

INTISARI

Seiring dengan meningkatnya kebutuhan konstruksi di Indonesia, terutama kebutuhan tentang material bahan bangunan. Salah satu bahan pengganti alternatif yang mampu menggantikan fungsi batu bata yaitu beton ringan. Dalam penelitian ini digunakan bahan tambah berupa *silica fume* dan bubuk batu kapur dengan maksud untuk meningkatkan kualitas beton. Sedangkan untuk metode yang digunakan adalah metode Taguchi yang bertujuan untuk meningkatkan kualitas suatu produk dengan optimalisasi desain produk serta prosesnya untuk mendapatkan hasil yang sesuai target dengan variasi yang minimum.

Pada penelitian ini bertujuan untuk mencari desain proposi optimum suatu campuran beton ringan yang ditinjau dari segi kuat tekan, porositas dan berat jenis. Bahan penyusun benda uji meliputi semen, pasir, air, *foam*, *silica fume*, bubuk batu kapur dan *superplasticizer*. Benda uji berupa kubus berukuran 5 cm x 5 cm x 5 cm. Terdapat 16 *mix design*, pada setiap mix berjumlah 5 benda uji yang digunakan sebagai uji kuat tekan, uji porositas dan uji berat jenis.

Hasil penelitian proposi optimum berdasarkan nilai kuat tekan yaitu 280 kg semen, 200 kg pasir, 180 liter air, 400 liter *foam*, 60 kg *silica fume*, 60 kg bubuk batu kapur dan 2 kg *superplasticizer*. Sedangkan untuk proposi optimum berdasarkan nilai porositas yaitu 260 kg semen, 400 kg pasir, 240 liter air, 700 liter *foam*, 60 kg *silica fume*, 80 kg bubuk batu kapur dan 2 kg *superplasticizer*. Selain itu, proposi optimum berdasarkan nilai berat jenis yaitu 300 kg semen, 400 kg pasir, 240 liter air 400 liter *foam*, 60 kg *silica fume*, 40 kg bubuk batu kapur dan 2 kg *superplasticizer*. Proposi optimum ini berdasarakan kebutuhan sebanyak 1 m³.

Kata kunci : Beton ringan, kuat tekan, porositas, berat jenis, metode Taguchi

ABSTRACT

Along with increasing of construction needs in Indonesia, especially the needs of the building material. One of the substitutes that can replace the function of a brick. In this research use silica fume and limestone's powder as admixture to improve the quality of lightweight foam concrete. Meanwhile method used is Taguchi method to rise qualities with optimizing product design for getting result that is suitable with target and has minimum variability value

This research aims to obtain maximum mixture of lightweight foam concrete which is observed based on compression strength, porosity, and density. Sample are made from cement, sand, water, foam, silica fume, limestone's powder and superplasticizer. Sample that used in this research are cube with 5 cm x 5 cm x 5 cm size. There are 16 mix design where each mix design have 5 samples, those are used to test compression strength, porosity, and density.

The result of this research were obtained maximum mixer based on compression strength that were 280 kg cement, 200 kg sand, 180 litre water, 400 litre foam, 60 kg silica fume, 60 kg limestone's powder, and 2 kg superplasticizer. Whereas for maximum mixture based on porosity that were 260 kg cement, 400 kg sand, 240 litre water, 700 litre foam, 60 kg silica fume, 80 kg limestone's powder and 2 kg superplasticizer. Besides, maximum mixture based on density were 300 kg cement, 400 kg sand, 240 litre water, 400 litre foam, 60 kg silica fume, 40 kg limestone's powder and 2 kg superplasticizer. Those were for 1 m³ needed.

Keyword : lightweight foam concrete, compression strength, porosity, density, Taguchi method