

ABSTRAK

Salah satu sifat beton adalah susut, dimana susut terjadi karena perubahan volume beton saat mengalami proses pengerasan akibat adanya proses penguapan air bebas pada muka beton saat proses hidrasi berlangsung. Penggunaan bahan tambah yang dapat mengembang (*expander*) dapat menimbulkan reaksi yang membuat bertambahnya volume beton yang mampu menghambat laju susut beton. Penelitian ini dilakukan dengan menambahkan *expander* pada campuran beton dengan variasi penambahan 0, 0.45, 0.60, dan 0.90% dari jumlah semen untuk mengetahui pengaruh terhadap kuat tekan dan nilai susut beton pada arah horizontal. Campuran beton yang dipakai merupakan campuran beton dengan mutu beton rencana 20 MPa. Benda uji yang digunakan untuk uji susut merupakan beton berbentuk balok 10 x 10 x 28,5 cm. Benda uji kuat tekan menggunakan sampel berbentuk silinder dengan diameter 15 cm dan tinggi 30 cm. Pengujian susut beton mengacu kepada ACI 209R-92 dengan durasi pembacaan selama 90 hari. Dari hasil penelitian didapat hasil bahwa beton mengalami susut yang signifikan pada 14 hari pertama. Penambahan *expander* 0.45% dari berat semen mampu menurunkan susut sebesar 14%. Penambahan *expander* 0.60% dari berat semen mampu menurunkan susut sebesar 16%. Penambahan *expander* 0.90% dari berat semen mampu menurunkan susut sebesar 56%. Penambahan *expander* terhadap beton dengan mutu 20 MPa mampu menaikkan kuat tekan beton. Penambahan *expander* 0.45% dari berat semen mampu menaikkan kuat tekan beton sebesar 0,25%. Penambahan *expander* 0.60% dari berat semen mampu menaikkan kuat tekan beton sebesar 0,5%. Penambahan *expander* 0.90% dari berat semen mampu menaikkan kuat tekan beton sebesar 0,8%.

Kata kunci: Susut beton, Hidrasi, *Expander*, Horizontal

ABSTRACT

One of the properties of concrete is shrinkage, where shrinkage occurs due to changes in concrete volume during the hardening process due to the free evaporation of water on the surface of the concrete during the hydration process. Use of additives (expander) can cause reactions that increase the volume of concrete which can inhibit the rate of shrinkage of concrete. This research is done by adding expander in the concrete mixture with variations of the addition of 0, 0.45, 0.60, and 0.90% of the amount of cement to determine the effect on the compressive strength and shrinkage value of concrete in the horizontal direction. The concrete mixture used is a concrete mixture with a design concrete quality of 20 MPa. The specimens used for the shrinkage test were concrete in the form of blocks of 10 x 10 x 28.5 cm. The compressive strength test object uses a cylindrical sample with a diameter of 15 cm and a height of 30 cm. Concrete shrinkage test refers to ACI 209R-92 with a reading duration of 90 days. From the research results, it was found that the concrete experienced a significant shrinkage in the first 14 days. Addition expander 0.45% by weight of cement able to reduce shrinkage by 14%. Addition expander 0.60% by weight of cement able to reduce shrinkage by 16%. Addition expander 0.90% by weight of cement able to reduce shrinkage by 56%. Addition expander against concrete with a quality of 20 MPa can increase the compressive strength of concrete. Addition expander 0.45% by weight of cement able to increase the compressive strength of concrete by 0.25%. Addition expander 0.60% by weight of cement able to increase the compressive strength of concrete by 0.5%. Addition expander 0.90% by weight of cement able to increase the compressive strength of concrete by 0.8%.

Keywords: *Shrinkage of concrete, Hydration, Expander, Horizontal*