

# MC

MAGAZINE

MC-BAUCHEMIE 3-2023

# aktiv

MAIN FEATURE

## SCREED SYSTEMS | 8

Top products for better screeds

IN BRIEF

### “MC-FEST” IN CHILE | 3

All good things come in threes

INNOVATION

### WATERPROOFING SYSTEM | 6

Safely sealing balconies, loggias and porticos

BEST PRACTICE

### TUNNEL CONSTRUCTION | 15

Innovative coating system protects A100 tunnel in Berlin





## Ladies and Gentlemen,

Our products often play a key role in construction, and in the case of screeds in particular they are essential in making the mixes used in both industrial and residential applications truly fit for purpose.

We offer products and systems for the production and the improved application of screeds, as well as special solutions for the repair and finishing of screed floors. Our portfolio ranges from accelerators and rapid cements to floor levelling compounds and coating, finishing and repair systems. We thus offer building owners, planners and screed layers customised solutions to optimally adapt screeds to the requirements of their building projects – all reflected in our excellent reputation in the marketplace. Read more about the positive development of our Screed division in the main feature and on the interview page of this, our latest MC aktiv!

Our still young company in Chile has also shown positive development. We are proud of this and look forward to witnessing further advances! We are also proud of our current projects and what we have achieved so far, despite the circumstances remaining very challenging.

I hope you enjoy reading this, our flagship magazine, and wish you both an enjoyable and peaceful festive season and a good start to a happy and successful new year.

Kindest regards,

*N. Müller*  
Nicolaus M. Müller

# CONTENTS

## 03 | IN BRIEF

**"MC-Fest" in Chile: All good things come in threes**

New production line in the powder tower in Bottrop

## 04 | BIG PICTURE

**St. Mark's Church in Zagreb**

MC's advanced repair and strengthening techniques make the structural fabric of the Church earthquake-resistant.

## 06 | INNOVATION

**MC-DUR TopSpeed flex plus: New waterproofing system for balconies, loggias & porticos**

**Nafuflex Multi Tech 2: Cement-free thick-layer bituminous coating**

**MC-Proof protect: New protective coating system for car parks**

## 07 | INSPIRATION

**MC-Fibre® – Reliable solutions for fibre-reinforced concrete**

How you can optimise the performance of your fibre-reinforced concrete with MC-Fibre® and MC's concrete expertise.

## 08 | MAIN FEATURE

**Screed systems: Top products for better screeds**

Screed is becoming increasingly important in construction. It fulfils important functions in terms of load-bearing capacity and both footfall-sound and thermal insulation. MC-Bauchemie offers various screed systems from its screeds product range that serve both to improve the properties of this base layer and make it easier to install.

## 11 | INTERVIEW

**Insights from Tim Hillringhaus**

The Global Product Manager and Head of Screed Sales talks about the importance and development of MC's Screed division.

## 12 | SUSTAINABILITY

**Sustainable construction with geopolymers concrete**

71 climate-friendly social housing units are being built in the nationwide showcase project UBS4 in Norderstedt, Germany.

## 13 | BEST PRACTICE

**Prestressed concrete construction in Slovakia** 13

MC-PowerFlow facilitates the construction of an advanced-design motorway bridge.

**Excavation pit in Toronto stabilised** 14

With minimal invasiveness, MC-Injekt GL-95 quickly and efficiently ensures construction progress.

**Tunnel in Berlin given high-quality protective coating** 15

Innovative coating system from MC used for A100 motorway tunnel.

**Tunnel construction in Bosnia-Herzegovina** 16

Shotcrete accelerator from MC impressively meets all site requirements in full.

## 17 | IN-COMPANY

**Spotlight: MC-Ethiopia** 17

Introducing our new management team

**Portrait: Peter Schmidt** 18

An exceptional career at MC

**Introducing: Siddesh Rangnekar** 18

Building bridges to success in India

**Personnel at a glance** 19

**Long-service awardees honoured** 19

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## "MC-Fest" in Chile

# ALL GOOD THINGS COME IN THREES



Group photo showing all participants at the "MC-Fest" in Chile.

On 9 November 2023, the third "MC-Fest" celebration took place at our headquarters in Chile, attended by more than 80 customers from the infrastructure & industry, building construction and concrete sectors.

The aim of this event, which is modelled on Germany's famous "Oktoberfest" tradition, was to present new MC products in theory and practice, to inform the customers present about current business activities and projects and, of course, to strengthen customer relationships in a festive but relaxed atmosphere. Milan Ceric, Managing Director of MC-Chile, and Lorena Imbert, Marketing Manager

and organiser, welcomed the guests to the MC marquee and invited them to the first part of the event, namely the product demonstrations, in a specially constructed arena. Technical, product and sales managers from Chile and Brazil, together with the Application Engineering team, presented various new products and took the opportunity to answer in detail the numerous questions that came from the invitees.

After the stimulating and intensive exchange with the MC experts, the guests returned to the marquee in summery temperatures for the convivial second part of the party with German beer and traditional German food. Video greetings from Managing Director Nicolaus M. Müller and Regional Manager

LATAM Jaques Pinto were also transmitted to the gathering. Both congratulated MC-Chile on its recent successes, expressed a positive outlook for the coming year and wished all those present a joyful and entertaining celebration.

Since its establishment eight years ago, MC-Chile has continued to develop and portray itself as an important player in the Chilean construction industry. The young company employs 45 people and produces admixtures, resin products and powder products at its plant in Santiago de Chile.

Read more in the news section on our website:  
<https://bit.ly/3uGx8Qu>



## NEW PRODUCTION LINE IN THE POWDER TOWER

For almost 30 years, powder products such as mortar, plasters and fillers have been produced on several levels in the MC powder tower in Bottrop. In order to increase production capacity, the powder plant was expanded and a new, third production line was installed. This has been put into operation in recent months.

The construction work in the powder tower was carried out during ongoing operations and in several phases. To create space for the new production line, the production of bitumen emulsion

curing agent was relocated from the powder tower to the roof of the bitumen emulsion plant. The facility was commissioned in January 2023. In the next step, the area for automatic and manual dosing of raw materials was revamped.

Among other things, twelve large raw material silos and eight small component silos were connected here. This was followed by the installation of a new 3,000-litre mixer, including charge infeed and product outfeed bins, before a new filling system was installed in the final stage of the work; this fills the powder products into valve bags. It took just four weeks from the first commissioning signal test to full production service.



View of the powder tower and extension



## St. Mark's Church in Zagreb REPAIRING AND STRENGTH- ENING WITHIN A SYSTEM

*St. Mark's Church in Zagreb suffered significant damage to its roof, walls and vaults from two earthquakes in March and December 2020. Restoration was unavoidable and involved the rigid filling of cracks, joints and voids, as well as the use of MC's FRCM (Fabric-Reinforced Cementitious Mortar) system in vaults and walls. The system consists of the special mortar MC-RockMortar L, the high-strength carbon fibre mesh MC-CarboGrid 210 K and the carbon cord MC-CarboRope, which were bonded with MC-CarboSolid 1209 TX and sprinkled with MC quartz. In addition, anchor rods were used, which were rigidly filled in the bell tower and in the walls of the Church.*

*Through the use of modern restoration techniques from MC, the building fabric of the Church has been effectively stabilised and made more earthquake-proof, enabling its historic splendour to be permanently preserved. Today, one of the most important historical landmarks of Zagreb shines again in its former glory as a witness to an important chapter in the history of this fascinating city.*



You will find a detailed report on our website:  
<https://bit.ly/3t3sMqW>







MC-DUR TopSpeed flex plus is moisture-compatible during application and can be used at temperatures from 2 to 35 °C.

## SAFELY SEALING BALCONIES, LOGGIAS AND PORTICOS EVEN IN AUTUM


Balconies, loggias and porticos have to withstand numerous stresses due to their exposed location. The solution: MC's two-component, flexible MC-DUR TopSpeed flex plus waterproofing system, which has been awarded ETA\* certification and fulfils the highest requirements in every performance class. It can even be applied with good results under adverse environmental conditions.

Temperature, dampness, solar radiation and mechanical and chemical stresses make the waterproofing of balconies, loggias, porticos and similar walkways a challenge. Conventional reactive resin systems are of little use in high humidity and in the cold. As a truly viable option, MC's ETA-certified, UV-resistant MC-DUR Top-Speed flex plus waterproofing system based on KineticBoost-Technology® thrives on the presence of moisture during application and can be used at temperatures from 2 to 35 °C. The products that make

up the system cure particularly quickly and are therefore quickly trafficable and/or available for overworking/further coating.

\* European Organisation for Technical Assessment

Further information can be found on our website: <https://bit.ly/3T0jlxT>



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## CEMENT-FREE THICK-LAYER BITUMINOUS COATING

MC has expanded its portfolio of thick-layer bituminous coatings with Nafuflex Multi Tech 2. The two-component structural waterproofing system combines particularly good application properties with an innovative, cement-free formulation that serves to reduce the CO<sub>2</sub> footprint in the long term.

Meeting the high requirements of the German regulation DIN 18533, Nafuflex Multi Tech 2 can be used to protect vertical, horizontal and inclined surfaces from water under protective layers such as drainage membranes or insulation boards. The thick-layer bituminous coating can be applied by hand with a trowel or by spraying with a screw or peristaltic pump.



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## NEW PROTECTIVE COATING SYSTEM FOR CAR PARKS



MC-Proof protect is a versatile sealing slurry that can be used for waterproofing buildings in accordance with DIN 18533. It also serves as an OS 5b surface protection system in building construction and civil engineering and can be used to protect concrete structures at risk of cracking.

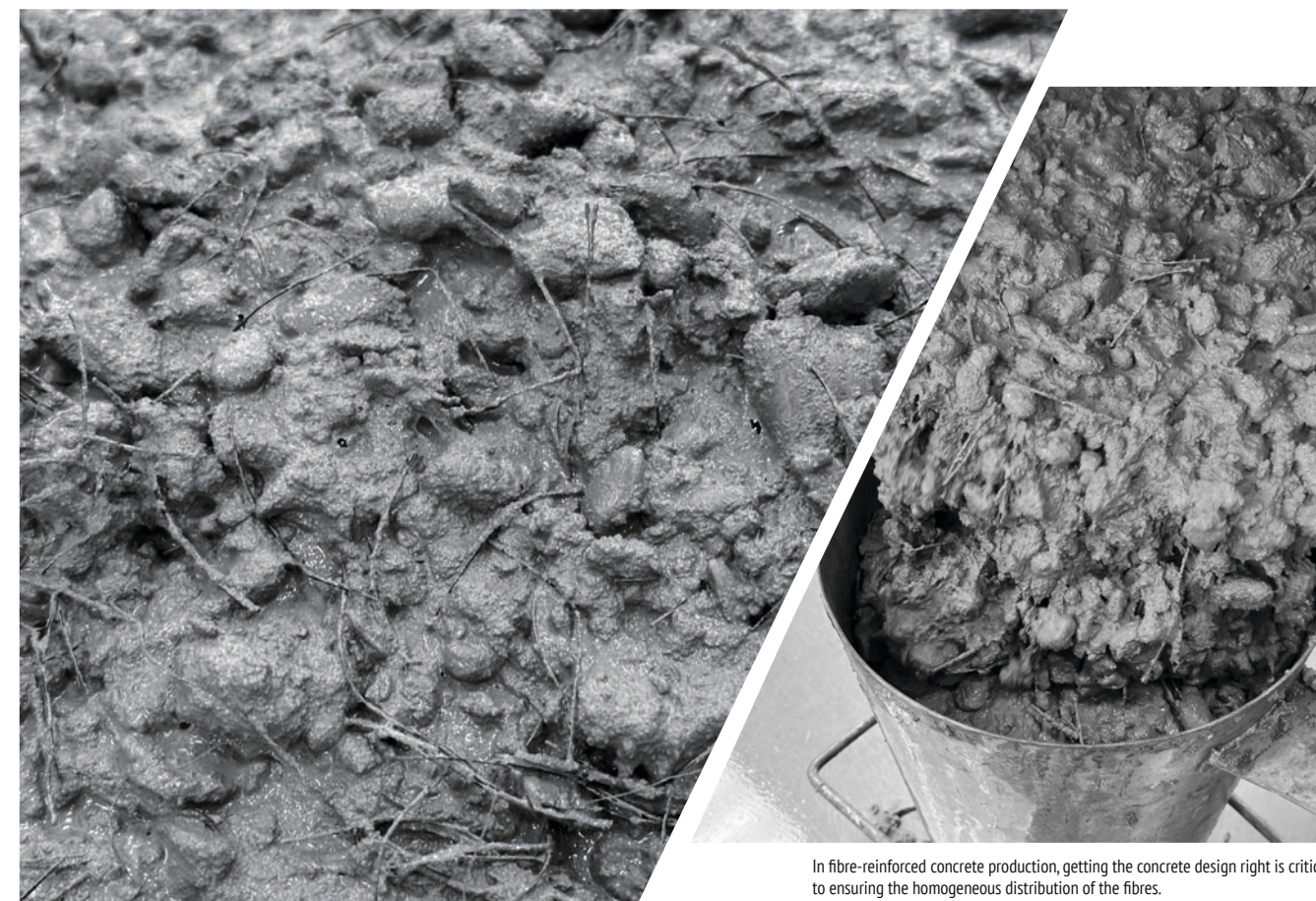
It also fulfils the requirements of the DBV\* data sheet "Multi-storey and underground car parks" for

foundations and supports in paved and subterranean car parks. MC-Proof protect inhibits carbonation, is radon-proof and can be applied at temperatures as low as 3 °C. With its frost/de-icing salt resistance, high UV resistance and ageing stability, the sealing slurry can truly be trusted to provide reliable protection.

\* German Concrete and Construction Technology Association



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In fibre-reinforced concrete production, getting the concrete design right is critical to ensuring the homogeneous distribution of the fibres.

## MC-FIBRE® – RELIABLE SOLUTIONS FOR FIBRE-REINFORCED CONCRETE

Fibre-reinforced concrete (FRC) is not just concrete with fibres. Rather, it is advanced concrete technology applied to the development of smart composite materials with enhanced strength and durability. When it comes to optimising the performance of FRC, we offer you not only our new MC-Fibre® fibres in various shapes and geometries, but also the comprehensive support and expertise of our experienced concrete technologists.

When producing fibre-reinforced concrete, the concrete mix must be adapted, otherwise the result will be defective concrete with a considerable loss in workability that can cause major difficulties during installation on the construction site. The addition of fibres changes the rheology of the fresh concrete, as more cement paste is required, making the concrete more cohesive and thus able to entrap more air. MC-Bauchemie offers significant expertise in concrete technology to meet the requirements of both the fresh and the hardened stage of FRC. To improve the rheology and workability of FRC, it is essential to use highly effective water-reducing admixtures such as our MC-PowerFlow high-performance superplasticisers.

**Finding the right balance for the FRC mix**  
The key is to find the right balance when adjusting the grain-size distribution curve for your concrete. During the mixing process, fibres require the coarse aggregates present to be

properly distributed. At the same time, fibres usually need a higher proportion of fine particles to achieve the required workability.

### MC's concrete expertise ensures reliable FRC solutions


Our concrete experts help concrete producers by advising on the appropriate concrete mix design for a given fibre geometry. This is to ensure homogeneous fibre distribution and avoid segregation and balling. Good fibre distribution is particularly important for structural applications, as the fibres should be able to bridge cracks and transfer stresses throughout the concrete to maximise their effectiveness.

Collaborating with us means gaining access to our technical support during the entire concrete production process. We are committed to providing reliable and effective concrete solutions that enable our customers to create structures that meet the highest standards of strength and durability.

**MC-Fibre® solutions for various applications**  
MC offers two fibre types: MC-Fibre® Micro and MC-Fibre® Macro. MC-Fibre® Micro helps to reduce microcracking at an early stage, mainly caused by shrinkage and settlement. MC-Fibre® Macro is available in various geometries and is suitable for structural purposes. It improves post-cracking mechanical properties due to its ability to transfer loads and redistribute stresses, allowing the partial or total replacement of traditional bar reinforcement.

Thus, with our new MC-Fibre® in combination with our concrete admixtures and our expertise in concrete technology, we can offer concrete manufacturers an exceptional overall package for fibre-reinforced concrete.

Interested? Then please contact us: <https://bit.ly/3qSDn7m>





# SCREED SYSTEMS

## Top products for better screeds

*Screed continues to grow in importance in construction – and not just as an essential basis for the subsequent floor covering. Screed fulfils an important function in the industrial sector by enhancing the load-bearing capacity of the floor. In residential construction, meanwhile, the multi-layer system provides footfall-sound insulation and a heat-insulating layer to prevent energy losses. Within its Screeds product family, MC-Bauchemie offers various screed systems to optimise the properties of this base layer according to the task at hand.*

View of the floor of the AMG Performance Centre in Essen, Germany, the screed of which was produced in 2022 using MC-Floor TurboCem fast-setting cement.

Screed is used today in a large number of variants. The general standard DIN EN 13318 basically defines screed as a layer or layers of screed mortar that is or are laid on the construction site directly on the substrate, with or without a bond, or on an intermediate separating or insulating layer. The screed fulfils two tasks. It ensures the required evenness of the floor and accommodates the intended floor covering. The specific requirements placed upon it depend on the intended use and the associated stress profile in each individual case. Other important factors include the surface covering, the planned construction times and, last but not least, conditions encountered on the construction site.

The initial criteria applied in specifying the screed derive from the installation: bonded screed adheres directly to the load-bearing concrete and can withstand particularly high loads. It is used in industry and sometimes also in basements. In

living spaces, on the other hand, screed is laid without any direct adhesion to neighbouring building components. This "floating" construction is the norm in Germany due to the requirements prevailing for sound and heat insulation.

### The five types of screed

Screeds are primarily differentiated by the binder that is added to the screed mortar. Cement screed (CT) is currently the most common type of screed. It is used indoors and outdoors and offers a wide range of applications, but generally requires a long drying time. Calcium sulphate screed (CA), also known as anhydrite screed, is almost exclusively installed as a levelling or free-flowing screed. It is characterised by good thermal conductivity, low residual stress/distortion and the ability to produce very even surfaces. This makes it more suitable for use in large jointless areas and in areas where underfloor heating is planned. Synthetic resin screed (SR), which is produced

with epoxy resin, is extremely robust. It is not only resistant to heat and cold, but also to many chemicals. It is therefore also suitable for industrial floors that are exposed to high stressing. Magnesia screed (MA) is a less common alternative for industrial floors that are subject to particularly high stressing. It offers both high strength and high load-bearing capacity. Mastic asphalt screed (AS), which uses bitumen as a binder and must be applied at temperatures of around 250°C, is a further option but is used less frequently.

### Screed systems from MC – always a safe choice

In Germany, cement or calcium sulphate screeds currently predominate in new buildings. The Screed division of MC-Bauchemie offers a comprehensive portfolio of product systems, particularly in the area of cement screed. Depending on the requirements, these can accelerate the drying of the cement screed, improve workability, ensure high early strength and final strength for early

readiness for covering and rapid trafficability, or ensure a good adhesive bond. Tim Hillringhaus is responsible for screed systems at MC. He has been Global Product Manager since the beginning of 2016 and Head of Screed Sales since the beginning of 2020. Since then, he has been driving the product division forward, particularly in Germany. The division is divided into two segments: products for the production and improved application of screed, and special solutions for the repair and finishing of screed floors. The portfolio ranges from screed accelerators, rapid cements and floor levelling compounds, to coating, finishing and repair systems.

### Improving the workability and application properties of screed

"In this field, it is all about improving the application properties of cement screed," explains Tim Hillringhaus. "Whereas concrete is supplied from the plant to the construction site ready to use, in

the case of screed it is the raw materials that are delivered. Charged into a mixing and conveying unit, these are then turned into screed mortar, which is conveyed directly to the application site." This is where the MC products come in. Pumping over long distances can be a challenge. While a hose length of 40 metres is quite commonplace, it can rise to around one hundred metres on large construction sites. Pumping the mortar over such distances is only possible with additives such as MC-Easyscreed. This highly concentrated application aid for cement screeds improves the pumping behaviour of semi-dry screeds and ensures a significant improvement in their workability, resulting in a significantly higher laying performance. "We once had a construction site where the screed mortar was pumped over 180 metres – it was in the hose for seven minutes," recalls Hillringhaus. In this case, MC-Easyscreed was the only product able to maintain the pumpability of the screed from start to finish.

### Accelerated drying

Alongside workability, the drying behaviour of the screed is a further key consideration, determining as it does the speed with which a screed can receive operational loading and how quickly it is ready for covering. "This is a classic area of concern and one that is constantly open to improvement. When has the screed reached its specified residual moisture content? When is it suitable to receive the floor covering? A standard cement screed can take six to eight weeks to dry out after installation, and even longer in adverse environmental conditions. This is a test of patience for private builders – and a real no-no for housing associations or in industry," explains Hillringhaus.

The shrinkage-reducing screed accelerators in the MC-Powerscreed series for semi-dry cement screeds can reduce the drying time to between seven and 14 days – an enormous time saving and a clear advantage for builders. And that's





Screed installation in a supply tunnel at the Virchow Clinic of the Charité hospital in Berlin

not all: the screed is also easier to compact and scores highly in terms of strength, allowing the layer thickness of the screed to be reduced. This not only makes it possible to compensate for a planning error in terms of floor height, but also increases cost-efficiency: for if, say, only 5 cm of screed needs to be heated instead of 8 cm, the savings on material, time and money can be huge.

#### Ternary binder for special applications

With MC-Floor TurboCem, MC has developed a special binder that can be used in a variety of ways. It can be applied as a rapid cement for residential construction as well as for the production of industrial screeds or high-strength commercial screeds – both indoors and out. The screed properties can be controlled with this one-for-all product by adjusting the dosage to specific application requirements. This is a great advantage for screed layers, as it makes handling easier and reduces the complexity of storage, transport and, above all, application. In addition, MC-Floor TurboCem requires less cement for the screed mix, which also saves on cost compared to conventional rapid cements.

As this special ternary binder – which came onto the market in 2020 – chemically binds significantly more water, only a small proportion of the mixing water used needs to evaporate. This means that readiness for covering can be reliably achieved within a few days, even under critical ambient conditions, and covering readiness values of between three and 14 days can usually be realised without problem. MC-Floor TurboCem offers a working time of  $\geq 90$  minutes for screeds of quality class C30-F5; it can be walked on after twelve hours and is ready for covering after ten to 14 days. For C50-F7, it offers a working time of  $\geq 45$  minutes, can be walked on after six hours and is ready for covering after three days. "Our quick-setting cement also has the advantage that

it hardens with extremely low residual stress, ensuring good dimensional stability. It further fulfils the criteria for SW1 screeds in accordance with DIN 18560," says Tim Hillringhaus.

#### Reliable screed repairs

MC's screed portfolio also includes a number of repair systems. Even when screeds are laid correctly, cracks can sometimes occur near the surface or even through the entire cross-section. If these are not repaired, they can cause serious failure at a later date. "Procedures do not always run smoothly on a construction site, things can go wrong here and there – and then the screed has to be repaired," says Hillringhaus. In such cases, MC-Bauchemie offers MC-Estrifan, a range of products with which cracks in screeds can be rigidly and permanently closed. The two-component reaction resin MC-Estrifan RIS-SL, for example, can be used to repair cracks and close joints quickly, cleanly and safely. Application is extremely simple: the base and hardener components are mixed in the bottle and then simply poured into the crack or joint.

#### Levelling and protecting the screed

In other cases, an uneven screed may need to be levelled. "A certain depth and clearance must always be maintained so that the doors still open. The screed also needs to be levelled so that tiles, for example, lie flat. Nobody wants to have a motocross track in their living room – everything needs to be nice and straight," explains Hillringhaus with a smile. MC also has the necessary levelling compounds in its range, such as MC-Floor Easyplan classic, which enables the levelling of uneven cement screed and concrete floors both indoors and out.

Products for surface protection and surface finishing also belong in this category. "These are not only used in industry," emphasises Hillringhaus,

"but also in residential construction. The classic example here is the basement. Hardly anyone lays tiles there these days unless they have money to spare. A simple coat of paint is enough to make the floor easier to clean and look good." Various products are also available here, such as MC-Estrifan SI impregnating agent for finishing mineral surfaces, or the pigmented MC-Estrifan Color Protect floor sealer. As coatings to enhance floor resilience, MC also offers the transparent universal resin MC-Estripox pro and the epoxy resin coating MC-Estripox protect.

#### In conclusion

Summarising the current situation, Tim Hillringhaus comments: "As a topic, screed was hardly ever discussed, even in the construction industry. It was simply 'the grey slab you have to have'. Today, people understand how much science is behind it – and what possibilities screed can offer with our speciality products." MC's portfolio is very broad. It not only offers solutions for practically all requirements, but also many advantages for everyone involved in the construction process. Builders and clients in residential construction benefit from shorter drying times and the resulting reduction in construction time. Builders and clients in the industrial sector benefit from a screed that is of a particularly high quality and has a much higher strength and resistance than the standard screed, as well as from the sometimes massive time and therefore cost savings during installation. And last but not least, screed layers benefit from easier application and higher productivity in terms of square metres per day.

*\* All figures are based on a temperature of 10 °C and a relative humidity of 80 %.*



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Screed division set to become ever more important going forward

## INSIGHTS FROM TIM HILLRINGHAUS

**"We have succeeded in significantly enhancing our profile in the marketplace while also gaining considerable market share."**

*Tim Hillringhaus*

**Tim Hillringhaus is responsible for screed systems at MC. The former chemical laboratory technician joined the company in 2016 as Global Product Manager for the Screed division and took on the position of Head of Screed Sales at the start of 2020. In this role, he initially built up his own team and worked closely with them to increase awareness of MC in the screed market and gain market share. Reason enough to talk to him about the importance and development of MC's Screed division.**

#### Mr Hillringhaus, what do you actually need screed for?

Screed is needed, among other things, to level floors, ensure stability and support thermal and sound insulation. Sound insulation and thermal insulation are very important in residential construction. If I were to apply a floor covering directly to the concrete floor of an apartment, the whole building would hear the occupant in his or her every move. And thermal insulation is becoming increasingly important, especially in view of energy efficiency targets.

The overall screed construction ensures that a heating system heats the room and not the concrete slab. Screed is also still used in industry, as it contributes to the stability, load-bearing capacity and durability of the floor.

#### What has changed in the screed industry in recent years?

Before 2020, there wasn't a single master craftsman qualified for the trade of screed laying, so until then practically anyone could call themselves an expert. In addition, important factors such as the shrinkage behaviour and dimensional stability of screed have only recently been

included in the governing standard. All of this has ensured that screed as a topic has become much more important. In general, it can be said that the screed industry has taken major steps forward in terms of technology, quality and sustainability in recent years.

#### How is the Screed division organised at MC?

We offer a broad product range that enables us to fulfil the requirements I just mentioned very well. It is divided into two segments. The application segment includes products for the production and improved handling and workability of screeds. In the special solutions segment, we have products that enable the production of floors for special requirements, such as are encountered in industry. This also includes systems that can be used to quickly and safely repair damage to screeds both old and new.

In addition, I have built up a bright, pro-active team over the last three years which currently consists of four sales employees and an application engineer. In this constellation, we have been able to significantly enhance our profile in the market and gain substantial market share in Germany – naturally benefiting from the exper-



**Tim Hillringhaus**

**"In the long term, we want to offer a complete flooring package: from concrete and screed to tiling and coating."**

tise available to us from within the wider MC Group. We want to further expand the model and the successes it engenders, and then take the whole thing out and beyond Germany's borders.

#### What are you planning for the future?

We want to further publicise our product range and our service capability so as to continue to grow our market share. In the long term, we also want to work with the companies in the MC Group to offer a complete package for floors, from concrete and screed to tiling and coatings.

Our aim is to be able to say to architects and building owners: 'We offer a complete MC system capable of meeting every requirement encountered in floor construction.' The combinations involving our fast flooring systems in particular offer huge potential in this regard.



# Sustainable construction GEOPOLYMER CONCRETE FOR CLIMATE-COMPATIBLE BUILDING



View into the excavation pit of the UBS4 project construction site

Photos: blu Gesellschaft für nachhaltige Immobilienprojekte mbH

**In Norderstedt, Germany, 71 climate-friendly social housing units are being built as part of the UBS4 project. The buildings feature a timber frame mounted on a geopolymer concrete foundation slab – a building method that makes the project a national show-piece of sustainable construction.**

The “4HÖFE” new-build project is one of Norderstedt’s largest and most important construction undertakings. Around 300 apartments, including owner-occupied, rental and retirement flats, are being built on four construction sites in the town centre. A special pilot project is being launched on one of the four construction sites. Under the project name UBS4, the company blu, a specialist in sustainable builds and subsidiary of the Hamburg construction company AUG. PRIEN GmbH + Co. KG, is building 71 climate-friendly social hous-

ing units there as the future owner and landlord. Three four- to five-storey buildings are to be erected on an area of 4,000 m<sup>2</sup>. The neighbourhood will also have an underground car park with space for 40 cars, 142 bicycles and 71 storage rooms.

### Sustainable energy supply

Through the construction project, blu wants to find out how much carbon dioxide can be saved in subsidised residential building. In order to construct the apartment blocks as sustainably as possible, the project team is focusing on various environmentally friendly measures. For example, in contrast to the other housing complexes in the “4HÖFE” project, electricity and heat are to be supplied by roof-mounted photovoltaic systems and a large heat pump per building. The façades of the three apartment blocks in the UBS4 construction project will also be made of recycled clinker brick, and environmentally friendly cellulose will be used as insulation. Many of the building elements are standardised and will be delivered ready-made. Moreover, the apartment blocks will be built as a timber-frame construction on a reinforced foundation slab made of cement-free geopolymer concrete.

### Sustainable construction

Geopolymer concrete is an environmentally friendly, cement-free alternative to conventional cementitious concrete. It contains binders based on industrial by-products such as granulated blast furnace slag or fly ash supplied by Holcim Germany. Together with the Australian company Wagners, MC has developed the first cement-free concrete, known as Earth Friendly Concrete (EFC). The required German building authority (DIBt) approval for the concrete was granted in September 2019. EFC and MC’s extensive expertise were also used for the UBS4 builds. Compared to reference concretes made from cement, EFC enables CO<sub>2</sub> savings of up to 75 % (see graphic).

### Building with geopolymer concrete

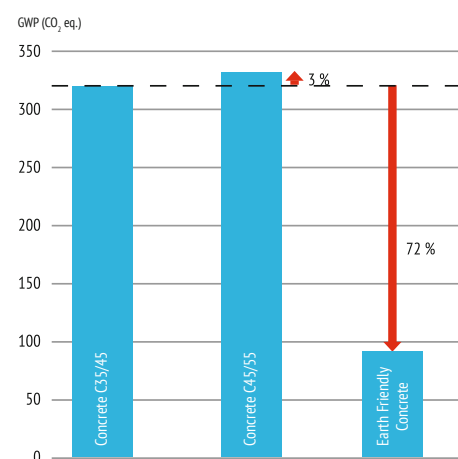
In the project, a powdered activator compound from MC was used to activate the binder in the EFC. In order to maintain a working time of 90 minutes, the high-performance superplasticiser MC-PowerFlow 4100 was also used. This enabled the application properties to be precisely adjusted and optimised, both for the precast concrete parts, which were produced by element manufacturer fdu GmbH & Co. KG, and for the ready-mixed concrete, which was produced in a collaboration between Betonlift GmbH & Co. KG and ROBA-Neuland Beton GmbH & Co. KG.

With its unique construction method, UBS4 is a future-oriented project that, quite rightly, was given the status of a model project by the state of Schleswig-Holstein. Construction work began in July 2023 and the apartments should be ready for occupancy as early as October 2024.



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### Up to 75% less CO<sub>2</sub> with geopolymer concrete



Use of EFC reduces CO<sub>2</sub> emissions by over 70 %.



Installing concrete by night

Prestressed concrete construction in Slovakia

# MC-POWERFLOW FACILITATES ADVANCED-DESIGN MOTORWAY BRIDGE

*The reconstruction of the Žilina railway junction in north-western Slovakia is the largest of the projects aligned to modernising the country’s railway infrastructure. As part of this undertaking, the construction of a special prestressed concrete motorway bridge was made possible thanks to the use of the high-performance superplasticiser MC-PowerFlow 5674.*

The Slovakian industrial city of Žilina, with a population of around 81,000, is located 200 km north-west of the capital Bratislava. The largest infrastructure project ever undertaken by the Slovak State Railways (ŽSR) started here in 2021, culminating in the complex reconstruction of the important Žilina railway junction. The project has been divided into independent units in order to optimise the organisation of the construction process while maintaining rail operations.

superplasticiser based on MC’s latest polymer technology. The universal superplasticiser is ideal for all ready-mixed concretes made from local cements.

### High-performance superplasticiser for advanced-tech demands

MC-PowerFlow 5674 demonstrated excellent properties in fresh concrete during material tests in Žilina. The customer was also fully satisfied with its curing behaviour, so it was indeed used for the bridge construction in Žilina. MC-PowerFlow 5674 ensures low stickiness of the concrete and long-lasting liquefaction, providing excellent workability. The high-performance superplasticiser can be used to produce stable, easy-flow concretes with a high-quality as-set surface. MC-PowerFlow 5674 minimises and in many cases eliminates slump and accelerates early strength development – all at a highly economical dosage rate.

As part of these measures, the construction of a new prestressed concrete motorway bridge was started in 2023. STRABAG s.r.o. was appointed by ŽSR as the main contractor for the project, and the entire construction phase was also controlled by the laboratory of TPA s.r.o.. The concrete was supplied by Cemmac Beton s.r.o., whose ready-mixed concrete plants have been working with MC in Slovakia for many years. As well as supplying concrete admixtures, MC also provides local consultancy, both at the concrete plant and on the construction site.

In order to minimise disruption to traffic on the site, the bridge is being concreted in several phases on Saturdays only – a challenge that has so far been successfully met. The bridge is scheduled for completion at the end of 2024.

### Demanding concrete construction

Construction of the bridge near the Žilina railway station began in January 2023. The design called for a special prestressed concrete structure with high compressive and flexural strength of C60/75 and a narrow profile. Another challenge was the consistency of the concrete, which had to be pumped long distances to the site and poured between the reinforcement elements. MC’s concrete technologists recommended MC-PowerFlow 5674, a high-performance



MC-PowerFlow 5674 ensures optimal workability



## Excavation pit in Toronto quickly and efficiently stabilised MC-INJEKT GL-95 ENSURES CONSTRUCTION PROGRESS



View of the excavation pit on Dupont Street in Toronto

In April 2023, MC's injection expertise was in demand for a new construction project in Toronto. The aim was to remedy inadequate support for the excavation pit of an office and residential building and to stabilise the unstable subsoil in the immediate area so that the construction work could continue as planned. In just two weeks, the foundation soil was stabilised with MC-Injekt GL-95 in a minimally invasive, time-saving and efficient manner, thus allowing excavation work to also continue in this area.

At the Dupont Street site in Toronto, soil stability problems were encountered in parts of the shoring wall. The main problem was that the soil collapsed into the pit during the excavation, which led to settlement movements at the surrounding surface that had to be prevented due to the presence of adjacent site equipment. The aim was therefore to stabilise the soil in such a way that the excavation work could be continued, with the lagging work then following. The special feature of this task lay in the confined space conditions on the construction site, which made conventional injection methods impossible. The renowned and MC-certified special foundation engineering contractor EBS Geostructural Inc. from Breslau, Canada, was commissioned by the clients to carry out the injection work to secure the subsoil in the affected area.

### Efficient and minimally invasive injection method

EBS got to know the Canadian MC team and the injection systems of MC at a technology presentation where, among other methods, acrylate gel-based injection was presented. EBS's interest in this technology was further strengthened by a compelling presentation by MC at a geotechnical symposium, which the client and the main designer also attended. EBS and the client were convinced of the method's effectiveness and used MC's solution in their Toronto excavation.

### Securing the excavation quickly and efficiently

The injections with MC-Injekt GL-95 were minimally invasive and could be carried out on a narrow strip along the shoring wall, as no bulky drilling equipment was required. The acrylate gel MC-Injekt GL-95 impressed with its low viscosity and the ability to adjust the reaction time to precisely control penetration into the sandy-

silty, partially gravelly subsoil. During the first three days of application, the MC team trained the applicator on-site to use the complete injection system. This consisted of the acrylate gel MC-Injekt GL-95, the pneumatic injection pump MC-I 710, and an easy-to-handle ram lance system, with which the site team then successfully stabilised the entire excavation area in just two weeks. The injection area extended over a length of approximately 32 m and reached a depth of 5.5 m. Apart from an unexpected cavity, which was also backfilled, the measure went smoothly.

### Accelerated construction process

Thanks to MC-Injekt GL-95 and the on-site service provided by the MC team, EBS was able to overcome the challenges of soil stability on the site effectively and on time. Acrylic-based injection proved to be a cost-effective, minimally invasive alternative to conventional cement-based injection methods and significantly accelerated the overall construction process of the modern office and residential building on Dupont Street. A remarkable success for all involved!



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## New tunnel in Berlin given high-quality protective coating MC-COLOR T 21 SYSTEM USED FOR A100 MOTORWAY TUNNEL

As part of the expansion of the A100 motorway in Berlin, the walls of the new Grenzallee tunnel received MC's latest protective coating MC-Color T 21. As the motorway is one of the most important traffic arteries serving the city, a particularly safe and durable solution was required. With Nafufill R3 FM and MC-Color T 21, a proven coating system from MC, the tunnel walls are now permanently protected.



The high-performance coating MC-Color T 21 was applied using the airless spraying method.

German motorway A100, also known as the Berlin ring road, connects numerous districts of the German capital. It runs right through Berlin and serves as a link to other motorways and major roads. The A100 motorway consists of two sections known as the eastern and western ring. The eastern ring runs through the districts of Friedrichshain, Kreuzberg and Neukölln, while the western ring links districts such as Charlottenburg and Tempelhof.

### Berlin ring road – key to the city's transport flows

With a total length of 20.9 km, the Berlin ring road is one of the city's most important traffic arteries, enabling road users to quickly and easily bypass the city centre. The Berlin motorway is currently being extended between the Neukölln junction and the Treptower Park junction. It is connected

to the urban traffic network via three exits and includes the 385 m long Grenzallee tunnel.

### Innovative OS 4 coating system for road tunnels

To protect the inner shell of the Grenzallee tunnel, the BAB A100 consortium consisting of Max Bögl Bauservice GmbH & Co. KG and HOCHTIEF Infrastructure GmbH, together with the application contractor DMI Injektionstechnik GmbH from Berlin, decided in favour of an innovative OS 4 coating system from MC. This involved a combination of the new polymer-modified fine mortar Nafufill R3 FM and the high-performance coating MC-Color T 21. The work started in March 2023, after the coating system had already been successfully tested on a trial area a year earlier. Since then, around 8,000 m<sup>2</sup> of the tunnel's wall surfaces have been duly coated with the protective system.

### Durable surface protection of the tunnel's inner shells

After the substrate had been prepared for coating by high-pressure water blasting, it was levelled with the curing-free fine mortar Nafufill R3 FM. It fulfils all the requirements of performance class R3 in accordance with EN 1504-3. As there was no need for time-consuming curing after application, this significantly reduced the amount of work required on site. In the next stage, the ready-to-use surface

protection MC-Color T 21 was applied using the airless spray method. MC-Color T 21 is a high-performance coating with exceptional reflective and dirt-repellent properties. It is a tough, weather-resistant coating with fast curing and overcoating times, which makes it an exceptional fit for traffic structures. These properties also make it suitable for application in road tunnels and it has been tested and approved in accordance with the national codes ÖBV, ASTRA and ZTV-ING Part 7.

Finally, the transparent anti-graffiti system MC-Color Proof vision was applied to the cornices of the tunnel entrance areas above the tunnel tubes. This serves as additional protection against graffiti for the coat of arms of the city of Berlin, which will adorn the entrance to the tunnel. As things stand, the A100 tunnel with MC's protective coating system is scheduled to be opened to traffic at the end of 2024.



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View inside the tunnel



View of the tunnel entrances of the two tunnels Putnikovo Brdo 1 and 2



## Tunnel construction in Bosnia-Herzegovina SHOTCRETE ACCELERATOR FROM MC MEETS SITE REQUIREMENTS IN FULL

The construction of the Doboj bypass is an ambitious project in the north-east of the Republic of Srpska, one of the two constituent states of Bosnia-Herzegovina. With a total length of approximately 4 km and construction of the Putnikovo Brdo 1 and 2 tunnels, the project represents a milestone in the development of the region's infrastructure, to which MC also contributed with Montan Shotcrete HA 01 HR accelerator.

The Doboj motorway bypass connects the northern end of the motorway in the Federation of Bosnia and Herzegovina with the Johovac-Rudanka motorway section currently under construction. This section runs west of the town of Doboj and is of strategic importance as a regional transport link. Autoputevi Republika Srpska contracted MC's client Integral Inženjering a.d. Laktaši to carry out the infrastructure pro-

ject, which cost around €110 million. The project was supervised by IRD Engineering from Italy.

**Montan Shotcrete HA 01 HR gives best results**  
The construction of the two Putnikovo Brdo tunnels required a special solution. One of the main challenges of the project was the lack of stability of the ground through which the tunnels were being dug. Initially, Brdo 1 tunnel was in danger of collapsing in places. The search for a suitable approach was a lengthy process, which eventually led to the MC team in Bosnia and Herzegovina being asked to carry out on-site tests and prove the quality of Montan Shotcrete HA 01 HR accelerator. This was crucial as the project stakeholders had been working with an established competitor for years. Once MC was involved, the work went smoothly. Montan Shotcrete HA 01 HR was the only accelerator that could meet the early strength requirements of the concrete. After months of testing, MC was left as the only supplier able to offer a satisfactory solution.

**Considerable time and cost savings**  
Montan Shotcrete HA 01 HR is a versatile hardening accelerator for shotcrete used in wet and dry spraying for tunnel and mountain stabilisation, temporary rock stabilisation and slope stabilisation. It offers high early strength and fast construction progress, allowing layer thicknesses of 15 to 25 cm per application, and thus sav-

ing time and money. In the testing phase, even layer thicknesses of up to 50 cm were no problem and performed well. Montan Shotcrete HA 01 HR is also characterised by a lower dosage than competitive products, which allows further significant cost savings.

The completion of the Doboj motorway bypass is an important step towards improving the infrastructure in Bosnia and Herzegovina. With the successful use of Montan Shotcrete HA 01 HR, MC-Bosnia-Herzegovina has once again demonstrated its ability to provide tailor-made solutions for challenging construction projects and to contribute to the success of major infrastructure undertakings.



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Shotcrete application in the tunnel

## Spotlight: MC-Ethiopia

# INTRODUCING OUR NEW MANAGEMENT TEAM



The new management team in Ethiopia (from left to right): Admasu-Arega Wubio, Kasahun Kebede, Habte Muleta Guta, Mihret Kebe Mengesha, Yidnekachew Mekonnen, Selamawit Fekadu, Ephrem Hailemariam, Million Tafesse and Addis Dessalegne.

*The Ethiopian management team has undergone a reshuffle over the past year. Yidnekachew Mekonnen joined MC-Ethiopia as Managing Director in September, Addis Dessalegne as Sales Manager, Selamawit Fekadu as Technical Customer Service Manager in October and November 2022 respectively, and Habte Muleta joined as Procurement and Logistics Manager in February 2023. Together they have formed a new management team with the aim of further developing MC's business in Ethiopia and increasing awareness of the "MC" brand.*

Over the past year, our management team has implemented a differentiated market strategy, focusing not only on distribution partnerships, through which MC's products have traditionally been sold, but also on introducing their own stores in the megacity of Addis Ababa. They opened the first such MC store in Addis Ababa in the first quarter of the year, selling mainly MC powder products such as tile adhesives,

plasters and mortars, as well as liquid products such as admixtures and paints, and plan to open a further three shops. The 85 employees at the company generated sales of around €4.2 million last year. A major focus is on the construction and building distribution sector, which accounts for around 70% of sales.

### Ambitious goals for 2023

"Our goals for this year are ambitious and multifaceted. First and foremost, we aim to strengthen our retail presence by strategically opening company-owned stores and expanding our reach in regional markets," insists Yidnekachew Mekonnen, while Addis Dessalegne adds: "At the same time, we are committed to maintaining and growing our Concrete Admixtures (CI) business while expanding our customer base, especially with new batching plants targeting mega projects, concrete goods and the precast business."

In addition, MC-Ethiopia intends to strengthen MC's waterproofing segment by introducing innovative products such as MC-Proof DF 8, designed for roofing and repair work, or MC-DUR 1150 and MC-DUR 1200 VK. Moreover, two new product groups, PCE-based admixtures and tile adhesives, have been launched to diversify MC-Ethiopia's product portfolio and to meet various construction needs.

### Export to the East Africa region in 2024

"Looking ahead to next year, our goals remain as ambitious as ever," says Managing Director Mekonnen. "We plan to venture into the export market in the East Africa region, capitalising on our established expertise. We are also keen to introduce epoxy-based flooring products to meet evolving market demands. As always, we remain open to adapting and introducing new products as required by the ever-changing landscape of the construction industry."



Y. Mekonnen (L) and A. Dessalegne in Botrop in April 2023





Peter Schmidt  
AN EXCEPTIONAL MC CAREER



Peter Schmidt (58) can look back on an impressive career at MC. Born in Oberhausen (not far from HQ), he joined MC as an apprentice in 1988 and – with a three-month interruption in 1999 – has thus been with MC for over 35 years. During this time, he has worked in many areas of the company and has repeatedly been deployed as a “firefighter”. Most recently appointed Product Line Manager for the Resin Floor & Road Resin group, he has been supporting our national companies in the marketing and sale of our resin products in the industrial floor and bridge sectors for over two years.

After graduating from high school and completing his civilian service, Peter Schmidt began his apprenticeship as an industrial clerk at MC in 1988. An early highlight was his three-month stay in Ireland,

enabling him to cultivate his language skills and broaden his outlook towards other cultures. After completing his apprenticeship, he was taken on as an office worker in the Surface Protection department. In 1995, he switched to field sales and worked there successfully until 1999. At the end of 1999, however, he was tempted away by a customer company. But he quickly realised that it wasn't for him and he returned to MC after three months. Here he rebooted as Product Manager Concrete Repairs and also travelled a lot pursuing field sales.

**Firefighter with special duties**

In the years that followed, he lived up to his name as a firefighter. During this time, he took on various roles and special tasks and even headed up Marketing for a while. In 2002, he was put in charge of MC's private label business, to which he remained

loyal until 2020. In 2015, he was additionally appointed Global Target Manager Bridges, where his experience and expertise was very much appreciated. At the end of 2020, he finally moved to the newly created Product Line Management with a focus on Resin Flooring & Road Resin. Here, he serves as a link man between various MC departments and national companies.

Outside of work, Peter enjoys playing electric drums, cycling and spending time with his Sheltie dog Kira. In his youth, he competed at Latin American dance tournaments and had a passion for horse riding. In his free time, he enjoys cooking and indulges in a particular passion for collecting: he can call numerous musical instruments his own. Peter Schmidt is proud of his long service at MC and grateful to have played a small part in the successful development of the company.

**INTRODUCING: SIDDESH RANGNEKAR**

Building bridges to success in India

Siddesh Rangnekar (48) joined MC-Bauchemie India in 2012 and currently holds the post of Technical Senior Manager. A mechanical engineer with additional qualifications in business administration, Siddesh began his career in 1999 with an agricultural products manufacturer in India, where he worked for two years as a project engineer. He then spent 11 years as a project manager with a well-known Indian construction company specialising in the manufacture of waterproofing products, concrete repair products, coatings and sealants. In his current role, his responsibilities range from business expansion in the power sector and bridge waterproofing to technical support for all MC products in India except injections. His major achievements include many successful bridge coating projects with EmceColorflex, some of which have been featured in MC aktiv. Siddesh enjoys his work, which he continues to find interesting and varied. In his leisure time, the father of two enjoys music, cricket, cycling, working out and reading research papers.



*Wishing you continued enjoyment and success!*

**PERSONNEL AT A GLANCE**

New colleagues



**RAY J. WANG (56)** has taken over as Managing Director of MC Taiwan with effect from 16 August 2023. A civil engineer, Mr Wang has more than 20 years' experience in the construction industry, particularly in civil engineering. Most recently, he worked for a renowned Taiwanese construction company for more than ten years, specialising in project planning and design as well as in the execution of construction projects. Prior to that, he spent six years with one of Japan's largest construction companies, where he was involved in a wide range of construction undertakings and services. Ray first met MC while working on the Taiwan Highspeed Rail project, one of the largest projects in MC's history.

**YASSINE BEN AYADA (35)** started as Area Manager Africa at MC on 6 September 2023. He reports to Christoph Hemming, Regional Manager Africa, and supports him in the regional management of the African continent. The Tunisian has worked for a well-known construction chemicals company in recent years, where he initially started as Target Manager and later became Managing Director responsible for setting up a new country subsidiary in Africa. His arrival marks the first step towards a successful succession plan for regional management in Africa.



**LONG-SERVICE AWARDEES HONOURED**



We were finally able to return to our old company tradition of honouring the long-service anniversaries of current MC Group employees on the first Thursday in December at a traditional dinner at Gasthof Berger in Bottrop. The ceremony held on 7 December 2023 was attended by MC employees from Germany who were marking their 10th and 25th anniversaries with the company this year. After the welcoming address from Managing Partner Nicolaus M. Müller, the Managing Directors and division heads of MC-Germany took time to speak to and get to know each awardee,

thanking them for their many years of service and special commitment to the company. The managers also presented gifts to the honourees, the latter clearly enjoying the evening with a delicious three-course meal taken in a relaxed atmosphere. In addition to the gala in Bottrop, anniversary celebrations were also held at other MC locations around the world. Below you will find a list of all this year's awardees worldwide, sorted alphabetically by country and surname.

- |  |  |  |  |  |
|--|--|--|--|--|
| <p><b>40 years' service award</b><br/>Rosemary Hughes-Merry (IRL)*<br/>Anne McArdle (IRL)*<br/>Anthony Mc Verry (IRL)*</p> | <p>Luzian Haida (DEU)<br/>Burkhard Hartlieb (DEU)<br/>Peter Janetzki (DEU)<br/>Sergej Krylov (DEU)<br/>Marita Löcker (DEU)<br/>Nadir Meral (DEU)<br/>Thomas Pfäffle (DEU)<br/>Christian Rahe (DEU)<br/>Uwe Ruppelt (DEU)<br/>Henrik Schönitz (DEU)<br/>Rafael Morales (ESP)*</p> | <p>József Orsós (HUN)*<br/>Csaba Pethő (HUN)*<br/>Tulsidas Gaonkar (IND)*<br/>Naneshwar Chandu Gaunkar (IND)*<br/>Ewa Andrzejewska (POL)*<br/>Witold Chodyń (POL)*</p> | <p>Christian Dreps (DEU)<br/>Aline Gradowski (DEU)<br/>Stefan Hettwer (DEU)<br/>Denis Hoffmann (DEU)<br/>Pierre Kral (DEU)<br/>Andreas Oxen (DEU)<br/>Herbert Paul (DEU)<br/>Stefan Reichelt (DEU)<br/>Roland Schepers (DEU)<br/>Dieter Theodor Schneider (DEU)<br/>Dr. Patricia Steffen (DEU)</p> | <p>Oliver Winking (DEU)<br/>Rafael Tarrazona (ESP)*<br/>Zsanett Varga (HUN)*<br/>Adrienn Vászics-Mayer (HUN)*<br/>Eugene Deane (IRL)*<br/>Ian Minihane (IRL)*<br/>Munusamy a/l Shanmugam (MY)*<br/>Desmond Ng (SGP)*<br/>Dragana Drca (SRB)*</p> |
|--|--|--|--|--|

\* These awardees were honoured in their own countries.



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