STORAGE MODULUS OF PRESSURE SENSITIVE ADHESIVE

What are the mechanical properties of pressure sensitive adhesives (PSAs)? The aim of this review is to summarize research works on mechanical properties of pressure sensitive adhesives (PSAs). The mechanical properties of PSAs are usually described by tack,shear resistance and peel strength,which are strongly dependent on bulk viscoelastic properties of adhesive system.

What are the properties of pressure sensitive adhesives? Three properties,shear resistance,tack and peel strength,generally characterized pressure sensitive adhesives (PSA). These properties are directly related to the PSAa??s response to the application of stress and may be measured using rheology.

What is the rheological behavior of pressure sensitive adhesives? The rheological behavior of three different pressure sensitive adhesives is well characterized using rheometry and successful correlations to describe PSA behavior are shown. All of the results for each PSA were determined by using one Time-Temperature-Superposition (TTS) procedure.

Do pressure sensitive adhesives have linear viscoelastic properties? Chang reviewed the correlation of linear viscoelastic properties of pressure sensitive adhesive (PSAs) with industry standard performances such as peel, tack and shear. The viscoelastic windows (VW) proposed by different workers were also compared for different types of pressure sensitive adhesives.

What is the plateau modulus of a pressure sensitive adhesive? The plateau modulus of a pressure sensitive adhesive,particularly when located in proximity to the application temperature and frequency,is inversely correlated with the complianceof the material which is critical to its ability to create a bond with a substrate or surface.

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What are supramolecular pressure-sensitive adhesives? Supramolecular pressure-sensitive adhesives (PSA s) are newly emerging materials that exhibit physical pressing-induced adhesion effects. Supramolecular PSA s have many advantages over hot molten adhesives and show significant potential for the application in surface adhesion and coatings.

Comparison of the storage modulus and tack of a PSA as a function of temperature. Pressure-sensitive adhesives, as stated before, have a special position among the adhesive classes since they do not change their physical state from an initial liquid to a solid after final bond formation. 35 The materials,

Figure 1. Storage modulus G'' for a typical natural rubber-based PSA as a function of frequency with approximate strain rates encountered in typical operations associated with the manufacture and end use of a standard pressure-sensitive tape adhesive. Figure 2. Master curve of PSA Samples A and B measured at temperatures from -90

This paper suggests a testing method to measure the frequency-domain viscoelastic properties of a micron-scale thickness adhesive. To test a thin adhesive below room temperature, a new double-shear tester is designed in this study. A thin pressure-sensitive adhesive (KGK-200A50) with the thickness of 50 I 1/4 m is tested in the range of a?? 5.5 a?? C $-5.5 a?|

Radiation Curable Pressure Sensitive Adhesives Jin Lu and Chuck Dong Arkema Inc., Sartomer Business Unit Exton, PA 19341 Abstract The peak tan I' temperature and storage modulus G'' at 20 C are reported. Frequency sweep were done at 30C in RDA 111, using 8mm parallelplates from 0.01 rad/s to 100rad/s

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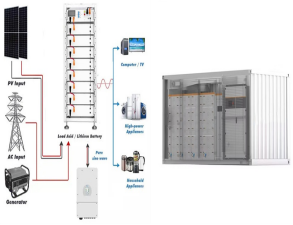
On the other hand, material B showed a more elastic-like response in this region, with a higher storage modulus and no clear evidence of a terminal flow region (Fig. 3). At 20 ?C and 0.1 rad/s, the real part of the shear modulus of adhesive B (Ga?2 = 220 kPa) was indeed about ten times that of adhesive A (Ga?2 = 30 kPa).

In the area of pressure-sensitive adhesives (PSAs), acrylic PSAs have been successfully applied in many fields, including self-adhesive tapes, sign labels, carrier-free tapes, double-sided tapes

In linear viscoelasticity, the dynamic modulus (G[I?]) is the ratio of shear stress to shear strain and is independent of the shear amplitude. Dynamic modulus may be separated into elastic a?|



The adhesion of pressure-sensitive adhesives (PSAs) is a complex phenomenon that can be understood through the characterization of different properties, including viscoelastic, mechanical, and fracture properties. The aim of the present paper is to determine the viscoelastic behaviour of an acrylic PSA and place it in the viscoelastic window, as well as to a?|

Given the viscoelastic nature of pressure sensitive materials, the rheological profile of a PSA can provide insight into performance. Loss modulus (G") can be linked to a measurement of adhesion while storage (or elastic) modulus (G") can be linked to a measurement of cohesion. The temperature sweep

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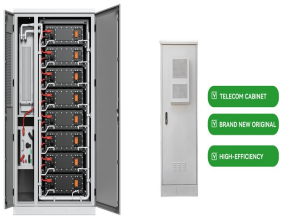

A pressure sensitive adhesive (PSA) is a type of adhesive that can bind the materials together immediately and be removed when necessary. Due to its convenience, desired that the storage modulus (G'') of the PSA is larger in order to increase the a?|

Silicone Pressure Sensitive Adhesives (PSAs) are widely used in applications where common organic PSAs are not fully adapted. Typical applications are for masking, plating and splicing tapes, Bonding of adhesion has been found to be correlated to the elastic modulus at low frequency - G'' (0.015 Hz) - and debonding has been shown to be

Controlling of Pressure Sensitive Adhesive Properties by Blending Poly(vinylidene fluoride-co-hexafluoro acetone) into such as the storage modulus G'', loss G'' and glass transition temperature

On the other hand, SBS copolymers display a much higher elastic modulus and better low temperature properties. 1 Thus, most SIS copolymers are traditionally used in hot-melt pressure sensitive

Pressure-sensitive adhesives (PSAs) have been an integral part of many industries that require the bonding of two or more materials. As expected, the storage modulus is lower compared to its lower epoxy-loaded example before transposition and higher strength after transposition. This data confirms what was expected, but contradicts the lap

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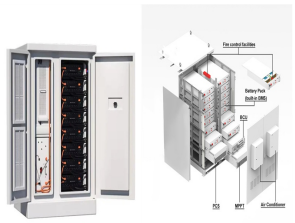
study which exhibited pressure-sensitiveadhesive performance at an appropriate concentration of resin. Sherriff et al. found that addition of the resin to the rubber shifted the entry to the a?|



Pressure-sensitive adhesive (PSA) is a semisolid material that adheres to various substrates at room temperature without additional chemical reactions and does not leave a residue after removal. The storage modulus (G") and loss tangent of PSAs were measured using a rheometer (MCR 102, Anton Paar, Graz, Austria). The samples were mounted

The adhesion performance of pressure sensitive adhesives (PSAs) is determined by three properties: tack, peel strength and shear resistance. interesting conclusions can be drawn from Figure 3, which shows the storage modulus G" and the adhesive-failure energy Ga for PEHA and a high-molecular-weight polyisobutylene (PIB). Both polymers a?|

PDF | Acrylic pressure-sensitive adhesive (PSA) is used to fix each layer of a flexible display. Additionally, as the content of the crosslinking agent increased, the storage modulus also

Provided is a pressure-sensitive adhesive composition for a foldable display, more particularly, a pressure-sensitive adhesive composition for a foldable display which, by satisfying a specific range of storage modulus at high temperature as well as at low temperature and room temperature, not only allows excellent folding properties to be realized but also satisfies a?|

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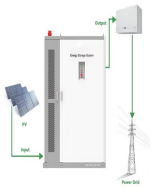
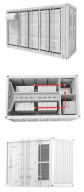


OF PRESSURE SENSITIVE ADHESIVE PERFORMANCE Bharath Rajaram, Ph.D. Co-Author Gregory Kamykowski (G"") to the storage modulus (G"). One critical aspect to keep in mind while performing oscillatory dynamic tests on viscoelastic samples pertains to the choice of the strain used for testing: ideally, the strain should be small


In some applications, acrylic adhesives do not require the addition of a tackifier to provide pressure-sensitive characteristics. However, in most pressure-sensitive applications, tackifiers are required to: Increase tack and peel strength ; Improve adhesion to low surface energy substrates


In Figure 5, the storage modulus (G") measured at a set temperature and frequency that is expected to be representative of the plateau modulus, was shown to increase proportionally as a?|


The storage modulus value of the whole PSA sample containing both high and low cured region does not show a very large difference between samples, but shows a clear trend: the storage modulus of each patterned sample (Fig. 3) tended to increase with increasing curing density in one region. Dividing the PSA into two same-sized regions while




2.1 Tack a?? Soft Enough for Rapid Wet-Out. To enable rapid and intimate wet-out of a surface by a film of adhesive requires only that it be sufficiently soft. Dahlquist found that materials with a dynamic shear modulus (stiffness) of less than 3 x 10 6 dynes/cm 2 (10 5 Pa) when deformed in 1 s will exhibit "tack." When the application requires tack to develop either faster or slower than

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Also, understand how to improve the performance of your pressure-sensitive adhesives by using comprehensive testing methods. Key Considerations for Good PSA Performance If we consider the mechanical response in terms of the storage modulus (G'') for a typical natural rubber-based PSA as a function of frequency.

moduli values are indicative of the stronger adhesive strength afforded by the use of Sample A. By contrast, the lower storage moduli values of Sample B are reflective of a material with a low a?|

In this study, the adhesion properties of polyurethane (PUR) pressure-sensitive adhesive (PSA) were investigated. The PUR-PSA was prepared by the cross-linking reaction of a urethane polymer consis

For a good pressure-sensitive adhesive, the ratio of storage modulus at high frequencies to low frequencies should be high. They also have a higher loss tangent at high frequencies than at low frequencies. The pure acrylic pressure sensitive resin had a shear strength of 13 min and peel strength of 3.0 lbf/in.

Nanoindentation can assess tackiness and mechanical properties of high-performance adhesives by quantifying storage modulus, loss modulus, tan delta, and near-surface work of adhesion under a range of conditions. This application note focuses on pressure-sensitive adhesives (PSAs), which are low-modulus elastomers that deform easily under low

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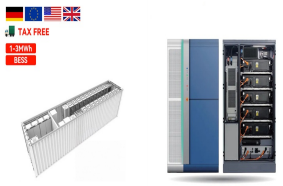
A plot of storage modulus, loss modulus and tan delta as a function of increasing temperature. Whether working with pressure-sensitive adhesives, hot melt adhesives or multiple component adhesives our lab is familiar with a variety of rheological methods for characterisation and can help you derive the most value from the results. Contact



Pressure Sensitive Adhesives (PSA). The significance of viscoelastic effects over the strain rates and temperatures of interest should be evaluated to determine if a viscoelastic model is required. Structural adhesives are typically used below their glass transition temperature, making viscoelastic effects less

In oscillatory tests, modulus is represented by G*, and represents the rigidity of a sample, or its "stiffness". Figure 2 shows typical curves for storage modulus (G'), loss modulus (G"), and loss factor (tan d) for a hot-melt adhesive, measured across a temperature range of -60 to +140 degrees C.

The drop-off temperature of the storage modulus G" thus correlates very well with shear-resistance-at-use-temperature; the higher the drop-off temperature, the higher the shear resistance. TACK TEST A pressure-sensitive adhesive adheres instantaneously to most solid surfaces upon the application of light pressure to the adhesive film.