

MasterCO₂re 3400

Superplasticizer based on the Intelligent Cluster System (ICS) Technology for low clinker concrete production.

Material description

MasterCO₂re 3400 is an innovative superplasticizer, based on the Intelligent Cluster System (ICS) Technology, developed in the R&D Laboratories of Master Builders Solutions. MasterCO₂re combines the performances of fluidification, extended workability retention, high early and ultimate strength with superior rheology, in one single solution. 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.

Fields of application

MasterCO₂re 3400 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.

MasterCO₂re 3400 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

MasterCO₂re 3400 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. MasterCO₂re 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 MasterCO₂re 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, MasterCO₂re releases the polymer over time, ensuring consistent flowability and workability during the transportation and placing of concrete. MasterCO₂re 3400 offers the solution 365 days a year, as the workability retention is achieved without retardation in setting and hardening.
- **Excellent strength properties:** MasterCO₂re promotes the formation of a denser and more homogeneous structure of cement hydrates, which is reflected into optimal strengths development.

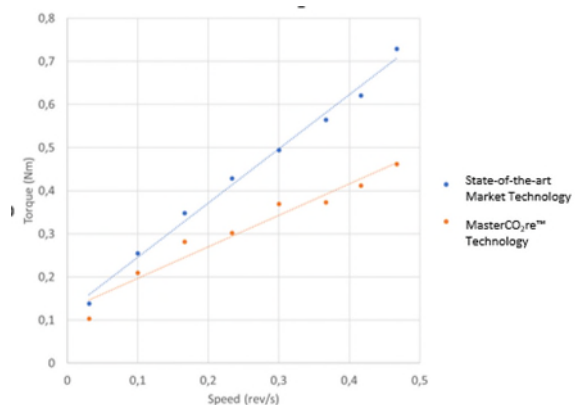


Fig. 1 Rheological performance of MasterCO₂re 3400

The Intelligent Cluster System (ICS) Technology

MasterCO₂re, 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 successfully controls the

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absorption rate and ensures consistently high performance of the concrete.

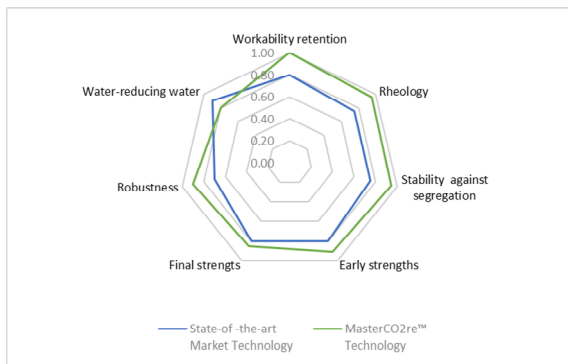


Fig. 2 Overall performance of MasterCO₂re 3400

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 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, MasterCO₂re 3400 allows for further water reduction, without negative impact on rheology. The effect of reduced cement paste is offset by the rheological improvement of MasterCO₂re 3400.

Dosage

The recommended dosage rate for MasterCO₂re 3400 range is 0.7 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.

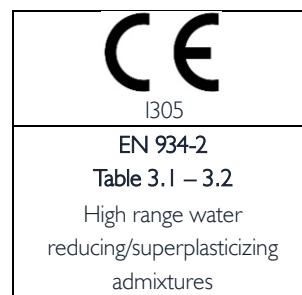
Packaging

MasterCO₂re 3400 is available in 10L cans, 1.000L tanks or in bulk.

Storage

MasterCO₂re 3400 must be stored in a place where the temperature does not drop below 5 °C.

In compliance with the European Regulation (EU No 305/2011 and EU No. 574/2014) the product is provided with the CE marking according to UNI EN 934-2 and the relative DoP (Declaration of Performance).



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Technical Information	
Form	Liquid
Relative density (g/cc at 20°C)	1.054 – 1.094
Essential characteristic in accordance to EN 934-2	Performance
Chloride ion content	≤ 0.1% by mass
Alkali content (Na ₂ O equivalent)	≤ 3.0%
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	Equal consistence: ≤ 2.0 % Equal w/c ratio: ≤ 2.0 %
Water reduction	≥ 12%

Directions for use

MasterCO₂re 3400 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 3400 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 MasterCO₂re 3400 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.

Compatibility

MasterCO₂re 3400 is compatible and recommended for use with:

- air entraining agent MasterAir to improve freeze thaw resistance (exposure class XF1 to XF4, EN 206-1);
- silica fume, MasterLife MS 610, for high performance concrete and to improve the durability in chemical aggressive environments (exposure class XA1 to XA3, 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.

MasterCO₂re 3400 is not compatible with all admixtures of MasterRheobuild series.



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Other services

For additional technical information, brochures, references, technical reports and technical support please visit www.master-builders-solutions.com/it-it or alternatively contact infomac@masterbuilders.com.



Scan QR code to visit the product page and download the latest version of this technical data sheet and any additional documentation.

Disclaimer

Since 16/12/1992, Master Builders Solutions Italia Spa has been operating under a Certified Quality System compliant with the UNI EN ISO 9001 Standard. Furthermore, the Environmental Management System is certified according to the UNI EN ISO 14001 Standard and the Safety Management System is certified according to the UNI ISO 45001 Standard.

For further information, please consult the local Technician of Master Builders Solutions. The technical advice on how to use our products, either written or verbally given, are based on the current state of our scientific and practical expertise, and does not imply the assumption of any guarantee and/or responsibility for the final results of works executed using our products.

Therefore, the customer is not exempted from the exclusive task and responsibility of verifying the suitability of our products for the intended use and purposes.

This version supersedes all the previous ones.

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