

MC Report

## KineticBoost-Technology®

The new benchmark for floor coatings



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## Dear Reader,



Once upon a time, the idea of carrying out floor coating work with reactive resins in damp conditions and/or in the cold at around 2 °C, or indeed at temperatures in the 35 °C range, was rightly considered out of the question. However, the difficulties that once arose due to disruptive side reactions during any such attempts can now be assigned to the past.

With KineticBoost-Technology®, we have developed a new system that can also be reliably used in comparably adverse conditions. KineticBoost-Technology® is the basis of our MC-Floor TopSpeed range of high-performance coating products launched onto the market at the end of 2013 and successively and successfully expanded in the intervening years. Today it includes primers, repair mortars, coatings and sealants that all combine synergistically to allow floor coatings to be applied and finished within one day. We have thus created a unique product system that sets a new benchmark for industrial floors. You can read more about it in this issue's MC Report and in also the MC Innovation

section where we present our latest development MC-Floor TopSpeed flex, a high-performance crack-bridging coating.

Our products and solutions make a key contribution to ensuring the success of construction, repair and refurbishment undertakings around the world. In this issue of MC aktiv, which I gladly commend to you, we have focused on a number of interesting projects in Central Europe. We have also included some Group-internal reports. We are particularly delighted with the development of our company in Ghana, which has just opened a new production facility, giving us good reason for a celebration there. And as usual, we close the issue with news relating to our personnel, with the focus – in keeping with our priorities – once again on our upcoming talents and the career paths open to them in our company group.

I am sure, that this MC aktiv will once again have something of interest for you and, with that, I wish you a good read!

Kindest regards,

Dr.-Ing. Claus-M. Müller

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Whether in industry, multi-storey car parks, retail stores or new build constructions – the demands placed on floors are as varied as their use. Yet many established epoxy, PU and PMMA systems reach their limits in adverse environmental conditions such as the presence of moisture or excessively high or low temperatures. With KineticBoost-Technology®, MC has developed a new technology that can be used in such adverse conditions. A new standard.

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Grandstand view of the New Puskás Arena in Budapest. Named after the legendary Hungarian footballer Ferenc Puskás, Hungary's largest public building with a capacity of over 67,000 spectators has 15,000 m<sup>2</sup> of grandstand floorspace covered with MC-Floor TopSpeed flex, the flexible roll-on coating with impressive crack-bridging properties. More than almost any other floor coating material, this allows hardness and elasticity to be adjusted in advance from low to very high – something that the developers and planning engineers responsible for the state-of-the-art stadium utilised to the full – particularly as the work had to be carried out in the winter months.

Photo: MC-Bauchemie Hungary

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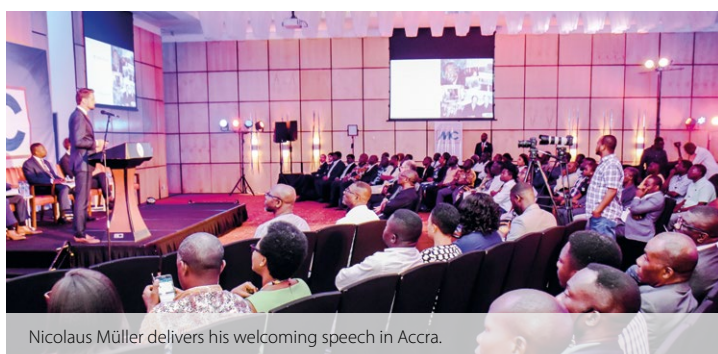
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Group picture of MC-Ghana with the MC leadership team.

## MC celebrates opening of new production facility in Ghana

On 17 July 2019, MC-Bauchemie Ghana Ltd. ("MC Ghana") celebrated the official launch of its business, with 100 representatives from politics, industry and academia as well as customers and partners all attending the festive inauguration of a new production plant in the Ghanaian capital of Accra.



Nicolaus Müller delivers his welcoming speech in Accra.

The team around Noble Bediako, Managing Director of MC Ghana, together with Moritz Koch, Business Development Manager responsible for local operations, have successfully built up a sales network in the West African country since the founding of MC Ghana at the beginning of 2016, getting the MC name known and recording numerous successes in the interim.

### New production facility

In Accra, MC Ghana has now commissioned another production plant, raising the manufacturing capacity of the Ghanaian company to a whole new level. "Here in Ghana, we don't need the entire MC product range;

instead, we produce some 16 different product groups, applying the same first-class quality standards that MC is known for worldwide, but with properties and attributes adapted to the needs of the regional construction sector," explains Moritz Koch. Managing Director Noble Bediako adds: "We already produce various concrete admixtures such as superplasticisers, retarders and hardening accelerators for our market. In our new facility, we will now also be manufacturing concrete repair products, grouting concretes and mortars, as well as waterproofing systems, thus offering our customers a comprehensive service with enhanced technical support."



Group picture of the MC management team (from left to right): Nicolaus Müller, Managing Director of MC-Bauchemie, Noble Bediako, Managing Director of MC Ghana, Christoph Hemming, Regional Manager Africa, and Moritz Koch, Business Development Manager.

### Ghana's booming construction sector

The construction sector accounts for around 14% of Ghana's gross domestic product and has been booming for a number of years now. Experts predict a further significant increase in growth this year in the wake of increased investment in infrastructure projects such as roads, seaports and housing.

"The economic situation in Ghana looks promising and the country has one of the most stable democratic systems on the continent. So it's important for us to continue to invest in this market," stresses Nicolaus Müller, Managing Director of

MC-Bauchemie to which Christoph Hemming, Regional Manager Africa at MC, adds: "Our primary motivation is to contribute with our products and systems to the development of a better and more sustainable construction landscape in Ghana. However, rather than aiming to establish a German company in Ghana, we want to grow a Ghanaian company with German know-how."

MC has long-standing business relations across the entire African continent and has been represented for several years by its own companies in Ghana and Guinea, and since the end of 2018 in Ethiopia as well.



An eye for detail: Oxal SM TK 5, MC's trass-bearing speciality mortar, impressed the clients both technically and optically by virtue of its natural ochre-toned sand colour.

## New façade for the National Museum in Prague

**When renovating historic buildings, planners like to use products that resemble the historical originals. In some countries, such as Germany, there are rules for the protection of historical monuments, and these will invariably require close similarity of appearance. During the restoration of the historical façade of the National Museum in Prague, special MC products were used which fully meet the exacting demands of heritage preservation.**

The reconstruction of the façades of the National Museum in Prague has been underway since 2014. After the damaged parts of the render had been removed, 35 sample areas were tested with different masonry mortars in different colours. At the end of this extensive trial phase, the client opted for Oxal SM TK 5, a special trass-bearing mortar from MC-Bauchemie for natural stone restoration. The mortar impressed both technically and optically by virtue of its natural ochre-toned sand colour.

### Impressive mortar credentials

For the National Museum, MC supplied the special mortar Oxal SM TK 5 in the colour R3, referred to for short as Oxal SM TK 5 R3. It has a maximum grain size of 4 mm, but can also be mixed with additional aggregate to raise

this to 8 to 10 mm. This allows the mortar to adapt even more effectively to the existing façade mortars and renders, in terms of both colour and grain structure. And it meant that integration with the existing covering could also be carried out without colour and quality deviations across the entire façade surface. In addition, larger layer thicknesses of 60 to 80 mm were possible in a single application.

In contrast to the other products tested, MC's special mortar was the only one to contain an alkali-free binder with high sulphate resistance. The introduction of alkalis would mean an increase in harmful substances attacking the fabric of the building. From alkalis especially, soluble salts such as sulphates, chlorides or nitrates can form more aggressive compounds such as Glauber's salt, which have a highly destructive effect on masonry. Added to this, Oxal SM TK 5 R3 is free from organic agents such as dispersions. These will never have been constituents of historical renders or mortars and would lead to disruptive side reactions.

### Rigid crack repair

During the reconstruction of the façades of the National Museum, cracks in the old masonry came to light and had to be repaired. In the structurally critical areas, these cracks were closed and sealed using spiral masonry anchors and ties and special Oxal AVG-QM mortar – a combination that has already been used successfully in many historic buildings, including in the Czech Republic.

The newly developed formula for Oxal SM TK mortar won the confidence of the clients during the test phase thanks to its ability to adapt to historical mortar and render mixtures and its natural sand colour. At the same time, the application company was able to rely on comprehensive advice and support from Lukaš Pečenka, MC's specialist for the restoration of historical buildings in the Czech Republic.

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Before and after images of the restored historical façade of the National Museum in Prague.



# Tett nang Palace restored to former glory

Commissioned by the state authorities of Baden-Württemberg, the several painstaking years of restoration work on the New Tett nang Palace have resulted in great success. Exuding fresh splendour, the Baroque "chateau" complex was awarded the title of "Palace of the Year" in 2018. MC was also able to contribute to the success of the project with its moisture regulating and salt transport plaster system Exzellent STP.

Each year, the Palaces and Gardens Authority of the state of Baden-Württemberg awards a monument with the title "Palace of the Year" where extensive state investments have been made in making such heritage sites more future-viable. And last year, the impressive New Tett nang Palace was an obvious choice. The New Palace, designed as a four-winged complex and built in the late 17th century as the residence of the Counts of Montfort, is one of the most beautiful Baroque chateaux of the Upper Swabia region. Between 2011 and 2018, the state of Baden-Württemberg invested around 9.1 million euros in the complete restoration of the structure. The building with its four corner towers received a finely shaded appearance in light gold ochre – very much reminiscent of the look it must have had in previous centuries.

## Integrated moisture regulation and salt transport system

For the repair of the base areas, which consisted of mixed masonry exposed to constant moisture and salt ingress over the years, with extensive damage ensuing, the client opted for Exzellent STP, MC's moisture regulating render system. This has already been widely and successfully used over many years in the repair of heritage structures and old masonry contaminated with moisture and salt. It was applied in three construction phases between 2014 and 2017 to both the outer walls and the inner courtyard.

After the removal of the old render, Exzellent STP 540 was initially applied as a pre-spray primer. A

grey trowelling render, this product is a good adhesion promoter on smooth surfaces. In the next step, Exzellent STP 540 was again used, this time as a levelling coat. Finally, Exzellent STP 700 was applied by spraying, perfectly matching the "new, old" appearance of the palace with its pale yellow colour. A total of around 350 linear metres of plinth was repaired. The render system is unsusceptible to mildew attack as well as being resistant to weathering, flooding and splash/spray water. Exzellent STP can be used on salty and damp masonry up to a moisture penetration level of 95%. The special macro-pore geometry, combined with the high lime content of the non-hydrophobic render and the greatly shortened diffusion path that results, enables a significantly faster release of moisture into the environment compared to conventional restoration renders and plasters. This ensures permanent moisture regulation and sustained transport to the surface, where the dissolved salt crystallises without damaging the façade.

## Preserved cultural heritage

At the opening ceremony, Gisela Splett, Baden-Württemberg's Secretary of State for Finance, was visibly delighted: "Finally we see Tett nang Palace returned to its baroque splendour! Through the successful collaboration of the many specialists involved, we have succeeded in not just preserving our cultural heritage but also in bringing it right back to life."

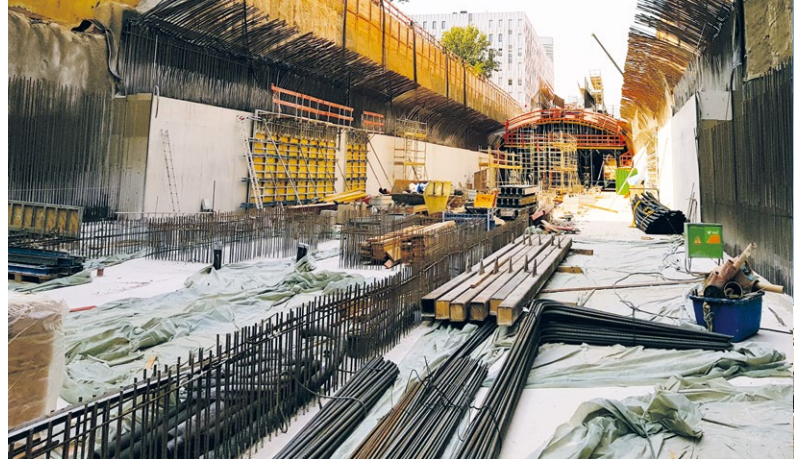
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The damp and salt-laden base area of the palace was repaired with Exzellent STP. Conventional restoration plaster is capable of enabling moisture transport of 150 to 250 ml per m<sup>2</sup> per day. Exzellent STP, on the other hand, can transport up to 2100 ml of moisture per m<sup>2</sup> per day, provided the moisture is present in the masonry in the first place.



View of the new underground S-Bahn station Gateway Gardens, built using the cut-and-cover construction method: Thanks to the release agent Ortolan Basic 761, the exposed concrete walls of both the tunnel and the metro station exhibit a high-quality fair-faced finish.



## Ortolan for reliable concrete stripping

**On the outskirts of Frankfurt am Main, a new railway line is currently being built between the airport station and the “Stadion” (stadium) station to connect the Gateway Gardens development area. A double-track tunnel is also being constructed, adjoined by the new underground “S-Bahn” (metropolitan railway) station serving Gateway Gardens. Thanks to the release agent Ortolan Basic 761, the exposed concrete walls of both the tunnel and the metro station exhibit an immaculate fair-faced finish.**

In addition to the construction of the new Gateway Gardens stop, the planned S-Bahn connection includes the relocation of the S-Bahn line between Frankfurt Stadium and Frankfurt Airport Regional Station. Around two kilometres of the new line run underground in a double-track tunnel, most of which will be constructed using the cut-and-cover method. The client, German railway operator Deutsche Bahn, commissioned Wayss & Freytag Ingenieurbau AG of Düsseldorf with this major construction project valued at an estimated 223 million euros. The civil engineering work began in 2016.

### Challenging concrete works

The tunnel has since been built in the form of a rectangular frame structure made of various concrete components cast on site, requiring wall thicknesses of up to 180 cm. With these dimensions, it is not just the high level of heat development due to hydration that constitutes a significant challenge; also the fitting

of the walls with large quantities of structural steel and the small clearances available for vibrating the concrete can give rise to major porosities and shrinkage cavities. This problem is particularly acute in the area of the new underground S-Bahn station, where exposed concrete class SB 3 is required.

### The right concrete release agent

Given the size of the concrete components required, cement containing granulated slag was used in their production. It sets more slowly, develops less hydration heat and reduces early cracking in the concrete. The disadvantage: The freshly demoulded or stripped concrete surface can temporarily develop a greenish-blue tinge. However, the release agent used can have a significant impact in this regard. Its effect on the colour of the concrete is an aspect that is frequently underestimated. Extensive preliminary tests had to be carried out in order to determine which release agent would guarantee an unadulterated concrete grey finish after stripping. Ortolan Basic 761 was the only concrete release agent able to consistently convince in terms of quality during these trials: While the blue colour caused by other products actually changed to darker tones and even to black after stripping, Ortolan did not produce any discoloration once hydration had been completed.

### Ortolan separates, preserves and protects

Ortolan Basic 761 is a high-quality concrete release agent from MC with a universal performance profile. It is robust enough for the construction site and has been successfully tested for all types of formwork. It preserves and protects steel formwork yet also prevents swelling, warping and the drying-out of timber formwork. Its very good release and separating effect in summer and winter also ensured that the concrete in the Frankfurt project had an impressively attractive fair-faced finish. Ortolan Basic 761 also scores high in terms of its harmlessness to users and the environment alike: It is classed as a non-hazardous substance, corresponds to the water hazard class WHC 1, and is quickly biodegradable with a degradation rate > 99 % after 28 days. It is particularly easy to spray and economical in dosage and use. The section with the new station is to go into operation for the timetable change on 15 December 2019 so as to relieve the load on the surrounding roads.

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View of the sealed S-Bahn (metro) station.





The stupa in Wagram represents peace and understanding.

## New approach to temple construction in Austria

**Close to the romantic Grafenegg Palace in Lower Austria, the domed building of a Buddhist shrine is currently under construction. Even though the list of unusual buildings in which MC products have been used is long, this project is something special.**

The shrine or "stupa" is nestled in the gentle hills of the traditional Wagram wine-growing region. After its completion, it will be the largest stupa in Europe with a diameter of 30 m and a height of 33 m. The stupa is a symbol of peace, where all people, regardless of their denomination, are invited to experience calming silence and reflection. According to traditional Buddhist teaching, it brings happiness to all those who see it, circle it clockwise, or meditate in its vicinity.

The building project, planned and executed exclusively with private funds of the Stupa Institute under the direction of the Buddhist monk and scholar Bop Jon Sunim, began in 2018. The tower-like central section is surrounded by three accessible

floors and consists of bricks, adobe plaster, concrete and lime from the region. The dome and the spire are timber-supported. The construction reflects the intention to "defuse the forces of chaos and negativity, and generally express spirituality, wisdom, love and compassion for humanity and all living things", as stated by the funding body.

### The right release agent for a perfect finish

The exterior of the temple of peace is a central element of this extraordinary architecture. For the structure, the three levels are traditionally built one after the other in a clockwise direction from bottom to top. Here, very high demands were placed on the concrete appearance of the balcony balustrades and the banisters.

Consequently, instead of in-situ concrete, high-quality precast elements were used. These were manufactured by Franz Seidl & Sohn GmbH of Altwieira in Austria, a company known for high-quality concrete components made from ecologically sound raw materials. Working together with MC, the company developed a special concept to achieve the desired concrete finish on the back of a high-performance release agent. The decision was made to use Ortolan Extra 732, a specially formulated separation oil from MC that is particularly suitable for achieving attractive fair-faced concrete surfaces.

### White fair-faced concrete cosmetics instead of paint

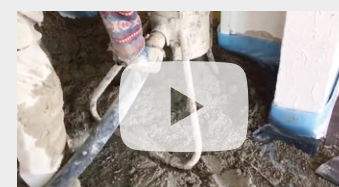
The balustrades of the building were originally to be finished with a white

paint. In the end, however, the client followed MC's recommendation to uprate their appearance with fair-faced concrete cosmetics, with impressive results ensuing from the use of white Emcefix-Spachtel F lang filler compound. The surface, which had been optimised by hand, was now visually better suited to the adobe-plastered walls, allowing the concept of purely mineral surfaces to be retained. And there was the added advantage that the originally planned painting stage could be scrapped.

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## Screed ready for covering after three days

A beach snack bar in the Baltic seaside resort of Kühlungsborn needed a new screed floor with an area of 40 m<sup>2</sup>. In order to minimise any loss of earnings, the owner decided to get the job done quickly with Powerscreed RS Binder, an MC special. Powerscreed RS Binder sets very quickly, cures rapidly and deformation-free and therefore ensures both fast accessibility and early readiness for covering. The quick-acting cement is mixed with 0/8 screed sand in a ratio of 1:5 to create a screed mortar compliant with EN 13813, ensuring that the w/c ratio does not exceed 0.45. For the Kühlungsborn job, 70 kg of Powerscreed RS Binder was used per batch to ensure readiness for covering after just three days. And it worked: The screed was laid on Friday 5 April 2019 and was ready for tiling on the following Monday. As quick-acting cements are generally more difficult to apply than normal cements, new MC-Easyscreed plasticiser was also added to the screed mix as a precaution. It reduces the screed's resistance to levelling and thus significantly improves its workability, as can be confirmed by delighted applicator Mike Köhnke of SoKo Fussboden GmbH.



Use this link to access a video of the application.



<https://youtu.be/n9On6iYO5ts>

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# KineticBoost-Technology® – the new benchmark for floor coatings

Whether in industry, multi-storey car parks, retail stores or new build constructions, the demands placed on floor-laying are as varied as the floor usage profiles themselves. Yet many established epoxy, PU and PMMA systems reach their limits in adverse environmental conditions such as the presence of moisture or excessively high or low temperatures. MC-Bauchemie has developed a new technology that can also be used in such adverse conditions, facilitating the fast laying of aesthetically attractive and durable floors. MC's KineticBoost-Technology® sets a new benchmark for industrial floors while expanding the application spectrum in terms of time and geography, i.e. both far into the winter and into tropical regions such as Southeast Asia.

## Advantages and disadvantages of common floor coatings

Reaction resin-based floor coatings offer longer service lifetimes than mineral floors, can be laid joint-free and are impact-, scratch- and shock-resistant. With their completely smooth surface, they can be kept clean even under difficult hygienic conditions. In addition, they are exceptionally resistant to a variety of chemicals and are extensively immune to high temperature fluctuations, such as can occur in food processing plants.

The reaction resin-based liquid plastics in question are supplied and applied in the form of 1-, 2- or multi-component products. While 1-component products usually harden due to the

humidity in the air, 2-component and multi-component products undergo a chemical reaction between the base resin and a hardener or catalyst in the liquid plastic. After a certain reaction time, the liquid plastic cures to provide a seamless sealant over wide areas. In general, it can be said that a PMMA-based liquid plastic reacts particularly quickly, epoxy resins are characterized by their high mechanical and chemical resistance, while polyurethanes (PU) exhibit elastic properties. Such products can therefore be used in a wide range of applications – from decorative and design flooring to extremely hard-wearing and chemical-resistant industrial floors. However, they all have one disadvantage in common: In the presence of moisture, the hardening

process is invariably accompanied by disruptive side reactions.

## Disruptive side reactions

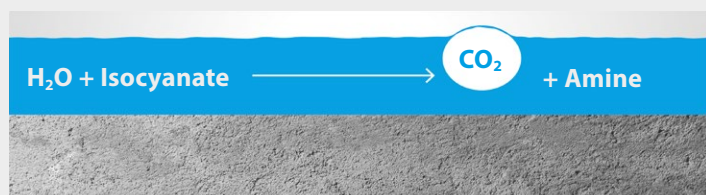
When exposed to moisture and carbon dioxide, epoxy resins form solid white carbamate, while the catalyst of the PMMAs can disassociate and lose its effect. Within polyurethanes, the isocyanate component reacts with water to form CO<sub>2</sub>, and this in turn can lead to undesired bubble formation within the coating (see diagram below). Hence the application of classic reactive resin coatings under conditions of high humidity (> 80% RH) is highly problematic. Since these conditions can arise in many regions of the world, planners, builders and applicators alike are fre-

quently frustrated as coating work falls behind schedule.

## The solution: MC-Floor TopSpeed

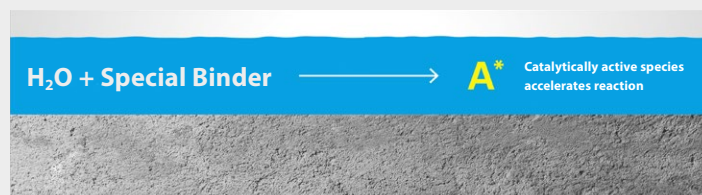
In order to solve the problem of restricted application possibilities, MC has developed MC-Floor TopSpeed, a special resin system for flooring in industry and building construction with the specific advantage of suitability for use under adverse environmental conditions. This innovative coating system is based on a new special binder chemistry featuring KineticBoost-Technology®. It enables coating work even in high humidity and in the presence of moisture in the substrate, combined with a wider temperature range from 2 to 35 °C. With MC-Floor TopSpeed, both interior

## Disruptive side reactions in PU coatings



In addition to the desired formation of the polymeric lattice through the urethane links created, the isocyanate-containing hardener component in PU coatings can also undergo disruptive side reactions with water, resulting in the formation of gaseous carbon dioxide which leads to bubble formation in the coating.

## No disruptive side reactions when coating with KineticBoost-Technology®



MC's new coating system based on KineticBoost-Technology® is characterised by the fact that the kinetic reactivity of the system is altered so that the water is trapped by the special binder and a catalytically active species is formed. The intercept reaction combined with extreme acceleration means that the water is prevented from reacting with the isocyanate groups.





Photo left: View inside the new production facility of Resch & Frisch, one of Austria's biggest bakers and bakery chains. Resch & Frisch opted for a floor coating with MC-Floor TopSpeed, as construction began in winter and the residual moisture of the screeds was too high to provide them with standard EP or PU coatings. Photo above: View inside the New Ferenc Puskás Arena in Budapest. There, 15,000 m<sup>2</sup> of grandstand flooring was coated with MC-Floor TopSpeed flex, the flexible roller coating with crack-bridging properties.

and exterior industrial floors can be primed and coated within a few hours and then fully loaded after no more than a brief curing period.

### **KineticBoost-Technology® explained**

The accelerated hardening of MC-Floor TopSpeed is the result of the KineticBoost-Technology® developed by MC. The kinetic reactivity of the system is altered so that the water is trapped by the special binder and a catalytically active species is formed. The intercept reaction combined with extreme acceleration means that the water is prevented from reacting with the isocyanate groups. Since the reactivity of such coating materials remains virtually unchanged even at low ambient temperatures, MC-Floor TopSpeed can be safely applied even at high humidity and low temperatures just above freezing. This also means that there is no more freeze-thaw sensitivity and no squinting at the hygrometer. Plus, due to the speed with which the coating dries and the fact that it is rainproof within 30 minutes, the otherwise often significant risk of precipitation can be almost ignored.

### **Fast coating application, reduced cost**

All the components of the KineticBoost-Technology® system use ambient

moisture to boost the curing process. KineticBoost-Technology® also increases the adhesion, abrasion resistance and scratch resistance of the coating. A coating job can be completed from start to finish in one day, enabling planners to save their clients time and money, not least because of the fewer trips to site. In addition, work can also be carried out under poor weather conditions without the area having to be enclosed or heated. Moreover, such coating can also be carried out with revenue-earning operations still ongoing, as the following examples show.

#### **Use on car park surfaces**

MC-Floor TopSpeed demonstrated all its advantages during repairs carried out on the car parking areas of the Europa shopping mall in Banská Bystrica, Slovakia. The car park is located on the roof of the shopping centre, and the ageing concrete surfaces were saturated with moisture. Therefore, a solution with a coating system open to water vapour diffusion as well as being UV-stable and non-slip was required.

Scheduled for the middle of summer, when rain showers combined with intense heat are common in the region, the remedial coating work with MC-Floor TopSpeed was undertaken while the mall was still open for business. After the 12,000 m<sup>2</sup> of old

concrete surface had been abraded and prepared, it was primed with MC DUR 1320 VK. The subsequent scratch coat, again with MC DUR 1320 VK, was spread with 0.3 to 0.8 mm quartz sand. After the excess sand had been vacuumed off, a top coat of MC-Floor TopSpeed, pigmented concrete grey to RAL 7023, was applied over the entire surface using a hard rubber rubbing board and then roller-finished in a criss-cross pattern. The fast curing process meant, of course, that the downtimes for the car park areas under repair were much shorter – an additional cost advantage that appealed to both the planners and the investor.

#### **Application in winter**

More than almost any other floor coating material, MC-Floor TopSpeed allows hardness and elasticity to be adjusted in advance from low to very high – something that the developers and planning engineers responsible for the New Ferenc Puskás Arena utilised to the full. Named after the legendary Hungarian footballer Ferenc Puskás, Hungary's largest public building with a capacity of over 67,000 spectators has 15,000 m<sup>2</sup> of grandstand floorspace covered with MC-Floor TopSpeed flex, the flexible roll-on coating with impressive crack-bridging properties (for more information on the product, go to page 13).

Since the coating of the half-covered areas had to take place in November and December 2018, a classic OS 11 system was out of the question. After all, the work would also need to be carried out at freezing temperatures and between falls of snow and rain. Relative humidity was a constant 80 to 90 percent. In some places, areas which had only been coated a couple of hours earlier were hit hard by wind and snow. Yet MC-Floor TopSpeed flex was also able to withstand these extreme weather conditions. Thus, areas of 1,000 to 1,500 m<sup>2</sup> were coated daily by a team of six to eight applicators. The clients and planners also chose MC-Floor TopSpeed flex because new or young concrete surfaces can still crack – a big problem if inflexible floor coatings are employed. MC-Floor TopSpeed flex is able, without cracking, to bridge static cracks up to 0.8 mm at 23 °C or 0.4 mm at –10 °C as well as dynamic cracks up to 0.15 mm at –10 °C.

#### **Ideal for the food processing industry**

A similar challenge was met by MC-Floor TopSpeed in Upper Austria, where Europe's most modern bakery covering an area of 56,000 m<sup>2</sup> is being built in Gunkskirchen, southwest of Linz. The project, commissioned by

*Continued on page 10*



MC-Floor TopSpeed was able to demonstrate its suitability for application in damp conditions and its ability to become rainproof in just 30 minutes during repairs carried out on the car parking areas of the Europa shopping mall in Banská Bystrica, Slovakia.

Continued from page 9

the family business Resch & Frisch and planned in several stages, was started in the second half of 2017. Planning engineers Machowetz and Partners brought in MC to provide the floor coating solution. A decisive criterion in the selection of the floor coating products here was again moisture compatibility, as construction began in winter and the residual moisture of the screeds was too high to provide them with standard EP or PU coatings. After preparing several sample surfaces and visiting a reference project, the client and planners finally decided unanimously in favour of MC-Floor TopSpeed. The work started in September 2017. A total of 35,000 m<sup>2</sup> of ceiling coating and a further 12,000 m<sup>2</sup> of floor coating with MC-Floor

TopSpeed, TopSpeed SC and T are scheduled to be completed by 2022.

#### Systematic surface protection

From substrate preparation to final coating, application of the MC-Floor TopSpeed system requires no more than conventional tools such as rubber squeegees, scrapers/doctor blades and fleece rollers. To achieve optimum adhesion to the substrate, the floor surface is prepared with a concrete grinder or a shot peening machine. Defects and fractured areas can be repaired with the low-viscosity, fillable reaction resin MC-Floor TopSpeed SC. The subsequent priming, coating and sealing coats are then simply applied with a roller. Boundaries and plinth areas can be masked or simply bordered using a brush. The

system also offers creative scope in the design of the floor: MC-Floor TopSpeed is available in different colour tones as well as transparent, matt or flexibilised. Complete system structures with and without decorative chips are simple, safe and quick to implement.

#### More scope in floor coating

Epoxy-, polyurethane- and PMMA-based coating systems reach their limits in the presence of moisture or in excessively high or low temperatures. MC-Bauchemie's new reactive resins based on KineticBoost-Technology®, on the other hand, extend the range of applications for floor coating. They enable safe, fast coating even under critical environmental conditions such as low temperatures

down to 2 °C, high temperatures up to 35 °C, high humidity, and moisture in the substrate. All the system components use ambient moisture to boost the curing process. This ensures very good adhesion to all concrete and screed substrates and exceptionally high mechanical wear resistance. Planners, investors, developers and applicators thus have more scope for floor-laying in industry and in building construction.

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#### Excellent results in DAT test

In a driving abrasion test (DAT), Kaiserslautern University of Science and Technology compared a 2.5 mm thick coating of the new special resin system based on MC's KineticBoost-Technology® with a 4 mm standard epoxy coating under exactly the same conditions. Rolling contact with a pneumatic tyre and a superimposed load of 450 kg was simulated in 25,000 cycles on a coated concrete base. The result: The thin MC coating outperformed the twice-as-thick epoxy coating under strict DAT conditions. It was also easier to clean off the rubber residue from the tyres.



# Potable water tank in Oberwart repaired

**The potable water tank serving the town of Oberwart had developed signs of damage to the ceiling, walls and floor. In planning the repair measures, the operator decided to use the MC-RIM system as a particularly sustainable means of protecting the structure.**

Spalling at the rebar had occurred and distinct areas of brown discoloration had appeared on the floor, walls and ceiling inside Oberwart's 2,500 m<sup>3</sup> potable water tank, which was built in 1970. The impermeability of the mortar layer in the affected areas had gradually decreased over the years of service. A problem for the upcoming rehabilitation arose from the fact that the interior had been patched with abrasion-resistant plaster a few years ago due to similar damage. Together with the specialist construction company MM Kanal-Rohr-Sanierung GmbH from Hartl in Austria, the regional water authority (Wasserverband Südliches Burgenland) developed a sustainable rehabilitation concept for the elevated tank. This involved removing the old coating by means of high-pressure jetting (HPJ). Wall and ceiling surfaces were to be levelled and the concrete cover increased before the final new coating could be applied. Only materials that are demonstrably suitable for potable (drinking) water were to be used.

## MC-RIM PW at work

Both parties had already had a number of positive experiences with the MC-RIM PW surface protection system developed by MC for potable water tanks, a system with a proven record for efficacy and durable protection going back many years. The rehabilitation work in Oberwart was scheduled for the period from January through April 2019. The inner surfaces of the tank were first completely levelled with the cement-bound speciality concrete replacement MC-RIM PW 201. It can be applied by hand and sprayed and can be used on both structural and non-structural concrete components, walls, floors and ceiling surfaces in potable water

tanks. MC-RIM PW 201 is certified as an M3 mortar – the highest grade – according to Germany's DAfStb repair directive for steel-reinforced concrete structures.

The specified increase in internal concrete coverage was thus readily achieved. This was followed in the ceiling and wall areas by a finish with the mineral surface protection compound MC-RIM PW 101, a water-impermeable material offering high sulphate and chloride resistance and carbonation-retarding properties as well as being open to water vapour diffusion. Exhibiting identical properties but optimised for use on horizontal surfaces in the potable water sector, MC-RIM PW 301 was used as the surface protection solution for the floor.

## Far below specified max limits

The all-mineral MC-RIM PW system fully met the ÖVGW (Austrian Association for Gas and Water) requirements as per Codes of Practice W 347 and W 300 of its German counterpart DVGW (ÖVGW test reference W1.547). The coatings exhibit values well under the prescribed water-cement limit for lining mortars of  $(w/c)_{eq} \leq 0.50$ . And with fresh mortar air void contents far below the required 5% by volume, MC-RIM PW 101 and PW 301 offer excellent waterproofing properties. In all, the surface area coated with MC-RIM PW was 2,800 m<sup>2</sup>. Both chambers were successfully repaired one after the other over a period of three months, with the client more than satisfied with the sustainability, durability and long service life provided by this state-of-the-art solution.

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Around 2,800 m<sup>2</sup> of wall and ceiling surface area in the potable water tank were repaired with MC-RIM PW, the surface protection system from MC specifically developed for such applications.



The high-performance mineral mortar ombran MHP-SP 3000 was used in the refurbishment of the pumping station in Treis-Karden due not just to its extremely high chemical and mechanical resistance, but also to its ease of application and the savings this brings in terms of time and logistical effort.

## Mineral repair system for a pumping station

**After many years of service, a pumping station in the small town of Treis-Karden (Mosel) had developed significant damage due to concrete corrosion, particularly in the area of water level variation. The urgently required repairs were carried out with the high-tech mortar ombran MHP-SP 3000 from MC, a material with the classification B2/XWW4 that satisfies the highest possible requirements applicable to coating mortars according to DIN 19573.**

The pumping station in Treis-Karden, a small town in the district of Cochem-Zell in Rhineland-Palatinate, is owned by the local municipal authority. At the beginning of 2018, the engineering partnership Schönefeld und Briesch GmbH was given the task of inviting tenders for the necessary remediation measures in accordance with the latest regulations based on DIN 19573. The operator and the engineering firm specified the recoating of the damaged areas of the building with a high-performance mineral mortar offering exceptional chemical and mechanical resistance.

### Highest exposure class

The decision was therefore made to use the high-tech mortar ombran MHP-SP 3000, a material offering – in particular – optimised chemical resistance and the flagship of a new generation of mineral coatings

launched onto the market by MC. Its formulation is based on CEM III high-performance cements, which are key to achieving XWW4 status, the highest possible exposure class according to DIN 19573.

Its high chemical resistance is further enhanced by minimised porosity and optimised pore size distribution in the mortar matrix: MC's DySC® technology ensures that the mortar matrix continues to undergo compaction with ongoing solidification beyond the normal hydration process. This also produces extremely high abrasion resistance as well as resistance to sulphates and carbonation. In addition, ombran MHP-SP 3000 is able to withstand extreme temperature changes, freeze-thaw cycling and de-icing salt contamination.

### Stand-out application properties

The Cologne/Bonn branch of Aarsleff Rohrsanierung GmbH was awarded the contract to refurbish the approx. 90 m<sup>2</sup> of wall surfaces and the approx. 25 m<sup>2</sup> of ceiling surface of the pump sump. After careful substrate pre-treatment, the flexibility and good workability of ombran MHP-SP 3000 came to the fore as the coating and reprofiling work in the pumping station proceeded: ombran MHP-SP 3000 is, like all mortars of the ombran

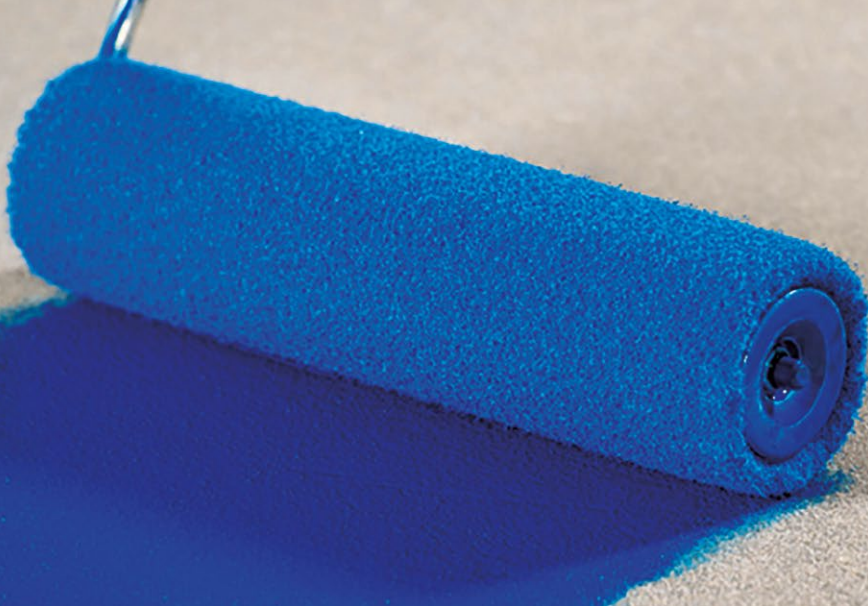
MHP family, a "dual performance" system, so while conventional repair systems require different products for reprofiling and coating, ombran MHP-SP 3000 offers a single-product solution. The same material can be applied either by spraying or by manual trowelling. This saves time and simplifies site logistics. ombran MHP-SP 3000 also forms a very good adhesive bond with the substrate, exhibits high stability even in thick layers, and can be quickly exposed to water, enabling coated water and wastewater structures to be returned to service after a short curing time of just a few hours.

Thanks not least to these application attributes, the repair of the pumping station in Treis-Karden was successfully completed by Aarsleff within the scheduled refurbishment period of just five weeks and very much to the satisfaction of all parties involved.

View of the refurbished pumping station.



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## Kinetic Boost Technology®

+

+

## Rapid floor coating with impressive crack-bridging

**In developing new MC-Floor TopSpeed flex, MC-Bauchemie has added a high-performance crack-bridging coating to this extensive family of floor-coating products.**

Available in a variety of colours, MC-Floor TopSpeed flex is a highly flexible roller-applied coating based on MC-Bauchemie's KineticBoost-Technology®. The two-component reaction resin offers all the advantages of the MC-Floor TopSpeed product family. It combines simple application and rapid curing – largely independent of moisture and temperature influences – with very good crack-bridging performance. With a total layer thickness of 0.6 mm, the verified values read 0.8 mm static at 23 °C (crack-bridging class A3 in accordance with EN 1062-7:2004) or 0.4 mm –10 °C (crack-bridging class A2) and 0.15 mm dynamic at –10 °C. This highly flexible rapid floor

coating can thus be applied both in areas at risk of cracking and in zones in which crack widening is already occurring.

### Unique properties and application variability

MC-Floor TopSpeed offers the flexibility of indoor or outdoor use in industrial facilities as well as in multi-storey car parks, in shop construction or even in classic residential applications, e.g. on balconies, terraces and access galleries. Once in place, the coating and its finish will ensure many years of aesthetically pleasing and exceptionally resilient usage – MC-Floor TopSpeed is UV-resistant, highly resistant to scratching

and also offers excellent abrasion resistance. Thanks to its properties, it is particularly suited not just to applications in winter, but also in tropical regions such as Southeast Asia, where classic reaction resins have little chance of success due to air humidity and the high substrate moisture contents encountered in such climates.

With MC-Floor TopSpeed, complete industrial floors and exterior surfaces can be built up and coated in just a day, with full resilience available after only a few hours more.

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## New fine filler for the repair of screed and concrete floors

**Emcefex floor is MC-Bauchemie's new cement-bound fine filler for fast yet long-lasting cosmetic refurbishment and repair of screed and concrete floors.**

This new cosmetic and repair filler from MC-Bauchemie is ready to use after simply mixing it with water. Yet its range of application is broad indeed: It is suitable for both small blemishes and major patching repairs

on screed and concrete floors in layer thicknesses from 1 mm to 10 mm, as well as for the repair of steps, stairs, landings and plinths, spalling, cavities and blowholes all in one pass with a layer thickness of up to 30 mm. Walls too can be filled and patched over large areas with this product. Given its elevated mechanical properties – compressive strength >35 N/mm<sup>2</sup>, flexural strength >6 N/mm<sup>2</sup> – it can also be

used without reservation for surfaces accessible to foot or indeed forklift traffic.

Emcefex floor is easy to apply and simple to smooth. The fine filler hardens crack-free and extensively stress-free, enabling walk-on access of the repaired surfaces after just six hours\*. Emcefex floor is currently available in concrete grey, with stone grey, medium grey and

pale grey shortly to be included in the range.

\* following application at 20°C and 50% relative humidity

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## New Managing Director in Belgium

**Maria Luisa Pérez Vergara (34) is set to be appointed Managing Director of MC-Bauchemie Belgium N.V. where she will be responsible – together with Benoit Verbiest (59) – for MC's Belgian business.**

After studying civil engineering at the University of Valencia, Spain, the masters graduate joined the MC headquarters in Bottrop eight years ago as a country manager. In her subsequent role as Business Development Manager during the last three years, Maria Luisa Pérez Vergara was able to successfully support MC's subsidiaries in Belgium, the Netherlands, Spain, France, Slovakia and the Czech Republic i. a. in the commercial and strategic further development of the market segments Concrete Industry and Infrastructure & Industry.

A Spaniard by birth, she aims to further grow MC Belgium's business and, in addition to her new management function, will continue to work as Business Development Manager for strategic projects in the Benelux countries in order to advance MC's success in this region.



## MC runs into first place

For the first time, MC entered five mixed relay teams for this year's VIVAWEST Marathon. Thus a total of 20 male and female runners from MC took part in the Ruhr region's biggest marathon on 19 May 2019, putting in a great set of performances in the summer temperatures prevailing: The team MC PowerFlow recorded an excellent time of 3:33:35 hours to take first place in the mixed relay ranking. The other teams also posted good times to take places 8, 15, 18 and 21. The traditional group photo before the start at the Musiktheater in Gelsenkirchen shows, standing left to right: Ruslan Rusch, Daniel Schütt, Valmir Mesquita, Lucien Staruszkiewicz, Matthias Rosenberg, Felix Elberfeld, Markus Lebek, Lena Maas, Kim Walter, Damian Ziemann, Sabrina Liebehenz, John van Diemen, Maiken Paas Thomas Pfäffle, Nicolaus Müller and Saki Moysidis. And squatting left to right: Christian Fyrk, Boris Hofmann, Isabella Foik-Moysidis and Uta Griesdorn-Kleinkoenen.

Take a look at the video at ...  
<https://bit.ly/2HwzF9n>



## Focusing on health

MC's Health Day took place in Bottrop on 11 July 2019 and offered a varied programme with lectures and hands-on seminars covering health, sport, fitness and nutrition. The purpose of the event is to heighten the awareness of MC employees as to the benefits of a more health-conscious approach to life. In addition to an entertaining and informative lecture on the myths of healthy nutrition, the programme also included relaxation, fitness and concentration courses, including use of the 3D flight simulator ICARUS. MC's employees were also able to check out how good their hearing is, how it is likely to develop in old age and how much body fat they have. The smoothie bar proved highly popular and the canteen also offered special dishes for the day. The photo above shows Tobias Spiekermann testing the 3D flight simulator ICARUS.

Take a look at the video at ...  
<https://bit.ly/2Zj14GJ>



# Welcome to the team

## New employees at MC



**Heidi Dietz** (38) joined MC as Sales Manager IN/B Rhine-Main on 1 September 2019. After completing her studies and qualifying in industrial engineering with business management, she worked for ten years in the sales department of an internationally active tool manufacturer. During the last two years, she worked as area sales manager for a manufacturer of fastening and sound insulation solutions. She is now responsible as Sales Manager for all sales and distribution activities of the Infrastructure, Industry & Buildings division in the Rhine-Main region.



**Ulrich Schnittler** (44) joined MC Austria on 1 July 2019 as Sales Manager for the Concrete Industry division. Having initially qualified as a mechanical engineer, he has been working in the concrete industry for 23 years, including 14 years in the field of concrete admixtures. During the previous four years, he worked as sales manager for a renowned cement manufacturer in Austria. His main tasks are to win back the concrete admixture market in Austria for MC and to regain awareness of MC's CI products in the country.

## Further changes



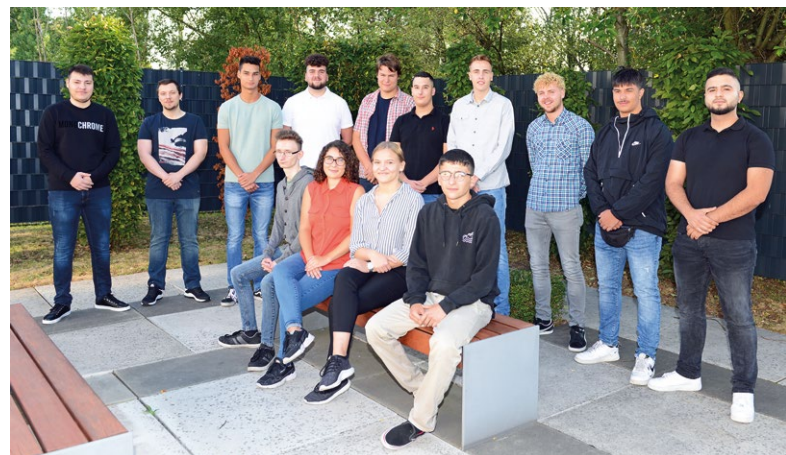
**Max Lu** (39) was appointed Managing Director of MC Taiwan as of 1 April 2019. He has been with MC since 2012 and worked for a number of years in sales. In 2015 he assumed the role of Sales Manager for Infrastructure Industry and at the end of 2016 was promoted to the position of Assistant to the Management Board. Before joining MC, the qualified interior designer worked for seven years as a marketing and sales specialist in the medical technology segment, in machine tools and in automotive components.



**Aleksandar Andonović** (45) assumed the position of Business Development Manager at MC in Bottrop on 1 July 2019. He had already been with MC in Serbia since September 2012, working as a sales representative in the Concrete Industry division. During this time, he succeeded in moving MC into the position of market leader for admixtures in the concrete industry. Prior to this, he worked for many years as a key account manager and sales manager in the Serbian oil industry. In his new role, he will be working in a team responsible for Belgium, Holland, Denmark, Czech Republic, Slovakia, Hungary, Romania, Croatia, Bosnia and Herzegovina, and Serbia.

## Fourteen trainees start at MC


Our new trainees at MC in Bottrop commenced their apprenticeships in various commercial and industrial professions on 1 August 2019. We are delighted to welcome them to the company and wish them every success! Standing left to right: Emre Özhan (chemical production), Kevin Piljug (warehousing logistics), Jamie Lee (chemical technician), Emre Kas (forwarding and logistics), Mark Pacholik (chemical lab technician), Tamer Yavuz (warehousing logistics), Patrick Heeger (industrial management), Lukas Freund (industrial management), Erkan Aykut (chemical production) and Mert-Can Cayirli (chemical technician). Sitting left to right: Pierre-Rene Zakrzewski (warehousing logistics), Duygu Cetin (paint lab technician), Laura-Marie Gieselmann (industrial management) and Atakan Basar (chemical technician).



## MC honours its trainees

On 25 July 2019, at a ceremony held at the MC Training Centre in Bottrop, MC honoured company apprentices who had successfully passed their Chamber of Commerce and Industry exams. Well done to them all! Group photo from left to right: Elena Fadejew (commercial trainer), Leon Rehage (industrial management/financial control), Alexander Classen (warehousing logistics), Niklas Faerber (industrial management/back office sales, BOTAMENT), Nicolaus Müller, Inga Biesenbach (industrial management/CI sales) and Swen Linning (warehousing logistics trainer).






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