

# The Adherent<sup>®</sup>

## Technology Insights from Adhesives Research



Taking your products further.™

### Tight-Thickness Tolerance Adhesives – When Precision is Paramount

Pressure-sensitive adhesive (PSA) tapes are a critical component in many disposable in-vitro diagnostic medical device applications, namely biosensors, microfluidics and lateral flow test strips. PSAs offer precise and accurate bond lines that improve the reproducibility of these devices, so one or more layers of PSA tape product may be used to bond, laminate or assemble components within a test strip.

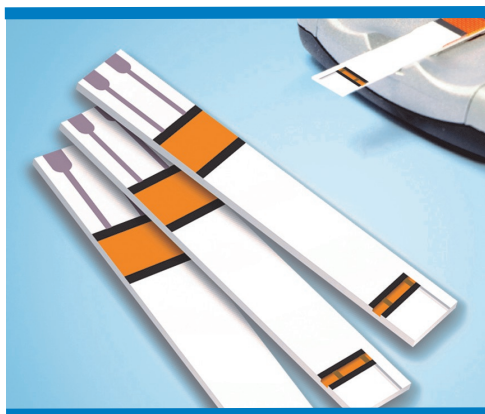
One of these PSA layers is often a double-faced spacer tape featuring a precise die- or laser-cut capillary channel for capturing and transporting a biological sample. This material is then laminated to other components containing analytes and biosensors to complete the functionality of the device.

Because these devices completely rely on the height of the capillary channel to capture the exact amount of biological sample for accurate test readings, maintaining tight thickness tolerances for these double-sided tapes is crucial to avoid any thickness variations. Adhesives Research has defined a process that assures the tight-tolerances of these products to address the specialized needs of diagnostic device manufacturers.

#### Defining Tight-Tolerance

Tight tolerance refers to the precise thickness control of our end tape product. Adhesives Research has the capability of maintaining tolerances of

+ or - 0.15 mil (approximately 3.7 microns). By providing a consistent product, we enable our clients to simplify their calibration processes. For example, a customer can establish one universal calibration code for a product line, eliminating the need to determine lot specific calibrations. This design feature can allow the customer to save significant time and money.



#### Steps to Achieve Tight Tolerance

Achieving a tight thickness tolerance product is a carefully engineered process beginning with the control of our raw materials. Any variances in an extruded film substrate will directly impact the thickness of our final tape product. We only accept materials that meet the strict tolerances we establish for our own products.

Much of our ability to control adhesive thickness can be attributed to our ability

to custom formulate adhesives with tightly controlled viscosity and solids tolerances determined to be ideal for our coating processes. The adhesive is then applied to the approved substrate using a proprietary, controlled coating process that is proven to reliably apply the adhesive at a consistent thickness across the web.

Finally, the adhesive thickness and tight tolerances are monitored and maintained through our state-of-the-art online coating controls in conjunction with off-line monitoring gauges to immediately adjust the coating process if variations appear.

#### Other Applications for Tight Tolerance Adhesives

Adhesive tape thickness is critical in applications beyond medical diagnostics. Another example can be seen in some drug delivery patches that feature microprojections, which are arrays of solid metal, hollow metal, or polymer drug-treated micro needles that adhere to the skin with a PSA. The combined thickness of the components of the device controls the depth of penetration of the microneedles to release a drug into the bloodstream or lymphatic system. If penetration through the skin is too shallow, the user may not receive the proper dose; alternatively, if the needles penetrate too deeply, the user could experience unwanted discomfort and pain.



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