

# Putzmeister

MADE BY PUTZMEISTER

PUTZMEISTER 60 / 2018

YEAR OF CONSTRUCTION: 1958

THE STORY OF PUMPS



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THE STORY OF PUMPS



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Development with  
mortar pumps

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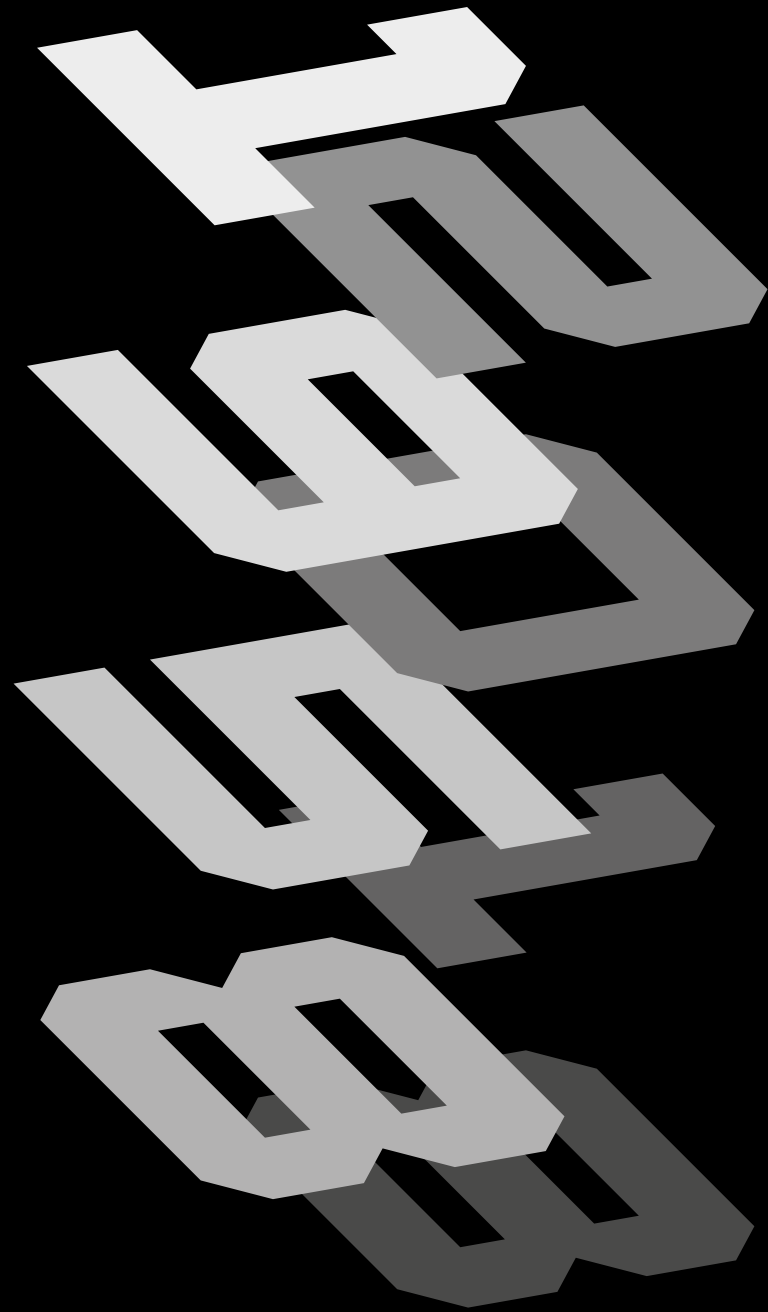
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„The future Putzmeister is not only a machine manufacturer, but also a provider of solutions, who networks all processes on the construction site in collaboration with its partners – and in doing so does not lose sight of its core business.“

Putzmeister-CEO Martin Knötgen





Karl Schlecht's first mortar pump, invented in 1958 and called the PM 1, was the basis for the company's success. To this day, users are still benefiting from this innovation.

- > Inventor, founder, visionary.  
A portrait of Karl Schlecht
- > 1966 – Triad of success
- > Digital construction sites

# THE MASTER MIX

Development with mortar pumps

Is there an easier way to apply mortar to walls? Karl Schlecht answered this question with a ground-breaking invention. For many decades, he controlled the destiny of his company. The impact of his ideas is still felt today.

**THE FLIGHT TO THE TOP BEGAN STRAIGHT AFTER UNIVERSITY: KARL SCHLECHT QUICKLY LED PUTZMEISTER TO SUCCESS.**



P O R T R A I T

# INVENTOR, FOUNDER, VISIONARY

**A**s a boy growing up in the 1950s, Karl Schlecht experienced first-hand how tough the trade of plastering was. Plasterers stirred the mortar by hand, carried it in tubs on their backs and applied it onto the wall with a trowel. As a schoolboy, Karl Schlecht helped out in his father's plastering business in the Swabian town of Bernhausen in southwestern Germany. It was difficult and dirty work. At the age of 2

and by now a student of mechanical engineering at Stuttgart Technical University, he thought there had to be an easier way, but no suitable machine existed yet. "Then I'll invent one myself," he decided. He submitted the plans for an initial mortar machine as his dissertation. And he tested the prototype in his father's company. Did he have visions back then? "Just one," says the 86 year-old looking back: "To get the mortar onto the wall as easily as possible." He

tinkered, tested and rejected his ideas again. Persistence is an important success factor for the founder of Putzmeister.

## TRUST AND MARKETING

In 1958, the recently graduated engineer founded the "Karl Schlecht Maschinenfabrik". For his first machine, the PM 1, he procured compressors and other components that he assembled in his father's garage. Occasionally, the village blacksmith in Bernhausen helped out, shoeing horses on the side. "It was all very primitive," says Karl Schlecht, laughing as he remembers it. But, in all seriousness, he points out that the principle of buying parts applied even back then: Instead of producing its own parts, Putzmeister relies upon suppliers. The single parts are assembled into powerful machines in the main works in Aichtal and throughout the world. The time was right: After the end of the Second World War, many German cities were in ruins. They had to be rebuilt, the people needed housing. Following the currency reform in 1948 and with the subsidies of the Marshall Plan, the economy slowly began to recover. From the 1950s, many people were able to afford some luxuries again thanks to the upturn, which came to be known as the "Wirtschaftswunder" – an economic miracle. The dream of prosperity often became a reality – complete with car, holiday and the deeds to a house. In particular, the construction industry flourished. On his father's construction sites, Karl Schlecht showed anyone with an interest how his machines worked. "It made an impression," he recalls, "how the machine pumped the mortar and sprayed it onto the wall with a hose." Schlecht's invention soon caught on. The young entrepreneur was successful and had already earned his

first million by 1960/61. There was no room for expansion in his father's backyard, but an industrial estate was being created on Echterdinger Straße in Filderstadt-Bernhausen. There, he found a site and, on 1st January 1962 renamed his company "Putzmeister Maschinenfabrik". "Putzmeister verputzt meisterhaft" was the first slogan (Professional plastering with Putzmeister). "Everyone wants to be a professional, not just in sport. The term 'Meister' is also deeply rooted in trade," explains Schlecht. He further developed the PM 1, and revenue continued to rise.

## GROWTH AND INTEGRITY

The boom years ended in the 1960s, with the first recession since the war. Karl Schlecht sought new business areas and saw great opportunities for the up and coming ready-mix concrete. Delivered to the construction site by a truck mixer, it made for very efficient construction. A floor could be created within a few hours – provided the concrete was delivered to the construction site quickly. For this to happen, powerful pumps were required – just like the

pumps being developed by the engineer Karl Schlecht. In this business area, too, Putzmeister soon became one of the leading providers in Europe. By the start of the 1970s, about ten years after it was founded, around 300 people were already working for Putzmeister. But how did the inventor become an entrepreneur with responsibility for many people? "I hadn't studied business management or psychology," says Karl Schlecht. He learnt some of it from his father. "You have to know exactly how much everything costs," he explains. He created bills of materials for the increasingly complex machines and ensured that spare parts were in stock at all times. The engineer stresses that Putzmeister has always earned money. →



A TRADE LEARNED FROM THE TROWEL UP  
Even as a pupil and student, Karl Schlecht did odd jobs for his father's plastering business.

P O R T R A I T

Its high equity capital was also what saved the company during the big crisis of 2008.

#### DISPUTED DECISIONS, GREAT RESPECT

As Karl Schlecht openly admits, his decisions were frequently criticised. But he considers his decision to convert the company into a foundation in 1998 to be “one of my best.” The foundation’s projects support young people and up-and-coming managers, and it is also strongly committed to the region. The focus on humanist values is important to him. When Karl Schlecht is convinced about something, he rarely lets himself be dissuaded. As boss, he demanded a lot of his employees, acting entirely like the patriarch of a family company. Conflicts were usually open and hard-fought but the entrepreneur enjoys a lot of respect even today. He still follows the development of Putzmeister with great interest, even though he has long since stood down from operational business. He is on site every day, working for the foundation. At lunchtime, you can find him chatting to employees, sometimes joking sometimes talking shop. “I’m happy and thankful that I am still able to sit at any table.”

The secret of his success, says Karl Schlecht, is that he is open to what the customers have to say. Getting

#### ONE MAN AND HIS MACHINES

The founder still follows the company’s development with interest. With his foundation, he is now primarily committed to supporting upcoming talent and the region.



to the bottom of their problems and understanding what motivates them is important. Offering something that is of real benefit to the customer – that has always been what Karl Schlecht’s Putzmeister was all about, right from the beginning. Even if the company has developed into a global Group since the days of tinkering in his father’s garage, even if the Swabian family company Putzmeister is part of the SANY Group today: Karl Schlecht’s ideas, his vision and his values are still alive within the company, today as before. 🇩🇪



#### ALWAYS AN OPEN EAR

One of his recipes for success, says Karl Schlecht, is closeness to customers.

## WHAT SUCCESS IS MADE OF

We are all familiar with the materials that are so important at Putzmeister. But what exactly are the differences between mortar, plaster and screed? Here is a little lesson in materials.

### MORTAR

#### FINE, SOLID MIXTURE

A traditional mixture: Even in ancient times, builders used mortar to plaster walls and ceilings. It is produced by mixing a binder such as lime or cement with water and stone granules.

Usually sand is used, with particles of no more than four millimetres in size. When the particles are larger, we call it concrete.

How much water and how much sand are contained in the mixture depends, amongst other things, on whether the mortar will be used inside or outside. There are significant regional differences in the mixture – ultimately, every region has its own trade and craft traditions.

### GYPSUM

#### MAGIC MINERAL

Innocuous, ubiquitous, yet a special substance: Gypsum, the main ingredient of plaster, occurs naturally in plentiful supply. The mineral usually lies close beneath the earth’s surface and is easily extracted. But it is also created as a side product of industrial processes, such as in the flue gas desulphurisation plants (FGD) of coal-fired power stations. The gypsum produced in this way is also referred to as FGD gypsum. The molecules of the mineral are arranged in characteristic crystals. Because gypsum is not combustible, it is used in particular for interior construction, such as for non-supporting walls. This substance, mixed with water, can be changed back into stone – a truly magical mineral.

MORTAR, GYPSUM,  
SCREED –  
WHAT EXACTLY  
ARE THEY?

### SCREED

#### VERSATILE CONSTRUCTION BASIS

No structure can do without it: As soon as the building carcass is finished, one or more layers of screed are placed on the substrate. Inside a house, screed is usually used as an underlay for floor coverings such as parquet, carpet or laminate. But it can also be used directly, such as in garages or basements. The concrete mix can differ depending on the binders used: The most frequent form is cement screed, with stone particles of about eight millimetres in size, and three parts sand to one part cement. Binders such as poured asphalt, synthetic resin, calcium sulphate and magnesite are also used. And there are just as many types of processing as there are mixtures: Screed layers refer to compound screed if the screed is applied to the substrate and bonds with it. But floating screed is also a possibility, meaning that the screed is laid without coming into contact with the subfloor and the side walls.



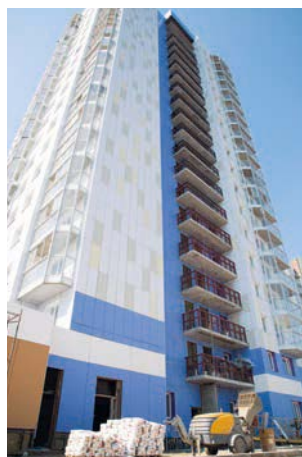
SHOWCASE

Machines for a modern Moscow: These high, five-storey apartment blocks in Russia are called Khrushchyovkas. The first of them were built in 1953, with refurbishment beginning in 1999. More than 250 buildings are currently in construction, and Putzmeister technology is involved in almost all of them; both concrete pumps and mortar machines are on site. The screed laid with the Mixokret series has several functions in the major project in Moscow: It levels surfaces, supports high loads and forms the basis for the top floor covering. As an insulating layer, it also increases living comfort – a valuable advantage in the often icy Moscow winters.



**THE M 740 IN ACTION**

This screed professional delivers the building material efficiently and evenly. The robust machine even handles sand and fine concrete with a particle distribution of up to 16 millimetres.

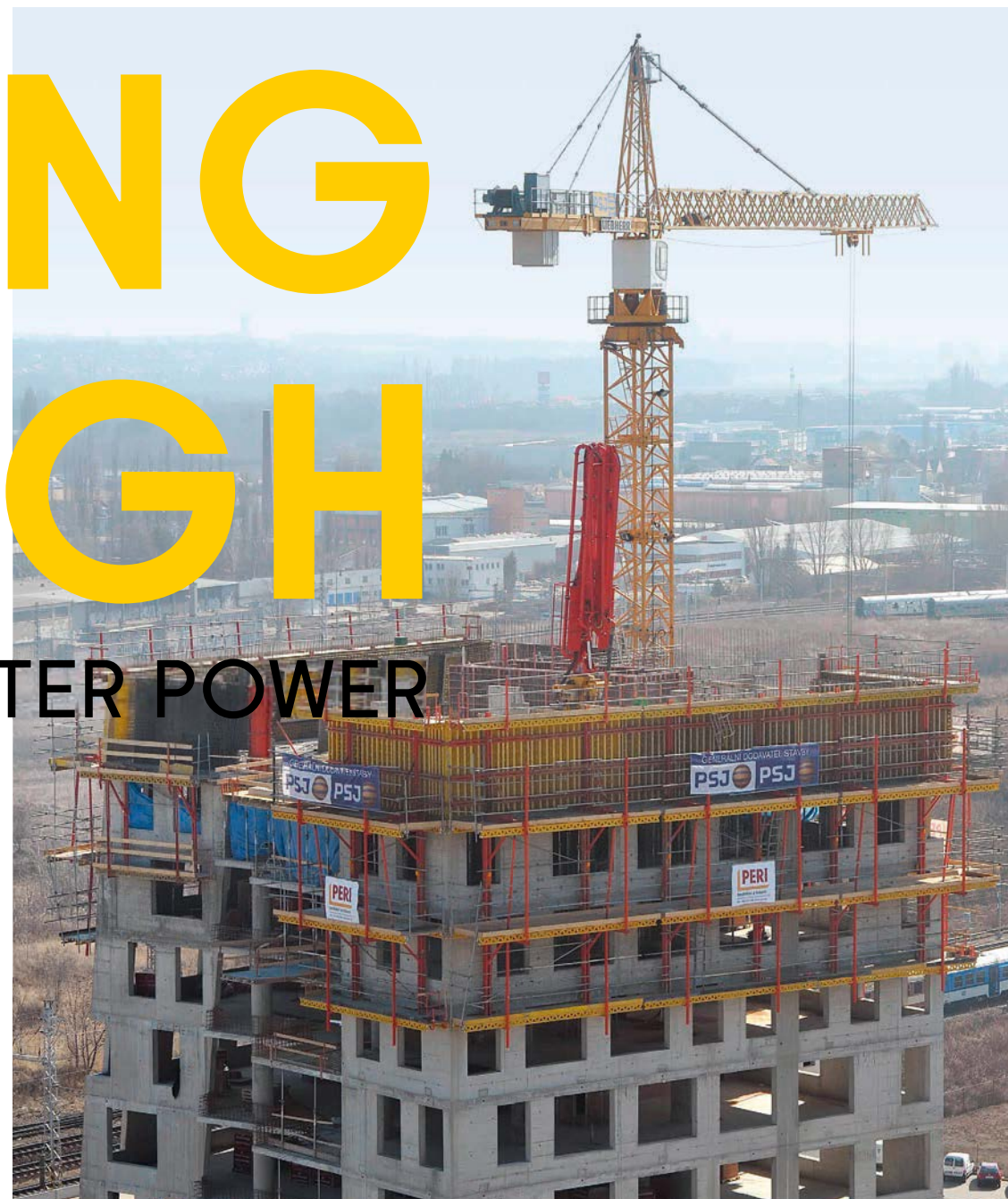


Between 2011 and 2013, the tallest skyscraper in the Czech Republic was built in Brno: The AZ Tower consists of 30 floors over 111 metres, with modern photovoltaic systems and heat pumps ensuring energy efficiency. There are shops and offices on most floors, but the top six floors are filled with luxury apartments – levels 28 and 29 even have swimming pools. In total, 10,000 square metres of cement screed were placed by the Czech company Beton K.R. – relying on Putzmeister’s 740 Mixokret series and, above all, the Mixokret 760. Thanks to this machine, it was possible to handle the challenging delivery ranges and heights.



# RISING HIGH

## WITH PUTZMEISTER POWER



SHOWCASE



## ENDURANCE RUNNER



### GIPSOMAT

#### THE SOLUTION TO A SEEMINGLY UNSOLVABLE PROBLEM

In Putzmeister's Swabian homeland, inner walls and ceilings were traditionally plastered with gypsum mortar. Since this hardens within about 15 minutes, it had not previously been possible to pump it mechanically. But Putzmeister found a solution: A machine that simultaneously mixed and pumped – the Gipsomat. The reservoir, mixer drum and worm pump are arranged one on top of each other in the Gipsomat. The plasterer fills the dry mortar into the reservoir, from which it falls down into the mixer drum and is stirred with the added water. The worm pump then pumps the gypsum mortar into the delivery hose. The ratio of water to dry mortar must be exactly right in order to achieve the correct consistence – "trowellable plaster", as the experts say. The simple, effective design was crucial for the success of the Gipsomat. At the same time, the mortar industry developed gypsum plaster that only hardened after a good hour and therefore also made work easier.

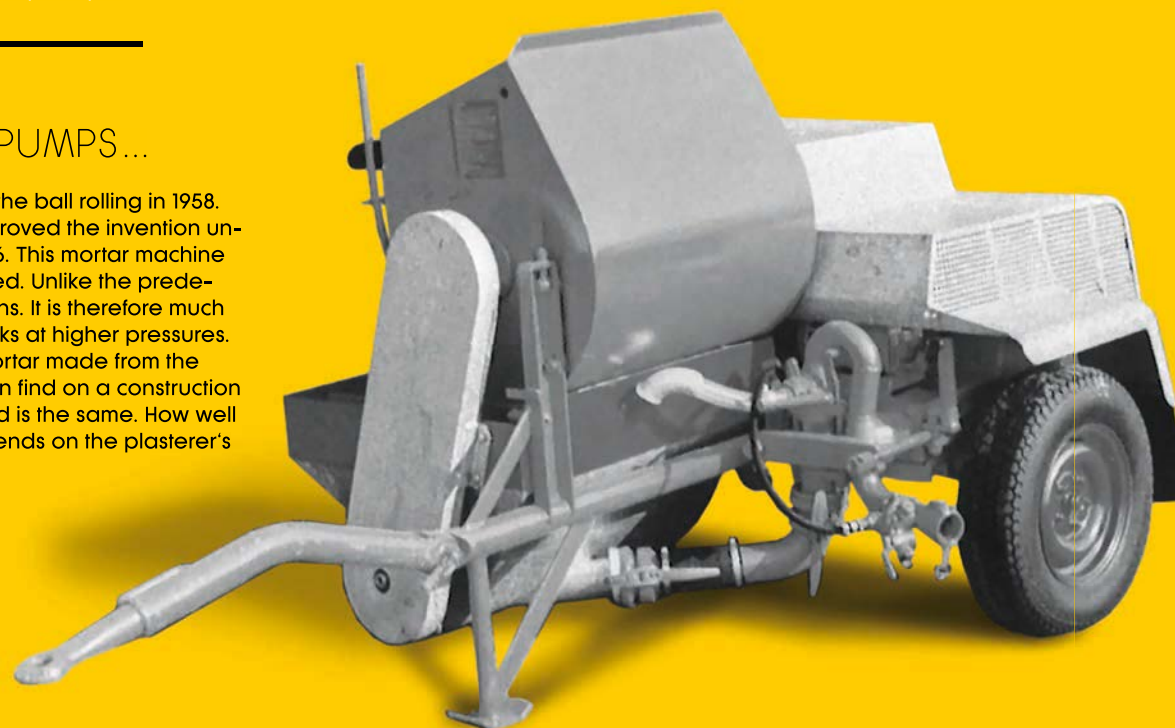
#### P1 · 1966

Putzmeister continued developing the Gipsomat over a period of decades, varying the technology and design. Yet even the current model, the MP 25, works according to the tried and tested principle from 1966.

### P13

#### PUMPS AND PUMPS AND PUMPS...

With the Putzmeister 1, Karl Schlecht had set the ball rolling in 1958. In the years that followed, his designers improved the invention until the P 13 went into series production in 1966. This mortar machine is still produced today, practically unchanged. Unlike the predecessor models, it has a pump with two pistons. It is therefore much more robust, pumps more material and works at higher pressures. This makes it ideal for "site-made mixes": Mortar made from the lime or cement and sand that the tradesmen find on a construction site. Not all lime is the same, and not all sand is the same. How well the mortar mixtures can be processed depends on the plasterer's skill and on the starting material.



## ENDURANCE RUNNER

### MIXOKRET SCREED CONVEYOR FROM TEST TO SERIES PRODUCTION

Shortly after the Gipsomat came the next ground-breaking invention: The Mixokret screed conveyor. This machine, too, solved a problem on construction sites. It was barely possible to pump stiff and almost dry screed with Putzmeister's piston

and worm pumps. So Putzmeister developed the so-called plug delivery. Using compressed air, the screed mixture is pushed to the right position plug by plug. The prototype, the M 300, had a volume of 300 litres, and the M 150 went into series production with 150 litres. A screed installer from Ludwigsburg tried out the new machine: Burhard laid screed in the Iduna high-rise building in Stuttgart, pumping the mixture through a 60-metre long hose to a height of up to 42 metres. The trial was a success! Since then, Putzmeister has improved the design and equipped with the Mixokret with increasingly more efficient compressors.



#### MIXOKRET · 1966

The Mixokret is versatile and not only pumps screed but also soil, sand and other materials. Significantly more than 20,000 models have been delivered from the Aichtal plant to all corners of the world.

# 1966 TRIAD OF SUCCESS

#### P 13 · 1966

The P 13 is successful even today in eastern Europe, Russia and Asia. These regions mainly use "site-made mixes," whereas standardised, industrially produced plasters are used in Germany.

1966 was a crucial year: With the P13, Putzmeister presented a further development of its first mortar machine, soon followed by two further inventions in the shape of the Gipsomat and the Mixokret screed conveyor. These pioneering innovations changed the trade fundamentally and are still very successful even today.

Digitalisation sets new challenges for the construction industry and mechanical engineering alike. For Industry 4.0, Putzmeister is working on solutions that are of use to the customer – and is developing corresponding innovative business models.

# DIGITAL CONSTRUCTION SITES

## THE ADVANTAGES OF CONNECTIVITY

When the machines on the construction site communicate with each other, complex major projects can be planned accurately and implemented efficiently.

For some years now, Putzmeister has been working together with other companies on further developing the construction industry as a whole. Digitalisation requires cooperation: Sensors are installed in many machines, electronics improve safety and enable precise control even over large distances. To make the most of the advantages, connectivity is required: The machines must be in contact with each other. Yet technical developments also bring with it new business models, for the customers' requirements are changing, the more so as they are in global competition and are facing increasing pressure on costs.

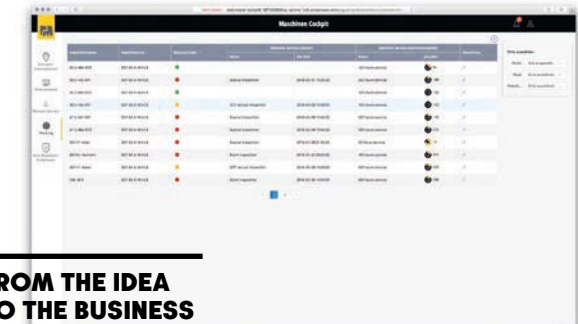
## MACHINES IN DIGITAL TIME

Central to this is the exchange with manufacturers of other construction machines and with planning office. On the digitally networked construction sites, all machines, some of them highly complex, reconcile their data – the experts call it “machine-to-machine communication”. For large projects, individual building sections can

be simulated in advance, planned exactly and thus implemented more efficiently. It will take some time still until a fully networked construction project is achieved. But one thing is certain: Putzmeister technologies will play a key role on the digital construction site.

## NOT AN END IN ITSELF

The “Innovation Factory” is a Putzmeister unit that has been working on digital solutions since October 2015. The result is the “Machine Cockpit”, which allows users to see exactly how a Putzmeister machine works in real time. That reduces downtimes and improves utilisation. In addition, the data indicates when parts need to be replaced or maintenance work is due. Another advantage: As you always know where the machine is, the risk of theft is significantly reduced. Thanks to connectivity, Putzmeister is improving its existing services – or even developing brand-new business models. But digitalisation is not an end in itself for Putzmeister: The aim is always to find innovative solutions that are of real benefit to the customer. 🏠



## FROM THE IDEA TO THE BUSINESS MODEL

Since 2015, the in-house Putzmeister “Innovation Factory” has been developing digital solutions.

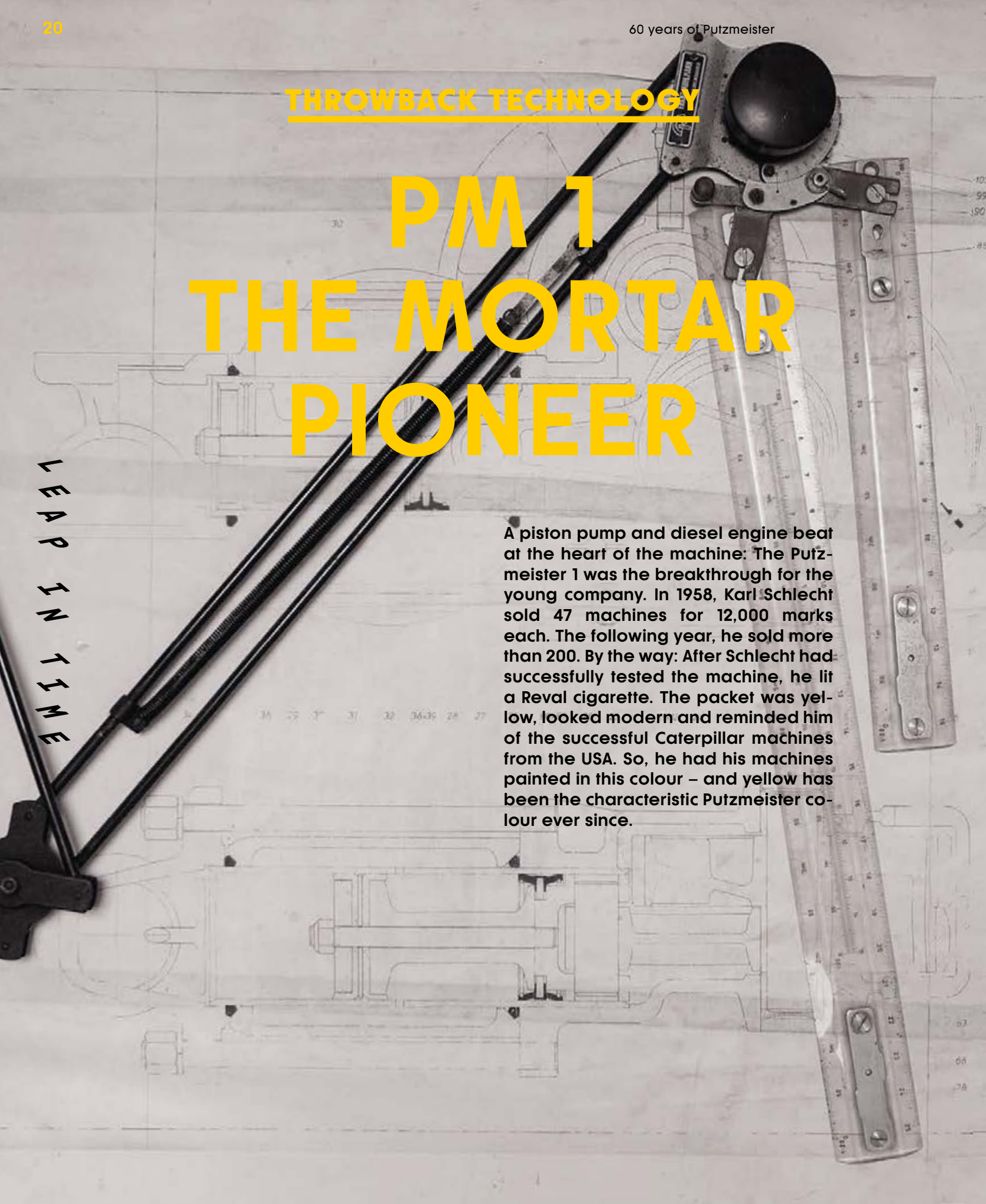


**THROWBACK TECHNOLOGY**

# PM 1 THE MORTAR PIONEER

LEAP  
IN  
TIME

A piston pump and diesel engine beat at the heart of the machine: The Putzmeister 1 was the breakthrough for the young company. In 1958, Karl Schlecht sold 47 machines for 12,000 marks each. The following year, he sold more than 200. By the way: After Schlecht had successfully tested the machine, he lit a Reval cigarette. The packet was yellow, looked modern and reminded him of the successful Caterpillar machines from the USA. So, he had his machines painted in this colour – and yellow has been the characteristic Putzmeister colour ever since.

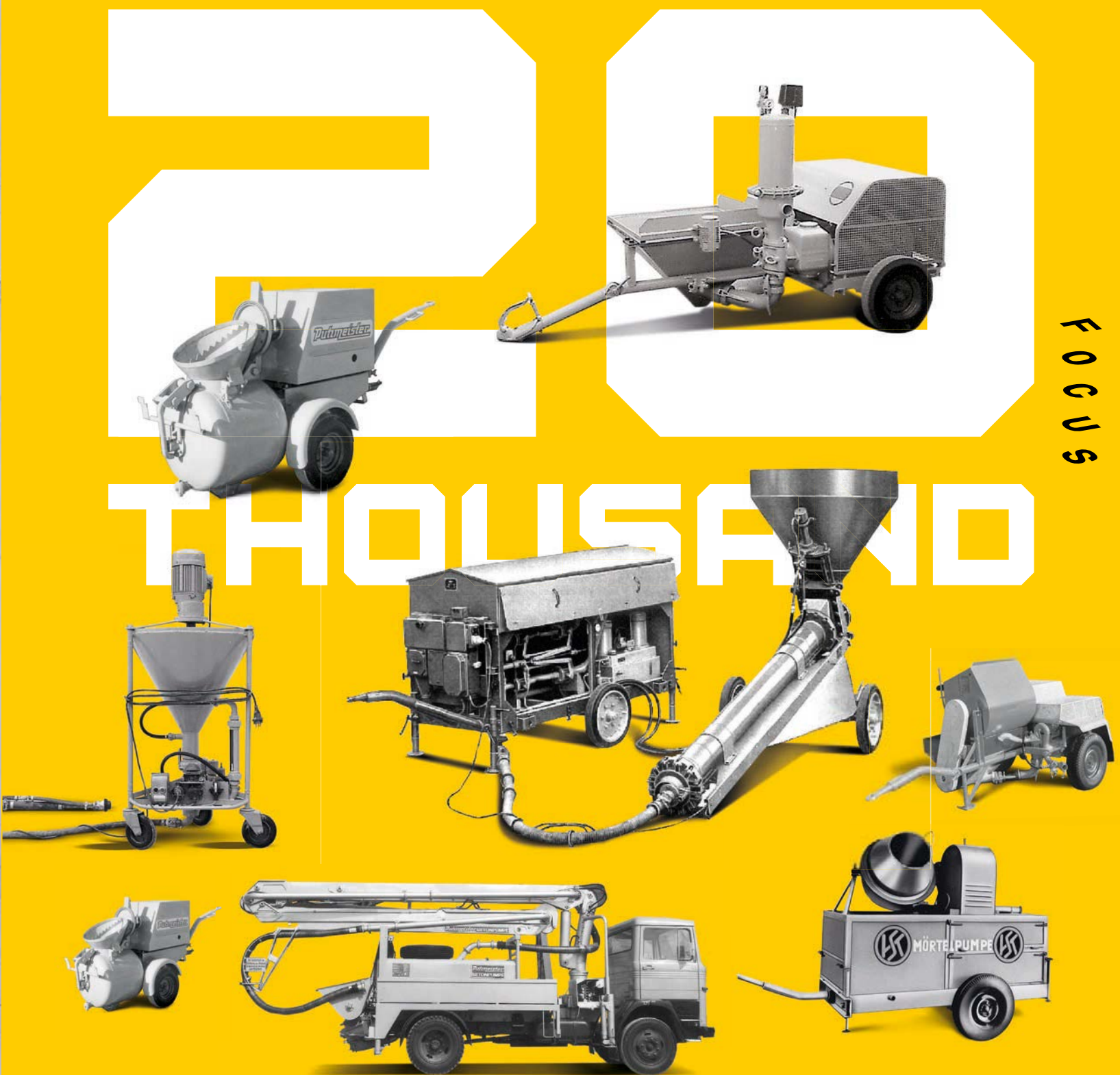


**MILESTONE 1972**

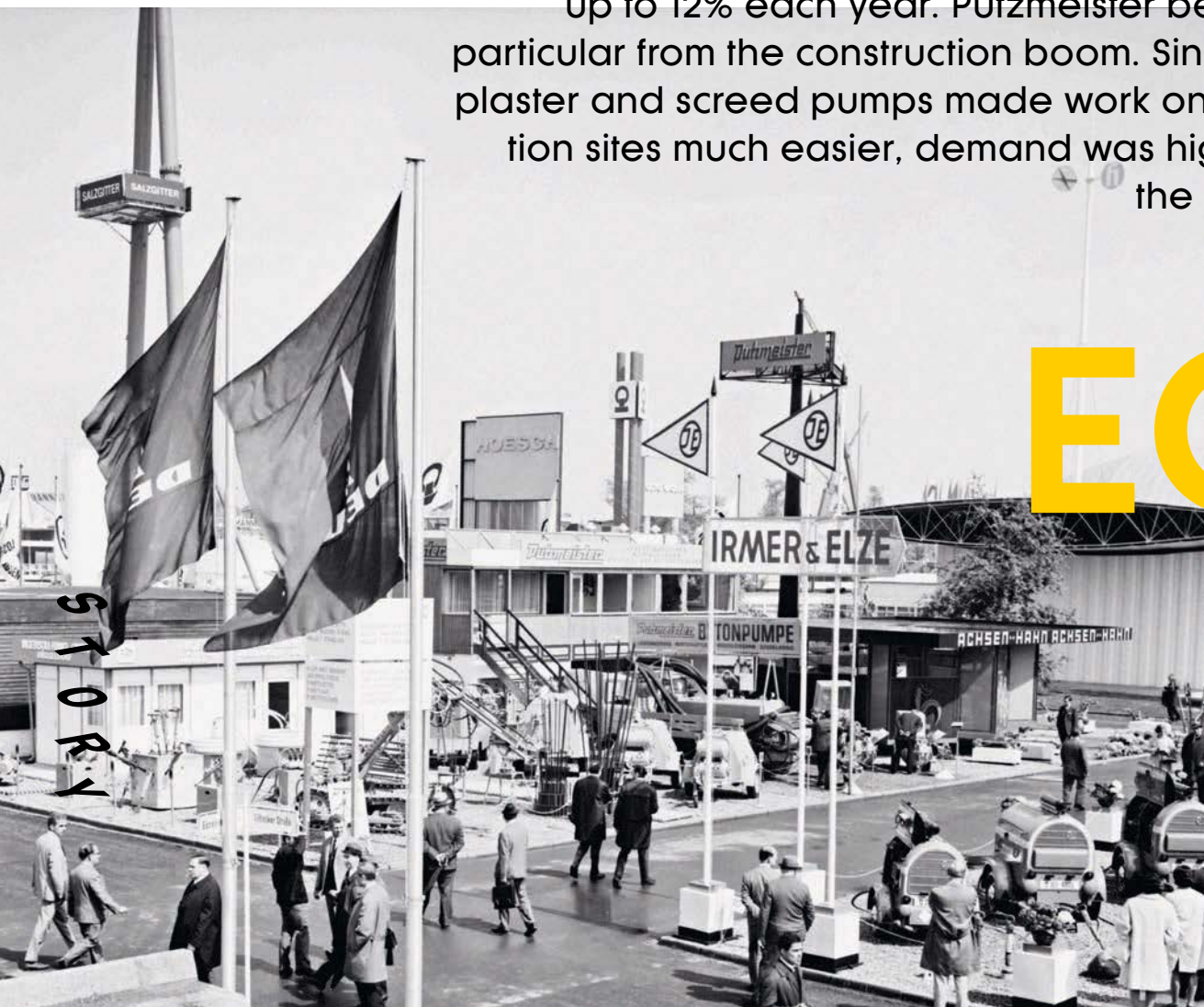
Putzmeister's mortar machines soon became bestsellers: In 1972, almost 15 years after the company was founded, the 20,000th plastering machine left the works in Aichtal. Space gradually became tight, which is why a new, large production hall was soon developed in Aich.

# 20 THOUSAND

FOCUS



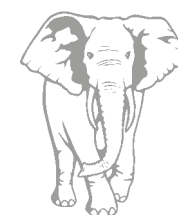
The economic upturn after 1945 brought prosperity to many Germans, with the economy growing by up to 12% each year. Putzmeister benefited in particular from the construction boom. Since mortar, plaster and screed pumps made work on construction sites much easier, demand was high up until the late 1960s.



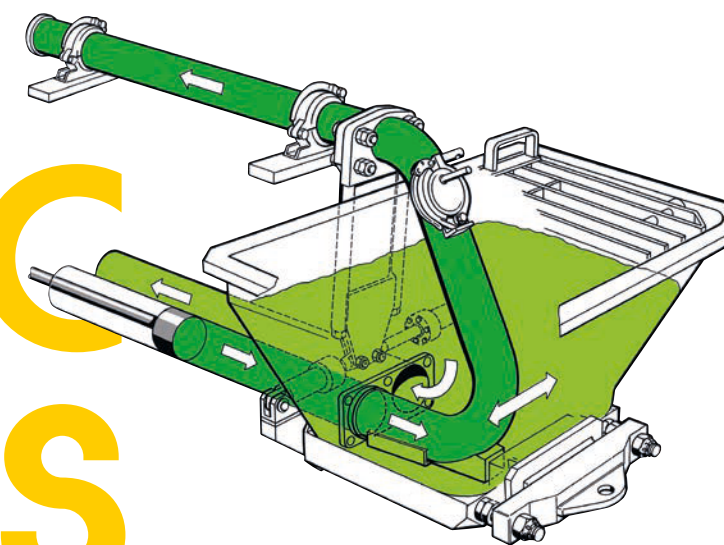
# ECONOMIC CRISIS

## FROM INVENTION TO TRADE-MARK

The shape of the C transfer tube reminded the developers of an elephant's trunk. And that's how the part got its name. Unlike with the large, grey animal, however, the C-tube is located inside instead of outside



## HOW PUTZMEISTER FORGED NEW PATHS



**B**ut that began to change slowly, when the first recession kicked in 196 /67. The years of the “economic miracle” were over, and unemployment rose from 0.7 to 2.2%. Although this might hardly seem worrying today, it fuelled fear back then – many people had become used to a continuing boom scenario. Putzmeister too kept a close eye on developments, and the company founder, Karl Schlecht, looked around for new business fields. He knew that the plastering walls and ceilings with plasterboard was becoming increasingly common in the US. If this trend were to come

to Germany, too, the mortar machines business would be in serious jeopardy.

### SUCCESS THANKS TO ELEPHANT'S TRUNK

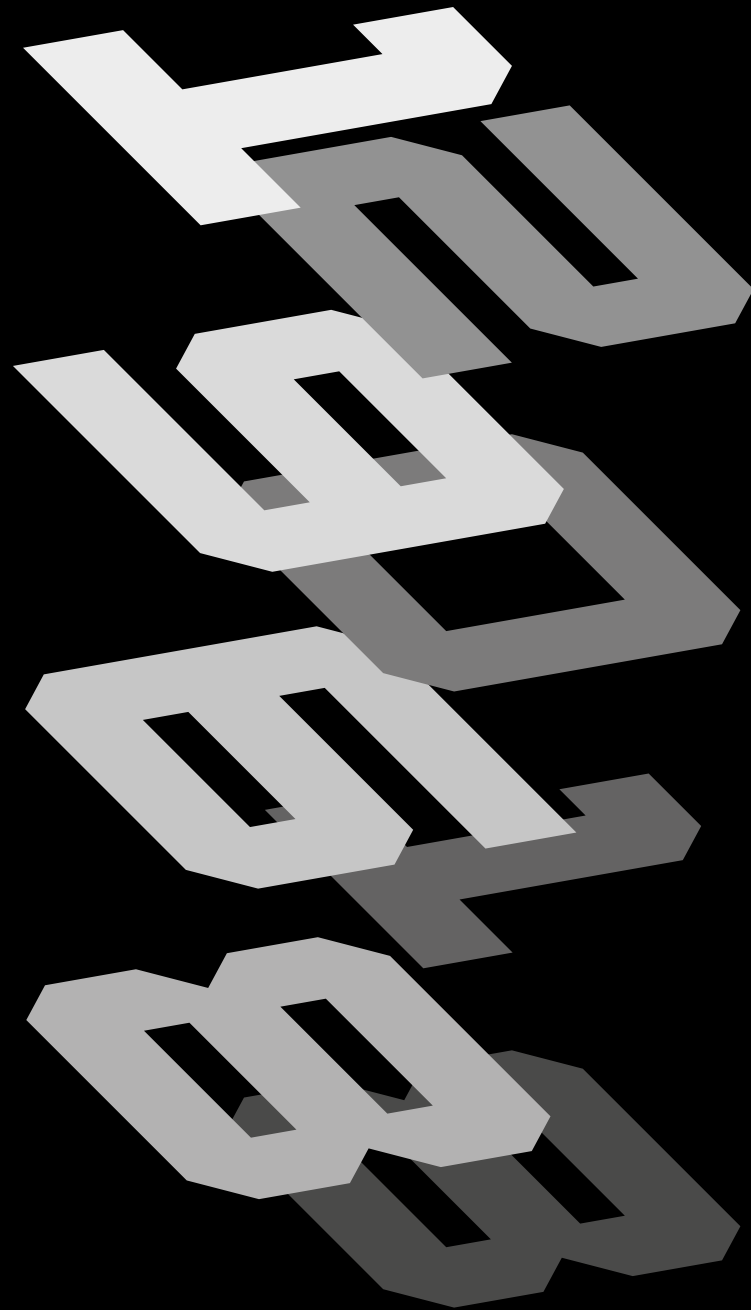
Ready-mixed concrete offered good opportunities in the 1960s and Putzmeister joined the concrete pumping business in 1968. But – unlike with the mortar machines – there were already some successful manufacturers. Nonetheless, Schlecht's concrete pump with patent number DP 1703112 was a success. It had a large volume and a water hydraulic drive. When Putzmeister presented its design at the Hanover

trade fair in 1968, the experts were sceptical. After all competitors had just given up using water hydraulic drives. But Schlecht's pump prevailed, as it was relatively cheap to produce and offered more power than other pumps at low and medium delivery pressures. One crucial improvement also guaranteed success from the 1970s on: The so-called C transfer tube. What's behind this? Concrete pumps usually use pumps with two delivery cylinders and one delivery piston each. One piston pushes the concrete into the delivery line while the other sucks the concrete out of the filling hopper in the opposite direction. Between the pump and the delivery line, one component ensures that the concrete flow continuously into the line. For a long time, the so-called flapper principle was considered to be the best solution: After each piston stroke, a flap rotates by 90°. It guides the output flow into the line and the suction flow into the piston. But if the concrete was pumped at a higher pressure, this flap was no longer complete

watertight – thus reducing the quality of the concrete. It could even “bleed”, as the experts say: Water could leak out of the fresh concrete making the concrete less pressure-resistant.

Inventor Karl Schlecht resolved this problem with the C transfer tube, a C-shaped pipe that is pivoted at the top. It can swivel quickly between the openings of the delivery cylinders. The C transfer tube is similar in shape to an elephant's trunk and so that was the name given to the component by the developers. Since 1968, Putzmeister has used an elephant as its company logo.

The simple “trunk” solution worked extremely reliably and soon prevailed on the market. It was particularly well suited to truck-mounted concrete pumps, as, thanks to the trunk, the delivery line could run straight to the placing boom. The “elephant's trunk” was soon able to prove just how efficient it was on large projects. 🐘



In 1968, Putzmeister extended its portfolio to include concrete pumps. Putzmeister soon secured a large market share – and is one of the world's leading manufacturers today.

- > Quick reactions. Pumping in emergencies
- > Smart control. Radio innovation
- > High performance. Above the rooftops of Dubai

# CONCRETE KNOW-HOW

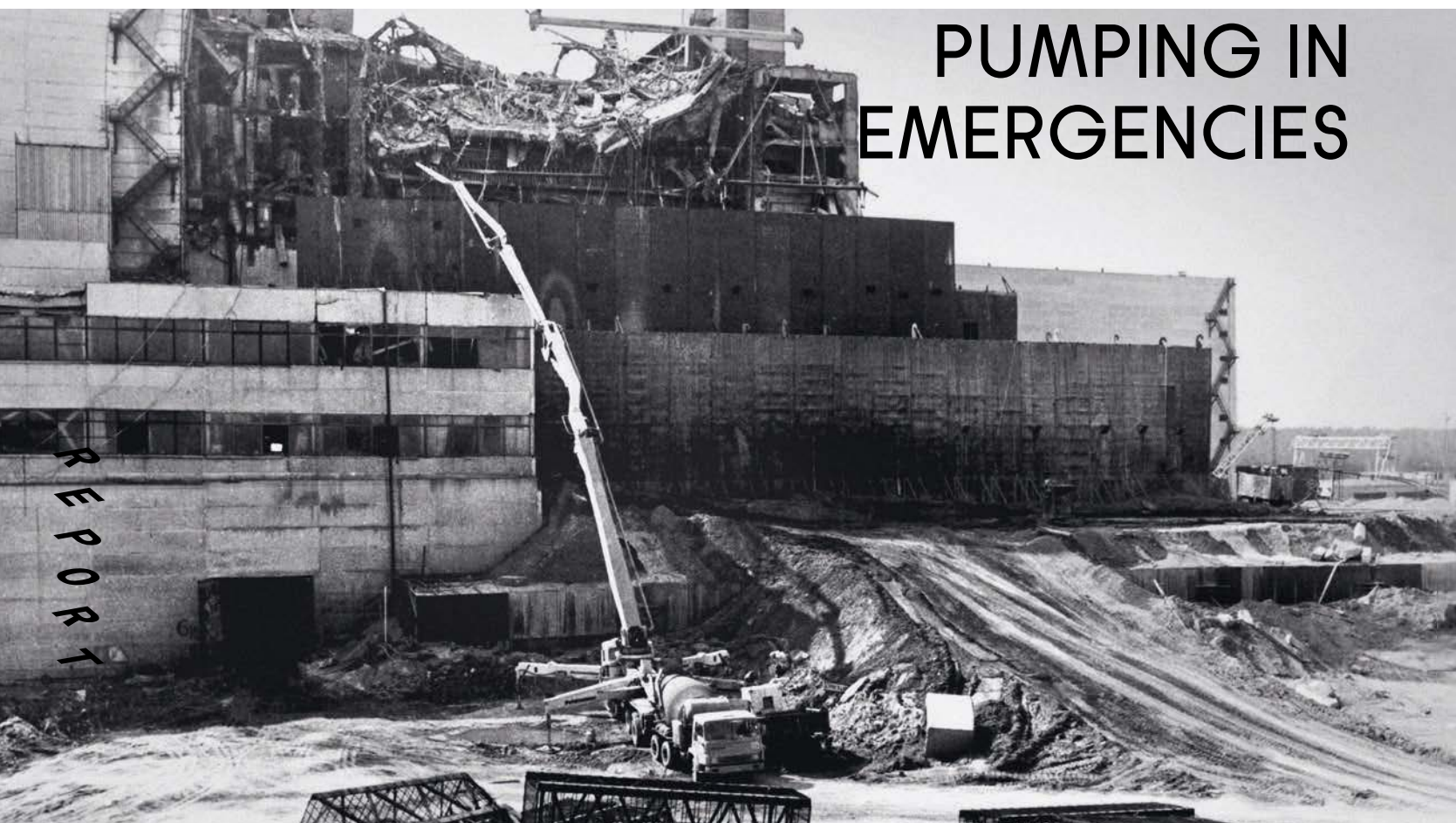
Expansion with concrete pumps

### SOON AFTER THE DISASTER

In early summer of 1986, Putzmeister sent ten truck-mounted concrete pumps to Chernobyl.

# QUICK REACTIONS

## PUMPING IN EMERGENCIES



1986 in Chernobyl, Ukraine, 2011 in Fukushima, Japan. Concrete pumps from Aichtal helped to reduce the catastrophic consequences of the reactor accidents. Two disasters and two extreme application cases for Putzmeister technology.

### PUMPING WITH SPECIAL EQUIPMENT

The models used at the site of the disaster were given a lead covering as radiation protection and were controlled by radio and video technology.



**F**riday, 25th April 1986, 1 a.m. Anatoly Stepanovich Dyatlov, Deputy Chief Engineer at the Chernobyl Nuclear Power Plant, and his team started a test. The engineers wanted to demonstrate that the core reactor in block 4 could be cooled even if the external power supply was switched off. They assumed that the main turbine would continue to supply electricity for another 40 to 60 seconds – long enough for the emergency power generators to take over. They had already tried this one year earlier in block 3 and encountered problems, because the voltage of the generator in the main turbine fell too sharply. But this time around, even a better voltage regulator was not enough and there were complications. Technical faults and human error triggered a chain reaction. Barely 24 hours later, a gigantic explosion blasted the 1,000-ton cover of the core reactor into the air, releasing vast quantities of radioactive material – the feared meltdown had actually happened.

### REQUEST FROM MOSCOW

In the first weeks after the disaster, helicopters were used to deposit around 5,000 tons of sand, clay and lead onto the reactor from above, ensuring initial relief. Rescue teams extinguished the fire with nitrogen, thus reducing the speed at which the radioactive material was leaking. But it wasn't enough, the reactor needed to be sealed within a concrete sarcophagus. Some machines were already on-site and began to pump concrete immediately. But they were too slow. In summer 1986, the Soviet Ministry of Foreign Trade bought ten Putzmeister truck-mounted concrete pumps: The type M 52-5 machines were the biggest available models at that time. The 62-metre main booms were still in development in

Aichtal and would only be launched on the market six months later.

### HIGH-TECH FOR CHERNOBYL

The Putzmeister pumps were given special equipment: Two slewable video cameras, radio and cable remote controls with a reach of up to 800 metres.



NON-STOP EMERGENCY DEPLOYMENT  
In the months after the meltdown, Putzmeister pumps operated around the clock

Today this is all taken for granted – the machines from Aichtal include all sorts of high-tech equipment – but back then it was all very new. Putzmeister had only just started developing radio and video systems. Chernobyl set particular requirements: On four of the custom-made pumps, a lead cover weighing around four tons protected the driver's cab against radiation. The drivers could only reach their cabs through a roof hatch and could only look through small windows to the front and to the side. In these weeks, a state of emergency reigned in Aichtal: Some customers agreed to waive on-time delivery of their orders, so that by the end of June, the first two machines were able to start their work at the scene of the disaster. The

rest arrived by September. Three stationary concrete pumps supplied some of the truck-mounted concrete pumps in Chernobyl. Using these pumps, a tunnel was also constructed under the reactor building. From there, a 2.5-metre thick protective plate was installed underneath the destroyed block. 20 machine operators, who had experience of Putzmeister machines, travelled quickly to Chernobyl and gave 80 of their colleagues training on how to operate the machines. One of them, Haertdinov Baschir, wrote to Aichtal twenty years after the disaster: "our concrete pumps have worked non-stop, around the clock. They were only switched off to check the oil level in the engine. [...]"

Once again, a big thank you for your technology!" In the first three months, the first machine pumped 80,000 cubic metres of concrete, and so it didn't take long for the total flow volume of 400,000 cubic metres to be pumped for the sarcophagus. Despite Putzmeister's rapid intervention, the radioactive radiation caused significant damage to people and nature, which is still noticeable to this day.



#### WATER JETS FOR FUKUSHIMA

At the end of March 2011, almost exactly 25 years after the meltdown at Chernobyl, a 62-metre pump weighing 60 tons rolled into the belly of an Antonov cargo plane at Stuttgart airport. It took off in the direction of Tokyo, from where it travelled on towards Fukushima. Two weeks before, a gigantic earthquake and tsunami off the east coast of Japan had triggered a meltdown in three nuclear reactors. Coincidentally, another large Putzmeister pump was already in the area: It was in a Japanese harbour and was intended for a customer in Vietnam. But now it was transported to the disaster zone. Putzmeister helped to cool the reactors in



60 years of Putzmeister

Fukushima with a total of four machines. The special feature: It is possible to install a fire-extinguishing system on the concrete pumps, so that instead of pumping concrete through the lines, water could be pumped – up to 160,000 litres of it per hour, at a pressure of 85 bar. That's about two to three times as much as a normal fire engine. Unlike with hoses and water cannons, the water jet from the pump is not atomised by the wind. In the Tokyo branch, Putzmeister equipped the radio-controlled pumps with video cameras. Thus, the specially trained Japanese workers could see exactly where they were directing the water. Thanks to the arm hinges in the 70-metre long placing boom, almost every point could be controlled with precision, even from a large distance. So, once again, first aid was sent from Aichtal with haste. But like in Chernobyl, the repair work continues and the consequences of the meltdown will be felt for decades to come. 🇯🇵

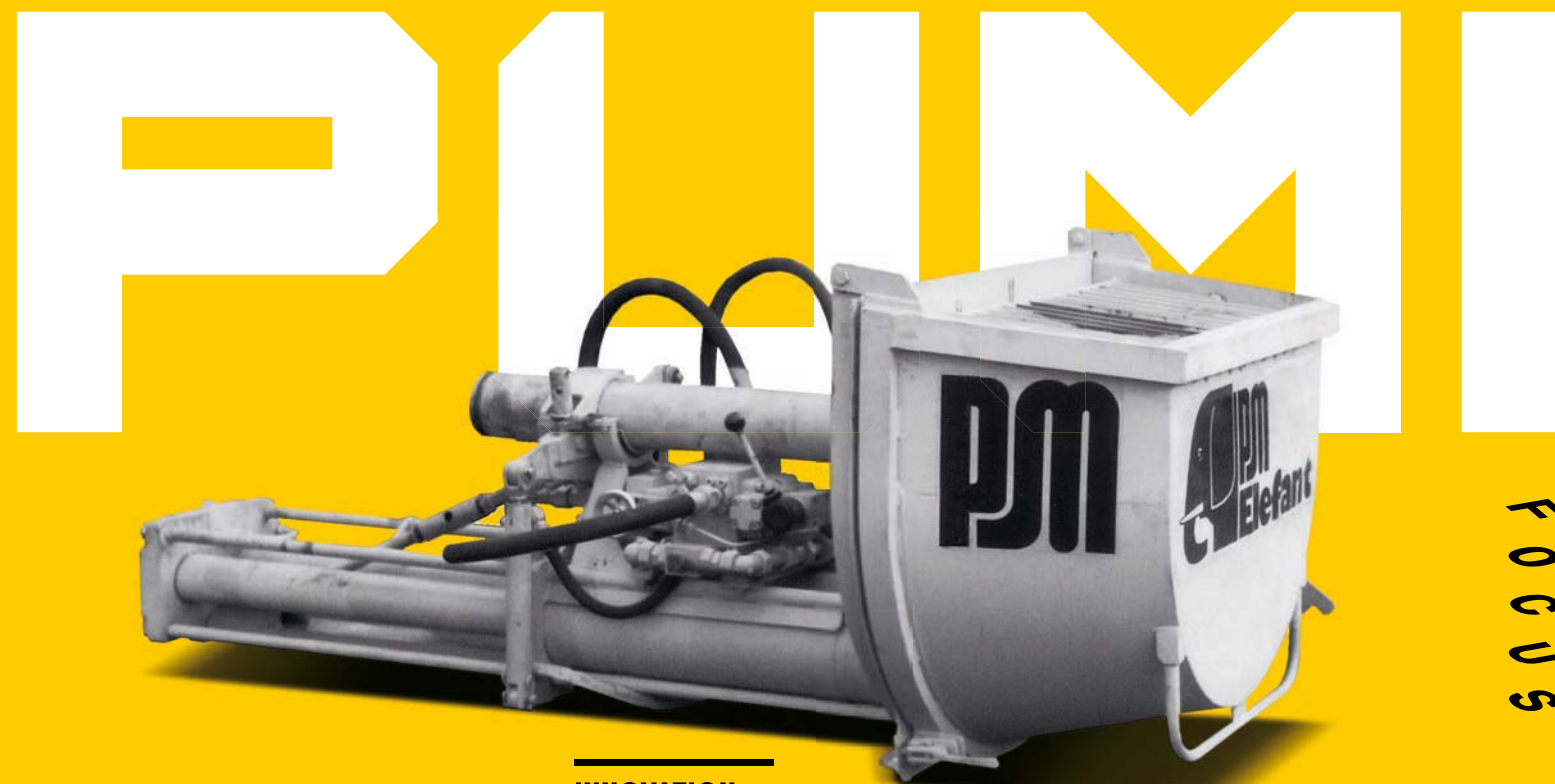


#### FLIGHT TO FUKUSHIMA

After the meltdown on the east coast of Japan, Putzmeister technology helped to cool the reactors.

## MILESTONE 1976

Putzmeister joined the concrete pump business in 1968 and soon became a market leader. But smaller projects required a cheaper and more flexible solution.



#### INNOVATION FROM 1976

It pumps and mixes.

# Big on mobility in small spaces

For some construction companies, a truck-mounted concrete pump was simply too big and expensive when they only had to concrete a garage floor or terrace. So, they lost out on some orders. There was demand for a cheaper solution and a machine for smaller construction sites. On these sites, concrete was usually still transported with belt conveyors and wheelbarrows, making the work laborious and exhausting, as Karl Schlecht observed on construction sites in Italy in particular.

The pump, mixer and placing boom are combined in one machine. But a lot of tinkering was required before the PUMI worked efficiently and became a success on the market. The rotor pump was crucial. Since 1989, it has transported the concrete inside the housing. A delivery hose, which is moved by a rotor with two rollers, runs along the inner wall. The hose is squeezed in much the same way as a tube of toothpaste. And since the hose is constantly in motion, hardly any concrete residue settles – with the result that the pump also helps to save material.

The pressure of max. 30 bar is sufficient for shorter placing booms, and the 16-metre variant was particularly popular for a long time. In the meantime, models with booms of up to 31 metres have been developed. The principle behind the machine has established itself as the norm. The PUMI is ready for use quickly and can be operated by just one person. To this day, it is a core part of the Putzmeister product range.

There are some real giants among Putzmeister's concrete pumps: The biggest models are almost 16 metres long and weigh up to 60 tons. A whole host of different technologies ensures they remain stable on the construction site.

#### FOLDED AND SECURED

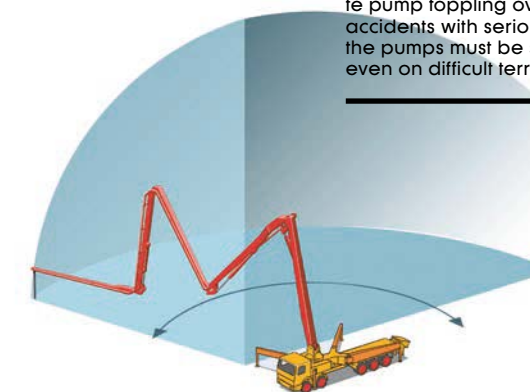
The large and heavy chassis and frame, on which the placing boom is secured and the pump is mounted, forms a counter-weight to the load torque of the placing boom. But that alone is not enough if the boom is fully extended. In addition, the weight of the chassis is limited, as there are legally prescribed maximum weights for bridges and roads. Therefore, Putzmeister's placing booms have become increasingly light in weight. In 1986, the load torque also fell due to a special folding technique for the boom, which has been continuously improved ever since. It moves the boom's centre of gravity closer to the truck, allowing the pump to become more stable.

#### SENSORS REDUCE ACCIDENTS

The four support legs of the base structure are crucial for stability. They can be extended diagonally and support the pump securely. The forward legs can be set to different, pre-defined positions, while the rear legs can be placed in almost any desired position. Sensors then define the radius within which the placing boom can work – with a vertically unfolded boom, a 360° radius is possible. When the boom leaves the working range, the pump stops automatically, so it cannot fall over. But, although rare, accidents do still occur, for example if the support legs are not positioned correctly. Putzmeister provides special training to prepare

drivers for the requirements at difficult construction sites. But usually the supporting ground on which the pump is parked is simply not sturdy enough. Putzmeister has a solution for this problem too: The concrete pump's control system continuously checks whether it is in equilibrium and detects when the ground begins to yield – deactivating if there is a risk of toppling over. 🚧

The placing booms on truck-mounted concrete pumps can be steered and unfolded in almost any direction. In particular when the boom is unfolded horizontally, enormous forces act on the truck on which the pump is mounted – physicists call this load torque. The further the arm of the pump is extended, the greater the load torque. And the greater the risk of the heavy truck-mounted concrete pump toppling over. To prevent accidents with serious consequences, the pumps must be secure at all times, even on difficult terrain.



# LIGHT ARMS, STURDY LEGS

#### SECURE STAND

In particular when the placing boom is extended horizontally, the pump must remain stable.

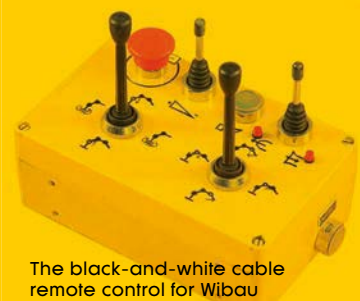






**ON/OFF, BLACK/WHITE**  
Moving placing booms evenly using black-and-white control systems required a lot of skill and experience.

Top - Replica of a black-and-white cable remote control for an M31-3 overhead roll-and-fold boom, as returned to Putzmeister from a demonstration tour in the Soviet Union in 1987. Since the original control had somehow got lost, resourceful local machine operators had made this fully functional replica out of a metal casing, bakelite mounting plate and toggle switches.



The black-and-white cable remote control for Wibau truck-mounted concrete pumps with three boom arms from the 1980s. The Wibau control system for four-arm booms had an additional control lever.



Even the first Putzmeister radio remote control in 1981 used digital technology and encoded frequencies.



Black-and-white radio remote control for concrete pumps with four-arm placing boom (1985-1998).

# SMART CONTROL

## RADIO INNOVATION



**QUANTUM LEAP**  
In 1985, Putzmeister introduced the proportional radio remote control. This enabled even and precise control of the placing booms.

Proportional Putzmeister radio remote control from the middle of the 1980s, protected by a circulating strip, on the left for three-arm and on the right for four-arm placing booms.



Proportional radio remote control for four placing boom arms, such as those included in the Putzmeister range from about 1989 to 1998. The control systems had two or three joysticks and, later, radio channel selector switches for four frequencies.



Black-and-white cable remote control for three-arm placing booms, which Putzmeister offered between 1982 and 1992.



There had already been cable remote controls for the pumps in the 1970s. Since 1981, radio remote controls have made the work even easier. Today, even five-arm placing booms can be operated smoothly with just one joystick.

This black-and-white cable remote control was supplied for placing booms with three arms until 1982



Putzmeister equipped its truck-mounted concrete pumps with five-arm booms with this proportional radio remote control in the modern Ergonic housing between 1998 and 2001.



Ergonic® Inside - With the modern, ergonomic radio controls, Putzmeister machines can be operated comfortably and precisely. The graphical display shows all the important information at a glance.



FOCUS

FOCUS

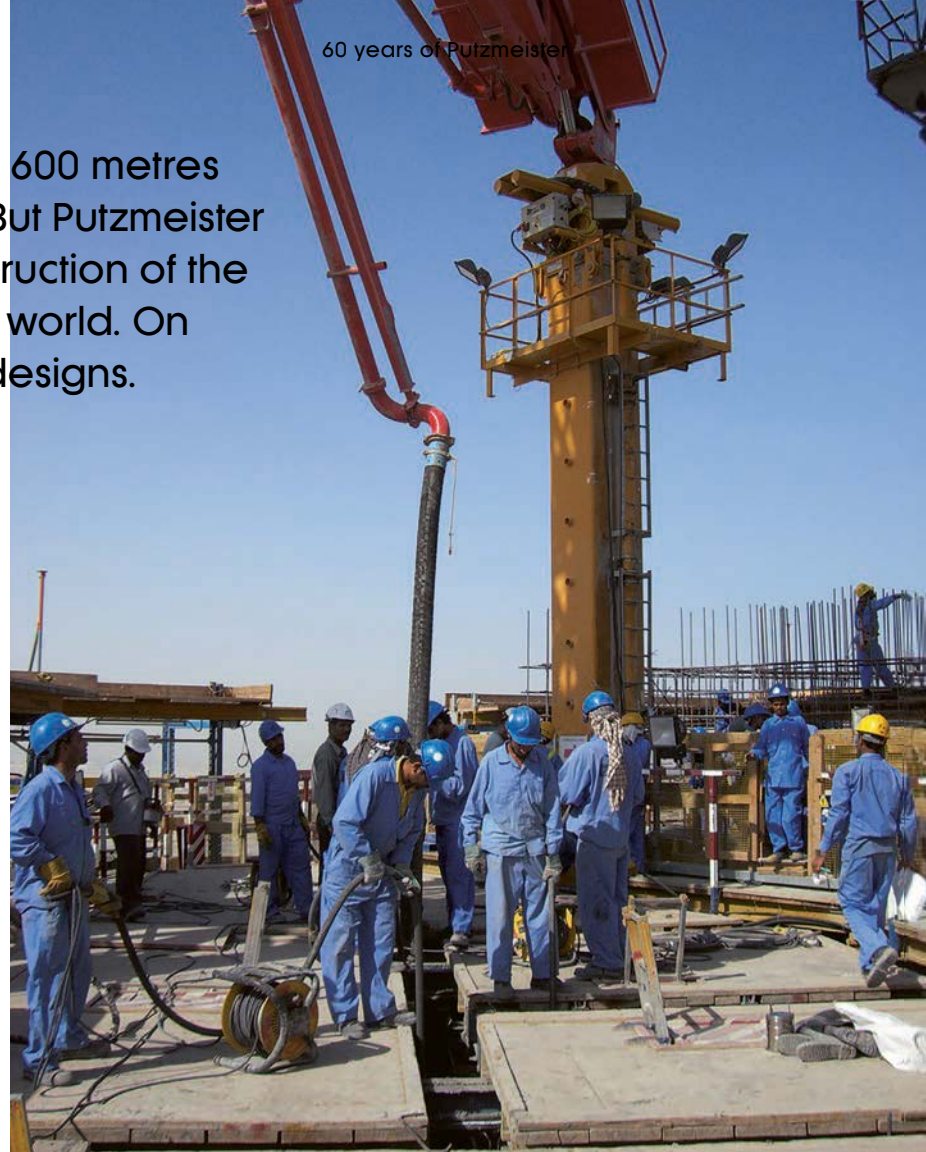
ABOVE THE  
ROOFTOPS OF DUBAI

# PERFORMANCE HIGH

REPORT

REPORT

Pumping concrete to heights above 600 metres was long thought to be impossible. But Putzmeister managed it in 2008 during the construction of the Burj Khalifa, the tallest building in the world. On extreme conditions and innovative designs.



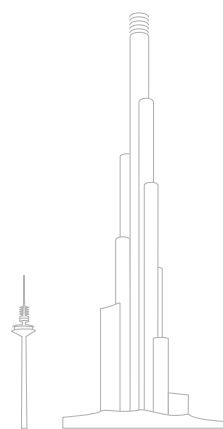
60 years of Putzmeister

From below, the buildings in downtown Dubai look like skyscrapers. From above, they're like toy houses. In the new district of the capital city of the United Arab Emirates, one structure towers above all the rest: The Burj Khalifa. The tower, Burj in Arabic, has been the tallest building in the world since 2008, at a height of 829.9 metres, almost twice as tall as the Empire State Building in New York. The construction works took four years. Putzmeister technology played a crucial role: After all, a total of 300,000 cubic metres of concrete had to be pumped to dizzying heights for the 189 floors of the building. The Putzmeister pumps had proven many times in the past that they were able to handle large distances.

But this project outshone all the others – 600 metres was simply considered too high.

#### CLOSE COLLABORATION, INNOVATIVE DESIGN

The fact that it was possible in the end was in part due to the close collaboration between engineers from Dubai and Aichtal. In Dubai, the engineers initially tested how the concrete would behave in horizontally laid pipelines, what pressures would act on it and what friction was to be expected. Using this data, the designers in Aichtal developed a super high-pressure pump for the mega project: The BSA 14000 SHP D. With a reinforced frame and hopper, it was able to cope with huge pressures, and a filter system kept the pump's hydraulic flu



#### ALMOST DOUBLED

In 1977, Putzmeister pumped to a height of 310 metres in Frankfurt. In 2008, it pumped to 606 metres in Dubai.

clean. But its special hydraulic drive was the decisive factor: With this, the concrete could be pumped upwards with a pressure of up to 400 bar. In the end, 220 bar was all that was needed to pump up to 33 cubic metres of concrete per hour at the construction site in Dubai.

#### JUMPING PIPES, EXTREME HEAT

The engineers in Dubai combined two of the new super-pumps with a normal high-pressure pump to create a pump station. On the construction site, the material travelled through pipelines measuring a total of 1,800 metres to wherever it was intended to be processed. A single pipe run weighed almost 30 tons. If there was concrete inside it, a further 25 tons were added, presenting a significant strain for the pipes and making the entire construction judder with each beat of the pumps: The two pistons of the pump pushed concrete columns, around 210 centimetres in length, through the steel riser pipes every five to seven seconds in alternation. Thei

#### THE TALLEST TOWER IN THE WORLD

For the 189 floors of the Burj Khalifa, the Putzmeister machines pumped a total of 300,000 cubic metres of concrete upwards.



wall thickness of 11 millimetres decreased with every beat, every working hour, which is why the engineers had to check them regularly with ultrasonic devices. Add to that the hydrostatic pressure of the concrete inside the delivery line. These columns of around 500 metres in length slipped slightly downwards before each new stroke of the pump. Therefore, the engineers only →



secured the lines at the base of the tower, leaving them mobile at the top. This caused the pipes to downright jump: They dropped about four centimetres downwards with the return flow of concrete and were then immediately pushed four centimetres upwards again. The concrete itself had to be able to withstand the extreme conditions in Dubai: Thanks to a special recipe, it was four times as pressure-resistant as normal concrete, with around 20 additives being added to the mixture of sand, cement and water. The concrete had to be transported from the base of the tower to the tip within two hours of being mixed, as there was a risk of it hardening prematurely on its journey upwards. When being filled into the formwork, the concrete could also no hotter than 35 °C. As daytime temperatures in Dubai frequently exceed 50 °C, work was mainly carried out at night.

As an extra precaution, the engineers also cooled the sand and binder, and at times replaced the water with ice. Design, pumps, pipelines, concrete – everything had to mesh together perfectly on this highly complex construction site so that the concrete could succeed in reaching a height of 606 metres.

**THE SKY'S THE LIMIT**

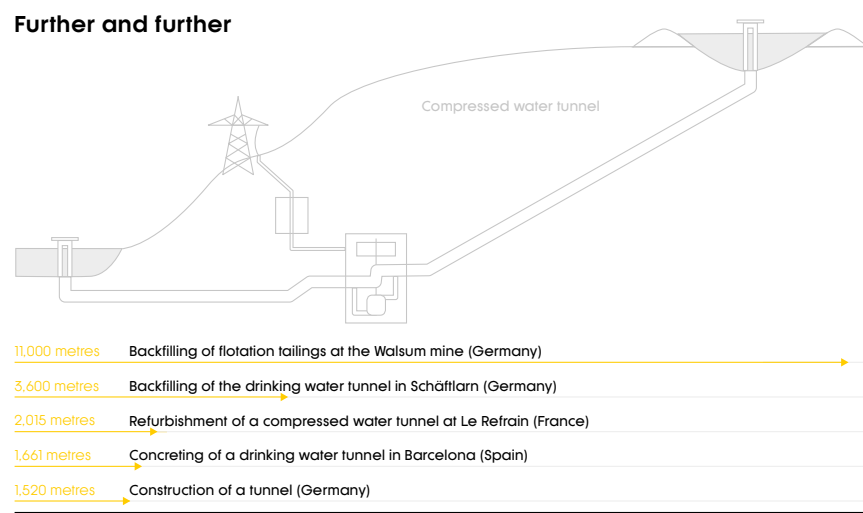
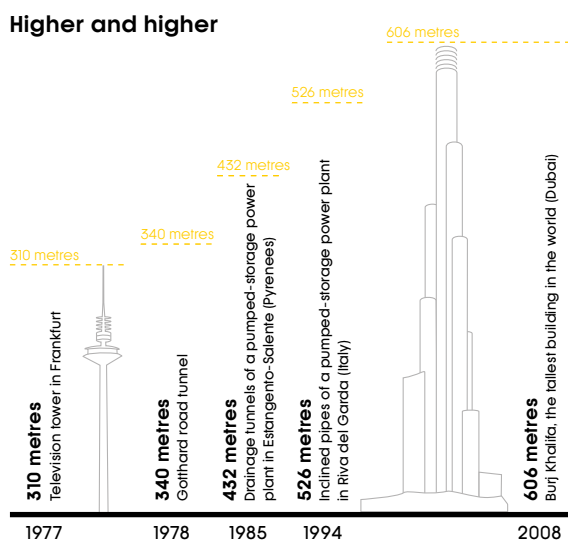
In April 2008, the gigantic tower was completed – on time for Putzmeister's 50th anniversary. At the opening ceremony on 4th January 2010, the tower was named after Khalifa bin Zayid Al Nahyan, the President of the United Arab Emirates. Today, the bottom 38 floors are taken up by a hotel, and above that there are offices, suites, restaurants and technology floors. Two lifts take visitors to the outside terrace on the 124th floor in just 55 seconds. In 2014, two viewing platforms were added: In one minute, visitors with a head for heights can access the 125th floor, and after switching to another lift, they can continue up to a terrace on the 148th floor at 55 metres. The tip of the tallest building in the world can be seen from far away. This kind of project is less about profit than about the challenge and the reputation. Putzmeister wants to prove that, with expertise, a lot of experience and the involvement of all partners,



IN THE COOL OF THE NIGHT In Dubai, the work was mainly carried out at night, as there was the risk of it hardening prematurely due to the high daytime temperatures.

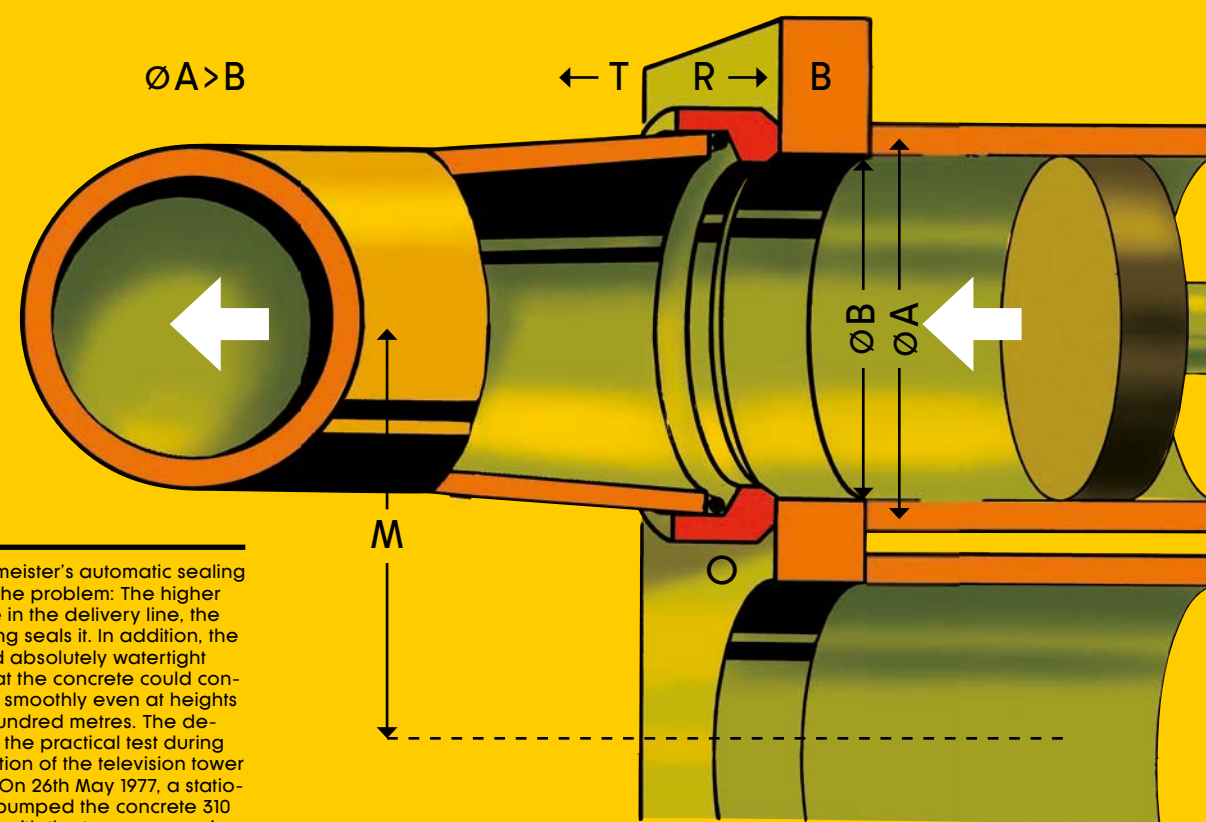
the seemingly impossible can be made possible. How long the Burj Khalifa will remain the tallest building in the world remains to be seen. In Jeddah in Saudi Arabia, the Kingdom Tower is already under construction – with a planned height of 1007 metres. Pumping concrete to such a height simply isn't feasible, some sceptics say. But we've heard that plenty of times before in Aichtal.

REPORT



**LITTLE BIG RING**

180 metres was the limit: When pumping concrete upwards, many tons of weight built up in the pipelines. With every kilogram, the pressure on the connections between the pump and the line increased and they soon became leaky. Fine particles would leak out together with water, resulting in significant wear to the components. Not to mention that the pipes kept blocking. Putzmeister feverishly searched for a solution to this problem, because concrete pumps were in high demand in the 1960s and 1970s, especially for the construction of high-rise buildings. Builders had been using cable winches and cranes – a slow, time-consuming and expensive technology.



In 1976, Putzmeister's automatic sealing ring solved the problem: The higher the pressure in the delivery line, the better the ring seals it. In addition, the ring ensured absolutely watertight pipes, so that the concrete could continue to flow smoothly even at heights of several hundred metres. The design passed the practical test during the construction of the television tower in Frankfurt. On 26th May 1977, a stationary pump pumped the concrete 310 metres high, with the tower measuring 331 metres to the tip. Since then, automatic sealing ring technology has become standard, although Putzmeister designers have continued to develop it further – and over the course of the next decades, it should be able to handle even greater heights.

What makes the automatic sealing ring a top performer

FOCUS

Putzmeister has always been characterised by closeness to its customers: On Swabian construction sites in the early days, as well as throughout Germany, Europe and the entire world today. Employees maintain relationships with customers and are points of contact for small and large problems alike.

# ON-SITE AROUND THE WORLD

S T O R Y

At the beginning of the 1970s, Putzmeister expanded its portfolio with concrete pumps. New branches were soon added, the first in 1974 in France, Italy, Spain, the UK and Brazil. Ultimately, sales markets for tried and tested machines had to be tapped, as well as for new machines, and, at the same time, customers had to be provided with support on-site, competently and quickly. In 1993, Putzmeister set up a branch in Wisconsin in the USA, and three years later also had a production site in Shanghai, China. Today, Putzmeister has a total of 16 subsidiaries worldwide, with agents in over 120 countries.

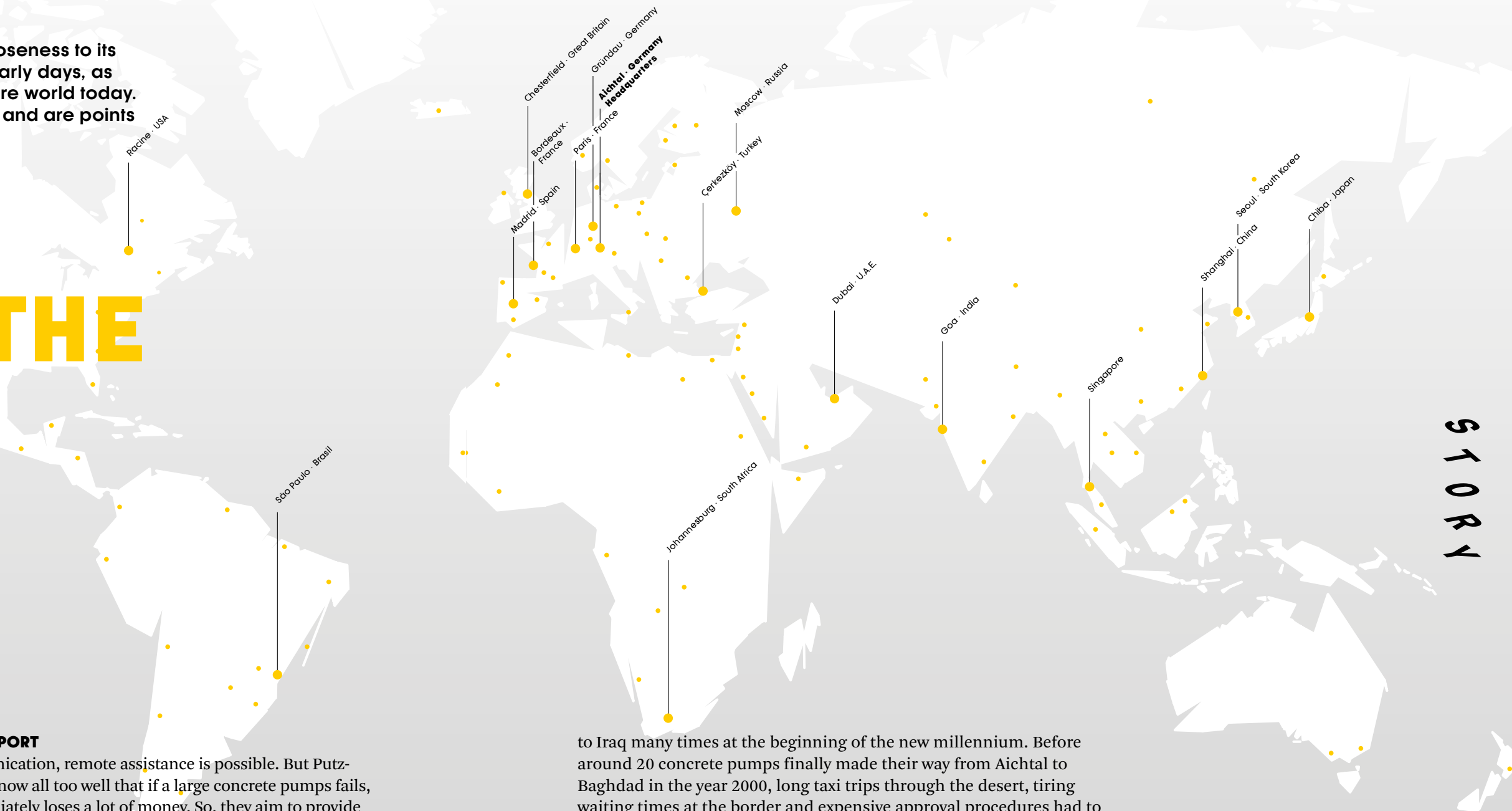
- Putzmeister
- Dealer

## FAST, RELIABLE SUPPORT

With digital communication, remote assistance is possible. But Putzmeister employees know all too well that if a large concrete pumps fails, the customer immediately loses a lot of money. So, they aim to provide the customer with qualified personnel on-site and the necessary spare parts all within a few hours. This costs time: Sales staff are away for more than a hundred days a year on average and in peak times it can even be more than 200 days. They engage in other cultures, make contacts and see what their customers are dealing with on-site.

## SPECIFIC VIEWS, NEW IDEAS

Establishing business relationships can take many years of preparation. This was the experience of a long-term export employee who travelled



to Iraq many times at the beginning of the new millennium. Before around 20 concrete pumps finally made their way from Aichtal to Baghdad in the year 2000, long taxi trips through the desert, tiring waiting times at the border and expensive approval procedures had to be endured. But the friendly contacts at the construction machinery manufacturer Liebherr, which already had an office in the Gulf States since 1970 and was happy to share its experiences, were very helpful. During his travels, he also experienced first hand the tragic fate suffered by many people due to the politically unstable situation. At the same time, he was impressed by the talent for improvisation and the significant expertise shown by building contractors and workshop owners in their handling of machinery or worn parts.

S T O R Y

## MOBILE CONCRETE PUMPS



### MOLI 2110 HP

This machine only takes up space during concrete placement. The construction site can then be cleared – no time-consuming set-up, no crane required.



### MOLI 2116 H

This machine only takes up space during concrete placement. The construction site can then be cleared – no time-consuming set-up, no crane required.



### M20-4

Truck-mounted concrete pump becomes renovation professional: The Sanima kit for renovation jobs offers sufficient space for hoses, pipes and accessories in stowage compartments and shelves.



### M24-4

Big benefit in a small space: The strengths of the M24-4 play out in particular on small to medium-sized universal construction sites where there is little space for set-up.



### M28-4

As an all-rounder, the M28-4 is a special class among the mobile concrete pumps. The flexible 28-metre boom in a Z fold system can reach places others can only dream of.



### M31-5

The M31-5 hall master mobile concrete pump is unbeatable when space is limited. This makes the pump ideal for small to medium-sized universal construction sites.



### M36-4

With the next generation of the 36-4, almost anything is possible. Medium to high concrete volumes are no problem for this truck-mounted concrete pump.



### M38-5

You can rely on the M38-5. Regardless of the type of construction site it is used on, this truck-mounted concrete pump can handle any challenge.



### M42-5

The M42-5 is suitable for all kinds of construction sites. It weighs less than 32 tons, including reserves for additional loads and functional fluids.



### M46-5

Medium and large construction sites are no problem for the M46-5, nor are construction sites with little space for set-up. Ergonic Setup Control and One Side Support are available as options.



### M47-5

The M47-5 is a lightweight on four axles. It weighs less than 32 tons and is therefore one of the lightest machines in its class.



### M49-5

The M49-5 has the largest reach in the 40-metre class. This makes it ideal for use on large construction sites and on sites with little space for set-up.



### M53-6

The strengths of the M53-6 come into play in particular during concrete placement for high floors and on construction sites that require flexible boom control.



### M54-5

The M54-5 offers a load torque of 200 kilograms at the boom tip. Thanks to One Side Support (OSS), it is ideal for construction sites with little space for set-up.



### M56-5

The M56-5 is used wherever other booms are too short: On large construction sites, when building bridges, multi-storey buildings or slabs.



### ROLINE BQ06

With the RoLine BQ 06, you get exactly the amount of concrete you are paying for, because barely any concrete residue is left in the system when the work is done.



### M62-6

The Putzmeister M62-6 truck-mounted concrete pump has a flexible six-part placing boom with a vertical reach of 62 metres and a low unfolding height.



### M63-5

The M63-5 scores highly with maximum vertical reach and maximum flexibility – perfect for large construction sites with little space for set-up.

## STATIONARY CONCRETE PUMPS



### P715 TD, TE, SD

The P715, with its powerful twin piston pump, is ideal for applications such as calcium sulphate based self-levelling floor screeds, concrete self-levelling floor screeds, delivery of fine concrete and grouting work.



### P718 TD, TE, SE

The P718 is the strongest and most compact Putzmeister fine concrete pump of this kind. It combines all the advantages of the P715, pumps concrete up to a particle size of up to 32 millimetres and can be used flexibly, in particular for fine concretes.



### BSA 1005 D3B C

With a steel hood and modern diesel drive, it is a flexible solution for smaller construction sites. It is also suitable for concrete spatter.



### BSA 1005 E C

Thanks to its quiet electric motor, the BSA 1005 E C is particularly well suited to tunnel construction and construction sites in the city centre.



### BSA 1405 E

The BSA 1405 E stationary concrete pump is the reliable all-round concrete pump among the electric pumps.



### BSA 1407 D

The BSA 1407 D is an all-rounder. With its Deutz diesel engine drive, it is the ideal solution for medium distances, such as in infrastructure construction. It is not approved for Europe and the USA – the equivalent for these regions is the BSA 1407 D4.



### BSA 1407 D4

The BSA 1407 D4 is driven by a Deutz diesel engine with emissions level Tier 4. It is particularly well suited to medium distances, such as in infrastructure construction.



### BSA 1408 E

The reliable all-round concrete pump for medium power ranges with FFH control system can be mounted on a rail drive unit, if required. The machine is very quiet, powerful and emissions-free.



### BSA 1409 D

The strengths of the BSA 1409 D with a six-cylinder diesel engine from Deutz lie in medium distances, high-rise and tunnel construction and infrastructure construction. It is not approved for Europe and the USA – the equivalent for these regions is the BSA 1409 D4.



### BSA 1409 D4

The BSA 1409 D4 has a Deutz diesel engine with emissions level Tier 4. The stationary concrete pump can be used for medium distances as well as for infrastructure construction.



### BSA 2108 HP E

The BSA 2108 HP E long-stroke concrete pump with big power and high delivery pressures is ideal for long and high pumping distances.



### BSA 2109 H D4

The BSA 2109 H D4 combines emissions guidelines with our customers' requirements. Equipped with a Tier 4 Deutz diesel engine, it easily handles medium distances and infrastructure construction projects.



### BSA 2109 H E

The BSA 2109 H E long-stroke concrete pump with big power and high delivery pressures is driven by a 160 kW electric motor.



### BSA 2110 HP D

The BSA 2110 HP D is the world record long-stroke concrete pump with big power and high delivery pressures. With this machine, you are always on the safe side for all kinds of jobs.



### BSA 2110 HP D4

The BSA 2110 HP D4 combines emissions guidelines with our customers' requirements. Its Deutz diesel engine (emissions level Tier 4) as well as two SCR (selective catalytic reduction) means there is no need for a diesel particle filter.



### BSA 14000 HP D4

With the further development of the tried and tested BSA 14000 HP D, the emission guidelines were brought in line with the needs of our customers. The result: Despite high power and reduced fuel consumption, emissions thresholds are observed and competitiveness is even increased. Driven by a Caterpillar diesel engine with emissions level 4, the BSA 14000 HP D4 knows almost no bounds. From long-distance pumping to high-rise construction applications – this pump can handle anything.



### BSA 14000 HP E

The BSA 14000 HP E high-pressure concrete pump knows almost no bounds. With two electric motors, it is suitable for high-rise construction and for pumping over long distances.



### BSA 14000 SHP D

The BSA 14000 SHP D is the ideal pump for all extreme jobs in which long-distance and high-rise pumping are required. With this pump, everything is possible. It is not approved for Europe and the USA – the equivalent for these regions is the BSA 14000 SHP D4.



### BSA 14000 SHP D4

The BSA 14000 SHP D4 (Caterpillar diesel engine Tier 4) combines emissions guidelines with our customers' requirements. Despite high power and reduced fuel consumption, emissions thresholds are observed.

## CRAWLER CONCRETE PUMPS



### BSC 1005 D3B

The BSC 1005 D3B on a steel crawler track is particularly well suited to small delivery rates. The pump is used primarily with drilling devices to create drilled piles. The chassis mounted on crawler tracks enables independent operation. The cleaning accessories include a water tank, cleaning pump, compressed-air compressor and compressed-air tank.



### BSC 1409 D

The BSC crawler track concrete pump is a combination of the latest Putzmeister technology and the autonomy of powerful crawler tracks. It is ideal for filling holes in civil engineering and construction projects. The chassis mounted on crawler tracks enables independent operation. The cleaning accessories include a water tank, cleaning pump, compressed-air compressor and compressed-air tank. As an option, a 500-litre water tank can be fitted.



### BSC 1409 D4

The BSC 1409 D4 is a mobile concrete pump mounted on a steel crawler track and can be used for large delivery rates. It is particularly well suited to jobs with drilling devices for creating drilled piles. The BSC 1409 D4 can handle normal concrete with a particle distribution of up to 32 millimetres without any problems. As an option, an 800-litre water tank can be fitted.



### BSC 2113 D4

The BSC 2113 D4 crawler track concrete pump combines the latest Putzmeister technology with a powerful crawler track. It is the ideal solution for filling holes in civil engineering and construction projects.

## THOM-KATT TRAILER CONCRETE PUMPS



### TK 7

The TK 7 is our compact, electrical-driven pump for shotcrete and fire-proof mortar. Thanks to the optional, removable mixer, it can process concrete mixes directly on the construction site.



### TK 20

Our robust TK 20 is particularly well suited to medium distances and is ideal for fire-proof applications, civil engineering and underground construction work.



### TK 40

The TK 40 is an extremely reliable machine for numerous concreting jobs, in particular for shotcrete.



### TK 50 T3

The TK 50 (emissions level Tier 3) offers high power for the processing of shotcrete and other concrete recipes. It can also easily handle coarser mixtures.



### TK 50 T4

The TK 50 (emissions level Tier 4) offers high power for the processing of shotcrete and other concrete recipes. It can also easily handle coarser mixtures.



### TK 60 HP

The TK 60 HP is specially designed for shotcrete applications and also pumps more difficult concrete mixes over long distances.



### TK 70 T3

The TK70 (emissions level Tier 3) is ready for use with the widest ranging materials – including coarse mixes. It can therefore be used on many different construction sites.



### TK 70 T4

The TK70 (emissions level Tier 4) is ready for use with the widest ranging materials – including coarse mixes. It can therefore be used on many different construction sites.

## TRUCK MIXERS



### TRUCK MIXER P 7 (UL)

A powerful machine with reduced consumption and operating costs and high resistance to wear and abrasion.



### TRUCK MIXER P 8 (UL + HR)

Designed for tough and rough materials and for transporting concrete in the same quality for many years.



### TRUCK MIXER P 9 (UL + HR)

Heat-treated steel provides additional, special protection and improved performance data.



### TRUCK MIXER P 10 (UL + HR + DS)

Durable machine with high resistance to coarse material. The reduced operating costs are another advantage.



### TRUCK MIXER P 12 (UL + HR + DS)

The truck mixer offers high load capacity as well as the latest Ergonic control system.

## TELEBELT® BELT CONVEYORS



### TB 110

The Telebelt® TB 110 is an all-round machine, e.g. for environment projects, civil engineering and track construction, low ceiling heights and special applications. It can transport sand, hardcore, non-pumpable bulk solids and broken material with a particle size of up to 100 millimetres.



### TB 130

The Putzmeister Telebelt® 130 is the high-end machine for construction sites that require long reaches and high power. It can be used for concrete with a spread of up to 305 millimetres as well as for sand and gravel with a particle size of up to 100 millimetres.



### TB 200

With a horizontal reach of 61 m, the Putzmeister Telebelt® TB 200 is ideal for large construction sites. The ballast of the TB 200 is integrated in the machine as a structural element. Thus, you always have the right mass at the right place, to balance the load of the extension.



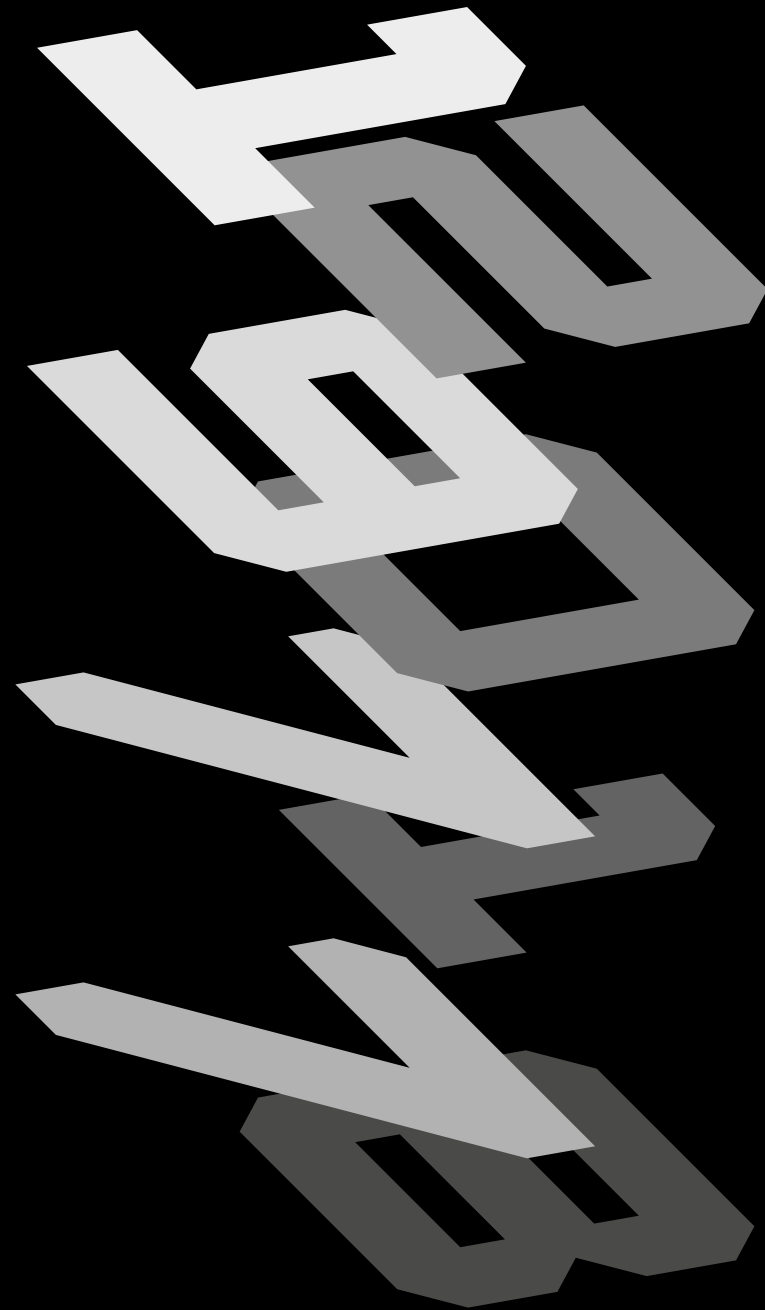
### TBS 130

Greater manoeuvrability, tighter turning circle, lower axle loads: The Telebelt® TBS 130 is ideal for pumping large, dry concrete volumes and bulk solids with a particle size of up to 100 millimetres. The semi-trailer can be driven by any two- or three-axle vehicle.



### TBS 600

The Telebelt® TBS 600 is ideal for large concrete volumes and other bulk solids and pumps easy-flowing material and stone with a particle size of up to 152 millimetres. Its semi-trailer configuration guarantees good manoeuvrability, a tight turning circle and low axle loads. The semi-trailer can be driven by any two- or three-axle vehicle.



In 1977, Putzmeister applied its technical expertise to additional materials and applications. Since then, its industrial and special pumps have been used for challenging projects throughout the world.

- > 50,000 metres under the sea. How Putzmeister helped construct the Eurotunnel
- > Clean work. All that can be pumped
- > Floating giant. Airport construction off the coast of Japan

# SOLID SPECIALISTS

Consolidation with  
industrial and special pumps



The recession of 1966/67 may not have brought the economic boom after the Second World War to an end, but it certainly slowed it down. In the first half of the 1970s, it became clear that the times of uninterrupted upturn were over.

# NEW MATERIALS, NEW MARKETS

## DIVERSIFICATION WITH INDUSTRIAL AND SPECIAL PUMPS

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### GAINING LAND WITH PUTZMEISTER

With six gigantic twin piston pumps installed on a ship, Putzmeister laid the foundation for the "Central Japan International Airport" in 2004.

### NEW MATERIALS

Since 1977, the extremely tough high-density solids pumps have been transporting other materials in addition to concrete.

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**A**fter the Yom Kippur War with Israel, Arabic oil-exporting countries drastically increased oil prices and restricted supply quantities. The German federal government reacted to the so-called oil crisis of 1973 with car-free Sundays and speed restrictions. In all economic areas, prices rose and gross domestic product stagnated. Investment subsidies for companies, interest rate reductions and state construction programmes were intended to counteract these developments. Yet in 1975, the entire economy almost fell into crisis and, for the first time, more than one million people were unemployed.

### HIGH-DENSITY SOLIDS PUMPS FOR THE WORST CASE

Putzmeister was very successful with its mortar machines and concrete pumps, but its products were dependent on the construction industry, which was particularly badly affected by the weak economy. The company founder, Karl Schlecht, sought new applications for his machines, which had proven their worth

time and again in small and large projects. Couldn't it also be possible to transport other materials? The pump technology with oil-hydraulic drive, long piston stroke and little switching of the transfer tubes really must be transferable to other sectors, thought Schlecht.

From 1977, Putzmeister used its pumps in industrial and plant engineering to pump other materials, instead of concrete. At an early project at the Aswan Dam in Egypt, it was necessary to pump sludge deposits from the ground and transport it to the river bank through floating pipelines. Gradually, the engineers in Aichta made improvements to the pumps until they were even better at pumping sewage sludge, coarse pieces of rock, grease, ash and other materials. "High-density solids pump for the worst case," is what Putzmeister called the extremely tough constructions. They were also used in mining and tunnel construction and cleared the spoil pile – "sea silt", fine, solid sludge – for the subway in Tokyo. This was a first test for the advanced technology, which just a few years later played a significant role in the construction of the Eurotunnel. 🏗️

# 50,000 METRES UNDER THE SEA

HOW PUTZMEISTER HELPED CONSTRUCT THE EUROTUNNEL

REPORT

REPORT



»The stormy bulwark that God has placed around our coast must not be undermined.«

— Lord Palmerston, British Prime Minister (1855–1858; 1859–1865)



1st December 1990. At exactly twelve minutes past noon, Philippe Cozette used his jack hammer to shatter the last piece of rock separating France from England. At that instant, due to the difference in air pressure, a sharp wind blew into his face. But it didn't stop him.

**A**round 15 kilometres from his homeland, the French tunnel worker climbed through the hole and drove across to England on a trolley. At about the same time, Graham Flagg, Cozette's English colleague, climbed onto a trolley on the other side and drove towards France. The big breakthrough had been made, the European continent was connected to Great Britain via a tunnel. Around 15,000 workers had spent almost three years working seven days a week on both sides of the English Channel, and beneath it. The construction of the Eurotunnel had begun on 15th December 1987 on the English side and on 28th September 1988 on the French side.

#### OLD IDEA, NEW INITIATIVE

Even Napoleon Bonaparte dreamed of a tunnel between France and England, and there were plans for a connection by rail already in the early 19th century. Initial attempts failed due to technical problems, but there was also political resistance. The English in particular had concerns. "The stormy bulwark that God has placed around our coast must not be undermined," said the British Prime Minister Lord Palmerston (1855–1858 and 1859–1865). Until well into the 20th century, some feared a military invasion, while others warned that foxes would bring in rabies or that drug dealers would use the tunnel for illegal transactions. Finally, in Canterbury Cathedral in 1986, the British Prime Minister Margaret Thatcher and the French President François Mitterand decided to build a railway tunnel – but without state funding. The French-British Groupe Eurotunnel was commissioned with the construction, financing an operation of the billion-pound project. The project was named after the company, which has operated under the name Getlink since November 2017. After six and a half years of construction, on 6th May 1994, Queen Elizabeth II and the French President

François Mitterand met half way under the English Channel for the official opening ceremony. At a length of 50 kilometres, including 37 kilometres under the sea, the Eurotunnel is the longest underwater tunnel in the world. Each hour, up to four high-speed, cargo and shuttle trains for cars and trucks commute through two parallel tunnels between Coquelles in France (4.5 kilometres south-west of Calais) and Folkestone in England, about eleven kilometres south-west of Dover. The service tunnel between the two tunnels accommodates systems for operation, monitoring and maintenance, and connecting tunnels enable access to the two main tunnels, as well as evacuation in the event of an emergency.



ON THEIR WAY TO THE CONSTRUCTION SITE  
Transportation of the reinforced concrete rings from which the tunnel pipes were produced. Great precision was required when placing the concrete.

#### A FACTORY 40 METRES UNDERGROUND

Putzmeister technology was used for this British-French mega project, too. To drill and secure the tunnel tubes, the engineers set up a bona fide factory 40 metres under the sea floor: Six tunnelling machines drilled pipes into the chalk

layer. Each hour, the huge machines advanced by a good metre, producing a spoil pile of about 1200 cubic metres, consisting of fragments of rock and damp chalk rock. The rubble was transported by rail to the starting shaft on the French side. There a plant crushed the rock fragments and mixed them with the remaining spoil pile and water. This is where eight Putzmeister high-density solids pumps came into play. These pumps transported the spoil pile from the tunnel through pipelines to a landfill site – eight million cubic metres in 90,000 operating hours. Then came a challenging task: The tunnel pipes had to be concreted in the rock. The pipes were made up of hundreds of individual reinforced concrete rings, so-called tubbing rings. To ensure that these did not sink during concrete placement, particular precision and technical expertise were required. Putzmeister supplied the vast

construction site under the sea with three at the time unique mortar injection and backfilling systems. Putzmeister engineers installed them on so-called trailer wagons, which were suspended from the tunnelling machines. The systems mixed a special, extremely rapidly hardening mortar, which was injected from the trailers into the cavities between the tubing rings and the rock. With the help of sensors, only the exactly required quantity of mortar was injected into the cavities.

**A MODERN WONDER OF THE WORLD**

The Putzmeister technology worked reliably, and to this day the pipes of the Eurotunnel are firmly anchored and watertight under the English Channel – at an average depth of 40 metres, with the deepest point being 75 metres. The critical voices have largely fallen silent. At €15 billion, the construction costs were twice as high as originally planned, but the operating company has been in the black since 2007. The tunnel has been a success because the train line between the tunnel and the financial centre of London was improved. Each year, around seven million passengers and countless goods travel from France to Great Britain and vice versa.



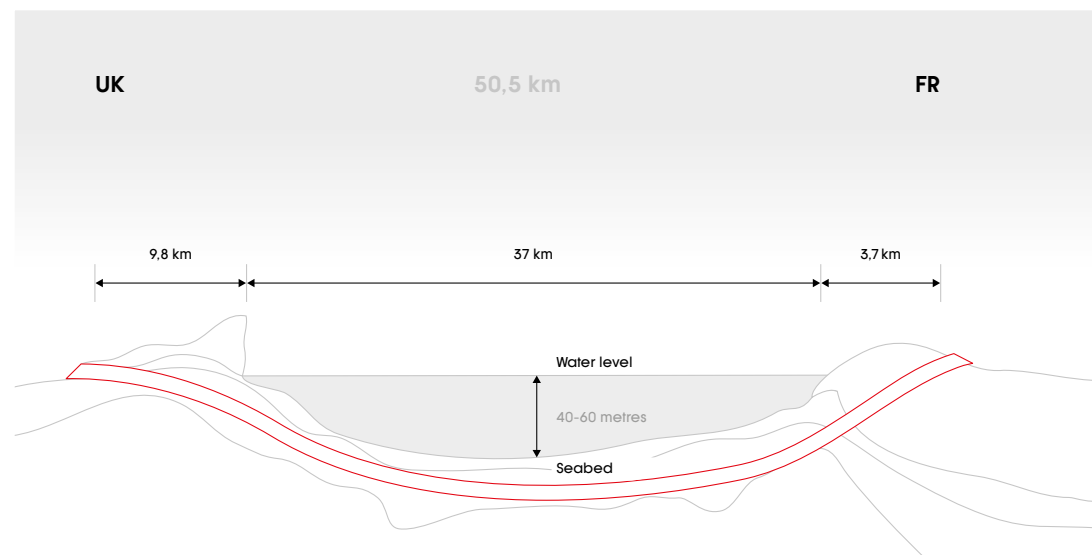
**THE BIG BREAKTHROUGH**  
 Since 1st December 1990, the tunnel has connected Great Britain with the European continent under the sea bed. 15,000 workers worked on it for three years, seven days a week.

The American Society of Civil Engineers even counts the Eurotunnel as one of the seven modern wonders of the world – alongside the Empire State Building in New York, the Itaipu Dam on the border between Brazil and Peru, the CN Tower in Toronto, Canada, the Panama Canal, the North Sea Protection Works in the Netherlands as well as the Golden Gate Bridge in San Francisco.

REPORT

**EUROTUNNEL**

At a length of 50 kilometres, including 37 kilometres under the sea, the Eurotunnel is the longest underwater tunnel in the world. On average, it is 40 metres below the sea bed, with the deepest point being 75 metres down.



**ALL THAT CAN BE PUMPED**

Putzmeister machines don't only pump concrete, but all kinds of other materials – and help protect the environment in the process. Here is a short overview.

**SEWAGE SLUDGE**

**SIMPLE PUMPING OF SEMI-SOLIDS**

Sewage sludge is produced during wastewater treatment. In a first step, the sludge is dewatered using centrifuges or presses, leaving behind a relatively solid, dense mass. Putzmeister high-density solids pumps can pump this kind of material just as easily as other types of waste and grease – up to 50% solid content is possible. Screw conveyors then push the material into a hopper and the pump can pump more material.



**BIOMASS**  
**TURNING WASTE INTO ENERGY**

The global scrapheap is growing and growing. But what should we do with all the packaging material, plastic, glass and sheet metal? These materials have to be separated from the biomass of organic waste before it is fermented in the septic tanks of a waste water treatment plant, because if the biomass contains large foreign bodies, the fermentation capacity falls. Putzmeister has developed complete solutions for this. Since the 1980s, Putzmeister piston pumps have been being used in biogas plants, pumping different kinds of biomass, which is converted into electric energy.



KNOW-HOW

**Clean work**

**HAZARDOUS WASTE**  
**PROTECTION FOR PEOPLE AND THE ENVIRONMENT**

Hazardous waste must be handled with care to prevent toxic substances from being released into the environment during transport. The EKO single-piston pump is a solution to this problem: It shreds, mixes and presses difficult and toxic waste products. It can also pump extremely dry material with many foreign bodies – the machine can even handle shredded barrels. Since it works continuously and automatically, nobody needs to intervene in the operation and there is therefore no danger.



# BELOW THE METROPOLIS

UNDERGROUND RAILWAY PROJECTS THROUGHOUT THE WORLD

STORY

STORY



Big Putzmeister pumps are a familiar sight on many construction sites. But sometimes they are concealed from view – as is the case with the challenging underground railway projects in the big cities of this world.

In 1863, the first steam trains drove under the ground. The Tube, London's underground railway, is the oldest underground railway in the world. More lines have been added over the decades, and in 1900 operation switched to electric drives. Today, underground trains in the British capital roar across 402 kilometres of track and stop at 270 stations. One of them is barely 30 minutes walking distance north of the Tower of London: At Liverpool Street station, the trains of the Central Line travel in and out on two tracks daily, putting the tracks under extreme strain. At the Liverpool Street diamond crossover, the 60-year old tracks were to be replaced in May 2016. The complex project required exact coordination by all those involved, including "Transport for London" as the operating company of the London transport system as well as the "Track Partnership", which was responsible for the replacement of the tracks.

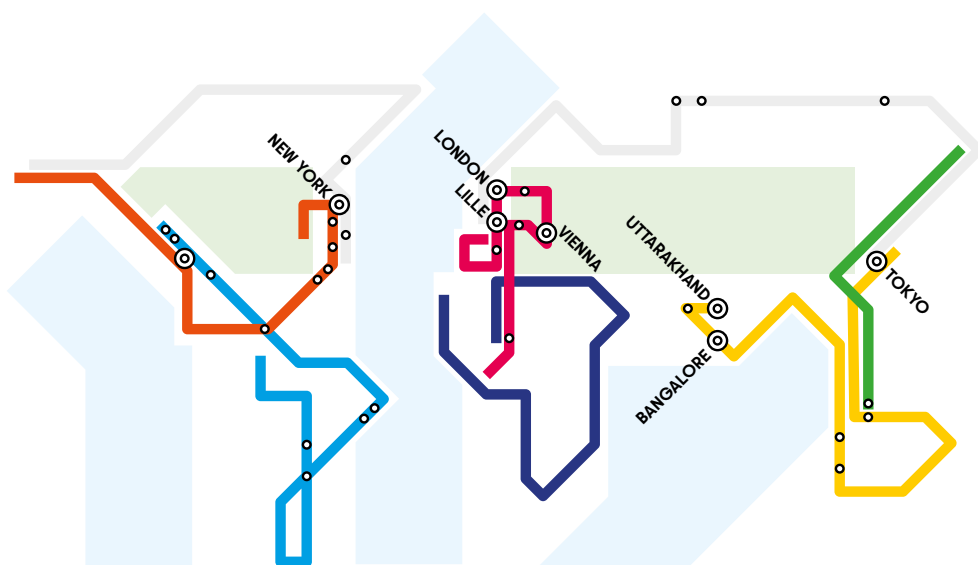
**ZIGZAGGING INTO THE TUNNELS**

Exact planning was required to enable construction right in the centre of the bustling city: Two stationary BSA 1409 D pumps were set up on a bus lane at Bishopsgate, a crossroads with Liverpool Street, and traffic had to be diverted. The best access to the two tube tunnels was via a 15-metre deep ventilation shaft at Bishopsgate. Through this, the engineers laid the pipelines for the concrete. They first bent them in a 90° angle and then guided them six metres deep into the tunnel at another 90° angle. At the hard-to-reach construction site, the workers initially filled two 105 cubic metre large caverns under the tracks. Next, they had to concrete the track bed and, in particular, embed the sleepers into the concrete slab. A tricky task, but the plans were correct and the Putzmeister pumps worked reliably. The concrete flowed at a rate of about 15 cubic metres per hour to exactly where it was needed. After just twelve hours of

STORY

**NETWORKED CITIES**

Putzmeister technology has been used at many underground train construction projects throughout the world since the 1980s. Each location presents its own challenges.



operation, the pipelines and machines were cleaned with compressed air and all the work was completed – earlier than planned, thanks to the excellent collaboration between all partners.

**GOING THE DISTANCE AT THE DANUBE**

A challenging task also awaited Putzmeister in Vienna: The Lainz Tunnel was to connect the west, south and "Donauländebahn" railway lines underground over a distance of 12.8 kilometres, and become part of the high-speed line from Paris to Budapest or Bratislava. With this tunnel, the Austrian Federal Rail Company was extending its east-west connection.

The start of construction, which had been planned since 1992, was delayed →



**TRICKY CONSTRUCTIONS**

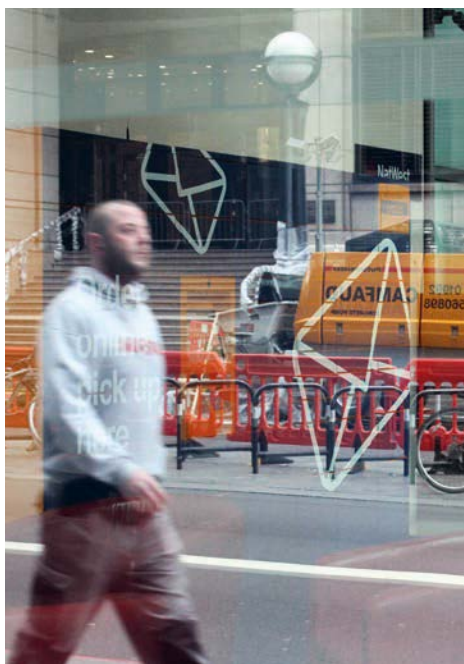
Thanks to Putzmeister technology, millions of people can use modern transport systems.



**RIGHT IN THE CENTRE OF THE METROPOLIS**

The machines have to work quickly and reliably for complex underground railway construction projects.

STORY



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**TIGHT SPACE,  
LARGE  
DISTANCES**

Putzmeister machines are used underground in many cities. On hard-to-reach construction sites, sophisticated designs are often required for the concrete lines.



time and again not least of all because residents and some politicians protested against the project. When the first head-works finally started in autumn of 2006, complaints slowed the project down again. It took a further three years until the breakthrough was achieved. Alongside tunnel drilling, work began for Putzmeister in October 2008 – under difficult conditions. The planned line led through a densely populated area and the tunnel to be concreted was very long. Particular care was required in a section with very loose rock. It was situated completely in the groundwater,

which is why the ground had to be specially prepared. Putzmeister used a stationary BSA 2109 H E concrete pump with a delivery line of more than 1400 metres in length, which was designed specifically for this project. A PP fibre additive in the concrete made the inner shell of the tunnel particularly fire-proof – after all, opponents to the project were concerned above all with fire safety. The pumps simultaneously supplied four formwork carriages with concrete and pumped up to 500 cubic metres of material daily, while the concrete parts were also reinforced. This extremely efficient proce-

sure shortened the construction works by half a year. In December 2012, the Austrian Federal Rail Company put the tunnel into operation. Because it runs partly underneath the Lainzer Tiergarten wildlife preserve, the inhabitants of Vienna jokingly call it the “wild boar tunnel” – definitely a sign of acceptance of the new connection.

**FLEXIBLE SOLUTIONS FOR EVERY SITE**

The fast action in London and the long-distance concrete delivery in Vienna were just two of many underground railway projects in which Putzmeister technology has been used since the 1980s. Whether in Tokyo, Lille, New York, the Indian metropolis of Bangalore or the state of Uttarakhand: Every site poses a new challenge. In some cities, the ground is loose, in others it's solid; sometimes the pipelines for the concrete are easy to lay, and sometimes inventive designs are required. In

**PUMPING IN  
THE CITY**

In the centre of London, the machines took their place in a bus lane.



all cases, however, the machines and pump systems have to cope with limited space in the densely populated cities, often coping with large distances and working quickly and reliably so that millions of people can use the underground transport systems in their cities comfortably as soon as possible. 🚧

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**TEAMWORK  
IN THE TUNNEL**

During the challenging underground construction works, all those involved must always be able to rely on each other.



## THE PUTZMEISTER ZOO

The elephant is the Putzmeister trademark. In addition to this grey giant, however, other “animals” romp about in the Putzmeister world. The names are widely known in the industry, and are catchier than the model designations.

# Ahead of the pack

### **STRASSENWOLF**

CLASSIFICATION: SW 3

The Straßenwolf is a mobile industrial machine used for cutting away asphalt and concrete floors.



### **TUNNELPUMA**

CLASSIFICATION: BMT 18.05

The highly mobile concrete pump with a very flexible placing boom is used for concreting tunnel formwork. To do this, it has a 360° pivot hinge in the last arm.



## THE PUTZMEISTER ZOO

### **HAMSTER**

The mobile industrial machine serves to gather, pick up and load bulk solids of any kind onto vehicles following behind, e.g. as a trailing implement behind road millers.



### **GIRAFFE**

CLASSIFICATION:

MD 14-100 AND MD 12-125

The giraffe is a hydraulic concrete placing boom on a steel base frame used for concreting floors. The machine was available either with a DN 125 pipeline and a boom length of 12 metres or a DN 100 pipeline and a boom length of 14 metres.



### **SPRITZBÜFFEL**

CLASSIFICATION: AJ 8, AJ 10, AJ 12

The Spritzbüffel is a concrete spraying machine on crawler tracks. It enables the quick and safe placement of shotcrete in large tunnels. Today, Putzmeister Wetkret models do this job.





A KOS 25200 double piston pump, which pumps 500 cubic metres of material per hour with 860 hp (630 kW) power, weighs more than 22 tons. In 2004, Putzmeister installed six of these giants on a ship off the Japanese coast, two kilometres away from the coastal town of Tokoname in Ise Bay.



#### BIG PUMPS, BIG TASKS

The gigantic Putzmeister machines laid the foundations for the airport in the middle of the sea

REPORT

**A**nd the job was vast too: The pumps were to lay the foundation for an artificial island in the Pacific, as big as 470 football fields. A new airport, the “Central Japa International Airport,” was to be created on this area. Since space on the densely populated Japanese islands was scarce, they were side-stepping into the sea. For the foundations, the Putzmeister pumps delivered a mix of seabed and cement into several basins. Their protective walls of rock and concrete blocks prevent the powerful current of the Pacific from sweeping the foundations away with time. The third ingredient of the pump mix – a foamy mass consisting of secret components – ensured that the foundations remained light. Too much weight could cause the airport to tilt on the soft seabed. After ten months, the pumps had completed the foundation of almost nine million cubic metres of cement sludge. The Japanese then placed vast quantities

of earth and rock on top, which had been taken from the mainland. On 17th February 2005, the airport was finally opened. Today, it is the most important transport hub in the Chubu region. From here, around 12 million passengers per year travel to all corners of the world. But the airport itself is also an attraction: Each day, many people travel over two bridges of 1.3 kilometres in length to go shopping in the “Skytown”, the airport’s shopping mall, and to marvel at the artificial island.

#### FOURTH RUNWAY IN TOKYO BAY

Two years later, almost 400 kilometres further east, Haneda Airport in Tokyo was experiencing capacity problems. It was to be given a fourth, 2500 metre long runway, also on an artificial island. Putzmeister provided goos services for this special job too: Load cranes transported the seabed taken from Tokyo Bay to special ships. There, it was mixed with cement and the special, lightweight foam.

Two high-density solids pump from the KOS 25200 series pumped 440 cubic metres of the material per hour through pipelines with an internal diameter of 350 millimetres. The lines flowed into M52 placing booms with diameters of 200 millimetres, like the booms used on concrete pumps. However, the Putzmeister engineers had adapted the booms

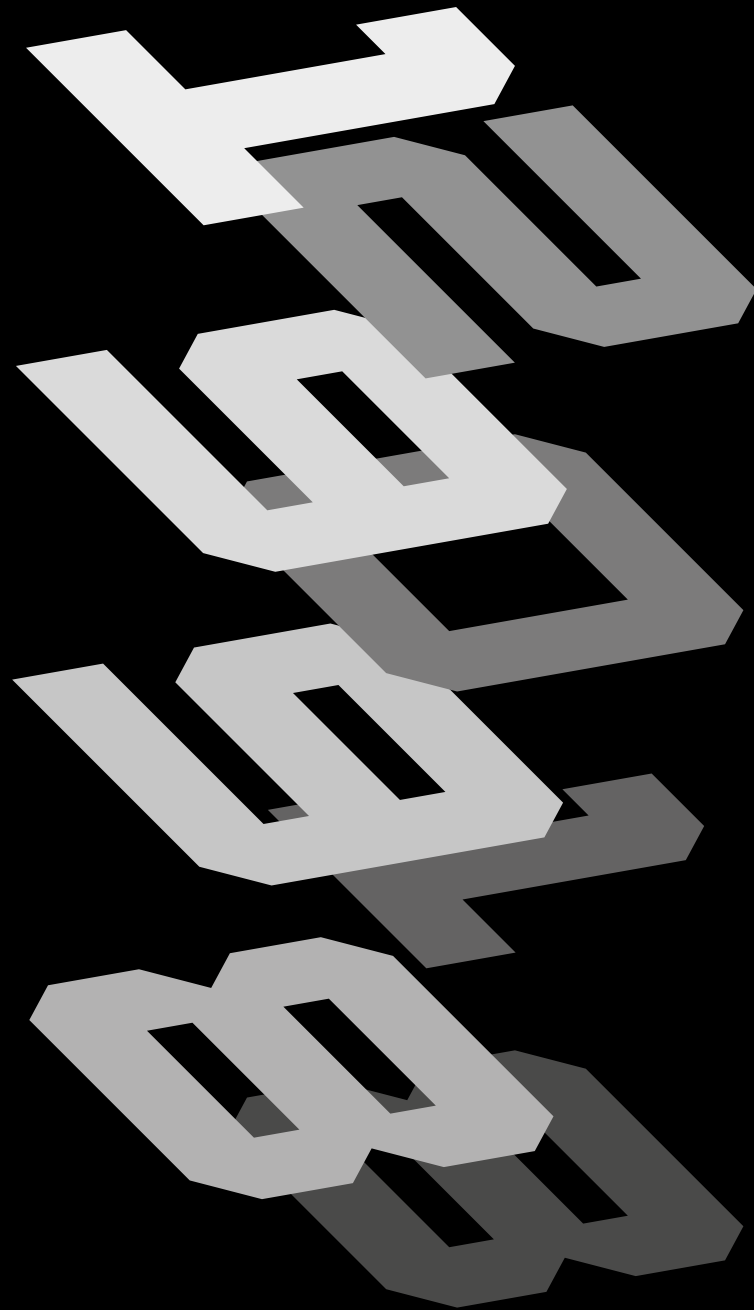
in such a way that they had over 30 metres of horizontal reach. The arms dived down repeatedly, carrying layer by layer from the bottom to the top. In 2010, the new “Runway D” was opened along with the new international terminal. With more than 80 million passengers per year, the extended airport is the fifth largest in the world today.

# FLOATING GIANT

## AIRPORT CONSTRUCTION OFF THE COAST OF JAPAN



REPORT



In 1998, the company founder Karl Schlecht withdrew from operational business and transferred all shares of Putzmeister AG to two foundations. The future of the company is secure. It can deal with set-backs and enjoys a high reputation globally to this day.

- > Fall, land, start again. How Putzmeister coped with the crisis
- > Home match. Strong team play in the USA
- > Putzmeister CEO Martin Knötgen on the company's present and future

# STRONG BRAND

Regional roots,  
global success

In 2008, Putzmeister felt the full impact of the global financial crisis. Turnover fell and employees had to leave the company. How Putzmeister fell into crisis – and survived.



# FALL, LAND, START AGAIN PUTZMEISTER IN CRISIS

In 2007, the real estate sector in the USA fell into a deep crisis: Prices stagnated, in some places they even fell. Because interest rates were rising at the same time, many homebuyers were no longer able to pay their instalments. The banks had also speculated with securities in which significantly undervalued credit risks were bundled. This dangerous mix was ominous, but the consequences were felt only with some delay. So, Putzmeister was initially untouched by the crisis. Quite the contrary: In 2007, business was going exceptionally well, turnover was at almost one billion euros. In that year, the company delivered 1200 truck-mounted concrete pumps from Aichtal to all parts of the world, 200 of these to Spain – a record result. But by the end of 2007 and in the first months of 2008, the US real estate crisis gradually developed into a global financial crisis. The construction sector was one of the first industries to be affected, with the impact now also reaching Putzmeister – even if initially relatively mildly. From one month to the next, the company did not sell a single further concrete pump in the USA and Spain. In fact, machines were even being sent back from the Iberian peninsula. That being said, it was possible to compensate for the loss in turnover thanks to the good results on other Putzmeister markets.

## THE BUBBLE BURSTS

By mid 2008, Putzmeister had even been able to further increase its record results from the previous year. But then, in the year of the company's 50th anniversary, the dramatic crash happened: The real estate bubble in the USA burst and banks like Lehman Brothers, one of the biggest financial institutions on

Wall Street, went bankrupt. At Putzmeister, turnover suddenly fell to €450 million – a drop of 50 percent. The crisis intensified, because many customers of Putzmeister products expected short delivery times and couldn't wait for months. The pedestals on which the pumps are mounted, however, were in some cases only available in ten to twelve months time. Putzmeister

hastily pre-ordered the necessary parts, but couldn't find any buyers any more. Hundreds of machines were left standing on the company premises in Aichtal. Worldwide, stocks of finished and semi-finished machines, spare parts, etc. grew to a value of half a billion euros. By this time at the latest, it was also clear to the 3,700 Putzmeister employees worldwide that the situation was serious.

## SHORT-TIME WORK AND DIFFICULT DECISIONS

What was to be done in this dramatic situation? In 2008 already, the company decided to make around 200 fixed-term employees redundant and not to extend temporary contracts. In negotiations, the Board of Management and the Works

Council also agreed to two years of short-time work. For employees, who had felt secure at Putzmeister for decades in some cases, this was a worrying time. A little later, two other measures entered into force: With the 60+ programme, older employees left the company prematurely and in a socially responsible manner, while others received bonuses when they left the company voluntarily. But a further 60 employees were to be made redundant nonetheless. Who would be affected? Even employees in management experienced a stressful period of uncertainty. Some of them had to work for a few weeks with colleagues that they already knew would be leaving the company. The 60 employees concerned were given



STAGNATING ECONOMY  
During the economic crisis of 2008, turnover at Putzmeister fell by half.

a guarantee of re-employment for the period after the crisis – and, in fact, half of them did later return to Putzmeister, with the other half soon finding employment in other companies.

#### RESCUE FROM WITHIN

Despite the tough decisions that had to be made at this time in Aichtal, Putzmeister survived the crisis. The company had performed well for decades and had accrued significant equity capital, which was now used as part of the rescue plan. When short-time work ended in 2011, employees began to notice a gradual improvement. In 2012, turnover started to rise again. But another deep cut awaited the employees: The company was sold to the Chinese SANY Group. 🇨🇳



#### VISIBLE SHOCK

During the crisis, hundreds of machines were left standing on the company premises in Aichtal.

## ALWAYS IN MOTION

Health management at Putzmeister: There's a tip on display to anyone who stands in front of the lift in the administration building in Aichtal. The saying "Get fit with every step" invites them to take the stairs more often.

# Get fit with every step

Employees, especially those who spend a lot of time sitting at work, know full well that movement is important for health. For Putzmeister as a company, success is largely dependent on its employees' vitality. If they are unable to work for a long period of time, this not only results in costs and strain for colleagues, but above all puts those concerned in a difficult situation. That is why the company has introduced a comprehensive company health management scheme. For those in charge, one thing is clear: The pressure to succeed and meet deadlines in global competition sets high demands both physically and mentally. Contemporary health management must take both into account.

#### Three pillars for health

Putzmeister's health management programme extends beyond the statutory requirements. The company values information and raising awareness, and involves its employees in the promotion of health. They are regularly and anonymously asked about their job situation, and some also play an active role in the health scheme, cooperating in making improvements. Putzmeister's health management has three pillars: Occupational health and safety, health prevention and promotion of health. To begin with, there are regular workplace inspections. Where are the hazards? How can accidents be avoided and how should the workplace be designed? This concerns administration and production in equal measure. If an accident does occur, the company doctor and company medical service are soon on-site. The second pillar, prevention, includes training on procedures in production, including from an ergonomic perspective. Addition prevention, screenings as well as information and sensibilisation are intended to ensure that serious problems are detected at an early stage. And if an employee is absent for a long period of time, company integration management is available to help the employee return to the workplace in whatever way possible. Promotion of health, which is the third pillar, includes a regular health report, training and also in-house courses, such as on strengthening the back or general fitness. The aim of all measures is to maintain the quality of life, performance and motivation of all employees for as long as possible. Putzmeister knows: If you want to produce strong products, you need a strong team.

#### MAKING PROVISIONS FOR FITNESS

For health management, Putzmeister identifies hazards at the workplace, supports prevention through special training and offers its employees lots of courses and training.

Putzmeister's customers must operate the machines safely and deliberately. Before beginning with practical work, many machine operators first focus on the theory. The company shares its 60 years of experience in the Putzmeister training centres.

# THE PUTZMEISTER ACADEMY TEACHES EXPERTISE WORLD-WIDE

# ACCUMULATED KNOWLEDGE



KNOW-HOW

KNOW-HOW

### THOROUGH LEARNING

Anyone who knows their machine inside out will use it safely and carefully – minimising material and energy consumption

**M**ortar machines, concrete and special pumps require great skill and huge amounts of expertise. After all, the machines are sometimes used on hard-to-reach or small construction sites. Safety at work has top priority to prevent injuries. Costly damage to the machines should also be prevented. Even the sophisticated electronics and sensor technology integrated by Putzmeister requires a lot of knowledge to save materials and energy and to ensure optimal use of the machine.

### CERTIFIED AND PRACTICE-ORIENTED

As a global leader in the production of concrete pumps, Putzmeister passes on its decades of experience to customers and its own employees. It does this through the Putzmeister Academy, founded by Karl Schlecht in 1994. The company was one of the first SMEs to have its own training centre. Today, the

Academy exists not only in Aichtal, but also at sites in India, Spain, Turkey and the USA. There, machine operators get to know everything in detail: How does the machine work and what can I do with it? What safety rules have to be observed? The Academy trainers teach basic knowledge of mechanical engineering and maintenance so that the operators can eliminate minor faults by themselves, for example. Young professionals in particular are often keen to know the quickest way to become an experienced machine operator for concrete pumps. The answer is often: With time! Nothing helps more than thorough training at the machines on-site. In collaboration with the Industrial Employers' Liability Insurance Association for Raw Materials and the Chemical Industry (BG RCI) in Germany, Putzmeister offers preparatory seminars to train as a "qualified concrete pump operator". Proof of the qualification, awarded by the Industrial Employers'



KNOW - HOW



Liability Insurance Association after an examination, is generally recognised in Germany. The operating companies thereby also meet their legal obligations to provide qualification and training to machine operators.

**GLOBAL LEARNING**

The Academy's offering is also focused on the benefit to the customer. With its own range of customer seminars, Putzmeister covers a broad range of subjects. It extends from one-day workshops for participants with little prior knowledge to training courses for mechanical engineers, who are also responsible for maintenance. For customer employees, who want to consolidate their knowledge of technology, maintenance and repair, Putzmeister offers seminars that are specifically customised to the respective requirements, and it does so worldwide. And there is often barely any need for foreign language skills.

The Academy shows how comprehensible learning aids and practical experience can be used to achieve learning success. In Aichtal, the qualifications on o-



fer are in particularly high demand from September to May, when construction sites are less busy. The training courses are attended by machine operators from Europe, the Middle East and Africa as well as by service technicians from across the globe. More than 1,200 people take part in each training cycle. And it pays off for them: They not only operate their machines more safely, but also more cost-effectively. 🇩🇪

KNOW - HOW

**PRACTICAL LEARNING**

Thanks to the varied Putzmeister training programme, people from all corners of the world can operate their machines more safely and more efficiently.



# A STRONG CONNECTION

PUTZMEISTER AND THE SANY GROUP

STORY

**W**hen Chinese groups take over traditional German companies, fears usually abound: Employees worry about their jobs and the reputation of the brand, and customers worry about a loss of quality. In the public view, the position of the German industry as a technological leader even comes into question. So, it came as a genuine shock to many people when they found out, at the end of January 2012, that the Chinese Sany Group was going to take over its German competitor. Sany was one of the leading construction machinery manufacturers in China, with a domestic market share of almost 50% for concrete pumps. And the Chinese market made up almost half of the global market. Putzmeister was the first German SME to be ac-

quired by a Chinese owner. The uncertainty was immense, with around 700 employees protesting against the decision at the factory site in Aichtal, in particular due to worries about losing their jobs. By this time, the staff had started to notice that the company was finally beginning to recover after the crisis of 2008: Revenue had risen in 2011 and again in 2012. At Putzmeister, they might not have considered themselves as secure as in earlier times, but there was a sense of relief and optimism. Which made the agreed acquisition initially all the more shocking.

#### TECHNOLOGY AND MARKET SHARES

The global crisis left Putzmeister with severe financial problems, and the company's existence was on

the brink. In the end, it was saved by its own high equity, but Putzmeister was considered in the industry as a candidate for acquisition. Despite everything, the brand still enjoyed a good reputation worldwide – the quality of Putzmeister products was undisputed. And the close service and sales network outside of China made Putzmeister an attractive prospect for Sany.

And then there was a second development: In 2009, at the height of the crisis, Putzmeister had planned and gradually implemented restructuring together with the banks. At the same time, it became apparent that the market for truck-mounted concrete pumps was moving more and more to the east. Putzmeister gradually withdrew from the USA and Spain – traditionally strong markets – →

The news caused a great sensation in the German economy: In 2012, the Chinese Sany Group took over Putzmeister. Competition turned into cooperation.



and focused on its business in Asia. The fusion with a Chinese company could strengthen its own position. By the end of 2011, the company founder Karl Schlecht and the Putzmeister Board of Management were in negotiations with Liang Wengen, co-founder of Sany. The parties reached an agreement and, for €360 million – the largest Chinese investment in Germany to date – Putzmeister was acquired by the Sany Group. The entire proceeds of the sale flowed into the two foundations Karl Schlecht Gemeinnützige Stiftung (KSG) and Karl Schlecht Familienstiftung (KSF). Cooperation instead of competition.

#### INDEPENDENT SUBSIDIARY

Today, if you speak to the people in charge and to the staff, there is no sense of the initial scepticism. The Chinese parent company left the traditional company

with maximum independence, with both sides agreeing a location guarantee in the acquisition negotiations. Jobs in Aichtal will be retained until 2020 and there were no redundancies. Today, the focus is above all on the advantages of the decision. After all, the strengths of the parent group can also provide security in the event of another crisis. In the industry, too, the takeover is considered as an example of a successful acquisition. In the meantime, the companies are splitting the global market: Sany is active in China and some African countries, while Putzmeister operates globally with the exception of China. The people in charge at Putzmeister see synergy effects above all in joint basic research and development, in particular for applications to do with Industry 4.0. The starting position is favourable: Sany and Putzmeister together are the undisputed number one in the industry. 🏆

#### NUMBER ONE TOGETHER

In future, Sany and Putzmeister are aiming for even closer cooperation to work on problems such as industry digitalisation





### PM IN FIGURES

# DATA SHEET

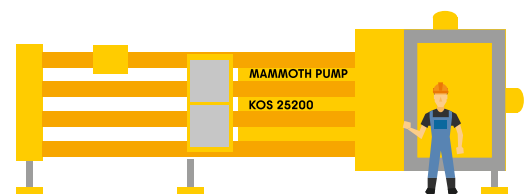
FROM HOW MANY DIFFERENT COUNTRIES DO PUTZMEISTER EMPLOYEES COME?

FOCUS



**3100**

HOW MANY PEOPLE WORK AT PUTZMEISTER?



HOW SMALL IS THE SMALLEST PUMPABLE MATERIAL AND HOW BIG IS THE BIGGEST?

From 2 millimetres for interior plaster up to 32 millimetres (particle diameter for concrete pumps) – the biggest machines can also handle bulky industrial waste, e.g. shredded oil barrels.



**60**

HOW MANY CONCRETE PUMPS HAS PUTZMEISTER SUPPLIED IN THE LAST 60 YEARS?

**MORE THAN 100,000**



**2000 METRES**

HOW HIGH AND HOW FAR DO THE CONCRETE PUMPS REACH?

Putzmeister has already produced truck-mounted concrete pumps with a maximum vertical reach of 70 metres. Stationary pumps can reach over 600 metres vertically and, depending on the material and site of use, over two kilometres horizontally.

**600 METRES**

**70 METRES**

WHAT IS THE GREATEST HEIGHT AT WHICH A PUTZMEISTER MACHINE HAS WORKED?

**4450 METRES – IN 2014 IN THE ANDES**



HOW MANY APPRENTICES HAS PUTZMEISTER TRAINED IN THE PAST 60 YEARS?

**750**



FOCUS



HOW OLD CAN PUTZMEISTER MACHINES BECOME?

With good maintenance and sufficient investment, Putzmeister machines can last forever. The machines are designed and built for a 15-year service life – but many machines continue to run without any problems even after 30 years.





STRONG TEAM PLAY  
IN THE USA

# HOME MATCH

In 2008, a decision was made: In future, the Braves baseball team was to chase home runs in Gwinnet County, Georgia. But to do that, they urgently needed a modern stadium. For Putzmeister, the race against time began – the new venue needed to be complete within just one year.



REPORT

**F**or 43 years, the Braves had played in Richmond, Virginia. But in professional sports in the USA, even more so than in Germany, team revenue counts. A study indicated that Gwinnet County would be a suitable location for a profitable and successful baseball team. Above all, it was to be the training site for up and coming athletes for the Atlanta Braves, a Major League Baseball team, the highest division in the USA. The new stadium was to be built around three kilometres east of the Mall of Georgia, a famous shopping centre in the region. For the construction, the people in charge backed Putzmeister technology. After all, the company had a lot of experience with chal-

lenging projects under pressure for time. All processes had to run precisely and efficiently together.

#### **FLEXIBLE, PRECISE, CLEAN**

Time was tight and the construction site was technically challenging. In some areas of the stadium, the reinforced concrete frame was already in place, which meant that the pump's four placing booms had to reach under the construction to deliver the concrete to the right place. For the work under the reinforced concrete frame of the stadium, Putzmeister used two machines in particular: A 38Z metre and a 47Z metre truck-mounted concrete pump. With their horizontal reach of up to 38 and 47 metres,

#### **COOL WORK AT COOLRAY FIELD**

After just ten months of construction work, the stadium in Georgia was ready for use.

these delivered the concrete to its site of use – and worked extremely cleanly, because there was no need to lay a separate hose system. Since it was not possible to position pumps on the field for some of the work, they were instead positioned on a car park outside the stadium.

#### **THE ENTIRE PUMP TEAM IN ONE STADIUM**

The stadium construction site was so complex that Putzmeister used its entire concrete pump fleet, from the compact 20Z machine to the 63Z model with seven axles. The pumps reached their capacity limits in Georgia, but worked extremely precisely – day and night. The top performance of the pumping team and the exact coordination with the other trades paid off. By 1st April 2009, after just ten months of construction work, the stadium was completed. The Coolray Field, as it's officially known,

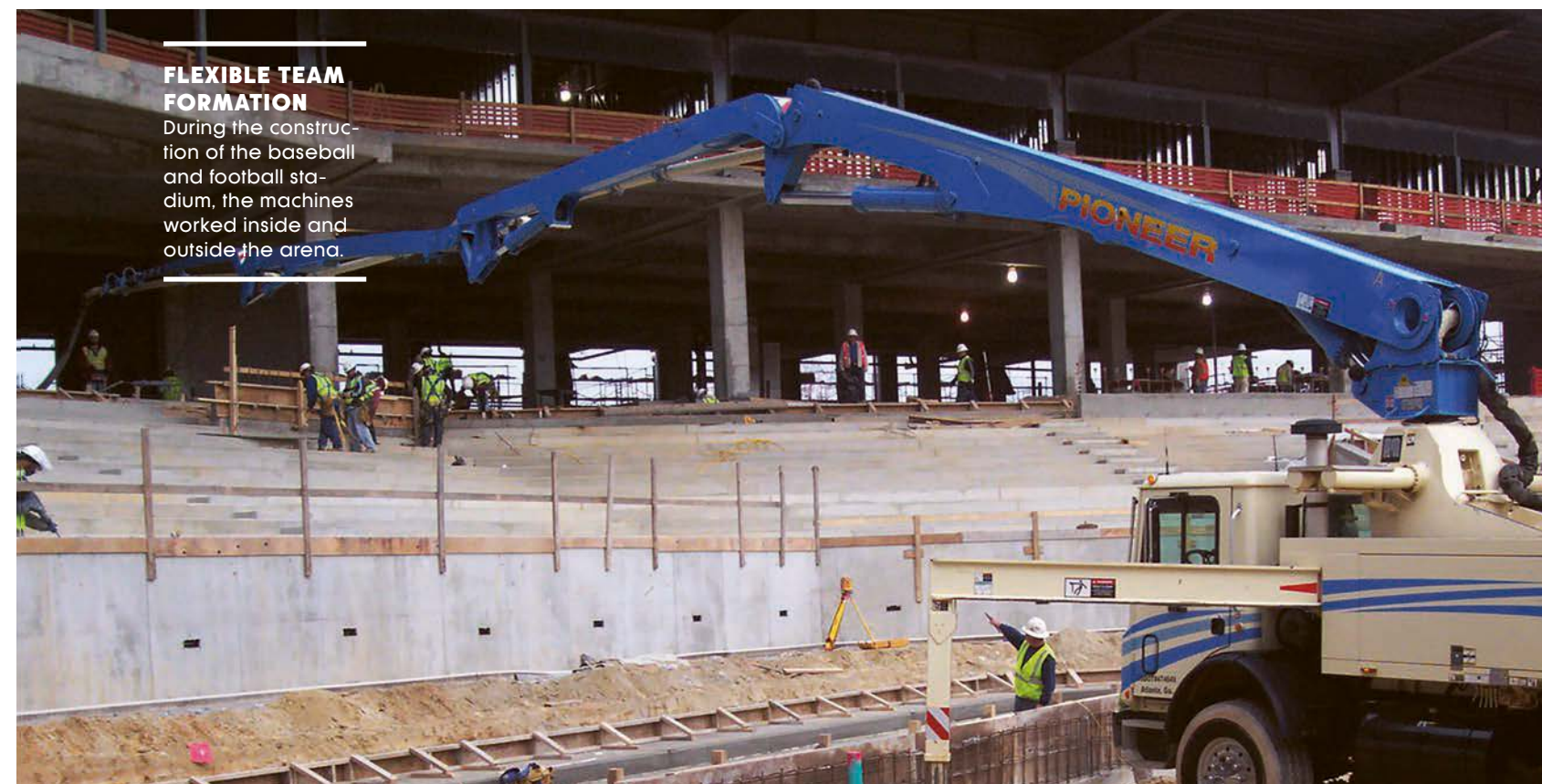
has space for almost 11,000 people and is a venue for ambitious team play. In addition to the baseball team, which has been called the Gwinnett Stripers since 2018, the Atlanta Team of the United Soccer League also regularly hosts its home games in the Coolray Field. 🏈



REPORT

#### **FLEXIBLE TEAM FORMATION**

During the construction of the baseball and football stadium, the machines worked inside and outside the arena.



## MADE BY PUTZMEISTER

Mortar machines, concrete pumps and special products have to be able to withstand enormous loads. Customers can rely on “Made by Putzmeister” quality at all times. But how does Putzmeister achieve this high standard?

# MAXIMUM QUALITY FOR MAXIMUM PERFORMANCE

KNOW - HOW

KNOW - HOW


**S**ince the first mortar machine in 1958, Putzmeister has repeatedly set benchmarks with innovations and improved products.

In terms of quality, too, the company has always taken a pioneering role. And so, as early as 1994, Putzmeister was certified in line with DIN ISO 9001 – the first concrete pump manufacturer worldwide to achieve this certification. The standard is nationally and internationally recognised and confirms that the company has a sustainable, functioning quality management system in place. The highest quality demands apply to all employees and products. For the customer, this means that regardless of whether the machines come from Aichtal or another production site, “Made by Putzmeister” applies worldwide. Anyone who buys a Putzmeister machine, must be able to rely on it at all times. After all, precisely defined safety standards apply to operation

### SEAMLESS DOCUMENTATION

Putzmeister must prove its quality again every year. Independent TÜV inspectors come to the company and inspect all production processes, from procurement of individual parts to manufacturing and assembly and on to delivery. Often, they specify the number of a random machine. Then the Putzmeister employees demonstrate that they know everything there is to know about it: When and where it was built, which employees were involved, who tested its functionality and who collected the machine on behalf of the customer. To answer such questions quickly and correctly, seamless technical documentation is required – which has also been certified regularly since 1997. This requires a lot of effort but is crucial for the safety of the machines. Every customer receives documentation and Operating Instructions with their machine. They can

therefore immediately and safely use it wherever it is needed. And, if there are ever any snags, service employees are on hand immediately to solve the problem.

The high quality demands that Putzmeister sets for itself also apply to its suppliers. After all, they produce the majority of the single parts that are assembled in the Putzmeister works worldwide to create the powerful machines. Each part is inspected in detail. To guarantee the industry quality standard overall, Putzmeister is also collaborating in new standards – for example, in 2004 the company played a leading role in the introduction of the European concrete pump standard EN 12001. 

>>We are  
always on  
the lookout  
for added  
value for our  
customers.<<



INTERVIEW

INTERVIEW

**Mr Knötgen, what sort of company did you find when you assumed responsibility?**

Putzmeister is a well-known and reputable brand that enjoys high regard in the industry. And I felt something quite special here right from the beginning: The employees' pride in their company and how much they identify with Putzmeister.

**What do you think makes Putzmeister special?**

Over the past six decades, Putzmeister has grown into a globally active company. We have production and sales sites in many countries on all continents. We control our global activities and support our subsidiaries from Aichtal.

**It can't be easy to find a balance between a regional foothold and global competition ...**

You're right. We need the right balance, even between the different markets. Management structures which allow us to respond to global trends guarantee long-term success.

**Even to make the company crisis-proof? Many employees still have the slump during the financial crisis of 2008 in the back of their minds.**

It doesn't necessarily have to be a global crisis – even minor fluctuations can create problems. We want to make Putzmeister even more financially stable, so that we become more independent from fluctuations on the market. It's always better to be able to act than to have to react.

**How can you achieve that?**

We have bundled our efforts in one programme – “B -

come One”. We want to be number one in everything we do. We have the highest market shares in many markets for concrete pumps. But this also involves higher cost efficiency and technology leadership. We want and need to stay in front here in future, too. And of course we want to expand our market shares. In short: The process affects products, services and internal processes.

**In the past, Putzmeister was known for innovations and improvements to existing products. Where are new developments possible today?**

The issue of digitalisation is exciting for us. In my opinion, there is a certain degree of stagnation in the construction industry overall – but this also means there are big opportunities, in particular for Putzmeister.

**Can you give an example?**

It begins with our machines. With the cockpit, users receive data about their machine in real time. Where is it, how exactly is it working? This makes everything much easier to monitor: Maintenance, wear of certain parts, even theft protection. The data also provides important information for our service team, so that we can make targeted

suggestions to our customers. But that's not all ...

**What are the next steps?**

We aren't only looking at our machines, but also at the entire chain of concrete processing, from the mixing apparatus to the construction site. By doing this, we can avoid waiting times or reduce delivery quantities in good time. We can help to reduce →



Putzmeister CEO Martin Knötgen sees big challenges for the construction industry due to digitalisation in particular.

Martin Knötgen has been CEO of Putzmeister since August 2017. In this interview, the Managing Director tells us what moves the company today and in future.

material, energy and ultimately the costs of our end customers. Such developments can also increase safety at work and protect resources on construction sites with a high potential for danger. These are very important issues for our customers.

**Can networking be extended to the entire construction site?**

Not at the moment, but we are stepping up our efforts in this regard. The aim is to create integrated concepts for the entire construction site and link all trades with each other.

**What are the difficulties involved?**

We have to collaborate with other companies – partners, but also competitors. And so there is the question of how we can drive development forward while at the same time protecting our own expertise. This is a concern for us, but it affects other companies just as much. I think we are on the right track, Putzmeister should definitely be an integrator on the construction site.

**Since 2012, Putzmeister has been part of the SANY Group, a group with a wide portfolio.**

**What are the resulting synergies?**

SANY made a deliberate decision to protect the globally recognised Putzmeister brand and to leave the company with the greatest possible independence. In my opinion, there are more opportunities than risks in the acquisition by SANY – even if it is often perceived differently. There is a big opportunity in operating basic developments together, such as with hydraulic systems or electronics, and then transferring these to different products and customer-specific applications. It comes down to using the possibilities without questioning existing structures too much.

**Let's take another look at the past. What values from the past still play a role today?**

First and foremost we have to mention Karl Schlecht, who established the company and made it successful. His life's work deserves huge respect and even today he is still actively working on the premises with his foundation. Trust in the brand and closeness to the customer are certainly values that we have been able to retain seamlessly to the present day. But the

models for success in global competition are definitely different today than they were 30 or 40 years ago. I also get a sense of this awareness from the employees. Time and again, they have demonstrated that they can accept new challenges and handle them with success.

**And if we look at construction in the future: Is it really all about repeatedly setting new records, to go "higher, faster, further", as we have seen in the Arabian region?**

I think the peak still hasn't been reached. With projects of this kind, Putzmeister is primarily demonstrating what we can do. But we are more concerned with the issue of how our customers benefit from our range of machines. How can we make our customers' daily work easier? That's what it is all about.

**So what do customers expect from Putzmeister products? There are cheaper alternatives, after all ...**

That's true, and that's a challenge for us. After all, our customers also look at the costs. We are always on the lookout for added value for our customers. Next to the products themselves, this primarily means our service, too. Many customers are aware that if they have a problem, Putzmeister can solve it for them. We are confident that this is still true today. In future, we want to keep this competitive edge, or even extend it. Brand loyalty, such as it still exists today, makes us happy and reflects the reputation of Putzmeister in the industry. But we mustn't rest on our laurels. That is why innovation is not an end in itself for us, but must offer our customers an actual, verifiable advantage.



**BIG PLANS**

CEO Martin Knötgen and CFO Dr Christian Danninger (on the right) want to maintain and expand Putzmeister's market leadership in the coming years.



**If you had to put it in a nutshell: What does Putzmeister stand for today?**

For the best product on the market technologically, for a diverse, experienced team in all areas: In sales, in service, in customer contact or more in the background. And I think our employees communicate their genuine pride in the company to our customers in their daily dealings with them.

**In your opinion, how does the future look for Putzmeister?**

Our aim is clear: To maintain and expand our market leadership in the coming years. This includes extending our range of services, which means broadening our horizons from our expertise in our core business in a healthy way. For me, the future Putzmeister is not only a machine manufacturer, but also a provider of solutions, who networks all processes on the construction site in collaboration with its partners – and in doing so does not lose sight of its core business. 🚧

## BRAND COLLECTION

In the course of its history, Putzmeister has continuously sought ways to make itself a little less dependent on the construction industry. The company hoped to enter new business fields with the new brands.

S O O O A



### PUMI BIG INNOVATION FOR SMALL PROJECTS

As a flexible solution for smaller construction sites, Putzmeister launched the PUMI in 1976. The truck mixer concrete pump pumps and mixes. To this day, the brand name is considered as a generic name in the industry. Even truck mixer concrete pumps from other manufacturers are often simply called PUMI by their users.

1976

1982

### THOM-KATT FROM MODEL TO GENERIC NAME

Putzmeister has been active in North America since the 1970s. When the competitor Thomsen Concrete Pumps got into financial difficulties in 1982, Putzmeister took over the company and thus also its Thom-Katt products. The former company Thomsen belongs to Putzmeister America. To this day, the brand name Thom-Katt is a generic term for trailer concrete pumps in the USA.

1997

**TELEBELT**  
CONVEYING MATERIAL FLEXIBLY

In 1997, Putzmeister took over the belt conveyor machine product line from Rotec, a company from Chicago. Telescopic belt stands for "Telescopic Belt Conveyor" and designates the truck base structure that carries the belt conveyor. It can be used to transport all materials except water.

What's special about it? The design of truck chassis, support legs and belt conveyor is not statically installed, but is extremely mobile. The belt conveyor is pivoted and can be extended. In the meantime, Telebelt has become a generic term in the industry.



### DYNAJET DIVERSIFICATION WITH HIGH PRESSURE

In 2001, Putzmeister acquired the manufacturer of high-pressure cleaners. The aim was to become less dependent on the construction industry. Around 2012, Putzmeister separated itself from the high-pressure cleaners again. Since then, Dynajet has been an independent company again.

2001

2003



### BRINKMANN FROM COMPETITOR TO DUAL BRAND STRATEGY

In 2003, Putzmeister invested in a former competitor and later took it over entirely. The company Brinkmann now no longer exists. But the brand name has been retained for the Estrichboy compressed air conveyor – and supplements Putzmeister's Mixokret machines in this product sector.

2006

### ESSER PURCHASE AND SALE OF A SUPPLIER

Putzmeister purchased this manufacturer of particularly wear-resistant two-layer pipes in 2006. However, the company remained fully independent both organisationally and in its market presence, also continuing to supply Putzmeister competitors. In 2012, Putzmeister sold the company and today it belongs to the US company Conforms.



2007

### ALLENTOWN SPECIALIST FROM THE USA

On the American continent, the manufacturer of dry spraying machines enjoys an excellent reputation. In 2007, Putzmeister America took over the highly specialised company and today markets mortar pumps and "small line concrete pumps", i.e. concrete pumps for small construction projects, via its sales network. Putzmeister also supplies the Weikret concrete wet spraying machine from Putzmeister for North American tunnelling and mining and for the widely used concrete spatter method in the USA in this way.

2012

### LANCY RENDEZVOUS WITH MORTAR MACHINES

In 2012, Putzmeister took over this French manufacturer of mortar machines. Worm and mixing pumps as well as compressed air conveyors are still sold in France under the brand Lancy. In the production network with Putzmeister, Lancy also constructs some mortar machine models.



2012

### INTERMIX FULLY SUPPLIED FROM ONE SOURCE

The German truck mixer manufacturer was acquired by Putzmeister in 2012. Putzmeister thus secured its position as a one-stop supplier, offering concrete production, transport and placement from one source. Since 2016, Putzmeister has been selling the Intermix truck mixer only under its own name.



## BRAND COLLECTION

It gave up some experiments after a few years, but, in the industry today, many of the Putzmeister brands still stand for high quality, reliability and durability.

S O O O A

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MADE BY PUTZMEISTER

PUTZMEISTER 60 / 2018

YEAR OF CONSTRUCTION: 1958

THE STORY OF PUMPS



