

# The Adherent®

Technology from the tape company you can depend on

## Hydrophilic Pressure-Sensitive Adhesives and Coatings for Efficient Fluid Transport and Reduced Analysis Times

In-vitro diagnostic (IVD) and microfluidic devices are indispensable tools for detecting various analytes such as nutrients, hormones, various biomarkers, drugs-of-abuse and environmental contaminants.

IVD device manufacturers seek materials and techniques for:

- 1) Reducing sample size
- 2) Reducing analysis times
- 3) Improving test accuracy

### Forming Microfluidic Channels

Pressure-sensitive adhesives (PSAs) are often used in the assembly of IVD and microfluidic devices due to their ease-of-use and efficiencies related to the continuous roll format. These devices typically feature a substrate material laminated to a spacer tape that is cut to form channels. The channels are then laminated with a top sheet substrate to form rectangular capillaries.

Hydrophilic coatings or adhesives are applied to the top sheet stock to improve device performance and are available in the form of films, PSAs and heat-seals to provide IVD manufacturers with configuration options in the assembly of hydrophilic channels.

### The Importance of Capillary Flow

The microfluidic channels found in IVDs allow for the transport of a biological fluid by mechanical means or capillary

flow action from a device sample inlet port to the detection zone. For capillary action to occur, the walls of the microfluidic channels must reliably demonstrate hydrophilic characteristics, including spontaneously filling in a rapid and consistent manner.



### NextGen Hydrophilic Bonding

Adhesives Research (AR) is addressing the industry need for faster, more accurate test results with enabling hydrophilic adhesive technologies that not only bond components, but also improve test performance.

AR's next generation **ARflow®** technology provides ample hydrophilic character to render the entire microfluidic channel hydrophilic. Because the technology is inherently and uniformly hydrophilic on all existing and newly created surfaces, it presents design options previously unavailable for forming capillary channels.

### Benefits of ARflow® Technology:

- Reduces surface tension of biological fluids to allow for rapid and consistent wicking
- Designed for use in diagnostic devices such as blood coagulation monitors, blood glucose, point-of-care tests, environmental test kits and biotechnology applications
- Improved die-cuttability capabilities deliver sharper cuts and less downtime for blade cleaning
- Stable, passive fluid transport
- Tailorable flow rates ranging from 1.5 to 20+ seconds
- Contact angles ranging from <math><10^\circ</math> to <math>60^\circ</math>
- Biocompatible with reagent chemistries and biological samples
- Heat-activated adhesives, PSAs and non-adhesive coatings
- Bond to low-surface energy and metalized substrates commonly used in diagnostic devices
- Offer long-term stability in high-temperature and humidity environments
- Available in hydrophilic heat-activated adhesive, PSA and non-adhesive coating formats