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General Information



The use of lime and cement in plastering mixes, provides highly workable mortars which are easy to apply - durable - quick to dry out - and minimise the risk of efflorescence, condensation and pattern staining. In damp conditions where other plastering systems may fail, cement:sand and cement:lime:sand plasters are satisfactory. Finish coat plaster is generally gypsum-based and is outside the scope of this data sheet.

Composition and Manufacture

Mortar Industry Association members' plastering mortars are supplied in bulk and are manufactured from carefully selected sand (now known as fine aggregate) conforming to BS EN 13139, cements conforming to BS EN 197-1, admixtures to BS EN 934-3 and when incorporated, lime to BS EN 459-1. They can be supplied either ready-to-use, or gauged with cement or gypsum on site in any mix ratio specified.

Plastering mixes conform to BS EN 998-1 when tested according to the methods given in BS EN 1015.

Properties

Factory produced mortars are well known for their plasticity and workability. The mortar, whilst possessing a high degree of cohesiveness, spreads easily under the trowel increasing productivity and minimising wastage. The setting rate of these mortars together with their high water retentivity allows time for straightening and scratching providing maximum bond. Lime:sand mortars also impart a degree of elasticity allowing for some building movement and allow the structure to breathe, minimising condensation. Drying out time is shorter than for many other types of plasters.

Some bricks and blocks contain soluble salts, and in certain conditions can cause unwanted efflorescence. These mortars minimise the chance of efflorescence.

Table 1: Bulk density, volume yield and coverage

Property		Lime:sand	Cement:sand Cement:lime:sand
Bulk density	without air entrainment	1850 - 2000 kg/m ³	1700 - 1850 kg/m ³
	with air entrainment	1700 - 1850 kg/m ³	
Volume yield		1 tonne of factory produced lime:sand for mortar when mixed with Portland cement on site will yield 0.65 to 0.73m ³	NA
Coverage	Thickness (mm)	Area (m ²) per tonne 1:6	Area (m ²) per m ³
	5	90 to 100	200
	10	45 to 50	100
	15	33 to 37	66
	20	29 to 33	50

Fire Protection

Cement and lime based plastering mortars do not support combustion (BS EN 13501-1) and give excellent fire protection. (See BS 5492 Section 4.35 for full details).

For detailed information on the applications of internal plastering mortars, refer to BS 5492.

Durability

Refer to BS 5492.

Application

Generally, all walls prior to receiving plastering mortar should be clean and preferably dry. All surfaces should be free from dust and efflorescence. Special care should be taken if the background is composed of concrete. It is essential to provide adequate key otherwise the adhesion and durability may be poor. In hot, dry weather, and/or, with high suction backgrounds it may be necessary to apply a coat of a proprietary surface treatment prior to plastering.

For guidance on working on low/freezing temperatures see data sheet no. 7.

Table 2: Background preparation requirement

Background type	Surface characteristics	Preparation of surface	Drying shrinkage movement of the background
Dense clay bricks or blocks	Low suction and poor key	May require more than raking joints e.g bonding coats or spatterdash. Note. Spatterdash is a mixture of 1 cement to 1½ - 3 coarse sand	Negligible
Normal clay bricks or blocks	Moderate to high suction, reasonable key	Rake joints unless key provided. Wall should be dry to minimise efflorescence	Negligible
Calcium silicate or concrete bricks or blocks	Moderate to high suction, reasonable key	Rake joints unless key provided. Wall should be dry to minimise shrinkage movement	Varies from low to high
Dense concrete precast or insitu	Low suction varies with type of aggregate and water/cement ratio. Poor key	Unless keyed use bonding agent or spatterdash bonding treatment. Use bonding treatments according to manufacturer's recommendations	Varies from low to high
No fines concrete	Low suction and good key	None	Varies from low to high
Concrete blocks	Low suction and good key concrete containing lightweight aggregate	Walls must be dry to minimise shrinkage movement	Moderate to high
Aerated concrete	Moderate to high suction reasonable key	Follow manufacturer's instructions	Moderate to high
Metal lathings	Good key	None	None

Table 3: Cement based undercoats

Type	Season	Mortar by volume		Traditional mortar designation by volume lime:sand	Factory produced lime:sand	Site mixing cement:factory produced		
		Cement:lime:sand	Cement:san			By volume	By weight kg:tonne No air Air	
Dense clay bricks or blocks	Winter	1:¼:3	1:3	i	1:12	1:3	250	-
	Summer	1:½:4½	1:3-4	ii	1:9	1:4½	170	190
Normal Clay bricks or blocks	Winter	1:1:6	1:5-6	iii	1:6	1:6	125	150
	Summer	1:2:9	1:7-8	iv	1:4½	1:9	90	100
Calcium Silicate or concrete bricks or blocks	Winter	1:1:6	1:5-6	iii	1:6	1:6	125	150
	Summer	1:2:9	1:7-8	iv	1:4½	1:9	90	100
Dense concrete either precast or in situ	Winter	1:½:4½	1:3-4	ii	1:9	1:4½	170	190
	Summer	1:1:6	1:5-6	iii	1:6	1:6	125	150
No fines concrete	Winter	1:½:4½	1:3-4	ii	1:4½	1:4½	170	190
	Summer	1:1:6	1:5-6	iii	1:6	1:6	125	150
Concrete blocks and concrete containing lightweight aggregate	Winter	1:1:6	1:5-6	iii	1:6	1:6	125	150
	Summer	1:2:9	1:7-8	iv	1:4½	1:9	90	100
Aerated concrete	Winter	1:2:9	1:7-8	iv	1:4½	1:9	90	100
	Summer							
Metal lathing	Winter	1:1:6	1:5-6	iii	1:6	1:6	125	150
	Summer	1:1:6	1:5-6	iii	1:6	1:6	125	150

Undercoats based on gypsum

1:3:9 gypsum:lime:sand

Prepared on site by mixing 1 volume of suitable gypsum plaster with 9 volumes of 1:3 factory produced lime:sand for mortar (75 kg gypsum to 1 tonne). This undercoat should not be used in winter.

Plaster strength

It is essential that the finishing plaster should be weaker in strength to the undercoat, and that the undercoat should be weaker than the background. If required a proprietary surface treatment may be applied.

Recommended thickness

Unless greater thicknesses are required for the purpose of fire protection or acoustic insulation, the following thicknesses are recommended (BS 5492).

1 Solid backgrounds

Two coat work excluding concrete	13mm maximum per coat
Two coat work on concrete and key	10mm maximum per coat
Three coat work	19mm maximum per coat

2 Metal lathing

Total plaster thickness from face of lathing	13mm maximum
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Maintenance

Plastering work should be protected at all stages of its life from persistent attack by water or moisture through the undercoats or against the finished surface. Gypsum based plasters should not be used in damp conditions. Generally, if factory produced plasters have been applied correctly further maintenance is unnecessary.

References	
BS EN 197-1	Cement composition, specification and conformity criteria for common cements
BS EN 459-1	Building lime. Definitions, specifications and conformity criteria
BS EN 934-2	Concrete admixtures - Definitions, requirements, conformity, marking and labelling
BS EN 934-3	Admixtures for masonry mortar - Definitions, requirements, conformity, marking and labelling
BS EN 998-1	Specification for mortar for masonry - Part 1: Rendering and plastering mortar
BS EN 1015	Methods of test for mortar for masonry
BS EN 13139	Aggregates for mortar
BS EN 13501-1	Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests
BS 4551	Methods of testing mortars, screeds and plasters
BS 5492	Code of practice for internal plastering
PD 6678	Guide to the selection and specification of masonry mortar
PD 6682-3	Aggregates for mortar - Guidance on the use of BS EN 13139

All references to British and/or European standards should refer to the current published edition.

For a comprehensive list of British and European Standards see the MIA data sheet of technical references.



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The Mortar Industry Association is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and silica sand industries

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There is a real danger of contact dermatitis or serious burns if skin comes into contact with wet mortar. Wear suitable protective clothing and eye protection. Where skin contact occurs either directly or through saturated clothing wash immediately with soap and water. For eye contact immediately wash out eyes thoroughly with clean water. If swallowed wash out mouth and drink plenty of water.

The relevant codes of practice, standards and statutory regulations must always be observed.

The information in this data sheet may be freely copied with acknowledgement to the Mortar Industry Association. Current issue numbers of all MIA publications are available from the MIA website.