



System Solutions for the Concrete Goods Industry

EXPERTISE
CONCRETE GOODS

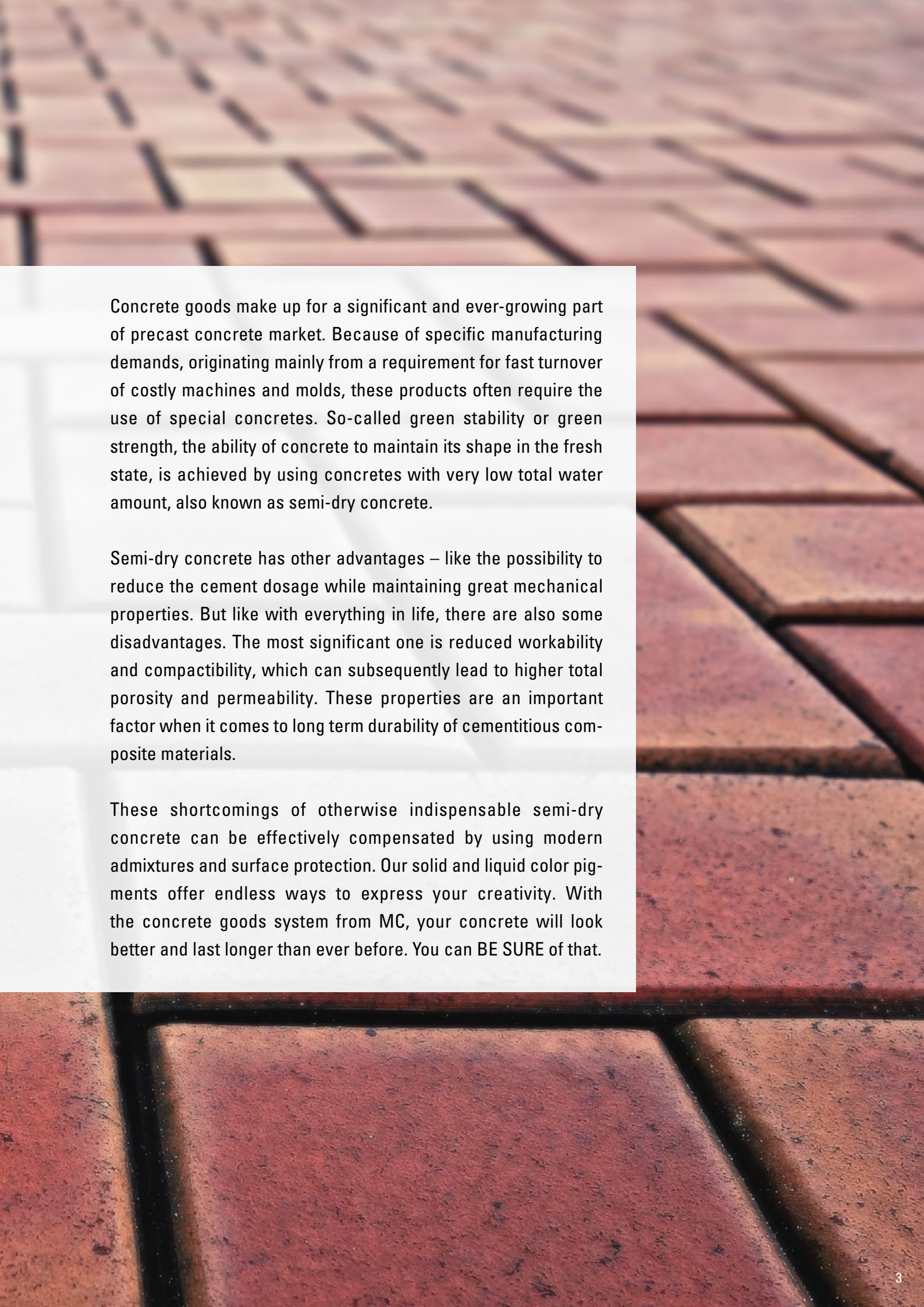




Cement, sand and gravel is up to you.

MC-Bauchemie takes care of the rest.

Compaction admixtures	04-05
Waterproofing admixtures	06-09
Color pigments	10-13
Surface protection	14-17
Machinery	18-19
Release agents	20-21
Intensive Compactor	22-23



Concrete goods make up for a significant and ever-growing part of precast concrete market. Because of specific manufacturing demands, originating mainly from a requirement for fast turnover of costly machines and molds, these products often require the use of special concretes. So-called green stability or green strength, the ability of concrete to maintain its shape in the fresh state, is achieved by using concretes with very low total water amount, also known as semi-dry concrete.

Semi-dry concrete has other advantages – like the possibility to reduce the cement dosage while maintaining great mechanical properties. But like with everything in life, there are also some disadvantages. The most significant one is reduced workability and compactibility, which can subsequently lead to higher total porosity and permeability. These properties are an important factor when it comes to long term durability of cementitious composite materials.

These shortcomings of otherwise indispensable semi-dry concrete can be effectively compensated by using modern admixtures and surface protection. Our solid and liquid color pigments offer endless ways to express your creativity. With the concrete goods system from MC, your concrete will look better and last longer than ever before. You can BE SURE of that.

Four factors that influence compactibility of semi-dry concrete

- 1. Additional water** improves workability and compactibility, but can increase capillary porosity and reduce mechanical properties.
- 2. Additional cement** can result in increased workability and compactibility, but also material costs and carbon footprint.
- 3. Longer compaction** with higher energy can lead to more compact concrete, but it also means increased power consumption and slower production.
- 4. Compaction aid admixtures** are developed specifically to bring all the benefits of enhanced compactibility with no drawbacks. They are often the most economical solution for uninterrupted production with constant quality.

Murasan Hydrotech 14	Compaction aid for concretes with higher fine particle content
Murasan Hydrotech 15	Compaction aid for concretes with requirement for reduced stickiness
Murasan Hydrotech 16 (eco)	Compaction aid for concretes with extra low water content
Murasan Hydrotech 802	Rheology modifying admixture that allows higher water content without loss of green stability
Murasan Hydrotech 860	Modern compaction aid for concretes with lower water content
Murasan Hydrotech 861	Modern compaction aid for concretes with higher fine particle content
Murasan Hydrotech 862	Modern universal PCE-based compaction aid
Murasan Hydrotech 863	Modern PCE-based compaction aid with improved performance in concretes with lower water content
Murasan Hydrotech 864	Modern PCE-based compaction aid for semi-dry concretes with higher density requirements



Murasan Hydrotech

Each block perfectly compacted. Every time.

In order to achieve the optimal turnover of molds and machines, concrete goods are generally produced from so-called semi-dry concrete. Its low total water content brings important benefits, but at the same time some disadvantages.

The advantages include improved green strength, the ability of concrete to hold its shape in fresh state, as well as the possibility to reduce the amount of cement in the recipe while still achieving good mechanical properties. This significantly improves the environmental and economical aspect of concrete goods production. Hand in hand with said benefits goes one obvious drawback. The workability and compactibility of semi-dry concrete is noticeably reduced. When not properly compacted, both mechanical properties and durability of hardened concrete can be impaired.

Our compaction admixtures bring a variety of benefits

- **Improved mechanical properties** as a result of more densely packed microstructure with less porosity.
- **Higher hydration degree** with selected products that allow adding more water with no effect on green stability. Higher cement hydration degree results in stronger concrete and more efficient production.
- **Enhanced visual aesthetics** thanks to more defined shapes and smoother surface, which results in brighter, more dynamic concrete colors.
- **Reduced risk of efflorescence** as a result of reduced water exchange between concrete and surrounding environment. However, an additional water-repellent admixture is highly recommended for maximum protection.
- **Faster and more reliable production** due to shorter production cycles and less equipment wear. Improved internal cohesion of compacted fresh concrete lowers the risk of defects.

Murasan Hydrotech Efflorescence and frost protection. Lasting and reliable.

Water is generally considered to be one of the main culprits of concrete degradation. It either directly or indirectly participates in processes which can lead to loss of mechanical properties as well as visual degradation. With concrete goods, this problem is amplified by characteristically higher permeability.

Regular concrete is considered to be fairly hydrophilic material. When the surface contact angle for water is 90° or lower, water wets the pores and capillaries and spontaneously fills them. With the right waterproofing admixture the surface contact angle can be increased significantly. This forces the water droplets to assume more spherical shape which are not able to penetrate the concrete without the help of external pressure.

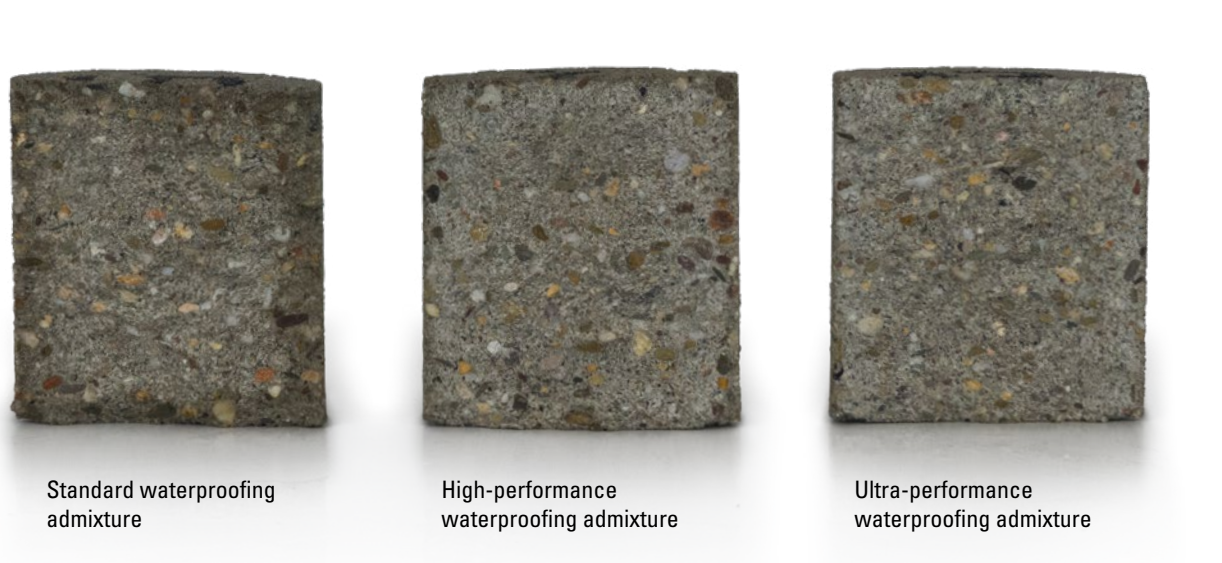
Hydrophobic (or water repellent) waterproofing admixtures should not be mistaken for integral waterproofing admixtures. Integral waterproofing admixtures are able to completely fill larger pores and voids, making it more difficult for water to penetrate deeper into the concrete. Hydrophobic waterproofing admixtures, on the other hand, are able to reach pores and capillaries that are several orders of magnitude smaller, thanks to their tiny, specially tailored molecules. This means that, with the exception of water under high hydrostatic or other pressure, hydrophobic admixtures can provide greater water resistance.

Improved frost resistance and reduced exposure to waterborne corrosive substances such as chlorides and sulphates results in extended long term structural robustness. At the same time, the susceptibility to efflorescence and growth of algae, moss and small plants are reduced substantially. All considered, waterproofing admixtures can prolong the lifetime of concrete goods while keeping them looking good, preventing all common water-related visual defects.



No waterproofing admixture





Standard waterproofing admixture

High-performance waterproofing admixture

Ultra-performance waterproofing admixture





Murasan Hydrotech 21

Classic 2-in-1 waterproofing admixture with a compaction aiding effect

Murasan Hydrotech 22

Classic standard waterproofing admixture

Murasan Hydrotech 873

Modern 2-in-1 waterproofing admixture with a compaction aiding effect

Murasan Hydrotech 883

Modern standard waterproofing admixture

Murasan Hydrotech 883 plus

Modern high-performance waterproofing admixture

Murasan Hydrotech 883 ultra

Modern ultra-performance waterproofing admixture



Murasan Hydrotech Effective protection against concrete degradation.

There are several ways in which liquid water contributes to concrete degradation. By degradation, we don't only mean the loss of strength and disintegration, but also purely visual phenomena reducing the aesthetical value of concrete.

Mechanical degradation

When water freezes, its volume increases by approximately 9%. If this expansion happens inside concrete's porous system the crystallization pressure can reach up to tens of megapascals, far exceeding the tensile strength of concrete, leading to cracking, spalling and eventually complete disintegration.

Chemical degradation

There are three main types of water-related chemical degradation:

- **Leaching waters** with low content of ions, especially calcium and magnesium. These waters slowly dissolve the cement stone, lowering mechanical properties and causing secondary efflorescence.
- **Acidic waters** that create easily soluble compounds with cement hydration products. These are then washed away, leaving behind nothing but incoherent aggregate grains.
- **Waters containing soluble chlorides and sulfides.** These can react with cement stone and form insoluble products with increased volume. This leads to a development of cracks and even total disintegration of concrete.

Visual degradation

One of the most common issues of concrete goods is efflorescence. It is caused by calcium hydroxide and water-soluble salts migrating towards the surface. The water then evaporates, leaving behind white deposits.

These negative occurrences are driven mainly by the exchange of water between concrete and the environment. Our waterproofing admixtures for concrete goods are specifically designed to prevent water from entering the internal capillary system of concrete. No water, no problem.

Murasan Color products from MC **Away with the grey.** **Pick a color.**

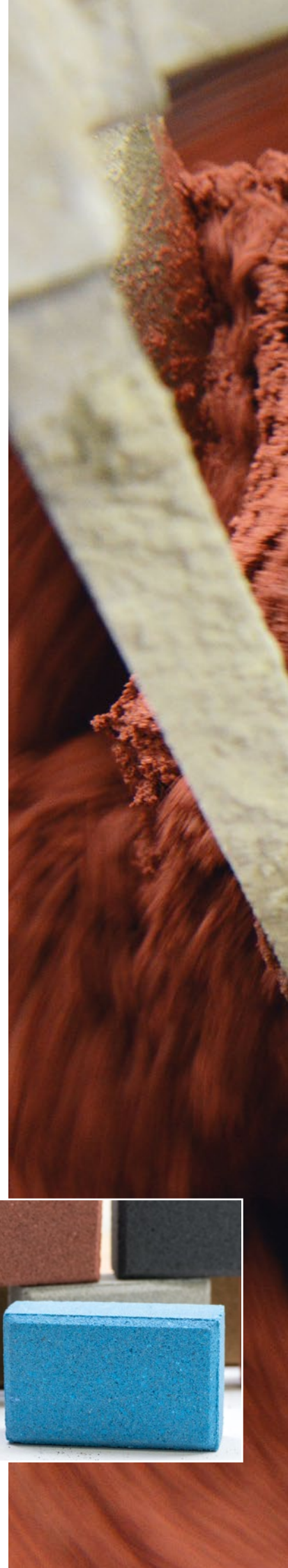
Coloring your concrete with pigments increases its aesthetic value and makes it stand out in the sea of grey. In addition to a wide range of black, brown, red and yellow we also offer green, blue and white pigments.

All powder pigments, slurries and granulates are compliant with the EN 12878 standard. That means they are produced using inorganic raw materials such as iron oxides, chromium oxide, cobalt oxide and carbon black. This guarantees that our pigments have good resistance against high pH environments (e.g. cement stone) as well as harsh weather conditions like UV radiation, high humidity and extreme temperatures.

We offer complete assistance in the selection of the right pigment for each application, as well as the supply and installation of the necessary dosing equipment.

To ensure the best possible color intensity and minimal fading over time, it is important to follow several principles:

- **Flawless concrete processing**, especially low water-to-cement ratio, good compaction and thorough curing.
- **Waterproofing admixtures** reduce the risk of efflorescence and water-related damages that prematurely degrade the concrete.
- **Surface protection** offers even higher degree of protection and can improve the aesthetics thanks to color-intensifying components.





MC-Bauchemie offers all three types of concrete pigments in the Murasan Color product range.

Powdered pigments Murasan Color P will not break the bank, liquid pigments Murasan Color L allow for clean and precise mixing and granulate pigments Murasan Color G combine the benefits of both. The right type of pigment and its color tone depends entirely on the concrete recipe, production conditions and desired visual characteristics.

Powder

- + Cost efficient
- + Best availability
- + Long shelf life
- + No extra water
- Extremely fine and dusty
- Harder to mix
- Mess in the production
- Less accurate dosing
- Not flowable

Liquid

- + Better color control
- + No dusting
- + Wider range of colors
- + Easier handling
- + Accurate dosing
- + Shorter mixing time
- Limited shelf life
- Sedimentation over time
- Can freeze in winter

Granulate

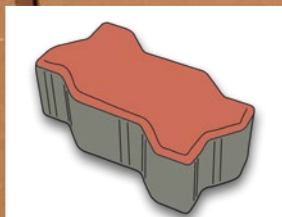
- + No dusting
- + Flowable
- + Easy handling
- + Accurate dosing
- + No extra water
- + Long shelf life
- Limited range of colors



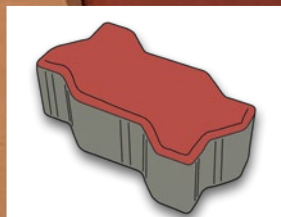
Standard colours on white cement



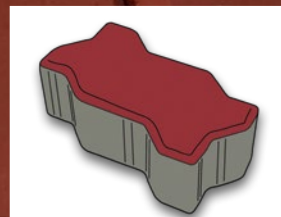
Standard colours on grey cement



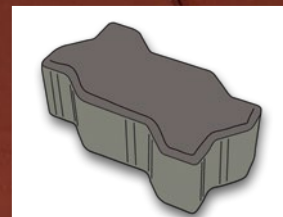
Murasan Color P Red 100
Murasan Color L Red 110



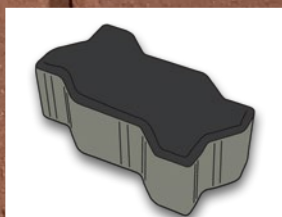
Murasan Color P Red 120
Murasan Color L Red 120



Murasan Color P Red 130
Murasan Color L Red 130



Murasan Color P Black 330
Murasan Color L Black 320



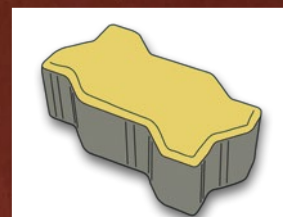
Murasan Color P Black 350
Murasan Color L Black 351



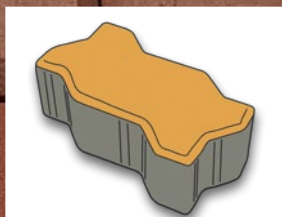
Murasan Color P Black 365
Murasan Color L Black 370



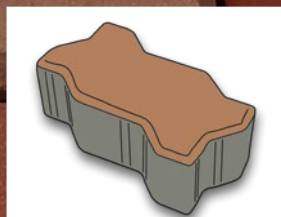
Murasan Color P Black 772
Murasan Color L Black 830



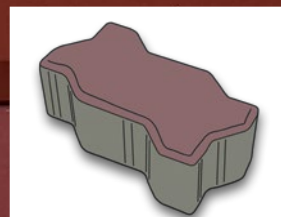
Murasan Color P Yellow 420
Murasan Color L Yellow 420



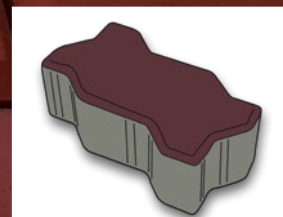
Murasan Color P Yellow 960
Murasan Color L Yellow 960



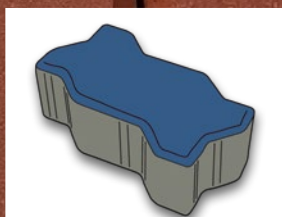
Murasan Color P Brown 610
Murasan Color L Brown 610



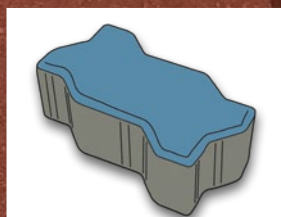
Murasan Color P Brown 655
Murasan Color L Brown 655



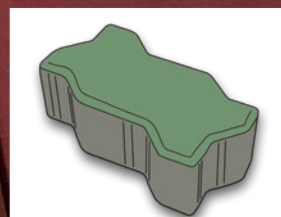
Murasan Color P Brown 686
Murasan Color L Brown 686



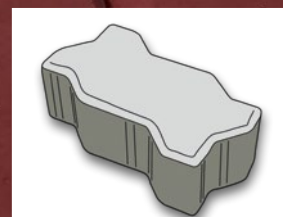
Murasan Color P Blue 5015
Murasan Color L Blue 731



Murasan Color P Blue 730
Murasan Color L Blue 730



Murasan Color P Green 740
Murasan Color L Green 744



Murasan Color P White 720
Murasan Color L White 720

Important: The colors shown are for reference only. The color tone depends on many influencing factors. Tests must be carried out before use.

Murasan Surface products from MC **Maximum surface protection. For a long time.**

Even at the best possible degree of compaction, concrete goods are known for their relatively higher open porosity.

Preventing the penetration of damaging substances into the concrete is the most effective way of preventing premature aging. When it comes to concrete degradation, water is most often the main culprit. Using a suitable surface protection significantly hampers or even completely prevents water from entering the concrete.

The damages preventable by surface protection can be split into two groups:

- **Damages negatively affecting structural integrity of concrete** such as cracking and spalling caused by crystallization pressure of ice and salts, gradual erosion caused by abrasive particles and mechanical wear caused by pedestrians and vehicles.
- **Damages causing visual deterioration** such as contamination caused by food and drinks, oil, petrol and other staining substances, discoloration caused by crystallization of water-soluble minerals on the surface (efflorescence) and growth of simple organisms like algae, moss and small plants.

While the second group has little to none effect on the functionality of concrete goods, all mentioned issues can lead to costly and time-consuming warranty claims and are preventable with a proper surface protection system.



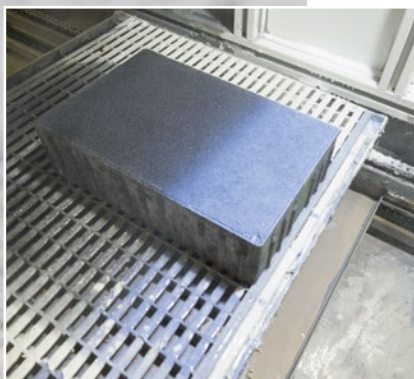


Product	Film formation	Degree of protection	Note
Murasan Surface 500 lite	●○○○○○	●○○○○○	Barely visible film
Murasan Surface 500	●●○○○○	●●○○○○	Colour enhancing effect
Murasan Surface 510	●●●○○○	●●●○○○	Colour enhancing effect
Murasan Surface 510 white	●●●○○○	●●●○○○	Only for white concrete
Murasan Surface 520	●●●●○○	●●●●○○	Colour enhancing effect
Murasan Surface 520 white	●●●●○○	●●●●○○	Only for white concrete
Murasan Surface 610	○○○○○○	●●○○○○	Only against non-pressurized water
Murasan Surface 700 primer	●○○○○○	●○○○○○	Primer for Murasan Surface 700 coat
Murasan Surface 700 coat	●●●●●●	●●●●●●	Requires UV lamp for curing

One of the most important characteristics of surface protection products are their recommended application conditions. Some products can only be applied on hardened concrete (dry side), while others are applicable immediately after production (wet side). Film-forming products create a visible coating on the surface while non-film-forming ones do not alter the natural concrete aesthetics.

Dry side

Some products, for example **Murasan Surface 610**, can only be applied on completely cured and hardened concrete. This is called the **dry side** of production. At this stage, concrete goods are generally ready to be packaged. To avoid delays, it is necessary to make use of additional production line equipment such as near infrared (NIR) and ultraviolet (UV) lamps.



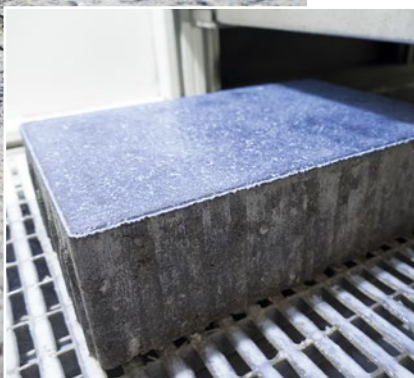
Wet side

The majority of our surface protection products are also applicable on the **wet side** of the production. The material then gradually sets together with the concrete in the curing chamber, therefore no additional equipment is necessary.



Film-forming

Film-forming products can be further divided depending on the layer thickness. An example of **slightly-film-forming** material would be **Murasan Surface 500 lite**. On the opposite side of the spectrum is then our two component, UV-hardened system **Murasan Surface 700**. In addition to extending the surface durability, our film-forming materials will intensify the color of any pigmented concrete. For white concrete we offer special versions with enhanced translucency.



Non-film-forming

Generally speaking thicker coating layer means better protection but also glossier and less natural looking concrete surface. A **non-film-forming impregnation** such as **Murasan Surface 610** provides significantly higher degree of protection against liquid water (compared to untreated concrete) with no visual change of the surface.



For the most uniform layer thickness and consistent performance with optimal utilization of material we highly recommend application of our surface protection products by spraying. Application by rolling, brushing or dipping is also possible but should be consulted first.

Equipment and machinery from BM **Have the right tools for the job. Get it done.**

Great admixtures, surface coatings and color pigments are just one part of our concrete goods system. In order to fully utilize the benefits of our products, we partnered with company BM-Anlagebau & Dosiertechnik GmbH, which will assist our customers with designing and building the perfect production line. Four groups of production equipment are available:

Dosing systems

Precise dosing of solid and liquid products. Volumetric or gravimetric, mobile or stationary, automatic or manual, every dosing system can be customized for particular needs and conditions of each production line.

Spraying systems

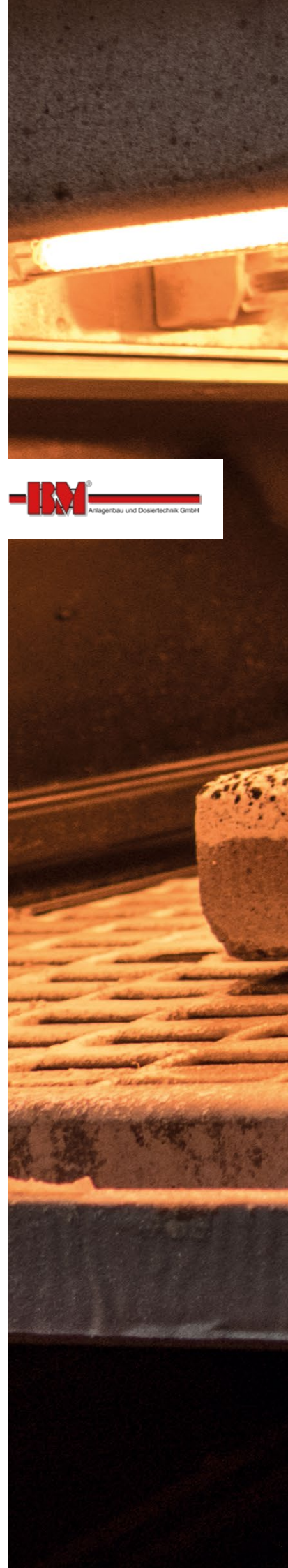
Efficient and accurate application of surface coatings and impregnations. The equipment is custom designed and expertly built using state-of-the art components. All parameters can be precisely set for a completely automated production.

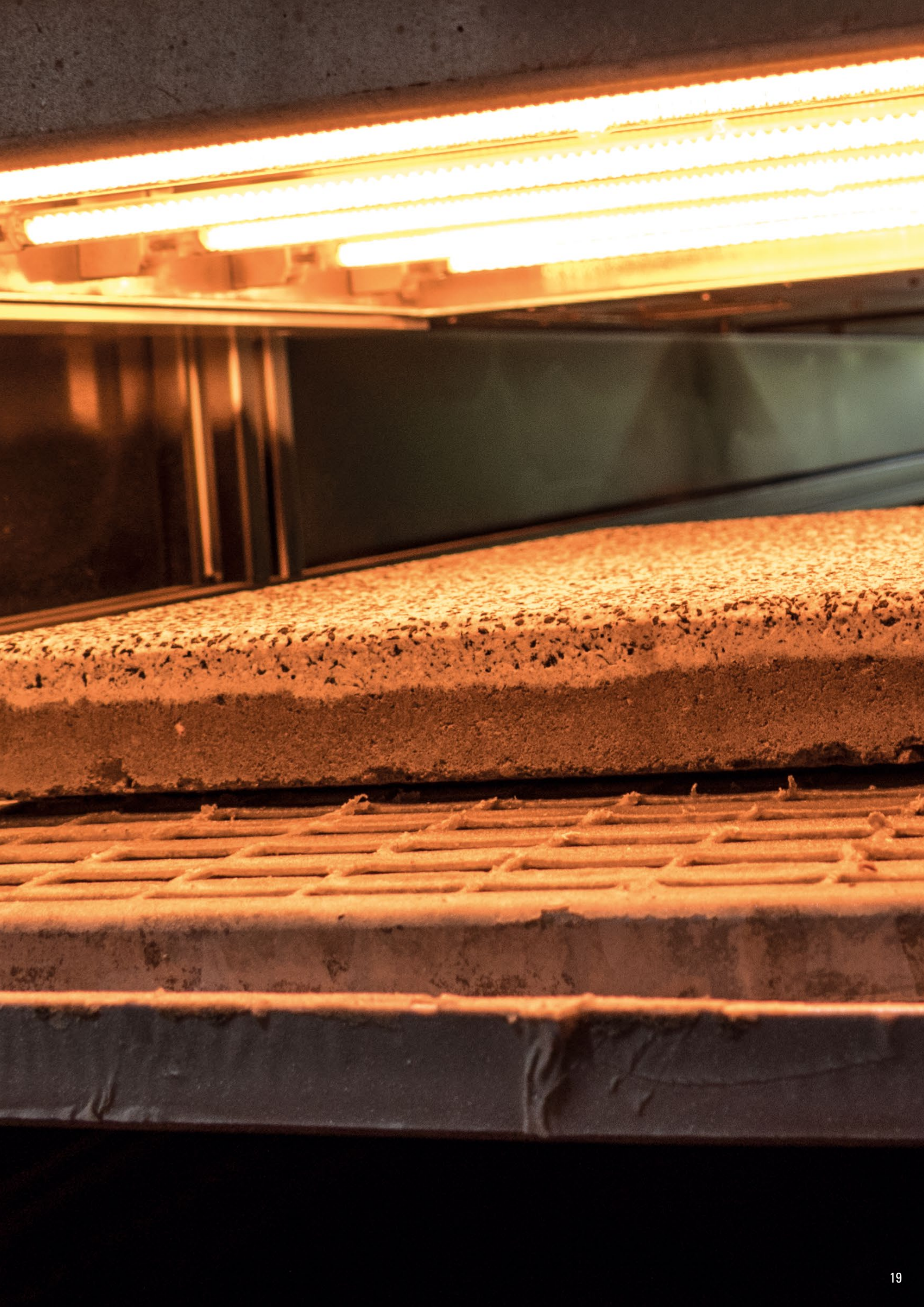
NIR drying equipment

Great for accelerated drying and curing of surface protection. When applied on the dry side of production, there is often not enough time for the surface protection products to properly dry and set before stacking and packaging. In order to optimize the production flow, a near-infrared radiator is the most efficient solution.

UV curing equipment

Necessary for hardening of our high-end Murasan Surface 700 system. The ultraviolet lamp used works in a spectrum that quickly initiates the polymerization but does not produce any harmful ozone. The whole hardening process takes place in a closed chamber with integrated ventilators for temperature control.










Ortolan products from MC Get perfect surface. Every time.

With decades of comprehensive experience, Ortolan release agents from MC-Bauchemie are the best solution for a clean and reliable separation between the form and concrete.

Using Ortolan not only ensures that the surface will look great, but also protects and preserves expensive steel equipment. This is especially the case for the products with optional enhanced corrosion protection. Even though our release agents come in a variety of viscosities, from low viscosity mineral oils to paste-like waxes – they are all easy-to-use and meet the highest occupation and environmental hygiene demands.

There are five main product lines in our Ortolan portfolio, each offering a unique combination of features:

- **Ortolan Basic** are robust products for the most conventional use cases. The main focus of Basic is good separation between concrete and formwork.
 - **Ortolan Classic** are our release agent all-rounders. They can be used in a broad spectrum of applications, offering good separation performance and high focus on surface quality.
 - **Ortolan Extra** meets the highest requirements for concrete surface aesthetics. Products are available in a range of viscosities stretching from mineral oil emulsions to thick wax pastes. Enhanced corrosion protection is optional.
 - **Ortolan Premium** are our top-of-the-line release agents. They are produced from high performance, low viscosity mineral oils, offering superb separation and highest possible surface quality. Included corrosion inhibitors protect and preserve steel forms.
 - **Ortolan Bio** are aqueous release agents based on renewable plant oils. Thanks to that, they offer an unparalleled environmental and user friendliness without sacrificing separation performance, high quality surface aesthetics and enhanced steel corrosion protection.
- 

Intensive Compactor

The ultimate tool for analysing no-slump concretes.

Compactibility is one of the most important measurable properties in the design of semi-dry concrete – using the correct quantity of the suitable aggregates, the lowest amount of cement needed, and just the right water-to-cement ratio is one thing. Chemical admixtures add a whole new dimension to the process.

With compaction aiding and rheology modifying admixtures, we can advance the concrete design and improve its visual aesthetics, mechanical properties and durability while simultaneously making it more economical and environmentally friendly. However, when we try to recreate the manufacturing process in the laboratory, we hit a roadblock. Even though we have devices to compact semi-dry concrete, there is no dependable method that can provide vibropress-level compaction energy delivery with the required precision. Except there is now.

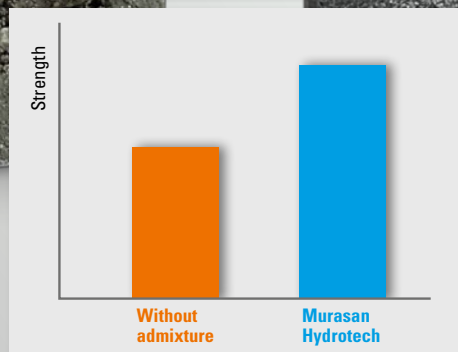
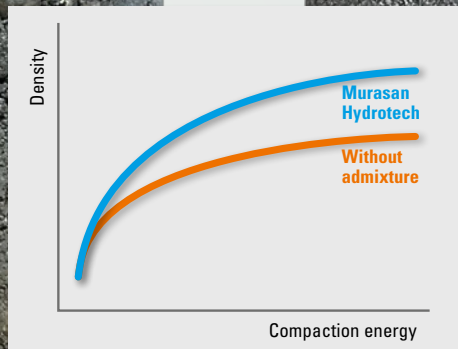
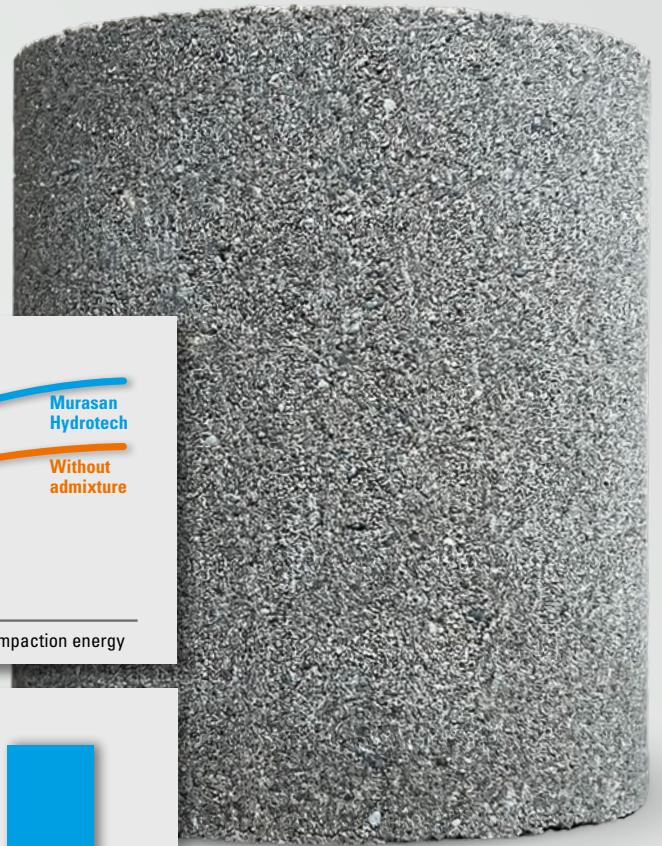
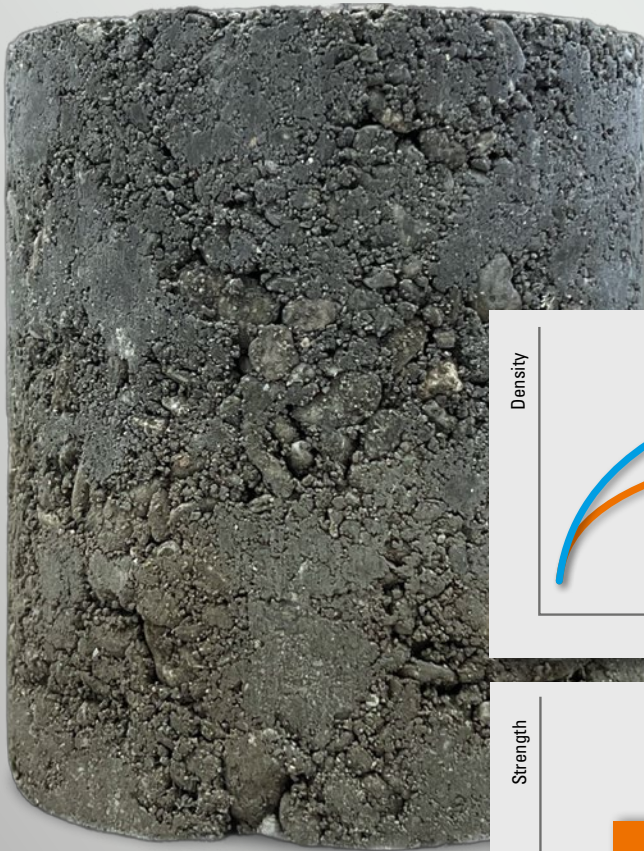
An intensive compactor is a laboratory device that enables for highly accurate and consistent testing of difficult-to-compact materials such as semi-dry concrete, screeds, or road concrete. The key advantage is the ability to precisely regulate and reproduce the compaction process speed and circumstances. Not only does this produce superb and consistent concrete specimens, but the machine also measures various compaction data and provides it for further assessment.

Thanks to this, we can quickly test products and optimise concrete recipes while using very little material. We can delve much deeper into the correlations between concrete recipe variables like cement content, aggregate type, and water-to-cement ratio by comparing compaction data with standard tests like water absorption or compressive strength. It also allows us to compare different admixtures at different dosages quickly and reliably.



Without admixture

With Murasan Hydrotech



Get the most out of your concrete

Finding the best ratio of sand, gravel, cement, and water for maximum strength and durability is a tricky problem. We can try out different variations with the given components quickly and reliably to find the best possible mix design.

Cost vs. carbon footprint vs. quality

Portland cement is the most important, most expensive, and least eco-friendly component of any concrete. We can support you in balancing the total cement content and carbon footprint of your concrete so that you get the most while saving money and the environment.

Save time and money in the production

The main advantage of semi-dry concrete goods – the possibility of automated mass production – creates a unique problem. The machines and the energy required to power them are not free. We can help increase production output while saving energy and maintenance costs by optimising the concrete's mix design.

Find the perfect admixture at the right dosage

Compaction aiding admixtures can provide benefits that pay for themselves almost immediately, such as increased strength, faster and less wasteful production, and the possibility of cement reduction.

System solutions for concrete goods

- Compaction admixtures
- Waterproofing admixtures
- Color pigments
- Surface protection
- Machinery
- Release agents
- Intensive Compactor

MC-Bauchemie Müller GmbH & Co. KG
Concrete Industry
Am Kruppwald 1-8
46238 Bottrop, Germany

Phone: +49 2041 101-50
Fax: +49 2041 101-588

CI@mc-bauchemie.com
www.mc-bauchemie.com



BE SURE. BUILD SURE.

Contact details

