



Born to accelerate

**Advanced Solutions
for Concrete Acceleration**



Faster production and greater efficiency in Precast Plants

The precast concrete industry is undergoing rapid transformation. Driven by stricter environmental regulations and ambitious sustainability targets, the shift toward low-clinker cement systems is accelerating, enabling producers to significantly reduce CO₂ emissions and move toward more responsible construction practices.

However, this evolution brings a critical challenge.

Lower clinker content, along with increased use of supplementary cementitious materials (SCMs) such as fly ash, slag, and calcined clays, can slow hydration kinetics and delay early strength gain. These changes in binder composition directly influence the reactivity of the system, often leading to longer setting times and slower strength development at early ages.

For precast producers, this has immediate operational consequences. Slower early strength development can extend demoulding times, disrupt tightly scheduled production cycles, and ultimately reduce plant throughput. In highly optimized production environments, even minor delays can create bottlenecks, increase energy consumption, and influence delivery timelines.

In an industry where time directly translates into profitability, it is crucial to maintain speed without sacrificing quality. Producers must balance the need for sustainability with the demands of consistent mechanical performance, surface quality, and long-term durability.

Today, maintaining fast and reliable production cycles while adapting to new cement technologies has become a key priority across the sector.

To stay competitive, precast manufacturers need advanced and reliable solutions that not only restore but also enhance early strength development. These solutions must be compatible with modern low-clinker systems, ensuring high performance while fully supporting sustainability objectives.

With cutting-edge R&D capabilities and hands-on technical expertise, Master Builders Solutions empowers precast producers to overcome these challenges, accelerating production, maximizing efficiency, and unlocking the full potential of sustainable concrete technologies.



MasterCO₂re HES 30

MasterCO₂re HES 30 is a next-generation accelerating superplasticizer that combines two advanced technologies in a single, high-performance solution.

By integrating the Intelligent Cluster System technology of MasterCO₂re with the proven Crystal Speed Hardening technology of Master X-Seed, it delivers a synergistic effect that optimizes both fresh and hardened concrete properties.

The Intelligent Cluster System does not act merely as a dispersant, but dynamically organizes water and cement particles into stable, responsive clusters, creating optimal conditions for hydration from the earliest stages. Within this tailored microenvironment, crystal growth is not only accelerated but directed, enabling the formation of a dense, well-connected hydrate network. The result is an optimal balance between efficient water reduction and accelerated strength development, even in challenging low-clinker cement systems.

This unique dual-action mechanism significantly improves workability and flowability while accelerating early strength gain. As a result, precast producers can achieve faster demoulding times, shorter production cycles, and more consistent output, without compromising long-term performance or durability.

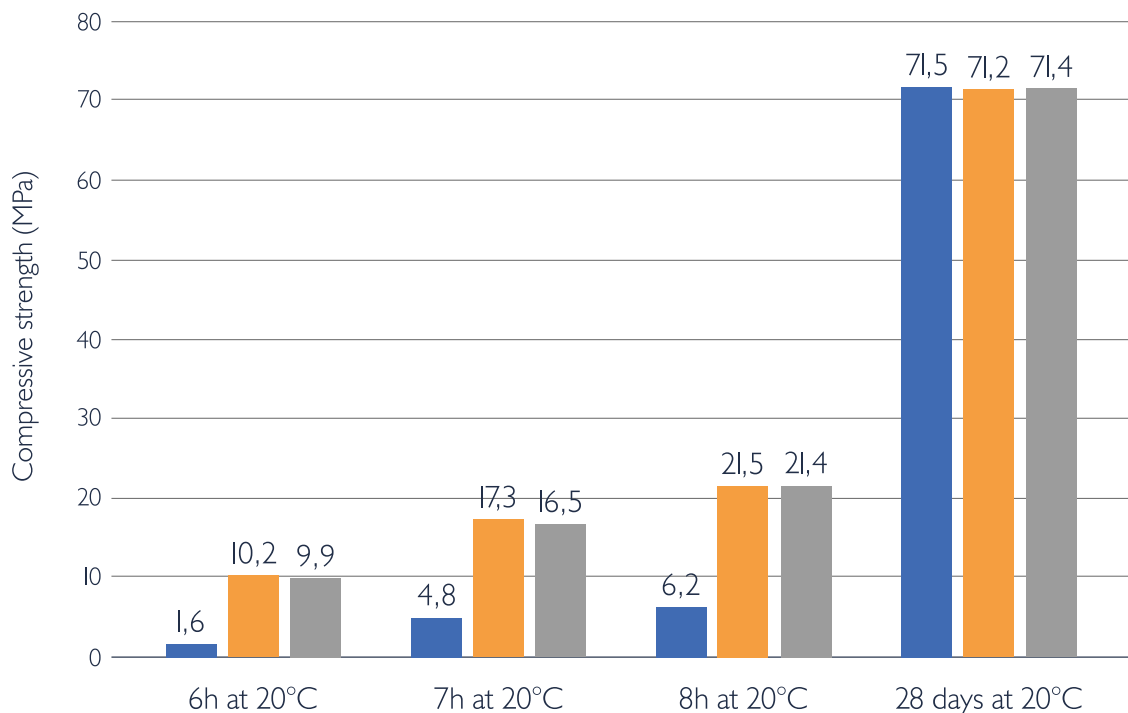
Key benefits

- Water reduction and hardening acceleration in one product
- Superior dosage efficiency
- Improved workability retention and consistency
- Faster strength development
- Reduced cycle times
- Optimized performance in modern, low CO₂ concrete mixes
- Overall cost optimization

MasterCO₂re HES 30 application case

**Water reduction and hardening acceleration in one single product
with improved dosage efficiency**

RAW MATERIALS	MIX 1	MIX 2	MIX 3
Sand	1040	1040	1040
Gravel (d. max 20 mm)	825	825	825
CEM II/B-S 52,5 R	365	365	365
Water	162	162	162
PCE-based superplasticizer	3,65	3,65	—
Traditional CSH-based accelerator	—	10,95	—
MasterCO ₂ re HES 30	—	—	11,7



- Mix 1 (1% PCE-based superplasticizer)
- Mix 2 (1% PCE-based superplasticizer + 3% CSH-based accelerator)
- Mix 3 (3,2% MasterCO₂re HES 30)



Master X-Seed 300 NEXT

Master X-Seed 300 NEXT represents the latest evolution of CSH crystal-based acceleration technology.

It enables precast producers to significantly enhance early strength development across different types of mixes and conditions.

Designed for flexibility and performance, it can be used as a standalone solution or in combination with MasterCO₂re HES 30 and/or MasterBoost 3000 to unlock even greater efficiency.

Key benefits

- Faster early strength development
- Shorter demoulding times
- Improved productivity and cycle efficiency
- Reduced energy input (heat and steam curing)
- Cement reduction and/or cement type downgrade
- Reliable and consistent results across varying conditions
- Overall cost optimization



Magnify Crystal Speed Hardening (CSH^m): accelerating hydration from within

Master X-Seed 300 NEXT harnesses advanced seeding technology to accelerate the early stages of cement hydration, providing a step-change in concrete performance.

Unlike conventional solutions, it delivers a significantly higher number of synthetically engineered CSH^m seeds with an ultra-fine particle size distribution. This creates a vastly larger active surface, promoting faster and more efficient nucleation of hydration products.

At the same time, proprietary polymers ensure these seeds remain evenly dispersed and optimally organized within the mix. This controlled distribution maintains the perfect balance between stability and reactivity, allowing hydration products to form in a more structured, uniform manner.

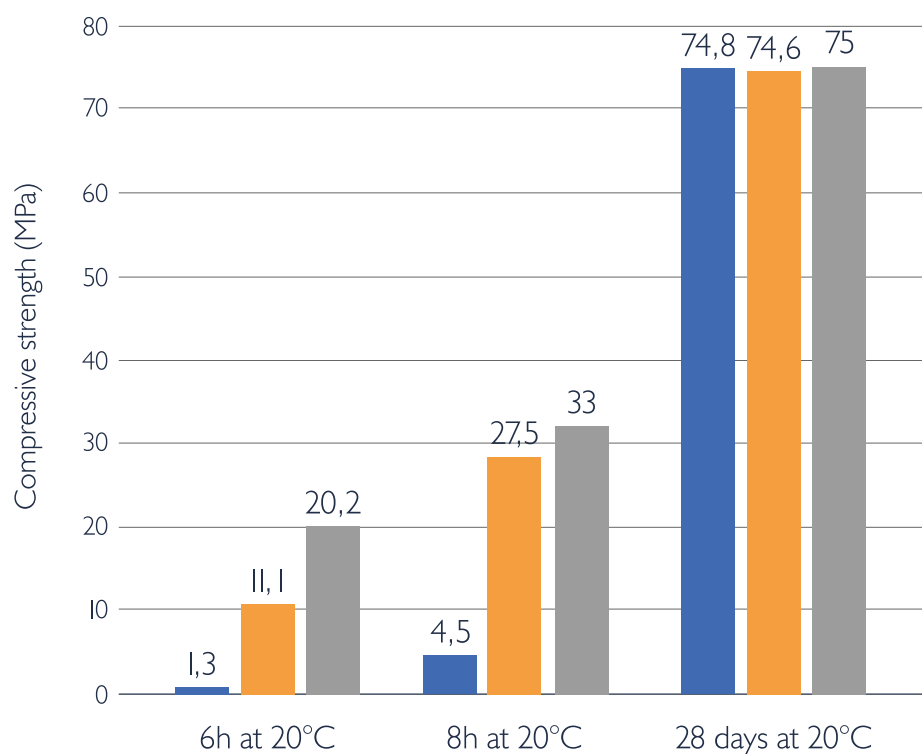
The outcome is a denser, more coherent microstructure that drives faster early strength development, enhances mechanical performance, and improves process stability.



Master X-Seed 300 NEXT application case I

Performance on traditional CEM I

RAW MATERIALS	MIX 1	MIX 2	MIX 3
Sand	985	985	985
Gravel (d. max 16 mm)	880	880	880
CEM I 52,5 R	400	400	400
Water	168	168	168
PCE-based superplasticizer	3,2	3,2	3,2
Traditional CSH-based accelerator	–	16	–
Master X-Seed 300 NEXT	–	–	16

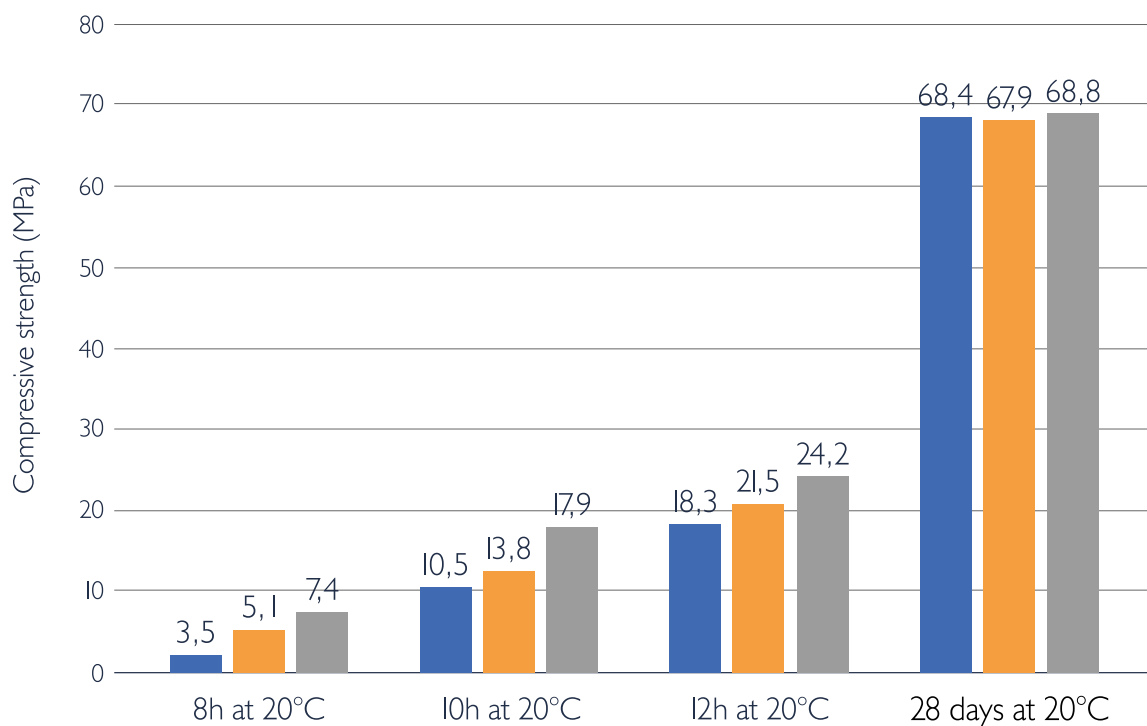


- Mix 1 (0,8% PCE-based superplasticizer)
- Mix 2 (0,8% PCE-based superplasticizer + 4% CSH-based accelerator)
- Mix 3 (0,8% PCE-based superplasticizer + 4% Master X-Seed 300 NEXT)

Master X-Seed 300 NEXT application case 2

Performance on clinker-reduced composite cement

RAW MATERIALS	MIX 1	MIX 2	MIX 3
Sand	825	825	825
Gravel (d. max 16 mm)	1000	1000	1000
Limestone filler	55	55	55
CEM II/A-M 52,5 R	370	370	370
Water	160	160	160
PCE-based superplasticizer	2,4	2,2	2,2
Traditional CSH-based accelerator	—	5,55	—
Master X-Seed 300 NEXT	—	—	5,55



- Mix 1 (0,65% PCE-based superplasticizer)
- Mix 2 (0,6% PCE-based superplasticizer + 1,5% CSH-based accelerator)
- Mix 3 (0,6% PCE-based superplasticizer + 1,5% Master X-Seed 300 NEXT)



MasterBoost 3000

MasterBoost 3000 is a strength-booster admixture specifically developed for sustainable concrete mixes with reduced clinker content.

It is designed to unlock strength development in binders with high levels of supplementary cementitious materials (SCMs), where traditional acceleration solutions often reach their limits.

At a mechanistic level, MasterBoost 3000 acts by enhancing the dissolution of key cement phases, increasing the availability of reactive species in the early stages of hydration.

By selectively stimulating these dissolution processes, MasterBoost 3000 boosts early hydration efficiency without compromising long-term phase development.

When combined with products from the Master X-Seed family and/or MasterCO₂re HES 30, MasterBoost 3000 operates within a complementary, multi-mechanism system.

While Master X-Seed technologies guide hydrate nucleation and growth and MasterCO₂re technologies optimize dispersion and water utilization, MasterBoost 3000 ensures a sufficient supply of dissolved cementitious species to fully activate these pathways. Together, these mechanisms enable maximum performance in concretes containing less than 50% clinker as binder, delivering reliable early strength development even in highly substituted, low-clinker cement systems.

Key benefits

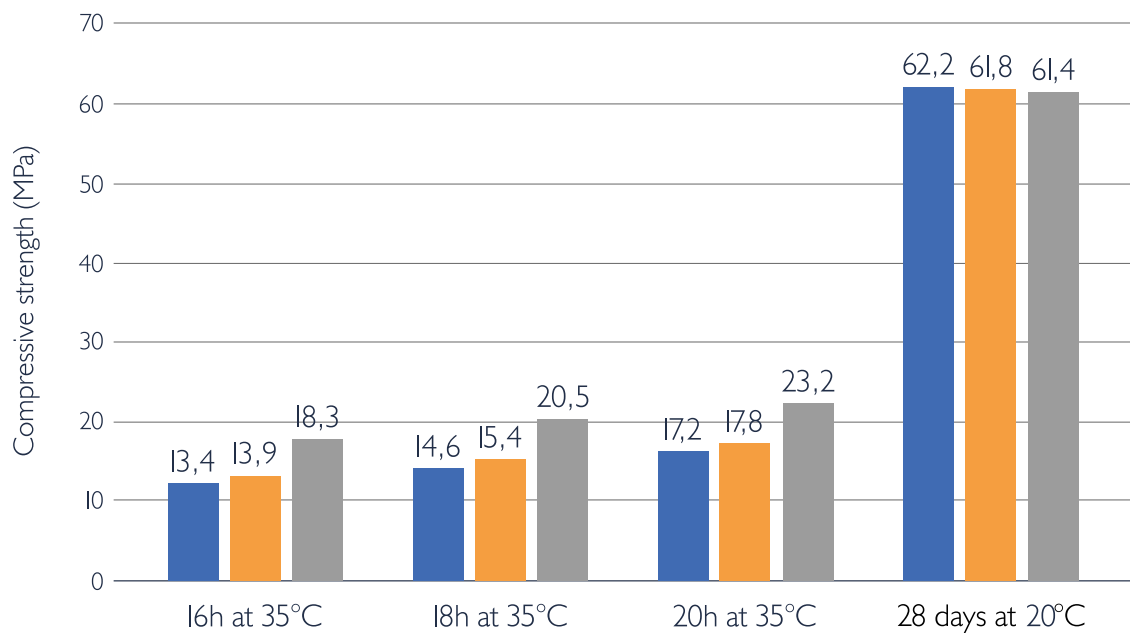
- Enhanced strength in low-clinker systems
- Improved performance with SCM-rich mixes
- Synergistic effect with acceleration technologies
- Greater flexibility in mix design
- Increased production reliability



MasterBoost 3000 application case

Boosting early strength development with high levels of SCMs

RAW MATERIALS	MIX 1	MIX 2	MIX 3
Sand	840	840	840
Gravel (d. max 16 mm)	970	970	970
Slag	216	216	216
CEM II/A-LL 52,5 R	144	144	144
Water	173	173	173
PCE-based superplasticizer	2,5	2,5	2,5
Traditional CSH-based accelerator	7,2	14,4	7,2
MasterBoost 3000	—	—	18



- Mix 1 (0,7% PCE-based superplasticizer + 2% CSH-based accelerator)
- Mix 2 (0,7% PCE-based superplasticizer + 4% CSH-based accelerator)
- Mix 3 (0,7% PCE-based superplasticizer + 2% CSH-based accelerator + 5% MasterBoost 3000)



Unlock the instinct of speed

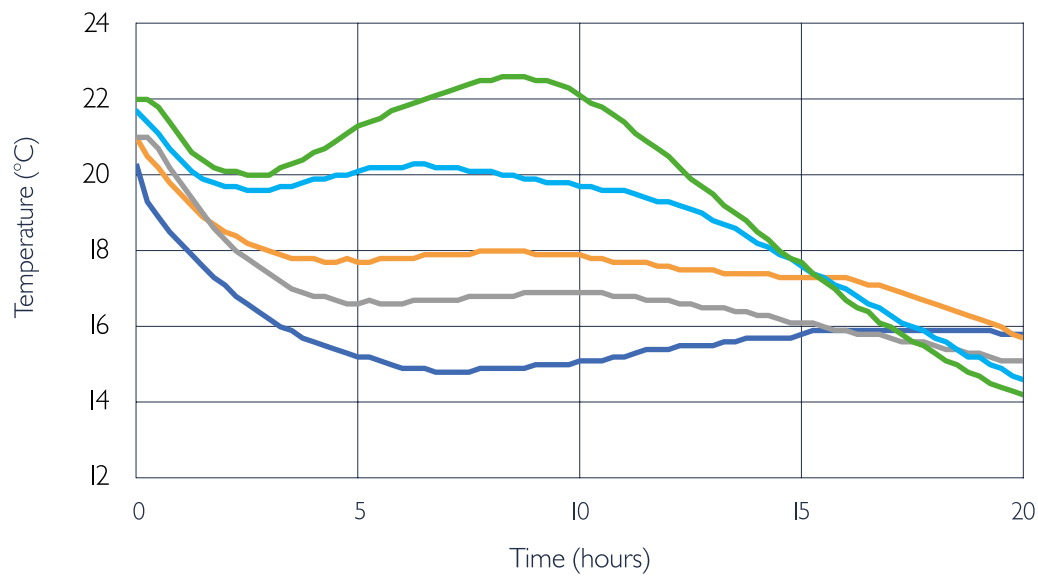
MasterCO₂re HES 30, Master X-Seed 300 NEXT, and MasterBoost 3000 form a flexible and high-performance acceleration package suitable to face today's challenges of the precast industry.

Laboratory tests confirm the effectiveness of the new admixtures package in accelerating early strength development across different curing conditions.

As shown in the performance tests, using the full 3-component package results in significantly higher early compressive strength, even at low curing temperatures, while maintaining comparable 28-day strength values. This ensures enhanced durability and reliable long-term structural performance.

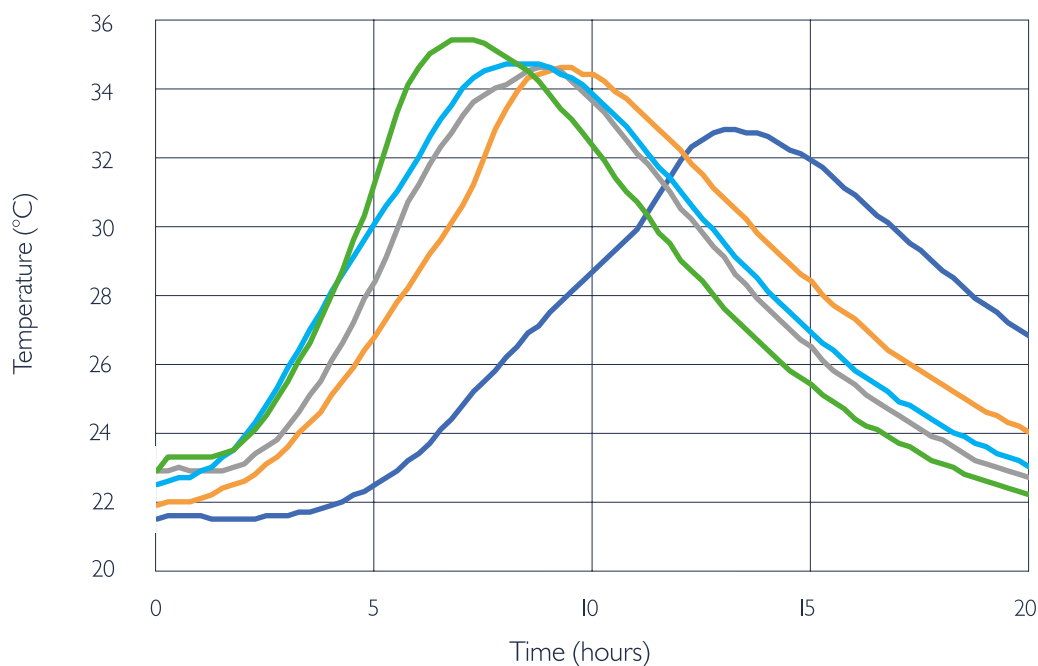
RAW MATERIALS	MIX 1	MIX 2	MIX 3	MIX 4	MIX 5
Sand	945	945	945	945	945
Gravel (d. max 20 mm)	930	930	930	930	930
CEM II/A-LL 52,5 R	400	400	400	400	400
Water	175	175	175	175	175
PCE-based superplasticizer	2,4	2,4	–	–	–
Traditional CSH-based accelerator	–	8	–	–	–
MasterCO ₂ re HES 30	–	–	4,8	4,8	4,8
Master X-Seed 300 NEXT	–	–	–	8	8
MasterBoost 3000	–	–	–	–	16

Temperature evolution of concrete cubes cured at 10°C

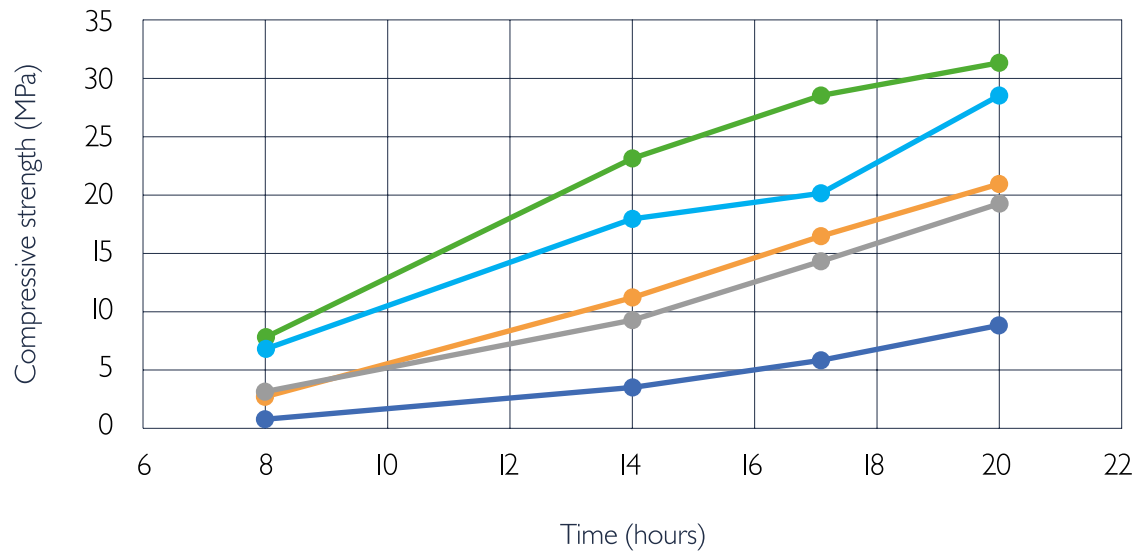


- Mix 1 (0,6% PCE-based superplasticizer)
- Mix 2 (0,6% PCE-based superplasticizer + 2% CSH-based accelerator)
- Mix 3 (1,2% MasterCO₂re HES 30)
- Mix 4 (1,2% MasterCO₂re HES 30 + 2% Master X-Seed 300 NEXT)
- Mix 5 (1,2% MasterCO₂re HES 30 + 2% Master X-Seed 300 NEXT + 4% MasterBoost 3000)

Temperature evolution of concrete cubes cured at 20°C

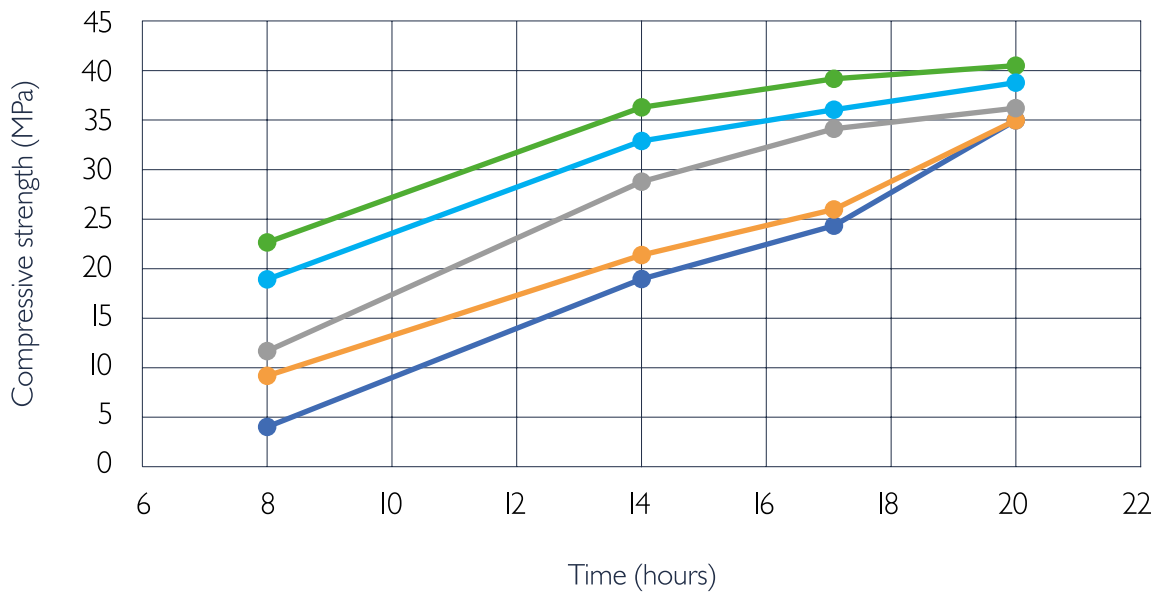


Early compressive strengths development at 10°C



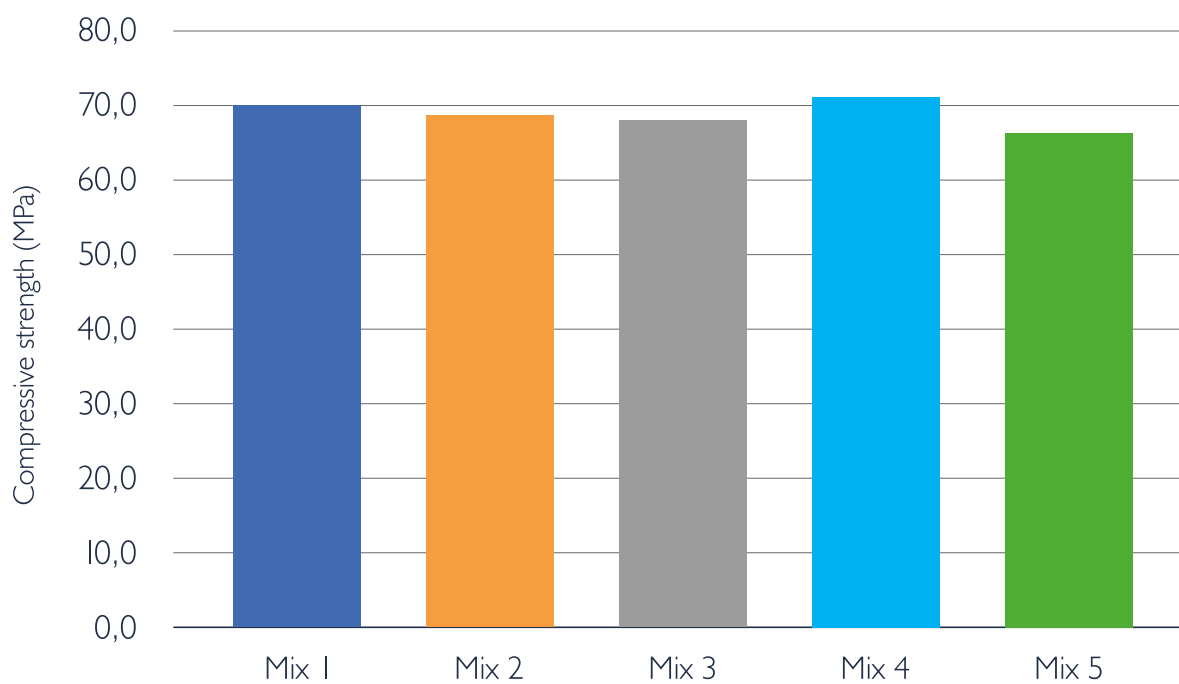
- Mix 1 (0,6% PCE-based superplasticizer)
- Mix 2 (0,6% PCE-based superplasticizer + 2% CSH-based accelerator)
- Mix 3 (1,2% MasterCO₂re HES 30)
- Mix 4 (1,2% MasterCO₂re HES 30 + 2% Master X-Seed 300 NEXT)
- Mix 5 (1,2% MasterCO₂re HES 30 + 2% Master X-Seed 300 NEXT + 4% MasterBoost 3000)

Early compressive strengths development at 20°C





Compressive strengths at 28 days



- Mix 1 (0,6% PCE-based superplasticizer)
- Mix 2 (0,6% PCE-based superplasticizer + 2% CSH-based accelerator)
- Mix 3 (1,2% MasterCO₂re HES 30)
- Mix 4 (1,2% MasterCO₂re HES 30 + 2% Master X-Seed 300 NEXT)
- Mix 5 (1,2% MasterCO₂re HES 30 + 2% Master X-Seed 300 NEXT + 4% MasterBoost 3000)

Master Builders Solutions® for the Construction Industry

MasterAir®

Complete solutions for air entrained concrete

MasterBoost®

Solutions for boosting early strength in ultra-low clinker systems

MasterCast®

Solutions for the manufactured concrete product industry

MasterCem®

Solutions for cement manufacture

MasterCO2re™

Solutions for low-clinker concrete

MasterEase®

Low viscosity for high performance concrete

MasterFinish®

Solutions for formwork treatment and surface improvement

MasterFiber®

Comprehensive solutions for fiber reinforced concrete

MasterGlenium®

Solutions for high performance concrete

MasterKure®

Solutions for concrete curing

MasterLife®

Solutions for enhanced durability

MasterMatrix®

Advanced rheology control for concrete

MasterPel®

Solutions for hydrophobization, anti-efflorescence and surface protection

MasterPolyheed®

Solutions for mid-range concrete

MasterPozzolith®

Solutions for water-reduced concrete

MasterRheobuild®

Solutions for high strength concrete

MasterRoc®

Solutions for underground construction and surface improvement

MasterSet®

Solutions for set control

MasterSphere®

Solutions for guaranteed freeze-thaw resistance

MasterSuna®

Solutions for sand and gravel in concrete

MasterSure®

Solutions for extraordinary workability retention

Master X-Seed®

Advanced accelerator solutions for concrete

Advanced Solutions for Concrete Acceleration

Faster strength development for more efficient and sustainable production

<https://info.master-builders-solutions.com/x-seed300next>

**Master Builders Solutions Deutschland GmbH**

Glücksteinallee 43-45
68163 Mannheim
Germany

constructionchemicalsinfo@masterbuilders.com

www.master-builders-solutions.com

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