

# MasterCO<sub>2</sub>re 3850

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

MasterCO<sub>2</sub>re 3850 is an innovative superplasticizer, based on the Intelligent Cluster System (ICS) Technology, developed in the R&D Laboratories of Master Builders Solutions. MasterCO<sub>2</sub>re combines the performances of fluidification, high early and ultimate strength with superior rheology, in one single solution. MasterCO<sub>2</sub>re 3850 is designed to exhibit workability retention for periods up to 2 hours. It improves considerably the pumpability, placing and finishing of concrete, simplifying the operations for all construction activities.

This advanced technology 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

MasterCO<sub>2</sub>re 3850 is especially engineered for ready-mix rheoplastic concrete having fluid consistency and for self-compacting concrete, to impart exceptional rheological properties and ensure exceptional workability retention, in all weather conditions.

MasterCO<sub>2</sub>re 3850 is chloride free, meets UNI EN 934-2 and is compatible with all cements meeting the EN 197-1 and EN 197-5 standard.

## Characteristics and benefits

MasterCO<sub>2</sub>re 3850 offers the following main benefits (Fig 1 and 2):

**Unmatched robustness:** With rapidly changing cement types and binder compositions, nowadays the stability and quality consistency of concrete is a challenge in the daily operations of concrete plants. MasterCO<sub>2</sub>re successfully counteracts the potential of high-water absorption and other undesirable effects caused by the variation in chemical and mineralogical composition of the binders.

**Advanced rheology:** concrete with MasterCO<sub>2</sub>re has lower viscosity and is easier and faster to pump and place, as compared to state-of-the art admixtures in the market. Thanks to this superior rheology, the content of water can be further reduced without compromising the pumpability and ease of placing, even in concrete mixes with reduced clinker amount.

**Extended workability retention:** thanks to the Intelligent Cluster System technology, MasterCO<sub>2</sub>re releases the polymer over time, ensuring consistent flowability and workability during the transportation and placing of concrete. MasterCO<sub>2</sub>re 3850 offers the solution 365 days a year, as the workability retention is achieved without retardation in setting and hardening.

**Excellent strength properties:** MasterCO<sub>2</sub>re promotes the formation of a denser and more homogeneous structure of cement hydrates, which is reflected into optimal strengths development.

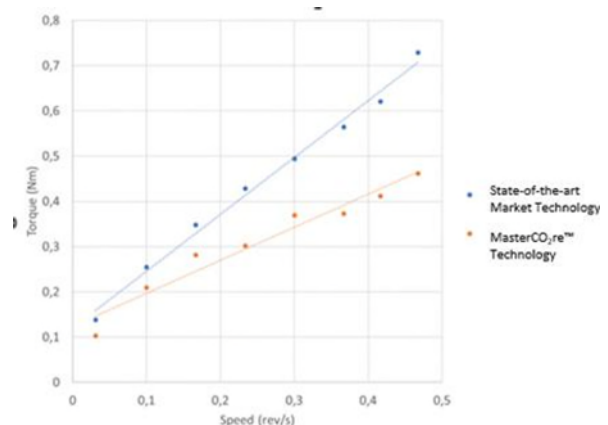


Fig. 1 Rheological performance of MasterCO<sub>2</sub>re 3850

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## The Intelligent Cluster System (ICS) Technology

MasterCO<sub>2</sub>re, 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, MasterCO<sub>2</sub>re successfully controls the absorption rate and ensures consistently high performance of the concrete.

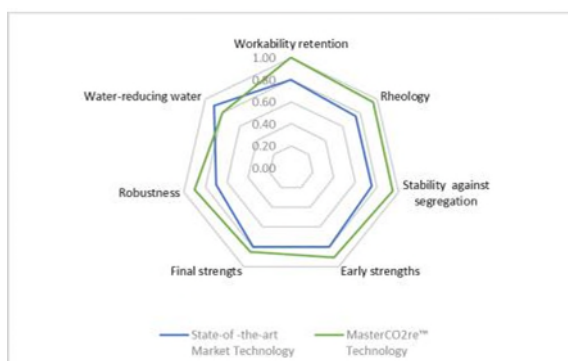


Fig. 2 Overall performance of MasterCO<sub>2</sub>re 3850

## Simplifying the production of low-clinker concrete

Reducing the clinker content in concrete is a necessary measure, to achieve the current challenges of CO<sub>2</sub> reduction. Low-clinker concrete can be produced through three main routes:

- Switching to a cement with reduced CO<sub>2</sub> 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, MasterCO<sub>2</sub>re 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 and in an economically viable way.

- As compared to the state-of-the-art admixture technology, MasterCO<sub>2</sub>re 3850 allows for further water reduction, without negative impact on rheology. The effect of reduced cement paste is offset by the rheological improvement of MasterCO<sub>2</sub>re 3850.

## Dosage

The recommended dosage rate for MasterCO<sub>2</sub>re 3850 range is 0.5 to 1.5 liters 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.

## Packaging

MasterCO<sub>2</sub>re 3850 is available in 15L cans, 1,000L tanks or in bulk.

## Directions for use

MasterCO<sub>2</sub>re 3850 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 MasterCO<sub>2</sub>re 3850 is mixed into the concrete right after the addition of the initial 80-90% of the total water
- Avoid adding the admixture to the dry aggregates, add MasterCO<sub>2</sub>re 3850 admixture and mix again for to 60 seconds in order to disperse it homogeneously
- Continue mixing until required workability is obtained, with addition of the remaining water.

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## Compatibility

MasterCO<sub>2</sub>re 3850 is compatible and recommended for use with:

- Air entraining agent MasterAir to improve freeze thaw resistance (exposure class XF1 to XF4, EN 206-1)
- Synthetic micro fibres MasterFiber to prevent cracks due to plastic shrinkage;
- Liquid admixture from MasterLife SRA to reduces drying shrinkage of cementitious binders;
- Curing agent MasterKure for sealing the surface of freshly finished concrete against rapid evaporation of water which may cause plastic shrinkage cracking.

MasterCO<sub>2</sub>re 3850 is not compatible with all admixtures of MasterRheobuild series.

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Product Data	
Form:	Liquid
Relative density (g/cc at 20°C)	1.04 – 1.08
Alkali content (%):	≤ 1.0%
Chloride content (%):	≤ 0.1% by mass
Corrosion behaviour:	Contains only components from EN 934-1 2008 Annex I
Compressive strength:	Equal consistence: 7 days ≥ 100%; 28 days ≥ 115% Equal w/c ratio: 28 days ≥ 90%
Air content in fresh concrete:	Equal consistence: ≤ 2.0 % Equal w/c ratio: ≤ 2.0 %
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 <sub>2</sub> re 3850 Safety Data Sheet
Disposal:	Refer to MasterCO <sub>2</sub> re 3850 Safety Data Sheet

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## DISCLAIMER

MasterCO<sub>2</sub>re 3850, Master Builders Solutions UK Ltd, Version 2

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](http://www.master-builders-solutions.com/en-gb)

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