mortar industry association

Data sheet 02

mpa essential materials sustainable solutions

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Factory produced ready-to-use mortar for masonry

General Information

Factory produced ready-to-use mortars fulfil the requirements of specifiers and users seeking factory made materials. They are delivered to site ready-to-use in every respect and require no further mixing; no further constituents should be added. They have guaranteed mix proportions and overcome any potential problems relating to site mixing.

The incorporation of a cement set retarder into factory produced mortars makes it possible to produce materials with extended working life that will set normally when used in masonry. These mortars are now included in the range of products available from members of the Mortar Industry Association.

Composition and Manufacture

The Mortar Industry Association members manufacture their factory produced mortars with fine aggregates conforming to the requirements of 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. If required, pigments conforming to BS EN 12878 can be accurately added at the factory to produce an extensive range of colours and shades. All mortars produced conform to the requirements of BS EN 998-2. Generally, they are delivered in bulk and discharged into site containers designed for easy handling and distribution of the mortar.

The following table gives the mix designation, compressive strength (BS EN 998-2 mortar class) and composition.

The compressive strength of prescribed mortars will vary according to a number of factors, particularly the type of sand that is used, but historically there has been an empirical relationship which has been used in arriving at Table 1. For these traditional mixes, although a mortar class is given in the table, the strength of a prescribed mortar should not be used as the basis of conformity with the standard. If a definite strength is required of a mortar, then a designed mix should be used or the mortar manufacturer should be consulted.

Table 1: Mixes for prescribed masonry mortars and mortar classes

Mortar designation	Prescribed mortars (traditional proportion of materials by volume)[A]				Mortar class that may be assumed	Suitable for use in environmental condition
	Cement[B] : lime : sand with or without air entrainment	Cement[B] : sand with or without air entrainment	Masonry cement[C] : sand	Masonry cement[D] : sand		
(i)	1:0 to ¼ :3	1:3	Not suitable	Not suitable	M12	Severe (S)
(ii)	1:½ :4:4½	1:3 to 4	1:2½ to 3½	1:3	M6	Severe (S)
(iii)	1:1:5 to 6	1:5 to 6	1:4 to 5	1:3½ to 4	M4	Moderate (M)
(iv)	1:2:8 to 9	1:7 to 8	1:5½ to 6½	1:4½	M2	Passive (P)

[A] When the sand portion is given as, for example, 5 to 6, the lower figure should be used with sands containing a higher proportion of fines, whilst the higher figure should be used with sands containing a lower proportion of fines

[B] Cement or combinations as detailed in the National Annex BS EN 998-2

[C] Masonry cement (organic filler other than lime) as detailed in the National Annex BS EN 998-2

[D] Masonry cement (lime) as detailed in the National Annex BS EN 998-2

Properties

In respect of fresh properties the manufacturer is required to declare the workable life and, where relevant, the chloride content and air content.

For the hardened properties of design masonry mortars the compressive strength shall be declared and where relevant the bond strength, water absorption and density. In addition the water vapour permeability and thermal conductivity are required to be declared by reference to tabulated values.

For prescribed mortars the mix proportions by volume or by weight of all the constituents shall be declared by the manufacturer. In addition, the indicative compressive strength shall be declared with reference to clause NA.1 of the National Annex to BS EN 998-2 and PD 6678.

Selection of Mortar Mix

The mortar should be selected by reference to the European Code of Practice Eurocode 6; BS EN 1996.

Durability

Factory produced ready-to-use mortars are of guaranteed composition, thoroughly mixed and will therefore provide satisfactory performance. However, this does not negate the designer's responsibility to specify the correct mortar designation for the type of structure, exposure conditions and type of masonry units. Neither does it relieve the builder of his responsibility to ensure that operatives use site best practice. Recommendations are given in other data sheets in this series and the manufacturers' technical literature should be followed.

Working Characteristics

Factory produced mortars are designed to have good workability and plasticity over the whole of their stated working life. In hot conditions some stiffening may occur which may be corrected by the addition of a small amount of water followed by trowel mixing on the spot board in the traditional manner. Once the initial set has started, the mortar must not be re-constituted in a mechanical mixer or by any other method.

It is inadvisable to proceed with the construction of masonry whilst the temperature is below 3ºC and falling. If the mortar freezes any frozen material should be discarded.

The unfrozen mortar may then be used providing that the air temperature is suitable and the bricks and blocks are not saturated or frozen.

Protective Measures

All mortar should be protected against excessive rain or drying conditions.

All newly erected masonry should be covered at the end of a working day or when rained off until work recommences.

No further measures are required in respect of ready-to-use mortars beyond those recognised as being site best practice.

Maintenance

Generally, factory produced mortars require the minimum of maintenance.

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 998-2	Specification for mortar for masonry - Part 2: Masonry mortar
BS EN 1015	Methods of test for mortar for masonry
BS EN 1996	Eurocode 6, Design of masonry structures, design consideration, selection of materials and execution of masonry
BS EN 12878	Pigments for the colouring of building materials based on cement and/or lime, specifications and methods of test
BS EN 13139	Aggregates for mortar
BS 4551	Methods of testing mortars, screeds and plasters
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

Mineral Products Association Ltd
Gillingham House
38 - 44 Gillingham Street
London SW1V 1HU
Tel +44 (0)20 7963 8000
Fax +44 (0)20 7963 8001
brian.james@mineralproducts.org
www.mortar.org.uk

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.