hardens owing to chemical reaction with water rather than atmospheric action. In the United Kingdom, the lime used for mortar must conform to BS 890.

2.5 SAND

The sand for mortar must be clean, sharp, and free from salt and organic contamination. Most natural sand contains a small quantity of silt or clay. A small quantity of silt improves the workability. Loam or clay is moisture-sensitive and in large quantities causes shrinkage of mortar. Marine and estuarine sand should not be used unless washed completely to remove magnesium and sodium chloride salts which are deliquescent

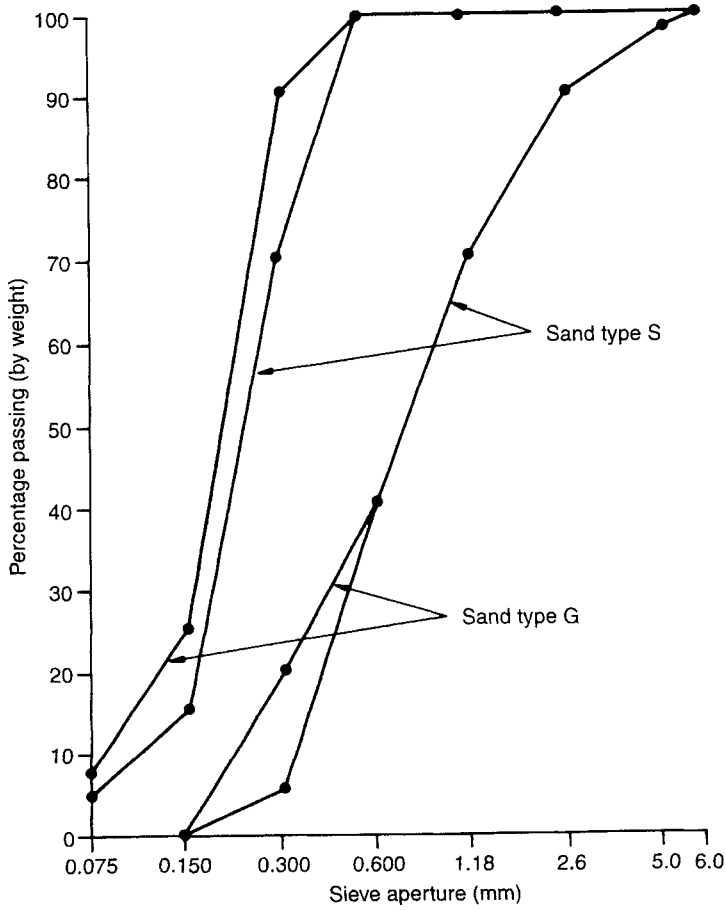

Fig. 2.4 Grading limits of mortar sand (BS 1200).

and attract moisture. Specifications of sand used for mortar, such as BS 1200, prescribe grading limits for the particle size distribution. The limits given in BS 1200 are as shown in Fig. 2.4, which identifies two types of sand:sand type S and sand type G. Both types of sand will produce satisfactory mortars. However, the grading of sand type G, which falls between the lower limits of sand S and sand G, may require slightly more cement for a particular grade of mortar to satisfy the strength requirement envisaged in BS 5628 (refer to Table 2.6).

2.6 WATER

Mixing water for mortar should be clean and free from contaminants either dissolved or in suspension. Ordinary drinking water will be suitable.

2.7 PLASTICIZED PORTLAND CEMENT MORTAR

To reduce the cement content and to improve the workability, plasticizer, which entrains air, may be used. Plasticized mortars have poor water retention properties and develop poor bond with highly absorptive bricks. Excessive use of plasticizer will have a detrimental effect on strength, and hence manufacturers' instructions must be strictly followed. Plasticizer must comply with the requirements of BS 4887.

2.8 USE OF PIGMENTS

On occasion, coloured mortar is required for architectural reasons. Such pigments should be used strictly in accordance with the instructions of the manufacturer since excessive amounts of pigment will reduce the compressive strength of mortar and interface bond strength. The quantity of pigment should not be more than 10% of the weight of the cement. In the case of carbon black it should not be more than 3%.

2.9 FROST INHIBITORS

Calcium chloride or preparations based on calcium chloride should not be used, since they attract water and cause dampness in a wall, resulting in corrosion of wall ties and efflorescence.

2.10 PROPORTIONING AND STRENGTH

The constituents of mortar are mixed by volume. The proportions of material and strength are given in Table 2.6. For loadbearing brickwork the mortar must be gauged properly by the use of gauging boxes and preferably should be weigh-batched.