

TR9-176-178 R. 463

27. MACHEN'S BRICK COMPANY, LAUNCESTON

The Samples

Two samples marked "Kings Meadows" and "Quarantine Road" were submitted by the above Company for brick manufacturing tests by the stiff-plastic pressing method. Tests on individual samples and several blends were required. The following blends were requested:—

Blend A: 3 parts K to 1 part Q.

Blend B: 2 parts K to 1 part Q.

Blend C: 1 part K to 1 part Q.

K = Kings Meadows sample.

Q = Quarantine Road sample.

The firing temperature specified by the Company was 1,100 degrees centigrade.

Summary

1. *Kings Meadows Sample "K"*

The raw material showed moderate to good plastic and cohesive properties. The green pressed bricks were well formed and of good green strength with no evidence of lamination. The bricks fired to 1,100° C were of reasonably good quality and appearance, but rather easily abraded on edges and corners. Surfaces were slightly roughened and showed some hairline random cracking. The fired brick was dark rust red in colour and was well fired at 1,100° C.

2. *Quarantine Road Sample "Q"*

This sample showed somewhat better cohesive and plastic properties than Sample "K". The green pressed bricks were well formed and of good green strength. No signs of lamination were observed, but the pieces showed a slight tendency to adhere to the die surfaces. Firing at 1,100° C produced slightly distorted bricks, dark rust red in colour with slightly roughened surfaces and random hairline cracks. Firing contraction was high and this material is considered unsuitable for brick manufacture, except when blended with other materials.

3. *Blends A, B and C*

All blends exhibited plastic and cohesive properties similar to sample "K". The green pressed bricks were well formed and of good strength and dried without cracking or distortion.

Firing to 1,100° C produced bricks of moderately good quality and appearance, dark rust red in colour with minor surface defects such as random hairline cracks and slightly rough surfaces. The fired test pieces, except those from Blend C are rather easily abraded. This defect could possibly be eliminated by firing to a slightly higher temperature, but the bricks would probably be darker in colour.

In general, bricks manufactured from the blends described are superior to bricks made from sample "Q", but rather similar to those made from sample "K".

Preparation and Testing

The samples were partially dried and roll crushed to pass a 10 mesh screen and thoroughly mixed. Blends were made up from the requisite amounts of each sample and thoroughly mixed in the semi-dry state.

The required amount of water for stiff-plastic pressing was incorporated by hand mixing followed by a pass through a Rawdon Pug Mill.

The pressed bricks were weighed and allowed to dry naturally for several days and finished by heating in an electric oven at 110° C.

Moisture contents and drying contractions were determined.

The dried bricks were fired to 1,100° C in an electric muffle furnace, soaking for two hours at this temperature.

Firing loss and firing contractions were then determined.

Results

Sample No.	Moisture in Green Brick	Per Cent			Firing Loss	Colour of fired Brick
		Drying	Firing 1100°	Total		
R.463 "K"	19.0	6.0	3.0	9.0	7.6	Deep rust-red
R.463 "Q"	23.2	8.0	7.0	15.0	12.0	Deep rust-red
Blend A	20.4	7.0	4.0	11.0	7.8	Deep rust-red
Blend B	22.6	7.0	5.0	12.0	7.8	Deep rust-red
Blend C	21.7	7.0	6.0	13.0	8.6	Deep rust-red

Note: The drying and firing contractions are based on the original length of green pressed brick.

Firing loss calculations are based on the weight of brick dried at 110° C.

REFRACTORINESS

Refractoriness tests were determined on both samples with the following results:—

Sample	Softening Point	Fusion Point
R.463 "K"	1380° C	1420° C
R.463 "Q"	1480° C	over 1500° C

MODULUS OF RUPTURE

Modulus of rupture tests were performed on fired specimens from each sample and blend. Results are calculated from the force required to rupture a bar 1½ inches wide by 1 inch deep supported by knife edges 2.75 inches apart. The tests were undertaken by Mr. K. Payne, Acting Principal, Launceston Technical College.

Sample No.	Modulus of Rupture/lbs per square inch
R.463 "K"	300
R.463 "Q"	700
Blend A	300
Blend B	600
Blend C	700

The above results were obtained from one brick specimen only for each test.