ANALISIS VARIASI WAKTU PERENDAMAN SERAT BULU AYAM DENGAN NaOH TERHADAP KEKUATAN TARIK DAN KEKUATAN *IMPACT* KOMPOSIT BERMATRIK *POLYESTER*

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh variasi waktu perendaman serat bulu ayam dengan menggunakan NaOH) terhadap kekuatan mekanik material komposit bermatriks *polyester*. Metode manufaktur menggunakan *hand lay-up* menggunakan fraksi volume konstan sebesar 15% serat dan 85% resin *polyester*. Proses alkalisasi dilakukan menggunakan larutan NaOH dengan konsentrasi 5% pada lima variasi, yaitu tanpa perendaman, serta waktu perendaman selama 7,5 menit, 15 menit, 22,5 menit, dan 30 menit. Pengujian kekuatan komposit menggunakan uji tarik dan uji *impact*. Hasil dari pengujian tarik spesimen komposit serat bulu ayam menunjukkan bahwa nilai rata-rata kekuatan tarik tertinggi terdapat pada serat dengan perendaman NaOH 5% selama 7,5 menit dengan nilai sebesar 31,98 N/mm2,. Sedangkan nilai rata-rata kekuatan tarik terendah terdapat pada fraksi serat dengan perendaman NaOH 5% Selama 30 menit dengan nilai sebesar 19,214 N/mm2. Hasi dari pengujian *impact* spesimen komposit serat bulu ayam menunjukkan bahwa nilai rata-rata kekuatan *impact* tertinggi terdapat pada serat dengan perendaman NaOH 5% selama 7,5 menit dengan nilai sebesar 0,077 J/mm2, sedangkan nilai rata-rata kekuatan *impact* terendah terdapat serat dengan perendaman 30 menit NaOH dengan nilai ebesar 0,008 J/mm2.

Kata Kunci **:** Komposit, Serat Bulu ayam ,Fraksi Volume, NaOH, Tarik, *Impact*.

ANALYSIS OF VARIATION OF CHICKEN FEATHER FIBER SOAKING TIME WITH NaOH ON THE TENSILE AND IMPACT STRENGTH OF POLYESTER MATRIKS COMPOSITES

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ABSTRACT

This study aims to analyze the effect of varying immersion durations of chicken feather fibers in Sodium Hydroxide (NaOH) solution on the mechanical properties of polyester matriks composites. The specimens were manufactured using the hand lay-up method with a constant volume fraction of 15% fiber and 85% polyester resin. The alkalization process was conducted using a 5% NaOH concentration with five duration variations: no immersion (control), 7.5 minutes, 15 minutes, 22.5 minutes, and 30 minutes. Mechanical evaluation of the material was performed through tensile and *impact* testing. The results indicated that the highest average tensile strength was achieved by specimens with a 7.5-minute immersion duration, reaching 31.98 N/mm², while the lowest value was found in the 30-minute duration at 19.214 N/mm². Consistent with these findings, the *impact* test also showed the highest strength at the 7.5-minute immersion duration with a value of 0.077 J/mm², whereas the lowest strength was recorded at the 30-minute duration at 0.008 J/mm². These phenomena suggest that a 7.5-minute immersion is the optimal duration for the alkalization process to enhance the interfacial bonding between the chicken feather fibers and the polyester matriks, while excessive immersion tends to degrade the fiber structure, thereby reducing the mechanical strength of the composite.

Keywords**:** *Composite, Chicken Feather Fiber, Alkalization, NaOH, Tensile Test, Impact Test.*