Insight

The Adherent®

Technology Insights from Adhesives Research

Taking your products further.™

Porous Adhesives Broaden The Scope Of Capabilities For Product Designs Requiring Fluid Exchange and Vapor Transmission

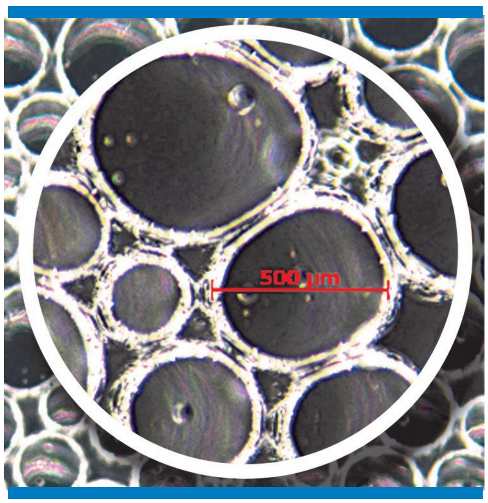
A novel porous pressure-sensitive adhesive (PSA) available from Adhesives Research (AR) demonstrates all the desirable properties of a conventional PSA, including quick adhesion and the capacity to bear load, while allowing the free transport of fluids and/or gases through the adhesive. This technology platform provides the same manufacturing efficiencies as conventional PSAs, such as continuous roll-to-roll manufacturing, while providing a new dimension of capabilities to product designers.

AR's porous PSA technology features open pores ranging in diameter from approximately 200–500 µm in a low-density, highly permeable structure. The distribution of pores throughout the matrix results in 30–50% porosity and a typical finished film thickness of 200 µm. The pores retain their physical dimension while resisting crushing or collapse when exposed to normal handling and pressure during lamination processes that could otherwise affect functionality.

The porous adhesive technology is available as a transfer adhesive or supported film construction in several customizable chemistries, including:

Hydrophilic — promotes moisture absorption and aqueous flow.

Hydrophobic— slows the exchange of fluids while facilitating good vapor transmission. This chemistry is recommended for bonding to nonpolar substrates like polyolefins and for maintaining adhesive bonds when in the presence of acids, polar organic solvents, alcohol and water.



Balanced Adhesion and Flow — for maintaining bonding capabilities and porosity while withstanding various environments, temperature cycling and solvents.

Applications for Porous Adhesives

The porous adhesive forms instant bonds to join film substrates, membranes, pads, filters, plastic parts and other components without the need for curing or clamping during production. It may be laminated to other substrates, including membranes, to bond components while enabling the unencumbered flow of fluids or free exchange of gasses.

While the technology can address the bonding needs of applications where a traditional impervious adhesive would be limiting, the medical industry is an area of interest where the porous technology can deliver significant benefits, particularly in the areas of in-vitro diagnostic (IVD) tests, such as home pregnancy and blood glucose testing, and advanced wound care applications.

For example, the adhesive's typical pore size of 200 microns is sufficient for allowing the passage of a whole blood sample in an IVD test. Alternatively, the adhesive may be laminated to a porous membrane to filter red blood cells. The porous PSA can enable the construction of a stack of filtration membranes within an IVD device for cost-effective sample preparation and it is being considered for flow-through diagnostic devices, sealing microplates and microfluidic devices.

The technology also offers many benefits for bonding components while enabling fluid management in advanced wound care applications. The adhesive's pore structure offers a reduced bonding surface area for less contact around or directly to a wound site. Additionally, the pores can potentially be used for delivering antimicrobial or other therapeutic agents to promote healing.

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