A comparison of performance characteristics of a new High Performance Dressing compared with a 100% CMC fibre based dressing and its reinforced equivalent.

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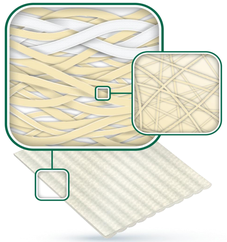
Introduction

Advanced Medical Solutions have developed a High Performance Dressing (HPD) consisting of a reinforced non-woven felt with the majority of the fibre composed of Carboxymethyl cellulose (CMC)..

HPD Key characteristics::
- High gelling
- High absorbency
- Good wet and dry strength
- Low lateral wicking

.HPD dressings were tested for absorbency, wet tensile strength, lateral wicking, dry tensile strength and wet integrity. The results were compared to two dressings indicated for similar wound types. These were a 100% CMC fibre based dressing (CMC) and its equivalent which uses threads for reinforcing (CMC reinforced)

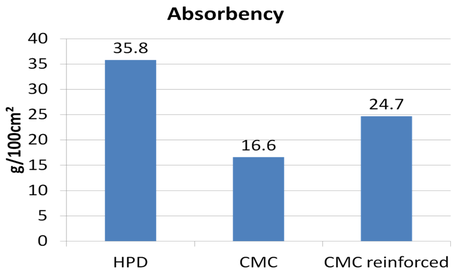


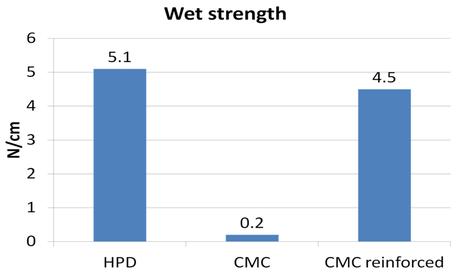
Method

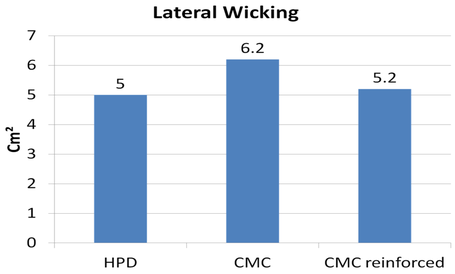
Absorbency – The absorbency of the dressing was measured using a free-swell absorbency test. A dry 5x5cm sample was weighed and then saturated in an excess of solution A at 37°C for 30 minutes. The sample was removed from the oven and suspended for 30 seconds and re-weighed. The difference in weight was measured and the absorbency of the dressing calculated in g/100cm².
Wet tensile – The strength of a wet dressing was tested using a tensometer to measure the force required to pull the dressing apart. Equal numbers of 20x100mm samples were taken at right angles to each other. This was to ensure the strength in both directions was measured. The samples were saturated in an excess of solution A. Each sample was then secured in the tensometer and the jaws pulled apart to give a force required to break the sample. This force was calculated in N/cm.
Lateral wicking –1ml of Solution A coloured with Methylene blue was dispensed centrally on a petri dish so that the liquid formed an even circle. The sample was placed onto the plate and the stop-watch started. After 5 minutes the sample was removed and inverted. The largest and smallest diameters were measured and lateral wicking area was calculated in cm².
Dry tensile – The strength of a dry dressing was tested using a tensometer to measure the force required to pull the dressing apart. The same method as wet tensile testing was used but with dry samples.
Wet integrity – This is the ability of the dressing to remain integral when saturated in solution A for an extended period of time. A 5x5cm sample was placed in a conical flask with an excess of solution A. It was swirled by hand for 60 seconds. This was repeated every day for 8 days. If there was clear evidence of the original structure, then the dressing was classified as integral.

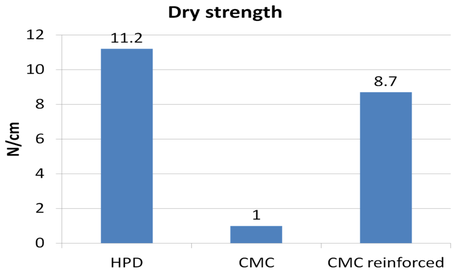
Results

All three dressings tested remained integral every day up to and including 8 days. The figures below show the results for absorbency, wet strength, lateral wicking and dry strenght









Discussion

HPD is **highly absorbent** making it suitable for use on moderate to heavily exuding wounds. HPD has an absorbent capacity 54% higher than the CMC dressing and 31% higher than the CMC reinforced.
HPD shows increased wet and dry strength in comparison to the CMC and CMC reinforced dressings. HPD wet strength is 96% higher than the CMC dressing and 12% higher than the CMC reinforced dressing. HPD dry strength is 91% higher than the CMC dressing and 22% higher than CMC reinforced. This provides evidence that the dressing will remain **intact on application and removal**.
Good lateral wicking contains the liquid within the point of application and prevents spread within the dressing. For this test a lower value for lateral wicking is better. HPD shows 24% less lateral wicking than the CMC dressing and 4% less for the CMC reinforced dressing. This results in **minimal risk of maceration** of healthy skin surrounding the wound.
HPD shows wet integrity over 8 days and will therefore **remain intact on a wound** for the intended wear time.

Results

In conclusion, HPD has equal or superior performance characteristics compared to CMC and CMC reinforced dressings in relation to absorbency, wet tensile strength, lateral wicking, dry tensile strength and wet integrity can be used for the same clinical indications i.e. moderate to highly exuding chronic and acute wounds.

References:
AMS data on file P3407R, P3179R, LD024-16, LD037-16, LD127-16 & LD137-16. AMS test method references LWILAB006, LWILAB036, LWILAB085 and LWILAB090.