

ABSTRAK

Penelitian ini mengkaji pengaruh variasi penambahan *Polypropylene Fiber* terhadap kuat tekan beton. Tujuan utama dari penelitian ini adalah untuk mengevaluasi peningkatan sifat mekanik beton melalui penambahan serat *polypropylene* dalam campuran beton. Dalam penelitian ini, dilakukan beberapa tahap prosedur yang meliputi persiapan material seperti agregat kasar, agregat halus, semen, air, dan *polypropylene fiber*, yang kemudian dicampur sesuai dengan komposisi yang telah ditentukan. Penelitian ini menguji campuran beton dengan variasi penambahan *polypropylene fiber* sebesar 0%, 2%, 4%, dan 6% dari berat semen. Pengujian kuat tekan dilakukan pada usia beton 7 dan 28 hari dengan menggunakan *Compression Testing Machine* (CTM). Hasil pengujian menunjukkan bahwa penambahan *polypropylene fiber* dalam campuran beton memiliki dampak yang bervariasi terhadap kuat tekan beton. Pada beton dengan penambahan 2% fiber, terjadi penurunan kuat tekan sebesar 3,2% dibandingkan dengan beton tanpa fiber, tetapi hasilnya masih dalam batas mutu yang diharapkan. Namun, penambahan serat fiber sebesar 4% dan 6% menyebabkan penurunan kuat tekan yang sangat signifikan, masing-masing sebesar 44,9% dan 56,6%, sehingga beton tidak memenuhi standar mutu yang diharapkan. Dengan demikian, meskipun penambahan serat *polypropylene* dapat mempengaruhi kekuatan mekanik beton, penambahan yang melebihi 2% dari berat semen terbukti tidak efektif karena menyebabkan penurunan kuat tekan yang signifikan. Disarankan agar penggunaan serat *polypropylene fiber* dibatasi hingga 2% dari berat semen untuk mempertahankan kekuatan struktural beton.

Kata Kunci : *Polypropylene Fiber*, Kuat Tekan, Mutu Beton

ABSTRACT

This study examines the effect of varying the addition of Polypropylene Fiber on the compressive strength of concrete. The main objective of the research is to evaluate the enhancement of the mechanical properties of concrete through the incorporation of polypropylene fibers into the concrete mix. The study involves several procedural stages, including the preparation of materials such as coarse aggregate, fine aggregate, cement, water, and polypropylene fiber, which are then mixed according to predetermined compositions. The research tests concrete mixtures with polypropylene fiber additions of 0%, 2%, 4%, and 6% by weight of cement. Compressive strength tests were conducted at 7 and 28 days using a Compression Testing Machine (CTM). The test results indicate that the addition of polypropylene fiber to the concrete mix has a varying impact on the compressive strength of the concrete. In the concrete with 2% fiber addition, there was a 3.2% decrease in compressive strength compared to concrete without fiber, but the result still fell within the expected quality range. However, the addition of 4% and 6% fiber resulted in a significant decrease in compressive strength, by 44.9% and 56.6% respectively, rendering the concrete unable to meet the expected quality standards. Thus, while the addition of polypropylene fiber can affect the mechanical strength of concrete, an addition exceeding 2% by weight of cement proves to be ineffective as it causes a significant reduction in compressive strength. It is recommended that the use of polypropylene fiber be limited to 2% by weight of cement to maintain the structural integrity of the concrete.

Keywords: *Polypropylene Fiber, Compressive Strength, Concrete Quality*