UTILIZATION OF VOLCANIC ASH IN THE MANUFACTURE OF GLAZED CERAMICS

A RESEARCH STUDY

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ABSTRACT

CARAIG, MARY GRACE P.; CUEVAS, JULIE R.; FEDERICO, RYAN P.; and **JIMENO, MA. IRENE T.,** Applied Research III (General Science Curriculum), Cavite State University, Indang, Cavite, February, 2000, **"UTILIZATION OF VOLCANIC ASH IN THE MANUFACTURE OF GLAZED-CERAMICS."**

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The study entitled "Utilization of Volcanic Ash in the Manufacture of Glazed-Ceramics" was undertaken to utilize volcanic ash in the manufacture of glazed-ceramics. It also aims to (a) evaluate the quality of the produced ceramics in terms of hardness and dryness; (b) determine the appropriate proportion of volcanic ash and clay that will produce good quality ceramics; and (c) estimate the cost and return of pr0oducing ceramics out of volcanic ash. The study was conducted at MSD-ITDI, Department of Science and Technology, Bicutan, Taguig, M.M. from August to December 1999.

The proportions used in the study were; *Treatment 0.* 100 g. Ilo-Ilo Black Ball Clay, 50 g. Feldspar and 350 g. Red Clay; *Treatment 1.*100 g. Ilo-Ilo Black Ball Clay, 100 g. volcanic ash, 50 g. Feldspar and 250 g. Red Clay; *Treatment 2.* 100 g. Ilo-Ilo Black Ball Clay, 175 g. volcanic ash, 50 g. Feldspar and 175 g. Red Clay; *Treatment 3.* 100 g. Ilo-Ilo Black Ball Clay, 250 g. volcanic ash, 50 g. Feldspar and 100 g. Red Clay; and *Treatment 4.* 100 g. Ilo-Ilo Black Ball Clay, 350 g. volcanic ash and 50g. Feldspar.

Highly significant results were obtained in the parameters such as mass of

unfired, fired, freshly-glazed and finished products; volume change of unfired and fired ceramics; moisture content; and production cost of the produced products. However, non-significant results were obtained from volume and densities of unfired, fired, freshly glazed and finished ceramic products; volume changes and density changes of unfired and fired ceramics.

The lowest firing shrinkage was observed in Treatment 3 composed of 20% Ilo-Ilo Black Ball Clay, 50% volcanic ash, 10% Feldspar and 20% Red Clay with a firing shrinkage of 6.387 cm^3. Meanwhile, the highest firing shrinkage was observed in Treatment 0 composed of 20% Ilo-Ilo Black Ball Clay, 10% Feldspar and 70% red Clay with a firing shrinkage of 36.923 cm^3.

It was proven that pure clay is still the most advisable material for glazed-ceramic production, although the proportion 20% Ilo-Ilo Black Ball Clay, 50% volcanic ash, 10% Feldspar and 20% Red Clay can also be utilized.

In terms of economic feasibility, Treatment 4 composed of 20% Ilo-Ilo Black Ball Clay, 70% volcanic ash and 10% Feldspar obtained the lowest cost of production of only P8.30 per piece.

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UTILIZATION OF VOLCANIC ASH IN THE MANUFACTURE OF GLAZED-CERAMICS

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[1/] A Research Study, presented to the Faculty of the College of Education Laboratory School, Cavite State University, Indang, Cavite, in the partial fulfillment of the requirements for Graduation, prepared under the supervision of Engr. Ruel Mojica and Mrs. Dulce Ramos, Advisers.

INTRODUCTION

Ceramics is a term that was originally applied to products made from natural earths that had been exposed to high temperatures. Today, the field of ceramics covers a widely glass, enamels, refractories (high temperature materials), structure clay products, abrasives, whitewares, porcelain enamel or metal system. Industrial ceramic maybe said to have begun with the first barter of potter's ware. Through ancient times and the middle ages, the techniques for making clayware continued to advance and with the coming of industrial and scientific revolutions, the industries were ready to supply the scientist with porcelain for chemical experimentation, manufacturing and also to supply an increased demand for containers, table wares, sanitary wares and construction materials.

Sometimes, the unavailability of clay is one of the main problems of ceramic manufacturers because they have to import the supply of clay at a very high price (Braganza, 1989). They have to do this because our country has very limited supply of non-metallic resources.