

MasterCO₂re 5800

Superplasticizer based on the Intelligent Cluster System (ICS) Technology for low clinker concrete production – BS EN / EN 934-2: T3.1 & T3.2

Material description

MasterCO₂re 5800 is an innovative superplasticizer, based on the Intelligent Cluster System (ICS) Technology, developed in the R&D Laboratories of Master Builders Solutions. Ideal for making precast elements with highly-fluid concrete without segregation. This technology allows low water/cement ratios and consequently, high early and final strengths. MasterCO₂re 5800 combines the performances of fluidification, workability and superior rheology in one single solution.

MasterCO₂re 5800 provides the perfect choice for stable and robust concrete performance in challenging low-clinker applications, paving the way for a more responsible future in the construction industry.

Areas of application

MasterCO₂re 5800 is especially engineered for precast concrete applications providing fluid consistency and for self-compacting concrete, to impart exceptional rheological properties in all curing conditions.

MasterCO₂re 5800 has been developed to have a particular synergy for use with the Master X-Seed Crystal Speed Hardening concept.

Characteristics and benefits

MasterCO₂re 5800 offers the following main benefits:

- Production of highly flowable, robust self-compacting concrete having a low water cement ratio along with an optimal rheology.
- Enhanced robustness and consistency in concrete quality with low stickiness.
- Sustainable performance, counteracting the potential of high-water absorption and other undesirable effects caused by the variation in chemical and mineralogical composition of the binders.
- Potential elimination or reduction of heat curing.
- Improved surface appearance.
- Durable precast concrete elements as per EN 206-1.

- Elimination of the energy required for placing, compaction and curing (ZERO ENERGY)
- Optimization of the curing cycles by reducing curing time or curing temperature. Increased productivity, particularly in combination with Master X-Seed Crystal Speed Hardening

Advanced rheology: concrete with MasterCO₂re 5800 has lower viscosity allowing easier placement, passing ability and resistance to segregation. Thanks to this superior rheology, the content of water can be further reduced without compromising the stability even in concrete mixes with reduced clinker amount.

The Intelligent Cluster System (ICS) Technology

MasterCO₂re 5800, thanks to its Intelligent Cluster System (ICS), can immediately release a portion of its available engineered polymers for initial water reduction. The finely tuned chemical structures of the diverse clusters adapt the release mechanism of the polymers to the characteristics of the cement matrix, thereby optimizing both workability retention and cement hydration. In this way, MasterCO₂re 5800 successfully controls the absorption rate and ensures consistently high performance of the concrete.

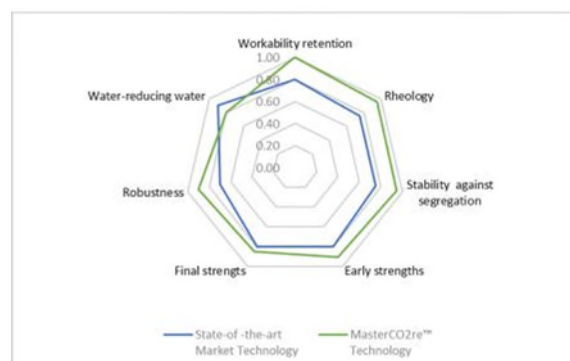


Fig. 2 Overall performance of MasterCO₂re 5800

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Simplifying the production of low-clinker concrete

Reducing the clinker content in concrete is a necessary measure, to achieve the current challenges of CO₂ reduction. Low-clinker concrete can be produced through three main routes:

- Switching to a cement with reduced CO₂ emissions; keeping the cement dosage at the lowest possible value, while ensuring the achievement of the desired strengths; including high amounts of supplementary cementitious materials (SCM) in the concrete mix.
- Providing improved workability retention, advanced rheology, and excellent strength properties, MasterCO₂re 5800 mitigates the well-known challenges associated with the production of low-clinker concrete, thereby supporting the Concrete Industry to achieve the Sustainability targets, without compromising on quality.
- As compared to the state-of-the-art admixture technology, MasterCO₂re 5800 allows for further water reduction, without negative impact on rheology. The effect of reduced cement paste is offset by the rheological improvement of MasterCO₂re 5800.

Dosage

The recommended dosage rate for MasterCO₂re 5800 range is 0.5 to 2.0 litres per 100 kg of binder and depends on the desired water reduction and workability retention. Other dosages may be recommended in special cases, according to specific job site conditions. In such cases, please consult our Technical Service Department for advice.

Directions for use

MasterCO₂re 5800 is a liquid admixture to be added to the concrete during the mixing process:

- Mix cement and secondary binders, sand, coarse aggregates and the mix water until a stiff, yet homogeneous, mixture is obtained.
- Optimal mixing water reduction is obtained if MasterCO₂re 5800 is mixed into the concrete right after the addition of the initial 80-90% of the total water.

Packaging

MasterCO₂re 5800 is supplied in Bulk, 1000-litre IBC's and 15-litre containers.

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Product Data	
Form:	Liquid
Relative density (g/cc at 20°C)	1.06 – 1.08
pH-value:	10-12
Alkali content (%):	≤ 1.0%
Chloride content (%):	≤ 0.1% by mass
Compressive strength:	Equal consistence: 1 day ≥ 140%; 28 days ≥ 115% Equal w/c ratio: 28 days ≥ 90%
Air content in fresh concrete:	Equal consistence: ≤ 2.0 % above control Equal w/c ratio: ≤ 2.0 % above control
Corrosion behaviour:	Contains only components from EN 934-1 2008 Annex I
Water reduction	≥ 12%
Logistics	
Shelf life:	12 months if stored according to manufacturer's instructions in unopened container.
Storage conditions:	Store in original sealed containers and at temperatures between 5°C and 30°C. Store under cover, out of direct sunlight and protect from extremes of temperature. Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging.
Handling and transportation:	Refer to MasterCO ₂ re 5800 Safety Data Sheet
Disposal:	Refer to MasterCO ₂ re 5800 Safety Data Sheet

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DISCLAIMER

MasterCO₂re 5800, Master Builders Solutions UK Ltd, Version 1

The following general comments apply to all products.

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs, (which may also be tainted with vapour until the product is fully cured and dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Keep away from children and animals. Reseal containers after use.

Health and Safety: *For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

Spillage: Chemical products can cause damage; clean spillage immediately.

DISCLAIMER:

"Master Builders Solutions UK Ltd" (the Company) endeavours to ensure that advice and information given in Product Data Sheets, Method Statements and Material Safety Data Sheets (all known as Product Literature) is accurate and correct. However, the Company has no control over the selection of its products for particular applications. It is important that any prospective customer, user or specifier, satisfies him/her-self that the product is suitable for the specific application. In this process, due regard should be taken of the nature and composition of the background/base and the ambient conditions both at the time of laying/applying/installing the material and when the completed work is to be brought into use. Accordingly, no liability will be accepted by the Company for the selection, by others, of a product, which is inappropriate to a particular application. Products are sold subject to the Company's standard conditions of sale and all customers, users and specifiers, should ensure that they examine the Company's latest Product Literature.



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Declaration of Performance can be found at:
www.master-builders-solutions.com/en-gb