

Aiding diabetics

Feet perspire and if footwear does not breathe sufficiently foot problems will ensue.

This is particularly true with sports shoes, where the physical exertions of the wearer cause extra sweating. There are many systems on the market designed to deal with this problem, but not many that can also work in a purely medical sense. DS2 Drying Sweat System appears to be one that does. Introduced as an insole or lining for sports shoes, it has been successfully tested for use in cases of podiatry problems where open wounds occur.

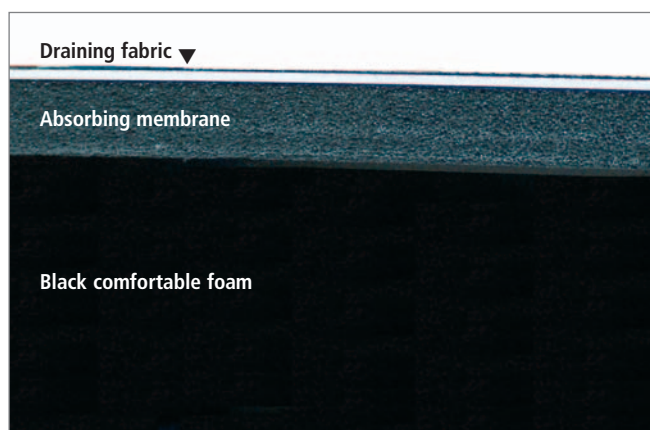
There has been a dramatic increase in recent years of people in the Western world developing diabetes. While the condition can be controlled through diet and medication, complications can still arise. One of these is ulcerated feet caused by pressure points inside the shoe. The problem then becomes one of healing, and the inside of a shoe is not the best place for this to take place.

In the majority of cases, the dressings applied to the wound will allow it to discharge into the shoe and create a septic environment prejudicial to the cure. The Drying Sweat System consists of a special patented insole that can absorb this so that the foot remains in a healthy environment and therefore heals more quickly. In addition to this, the use of an antibacterial additive allows the insole to be totally decontaminated. Therefore, treatment time is reduced, costs are lower and the patient is far more comfortable.

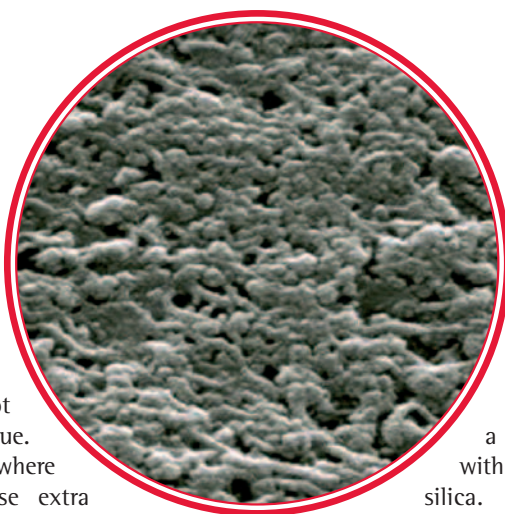
How does it work?

A typical DS2 insole is made of three layers joined by a special dot-coat hot-melt adhesive that preserves moisture absorption whilst ensuring good bonding, friction and water resistance:

- A foam base for mechanical comfort
- A patented microporous absorbing membrane
- A draining fabric next to the foot



Laminated DS2 - Drying Sweat System

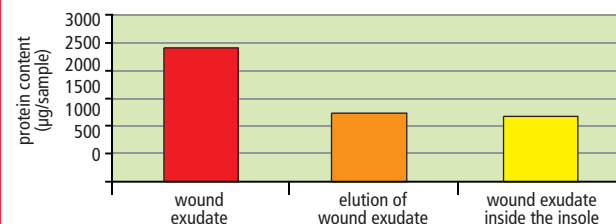


Membrane (20000 X)

The membrane itself comprises a polyethylene base that is filled with high absorption and fast drying silica. Its absorption capacity and hygienic capacities have been confirmed by tests carried out at SATRA and the Hohenstein Institute, and its lack of harmful side effects by further studies and patient trials on a variety of subjects. It has obtained a CE 'medical class 1' marking. The decontaminating antibacterial product that is also incorporated is widely used in dental surgery and is highly efficient against a broad spectrum of bacteria. The fact that the membrane dries very rapidly prevents the development of bacteria almost entirely.

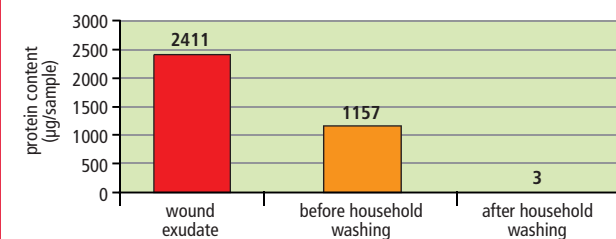
The effectiveness of this membrane can perhaps be best shown through reference to the graphs produced by tests conducted by the Hohenstein Institute.

Figure 1: Determination of the protein content of wound exudate after contamination of the insole and elution with artificial sweat solution



The left-hand column shows the number of proteins contained in the wound's discharge, whilst the centre column shows how many were washed away from the membrane after elution (washing out) with sweat solution. The right-hand column shows the number remaining after this process.

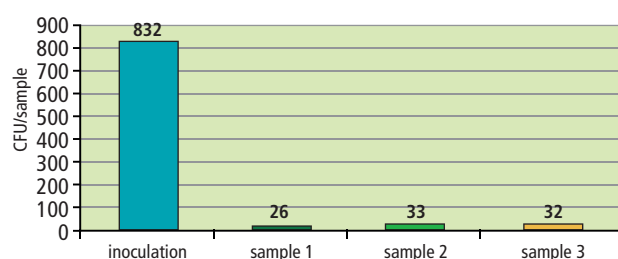
Figure 2: Determination of the protein content of wound exudate after contamination of the insole and after household washing



The left-hand column shows the number of proteins contained in the wound's discharge, while the centre column shows the number remaining after elution with sweat solution but before typical household washing. The right-hand column shows the number remaining after washing, thus indicating that washing cleanses the membrane completely.

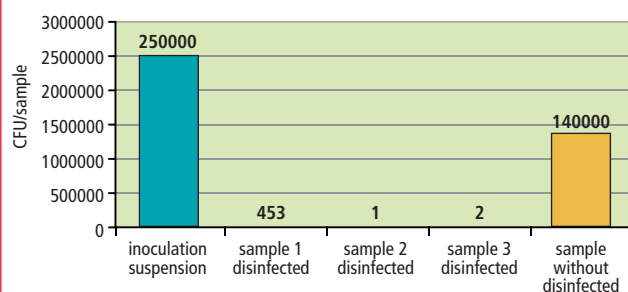
FOOTWEAR TECHNOLOGY

Figure 3: Inoculation with pseudomonas aeruginosa and contact plate analysis



Here, the insole has been inoculated with a germ population of 832 cfu. Once in contact with the insole and subjected to contact plate analysis (tested on three samples), there is only an average of 30 cfu (3.65%) that escapes, indicating that most were absorbed by the insole.

Figure 4: Inoculation with pseudomonas aeruginosa, Calbenium disinfection and elution of the insole



Now, the first column shows how many germs are contained in the suspension. The second, third and fourth columns show how many remain after disinfecting with Calbenium, while the last one on the right shows how many were contained in the insole before disinfecting. This indicates that the antibacterial disinfectant is extremely efficient and has reduced the number of bacteria by a factor of 10,000.

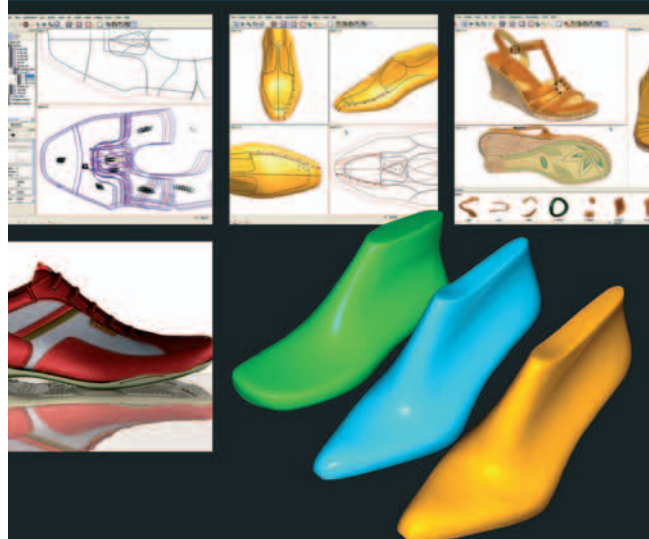


The DS2 membrane can be heat formed and so can be used for medical inserts moulded to the same contours used for the normal podiatric inserts used by many diabetics. There will be no change to the shoe fit or comfort factor, while the medical advantages aid the healing process on any open plantar wounds. In addition, this could offer benefits for many other types of footwear—after all, healthy feet must be a good thing for everyone. 🌐

All data and images courtesy of I.P.C., France.

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