



# Guidance on the use of M-LS BlockMix in Masonry

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M-LS (Manufactured LimeStone) is an economical, sustainable carbon negative lightweight product manufactured from thermal residues.

The aggregate is manufactured using accelerated carbonation technology (ACT). The innovative manufacturing process utilises carbon dioxide as a stabilising reagent. More carbon dioxide is permanently bound into the product than is generated through its manufacture, making M-LS the World's first carbon negative aggregate.

M-LS BlockMix is a 0-15mm graded product specially formulated for use in masonry. It is manufactured under a strict quality system in compliance with ISO 9001:2015, ISO 14001:2015 and OHSAS 18001. The product has End of Waste status, and is CE marked in accordance with BS EN 13055. M-LS BlockMix also scores very well in BES6001 assisting in attaining an "excellent" rating.

## General guidelines

As with other aggregates, particularly recycled or secondary aggregates such as crushed recycled concrete and Lightweight Recycled Aggregates (LRA), M-LS should be used with due regard to the protection of the environment and human health, Health and Safety Executive advice and CIRIA guidance C741 on Environmental Good Practice.

## Storage

M-LS is stored at the manufacturing plant until all quality control checks have been made. However, as M-LS contains a cementitious component, the product will continue to mature for up to 28 days. For best performance, we recommend storing the aggregate ideally for 7 days, ensuring good stock rotation.

M-LS can be readily stockpiled in uncovered bays. Like any other material, it is recommended that the stockpile is kept in good order and the site has appropriate surface water management. Please see the companion guidance for the M-LS Code of Practice for Unbound Applications for more details.

If unused, after several weeks the product may start to develop a weak surface crust (due to this residual cementitious property). This can easily be avoided or remedied by turning the stockpile once a fortnight.

## Handling

M-LS can be used and handled much like any other concrete or cement derived product. For more information, please refer to the MSDS.



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## Mix Proportion/Formulation

M-LS works well when blended with other materials. For optimum performance, it is recommended that M-LS is used at 15-20% by volume of the mix design.

Experimentation with your mix design may be necessary to determine the maximum amount of M-LS that is complimentary to the other raw materials used to achieve the desired block product. O.C.O have in-house expertise in masonry block manufacture, and will gladly assist with trials and mix development.

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## Other Materials

M-LS is compatible with many traditional block making materials including furnace bottom ash (FBA), glass sand, standard grade wood product (SGWP), crushed brick, lightweight expanded clay aggregate (LECA, Fibro, Argex etc), Lytag, pumice, crushed lightweight recycled aggregates (LRA), foundry sand, and of course virgin sands and gravels.

The use of M-LS with a high percentage of other highly porous materials may not give the best performance. It may be necessary to use a reduced % of M-LS in the mix design when using in conjunction with oolitic limestone or FBA.

O.C.O can assist with designing mix formulations.

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## Mix Water/Absorption

M-LS contains a free water component which is residual from the manufacturing process. Like other lightweight aggregates, water absorption needs to be factored in to the design of formulations. Around 3-4% absorption is typical in the first 10-15 minutes after mix water is added.

M-LS is excellent for mixing with other wet materials to absorb excess moisture and improve handling. This can be particularly useful in the winter months.

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## Cement Usage

It may be possible to reduce cement content where early strength is an important factor. Further OPC reductions may be possible when looking at the 28-day strength test results of the products, again this will be relevant to the other materials used in the mix design and with maximising the moisture content.

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## Additives

M-LS is compatible with water reducing admixtures. M-LS contains calcium chloride, so there is no need to add any additional chloride-based accelerating admixture.



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## Casting

M-LS can be used with all types of block making machines, including egg layers and static plant. A good quality moisture control system is recommended in the batching and mixing plant to ensure an accurate mix water addition, resulting in a consistent mix at the block machine.

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## Early Strength/Curing

When used during the optimum timescales (7-14 days matured), M-LS can improve early mechanical strength, enabling an earlier turnaround of the finished block product.

A higher early mechanical strength can be achieved in some mix designs which have a lower OPC content. This aids the ability to “turn around” the finished products and therefore increase daily production volumes especially where kiln space is restricted.

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## Carbon Footprint

M-LS is a carbon negative product. This is based upon a cradle-to-gate assessment in accordance with PAS2050. This offers onward benefits to products manufactured using M-LS. Assistance and advice on carbon footprinting will be willingly provided.



Certificate Number 11259

ISO 9001  
ISO 14001  
OHSAS 18001



CONCRETE  
BLOCK  
ASSOCIATION

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