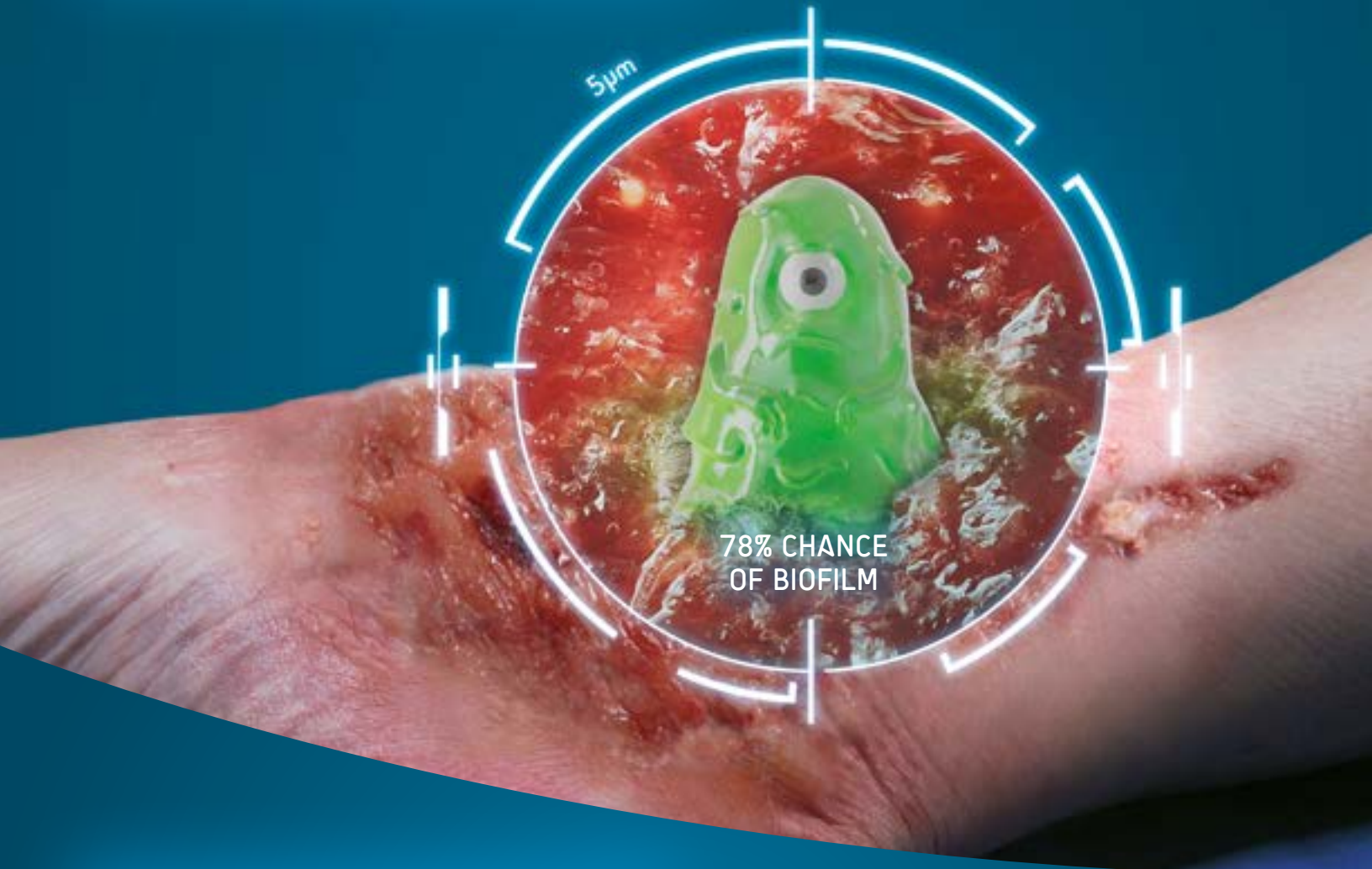


YOU HAVE THE POWER TO  
**DISRUPT AND DESTROY BIOFILM**  
TO ADVANCE HEALING



NON-HEALING WOUNDS NEED  
**MORE THAN SILVER™**



+



=

**AQUACEL<sup>®</sup> Ag+ Dressings**

2 TECHNOLOGIES, 1 SOLUTION

# Biofilm is one of the major causes of delayed wound healing<sup>1,2</sup>



## Biofilm is present in at least 78% of chronic wounds<sup>3</sup>

Biofilm can be defined as microbial cells adherent to a living or non-living surface, which are embedded within a self-produced matrix of extra-cellular polymeric substances (EPS). Biofilm provides tolerance to antimicrobial agents and can result in persistent inflammation and infection.<sup>4,5</sup>



### DEFENCE MODE

EPS shields micro-organisms from antibiotics, antiseptics and the host's immune response.<sup>5</sup>

This biofilm-specific defence and the inability to breach the EPS matrix contributes to a chronic inflammatory state in the wound environment.<sup>4</sup>



### RECOVERY MODE

Biofilm is difficult to remove completely as it is attached to the wound bed. Biofilm can reform in as little as 24h, even following aggressive debridement.<sup>6</sup>

To prevent biofilm reformation, effective long-lasting antimicrobial protection is needed.<sup>6</sup>



### ATTACK MODE

Biofilm can spread and form new colonies by constantly releasing micro-organisms from the mature biofilm structure.<sup>7</sup>

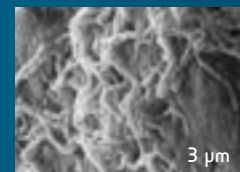
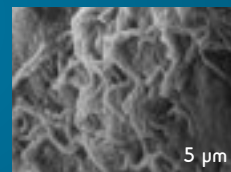
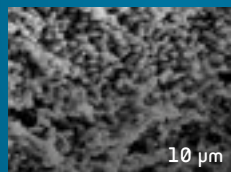
This can increase the risk of cross-infection both within the wound and in the surrounding environment.<sup>8</sup>

**Biofilm cannot always be seen with the naked eye and sometimes even wounds that do not show clear signs of infection may contain biofilm.**

Macroscopic view



High resolution scanning electron micrographs



# MORE THAN SILVER™ technology designed to **disrupt and destroy** biofilm

Specifically developed to win the battle against biofilm, MORE THAN SILVER™ technology contains three components; ionic silver together with a surfactant and metal chelating agent, which work together to deliver superior\*<sup>9</sup> anti-biofilm performance.

## ▶ 1. BEC†

BEC, a surfactant, reduces the surface tension within a biofilm to enhance the anti-biofilm performance of AQUACEL® Ag+ dressings.<sup>10-14</sup>

## ▶ 2. EDTA‡

A metal chelating agent, EDTA helps disrupt biofilm by removing metal ions that hold the EPS matrix together to expose microorganisms to the antimicrobial effects of the ionic silver.<sup>10-13</sup>



## ▶ 3. IONIC SILVER

A broad-spectrum antimicrobial contained in a safe and effective quantity (1.2%) ensures cell death of the exposed bacteria by damaging the DNA, denaturing proteins and enzymes, and interfering with protein synthesis.<sup>15-16</sup>

### The result of years of research

Developing MORE THAN SILVER™ technology involved researching a wide range of biofilm-disrupting agents and surfactants in combination with antimicrobials.<sup>9</sup>

**250,000**

POTENTIAL COMBINATIONS  
WERE IDENTIFIED

**60,000**

WERE TESTED

\* When compared to AQUACEL® Ag+ Extra dressing and other silver-only competitor dressings: ACTICOAT™ 7 and SILVERCEL™ Non-Adherent dressings

† Benzethonium chloride

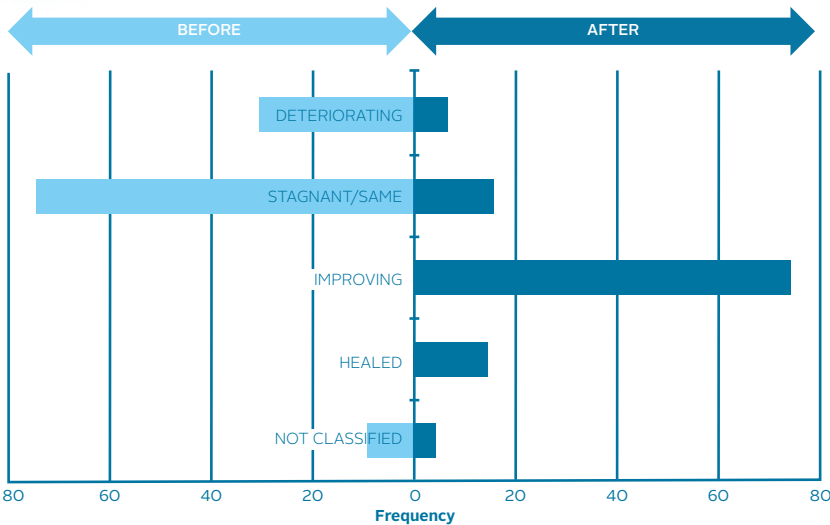
‡ Ethylenediaminetetraacetic acid disodium salt

# Winning the battle to advance healing

## AQUACEL® Ag+ dressings advance healing in stalled, deteriorating, chronic wounds

A real life evaluation of clinical cases<sup>17</sup>

111 PATIENTS ACROSS 60 CENTRES IN UK AND IRELAND  
WOUND DURATION RANGING FROM 1 WEEK TO 30 YEARS



**54%** of wounds showed clinical signs of biofilm presence at baseline

**78%** of wounds healed or progressed to healing during an average evaluation period of 3.9 weeks

**99%** of clinicians would recommend the use of AQUACEL® Ag+ Extra™ dressings

### Case studies: Advancing healing in chronic wounds

#### Example 1 - the wound:

Diabetic foot ulcer (6+ months) with the following clinical signs: odour, exudate, slough, suspected biofilm.

#### Results

AQUACEL® Ag+ dressings: peri-wound skin improved, wound bed improved, healed in 5 weeks.

#### Example 2 - the wound:

Stalled foot ulcer (3 months): no improvement following antibiotic therapy and standard silver dressing.

#### Results

AQUACEL® Ag+ dressings: change from sloughy to granulation tissue. Ulcer healed in less than 7 weeks.



Images kindly provided by Vitor Santos, Centro de Tratamento de Feridas São Peregrino – Med Caldas

### AQUACEL Ag+ Dressings

Dressing Size	Pack size	Product Code
<b>AQUACEL® Ag+ Extra™ Dressings</b>		
5 cm x 5 cm (2" x 2")	10	413566
10 cm x 10 cm (4" x 4")	10	413567
15 cm x 15 cm (6" x 6")	5	413568
20 cm x 30 cm (8" x 12")	5	413569

Dressing Size	Pack size	Product Code
<b>AQUACEL® Ag+ Ribbon Dressings</b>		
1 cm x 45 cm (approx. 0.39" x 18")	5	413570
2 cm x 45 cm (approx. 3/4" x 18")	5	413571

For more information, please call our Customer Relations Center (Registered Nurses on staff) at **1-800-465-6302**, Monday through Friday, 8:00 AM to 6:00 PM (EST), or visit our Web Site at [www.convatec.ca](http://www.convatec.ca)

1. Hurlow, J, Couch, K, Laforet, K, Bolton, L, Metcalf, D. et al. (2015). Clinical Biofilms: A Challenging Frontier in Wound Care. *Advances in Wound Care*, 4(5), 295-301. 2. Metcalf, Bowler. Biofilm delays wound healing: a review of the evidence. *Burns Trauma* 2013; 1: 5-12. 3. Malone M et al. 2017. The prevalence of biofilm in chronic wounds: a systematic review and meta-analysis of published data. *JWC*; 20:25. 4. Gurjala AN et al. Development of a novel, highly quantitative in vivo model for the study of biofilm-impaired cutaneous wound healing. *Wound Rep Reg* (2011) 19:400-410. 5. Hall-Stoodley L et al. Towards diagnostic guidelines for biofilm-associated infections. *FEMS Immunol Med Microbiol*. 2012; 65:127-145. 6. Wolcott RD et al. Biofilm maturity studies indicate sharp debridement opens a time dependent therapeutic window. *J Wound Care*. 2010; 19:320-328. 7. Costerton JW, Stewart PS, Greenberg EP. Bacterial Biofilms: A Common Cause of Persistent Infections. 1999. *284 Science*. 8. Saye DE. Recurring and antimicrobial-resistant infections: Considering the potential role of biofilms in clinical practice. *Ostomy Wound Management* 2007 53:4 (46-62). 9. Bowler PG, Parsons, D. Combatting wound biofilm and recalcitrance with a novel anti-biofilm Hydrofibre® wound dressing. *Wound Medicine* 14 (2016) 6-11. 10. Said J, Walker M, Parsons D, Stapleton P, Beezer AE, Gaisford S. An in vitro test of the efficacy of an anti-biofilm wound dressing. *Int J Pharmaceutics*. 2014; 474: 177-181. DOI: 10.1016/j.ijpharm.2014.08.034. 11. Composition comprising antimicrobial metal ions and a quaternary cationic surfactant WO12136968 Parsons World patent application 11th October 2012. 12. Banin E, Brady K.M. & Greenberg E.P. (2006). Chelator Induced Dispersal and Killing of *Pseudomonas aeruginosa* Cells in Bio Im. *Appl. Environ. Microbiol.* 72. 2064-2069. 13. Chen X, Stewart PS, 2000. Biofilm removal caused by chemical treatments. *Wat. Res.*, 4229-4233. 14. Seth AK, Zhong A, Nguyen KT, Hong SJ, Leung KP, Galiano RD, Mustoe TA. Impact of a novel, antimicrobial dressing on in vivo, *Pseudomonas aeruginosa* wound biofilm: quantitative comparative analysis using a rabbit ear model. *Wound Repair Regen.* 2014; 22: 712-719. DOI: 10.1111/wrr.12232. 15. Hobot JA, Walker M, Newman GN, Bowler PG, 2008. Effect of Hydrofibre® wound dressings on bacterial ultrastructure. *J Electr Micro*; 57: 67-75. 16. T. J. Beveridge, W. S. Fyfe. Metal fixation by bacterial cell walls. *Canadian Journal of Earth Sciences*, 1985, 22(12): 1893-1898, <https://doi.org/10.1139/e85-204>. 17. Metcalf DG, Parsons D, Bowler PG. Clinical safety and effectiveness evaluation of a new antimicrobial wound dressing designed to manage exudate, infection and biofilm. *Int Wound J* 2017; 14: 203-213. AQUACEL, AQUACEL Extra and Hydrofibre are trademarks of ConvaTec Inc. All trademarks are the property of their respective owners. ©2019 ConvaTec Inc. AP-020312-MM V1535