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## Study of use of Flyash with the Clay in the Ceramic production

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### Abstract

The use of Flyash in ceramic industry contributes to preserve the natural resources and to exclude the noisy residues. On other hand, it reduces the cost of the ceramic industry since it does not need manufacturing operations.

Hence, we planned to study the possibility of using the Flyash, which results during the different kinds of industries, as primary element in the production of the ceramic used to cover the walls and the grounds.

We based our research on the laboratory empirical methods. We used the clay and the Flyash (within appropriate proportions) as primary materials to produce the mixture required to produce the ceramic. Then, we tested the resulting mixture for its resistance to break and its degree of water absorption.

Results: we could define the appropriate proportions for the mixture components needed to produce the ceramic and we defined the criteria and database that enable us to put this technology in commercial industrial domain.

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**Keywords :**Geotechnical, Clay, Ceramic.

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For the abstract in Arabic see pages (85-99).

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**References:**

- [1] ASTM C373-88, Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products.
- [2] ASTM C1327-03, Standard test method for Vicker Indentaion Hardness of Advanced Ceramic.
- [3] Burst, J.F., 1991. The application of clay minerals in ceramics. *Applied Clay Science* 5 (5–6), 421–443.
- [4] F. Haendle (Ed.), *Extrusion in ceramics*. New York: Springer, 2007.
- [5] L. Barbieri, A. Corradi, and I. Lancellotti, “Bulk and sintered glass-ceramics by recycling municipal incinerator bottom ash,” *Journal of the European Ceramic Society*, 20 (2000), 1637- 1643.
- [6] L. Kreethawate et al., “High percentages of hydrometallurgical zinc waste loading in unglazed tile body,” *Ceramic Transactions*, 193 (2006), 99-105.
- [7] K. L. Lin, “Feasibility study of using brick made from municipal solid waste incinerator fly ash slag,” *Journal of Hazardous Materials*, B137 (2006), 1810-1816.
- [8] M.J. Ribeiro, J.M. Ferreira, and J.A. Labrincha, “Plastic behaviour of different ceramic pastes processed by extrusion,” *Ceramics International*, vol. 31, pp. 515–519, 2005.
- [9] N. Chandra et al., “Effect of addition of talc on the sintering characteristics of fly ash based ceramic tiles,” *Journal of the European Ceramic Society*, 25 (2005), 81-88.
- [10] P. Filippini et al., “Physical and mechanical properties of cement-based products containing incineration bottom ash,” *Waste Management*, 23 (2003), 145-156.
- [11] R.C.C. Monteiro et al., “Development and properties of a glass made from MSWI bottom ash,” *Journal of Non-Crystalline Solids*, 352 (2006), 130-135.
- [12] P. Filippini et al., “Physical and mechanical properties of cement-based products containing incineration bottom ash,” *Waste Management*, 23 (2003), 145-156.
- [13] Schmitz, R.M., Schroeder, C., Charlier, R., 2004. Chemo-mechanical interactions in clay: a correlation between clay mineralogy and Atterberg limits. *Applied Clay Science* 26 (1–4), 351–358.
- [14] TIS 37-2529 (1986), The Thai Industrial Standard Institute, Ministry of Industry, Thailand.
- [15] Peters, J.F., 1991. Determination of undrained shear strength of low plasticity clays. *International Journal of Rock Mechanics and Mining Science & Geomechanics Abstracts* 28 (1), 13.
- [16] Z. Haiying, Z. Youcai, and Q. Jingyu, “Study on use MSWI fly ash in ceramic tile,” *Journal of Hazardous Materials*, 141 (2007), 106-114.