

begins to burn, and the fire passes upwards until the whole clamp is burning. London stocks and most of the bricks burnt by this primitive method are made of clay to which sifted breeze has been added; alternate layers of clay, breeze and washed chalk are stacked and allowed to weather (see p. 2); this is subsequently mixed and the breeze thoroughly incorporated. Such bricks therefore contain fuel, and the clamp continues to burn for two and a half to six weeks until this breeze has been consumed. Little attention is needed whilst the clamp is burning. If the fire is proceeding too quickly, the air holes are stopped to reduce the draught. Protection is sometimes afforded by boarded screens fixed on the windward sides.

SIZES OF BRICKS.—The sizes of bricks have been stated in Vol. I (p. 3). According to the British Standard Specification, No. 657—1936, the bricks laid dry shall measure as follows¹ :—

- (a) Eight bricks laid end to end, in contact, in a straight line shall have a maximum length of 71-in. and a minimum length of 69-in.
 (b) Eight bricks laid side by side, in contact, in a straight line shall have a maximum length of 34-in. and a minimum length of 33-in.
 (c) Eight bricks laid on edge, in contact, in a straight line shall have a

Maximum length of $16\frac{1}{2}$ -in. } Type 1.
 Minimum length of $15\frac{1}{2}$ -in. }

Maximum length of $21\frac{1}{2}$ -in. } Type 2.
 Minimum length of $20\frac{1}{2}$ -in. }

Maximum length of $23\frac{1}{2}$ -in. } Type 3.
 Minimum length of $22\frac{1}{2}$ -in. }

Thus the standard dimensions of a brick are :

Length (in Inches).				Width (in Inches).					
Mean.	Max.	Min.	Tolerance.	Mean.	Max.	Min.	Tolerance.		
$8\frac{1}{2}$	$8\frac{7}{8}$	$8\frac{3}{8}$	$\pm\frac{1}{8}$	$4\frac{3}{8}$	$4\frac{1}{2}$	$4\frac{1}{8}$	$\pm\frac{1}{8}$		
Depth (in Inches).									
Type 1.			Type 2.			Type 3.			Tolerance.
Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	
2	$2\frac{1}{8}$	$1\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{7}{8}$	$2\frac{1}{2}$	$2\frac{1}{8}$	$\pm\frac{1}{8}$

For snap headers the width and depth shall be as specified above and the length shall be $4\frac{1}{8}$ -in. $\pm\frac{1}{8}$ -in.

For queen closers the length and depth shall be as specified above and the width shall be 2-in. $\pm\frac{1}{8}$ -in. (see U, Fig. 2, Vol. I).

¹ Included by permission of the British Standards Institution.

There is a wide range of colours of bricks, such as white, grey, brown, red, purple, blue and black, with intermediate shades. Bricks of varying shades, called *multi-coloured*, have within recent years been in big demand for faced work. Some bricks are uniform in colour, whilst others are mottled or irregularly shaded. The colour is influenced by : (a) Chemical constitution of the clay, (b) temperature during burning, (c) atmospheric condition of kiln, (d) sand-moulding, and (e) staining.

(a) **CHEMICAL CONSTITUTION OF CLAY OR SHALE.**—Iron oxides affect the colour considerably. Thus, clays which produce white bricks have little or no iron present, whilst blue bricks contain at least 7 per cent. oxide of iron. Careful blending of the clays and shales (see p. 2) is responsible for the production of many beautifully coloured bricks, and such colours are permanent.

(b) **TEMPERATURE DURING BURNING.**—Light coloured bricks are often the result of the temperature of the gases in the kiln being too low, or the duration of the maximum temperature being too short, whilst, at the other end of the scale, Staffordshire blue bricks require a temperature which may reach 1,200° C.

(c) **ATMOSPHERIC CONDITION OF KILN.**—Certain white bricks can only be produced if they are protected in the kiln from smoke, whilst dark brown and purple coloured bricks are made by creating a smoky atmosphere in the kiln (see below).

(d) **SAND-MOULDING.**—Sand-moulded hand-made bricks (see p. 4) and pressed bricks which have sand sprinkled over their oiled surfaces whilst being moulded are richly coloured during the burning process. The nature of the sand used for this purpose depends upon that of the clay or shale, and a good deal of experimental work with different coloured sands is often necessary before the desired colour of the facing bricks is obtained.

(e) **STAINING.**—Surface colours may be obtained by adding certain metallic oxides (such as manganese for browns, chromium for pinks, antimony for yellows, copper for greens, cobalt for blues, cobalt and manganese for blacks, etc.) which are crushed very finely and added to the sand sprinkled on the bricks prior to burning. Sometimes water is added to the oxides and brushed on the surfaces. Such colours, unlike those produced by blending (see above), are rarely permanent.

White bricks contain not more than a trace of iron and generally a large proportion of lime.

Cream bricks contain traces of iron and a small proportion of chalk.

Grey bricks are either commons which have been discoloured by scumming (see p. 14) or facings, such as *silver-greys*, which have been stained on the surface.

Buff bricks contain less than 2 per cent. of iron oxide.

Yellow bricks contain magnesia or sulphur (when clamp-burnt).

Red bricks contain at least 3 per cent. of iron oxide.

Brown and *purple* bricks may have a similar iron content to reds, but the difference in the colour is due to smoking and special firing.

Blue bricks contain 7 to 10 per cent. of iron oxide. A blue surface colour is obtained by pouring coal-tar in the fireboxes of the down-draught kiln (or that of the firing chamber of a continuous kiln) just before the burning process has been completed. This produces a dense smoky atmosphere. The damper is partially closed. This is repeated three times at twenty-minute intervals, when the damper is closed and the chamber is left sealed for at least forty-eight hours. If salt is mixed with the tar the exposed surfaces of the stacked bricks will be glazed. Purple bricks may be produced in a similar manner.

Black bricks contain a similar amount of iron to the blue clay, in addition to certain manganese oxides. This iron, etc., content is responsible for the colour produced when the bricks are burnt. Black colour is also produced as described for blues, except that zinc and not tar is applied to the fires, and twenty-four hours' sealing of the chamber is usually sufficient.