# Assessing the Moisture Vapour Transmission Rate (MVTR) of three commonly used wound dressings

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## Introduction

To promote re-epithelialisation, a wound must remain moist however, if a dressing retains too much moisture, maceration of the surrounding healthy tissue can occur (Junker *et al.* 2013). Wound dressings should have sufficient permeability to moisture vapour to prevent backward migration collecting within the dressing (Zehrer *et al.* 2014*)* however, entrapment of liquid can lead to serious health consequences for skin integrity. The Moisture Vapour Transmission Rate (MVTR) test method measures both water vapour and water contact for wound dressings using mass differential.

## Methodology

Three wound dressings were selected for MVTR assessment. The dressings were preconditioned at 21°C ± 2°C at a relative humidity (RH) of 60 ± 15 %RH for 48 hours. Dressings were clamped to the cylinders and filled with distilled water, leaving a gap of 5 ± 1 mm between the water and the dressing. To assess the dressing in contact with water vapour, each device was weighed and incubated at 37 ± 1 °C for 18 - 24 hours. To test the MVTR in contact with water, the Paddington cups were inverted and incubated at 37 ± 1°C for 4 hours.

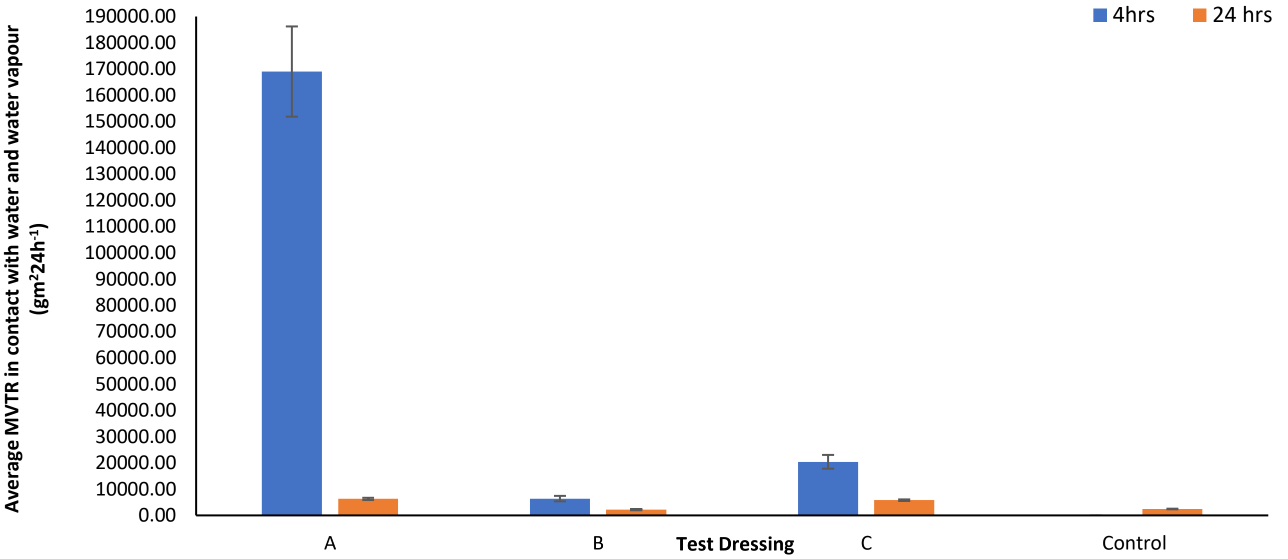


**Figure 1.** The average moisture vapour transmission rate of three test dressings in contact with water (4 hours contact time) and in contact with vapour (24 hours contact time).


**Figure 2.** Cylinders used for the MVTR test method

## Results

The observed ranges for dressings A, B and C when in contact with water were 40185.84 ± 12926.92 gm$^{-2}$24h$^{-1}$, 2342.52 ± 2409.61 gm$^{-2}$24h$^{-1}$ and 9740.40 ± 6886.89 gm$^{-2}$24h$^{-1}$, respectively. The control dressing in contact with water resulted in a range of 27.24 ± 47.36 gm$^{-2}$24h$^{-1}$.

The observed ranges for dressings A, B and C when in contact with water vapour were 926.40 ± 1956.67 gm$^{-2}$24h$^{-1}$, 564.96 ± 202.73 gm$^{-2}$24h$^{-1}$ and 563.50 ± 380.19 gm$^{-2}$24h$^{-1}$, respectively. The control dressing when in contact with water vapour resulted in a range of 469.18 ± 315.52 gm$^{-2}$24h$^{-1}$.

## Discussion and Conclusions

According to Xu et al. (2016), an MVTR of 2028.30 ± 237.8 gm$^{-2}$24h$^{-1}$ equates to the optimal moist environment which promotes wound healing. Dressing A demonstrated the highest range for both water vapour and water contact which was expected as this test sample is the most porous of the samples tested and would not be used for an exudating wound in the real world. Dressing B demonstrated the lowest range for both water vapour and water contact which was expected as this is test sample is categorized as a permeable film dressing and would be used for an exudating wound in the real world. Dressing C demonstrated a higher MVTR result compared to dressing B for both water contact and water vapour which was expected due to being suited to helping manage moderate to high exuding wounds. According to Xu et al. (2016), an MVTR of 2028.30 ± 237.8 gm-224h-1 equates to the optimal moist environment which promotes wound healing.

### References

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