

Comments on the negative pressure created by the Capillary Flow properties of Hydrofera Blue™ Wound Dressings

By Theodore L. Heying PhD

Hydrofera Blue™ is a wound dressing manufactured by Hydrofera, LLC of Willimantic, Connecticut. It is a unique complex of polyvinyl alcohol foam (PVA) and two organic pigments. The two pigments provide broad-spectrum germicidal protection while the chemical and mechanical properties of the foam provide a platform to wick fluids from the wound bed, bind and eliminate toxins.

For many years, dry PVA sponge has been used to absorb large quantities of fluids like water and blood, and various commercial products have taken advantage of this unique property. For example, during eye surgery, small tips of PVA sponge are placed near the surgical site to rapidly wick fluid from the site so that the surgery can proceed quickly and easily.

It is well known that mechanical vacuums currently marketed for wound care, provide negative pressure (typically 25 mm of Hg to 200 mm of Hg) to the wound site to remove exudates and help speed healing.

When Hydrofera Blue was developed, its fluid absorbing power was easily recognized also and was found to be very advantageous in gently removing wound exudates from the wound site.

In order to better understand the cause of the removal of exudates from the wound area, an outside laboratory, Porous Materials, Inc. (PMI) of Ithaca, New York, examined samples of Hydrofera Blue.

Upon examination, PMI determined that the negative pressure exhibited by Hydrofera Blue was the result of the structure of the polymer and its capillary flow properties. PMI therefore performed a Capillary Flow Analysis to determine the negative surface pressure provided by Hydrofera Blue wound dressings.

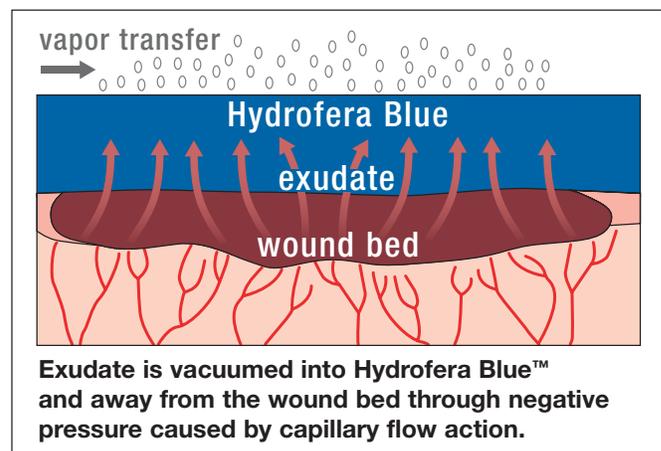
The PMI analysis, using Galwick, showed that the Mean Flow Pore Pressure for the Hydrofera Blue foam was equal .344 PSI. This converts to the formation of negative pressure equal to 17.8 mm of Hg when Galwick is used as the substrate. Using the appropriate conversion factor for water, the result is that Hydrofera

Blue creates a negative pressure of 71.2 mm of Hg when water is used as the substrate.

Under the assumption that no two wound exudates are alike, to determine the negative pressure for this liquid, one must approximate the average surface tension of wound exudates as compared to water and Galwick. It is known that wound exudates are ionic solutions having a lower surface tension than water but much higher than Galwick.

Therefore, it can be safely assumed that the negative pressure provided by Hydrofera Blue when placed on a wound would be slightly less than 71.8 mm Hg for water and much greater than the 17.8 mm of Hg with the Teflon-like Galwick.

Further, the results of this study indicate that the gentle negative pressure provided by Hydrofera Blue wound dressings to the wound site, approximates the low to mid settings on a typical mechanical vacuum machine.



Dr. Heying is an Organic Chemist who spent most of his lifetime in research. During that time he was Director of Research for a Fortune 300 Company. He has numerous publications in scientific and medical journals.