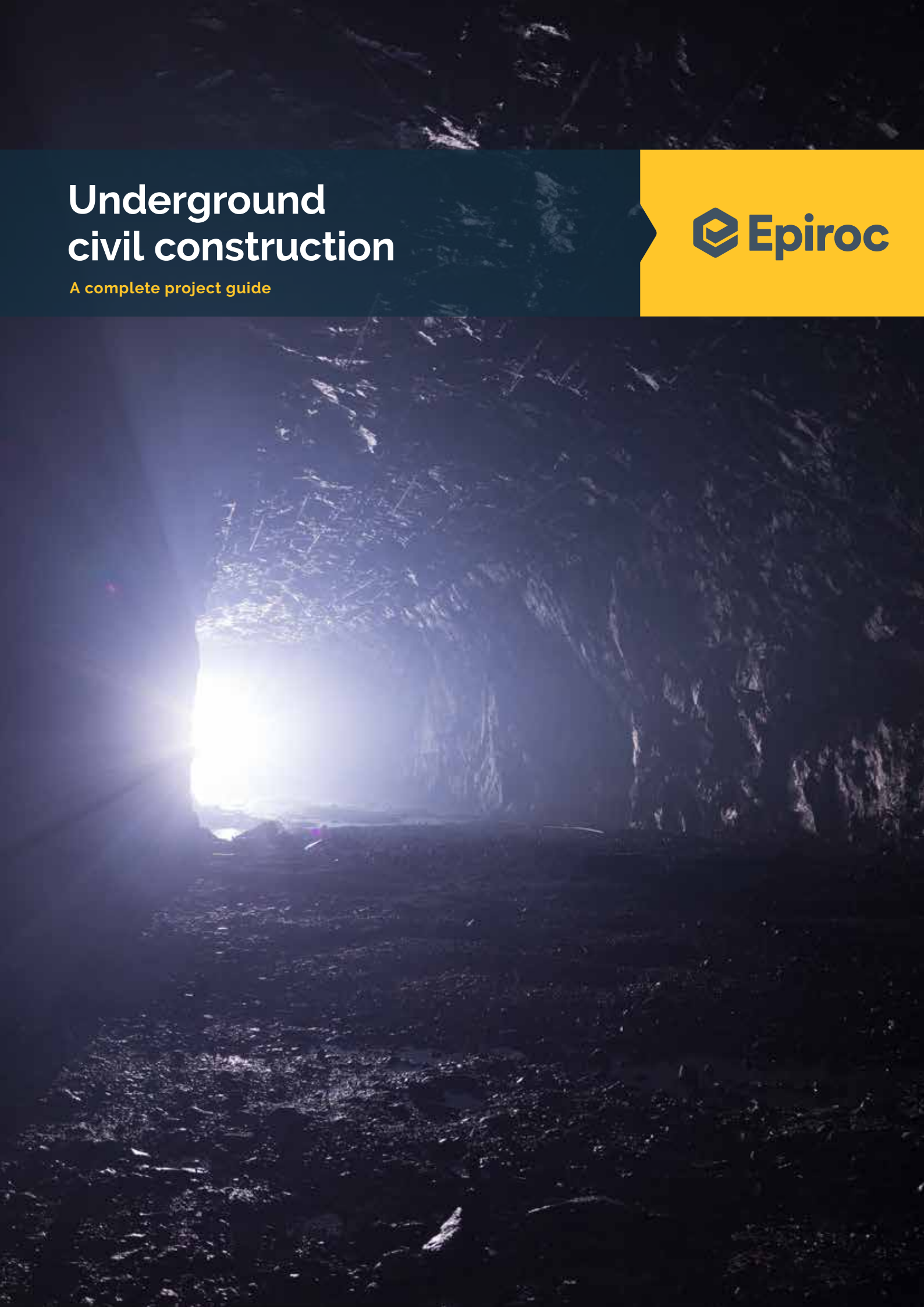


# Underground civil construction

A complete project guide



# A comprehensive offering for civil construction projects

Epiroc is a leading productivity and sustainability partner that offers complete value-creating solutions for the civil construction and mining industries. By understanding the importance of offering more than a product, we accelerate the transformation toward a higher level of productivity and a successful project.

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# Introduction

Improved safety and sustainability is vital to both our and your operations. Our solutions are always designed with safety in focus, and our innovation agenda always goes hand in hand with your sustainability agenda.

Through our application and product expertise we will be by your side right from the beginning of your project. Our ambition is to be more than just a product supplier, but also to be seen as a crucial partner in your civil construction project.

We want to ensure that we always offer the optimal project proposal to help solve your challenges and drive sustainability, in respect of time and cost. With this setup, we can ensure maximized utilization of our entire fleet.

Together with our aftermarket approach, from initial consultation to product supply, training and service support, you will have a committed partner from the very start to the completion of your project.



**FIND OUT MORE**

**Equipment and  
attachments**

**Digital  
solutions**

**Service and  
consumables**

**Financial  
solutions**

# Digital tools

The digital solution Underground Manager is used to connect machine data from one unit to another in the tunneling sequence.

Underground Manager is used for drilling, grouting and bolting process administration in tunneling projects. It is a powerful tool for planning, evaluation and reporting of operational information. Log files and drill plans can be transferred to and from the rig, with improved integration possibilities with other systems.

You simply import or define the contours of the tunnel in Underground Manager to create a drill plan that can be downloaded to the machine.

Measure While Drilling data from the drill rig can be used to determine needs for rock reinforcement and number of injection holes. The grouting unit will then use the drill data to define the hole identity and geometry. The grouting control system creates the Measure While Grouting data, used for the grouting report.

Finally, auto generated bolt plans from Underground Manager enables improved bolting precision with major time and cost savings.

The combined data gathered during the operation form a basis for as-built documentation for drilling, grouting and rock reinforcement.

# Situational awareness

Mobilaris Tunneling Intelligence is a digital support system for improving safety and productivity. The system connects people, machines and tasks. It is integrating shift planning, work progress data, asset tracking, and personnel into one decision support system.

The system is already being used in tunnels in Scandinavia today, to improve efficiency and safety. Mobilaris Tunneling Intelligence includes everything from real-time positioning, face utilization to shift reports and analytics. Evaluation of evacuation training, machine utilization and delay code statistics are also available.

With the Operator Client, pen and paper is replaced with an easy-to-use digital solution to document and report work done in the tunnel.

Work is reported with least amount of effort. And since it's done during progress, the quality of data becomes more accurate, supporting optimized flow of next task resulting in minimized time waste and improved completion of the project. Data can also be used to optimize upcoming shifts as well as quotation for next project.





# Ventilation

Air is not free! On an average ventilation contributes one third of the total project running cost. Epiroc offers a comprehensive solution for all your ventilation needs. From cutting-edge fans and ducting to advanced accessories like dampers and diverters, and even smart systems like Ventilation On Demand, we have you covered.

Our state-of-the-art test setup is meticulously designed to ensure the highest product quality. We push each fan to its stall point, rigorously verifying vibrations are within strict limits, and performance is optimized for peak efficiency. But we don't stop at just providing the latest technology. Our advanced Ventilation On Demand system goes beyond air quality, saving energy with automatic operation and smart controls that adapt to changing conditions in real-time.



# Face drilling

The Boomer E-series face drill rigs are equipped with advanced technology and automation features that improve drilling efficiency, accuracy, and safety. For example, the rigs feature advanced drilling control systems that enable precise drilling, accurate hole positioning, and automated drilling functions. They also have ergonomic operator cabins with state-of-the-art controls and excellent visibility, which improves operator comfort and safety. It is a versatile and high-performance machine that can be customized to meet the specific needs of different tunneling projects.

In addition to normal face drilling, Boomer E-series are capable of drilling injection holes and probe-holes with the fully automatic Rod Handling System that automatically adds and removes rods up to 30 meters. Thanks to the robust BUT45 booms it can also handle pipe-roofing applications when needed.

Safe and easy operation thanks to the rig control system RCS 5, which allows the operator to easily monitor and control all rig functions and maintain a better focus on safe drilling.





# Grouting

Grouting is a widely used engineering method for treating ground and structures to achieve specific characteristics. By using grouting, engineers can mitigate potential risks and ensure the safety and longevity of structures and facilities.

The tunneling industry is currently facing significant challenges such as increased demands on water resources management, complying with higher safety standards, and dealing with unfavorable ground conditions in urban areas. Grouting is emerging as a key method in tunneling projects to serve various purposes, including controlling water ingress and to improve ground properties.

Grouting has a long history as a ground treatment method in various surface and underground applications to address different challenges, many new dams are being planned for construction while existing ones need renovation. Grouting is a vital part in numerous dam projects and is frequently used for sealing, strengthening, and filling, for example in curtain grouting.

Epiroc's grouting portfolio of versatile yet robust and reliable units serves the needs of a wide base of customers. Our Unigrout units are complete grouting solutions, designed to minimize mobilization, simplify usage and maximize grouting efficiency.





# Rock reinforcement

A large yellow Epiroc Boltec rig is shown in a dimly lit tunnel, installing a rock bolt. The rig is positioned vertically, with its long drill pipe extending upwards. A bright red laser line is projected onto the rock wall to the left of the rig. The background is dark and rocky, with some light reflecting off the surfaces.

Productivity, operator safety, and bolt installation quality are the main keywords when it comes to rock reinforcement with the Boltec rigs from Epiroc.

To ensure consistent bolt installation quality, detailed data can be retrieved from the machine's Rig Control System, including the exact position of the hole, length of the hole, cement consumption, water-cement ratio, and more. This information can then be used for reporting and evaluation.

Epiroc offers both theoretical and practical training from knowledgeable staff in conjunction with the delivery of the machine, reassuring that the operator has the required skills to perform the task at hand.

# Loading and hauling

Epiroc's high performance underground LHD's are designed with reliability, serviceability, safety and operator comfort in mind.

Underground loaders from Epiroc are built to perform. Designed with safety in mind, ergonomic and automated functions you can be sure to find the right Scooptram loader. We offer both zero-emission loaders as well as diesel loaders, all depending on your needs.

With our Minetruck models up to 65 tonnes, we offer a wide range for underground mining and tunneling applications. As an operator of our Minetruck vehicles, you'll work in comfort with optional ergonomic controls and air conditioning, boosting productivity and reducing fatigue. Several of the Minetruck models are available with diesel as well as battery-electric driveline.





# Continuous loading

Häggloader is the solution for cost-effective tunneling and mining operations. With its unique continuous loading system, versatile applications, and unmatched loading capacity of up to 5m<sup>3</sup>/min, the Häggloader increases efficiency while lowering costs.

Safety is paramount in mining and tunneling operations, and the Häggloader is designed to meet the highest safety standards. It features an oil-free operator environment, cameras for enhanced visibility, and protective bars to safeguard the operator.

Choose from two boom options - dual digging arms or backhoe - to maximize productivity in your mining or tunneling operation. Customizable configurations ensure optimal performance.

The Häggloader's sliding attachment combines a hydraulic breaker and a bucket into the boom system, enabling safer working routines and flexibility in handling oversized rocks, also Häggloader boasts a combined diesel engine and electrical motor, with electrical operation for low ventilation demands compare to engine.

Revolutionize your tunneling and mining operations with the Häggloader's state-of-the-art features, loading capacity, and innovative attachments.





# Hydraulic attachment tools

Epiroc's hydraulic breakers and drum cutters are used in a variety of underground operations. The first hydraulic breaker was invented, and built, in our factory in Essen in 1963, where we have continued to invest in development and innovation so enabling us to retain Epiroc's market leading position.

Going underground is rapidly becoming the only viable option for meeting the infrastructure needs of the 21st century. The experts from UN expect that by 2050, two thirds of the world population will be living in urban areas giving us a promising business opportunity.

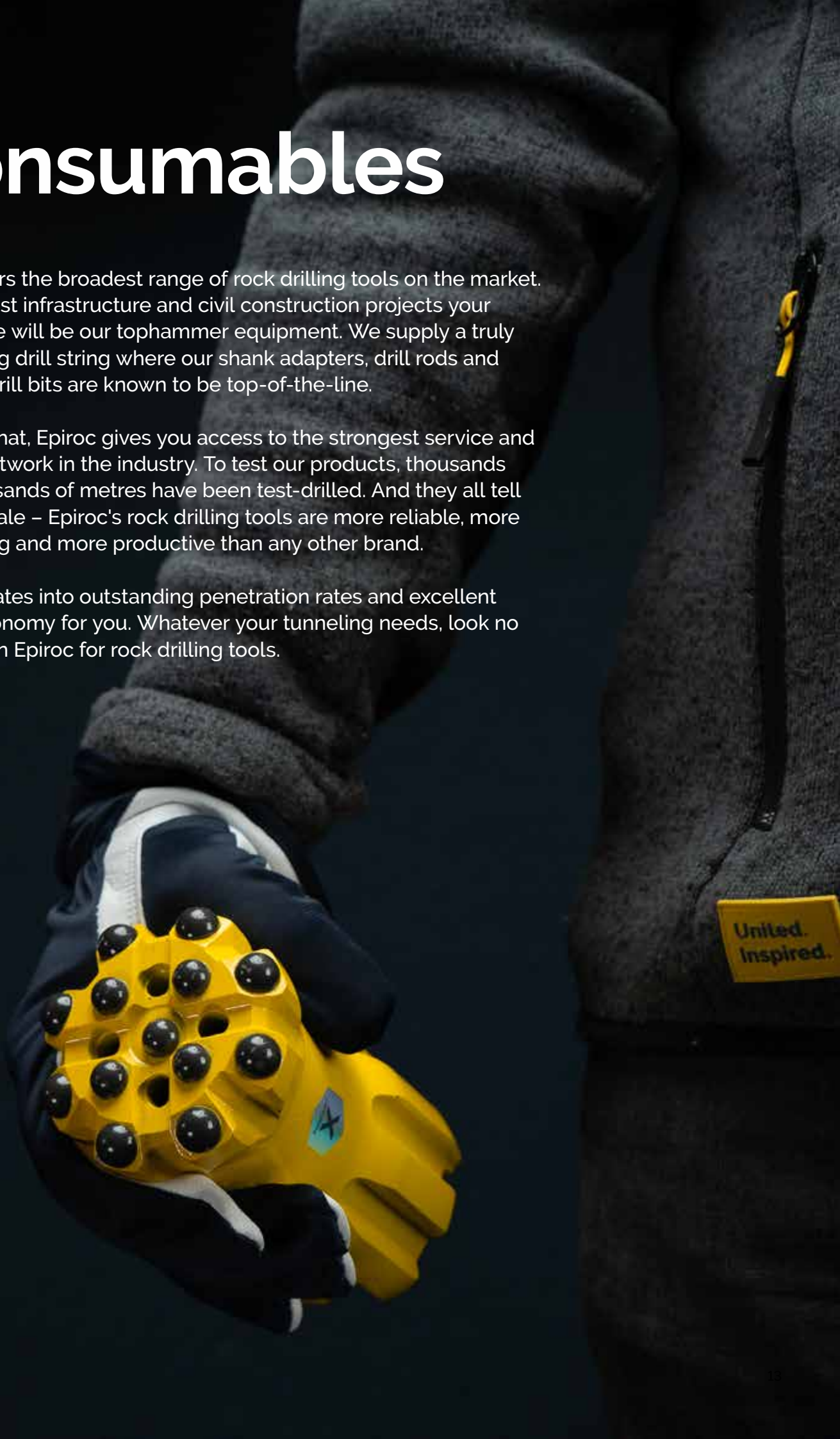


# Consumables

Epiroc offers the broadest range of rock drilling tools on the market. But, for most infrastructure and civil construction projects your best choice will be our tophammer equipment. We supply a truly outstanding drill string where our shank adapters, drill rods and powerful drill bits are known to be top-of-the-line.

On top of that, Epiroc gives you access to the strongest service and support network in the industry. To test our products, thousands upon thousands of metres have been test-drilled. And they all tell the same tale – Epiroc's rock drilling tools are more reliable, more long-lasting and more productive than any other brand.

This translates into outstanding penetration rates and excellent drilling economy for you. Whatever your tunneling needs, look no further than Epiroc for rock drilling tools.

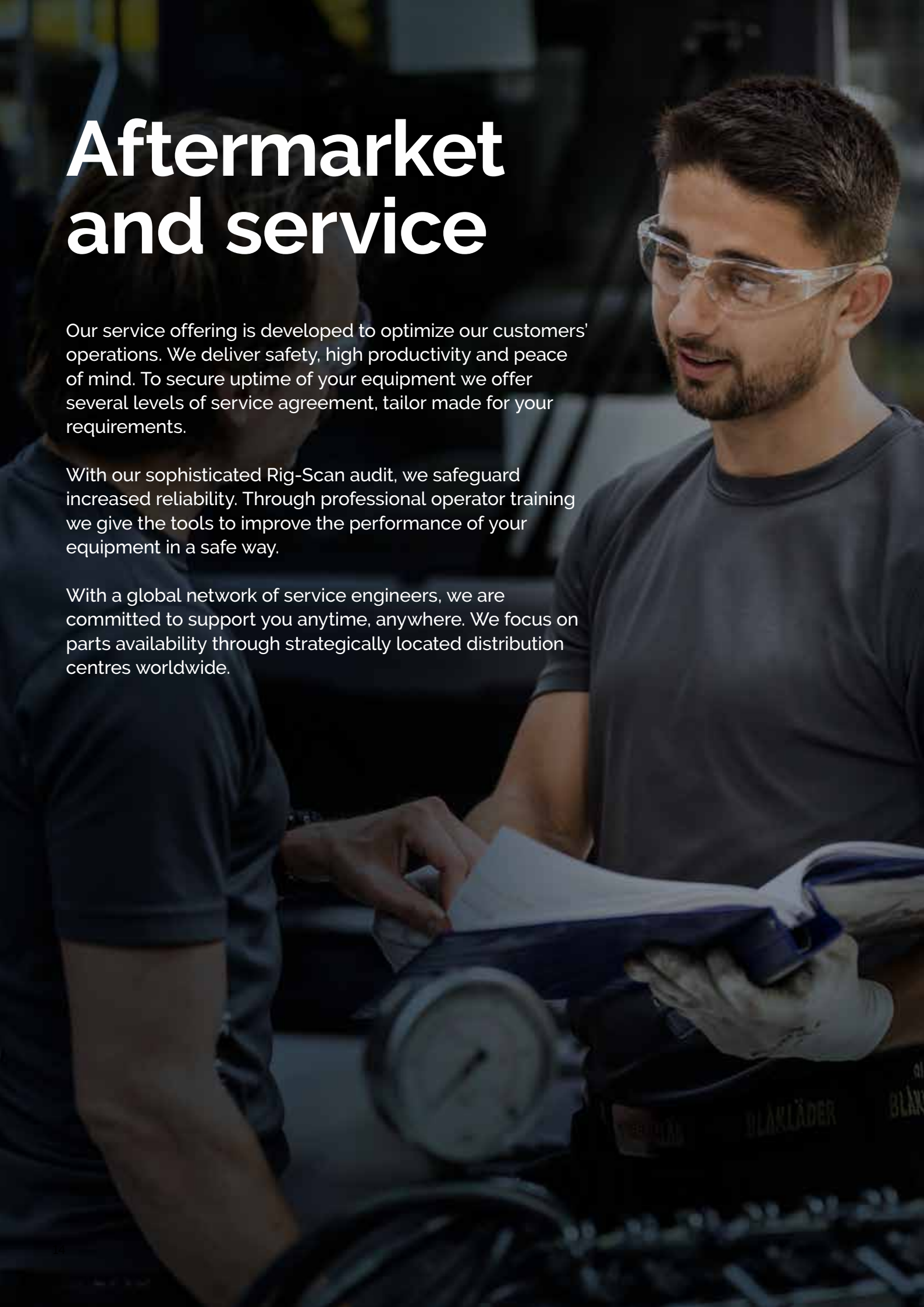


# Aftermarket and service

Our service offering is developed to optimize our customers' operations. We deliver safety, high productivity and peace of mind. To secure uptime of your equipment we offer several levels of service agreement, tailor made for your requirements.

With our sophisticated Rig-Scan audit, we safeguard increased reliability. Through professional operator training we give the tools to improve the performance of your equipment in a safe way.

With a global network of service engineers, we are committed to support you anytime, anywhere. We focus on parts availability through strategically located distribution centres worldwide.





# Financing solutions

## **We finance your investment in sustainable productivity**

Choose from a wide range of financing solutions for all types of Epiroc equipment. We offer payments customized to suit your plans and projections.

There are different types of financial products, and their use varies from market to market. The most common ones are:

### **Supplier credit agreements (available in most markets)**

The customer buys the equipment and ownership is transferred at delivery. The purchase price plus interest is paid over an extended period, according to a pre-agreed payment plan (normally 12-60 months). Normally (in many markets it is mandatory) we require a down payment of 15% to be effected at order. There is a repossession clause in the agreements stating that if the customer doesn't fulfill their payment obligations, Epiroc has the right to repossess the equipment..

### **Finance lease/capital lease (available in selected markets, mainly OECD countries)**

Epiroc keeps the ownership of the equipment and the customer uses it against payment of lease fees during the lease period. The payment plan is based on the purchase price plus interest with a low residual value - normally less than 10% of the purchase price. Ownership is transferred to the customer at the end of the lease term when the residual value is paid.

### **Operating lease (available in selected markets, mainly OECD countries)**

Lease with a higher residual value. At the end of term, the equipment may be returned or purchased at fair market value. The customer can also chose to extend the lease term. The intention is not automatically that the customer shall acquire the goods at the end of term. The customer pays a lease fee which is accounted for as an operating expense in exchange for using the equipment.





## United in performance. Inspired by innovation.

Performance unites us, innovation inspires us, and commitment drives us to keep moving forward.

Count on Epiroc to deliver the solutions you need to succeed today and the technology to lead tomorrow.

**[epiroc.com](https://epiroc.com)**

