Thesis Title	The Study of Basic Physical Properties of Refractory Brick Using Chainat Sand as from Raw Material
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Abstract

The study of sand from Chainat Province was described in this thesis. The aims were to study of physical properties, ratio of pressing refractory brick according to ASTM Standard, and then compare to the other refractory bricks from SIAM Industrial and Bangkok Sangthai Industrial Company Limited. In this study, Chainat sand was analyzed by the Department of Mineral Resource, the Chainat sand was used as the main raw material which has 20 percent of K-Feldspar in composition. The K-Feldspar was used as the natural binder mixed with clean water 10 percent by weight, and pressed at 300, 350 and 400 ksc according to ASTM Designation : C 20-97. This mixture was compared with the new ratio in which the amount of the K-Feldspar was increased to 30, 40 and 50 percent respectively. Then the binder was changed from K-Feldspar to fire clay in 10, 20, 30, 40 and 50 percent respectively, and pressed at the same standard of ASTM. All specimens were fired up to 1,310 $^{\circ}$C for about 12 hours.

The results from laboratory was compared with insulation fire clay brick produced from SIAM Industrial and Bangkok Sangthai Co., Ltd. The result of the study was indicated that the particle size distribution of Chainat sand was uniform Sand. The Bulk Density(B) of the presssing at 300 ksc of 60 percent of Chainat sand and 40 percent of K-Feldspar was slightly different from two companies (2.16 g./cm.^{3}). The Apparent Specific Gravity(T) of the mixture of Chainat sand and K-Feldspar was higher that of the two companies; that was more than 3.00, whereas the T of the mixture of Chainat sand and fire clay was not different; that was 2.80. The

Apparent Porosity(P) of both mixtures (Chainat sand and K-Feldspar, and Chainat sand and fire clay) was higher than that of the two companies: that is, more than 28 percent. The Water Absorption(A) was higher than two companies (12 percent). The Cold crushing strength was approximately 10 percent lower than the two company. The thermal conductivity(K.) of the ratio of Chainat sand and K-Feldspar was 0.48 kcal./hr.m. ^{o}C on average, and the K. of Chainat sand and fire clay was 0.61 kcal./hr.m. ^{o}C on average. The K. From SIAM Industrial Refractory Co.,Ltd. was 0.50 kcal./hr.m. ^{o}C, and that of Bangkok Sangthai Co.,Ltd. was 0.55 kcal./hr.m. ^{o}C. The Burning Shrinkage was average 6.72 percent on average which was higher than ASTM Standard which was only 2-5 percent.

Keywords : Refractory Brick / Feldspar / Fire Clay / Cold Crushing Strength