Abstract
Lightweight concrete is a concrete with lower specific gravity. Materials used in the study are Portland Cement Type I, fly ash, Sidoarjo calcified mud, fiber kenaf, and aluminium powder as aerated agent. The study proposed that the lightweight concrete include in classification based ASTM C1693-11.

The making of lightweight concrete in the study using 2 curing methods by autoclave, that is:
1. Autoclaving method I, with pressure of 1.38 MPa was kept constantly in 2 hours.
2. Autoclaving method II, with pressure of 0.7 MPa was kept constantly in 1 hour.

The result showed that compressive strength of lightweight paste and fibrous-lightweight paste at age 7 days were influenced by autoclave curing. Higher and longer curing in autoclave increased compressive strength. The autoclave methodes do not affect the specific grafity of the paste. Both methodes of curing gave almost the same specific grafity. The specific grafity of paste was affected by the addition of aluminium paste in the mixture.
Keywords: autoclave, lightweight concrete, Sidoarjo calcified mud, fiber kenaf.