

R.652. The production of light weight bricks.

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As part of a general programme to utilise waste by-products from other industrial processes, an investigation into the use of sawdust and waste coal fines in the production of light weight bricks was initiated.

#### EXPERIMENTAL METHODS

Two types of clay were used, both supplied by the Hobart Brick Company, one being their standard clay mix (A) while the second (B) represented clay from a location close to the sawdust source.

Each clay was dry mixed with various amounts of sawdust or coal and after addition of water, extruded and processed in the normal manner. The final products were dried and fired at 1000°C with a six hour soaking at this temperature.

#### RESULTS

| Test No. | Composition by mass | Compressive strength (MPa) | % mass reduction | % shrinkage (total) |
|----------|---------------------|----------------------------|------------------|---------------------|
| N1       | Standard clay (A)   | 101.0                      | -                | 6                   |
| N3       | A + 10% sawdust     | 7.3                        | 26               | 3                   |
| N3/1     | A + 20% sawdust     | 8.4                        | 34               | 5                   |
| N4       | A + 10% coal        | 68.4                       | 11               | 9                   |
| N5       | A + 50% coal        | 5.3                        | 50               | 9                   |
| N6       | Clay B              | 32.4                       | -                | 6                   |
| N7       | B + 10% sawdust     | 8.5                        | 23               | 5                   |
| N8       | B + 20% sawdust     | 2.4                        | 40               | 5                   |
| N9       | B + 10% coal        | 24.7                       | 17               | 7                   |
| N10      | B + 50% coal        | 2.5                        | 48               | 7                   |

#### CONCLUSIONS

Significant reductions in mass were only obtained by the addition of excessive amounts of coal waste and although this material is readily available, transportation costs from source to factory, would make its utilisation uneconomical.

The addition of sawdust to clay B gave products of limited compressive strength, related to the limited compressive strength of the basic raw material.

With the standard clay mix (A), a significant mass reduction in the final product by the addition of 20% sawdust can be obtained, and the compressive strength of this product would make it suitable for non load-bearing applications.

Clay bricks at present in production, have a mass of 3.6 kg and with the addition of 20% sawdust, a double brick with a mass of only 5.0 kg could be produced.

Laboratory equipment is somewhat limited in its ability to incorporate more than 20% sawdust into the clay mix and it is possible that in factory production a higher proportion of sawdust may be added with a corresponding further reduction in mass.

[30 January 1973]