

Factory produced mortar for use at low/freezing temperatures

DATA SHEET
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General Information

If the temperature of recently laid mortar falls below 0°C there is a probability of some degree of frost attack. The water may freeze and expand thus disrupting the mortar by forcing the material apart and breaking the bond.

It used to be thought that this process was completely irreversible. However, the presence of free lime in the mix imparts to some degree the property of self-healing and any hairline cracks formed will tend to seal, over a short period of time.

It is obviously desirable to take precautions to minimise frost attack. Special precautions should therefore be taken when using mortar in winter conditions.

The inclusion of carefully controlled air entrainment under factory conditions in mortar increases the frost resistance in its hardened state and it is for this reason that Mortar Industry Association members supply specially modified factory produced mortars for winter usage.

Precautions

Any frozen lumps in lime:sand mortar should be discarded and not used.

Any frozen material on the top of ready-to-use mortar should be discarded, the unfrozen mortar may then be used providing the air temperature is suitable and the bricks and/or blocks are not saturated or frozen.

It is inadvisable to proceed with the construction of masonry if the temperature is below 3°C and falling.

To minimise the freezing of lime:sand cover the stock pile or skip with waterproof sheeting and insulate with suitable material eg. polystyrene. The same recommendations apply to tubs of plastic ready-to-use mortar.

The setting of cement is affected by temperature and will proceed more slowly when it is colder. This factor is taken into account when ready-to-use mortars are manufactured but subsequent significant reductions in temperature may increase the retardation period.

Frost failure of well executed masonry usually occurs as a result of using unsuitable materials or neglecting site precautions. Bricks and blocks should be sheeted and kept dry to ensure that the masonry dries as soon as possible after construction - wet bricks will extend the drying out period and the masonry will be susceptible to frost attack for a longer time.

Newly erected or incomplete work should be covered to prevent rain saturation. While the mortar is still green, the face may also need covering during very severe weather. Perforated bricks especially need careful protection. Note that even good masonry, where the mortar has attained full strength, may suffer frost damage if it is allowed to become saturated with water. It can, therefore, be seen that incomplete work should always be protected if there is a chance of severe frost.

Ensure walls are adequately propped during winter conditions, particularly gable ends.

External rendering should not be carried out during frosty weather.

Internal plastering may be undertaken in frosty weather provided that cold winds are kept out

and the walls themselves are not extremely cold when the plaster is applied. Wherever possible windows should be glazed and during cold spells warm air heaters/dehumidifiers may be used. However, it is essential on warm dry days that windows should be opened to allow natural drying to take place.

Anti-freeze admixtures of the calcium chloride type should never be added to the mix. They will cause dampness and efflorescence and their frost resisting effect in mortar is minimal.

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 998-2	Specification for mortar for masonry - Part 2: Masonry mortar
BS EN 13139	Aggregates for mortar
BS 5628	Code of practice for use of masonry
Brick Information Sheet BIS 6.5	Bricklaying in winter conditions - BDA publication
GBG 34	Building in winter - BRE publication
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

British Standards are currently being revised in line with European requirements. The new standards are at varying stages of preparation and/or publication, for a full list of British and new European Standards see the MIA data sheet of technical references.



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.



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Promoting quality factory produced mortar

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