booklets

masonry
Masonry Units

Masonry units are classified both by their quality, which affects their use, and the manufacturing process and can be divided into two distinct categories, being: Clay and Concrete (concrete bricks or blocks are sometimes incorrectly referred to as cement bricks or blocks).

Size

Size varies depending on category, type and the manufacturing process. When describing the dimensions of a masonry unit, the standard procedure is length x width x height (all in millimetres).

How masonry units are manufactured

Clay

Clay Bricks are manufactured from a mixture of Clay and other additives, which are mixed together to make a pliable type mixture almost like plasticine, which is then shaped usually by extrusion and cut to size, then dried and fired. Different clays produce the different colours – in most cases the clay contains some traces of iron oxide that will give most clay bricks a reddish colour.

Concrete

Concrete bricks (sometimes incorrectly referred to as cement bricks) and blocks are manufactured from various types of aggregate (sand and other materials like ash mixed with small stone particles) creating the texture and colour, mixed with cement and water, which is then vibrated into a mould creating the shape, size and profile of the brick or block. The moulded products are then cured either in steam chambers or in the air and are regular in size and colour.

Brick Sizes

Most bricks (solid units) are usually manufactured to the imperial size 106mm (1 module) wide and 222 mm long (i.e. 2 modules, 2 x 106 plus a 10 mm mortar joint) long. There is a rough ratio of length to width of 2:1 and an aspect ratio of height to width of 0.7 in the standard or imperial brick of 222mm long x 106mm wide x 73mm high; when used with a 12mm mortar joint, the following formats are applicable:

- The format size becomes 234 x 118 x 85mm.
- The format length (234) is the module of stretcher + perpend.
- The format width (118) is the module of perpends.
- The format height (85) is the coursing height.

Block Sizes

Modular co-ordinating for specific blocks (hollow units) of suitable modular dimensions is 100 mm (1 module, i.e. 90 wide plus a 10mm mortar joint) or multiples thereof when built into a wall as in the case with bricks. Modular co-ordination is a method of co-ordinating the dimensions of buildings and building components to reduce the range of sizes required and to enable components to be built in on site without modification; modular door and window frames are required. While bricks are laid on a full-bedding face of mortar hollow units are laid on shell bedding across the width of the face shell.
Note: The table is based on exact sizes of solid masonry units, with 10 mm thick bedding and vertical joints, and no wastage (quantities are rounded up).

A figure of 10% is usually accepted when making allowance for wastage, which also includes for breakages (during off loading and construction).

0.34 m³ of mortar is required per 1000 bricks (standard imperial brick). 1.0 m³ of sand would be required for every 1.0 m³ of mortar.
**Bonds**

**Collar-jointed (double leaf) wall**

Wall comprising stretcher bonded parallel single leaf walls with the space between them (collar-joint) not exceeding 25 mm (between 10 to 15 mm), filled solidly with mortar and tied together with wall ties (see image below). Walls shall be cross-bonded using header courses or by using a mechanical tie to facilitate composite action between leaves.
There are two known practical bond methods, that is, the quarter brick lap called the quarter bond, or the half brick lap called the half bond.

Raking back

The stepped arrangement formed during the construction of a wall when one portion is built to a greater height than an adjoining wall. It is recommended that no part of a wall during its construction should rise more than 900mm above another wall at one lift, if unequal settlement is to be avoided.

Toothing and racking back

**Toothing**

A full or half brick is removed or a half brick projects from alternative courses of a wall in order to provide adequate bond if the wall is to be joined or connected at a later stage – see figure below. (Toothing is not usually permitted by many local authorities)

**Jointing & Pointing**

The reasons for jointing and pointing are firstly to prevent the penetration of water into the walls and secondly to provide a neat aesthetically pleasing finish, especially when using face bricks.

Various tools are used to produce a smooth outer edge to the joints in order to allow water to run off without obstruction and thus prevent it from soaking into the brickwork by means of capillary action.

Jointing is the process of finishing the face of the joint as the work proceeds. The actual mortar (Dagha) in which the bricks are laid is smoothed by means of the brick trowel or jointing tool; typically done when using stock bricks.