

TR12-184-185

R. 541

PRODUCTION OF BLACK FACING BRICKS

Samples

The department was supplied by Mr H. Goodger of McHugh's Brick Works with samples of clay and sand used in normal red brick production, together with a sample of manganese dioxide.

Summary

The suggested formulation, 25% sand, 71% clay and 4% manganese dioxide was found to produce an orange-brown brick. Only by increasing the manganese dioxide content of the mix to 15% to 20% was it possible to produce a satisfactory black brick.

A series of experiments indicated that the final colour of the brick was a function of manganese dioxide content, and the intensity of the colour could not be increased by oxidising, reducing, or high temperature conditions.

Investigation

Various mixtures of clay, sand and manganese dioxide were made, the increase in manganese dioxide content being made at the expense of the clay. These mixtures were pug milled twice to ensure homogeneity and then extruded. The manganese dioxide had little or no effect on the extrusion properties of the mixes and bricks were produced, dried and fired. The firing temperature was varied between 950° and 1050° C for samples of each particular mix.

Results

| Per Cent <i>MnO₂</i> Added | Colour of Fired Brick |
|---|-----------------------------|
| 2 | Orange |
| 4 | Orange-brown |
| 6 | Light brown |
| 10 | Dark brown |
| 20 | Black |

Conclusions

The high concentration of manganese dioxide required to produce a black brick is due in part to the clay used. This clay fires to a creamy-yellow colour, and the colour of the normal facing brick produced is due in no small part to the sand incorporated in the mix.

It follows then, that for a clay which burns to a light colour, a considerable amount of colouring agent must be added before an appreciable change in colour will take place. This is confirmed by current production which requires 25% sand to ensure uniformity of colour.

Black coloured brick can be made by using 15% to 20% manganese dioxide incorporated into the clay-sand mixture. The resulting product appears to be a simple coloured modification of the brick in current production, and as such should be satisfactory as regards structural applications.