



Mixing Mortar

Mortar proportions are always expressed as the proportion of cement to lime to sand ...and always in that order.

A common mortar made from portland cement has one part cement to one part of lime and 6 parts of sand (abbreviated to C1:LI:S6 or more simply 1:1:6).

The same mortar using blended cement will require one part cement to one part of lime and 5 1/2 parts of sand (C1:L1:S5 1/2 or 1:1:5 1/2)

In the listing below the correct proportions for GP (portland) cement are shown first, followed by the proportions for GB (blended) cement, for example 1:1:6 (1:1;S6XXXX).

The masonry standard also gives each mortar mix a code number MI to M4 which is also shown below.

M4 1:0:4 (1:0:3)

This cement mortar is very durable and is often specified to contain one third part lime for added workability which may otherwise be very poor. It is suitable for use in reinforced brickwork. In exposed and saline environments it should only be used with bricks of Exposure Class.

M4 1:1/2:4 1/2 (1:1/2:3 1/2)

This is the strongest and least permeable composition mortar. It is suitable for reinforced brickwork where the reinforcing is otherwise protected from corrosion, for example, by galvanising. Structural brickwork, retaining walls, fences, and seafront applications are typical uses. Because of its high durability this is the preferred mortar for producing fade-resistant pigmented mortar. In exposed and saline environments this mortar should only be used with Exposure Class bricks.

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M3 1:1:6 (1:1:5)

This is the common general-purpose mortar found in most specifications. It is usually specified when the properties of the brick to be used are unknown. This mortar suits the majority of building applications and brick types.

M3 1:0:5 (1:0:4)

This composition is not commonly specified for clay bricks. It is more appropriate for concrete and calcium silicate units that may have difficulty in achieving adequate bond. The addition of a methyl cellulose water thickener is usually required.

M2 1:2:9 (1:2:7)

This lime-rich composition mortar is most suitable for internal brickwork, brickwork above a damp-proof course and with General Purpose bricks when used in cottage construction. This is a forgiving mortar with a good balance between strength, flexibility and permeability. It is not suitable for colouring with pigments as it is prone to apparent fading. This is the preferred mortar for fireplaces and barbecues.

M2 1:3:12 (1:3:10)

The weakest of the standard composition mortars, it is suitable for internal brickwork, above the damp-proof course and sheltered external use particularly with high suction bricks. It has most of the flexibility of straight lime mortar with some early strength from the cement. This mortar is suitable for repointing old mortar and handmade bricks.

M1 0:1:3 (0:1:3)

This is a straight lime mortar that sets slowly. It develops very little early strength. These days it is usual to use this mortar only when repairing historic masonry originally built using lime mortar. In most cases a 1:3:12 (1:3:10) mortar is preferable.

Some cautions

Don't overlook lime! The Clay Brick and Paver Institute recommends you include lime in all mortar mixes. Bricklayers often avoid using lime because it is an additional material to mix.

Lime mortars also cause cuts and abrasions to sting but this should not be used as an excuse. Lime has the advantage of making mortar workable in the wet state and may eliminate the need for plasticiser admixtures.

Hardened mortar containing lime will be less pervious, more durable and more 'forgiving' than a mortar without lime. Go easy on the admixtures! The overdosing of plasticisers greatly reduces mortar strength and durability.

Never use any mortar admixture in proportions greater than those specified by the manufacturer. Always seek professional advice if you are unsure about any aspect detailed here.