ABSTRAK

Jeremy Yohanes Putra (01021190002)

PENGARUH THERMAL TERHADAP MUTU BETON GEOPOLIMER
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(xvi + 104 halaman; 85 gambar; 37 tabel; 5 lampiran)

Penggunaan semen portland sebagai binder utama beton menghasilkan emisi gas CO_2 yang cukup besar. Penggunaan abu terbang sebagai pengikat beton geopolimer menjadi salah satu alternatif penggunaan beton di Indonesia bahkan dunia. Oleh karena itu, penelitian beton geopolimer perlu dikembangkan lebih banyak di Indonesia. Hal ini dasar acuan penelitian ini dilakukan, untuk mengetahui seberapa lama beton geopolimer dan beton normal menahan pembakaran suhu tinggi. Pada penelitian ini beton geopolimer dengan molaritas 12M dan beton normal berkekuatan 30 MPa diuji bakar pada suhu 100°C, 200°C, 300°C, 400°C, 500°C dan 600°C. Pembakaran dilakukan dengan metode tak langsung dengan menahan setiap suhu uji selama 2 jam menggunakan oven dan tungku milik Universitas Pelita Harapan. Kuat tekan beton normal yang diuji pada suhu 100°C cenderung stabil dan mulai menurun secara bertahap pada suhu 200°C–600°C. Kondisi fisik dari beton normal mulai mengalami retak pada suhu 300°C dan pengelupasan mulai dari suhu 500°C-600°C. Beton geopolimer mengalami kenaikan kuat tekan pada suhu uji 100°C-200°C dan mengalami penurunan kuat tekan pada suhu 300°C-600°C. Kondisi fisik beton geopolimer mengalami retak halus pada suhu 400°C dan retak menjalar keseluruh permukaan luar beton pada suhu 600°C. Penurunan terbesar kuat tekan rata-rata beton normal terjadi pada suhu uji 600°C yaitu 61,28%. Penurunan terbesar kuat tekan beton geopolimer terjadi pada suhu uji 500°C yaitu 79,65%. Akan tetapi, beton geopolimer mengalami kenaikan kuat tekan secara berturut-turut pada suhu uji 100°C dan 200°C yaitu 19,45% dan 43,94%

Kata Kunci : Beton Normal, Beton Geopolimer, Kuat Tekan, Tahan Api

Referensi : 42 referensi (1988 - 2021)

ABSTRACT

Jeremy Yohanes Putra (01021190002)

THE EFFECT OF THERMAL ON GEOPOLYMER CONCRETE
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The use of portland cement as the main binder for concrete produces CO_2 emissions that are quite large. The use of fly ash as a binder for geopolymer concrete is an alternative use of concrete in Indonesia and even the world. Therefore, more geopolymer concrete research needs to be developed in Indonesia. This is the basis of reference for this research, to determine the effect of thermal on the compressive strength of geopolymer concrete and normal concrete. In this research, geopolymer concrete with a molarity of 12M and ordinary concrete with a strength of 30 MPa was tested at 100°C, 200°C, 300°C, 400°C, 500°C, and 600°C. Combustion was carried out by the indirect method by holding each test temperature for 2 hours using an oven and furnace owned by Pelita Harapan University. The result of compressive strength of ordinary concrete tested at a temperature of 100°C tends to be stable and begins to decrease gradually at a temperature of 200°C–600°C. The physical condition of ordinary concrete begins to crack at 300°C and peels from 500°C-600°C. Geopolymer concrete increases in compressive strength at test temperatures of 100°C-200°C and decreases in compressive strength at 300°C-600°C. The physical condition of geopolymer concrete is that it has fine cracks at 400°C, and the cracks spread throughout the outer surface of the concrete at 600°C. The most significant decrease in the average compressive strength of ordinary concrete occurred at a test temperature of 600°C is 61.28%. The most significant decrease in the compressive strength of geopolymer concrete occurred at a test temperature of 500°C is 79.65%. However, geopolymer concrete experienced an increase in compressive strength successively at test temperatures of 100°C and 200°C, namely 19.45% and 43.94%

Keywords : Normal Concrete, Geopolymer Concrete, Compressive Strength, Fire-Retardant

Reference : 42 references (1988 - 2021)