New technology offers improved fluid-handling capacity and strong, skin-friendly adhesion for direct-contact wound treatment, stoma care, and other applications.

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An aging population and accompanying demand for wound dressing and stoma care technologies that provide better treatment than conventional techniques have prompted the medical adhesives industry to produce a new generation of product solutions. One recently proven technology is a highly breathable formulation with superior fluid-handling capacity called Avery Dennison® Thin Absorbent Skin Adhesive, which is poised to shift current market expectations of conventional acrylic adhesives.

The patent-pending technology, which consists of a transparent polyurethane film coated with an advanced acrylic adhesive, represents a breakthrough in acrylic adhesive functionality. Although conventional acrylic adhesives have a high moisture vapor transmission rate (MVTR) and are widely used for securement of dressings, they display no absorbency. In contrast, Thin Absorbent Skin Adhesive technology offers high MVTR and absorbs wound exudates.

The new technology enables medical device manufacturers to offer skin-friendly adhesive solutions in diverse applications including direct-contact wound care, postoperative dressings, multilayer dressings, stoma flanges, and electrode backings.

Fluid Management

The advanced performance characteristics of Thin Absorbent Skin Adhesive technology were demonstrated in a two-part study conducted at the Avery Dennison Medical Solutions in-house test facilities. It evaluated fluid management and in vivo properties of Thin Absorbent Skin Adhesive technology compared with conventional acrylic-based film dressings and commercial hydrocolloid dressings.

Five commercial acrylic-based film dressings and two commercial hydrocolloid dressings were included in the first phase of the study, which tested Fluid Handling Capacity (FHC) following the European standard EN13726.

According to the test results, the Thin Absorbent Skin Adhesive recorded an MVTR of 1480 g/m²/24h — three times higher than the MTVR of the hydrocolloid dressings tested. The MVTR measurement was comparable to that of the commercial film dressings tested.

The overall FHC was obtained by combining the MVTR and static absorption values. The Thin Absorbent Skin Adhesive had a static absorption measurement of 930 g/m²/24h, giving it a total FHC of 2410 g/m²/24h. This value far exceeded the FHC of both the acrylic-based film dressings and the hydrocolloid dressings.

In addition, the Thin Absorbent Skin Adhesive demonstrated adhesion comparable to the commercial dressings. It scored approximately 6 on a 0–7 adhesion scale, with 7 being perfect adhesion. It also scored within the acceptable pain range on removal, as rated by the test subjects, and did not leave residue on the skin. The Thin Absorbent Skin Adhesive also displayed clean edges and minimal edge lift compared with the other dressings.

Transdermal water loss and skin hydration were measured one hour after dressing removal and compared against a baseline measurement. The Thin Absorbent Skin Adhesive’s score on the two tests was nearly 100 percent, showing that the three-day application
of the dressing did not disrupt the skin barrier function.

■ Study Conclusions
The study concluded that the Thin Absorbent Skin Adhesive technology demonstrates:
• Advanced fluid-handling capabilities, scoring higher in FHC than selected acrylic-based film dressings and hydrocolloid dressings.
• Excellent adhesion after three days’ wear and maintains a good appearance with minimal edge lift.
• No skin damage and no adhesive residue after removal.

■ Major Applications
The superior fluid management and skin-friendly characteristics of Thin Absorbent Skin Adhesive technology offers potential solutions for diverse medical applications, including:
• Postoperative dressings. These dressings usually consist of nonwoven wound pads secured with a secondary dressing. Clinicians typically change the dressing daily to observe wound healing and check for signs of infection. The Thin Absorbent Skin Adhesive technology, which features a transparent polyurethane film, can eliminate the need for wound pads in some applications. It is designed for extended wear and enables clinicians to view the wound without removing the dressing.
• Direct-contact wound care. Thin Absorbent Skin Adhesive technology offers an innovative alternative to hydrocolloid dressings in direct wound contact applications, such as protective covers for minor wounds, skin graft donor sites or dressings for treatment of pressure ulcers, where it is important to create a moist wound healing environment, while minimizing wound bed disturbance.
• Ostomy flanges. High FHC and ultra-thin design make the Thin Absorbent Skin Adhesive a cost-effective alternative to hydrocolloids in ostomy applications. It also has potential as caps to cover the stoma, providing more freedom of movement for ostomy patients.
• Electrode attachment. The Thin Absorbent Skin Adhesive offers a more comfortable, comfortable backing material for electrodes and other devices than existing options, such as polyethylene foam materials. It can also extend wear time without damaging the skin.
• Consumer applications. Its thin construction and resistance to edge lift qualify Thin Absorbent Skin Adhesive technology for use in consumer applications, such as blister dressings and blister-prevention patches.

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