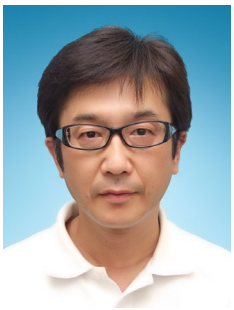
Department of Architecture



Study on Effective Use of By-products and Wastes

Toshitsugu INUKAI

Professor, Dr. Eng.

Email:inukai@gifu-nct.ac.jp TEL:+81-58-320-1419 FAX:+81-58-320-1429

Research Fields Concrete Engineering, Structural and Building Materials

Keywords Effective use, By-product, Waste, Fly Ash, Concrete Sludge

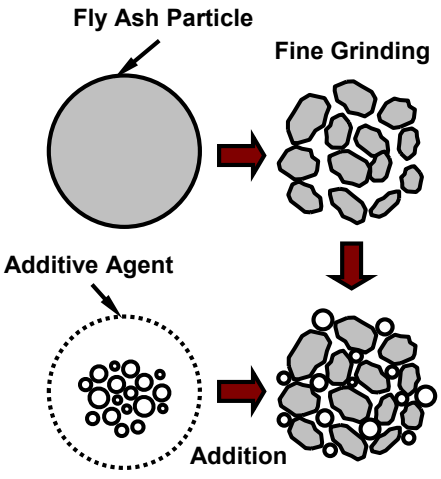
Research Outline

Fundamental Study on Improvement of Activity of Fly Ash

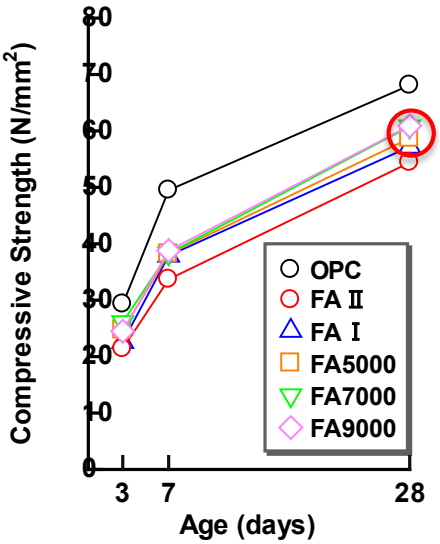
In Japan, the amount of emergence of coal ash is increasing by extension of the coal-fired power plant every year. The amount of emergence is over 10 million tons in one year in recent years. In order to make effective use of the coal ash is generated in large quantities, can be used as the admixture for concrete is most promising.

Since the fly ash which is one of the coal ash can aim at improvement of the workability by spherical particles, and improvement of the strength by pozzolanic reaction, many researches used as the admixture for concrete have been done. However, the actually use results are only 3.5% (use results of 2006) of coal ash discharged in Japan. The cause is reduction of early age strength by slow pozzolanic reaction, and remarkable change of the quality by difference in combustion method and coal type.

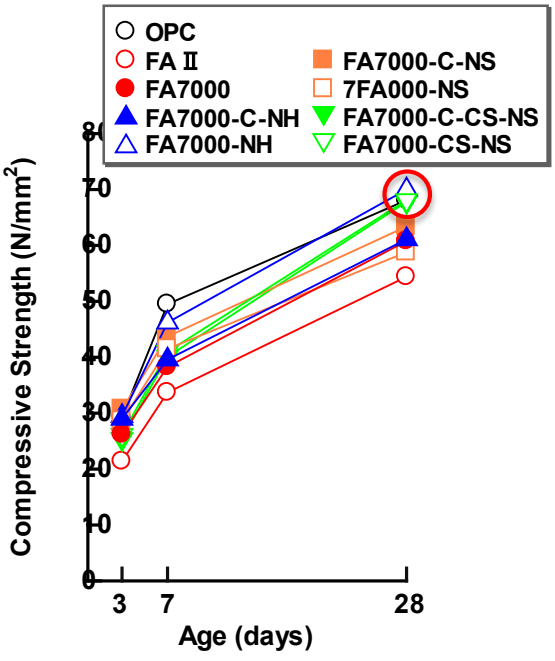
Main purpose of the present study is to improve activity of fly ash, and to use effectively the fly ash as an alternate material of ordinary portland cement. A series of experimental results are fine grinding of fly ash and adding a proper quantity of NaOH and $Ca(OH)_2$, and proved the improvement method of activity of obtaining stably compressive strength equivalent to ordinary portland cement.



Improvement Method of Activity of Fly Ash



Improvement Effect by Fine Grinding



Improvement Effect by Fine Grinding and Additive Agent