

Chapter 1

INTRODUCTION



Motivation, Objective and Scope

Motivation

In sanitaryware plants, where slip casting has been adopted as standard forming process, problems exist involving casting slip quality in the aspects of “*Rheology*” and “*Casting Properties*”.

Many research works confirm that rheological and casting properties can be improved by two factors:

- a) Organic colloid.
- b) Soluble salts.

These two factors come from ball clays. The importance part of organic colloid is *humic acid*. The effects of humic acid, are viscosity and water of plasticity but increase in drying strength.

“*Soluble salts*” are mostly of soluble sulfates, come from supply water in slip preparation, raw materials for slip preparation mostly from ball clay and scrap (recycle to slip).

In this case we will cover soluble salts from ball clays that affect deflocculants dosages (in slip preparation) which relate to casting quality. If we have proper soluble salts level, we will obtain good slip rheology, high percentage of solids, less problem in casting process, and high casting rate. If slip has too much soluble sulfates, it will create efflorescence, crawling (from efflorescence). So in this research of ball clay, we should

study two aspects for the profit of improvement and control of working properties of ball clays.

Well-known ball clays used in sanitaryware industry in Thailand and abroad are from Devon in United Kingdom and from Tennessee, Kentucky in United States. Thai sanitaryware manufacturers use both local ball clays (mostly from Mae Than, Amphur Mae Tha, Lampang province) and imported ones from former foremost sources. But no one knows about the difference in characteristics by systematic study, besides the workability of these ball clays that some superior than the others.

Objectives

1. To derive what are differences of Thai sanitaryware ball clays, especially organic matter and soluble salts and the effects of them on rheological and casting property.

2. To establish the appropriate methods for the determination of organic matter and soluble salts of ball clays.

3. To investigate organic matter and soluble salts in commercial ball clays.

4. To compare Thai ball clays and imported ball clay.

5. To create the desired ideal ball clay, and resulting improvement of local ball clays.

Scope

This research will cover ball clays used in Thai sanitaryware industry. There are both local and imported ball clays, which give good rheological and casting properties. Besides there are Thai ball clays that give inferior properties to

casting slip that have been interested to study in comparison. So they will be classed into three main groups to study,

Group I: Local ball clays that have good rheological and casting properties; they are : MAE SAN (MS), MAE VIT W (MVW), MAE TILE (MT)

Group II: Imported ball clays that have good rheological and casting properties; From United Kingdom. They are SB-75 product of the international Watts Blake Bearne Group(WBB) and HYCAST.VC (HVC) product of ECC International. From the United State of America are REX product of United Clay Co.Ltd. and BANDY BLACK (BB) product of H.C.SPINKS Clay Company Inc.

Group III; Local ball clays that have inferior rheological and casting properties; Jae Korn (JK), Kok Kharm (KK), Wang Nua (WN) and Parn (PC).

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