





### Contents

- 4 The BAUER Maschinen Group
- 5 Milestones in the company's history
- 6 Production locations
- 10 Development & design
- 12 BAUER Rotary drilling rigs
- 14 BAUER Diaphragm wall equipment
- 16 BAUER Rotary drilling tools
- 17 BAUER Foundation Cranes
- **18** BAUER Deep drilling rigs
- 19 EURODRILL Rotary drives
- 20 HAUSHERR, ABS Trenchless
- 21 KLEMM Anchor drilling rigs
- 22 RTG Pile driving equipment
- **23** MAT Mixing and separation systems
- 24 PRAKLA Well drilling equipment
- 25 TracMec Undercarriages
- 26 PILECO, FAMBO Hammers
- 27 Quality control systems
- **28** After sales service
- 29 BAUER Training Center
- 30 Trade fairs & exhibitions

## **The BAUER Maschinen Group**



Specialist foundation engineering machinery from Bauer has been a byword for top performance and quality and for continuous innovation since the late 1960s. **BAUER Maschinen GmbH**, which develops and manufactures rotary drilling rigs, diaphragm wall rigs, ground improvement equipment and all related tools, has been operating on the market as an independent entity within the BAUER Group since 2001. The other companies in the BAUER Maschinen Group are subsidiaries of BAUER Maschinen GmbH. Above and beyond the machine itself, Bauer Maschinen offers complete method solutions for specialist foundation engineering applications. The range also includes deep drilling rigs.





















**KLEMM Bohrtechnik GmbH**, with its plant in Drolshagen in the Sauerland region of Germany, specializes in small-diameter drilling rigs, anchor drilling rigs, drilling accessories and high-pressure injection systems.

**EURODRILL GmbH**, also based in Drolshagen, is a specialist in rotary drives and high-frequency hydraulic hammers.

**MAT Mischanlagentechnik GmbH** in Immenstadt develops complete systems for mixing and regeneration of slurries, as well as centrifuges and pumps for the entire range of specialist foundation engineering operations.

In **RTG Rammtechnik GmbH**, Bauer has at its disposal a centre of competence in telescopic piling leaders and high-frequency vibrators for the driving of sheet piles.

**PRAKLA Bohrtechnik GmbH** in Peine has decades of experience in the manufacture of well drilling rigs, and also builds exploration drilling rigs.

**TracMec Srl.** in Imola, Northern Italy, is the Group's specialist for small and medium-sized undercarriages.

**Pileco, Inc.**, based in Houston, Texas, has been a part of the BAUER Maschinen Group since 2005. Pileco diesel-powered hammers and leader systems add low-frequency piling equipment to the Group's range.

The small Swedish company **FAMBO Sweden AB** has high-level know-how in the field of low-frequency hydraulic hammers.

Hausherr System Bohrtechnik GmbH, based in Unna, is a company with a long tradition in the development and manufacture of blast-hole drilling rigs for open-cast mining.

**ABS Trenchless GmbH**, based in Olpe, possesses specialist know-how in the manufacture of machinery for horizontal trenchless pipeline laying.

### Specialist foundation engineering machinery

Specialist foundation engineering equipment from the BAUER Maschinen Group is the global benchmark in the industry. The origins of the Group's machinery design and manufacturing operations extend back to in the 1960s, when there was a lack of suitable anchor drilling and pile driving equipment on the market to support Bauer's construction activities. As a result, Bauer built the first anchor drilling rig to its own specification, the UBW. Then in 1976 came the first rotary drilling rig, the BG 7. Both rigs represented major innovations, driving forward the application of the respective construction methods significantly. Having originally intended the machines solely for in-house use, in the mid-1980s Bauer began selling them on the open market. The reasons for this were, firstly, that major construction companies were asking for Bauer equipment and, secondly, the high development cost could only be amortized by producing high volumes. Bauer utilized the opportunities offered by the market. From the early 1990s Bauer - together with its subsidiaries – began adding more machines to its range, and today is able to offer the full scope of equipment needed by specialist foundation engineering contractors. Its engineers also develop new construction processes and methods. Its know-how in all fields delivers synergy effects which benefit customers. Specialization by centres of competence, such as small-diameter drilling rigs from Klemm, keeps each product division at the top of its global field. BAUER Maschinen GmbH has been operating on the market as an independent entity within the BAUER Group since 2001; the subsidiaries of the BAUER Maschinen Group have their own specific profiles.

### Milestones in the company's history

- **1790** Sebastian Bauer acquires a coppersmith's shop in the centre of the town of Schrobenhausen
- **1870** Artesian well for the new Schrobenhausen railway station, start of piling work
- **1928** Dipl.-Ing. Karl Bauer (1894 1956) constructs the central water supply system for the town of Schrobenhausen; construction of wells and water pipes for municipalities and businesses in Bavaria
- 1948 New works building at the present-day location
- 1956 Dr.-Ing. Karlheinz Bauer (born 1928) becomes sole managing director; company focuses its operations on specialist foundation engineering
- **1958** Invention of the injection anchor on the construction site of the Bayerischer Rundfunk building in Munich; patent registration
- **1959** First construction site outside Germany, in Switzerland
- **1969** Launch of Bauer machinery manufacture; design and manufacture of the first anchor drilling rig UBW 01
- **1972** Construction of the new head office administration block
- 1976 First heavy-duty rotary drilling rig BG 7
- **1984** Works complex West in Schrobenhausen; development of machinery sales operations
- **1984** Development of the trench cutter to seal the Brombachsee lake
- **1986** Professor Thomas Bauer becomes sole managing director; internationalization of the BAUER Group
- **1989** First dedicated stand at the Bauma trade fair
- **1990** Founding of MAT Mischanlagentechnik GmbH
- **1992** Takeover of SCHACHTBAU NORDHAUSEN GmbH; soon thereafter, production of drilling rig masts and undercarriages for Bauer Maschinen
- **1994** Founding of BAUER AG as the Group's holding company
- **1995** Founding of RTG Rammtechnik GmbH
- 1998 Takeover of KLEMM Bohrtechnik GmbH
- 2001 Under the umbrella of BAUER AG, BAUER Maschinen GmbH becomes an independent operator on the market, demerged from BAUER Spezialtiefbau GmbH. BAUER Maschinen GmbH takes over drive manufacturer Eurodrill in Olpe

- **2002** Acquisition of large-scale factory halls with open-air show grounds for machinery manufacture in Aresing
- 2004 Takeover of PRAKLA Bohrtechnik GmbH







Dipl.-Ing. Karl Bauer (left) turned the company into an industrial well builder known throughout Bavaria. Dr.-Ing. Karlheinz Bauer led the company onto the international stage, taking it into the field of specialist foundation engineering and launching equipment manufacturing operations. Prof. Dipl.-Kfm. Thomas Bauer (born 1955) shaped the current global Group, with a network of operations on every continent.

- **2005** Founding of undercarriage manufacturer TracMec in Imola, Italy; founding of Bauer Maschinen Kurganstalmost in Russia; Bauer Maschinen acquires Pileco in Houston, Texas
- 2006 BAUER AG is listed on the stock market

### BAUER AG - in three segments on the market

Equipment

Resources

- **2007** Founding of BAUER Resources GmbH, entailing a restructuring of the mining and environmental business; market launch of the three new segments: Construction, Equipment and Resources
- **2008** Expansion of machinery manufacturing capacities in Aresing and Nordhausen as well as in Tianjin and Shanghai, China
- **2009** The BAUER Group concludes the largest capital investment programme in its history; official opening of the new head office administration building in Schrobenhausen and of the Edelshausen plant; launch of the machinery manufacturing plant in Conroe, Texas. New member companies of the BAUER Maschinen Group: Hausherr, ABS Trenchless and anchor manufacturer Spantec
- **2011** The first deep drilling unit will be delivered to South America

### Production locations Assembly around the globe

he BAUER Group's home town of Schrobenhausen is the base for the central production facilities of BAUER Maschinen GmbH. The Schrobenhausen plant – opened in 1984 and the centre of Bauer's machinery manufacturing operations for more than two decades – has been joined over the last decade by plants in Aresing and Edelshausen. The town of Drolshagen, in the Sauerland region of Germany, is home to the Group's centre of competence for anchor drilling rigs and jet grouting systems – the Klemm Bohrtechnik company. Close by, Eurodrill manufactures rotary drives and hydraulic hammers. MAT Mischanlagentechnik is located in Immenstadt in the Allgäu region.

The subsidiary Schachtbau Nordhausen is the key component supplier to the machinery manufacturing operations within the BAUER Maschinen Group, and also builds well drilling rigs for Prakla Bohrtechnik, which also operates assembly facilities of its own in Peine. In Italy, Bauer runs an undercarriage manufacturing company, TracMec, based in Imola, not far from Bologna.



Schrobenhausen plant



Klemm Bohrtechnik, Drolshagen



Prakla Bohrtechnik, Peine



Edelshausen plant



Aresing plant



Schachtbau Nordhausen (above and below)



MAT Mischanlagentechnik, Immenstadt



Assembly at the Edelshausen plant



Eurodrill, Olpe (right)





Assembly at the Schrobenhausen plant



Shanghai plant, China



Kurgan plant, Russia



TracMec in Imola, Italy

The Fambo company produces hydraulic hammers in Eslöv, Sweden. In Kurgan, Siberia, a joint venture with Kurganstalmost manufactures drilling rigs and cranes. Near Moscow, the Ljuberzy plant manufactures drilling tools, while another Russian plant, in Yaroslavl, makes undercarriage components.

Bauer Maschinen has two production facilities in China, in Shanghai and Tianjin. Drilling tools for Bauer largediameter rotary drilling rigs are manufactured in Kuala Lumpur. Singapore is the base for the Far East repair and general overhaul centre.

With its acquisition of Pileco in Houston, Texas, Bauer took the first step to establishing a production location in the USA. In order to establish a manufacturing base within the dollar zone, a completely new plant was built in Conroe, north of Houston, Texas. **B** auer machinery – including drilling rigs, trench cutters, anchor drilling rigs and well drilling rigs – is in operation around the globe. Service centres with their own engineers and technicians in many countries provide the necessary back-up for the equipment. A flexible sales organization maintains close contact with customers. There are Bauer production facilities on several continents: as well as the home plants in Germany, also in the USA, China, Russia, Malaysia, Singapore, Italy and Sweden.

### **Bauer Maschi**





Kuala Lumpur, Malaysia

Conroe plant, Texas, USA

### nen all over the world





Assembly at the Tianjin plant, China





### Development & design Ideas for progress

reativity, long-standing and closely focused practicality are key to the successful development of specialist foundation engineering equipment. That is something in which Bauer has a long tradition. For fifty years, its engineers have been gathering valuable experience and ideas on a huge number of construction sites, and utilizing that know-how to develop equipment and techniques which have continually advanced the specialist foundation engineering field.

In addition to state-of-the-art design methods and expert knowledge of applicable techniques in a wide variety of geological formations, the company has also devised its own in-house calculation methods. All of this forms a



sound foundation for the successful implementation of site-specific requirements.

The company's outstanding hydraulics know-how, in conjunction with optimized control programs, makes Bauer equipment a highly efficient and reliable partner on the world's construction sites. Tried-and-tested sensor technology and state-of-the-art data analysis and transfer systems also help to provide monitoring and documentation of the construction process at all times. Based on their extensive know-how in construction engineering technology and machinery applications, Bauer engineers also develop new construction techniques. The company has enjoyed major success with its soil mixing and displacement pile driving techniques in particular. Numerous patents and innovation awards demonstrate the innovative strength of Bauer's development and design engineers.





11



## Well-founded know-how

n the decades since the construction of the first BG 7 rig in 1976, Bauer engineers have been the key driving force in the advancement of rotary drilling rigs. Bauer inventions such as the lockable kelly bar, the feed cylinder for variable drive and torsionresistant mast constructions have enabled foundation piles to be driven down to depths of one hundred metres and in diameters of up to three metres, even in hard rock. Based on continuous efforts to reduce overall weight while increasing torque, the efficiency of Bauer rotary drilling rigs has been further improved.

Various drilling methods for kelly bars, continuous-flight augers, twin rotary



head systems, displacement piles as well as jet-drilling processes further enhance the versatility of the Bauer BG equipment series. For drilling at deeper levels and in harder ground, casing oscillators can be mounted in modular fashion as required.





K BAUER BG 40% . ... 13 BALNER 0 • S B A B e **MULTININ** 6 0 7 NA STATISTICS 0 . 0 0 Í. **新社社** 灌業 師都 北 1 HIME! BAUER Foundation works with Bauer drilling rigs in Dubai



## Grabbing the advantage

The grab technique has been in use for the construction of walls in soil since the 1960s. Initially the equipment was purely mechanically driven. In subsequent years, the use of hydraulics has significantly impro-



ved the performance capability and user-friendliness of this technique. Bauer's grab technique combines robust design with high closure forces and precision measurement with a wide variety of control mechanisms. A rotating device speeds up excavation rate and improves verticality additionally. This makes the diaphragm wall grab even more flexible, as well as making it suitable for deep walls in dense ground.







hen Bauer developed the first trench cutter in 1984, the boundaries of diaphragm wall technology were pushed back significantly.

Large-scale projects on several continents demonstrate the versatility of this technology: at the Péribonka Dam in Canada, the Bauer BC 50 is cutting sealing walls down to a depth of 130 metres in hard rock. At the Yehle Dam



in China, the tunnel cutter was used to construct 80 metre deep walls from a five metre high, six metre wide tunnel. The Bauer hard-rock cutter was deployed to seal the moraine embedded in the permafrost for the Diavik diamond mine inside the Arctic Circle in Canada. Bauer cutters enabled shafts for liquid gas tanks in Ichong, Korea, to be constructed as self-supporting structures, in 60 metre diameter, involving an excavation depth of 55 metres.

On the Cairo underground project, a Bauer BC 40 cutter mounted on the MC 128 base carrier was deployed (top left).



## Showing their teeth...



The tooling on hydraulic rotary drilling rigs or diaphragm wall equipment is subject to extreme loading – to illustrate the point, just think of the stresses and strains involved in drilling into rock! This demands sophisticated technical knowhow and long experience. Bauer has carried out extensive testing to determine the optimum layout of toothing on drilling tools.



There's lots of know-how invested in the consumable wearing parts too. Construction site operations, which are usually subject to time constraints, demand wearing parts which



are both durable and quick and easy to change when the need arises. Bauer has invested a great deal of development effort in the selection of hard materials and in finding the right tooth mountings.



Buer augr fights from our own production



## **Heavy-duty and powerful**



S ystem supplier for special foundation jobs – for BAUER it has always meant to be not only competent in special foundation equipment itself, but also to be a supplier for the required base machines. This philosophy has consequently continued in the development of the MCfoundation crane range.

These machines for the first time fulfil all the requirements for a crane developed for highly demanding specialist foundation engineering applications. In the 55 to 200 tonne size classes, MC users are provided with an extremely wide range of options, extending from highly specialized applications, including as base carriers for Bauer trench cutters, through to conventional use as a duty-cycle crane with free-fall winches or as lifting crane. The outstanding quality and performance attributes of the MC series are founded on the company's long-standing experience in the development of specialist machinery.





### **TBA - Deep Drilling Units**

TBA 300

The demand for energy – in the form of oil, gas or geothermal energy – is sure to remain a major concern to global business and industry in future, especially in view of ongoing population trends. To meet those challenges, Bauer Maschinen offers deep drilling rigs with hook load capacities up to 450 tonnes, enabling vertical and directional drilling down to depths of more than 7,000 metres. Beside the Bauer standard advantages like enhanced rig availability, redundancy of key systems, increased efficien-



cy and performance, the deep drilling units of the TBA series impress by automated pipe handling systems and the safe and easy transport and rig-up operation.

The compact footprints of the complete units – compared to conventional rigs of corresponding capacities – reduce enormously the costs for well site preparation and the environmental impact.

Customized walking systems and skidding systems allow highest flexibility in on-site rig moves with the equipment fully rigged-up.

Beside deep drilling units Bauer Maschinen also offers components like pipe handling systems, top drives, mud pumps, mud handling systems and mobile equipment to install surface pipes and conductor pipes. Bauer Maschinen offers solutions in the sector of deep drilling units tailormade to the client's requirements.





n 2001 BAUER Maschinen GmbH acquired the Eurodrill company based in Olpe. Eurodrill is a specialist in rotary drives, OTW drives and high-frequency hydraulic hammers in various sizes. Eurodrill is an OEM for other manufacturers of specialist foundation engineering equipment.







## Vertical and horizontal...



ausherr, based in Unna, develops and manufactures drilling rigs and equipment for use in quarrying, open-cast mining and mineral exploration. Its technical expertise



is founded on 60 years' experience and on continuous development in the fields mentioned.



# **Drilling in every direction**

The Klemm Bohrtechnik company in Drolshagen, in the Sauerland region of Germany, is the centre of competence for anchor drilling rigs and small-diameter drilling within the BAUER Maschinen Group. Klemm anchor drilling rigs are deployed all over the world, and are characterized by high levels of mobility and versatility of use. Well over 1.600 Klemm crawlerbased drilling rigs are in operation worldwide.

The product range comprises anchor drilling rigs in various sizes, jet grouting equipment and hydraulic hammers, as well as an extensive range of drilling accessories.





KLEMM Bohrtechnik



## **Rams in wide variations**

n RTG Rammtechnik GmbH, BAUER Maschinen GmbH has at its disposal a centre of competence in the manufacture of pile driving rigs with telescopic or fixed leaders and high-frequency vibrators for the driving of sheet piles. RTG variable rigs can now also be deployed as multifunctional systems for a variety of specialist foundation engineering processes. The fixed piling leader rig RG 25 S, for example, features a high torque capacity of 250 kNm and a pulling force of 530 kN, and is able to drive sheet piles to lengths of 25 metres. It is also capable of OTW drilling, and of executing the cutter soil mixing method CSM, as well as the MIP system using a triple auger, and of performing displacement and kelly drilling.









## **Mixing and separating**





n its subsidiary MAT Mischanlagentechnik GmbH, based in Immenstadt in the Allgäu region of Southern Germany, Bauer has a highly qualified partner in the field of mixing plant technology, as is needed when working with drilling rigs and diaphragm wall equipment or for high-pressure jet grouting.

MAT develops complete systems fox mixing, pumping and separating slurry, covering all specialist foundation engineering needs. As part of its expertise, MAT has developed centrifuges which can also be deployed in other industrial fields, such as in the chemical industry.



For separation (desanding) of slurry, MAT offers modular plant systems from which individual units can be combined or operated in isolation. Electronically controlled systems in the smaller-scale ranges can be operated on-site by the equipment operator.









n Prakla Bohrtechnik, based in Peine, the BAUER Maschinen Group has a manufacturer of exploration and well drilling rigs in its ranks. Prakla rigs are deployed under difficult conditions, specifically where the procurement of drinking water poses major technical and logistical problems, involving drilling down to great depths. Prakla rigs are usually truck-mounted, making them highly manoeuvrable and variable in use.

Prakla's know-how is being applied to a wide range of new tasks. Their specialist drilling rigs can be driven into the sea bed from research ships for example, enabling deep-sea drilling to be carried out and valuable data to be acquired. Exploration drilling in the mining sector is a major aspect of operations. And Prakla also offers geothermal drilling rigs for highly mobile applications.



### **Stable and mobile**

T elescopic undercarriages have been integral to the core competency of Bauer Maschinen for many years. The essential stability required by specialist foundation engineering equipment demands a wide track; the telescopic design then enables compact dimensions for transportation. The TracMec company, based in Imola, Northern Italy, forty kilometres from Bologna, manufactures excavator undercarriages for small and medium-sized specialist foundation engineering equipment, as well as special structures for mobile crushing plants, cranes and machinery used in the timber industry.

### SCHACHTBAU NORDHAUSEN GmbH



S CHACHTBAU NORDHAUSEN GmbH has a strong structural steel engineering business within the BAUER Group, and since the 1990s has been supplying key components to



Bauer's machinery manufacturing operations. Schachtbau Nordhausen makes masts, uppercarriages and large-format undercarriage units.



## At low frequencies...

**FAMBO** 

ambo, a small Swedish company, has high-level know-how in the field of low-frequency hydraulic

rilling has always been a core element of Bauer's traditional specialist foundation engineering know-how. With its RTG, Pileco and Fambo subsidiaries, piling is now also a key area of focus. Lowfrequency equipment now enables piles to be driven into the ground by percussion.

The Pileco corporation, based in Houston, Texas, has been part of Bauer since 2005, and is enjoying



major success with its diesel-powered hammers and leader systems in the oil industry in particular. The dieselpowered hammers can be guided by a suspended leader system on a crane or cable excavator, or by an add-on system mounted on a mast. In many cases low-frequency piling is a simple, cost-effective solution.



### Quality system Guaranteed self-monitoring

B auer applies stringent quality control in all areas of its manufacturing. From incoming materials through to handover of the finished rig, all aspects are monitored all the way through the process. The equipment and components manufactured outside Germany are subject to the same quality standards.

Prior to shipping, every rig is subjected to a series of tests. Spread of characteristic properties is limited by optimum tuning and by means of measurements. Checks carried out – based on the example of a drilling rig – include the torque, the rotary head, the service brake and swing brake, the carriage traction, the crowd force and the winch pulling power. The hydraulics are set up with the aid of automated protocols. The motor and pump parameters are also carefully checked and precisely configured. Finally the centre of gravity and the unit and overall weights are checked. Each rig is tested to ensure it is stable when fitted out with the equipment ordered for use on it. Bauer also operates a 55 metre deep test shaft to verify the smooth running of its telescopic kelly bars.

The object of the testing is to achieve optimum interaction between all the elements, so that the rig can attain its maximum efficiency.











## We are always on hand!



Reliable customer service is a key quality characteristic. Problems can occur at any time under site operating conditions, and to ensure the rig is back in operation as quickly as possible, spares need to be delivered within a matter of days or even hours, depending on distance. A hotline is permanently available. Rapidresponse assistance from experienced, highly trained and qualified personnel is something we offer as a matter of course, alongside an uncomplicated, collaborative approach to claims handling.

To this end, we operate a distributed network of spares and consumables stores at various locations. Our distributed network of production sites means in many regions of the world we can rapidly deploy service staff from close at hand, who also speak the local language. We can carry out routine servicing, maintenance and inspection of machinery as required.





## **Training to license**



onstruction machines are expensive items of equipment which represent major capital investments for contractors. Consequently, it is vital that they are handled professionally and with the utmost care. Bauer trains operators, as well as providing routine refresher courses. A separate business unit, BAUER Training Center GmbH, has been established to handle the Group's training activities. The BTC is certified as an accredited professional training



facility, enabling it also to offer training for the wider labour market. Wellequipped seminar rooms are available for training purposes at the various Bauer locations.

Similarly to the long-established system of permits for forklift truck drivers, a mandatory operator's permit for drilling rigs will soon be introduced in Germany. The tests required to acquire the permit will be organized by Germany's employers' liability insurance associations (Berufsgenossenschaften).

Not least with a view to the upcoming mandatory operator's permit, a training circuit for construction equipment has been created at the Bauer Maschinen plant in Aresing, enabling operators to undergo practical training. The 6,000 square metre site features a number of challenging exercises. Difficult tasks can be practised on a variety of different machines, such as dealing with the sensitive centre of gravity positioning of drilling rigs, learning how to safely remove a rig from a low-loader, how to assemble a rig, and how to handle critical situations which can occur on-site.

### Trade fairs & exhibitions Curtain up for our innovations

very three years, at the Bauma trade fair in Munich, the companies of the BAUER Maschinen Group present their latest developments. Bauer has been exhibiting the full range of its specialist foundation engineering machinery since the 1990s.

Bauer also shows at all the other major trade fairs in the construction



machinery industry, including Intermat in Paris, Conexpo in Las Vegas and Bauma China in Shanghai, as well as at other regional fairs.

In the years when the Bauma show is not scheduled, Bauer holds its own in-house exhibition. It attracts visitors from over fifty countries, who for several days have the opportunity to experience the full range of Bauer machinery. The evening entertainment provided during the event generates a special ambience, with construction specialists from all over the world getting together to have some fun and talk about more than just pile driving and drilling depths.





### Engineering Support

**B** AUER Maschinen GmbH operates support centres all over the world, and its engineers are experts in all specialist foundation engineering techniques. That expert backup relates not only to the machinery: Bauer Maschinen offers comprehensive assistance in all matters of detail relating to execution of the construction project, providing engineering support also for the planning and design of specialist foundation engineering projects.

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