

## PENGGUNAAN BETON *STYROFOAM* DENGAN PERKUATAN *WIREMESH* UNTUK PANEL DINDING TEBAL 7 CM

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### INTISARI

Perkembangan teknologi bahan bangunan untuk dinding mengarah pada penggunaan bahan-bahan yang memiliki beberapa karakter antara lain ringan, cepat dalam pelaksanaan dan ramah lingkungan. Pembuatan dinding beton ringan dari limbah *styrofoam* merupakan suatu upaya memanfaatkan limbah *styrofoam*. *Styrofoam* mempunyai berat satuan sangat ringan yaitu sekitar 13 - 15 kg/m<sup>3</sup>. Pemberian lapisan *wiremesh* dimaksudkan agar dapat memberi perkuatan pada dinding.

Penelitian panel dinding beton *styrofoam* ini menggunakan 12 benda uji panel berukuran panjang 1000 mm, lebar 300 mm dan tebal 70 mm, dengan penambahan tebal 15 mm lapisan plesteran / mortar di kedua sisinya. Komposisi 1 m<sup>3</sup> beton *styrofoam* terdiri dari 300 kg semen, dengan fas 0,5, *styrofoam* 60%, dan 40% pasir. Benda uji panel terdiri atas : 3 buah panel tanpa perkuatan *wiremesh*, dan 9 benda uji dengan perkuatan *wiremesh*. Benda uji panel dengan perkuatan *wiremesh* mempunyai variasi jarak *connector* 150, 250, 350 mm. Terdapat 3 buah benda uji untuk tiap-tiap variasi jarak *connector* tersebut. Pengujian yang dilakukan adalah uji lentur.

Hasil penelitian menunjukkan bahwa beton dari *styrofoam*, mempunyai nilai kuat tekan rata-rata : 3,348 MPa, dan berat isi : 1.510,86 kg/m<sup>3</sup>, modulus elastisitas sebesar : 330,24 MPa. Sedangkan bahan mortar mempunyai nilai kuat tekan rata-rata : 36,586 MPa, dan berat isi : 2.155,70 kg/m<sup>3</sup>. Rata-rata serapan air beton dari *styrofoam* : 11,97%. Rata-rata-serapan air mortar : 10,77%. Berat panel tanpa *wiremesh* sebelum diplester 97,98 kg/m<sup>2</sup>, dan 164,15 kg/m<sup>2</sup> setelah diplester. Sedangkan untuk panel dengan *wiremesh*, berat panel sebelum diplester 105,23 kg/m<sup>2</sup>, dan setelah diplester mempunyai berat 170,12 kg/m<sup>2</sup>. Kuat lentur panel terbesar dihasilkan oleh panel 2.A dengan nilai kuat lentur sebesar : 6,64 MPa. Hasil penelitian menunjukkan bahwa pemberian perkuatan *wiremesh* dan makin rapat jarak *connector*, memberi dampak peningkatan kuat lentur panel.

Kata kunci : Pemanfaatan limbah *styrofoam*, panel dinding, uji lentur.

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## **APPLICATION OF STYROFOAM CONCRETE WITH WIREMESH REINFORCEMENT FOR 7 CM THICK WALL PANEL**

### **ABSTRACT**

The recent technology of building material for walls, is getting toward to the use of walls that have some characters such as light, fast assembled and environmentally friendly. Making lightweight concrete wall from styrofoam waste is an effort to take advantage of styrofoam waste. Styrofoam has a very light weight unit that is about 13 to 15 kg/m<sup>3</sup>. The use wiremesh layers aimed to reinforce the walls.

The research for styrofoam concrete wall panel used 12 specimens of panel, 1000 mm length, 300 mm width and 70 mm thick, with the addition of 15 mm thick layer of plaster / mortar on both sides. The composition of 1 m<sup>3</sup> concrete styrofoam consisted of 300 kg cement, using 0,5 water cement ratio, and styrofoam and sand ratio of 60% : 40%. The specimens of panels as follows : 3 pieces without reinforcement wiremesh, and 9 with wiremesh reinforcement having connector space variations : 150, 250, 350 mm. There were 3 specimens for each of these connector spacing variation. Test conducted was bending test.

The results of the research showed that concrete material made from styrofoam had the average value of compressive strength : 3,348 MPa, weight: 1.510,86 kg / m<sup>3</sup>, and modulus of elasticity : 330,24 MPa. On the other hand, the mortar material had the average value of compressive strength: 36,586 MPa in average, and weight: 2.155,70 kg/m<sup>3</sup>. The average water-absorption of concrete made from styrofoam was 11,97%. The average water-absorption of mortar was 10,77%. The weight of the panel without wiremesh before plastered was 97.98 kg/m<sup>2</sup>, and 164,15 kg/m<sup>2</sup> after plastered. Whereas the panel with wiremesh, before plastered 105,23 kg/m<sup>2</sup>, and after the plastered had weight 170,12 kg/m<sup>2</sup>. Largest panel flexural strength was obtained by the panel 2.A with flexural strength values of 6,64 MPa. The results also showed that wiremesh reinforcement and the closer the connector space, increased flexural strength of the panel.

Key words: utilization of waste styrofoam, wall panel, bending test.