Contents

4 The BAUER Maschinen Group
5 Milestones in the company’s history
6 Production locations
8 Bauer machines all over the world
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 Mischanlagentecnik 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 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 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**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1790</td>
<td>Sebastian Bauer acquires a coppersmith’s shop in the centre of the town of Schrobenhausen</td>
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<td>1870</td>
<td>Artesian well for the new Schrobenhausen railway station, start of piling work</td>
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<td>1928</td>
<td>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</td>
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<td>1948</td>
<td>New works building at the present-day location</td>
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<td>1956</td>
<td>Dr.-Ing. Karlheinz Bauer (born 1928) becomes sole managing director; company focuses its operations on specialist foundation engineering</td>
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<td>1958</td>
<td>Invention of the injection anchor on the construction site of the Bayerischer Rundfunk building in Munich; patent registration</td>
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<td>1959</td>
<td>First construction site outside Germany, in Switzerland</td>
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<td>1969</td>
<td>Launch of Bauer machinery manufacture; design and manufacture of the first anchor drilling rig UBW 01</td>
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<td>1972</td>
<td>Construction of the new head office administration block</td>
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<td>1976</td>
<td>First heavy-duty rotary drilling rig BG 7</td>
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<td>1984</td>
<td>Works complex West in Schrobenhausen; development of machinery sales operations</td>
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<td>1984</td>
<td>Development of the trench cutter to seal the Brombachsee lake</td>
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<td>1986</td>
<td>Professor Thomas Bauer becomes sole managing director; internationalization of the BAUER Group</td>
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<td>1989</td>
<td>First dedicated stand at the Bauma trade fair</td>
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<td>1990</td>
<td>Founding of MAT Mischanlagentechnik GmbH</td>
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<td>1992</td>
<td>Takeover of SCHACHTBAU NORDHAUSEN GmbH; soon thereafter, production of drilling rig masts and undercarriages for Bauer Maschinen</td>
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<td>1994</td>
<td>Founding of BAUER AG as the Group’s holding company</td>
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<td>1995</td>
<td>Founding of RTG Rammtechnik GmbH</td>
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<td>1998</td>
<td>Takeover of KLEMM Bohrtechnik GmbH</td>
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<td>2001</td>
<td>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</td>
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<td>2002</td>
<td>Acquisition of large-scale factory halls with open-air show grounds for machinery manufacture in Aresing</td>
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<td>2004</td>
<td>Takeover of PRAKLA Bohrtechnik GmbH</td>
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<td>2005</td>
<td>Founding of undercarriage manufacturer TracMec in Imola, Italy; founding of Bauer Maschinen Kurganstalmost in Russia; Bauer Maschinen acquires Pileco in Houston, Texas</td>
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<td>2006</td>
<td>BAUER AG is listed on the stock market</td>
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<td>2007</td>
<td>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</td>
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<td>2008</td>
<td>Expansion of machinery manufacturing capacities in Aresing and Nordhausen as well as in Tianjin and Shanghai, China</td>
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<td>2009</td>
<td>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</td>
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<td>2010</td>
<td>Bauer employs 8,900 people worldwide, including 2,300 people in the BAUER Maschinen Group</td>
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The 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.
Aresing plant

MAT Mischanlagentechnik, Immenstadt

Schachtbou Nordhausen (above and below)

Assembly at the Edelhausen plant

Eurodrill, Olpe (right)
Bauer Maschinen – 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.

The Fambo company produces hydraulic hammers in Eslöv, Sweden. In Kurgan, Siberia, a joint venture with Kurganstal most 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 large-diameter 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.
Kuala Lumpur, Malaysia

Conroe plant, Texas, USA

Assembly at the Tianjin plant, China

nen all over the world
Creativity, 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.
In 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 torsion-resistant 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.
Foundation works with Bauer drilling rigs in Dubai
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 improved 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.
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).
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 know-how 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.

Bauer auger flights from our own production
System 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 MC-foundation 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.
The demand for energy – in the form of oil, gas or deep 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 loads up to 450 tonnes, enabling vertical and extended-reach drilling down to depths of more than 5,000 metres. The rigs of the TBA series impress with a new standard of safety in operation, high energy efficiency and enhanced productivity. Bauer deep drilling rigs are electro-hydraulically powered. The unique hybrid draw works – a combination of winch and cylinder feed – ensures great energy efficiency. Features such as the modular design, components in standard container dimensions and the self-erecting mast and drilling platform mean that the rigs can be rapidly erected and dismantled and moved quickly and easily from one drilling point to the next. The smaller footprint compared to conventional drilling rigs significantly cuts drilling site costs and reduces the environmental impact. Alongside its deep drilling rigs, Bauer also offers workover rigs for working over existing bores, mud handling systems and rigs for the installation of stand pipes and conductor pipes.
In 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.
Haußerr, 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.

ABS Trenchless, based in Olpe, manufactures machinery and accessories for trenchless pipe laying and the remediation of pipelines. The machines of the ABS and RBS series enable controlled and uncontrolled horizontal drilling as well as burst-lining, relining or swage-lining.
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 crawler-based 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.
Rams in wide variations

In 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 26 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.
In 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 for 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.
In 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.
Telescopic 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 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...

Drilling 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. Low-frequency 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 diesel-powered 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.

Fambo, a small Swedish company, has high-level know-how in the field of low-frequency hydraulic hammers. Attached to a leader, when skilfully handled a hydraulic hammer is a cost-effective alternative to other piling systems, and is also a low-emission solution.

FAMBO

Fambo, a small Swedish company, has high-level know-how in the field of low-frequency hydraulic hammers. Attached to a leader, when skilfully handled a hydraulic hammer is a cost-effective alternative to other piling systems, and is also a low-emission solution.
Guaranteed self-monitoring

Bauer 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 subject 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.
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. Rapid-response 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.
Construction 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. Well-equipped 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.
Every 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.
Bauer Maschinen GmbH operates support centres all over the world, and its engineers are experts in all specialist foundation engineering techniques. That expert back-up 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.