

# Peran Zat Pengisi Bahan Pati dan Bahan Kaolin pada Polivinil Asetat (PVAc) terhadap Peningkatan Daya Rekat = The Role of Starch and Kaolin Fillers in Polyvinyl Acetate (PVAc) on the Increase of Adhesive Strength

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## Abstrak

Penelitian mengenai pengaruh penambahan bahan pengisi atau filler berupa bahan pati dan bahan kaolin terhadap peningkatan kekuatan rekat Polivinil Asetat (PVAc) telah dilakukan. Penambahan filler dilakukan dengan dua kondisi yang berbeda yakni filler tanpa pemanasan dan filler yang melibatkan pemanasan. Pada setiap kondisi, dilakukan variasi komposisi filler yang ditambahkan ke PVAc antara lain 1%, 3% dan 5%. Terkhusus untuk kondisi filler dengan pemanasan, filler dilarutkan dengan akuades dengan temperatur 70-80 °C serta kecepatan pengadukan 300 rpm selama 60 menit. Pencampuran PVAc dengan berbagai variasi komposisi filler pati dan kaolin dilakukan dengan kecepatan agitasi 300 rpm selama 60 menit. Pengujian kekuatan rekat sampel dilakukan berdasarkan ASTM D905-03 tentang uji kuat geser dan diperoleh hasil kekuatan rekat PVAc meningkat seiring penambahan filler pati dan kaolin hingga batas komposisi 3%, lalu untuk komposisi filler sebanyak 5% kekuatan rekat yang dihasilkan menurun. Evaluasi beberapa parameter juga dilakukan dalam penelitian ini yang meliputi, pengukuran pH, densitas, viskositas, dan kandungan padatan (solid content). Beberapa metode karakterisasi juga dilakukan yakni FTIR, SEM dan PSA. Spektrum FTIR menunjukkan adanya kemiripan antara PVAc murni dan PVAc yang dilakukan penambahan filler, dengan adanya sedikit pergeseran serta penambahan spektrum dan intensitas puncak. Hasil SEM menunjukkan morfologi partikel filler pati dan kaolin yang tersebar dan mengisi pori matriks PVAc. Seiring penambahan komposisi filler, hasil PSA menunjukkan peningkatan ukuran rata-rata diameter partikel dari 2,12  $\mu\text{m}$  hingga 6,29  $\mu\text{m}$ .

.....Polyvinyl Acetate (PVAc) has been studied to find out what happens when fillers like starch and kaolin are added to make the glue stronger. Filler were added in two different ways: with or without heat. In each condition, different amounts of filler were mixed into the PVAc, such as 1%, 3%, and 5%. For the filler condition with heating, the filler was mixed with distilled water at 70–80°C and 300 rpm for 60 minutes. The PVAc was mixed with different combinations of starch and kaolin filler at a speed of 300 rpm for 60 minutes. The shear strength test of the samples was carried out according to ASTM D905-03, and the results showed that adding starch and kaolin fillers increased the adhesive strength of PVAc up to a composition limit of 3%. After that, the adhesive strength actually went down at a composition limit of 5%. Several parameters, such as pH, density, viscosity, and solid content, were also measured as part of this study. FTIR, SEM, and PSA were also used to figure out what the material was like. With a small shift and spectrum addition, the FTIR spectrum shows that pure PVAc and PVAc with filler added are generally similar. The SEM results showed the shape of the starch and kaolin filler particles, which were scattered and filled the holes in the PVAc matrix. When more filler is added to PVAc, the PSA results show that the average particle size was increased from 2,12  $\mu\text{m}$  to 6,29  $\mu\text{m}$ .