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MC aktiv

MC Report

High-speed coating of car park surfaces

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Dear Reader,

Time is money! Attributed to Benjamin Franklin from the 18th century, this saying is especially true when it comes to rehabilitating car parks. More than ever before, these major municipal assets are also seen as profit-making investments. Long lockout periods and downtimes inevitably lead to loss of revenue, something that investors and operators are always keen to avoid. So it is no wonder that, when it comes to repairing car park surfaces, the specifications stipulate not only high quality and durability, but also speed. This puts MC at a great advantage. We have pooled our know-how in the construction and repair of such structures in our Carpark field of expertise, offering inter alia tested various OS-grade systems for the repair and protection of wall and deck surfaces. In our main report and in one of our articles in the MC Innovation section we offer you an overview of our new OS 8 and OS 10 surface protection systems based on our unique KineticBoost-Technology®. These enable car park decks to be coated in the shortest of times so that they can be quickly returned to their intended use.

This edition also features our highly innovative MC-PowerFlow evo superplasticisers. These are a further development of our proven PCE polymer technology and represent an evolutionary leap in concrete formulation. You can also read more about them in the MC Innovation section. In addition, we again offer you a number of interesting project reports from our current portfolio and round off our issue, as always, with internal news and the latest personnel developments. Enjoy the read!

PS: Anticipating the increased spread of the novel coronavirus, we implemented a number of preventive operational measures at the beginning of March, including the cancellation of all technical and training events for customers and employees. We wanted to avoid exposing you to further risk and consider such moves to be appropriate in the circumstances. We will keep you informed of any plans to reschedule such events as they evolve. Thank you for your understanding and, in the meantime, stay healthy!

Kind regards
Dr.-Ing. Claus-M. Müller

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Cover

The newly tested and approved OS 8 and OS 10 surface protection systems from MC offer both accelerated hardening and high resilience: All the system components are based on the MC-Floor TopSpeed product range, meaning they all use ambient moisture to boost the curing process. Enabling much shorter downtimes and creating more durable systems, they ensure that car park operators save both time and money.

Photo: MC-Bauchemie, Bottrop

Credits

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Opening of new premises and 25-year anniversary in Hungary

In a ceremony held on 13 February 2020 and attended by 45 employees together with numerous guests, including the management of MC Germany, MC in Hungary officially opened a new office and laboratory in Budapest – an occasion that also marked the 25th anniversary of MC Hungary.

The attractive office building has been finished inter alia with various MC products, and so also functions as a living showroom. The site includes a modern laboratory wing which also houses the Application Technology team.

Special honours

The evening event also saw three employees honoured for their 25 years of service, each receiving a gold coin featuring the image of Heinrich-W. Müller (see p. 15). The awardees have been with MC Hungary right from when it was established in 1994. All guests received a specially designed plate sporting the anniversary logo and made of concrete cast with the special mortar MC-Design fix. The plate was developed in conjunction with a designer who has been working with MC for about eight years and who has already designed many items and objets d'art made of concrete such as jewellery, furniture, etc. The evening ended with a lavish dinner in a Budapest restaurant enjoyed by all the invitees.

10 years of CROM

The tenth annual edition of the training course series "CROM – Certified Rehabilitation Of Manholes" took place in February this year. 80 sewerage network operators, planning professionals and refurbishment contractors took part in the course modules provided at MC in Bottrop, with each session tailored to the specific needs of those three groups. In addition, there was also a training course at MC-Bauchemie in Dintikon (Switzerland) at the end of January, which was booked to capacity with 40 participants.

For further information, go to
https://bit.ly/2Uc5sTF

2019 product of the year

In November and December 2019, the readers of the specialist refurbishment magazine 'B+B Bauen im Bestand' again took part in the readers' poll 'B + B Product of the Year', with 79% voting MC-Floor TopSpeed flex, our new high-speed crack-bridging floor coating, '2019 Product of the Year' in the category Plasters, Mortars, Adhesives and Coatings. This is the fourth year in a row that MC has garnered this honour.

Specialist for concrete roadways in Ukraine

Since 2005, MC has been represented by its own company in Ukraine – in Berezan, 80 kilometres east of Kiev. It has since grown to become market leader in the Ukrainian concrete admixtures market, acquiring in particular an excellent reputation in the field of concrete road and runway construction. There is hardly a project in the country where the concrete know-how of MC is not utilised.

Three project examples for the construction of airport runways: Landing approach to the airport in Donetsk (top left). View of Terminal D of Kiev-Boryspil International Airport before its opening (above). Construction – in extremely high temperatures – of the runway at Dashoguz Airport, Turkmenistan, for which MC Ukraine was selected to supply the requisite admixtures (photo below).

Roads made of concrete are more resilient and durable than those of asphalt, although they are also more complex to construct. Their qualities have been in demand in the past and are still sought after today, for example in the construction of runways at the international airports of Donetsk (2011), Kiev-Boryspil and Lviv (2012), not to mention the current Odessa project (completion date 2021); and also in many motorway builds, such as the N14 trunk road currently under construction between Kropyvnytskyi and Mykolaiv in southern Ukraine.

Preference for concrete roads

Concrete road construction is popular in Ukraine not least because the material can be produced from local inputs and is quickly available in large quantities. The N31 trunk road between Dnipro and Reshetylivka located some 400 kilometres southwest of Kiev is a case in point, with a stretch of 80 kilometres scheduled to be completed by 2022. The progress rate there can be up to 500 metres per day. Two concrete plants ensure uninterrupted supply to the construction site, and MC in Berezan produces and supplies large quantities of admixtures for this and numerous other projects. In Ukraine, MC products have become the common standard for concrete road construction. The superplasticisers of the Muraplast series play a special role here. Their chemical and physical actions ensure a high degree of homogeneity in the concrete. They reduce the internal frictional forces in the concrete and therefore also the power required by the road pavers for placing, spreading and compacting. They likewise provide for high early strength values. This is particularly important for cutting joints, a necessary process in concrete road construction.

MC's concrete expertise in high demand

Particularly against the background of the difficult weather conditions prevailing locally, with double-digit sub-zero temperatures in winter and over 35 °C in summer, the competence of MC and the excellent equipment of its concrete laboratory in Berezan, augmented by a commitment to close cooperation with all those involved in the project, have greatly benefited the work. Among other things, the air-entraining agent Centrament Air 202 is used to ensure a high level of resistance in the concrete to freeze-thaw cycling and de-icing salts (exposure class XF4). This gives the concrete a structure of uniformly distributed micropores, the additional volume of which reduces the pressure caused by penetrating water freezing into ice. Once laid, the roadway is cured with Emcoril Traffic grip M. This protects the newly laid material from rapid water evaporation and overdrying, thus ensuring optimum hydration in the uppermost concrete layer. Ideal for the curing of trafficked concrete surfaces – not just in road construction but also in the construction of airport runways and car parks – it also minimizes the formation of early shrinkage cracks, increases surface tensile strength and reduces the rate of carbonation. With this mix of concrete know-how, tailored products, just-in-time production and collaborative reliability, MC has created a real Ukrainian success story in the field of concrete road and runway construction. There are currently more than 120 kilometres of concrete carriageway under construction. And MC is an integral part of each of these projects.

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Links to videos (commentaries in Ukrainian)

› https://bit.ly/39wXM3I
› https://bit.ly/3cMx4q2
› https://bit.ly/2Q0ectC
› https://bit.ly/38xUDzd

A green bridge under construction to help animals cross this road – likely to be very busy in the future – safe from danger.

Building bridges in Bratislava

One of Central Europe's biggest infrastructure projects, that of the D4R7 arterial, is now nearing completion in Slovakia. The construction project has been implemented to increase transport capacity into the Slovak capital Bratislava and the surrounding region and thus to improve not just the local but also the international links to and from the conurbation. And MC's expertise was in high demand for the bridge-building work.

The D4R7 construction project comprises the 27 km long D4 motorway, a bypass to the south of Bratislava, and the 32 km long R7 freeway, part of the southern motorway network connecting the western and eastern parts of Slovakia. The investment outlay for the project amounts to € 860 million, and the work began in October 2016. This major infrastructure undertaking also involves constructing a number of bridges, for which Doprastav a.s. and STRABAG s.r.o. have been supplying the precast concrete components. MC Slovakia has worked successfully with both companies for many years and developed the requisite concrete formulation in close cooperation with them.

Road traffic bridges

The prestressed concrete bridge parts were manufactured by Doprastav a.s., using the high-performance superplasticiser MC-PowerFlow 1130 and the concrete release agent Ortolan Premium 702, specially formulated for high-quality fair-faced concrete. MC-PowerFlow 1130 is a synthetic superplasticiser of the latest generation and is based on MC's PCE technology. Its special action mechanism ensures that, especially in precast construction, high-performance concretes with excellent processing properties and a high-quality appearance can be produced at economical dosage rates and with above-average water savings.

And Ortolan Premium 702 is the perfect adjunct. It is suitable for smooth formwork and facilitates the production of high-quality exposed concrete surfaces of classes SB 3 and SB 4. It provides for excellent release, has a corrosion-inhibiting effect with a continuous, closed film, and protects and preserves the steel formwork.

Green bridges

In addition to the traffic-bearing bridges, it was also necessary to provide a number of new green bridges in order to mitigate the consequences of the fragmentation of the countryside, caused by the road. Built with precast concrete elements from STRABAG, these bridges were designed with widths of 50 to 80 metres so as to meet their primary purpose of enabling wildlife to safely cross heavily trafficked routes. Again, they were constructed with the aid of Ortolan Premium 702 together with, MC-PowerFlow 3130 and Centrament Air 202.

Enabling the production of concretes with low tack and accelerating early strength development, MC-PowerFlow 3130 is a synthetic superplasticiser which is again based on MC's PCE technology. Hence it is particularly suited to precast concrete production applications. The air-entraining agent Centrament Air 202 makes the concrete more pliable, easier to work and more readily compactable, while also increasing a component's resistance to freeze-thaw cycling and de-icing salts.

Through a perfectly coordinated combination of additives and release agents, MC and its two cooperation partners have been able to contribute to technically and visually impressive results in the production of the prefabricated parts for the numerous bridge constructions used in this major infrastructure project. Final completion of the D4R7 arterial is due towards the end of 2020.

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Panoramic photo of a green bridge under construction.

View of the rehabilitated Flooz Tunnel.

Tunnel rehabilitation in Switzerland

In the Swiss canton of St. Gallen, two tunnels along the bypass around the town of Lichtensteig had to be renovated in response to the concrete coatings showing clear signs of ageing. And in this refurb campaign, KineticBoost-Technology® from MC once again proved invaluable in underpinning construction schedule reliability and shortening tunnel closures.

View of the rehabilitated Aeuli Tunnel.

After 37 years, the inner walls of both the Flooz (290 m) and Aeuli (430 m) tunnels, which were each built and commissioned in 1982 as part of the Lichtensteig bypass, had to be rehabilitated in the summer of 2019. The St. Gallen canton authorities responsible chose the company Trauffer AG Bautenschutz to perform the work.

In the first refurbishment phase from May to July 2019, a one-way traffic system was introduced to redirect vehicles using this busy bypass. This enabled demolition work to start on the Flooz and Aeuli tunnels, with the surface layer of the concrete walls being removed and then repaired with sprayed mortar.

Full closure reduced to a minimum

The second refurb phase entailed repairing, reprofiling and whitewashing the tunnel walls. The new coating was to provide increased protection against attacks by CO_2, road salt and the effects of freeze-thaw cycling. It was also designed to create an easy-to-clean and permanently bright surface, thus saving lighting costs and ensuring maximum traffic safety.

As problems with a high moisture load were expected during the work, all parties involved decided in favour of a tunnel coating solution from MC based on KineticBoost-Technology® that uses the moisture in the environment to strengthen and accelerate the curing reaction. The speed of coating application thus achieved also meant that full closure of the tunnels, which was essential for the coating work, was kept to a minimum. It also meant the full-closure period could be scheduled for the region's summer holidays. Once the concrete surfaces of the tunnel walls were smooth, they were coated with the transparent primer MC-DUR 1177 WV-A. This was followed by a coat of MC-DUR 2496 CTP Tunnel, a pigmented high-performance waterproofing compound with integrated KineticBoost-Technology®. This two-component, low-solvent, UV-stable reactive resin cures particularly quickly regardless of the influence of moisture and temperature and also scores high in terms of its good mechanical and chemical resistance properties.

Coating completed in five days instead of eight

The coating work, which normally takes eight days for comparable projects, was executed within just five days. Although completed in record time, the result was nevertheless a high-quality, non-yellowing and extremely easy-to-clean tunnel interior coating with excellent concrete protection properties. This benefited not only the client and specialist applicators, but also the motorists, for whom the traffic restrictions were soon lifted.

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In full swing: The repair and subsequent coating of the inner shells in cooling tower 3.

Cooling tower refurbishment in the Czech Republic

At the Dětmarovice power plant in the Czech Republic, the concrete shell of cooling tower 3 was repaired in the first half of 2019, for which purpose a range of innovative repair and protection systems from MC were used.

The Dětmarovice coal-fired power plant is located in northern Bohemia near the Polish border. It went into operation in 1975 and today has an installed capacity of 800 MW. It was no coincidence that, in 2019, MC was asked to assist in the repair of cooling tower 3: Because operator ČEZ, a.s. had already opted for MC repair and protection systems in the past – during the first rehabilitation campaign in 1996, to be precise. Offering new and innovative product systems, MC was again the obvious choice for this latest refurb. The planning and execution works were entrusted to REKO PRAHA, a.s., a planning and engineering company that specialises in the construction, repair and maintenance of cooling towers.

With the results of tests on SPCC mortars from other manufacturers falling short of the quality requirements specified by REKO, the company consulted MC's field sales adviser Zdenek Darebnik, and together they developed a new solution based on MC's Nafufill SM 04 microsilica-modified repair mortar.

Success with microsilica-modified repair mortar

The single-component mortar has been optimised for both the partial patching and full-surface repair of horizontal concrete components and can also be applied by dry spraying. Thanks to minimised scatter waste and optimised aggregate composition, it can be perfectly levelled and smoothed. Nafufill SM 04 is classified as non-combustible per building material class A1 according to EN 13501-1, has a high resistance to carbonation and is resistant to external influences such as temperature fluctuations. And although water-impermeable, it is also open to water vapour diffusion.

Proven solution for cooling tower coating applications

Nafufill KM 110 fine mortar was then used in the next step to optimise the levelled surface. This in turn was followed by renewal of the protective coatings on the cooling tower surfaces. For the internal areas, the applicator opted for a solution from MC which has already proven its effectiveness in more than 200 cooling tower applications. After priming with MC-DUR 1277 WV, the lower two thirds were coated with a reaction resin coating of MC-DUR VS NR 3, with the upper third being sealed with UV-resistant MC-DUR VS PUR.

Top external protection with MC-Color Flex

The external surfaces were sealed with the innovative MC-Color Flex protection system. The initial layer of MC-Color Primer was coated with MC-Color Flex pro, which is highly resistant to UV, weathering and alkali attack. As a crack-bridging concrete protection coating for exterior surfaces exposed to the elements, this system is colour-fast thanks to its UV-stability and weathering resistance, exhibits integrated greening protection and also offers great benefits due to its low dirt absorption capacity. The repair of cooling tower 3 in Dětmarovice was completed on schedule over a period of just two months between April and May 2019. The client and applicator were highly delighted with the results achieved, sure in the knowledge that the new coating will withstand many years of cooling tower service.

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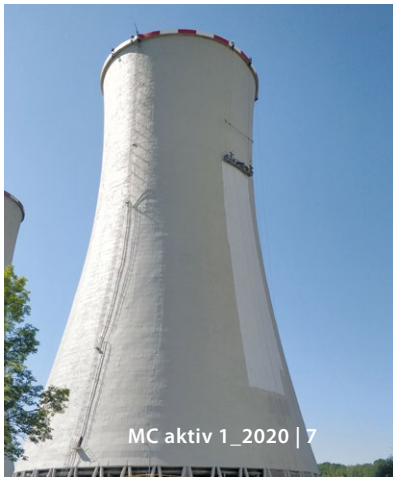


Before-and-after comparison: Cooling tower view from outside before (left) and during the repair work (right).

High-speed coating of car park surfaces

More than ever before, car parks are seen the world over as profit-making investments. Where the need for refurbishment is foreseeable, it is particularly important at the planning stage to also ensure that unavoidable downtime is minimised so as to avoid adding unnecessarily to the cost of the repairs. And the know-how on offer from MC's specialist advisers from its Carpark field of expertise can contribute massively to such undertakings. MC's innovative OS 8 and OS 10 surface protection systems ensure both fast and reliable floor and deck coating, with lasting protection of the car park areas thus treated.

Underground and multi-storey car parks are no ordinary reinforced concrete structures, especially in our latitudes. Compared to conventional high-rise buildings, they are exposed to high levels of stress loading. This is compounded by seasonal temperature fluctuations, rain and high humidity, the unrelenting mechanical stress caused by vehicle traffic and, last but not least, drip and spray water contaminated with de-icing salt, which the vehicles carry into the building – primarily on their tyres – during the winter months. The chlorides contained in road salt can cause particularly severe corrosion of the steel reinforcement in the concrete structure, thus reducing its load-bearing capacity. So any coating applied in car parks needs to be formulated as a strong and effective protective layer. A surface protection system adapted to the specific requirements prevailing will prevent water and the road salt dissolved in it from penetrating into the fabric of the building, thereby significantly extending the service life of the structure.

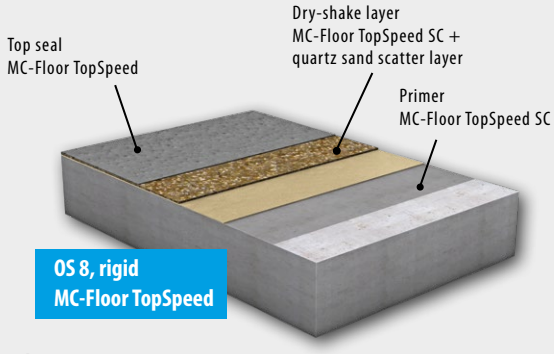
The code of practice issued by the DAfStb (German Council for Reinforced Concrete) distinguishes between rigid and flexible surface protection systems. While rigid systems are characterised by their high resistance to mechanical influences, flexible systems need to be considered wherever there is a risk of crack formation or where crack width changes can occur due to thermal and load cycling stress.

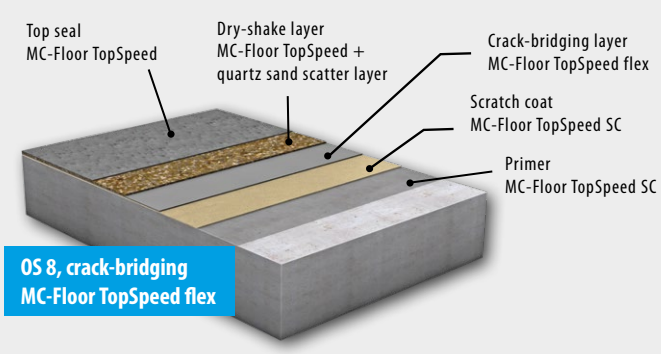
KineticBoost-Technology® – key to successful car park rehab

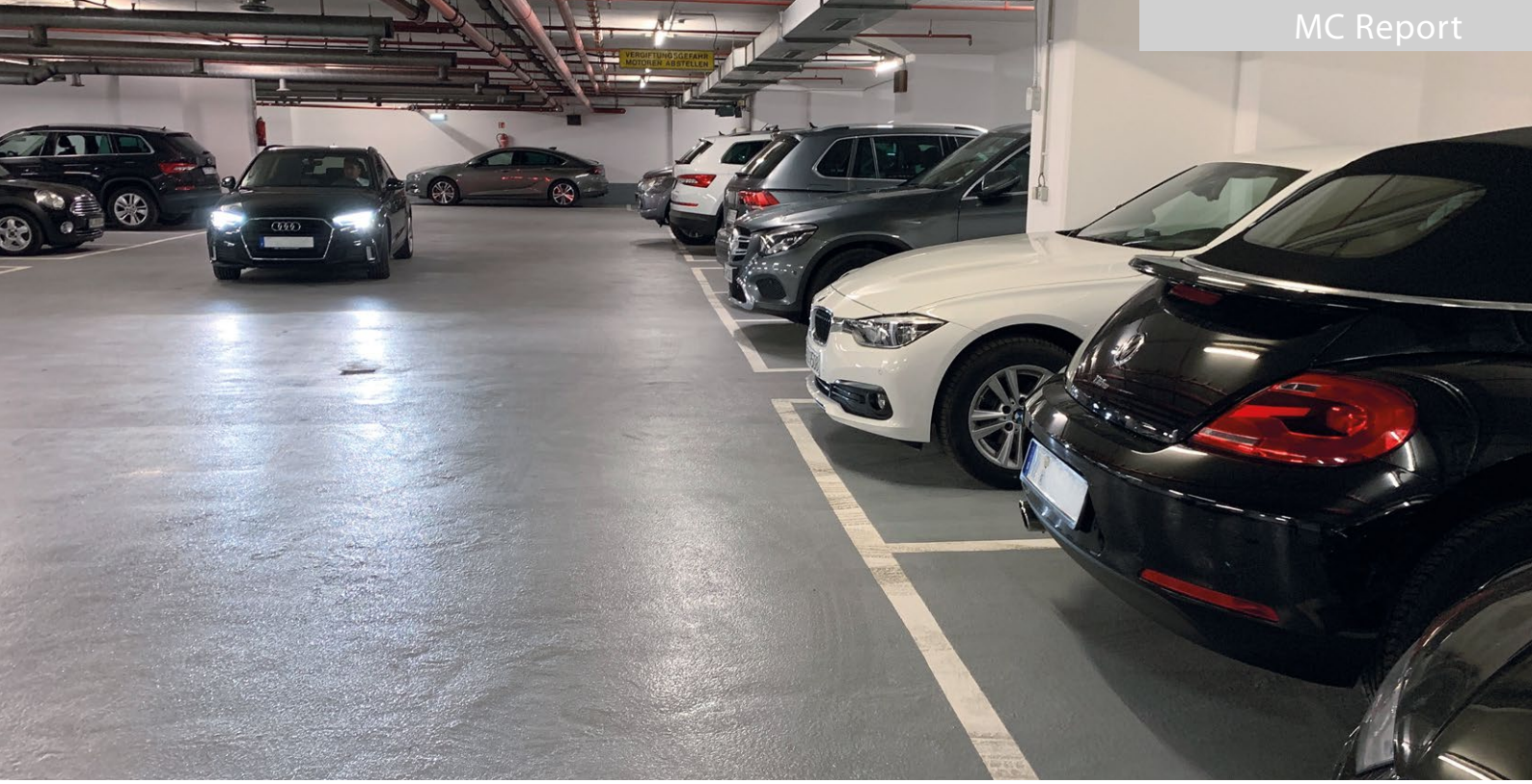
MC has consistently provided systems proven over the decades for the repair and sustainable protection of wall, floor and deck surfaces in car parking facilities. Make no mistake, these are highly durable solutions offering outstanding in-service performance characteristics.

Now MC has launched new coating systems based on KineticBoost-Technology®, with which multi-layered car park surfacing solutions can be applied in just a few days, even in adverse environmental conditions and without the need for enclosures or heating. In particular: They can even be laid in humid conditions and at temperatures ranging from 2 to 35 °C, while still providing excellent adhesion and exceptional abrasion and scratch resistance. The coated decks can be fully loaded again after a short period, thus minimising downtimes and ensuring a high degree of planning reliability to save both time and money.

Overview of the new grade OS 8 and OS 10 systems from MC



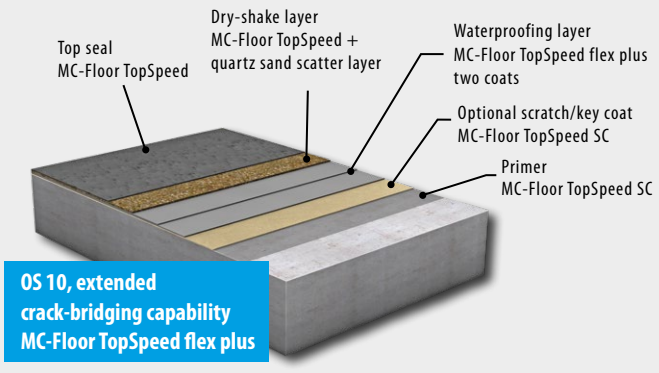




MC's new, highly crack-bridging OS 10 system was used for the repair of 600 m² of car park space in Düsseldorf's Bastionstrasse at the beginning of 2020.

OS 8 system – high mechanical resilience

Although codes of practice such as that issued by the DBV (German Society for Concrete and Construction Technology) governing the repair and surface protection of car park floors and decks provide for a flexible OS 11 or an OS 8 system with crack treatment, in practice a rigid OS 8 system such as MC-DUR 1252 from MC has consistently proved to be the better option. Its high wear resistance has not only been confirmed in roadworthiness tests, but also in the daily motorised vehicle usage of curves, ramps and spirals. Should crack width changes also occur here, MC's grade OS 8 systems can be applied in combination with crack-patching solutions. The MC-DUR 1252 system was also used, for example, for the rehabilitation of the multi-storey car park on De-La-Chevallerie-Strasse in Gelsenkirchen-Buer. The property, which is located directly next to an electrical goods store, is in a highly frequented area, so the operator, Parkhaus B+B GmbH & Co. KG, needed to ensure that repair downtime would be reduced to a minimum. Due to the stresses arising from intensive usage, the planning engineers and the operator decided on an OS 8 structure with MC-DUR 1252. The impermeability of this resilient, pigmented and low-yellowing epoxy resin coating ensures permanent protection of car park surfaces against chloride attack. The MC-DUR 1252 coating was combined with MC-Floor Connect CPS, the mechanically highly resilient car park joint profile system able to accommodate both horizontal and vertical joint movements. The profiles are carbon-fibre reinforced and require only a small installation depth and therefore short installation times, thus facilitating easy and economical repairs. Such surface protection with a rigid OS 8 system also offers clear advantages in car park decks with no cracking.



OS 10, extended crack-bridging capability MC-Floor TopSpeed flex plus

OS 8 with rapid completion times

Since the repair work in Gelsenkirchen had to be carried out during ongoing operations, systems offering rapid application and fast curing were required in selected areas. MC-Floor TopSpeed was used in such cases to ensure downtime was kept to an absolute minimum. As a two-component, UV-stable reactive resin based on KineticBoost-Technology®, MC-Floor TopSpeed can also be used under adverse weather conditions; it cures quickly and reliably, with extensive immunity to the influences of humidity and temperature. In fact, KineticBoost-Technology® actually harnesses the moisture in the environment to strenghten and accelerate the curing reaction, while also increasing the adhesion, abrasion resistance and scratch resistance of the coating. MC-Floor TopSpeed thus enabled the deck rehabilitation work in Gelsenkirchen to be carried out without any periods of total closure.

New grade OS 10 system with high crack-bridging capabilities

With MC-Floor TopSpeed already having been used for several years in surface coating in accordance with the OS 8 standard as per German code DAfStb Rili SIB 2001, and also in compliance with EN 1504-2, MC has now developed MC-Floor TopSpeed flex plus, another innovative product for a new OS 10 coating. OS 10 systems are used as a sealing layer with high crack-bridging capabilities for surfaces designed for pedestrian and motorised traffic. The entire system structure of MC's new OS 10 system utilises the same binder component based on KineticBoost-Technology®. It therefore offers all the advantages of this technology with superstrong adhesion ensured, together with very high values for abrasion and scratch resistance as well as exceptional crack-bridging capabilities (dynamic, class IV_{T+V}, at -20 °C, according to TL/TP BEL-B3). After 15,000 test cycles in the Parking Abrasion Test (PAT), a procedure that simulates and tests the wear of a car park deck coating under realistic tyre-contact conditions,

Continued on page 10

The multi-storey car park on De-La-Chevallerie-Strasse in Gelsenkirchen-Buer was repaired without having to be fully closed, i.e. with operations ongoing – thanks primarily to MC-Floor TopSpeed.

Continued from page 9

MC's new OS 10 coating system was confirmed as conforming to the premium wear-resistance class of VK 1. The coating system is also covered by a general building approval test certificate (abP), again confirming its grade OS 10 credentials. *(see also article on page 12)*

Repair of an underground car park in Düsseldorf

The first success with the new OS 10 system came at the beginning of 2020. The repair of 600 m² of floor space in an underground car park in Düsseldorf's Bastionstrasse by KEMNA BAU Andreae GmbH & Co. KG was also constrained by time and revenue loss – parking in the centre of this Rhine metropolis is costly, which of course means that closures and downtime are all the more expensive for the operator. Given the economic imperative, and because crack width changes were to be expected, the engineering consultants responsible for the project decided to use the new OS 10 system from MC. After re-profiling the damaged areas with Nafufill KM 130 – MC's PCC concrete replacement for the repair of horizontal surfaces – the floor was finished with MC's new OS 10 system. This consists of the primer MC-Floor TopSpeed SC, the flexible two-coat waterproofing layer MC-Floor TopSpeed flex plus with its extensive crack-bridging capabilities, the dry-shake coating MC-Floor TopSpeed combined with a scatter layer of quartz sand, and a sealing top coat of MC-Floor TopSpeed. Given its flexibility and its resistance to UV and yellowing, the system is ideally suited not just to the coating of areas at high risk of cracking, but also to outdoor car park surfaces exposed to weathering. Thanks to KineticBoost-Technology®, a complete car park coating was successfully applied within two days, despite the wintery cool and humid weather conditions prevailing. This choice of system meant that scheduling reliability was increased, while the costs arising from downtime and lost revenues were reduced to a minimum – all very much to the satisfaction of the client operating this car park in downtown Dusseldorf.

Flexibilised OS 8 system for minor crack width changes

If large crack width changes are unlikely to occur, a more flexible OS 8 coating can be used instead of an OS 10 system. MC has also developed a new flexible OS 8 system that offers an ideal combination of crack-bridging capability and high mechanical wear resistance, augmented by the unique advantages of KineticBoost-Technology®. The new and duly tested grade OS 8 system consists of MC-Floor TopSpeed SC serving as both the primer and the scratch coat, the new flexible roller coating MC-Floor TopSpeed flex, and the dry-shake layer and top seal MC-Floor TopSpeed. In addition to fast completion with very short overworking times and fast final strength attainment, the system offers static crack-bridging of up to 0.38 mm at -10 °C and dynamic crack-bridging of up to 0.15 mm at -10 °C, together with high mechanical resilience and very good cleanability as per EN 11998. In addition, the system is UV-stable and has a very good fire rating of Bfl-s1, i.e. it is fire-retardant.

Thus, in addition to the standard car park coatings so well proven over the decades, MC now also offers new yet already tried and tested OS 8 and OS 10 systems. With KineticBoost-Technology® integrated across the board, MC is able to offer planning professionals and car park owners new possibilities for the fast and reliable execution of rehabilitation projects and the sustainable protection of the assets in question.

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Overview of OS systems

OS 8 is a rigid, trafficable coating system particularly characterised by its high mechanical wear resistance. Where no cracking is expected to occur, OS 8 is still regarded as the coating of choice in all car park areas. The rigid properties of an OS 8 system can be modified with a small degree of flexibilisation.

OS 10 is a waterproofing system with extended crack-bridging properties. According to the current DAfStb code, the coating is described as a sealing layer with high crack-bridging properties under protective and cover layers for surfaces designed for pedestrian and wheeled traffic. Areas of application are concrete components with separating cracks and predictable mechanical stress, such as bridges and parking decks.

OS 11 is a flexible coating system for increased crack-bridging over floor and deck surfaces in underground and multi-storey car parks. The main areas of application are intermediate deck levels and weather-exposed parking decks. The maximum crack width that the system should be required to bridge according to DAfStb Rili SIB 2001 is 0.35 mm.

Soil stabilisation in Israel

This project in the Israeli town of Rishon LeZion involved the re-laying of residential sewage pipes in soil that was unstable due to the presence of extremely fine-grained sand. However, the use of high-performance MC-Montan Injekt DS ensured precisely the level of soil consolidation needed.

Rishon LeZion is an Israeli town in the southern part of the Tel Aviv-Jaffa metropolitan area, about ten kilometres south of Tel Aviv itself. In August 2019, the mating horizontal and vertical sections of a sewer pipe running through a residential area needed to be re-laid to increase system stability. The surrounding soil, which consists of very fine sand and is therefore difficult to stabilise, was a particular challenge. The work was further hindered by the fact that the area to be excavated was on a slope. The Israeli wastewater company Shafdan awarded the project to general contractor Rimon Ltd. from Caesarea, and they in turn commissioned Herodeng Engineering Solutions Ltd. to perform the consolidation work. Herodeng has in the past frequently collaborated with the Israeli partner of MC, AZ Marketing Ltd., and has been trained by MC and AZ in various groundworking techniques such as soil-consolidating injection methods. The planning engineer Shmuel Engel from Engel Engineering Ltd. in Tel Aviv has also participated in such events.

Sound advance planning and advice

The soil sample from Israel was tested beforehand at MC in Bottrop, Germany, with regard to the strength levels to be achieved with the injection resin and the various requirements identified by the planning engineer. Wolfgang Litz, Business Development Manager of MC and the regional coordinator responsible for Israel, actively supported the project from the very beginning, while injection expert Daniel Vandamme provided on-site advice as the work progressed. In order to stabilise the fine sandy soil on the slope, it was decided to inject a block section measuring 4 x 4 x 2.5 m.

MC-Montan Injekt DS delivers

This required a resin that could be injected at high pressure, had an appropriate viscosity and quickly developed sufficient strength to achieve adequate soil stability. The choice fell unanimously on MC-Montan Injekt DS, the injection resin for the flexible waterproofing and bonding of rock zones and soil. MC-Montan Injekt DS is a two-component product of particularly low viscosity that reacts to form an elastic, waterproof resin block incorporating the rock and soil into which it is injected. Like all MC-Montan injection resins, it offers the necessary good injectability and variable reaction times with selectable expansion values.

MC-Montan Injekt DS also meets the requirements of the DIBt (German Institute of Building Technology) pertaining to assessment of the effects of construction products on soil and groundwater when used to seal and consolidate loose rock, confirming that its use leads to no deleterious modification of the soil nor to groundwater contamination. The injection resin has a water-displacing effect and produces a controlled pore pattern with limited volume increase while still retaining its high elasticity. Thanks to a good mix of sound advice in advance of the work and smooth cooperation between all participants on the construction site, even this highly problematic subsoil for sewage pipe stabilisation was successfully consolidated within a short time.

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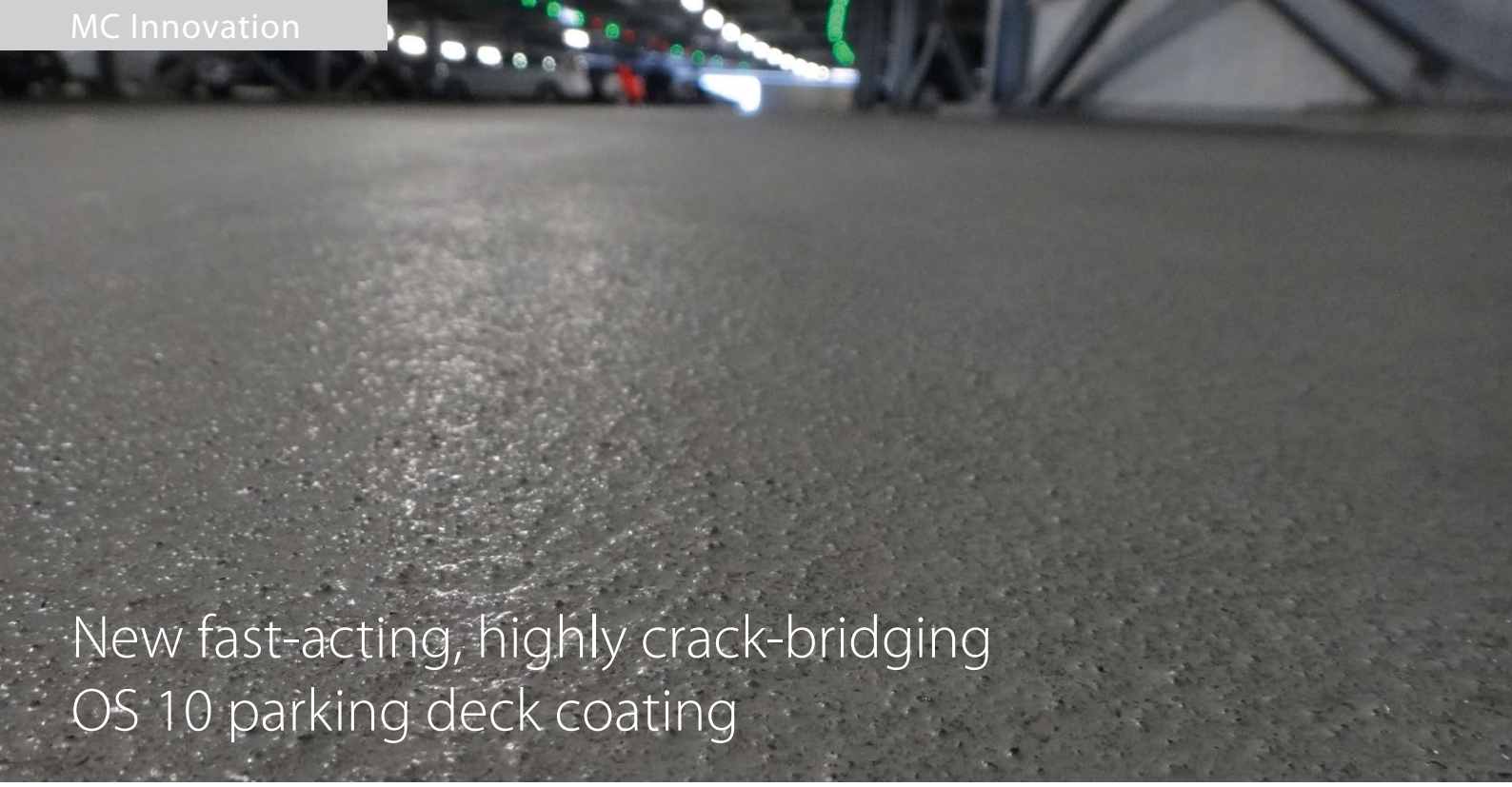
Thanks to MC-Montan Injekt DS, the fine sandy subsoil in Rishon LeZion was successfully consolidated, enabling the sewage pipe to be re-laid and stabilised.



New fast-acting, highly crack-bridging OS 10 parking deck coating

MC-Bauchemie has developed a new OS 10 surface protection system with excellent crack-bridging capacity and integrated KineticBoost Technology®, enabling it to be applied even in damp conditions and over an extended temperature range of 2 to 35 °C. Complete car park coatings can thus be provided in just two days.

The new OS 10 system from MC cures much more quickly than conventional OS 10 coatings, with rain resistance achieved after just 30 minutes. An important component of the new surface protection system is the new roller coating MC-Floor TopSpeed flex plus. This functions as an elastic seal with an exceptional crack-bridging capability. The new OS 10 system from MC is thus ideal for placement on car park decking, particularly that exposed to weathering or otherwise susceptible to cracking.

Top values in application speed and resilience

Whereas some OS 10 systems use different binders within the layer sequence – with a reduction in adhesion often the result – the entire structure of the new OS 10 surface protection solution from MC uses the same binder component throughout, based on KineticBoost-Technology®. This ensures that there is no degradation in adhesive effect. All components of the system, for which MC has been issued a general building authority test certificate (abP) confirming its OS 10 classification, harness moisture from the environment to strengthen and accelerate the curing reaction. This ensures exceptional adhesion to all common concrete substrates. It also results in top values for abrasion resistance, scratch resistance and crack-bridging (dynamic, class IV_{T+V}, at -20 °C, according to German code TL/TP BEL-B3). After 15,000 test cycles in the Parking Abrasion Test (PAT), a procedure that simulates and tests the wear of a car park deck coating under realistic tyre-contact conditions, MC's new OS 10 coating system was found to achieve the best wear-resistance class of VK 1. All of which serves to underline its exceptional resilience and the long service lifetimes this ensures.

Ideal for car park decks susceptible to both cracking and weathering

MC's new OS 10 system is also resistant to UV radiation and yellowing, making it suitable not just for coating car park surfaces that are highly susceptible to cracking, but also those exposed to the elements.

In addition to the combination of exceptional crack-bridging capabilities, high mechanical wear resistance and outstanding durability, MC's OS 10 system offers very good cleanability as defined in EN 11998. It also has a fire rating of Bfl-s1. This means that the coating is flame-retardant and develops no or very little smoke in the event of a fire – properties of particular significance for the safety of underground and multi-storey car parks.

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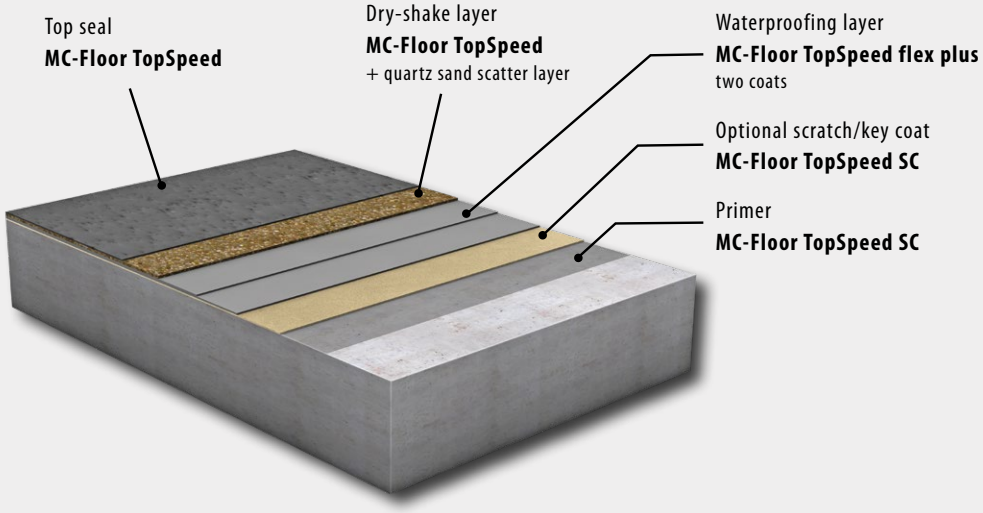
The new OS 10 coating system



An evolutionary leap in concrete technology

MC-Bauchemie has extended its product portfolio in the field of concrete admixtures with the new superplasticiser line MC-PowerFlow evo. In choosing this name, MC wishes to underline its belief that this constitutes an evolutionary leap in the development of MC polymerisation technology. MC's PCE production plant in Bottrop has been expanded so as to enable the adoption of new approaches to polymerisation and thus the development of particularly efficient PCE ingredients.

Technological challenges in concrete development

In almost all ready-mixed concrete and precast concrete plants in Germany, residual concrete and residual water are recovered, processed and reused. Increasingly, legislators are also demanding the use of recycled aggregates, and scientific studies indicate that this trend will gain further traction in the coming decades.

The gradual phase-out of coal-fired power generation in many countries will also lead to a steady decline in the amount of fly ash produced. The availability of primary raw materials such as gravel and sand is also finite. The concrete industry needs to accommodate these changing conditions, adapt to them and find alternative raw materials for concrete production. Plasticisers that also function under these new fundamentals are thus destined to become increasingly important.

Further development of proven PCE polymerisation technology

With its new PCE product generation MC-PowerFlow evo, MC-Bauchemie has launched a range of high-performance superplasticisers onto the market with which the challenges to concrete technology outlined above can be mastered, allowing and indeed ensuring the production of a robust concrete. These are synthetic superplasticisers based on a further development of the proven PCE polymer technology of MC-Bauchemie. They are manufactured in MC's own production facilities on the basis of a patented process.

Robust, readily workable concretes

The high-performance superplasticisers of the MC-PowerFlow evo line are very well suited to the production of ready-mixed concrete and precast elements, free-flowing and self-compacting concretes, and also to combination with clinker-optimised cements. They can be mixed homogeneously into the concrete in a short time, with dosage after the addition of water generating the greatest efficacy. Their excellent fluidising effect is then immediately unleashed to ensure fast and economical concrete production. Aside from achieving effective and economical adjustment to the target consistency, concrete manufacturers can also be sure of accurate replication time and time again.

Optimised rheological properties with effective consistency control

MC-PowerFlow evo enables significant optimisation of the rheological properties of the concrete. The noticeably reduced tack and viscosity of the concrete results in very good pumpability. The resultant ready-mixed concrete also impresses with excellent placement and compaction properties. The new high-performance superplasticisers thus specifically enhance the energy-optimised production and processing of concrete coupled with high output levels. And because they can also be combined with alternative starting materials such as clinker-optimised binders, recycled material and water or lower-quality raw materials, they also contribute to environmental and climate protection.

Compared to conventional superplasticisers, the new MC-PowerFlow evo generation offers concrete producers better possibilities for effective consistency control, even under difficult conditions, engendering greater reliability in the production of robust and rheologically optimised concretes.

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Effective manhole rehabilitation in Halstenbeck, Germany

View inside a manhole rehabilitated with ombran FT.

The municipal authorities of Halstenbeck, a town near Hamburg, had 75 sewerage-access manholes rehabilitated using MRT (Manhole Rehabilitation Technology) towards the end of 2019. This involved applying a combination of ombran MHP-SP special mortar and the hybrid silicate coating ombran FT from MC-Bauchemie, which offers durable resistance to biogenic sulphuric acid.

In addition to the usual age-related weathering, the up to 4.90 m deep, size DN 1000 concrete and masonry manholes in Halstenbeck had also suffered biogenic sulphuric acid corrosion (BSAC). The Pinneberg branch of consultant engineers d+p danekamp und partner was commissioned to plan the necessary refurbishment measures, which were then carried out by WEHE GmbH & Co. KG, a specialist contractor from Neuenkirchen-Vorden. In order to achieve a lasting rehabilitation result, the planners and contractor opted for the automated shaft rehabilitation technology developed by HDT GmbH and MC-Bauchemie using the MRT method and optimally matched special coatings from MC.

High efficacy thanks to the MRT truck

The refurb measures in Halstenbeck were particularly effective thanks to the use of an MRT truck. This comes with all the requisite MRT components and supplementary rehabilitation equipment, and can be used for both round and angular manhole structures of concrete or masonry down to a depth of 10 m. With this technology, the need for operatives to enter the manhole is reduced to a minimum, with all the technically difficult and dangerous work on the vertical shaft walls being carried out automatically.

Reprofiling with special mortar

As the first stage in the process, the cleaning and preparation of the manhole walls in Halstenbeck was carried out by the MRT blasting unit and a hand lance to control a high pressure water jet at approx. 500 bar carrying granulate as the abrasive. After successful testing of the surface tensile strength, the berms were coated with the special mortar ombran MHP 15. The following day and with the drain still operational, the channel was fully covered and the MRT spinning unit was lowered into the manhole shaft so as to automatically apply its first coating of ombran MHP-SP with a layer thickness of 15 mm. Both mortars in the ombran system are polymer-modified, highly resistant to chemical – and particularly – sulphate attack and classified according to DIN 19573 as a WW coating and grouting mortar per B1 – XWW3.

Durable protection against BSAC with ombran FT

Long-lasting BSAC protection was provided by the hybrid silicate resin ombran FT, which is optimally matched to the repair coat of ombran MHP mortar. The ombran FT coat was applied with the automatic HS coating head in a layer thickness of 4 mm. The air humidity from the flowing waste water caused by ongoing sewerage operations actually helped to cure the BSAC-protective coating. Due to its extremely dense matrix, ombran FT is highly resistant to mechanical stress and will readily withstand even heavy chemical attack. It also offers a high water vapour diffusion capability, thus effectively preventing osmotically induced bubble formation.

In Halstenbeck, the campaign was managed so that 4 to 10 manholes per road could be rehabilitated in one day using the MRT method. In addition to the time and cost savings engendered, the process ensured high, fully reproducible rehabilitation quality levels and significantly improved occupational safety compared to conventional manual application.

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Promotions and new hirings

Thomas Schneider (46) has taken on the newly created role of Sales Manager for Infrastructure, Industry & Buildings in Germany, effective as of 1 January 2020. A qualified civil engineer, Thomas Schneider has been working for MC-Bauchemie for four years, most recently as Global Target Manager in the "Bridge" field of expertise. In the interim, he also managed MC's Service Centre in Frankfurt/Main. Previously, he worked for more than 10 years as head of sales for a manufacturer of bitumen-based products. Led by Thomas Schneider, the German IN/B sales team covers product systems for the repair, protection and visual enhancement of concrete structures. Thomas Schneider reports to Anja Spirres, who as Regional Manager for the D-A-CH region (Germany, Austria, Switzerland), bears overall responsibility for the IN/B market segment there.

Andreas Over (43) was appointed Sales Manager for the ombran division of MC-Bauchemie in Germany as of 1 January 2020. Andreas Over joined MC-Bauchemie in July 2010. Since then, as Area Sales Manager, he has been responsible for the sale and distribution of ombran products and the provision of technical advice and support to engineers, network operators, municipalities, industrial companies and contractors/applicators in the planning and implementation of repair measures for underground sewerage facilities. Andreas Over previously worked for several years in sales elsewhere, most recently for an international tool manufacturer. In his new function, he will lead the German sales team of the ombran division.

Daniel Weber (42) took over the position of Sales Manager responsible for Switzerland/Liechtenstein at the Infrastructure & Industry division of MC Switzerland as of 1 March 2020. He has many years of experience in the construction sector and has worked in various positions for companies in the building trade over the last 20 years. A qualified building protection specialist, he has worked as a foreman and junior construction supervisor and as technical sales consultant for a major internationally active tool manufacturer. He served as a departmental and divisional manager of a construction company and was most recently employed as a planning consultant and client adviser at a large construction chemicals manufacturer. In his new function he will be responsible for a team of five field sales representatives.

25-year service awardees honoured in Hungary

MC Hungary's anniversary celebrations on 13 February 2020 included a presentation by Managing Director Dr. Ekkehard zur Mühlen to Csaba Koltai, Tibor Balogh and Tibor Tóth in honour of their 25 years of loyalty to MC, with each receiving a gold coin featuring an image of MC's founder, Heinrich-W. Müller. The three employees have been with MC Hungary since the day it was established.

MC Switzerland honours long-service employees

Four employees celebrated their 10th anniversary with MC in Switzerland in 2019 and were duly honoured on 16 January 2020. In keeping with the company's long-standing tradition, Anja Spirres, D-A-CH Regional Manager, presented the awardees with a wonderful memento, after which a fine meal was enjoyed against the backdrop of a breathtaking view from the Prime Tower in Zurich.

Group photo from left to right: Isabel Meili, Daniel Medina, Daniel Stirnimann and Stefan Scheck.

Boosting recycling quality.

MC-PowerFlow evo – the high-performance superplasticiser of the future

The use of recovered process water and recycled material, not to mention other starting materials of fluctuating quality, represents a real challenge in ready-mix concrete production today. So, using a modified polymerisation process, we have developed a new generation of raw materials that enable the production of completely new types of high-performance superplasticiser. Robust and highly effective, MC-PowerFlow evo ensures reliable fresh and cured concrete properties, even with lower-grade raw materials, while also reducing energy consumption both in the concrete production process and during placement.

Talk to us to find out how you too can boost your recycling quality.

EXPERTISE
ADMIXTURES & ADDITIVES

CI@mc-bauchemie.de

BE SURE. BUILD SURE.