Section 2 – Ceramic Investigations

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CLAY MATERIAL FOR HOBART BRICK COMPANY

Introduction

Four samples of clay material were submitted by Messrs Kemp and Denning of the Hobart Brick Co for investigation.

Samples

Samples were simply marked A, B, C and D with no indication as to their origin. Evaluation of each individual material for use in extruded brick production was requested.

Summary

All four samples produced firm extruded bricks of good green strength, which fire to a smooth texture with pleasing appearance. Some variation in colour does occur over the temperature range 950° C to 1040° C with three of the samples, but the only significant disadvantage appears to be the shrinkage over this short temperature range.

Preparation and Testing

Samples A and B were received crushed and required no further milling, but samples C and D were crushed prior to commencement of tests. Screening was not carried out, the material simply being pug milled with water addition and then de-aired and extruded. A firm column, easily cut, was produced from all samples with no evidence of dog earing or deformation. Cut bricks of A and B were air dried 48 hours, C and D for 72 hours, followed by oven drying at 110° C for a further 24 hours.

Bricks were then fired at various temperatures with two-hour soakings, cooled and examined.

Test Results

Sample	Green	950° C	1000° C	1040° C	1100° C	1200° C	Firing loss at 950° C
	Total Contraction						
	%	%	%	%	%	%	%
A	5	6	8	9	12	16	4.9
B	4	6	8	8	....	14	5.1
C	8	10	10	10	16	....	9.2
D	8	10	10	10	16	....	8.0

Conclusions

Sample A—Material fired at 950° C gives a firm white brick clear and free from surface blemishes. With increasing temperature, some deterioration in surface appearance, viz., slight cracking becomes apparent, but providing the firing temperature is kept below 1000° C this effect can be minimised. The only significant disadvantage is the increase in shrinkage from 6% at 950° C to 9% at 1040° C.

Sample B—This material gives a brick with a slightly pinkish tinge, an effect that can be reduced by firing at a higher temperature. This higher temperature will, however, accentuate surface cracks so that a compromise must be reached. The shrinkage disadvantage applies to this material over the same short temperature range.

Sample C—Bricks of this material fired at 950° C give a firm smooth white brick with a slight pinkish colouration. This colour is reduced by firing at 1040° C without any evidence of surface cracks. At this temperature there is however a slight tendency towards distortion. Shrinkage appears to be constant between 950° C and 1040° C, but rises rapidly at 1100° C.

Sample D—Green bricks have a slightly cream appearance but fire to a distinct pinky white. The intensity of this pink can be reduced by firing to 1040° C without any surface disadvantages, but the product, even at this temperature has a definite off-white colour. Shrinkage is again constant over the range 950° C to 1040° C but reaches a very high level at 1100° C.