

## What's in a Number?

**Looking beyond test results can help to best determine the right adhesive for a given application.**

*A submission from Adchem Corporation*

In the world of pressure sensitive adhesives or PSA's, you will find no shortage of physical property data. Peel strength, shear strength, loop tack and temperature information are all readily available. The question is: How useful is all of this data? As a provider of PSA solutions, we spend countless hours coaching our salespeople to understand the application and the conditions to which the PSA is subjected before we can select a pressure sensitive adhesive tape product. We are commonly asked, "What is your equivalent to Competitor's X." Or: "I need an acrylic transfer tape 5-mils in caliper with a peel strength of Y". Our response is: "What are you trying to do or what do you want the PSA to do?" Only then can we assist you in finding the optimal solution. There are several sources of test procedures but the most common tests are sanctioned by the Pressure Sensitive Tape Council (PSTC) and developed by the American Society of Test Methods (ASTM). In addition, some vendors report results from tests they have developed in house. If you do compare numbers, it is important to know who conducted the tests and the test methodology. How the numbers are generated is equally important. The American Association of Laboratory Accreditation (A2LA) has established standards for laboratories that include equipment calibration, technician training, laboratory environment and record keeping.

Some common test results that are often considered include:

- Loop Tack is a common measure of "quick stick," or how fast the PSA will adhere. A tensile type machine lowers a loop of the test tape on to a substrate, typically stainless steel, and contacts it for a specified period of time, typically one second or less, and then it is pulled away, Performance is usually measured in pounds per inch. When looking at loop tack numbers, it is important to know the machine speed as well as the backing used. We should not leave the discussion on tack without talking about the time-honored practice of using finger pressure. In addition to being totally subjective, the thumb appeal test is susceptible to many unpredictable distortions, such as, what breakfast sandwich the tester handled that morning. Adchem has engineered many systems with mediocre "thumb appeal" but with an excellent application fit.
- Peel numbers, usually expressed in pounds per linear inch, are impacted by the speed of the test apparatus, the dwell time or the elapsed time the adhesive has been in contact with the test surface following application.
- Static shear testing is done by hanging weights onto a sample and

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measuring the time to cohesive failure. Variables that need to be considered here include the amount of the weight and the area of the test sample.

- Service temperature is one of the more misunderstood properties of a PSA. Service temperatures are typically reported as constant and intermittent. Intermittent results always need further definition. Other factors that influence service temperature include the substrate that is bonded, other ambient conditions like humidity, how was the PSA applied and how much dwell time preceded the test.
- Another number that customers commonly use is the SAFT, or Shear Adhesion Failure Temperature. The test sample preparation is identical to Shear Testing, but the test temperature is raised in increments until the sample fails. All of the variables affecting temperature come into play here as well. So be sure the test conditions were identical.

In our opinion, the best evaluation process involves side-by-side testing of all PSA candidates. Comparing products in actual use conditions and/or environment involves time and effort, but it is infinitely better than comparing by numbers alone.

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