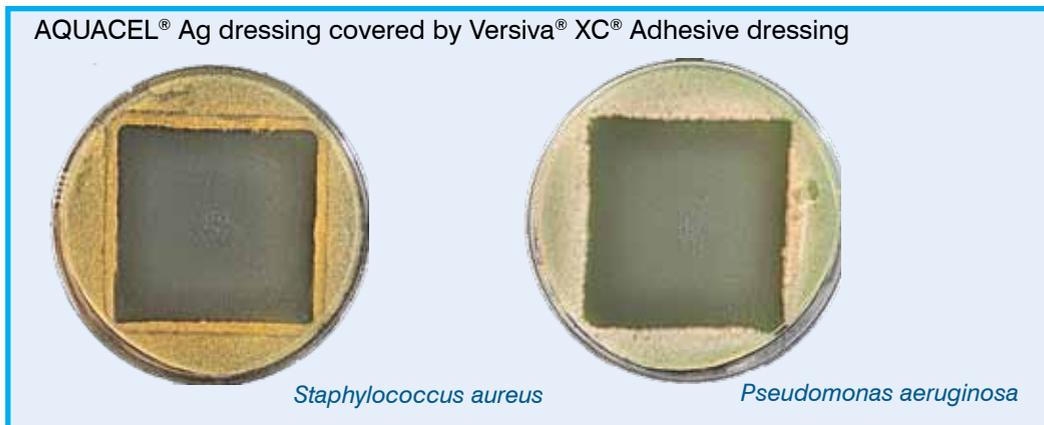
AQUACEL® Ag & Mepilex® Ag dressings: Silver availability¹⁴

Even when the dressing does contact the wound bed, it is important to maximize exposure of antimicrobials to the superficial bioburden.²

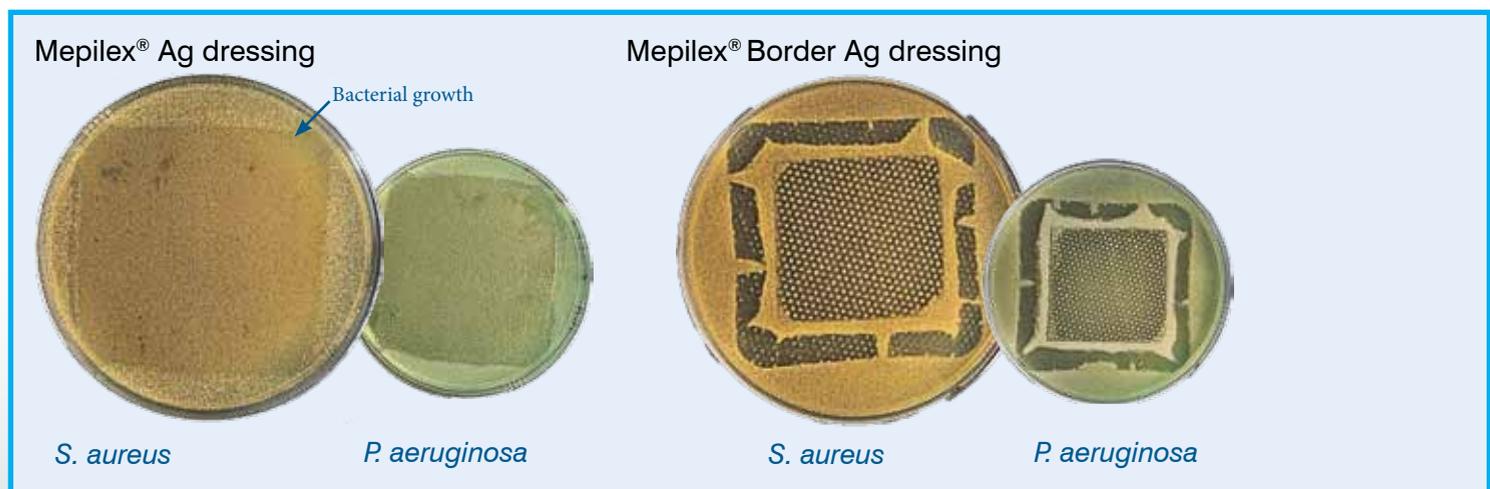
AQUACEL® Ag and various other silver dressings, including Mepilex® Ag dressings, were tested using an *in vitro* flat wound model,¹⁶ seeded with bacteria. This model was designed to maximize contact between the dressing and the flat wound surface.

- In this *in vitro* study, AQUACEL® Ag dressing, covered with Versiva® XC® Adhesive dressing, killed both *Staphylococcus aureus* and *Pseudomonas aeruginosa* on the simulated colonized 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



Mepilex® Ag dressings



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 observations¹⁴

Study Observations

Study details

Publication: Evaluating antimicrobial efficacy of new commercially available silver dressings. Cavanagh MH, Burrell RE, Nadworny PL. *International Wound Journal* 2010; 7(5):394-405

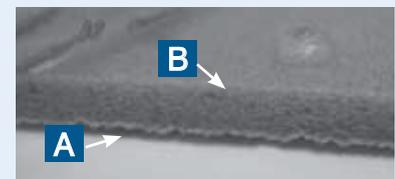
Design

This study compared the activity of some recently available silver-containing dressings, including Mepilex® Ag silver sulphate dressing.

Results

- "The wound-contacting surface of [Mepilex® Ag] dressing [was] hydrophobic...[it] repelled water droplets – preventing fluid from entering."
- "Mepilex® 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."

Reproduced with permission from Blackwell Publishing Ltd.* Testing was performed over a 30-minute period.

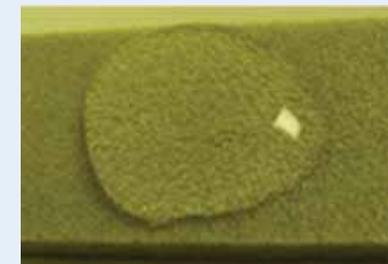
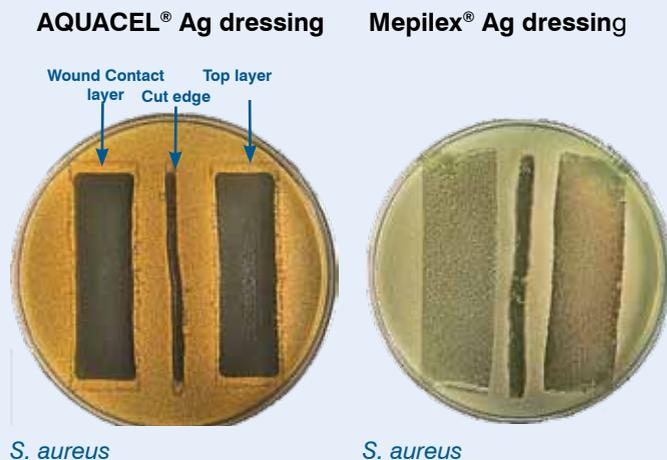


Dressing configuration for the silver sulphate dressing. The top surface of the dressing (a) and the wound-contacting adhesive surface of the dressing (b) both appear to be hydrophobic, as demonstrated by a water droplet placed on the wound contact surface.

ConvaTec Observations

The top, wound contact layer and cut edge of AQUACEL® Ag and Mepilex® Ag dressings were tested for antimicrobial activity against *S.aureus* and *Paeruginosa*. In both cases, the top and edges of Mepilex® 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® Ag dressing may be a physical barrier to the silver contained within the dressing.¹⁸



Similar results were observed by ConvaTec. During laboratory testing, Mepilex® Ag was initially hydrophobic – the test solution (simulated wound fluid) did not easily penetrate into the dressing and remained on the dressing surface.⁸

To find out more about AQUACEL® AG, visit www.hydrofiber.com

References

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