

Abstrak

Reactive Powder Concrete merupakan jenis beton mutu sangat tinggi. Reactive Powder Concrete tersusun dari air, semen, mikro silika, tepung kuarsa, pasir dan superplasticizer. Penelitian ini dilakukan untuk mengetahui sifat mekanik Reactive Powder Concrete menggunakan abu terbang dalam jumlah yang besar. Abu terbang diharapkan mampu mengisi rongga dan bereaksi dalam reaksi pozolanik membentuk kalsium silikat hidrat (CSH) sehingga mampu menghasilkan Reactive Powder Concrete dengan mutu sangat tinggi. Penelitian ini menggunakan abu terbang kelas F dan persentase abu terbang 40, 50 dan 60 terhadap total berat semen. Benda uji dibuat dalam bentuk silinder berukuran 10 x 20 cm dan balok berukuran 10 x 10 x 40 cm. Sampel dipelihara dengan cara perendaman selama 7 hari dilanjutkan penguapan selama 4 jam dan perendaman selama 28 hari dan 56 hari. Pada tahap berikutnya dilakukan pengujian mekanis untuk mengetahui kuat tekan dan modulus of rupture dari Reactive Powder Concrete. Hasil pengujian menunjukkan bahwa kuat tekan optimum terdapat pada Reactive Powder Concrete dengan persentase abu terbang 50 sebesar 71,12 MPa dan modulus of rupture pada Reactive Powder Concrete dengan masa pemeliharaan 7 hari sebesar 6,78 MPa.

Kata Kunci: *reactive powder concrete, abu terbang, pozolanik, kuat tekan beton, modulus of rupture.*

Abstract

One of the type of concrete is Reactive Powder Concrete that is an ultra-high strength concrete. Reactive Powder Concrete consists of water, cement, silica fume, quartz powder, sand and superplasticizer. This study was carried out to determine the mechanical properties of Reactive Powder Concrete using large amounts of fly ash. Fly ash is expected to be able to fill the cavity and react in pozzolanic reaction to form calcium silicate hydrate so it can produce ultra-high strength Reactive Powder Concrete. This study uses a class F fly ash and the percentage of fly ash are at 40, 50 dan 60 to the total weight of cement. Object was made in a cylinder shape with a size of 10 x 20 cm and a beam 10 x 10 x 40 cm. Then the object will be maintained by standard curing for 7 days followed by steam curing for 4 hours and standard curing for 28 days and 56 days. In the next stage, mechanical testing is carried to determine the compressive strength and modulus of rupture of Reactive Powder Concrete. Test results showed that the optimum compressive strength was found in Reactive Powder Concrete with 50 percentage of fly ash is 71,12 MPa and modulus of rupture on Reactive Powder Concrete with 7 days maintenance period is 6,78 MPa.

Keywords: *reactive powder concrete, fly ash, pozzolanic, compressive strength, modulus of rupture.*