Bosch: Solutions for the mining industry
Cutting-edge technologies from a global provider

All mining facilities have to meet especially demanding security, safety, communication, HVAC, energy, and automation criteria.

When you choose Bosch as a supplier of products and solutions for theaters, you can be assured of cutting-edge technologies from a global provider. True to our company slogan “Invented for life,” our products and solutions are designed with our customers in mind. As a leading global supplier of technology and services, Bosch understands that professionals need to be able to rely on their industry partners for technical expertise and innovative thinking.

The Bosch Group at a glance
The Bosch Group is a leading global supplier of technology and services. In 2013, its roughly 281,000 associates generated sales of 46.1 billion euros. Its operations are divided into four business sectors: Automotive Technology, Industrial Technology, Consumer Goods, and Energy and Building Technology. The Bosch Group comprises Robert Bosch GmbH and its more than 360 subsidiaries and regional companies in some 50 countries. If its sales and service partners are included, then Bosch is represented in roughly 150 countries. This worldwide development, manufacturing, and sales network is the foundation for further growth.

In 2013, the Bosch Group invested some 4.5 billion euros in research and development and applied for some 5,000 patents. This is an average of 20 patents per day. The Bosch Group’s products and services are designed to fascinate, and to improve the quality of life by providing solutions which are both innovative and beneficial. In this way, the company offers technology worldwide that is “Invented for life.”

The company was set up in Stuttgart in 1886 by Robert Bosch (1861-1942) as “Workshop for Precision Mechanics and Electrical Engineering.” The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant up-front investments in the safeguarding of its
future. Ninety-two percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.


**A leading global supplier of technology and solutions**
Bosch provides a comprehensive range of products and solutions for the mining industry to mine owners, planners, contractors, and mining engineering companies around the world. Whether the project requires energy-efficient heating and hot-water systems from respected brands, innovative and intuitive CCTV systems, or the hard-wearing power tools needed for professional installation, Bosch has a choice of products that are commonplace across mining sites today.

Under the brand name Rexroth, one of the world’s leading specialists in the field of drive and control technology, Bosch supplies industrial solutions for driving, controlling, and moving machinery and equipment designed especially for the mining industry.

**Bosch products and solutions**
Bosch offers a wide range of products and solutions to effectively manage mining operations.
- All areas and activities can be monitored efficiently, allowing emergencies, fires, and threats to be detected immediately
- The mine site can be evacuated fast, and in a controlled manner
- All safety, security, and communications solutions can be integrated in one facility management system
- Energy consumption can be monitored effectively, and energy costs decreased
- Heating solutions can be provided in many different areas, including process heat for production processes
- Things can be put into motion, whether for twisting, turning, or crushing
Full circle with Bosch solutions

1. Drive systems and components

2. Professional power tools

3. Service workshop

4. Access control and video surveillance systems

5. Fire and voice evacuation systems
10. Thermosiphons

9. Solar thermal systems

8. Process heat

7. Energy and Building Solutions

6. Building management system
Drive and control technology
Reliable performance for mining

If there is one thing we know how to do, it is how to get things moving. Our solutions provide you with the drive and control you need to gain maximum benefit from your investment, regardless of technology and environment. If your needs change, the solution can be easily adjusted and upgraded. This gives you a versatile asset that is a competitive advantage.

When it comes to reliable performance in demanding environments all over the world, we know all about providing the right movement, power, control, and function – regardless of technology or location. Flexible systems solutions for a wide range of applications help you to optimize performance and productivity, wherever you are.

If you really need to get things moving, the answer is Bosch Rexroth solutions. The scope of our solutions for heavy engineering projects is unrivaled, and with our expertise in applications engineering we provide an outstanding service to help you optimize performance and productivity – whether it’s a question of making your ship unloader work at the right speed, delivering power and controllability for your conveyor, or providing shock load protection to your bucket wheel drive.

A long-term partner
Wherever you are, we are right there with you. With our global network of knowledge and services, we offer local support that goes beyond the ordinary. Our experienced engineers are not only experts in our own solutions, but also specialists in your applications. With our own local service personnel who understand our products and your situation, we have the capacity to take care of systems solutions so that you can concentrate on the most important aspect of all – your core business.
Twisting, turning, and crushing: materials processing can be a tough job with high demands on reliability, flexibility, and speed. Bosch Rexroth offers reliable system solutions for smooth operations that make the most of the materials processed.

Bosch Rexroth offers both economical and easy-to-handle solutions for a wide variety of applications where energy-efficiency is a top priority. Variable-speed drives help to reduce operating expenses and minimize CO₂ emissions.

**Kilns and drums – features**
- Perfect load sharing
- High torque providing starting torque for an unlimited period of time
- Trouble-free inching with the main drive
- Flexible systems solution
- Reliability through redundancy

**Feeders – features**
- Full starting torque for an unlimited time
- Built-in overload protection
- Easy handling of frequent starts and stops
- Variable speed for process optimization

**Ship unloaders – features**
- Excellent controllability
- Unlimited forward and reverse movement in both driving and braking mode

**Conveyors – features**
- Torque control protects the belt from overloads
- Soft starts and stops keep belt stress to a minimum
- Low speeds can be used for easy inspection
- High starting torque that can be maintained for an unlimited period of time

www.boschrexroth.com/mining
Security systems
Safety and reliability for the future

The Bosch building integration system (BIS) provides a single web-based control point for monitoring all security, safety, and facility management systems. This includes alarm management, fast alarm identification via location maps, and follow-up procedures. It seamlessly integrates fire and intrusion alarms, evacuation, access control, CCTV, and building automation systems into a single platform. Use of the BIS lets a single operator monitor and control all security systems, as well as enabling faster responses to emergencies and greater overall effectiveness.

For security, safety, and communications products, solutions, and services, Bosch Security Systems is the perfect partner. The Security Systems division has the capacity to offer integrated systems tailored to the specific requirements of each application.

**Clamp down on fires and facilitate evacuations**

Fires constitute a major threat. To protect lives and property at mining facilities, it is vital to quickly detect, locate, verify, and contain fire events. Bosch fire panels and detectors are ideal for this. But they can also do much more. They apply multiple intelligent criteria to ensure early, reliable detection, with high immunity to false alarms and fast responses.

The panels automatically notify on-site firefighters or the local fire department, in addition to interfacing with sprinkler, ventilation, and public address systems as well as with facility management systems to coordinate evacuation. Bosch offers explosion-resistant products such as cameras for alarm verification and horn loudspeakers that are specially designed and approved as safe for use in the hazardous atmospheres that may also be found in mining operations.
Efficient processes are key
Such environments can be extremely challenging for process control and surveillance cameras, with the real possibility of damage from the elements. Consistent, high-quality video is required, day and night, whatever the conditions. Beyond the obvious safety concerns, interruptions or unnecessary stoppages caused by false alarms can result in losses that can quickly escalate. With Bosch’s rugged MIC series PTZ cameras it is now possible to have tough, vandalism-resistant cameras that can withstand these extreme and often harsh environments, while delivering the quality of video required to monitor the mining site and its operators. The MIC series cameras’ rugged and reliable performance can eliminate costly and unrecoverable downtime, outperforming conventional cameras and relieving the maintenance department of time-consuming repairs.

Guard against hostile acts
Hostile acts and vandalism in the mining sector can have catastrophic consequences. Bosch cameras with intelligent video analysis can guard against all of these risks by establishing a “virtual perimeter fence” that, if crossed, alerts a security operator. Cameras can then be used to check on the situation at any time of the day or night and enable appropriate action. They can be installed in even the harshest of environments. The ability to manage these safety and security risks is crucial. Bosch advanced intelligent video analysis (IVA) enables early detection of suspicious behavior. Tracking cameras can help confirm or invalidate alarms, alerting the security operator as appropriate.

Maximize security from the start
Bosch access control systems guarantee reliable access management both indoors and outdoors and permit easy integration of third-party equipment. All this can be combined with video surveillance to boost security in critical situations. REG license plate cameras ensure reliable plate number capture, even under the most challenging conditions. They are protected by a weatherproof casing and capture high-contrast plate images under all possible ambient lighting conditions, from total darkness to direct glare from sunlight and vehicle headlights.

More than just two eyes – for mobile security
Accidents involving large vehicles often occur as a result of poor visibility for the driver. Fitting large vehicles with one or more cameras (e.g. at the rear) can aid driving operations and safety. Video images can easily be fed to drivers in their cabin, directly from the camera, using special monitors for mobile applications. In addition, the signals can also be simultaneously fed to the control center and elsewhere via IP.
Heating systems
Your partner for energy-efficient heating and hot-water solutions

The planning and provision of heating and hot-water solutions for mining sites presents particular challenges to all involved. We at Bosch Thermotechnology are ideally prepared for such demanding tasks.

All our projects are planned from start to finish using an integrated, systematic approach – an excellent way to guarantee that the heating and hot-water systems will be energy-efficient and effective when they are completed. Thanks to our modular and extremely comprehensive product portfolio, we can find the optimum solution to meet the precise requirements of any mining operation. In this, our decades of experience and expertise are as decisive as our extensive professional competence. Place your trust in custom solutions from Europe’s market leader in heating and hot-water system solutions.

Our appliances support the mining production process, e.g. electrolysis during copper production. With numerous clients across a wide range of mining areas, we have gained extensive project knowledge by being a long-term partner at your side.

**Large-scale efficiency: heating systems and power generation**
- Reliable heat, hot-water, and power supply for mining sites and facilities
- Tailored, flexible solutions for highly efficient and eco-friendly boiler operation
- Our products are also able to generate process heat from a range of energy sources which are made available as hot-water, steam, and warm air
- Simple planning, installation, and commissioning of the entire system thanks to modular components
Gas- or oil-fired Bosch UNIMAT UT-L heating boilers with individual ratings of up to 19.2 MW and standard efficiencies of up to 109 percent with condensing heat exchangers

CHP: Standardized and customized combined heat and power systems for bio, sewage, landfill and natural gases with output of up to 2 MWe

Combined heat and power (CHP) is an attractive option. A cogeneration unit guarantees that electrical energy demand is met, while the resulting waste heat is transformed into process heat in a self-fired waste heat boiler. Frequently, this means that a peak-load boiler is no longer needed, and this significantly reduces capital expenditure and floor space requirements.

Hot-water with the generous support of the sun: solar thermal systems

- Complete high-performance solar thermal systems for efficient hot-water supply
- Plug and flow modules with up to 220 m² collector surface
- Individually configurable large-scale systems (up to 10,000 m²), custom-built to meet your specific needs
- Professional energy management ensures maximum operational reliability

Rising energy costs and statutory guidelines for CO₂ savings make it absolutely essential to manage energy demand, heat and hot-water effectively, as well as to further improve efficiency through technical installations and systems. Eco-friendly, decentralized energy production is a key element for securing our future. The industrial-scale heating systems made by Bosch ensure perfect interoperability and support the sustainable use of energy.
Automotive aftermarket
Parts, diagnostics and services

The Bosch Automotive Aftermarket division is one of the world’s leading aftermarket and workshop suppliers. It offers a complete range of diagnostics and workshop equipment as well as an extensive portfolio of components – from new and exchange parts to repair solutions – for passenger cars, commercial vehicles, construction equipment, and special-purpose mining vehicles. More than 15,000 associates in 140 countries, as well as a global logistics network, ensure that some 450,000 different spare parts reach customers quickly and on time. Its comprehensive range of services includes the reliable maintenance and repair of all types of systems and components, and even entire vehicles.

Parts
As the importance of optimized power-weight ratio, fuel savings, and reduced emissions continues to increase, vehicle manufacturers are setting higher standards for components. With their compact design, reliability, and long service lives, Bosch parts live up to manufacturers’ stringent requirements, making Bosch a leading supplier of automotive systems and spare parts.

The wide range of high-quality Bosch products is suitable for passenger cars, commercial vehicles, construction equipment, and special-purpose vehicles such as those used in mining.

Diagnostics
In all types of vehicles, technical systems are becoming increasingly diverse and complex. Customers are more demanding, and want solutions for their problems as quickly as possible. Bosch has responded with a wide range of state-of-the-art diagnostics and workshop equipment which includes control-unit diagnosis, chassis analysis, emission analysis, battery and A/C servicing, and vehicle-system analysis that allows systematic testing of components and systems without having to remove them from the vehicle.

The software that goes with this equipment also features technical information, circuit diagrams, service and repair instructions, system information, and spare-part catalogs.
This product range is rounded out by lift platforms for LCVs, tire-balancing and assembly systems, and brake testers for vehicles of all kinds, including heavy trucks.

**Services**

Bosch provides a wide range of services, including training programs, a technical hotline, and workshop networks. Bosch offers specialist training in the 43 Bosch Car Service training centers worldwide. The specialists working on the Bosch technical hotline can help workshop staff with any automotive technology-related questions.

The Bosch Car Service workshop network comprises over 15,000 locations in 150 countries. It includes the Bosch Car Service full-service workshops as well as Bosch Diesel Centers and Bosch Diesel Service. Bosch Car Service partners can also provide on-site support on request.

Bosch Car Service partners provide vehicle owners with technically advanced and cost-effective workshop services – from bumper to bumper. With their extensive expertise and specialized workshop equipment, Bosch Diesel Centers and Bosch Diesel Services offer diagnostics, components testing, and repairs for even the latest diesel systems and components. Moreover, they are the only authorized partners for processing warranty claims for Bosch diesel components.

With parts, diagnostics, and services from a single source, Bosch Automotive Aftermarket is uniquely positioned to put its experience and expertise to work for the mining industry. With its worldwide reputation for innovation and quality as well as large production capacity, it offers the right products at the right price.

**Typical spare parts in mining environments:**
- Starters and alternators
- Fuel injection systems and components
- Diesel systems
- Filters
- Braking systems

**Diagnostics and workshop equipment for all kinds of vehicles:**
- Control-unit diagnosis
- Vehicle-system analysis
- Chassis analysis
- Emission analysis
- Battery and A/C servicing
- Lift platforms
- Tire-balancing and assembly systems
- Brake testing, also for heavy trucks
Professional power tools
For trade and industry

Bosch professional power tools are engineered for excellence, meeting the highest standards in speed, precision, and robustness for consistent, professional work results. Bosch has a long history of making high-quality accessories for a wide range of applications. So whatever the job, you can rely on Bosch original accessories.

As one of the world’s leading manufacturers of power tools and accessories, Bosch offers professional tradespeople practically every tool they could ever need, from state-of-the-art lithium-ion cordless (battery-powered) to class-leading corded (mains powered) products.

Construction industry professionals have come to expect the Bosch brand to deliver continuous innovation, high manufacturing standards, and high performance, not to mention reliable support services.

Definite advantages for professionals
As Bosch knows how important it is for professionals to be able to rely on their tools, we offer services for all professional power tools and measuring tools beyond the legal warranty period.
After-sales service
Bosch offers top-quality after-sales services, from online information to a dedicated team of trained customer service personnel. Our partners’ authorized service centers ensure excellent availability of spare parts and a fast turnaround time for both warranty and chargeable repairs.

For professionals, from professionals
Bosch understands that a lot is expected of construction industry professionals: speed, reliability, competence, endurance. We believe it is only fair that they should demand the same of their power tools. When developing new power tools, Bosch works very closely with tradespeople who use power tools as part of their everyday work.

Bosch professional power tools are tested in extreme work environments, under the harshest conditions, be it on an oil rig, inside a mountain tunnel, or in a quarry. A power tool which passes our exhaustive tests is guaranteed to reliably fulfill the highest expectations. Bosch tools really are for professionals, from professionals.
Energy and Building Solutions
Efficient energy services for your properties

We are your experienced partner for energy efficiency in the mining industry — and as an energy services provider, we keep energy costs low while increasing supply security and comfort.

Energy Services – Individual energy solutions for your building
Our holistic partnership model provides you with a unique range of energy services. We can manage the energy and utilities supply of your single building or entire real estate portfolio — reliably, safely and efficiently, offering planning, implementation and operational services from a single source to help you achieve long-term reductions in your energy consumption for heating, cooling, ventilation and lighting. Partner with us and benefit from our strength and experience, individual energy solutions and maximum energy efficiency.

The amount of energy required always depends on the current state of your building and the technical facilities in place. Our tailor-made solutions for your energy concept are made to meet any requirements regardless of how diverse these may be. Efficiency is not ready-made. Rather, it comes from experienced engineers who take even the smallest of details into account.

Climate Technology – Greater efficiency and comfort with air conditioning and ventilation
Modern air conditioning and ventilation systems play a key role in the mining industry. These systems need to ensure that the indoor climate is comfortable all year round, while also contributing to the energy efficiency of a building. With a conventional control system that generates directed airflows, both objectives are difficult to achieve. Continuous flows do not mix the air in the room in the most effective way, resulting in temperature layering, cold pockets and drafts. In addition, these

Energy Platform: Solve your energetic future tasks
- Get full consumption and cost transparency on the energy usage in your buildings
- See your data anytime and from any location
- Specific analysis with individual graphical reports according to your requirements
- Get an optimum of transparency and keep costs under control
systems require higher volumes of fresh air — cooled in the summer and heated in the winter — to be supplied to the room. This requirement not only increases the complexity of your site’s systems, but also generates high energy costs.

Using our unique control algorithm, we can control your existing systems in an intelligent manner. We achieve, on average, energy savings of 25–75% percent in new and existing buildings. By mixing the supply air with room air in the most effective way, the temperature is kept consistent across the room, and drafts are prevented — increasing comfort for users throughout the building. We can achieve additional savings by combining this control algorithm with our innovative duct system.

**Energy Platform – Greater transparency reduced costs**

Our Energy Platform provides you with a full breakdown of your energy consumption and costs. The concept is as simple as it is effective: We first measure the precise consumption in all locations within your building where energy is converted or required. These values are then transferred to the Energy Platform via a secure connection and analyzed. They are then converted into useful data that you can access and use online.

The Energy Platform consists of four different modules that can be tailored to your specific requirements and used to manage your systems and energy consumption efficiently.
Reliability all the way

We are driven by the desire to provide outstanding solutions and services which ensure that our customers get the most out of their processes and operations. We want to be an active, long-term partner for our customers, and to share with them our experience, know-how, and technological innovations.
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