

Dateline MINExpo



IM previews some of the exhibits planned for MINExpo in September

Famur longwall system

Some 1,450 companies have signed on to exhibit their latest products, services, technology and equipment. They'll fill 12 exhibit halls in the Las Vegas Convention Center

Caterpillar Resource Industries Group President Denise Johnson, chair of MINExpo 2016, says the show is "an opportunity for us all to learn from each other how to increase productivity, control costs and improve overall operations."

Caterpillar says it will have an exhibit showcasing machines, technology, expertise and practical knowledge that miners "can apply to help address their cost, productivity and efficiency challenges in today's mining environment."

While there will be machines for both surface and underground mining on display, discussion on the booth will focus on "how Cat technology and know-how combines to help mining operations address and solve the issues that are most important to them. The main stage in the exhibit will feature presentations describing how mining companies, Cat dealers and Caterpillar work together to improve operations."

"The challenge for all in the industry now is to optimise operations—to drive costs down while creating sustainable businesses that can weather downturns," says Johnson. "We believe that through our expertise and the knowledge of our dealers—combined with innovative technologies and our growing data analysis capabilities—we can help them not only survive, but thrive in these challenging times."

The surface mining section of its exhibit will showcase two highly automated machines. A Cat 793F CMD autonomous truck will represent the fleets now operating in Australia. Cat

Command for hauling is now a commercial success as fleets grow and the benefits of consistent operation and increased availability boost production.

The new MD6420C rotary drill is autonomy ready and optionally equipped to leverage the safety and productivity benefits of Cat MineStar™ Terrain. This high-precision drill management system optimises utilisation and improves drilling and blasting operations by accurately guiding the operator and improving precision of hole placement and drilling depth—and the next step is fully autonomous operation, Command for drilling. The third-generation drill incorporates proven Cat components throughout for superior reliability and durability.

Additionally, the 794 AC Large Mining Truck will make its first mining show appearance. Featuring the same electric drive power train as the proven Cat 795F AC, the 291-t capacity truck delivers, Cat says, "class-leading speed on grade, superior four-corner braking and easier maintenance. The truck design focuses on class leading productivity and lower total cost of ownership."

The 6020B hydraulic mining shovel represents the versatility class of Cat shovels. The next-generation Cat shovel is a clean-sheet design that features a 22-t payload and 224-t operating weight and teams with the Cat 777G off-highway truck for optimised loading and hauling.

Completing the surface mining display are the 994K, the company's largest wheel loader, as well as support equipment such as the recently introduced 18M3 Motor Grader. The next generation 3516E engine highlights Cat engine and aftermarket offerings. A D10T2 Dozer on display features Command for dozing, the

remote control and guidance system that is part of Cat MineStar System.

An adjacent display presents a comprehensive view of Cat MineStar System, with capabilities ranging from machine health monitoring and data management to fully autonomous control.

The underground section will demonstrate the company's commitment to underground mining through its presentation of machines and technology for hard rock and soft rock mining—room and pillar, longwall and hard rock cutting.

The hard rock cutting display features a wholly new underground mining approach, longwall for hard rock mining. The recently announced Rock Straight System is a fully mechanised longwall system designed for continuous mining of flat and tabular deposits and reefs in hard rock mines. The key to the system is the cutting machine, which makes best use of unique Cat Activated Undercutting Technology specifically developed for the extraction of bedded hard rock deposits. Rock Straight also includes a specially designed chain conveyor and hydraulic roof supports.

For coal and other soft rock miners, Caterpillar will display a new drive system for longwall face conveyors. The precision engineered system has a smaller footprint and enables slower motor speeds while delivering more torque. At the same time, the system modulates power application to reduce mechanical stresses on the chain conveyor. The result is less wear, greater uptime and higher productivity.

The underground display also introduces the R1700K LHD. The new model features multiple systems enhancements, a new cab with enhanced ergonomics, and emissions reduction



Caterpillar's revolutionary fully mechanised longwall Rock Straight System designed for continuous mining of flat and tabular deposits in hard rock

technology that meets US EPA Tier 4 Final and EU Stage IV certification requirements. Complementing the R1700K are new ground engaging tools for LHDs and a simulator demonstrating Command for underground, the Cat system for remote and semi-autonomous operation of LHDs.

In addition to displays of its surface and underground mining equipment, Caterpillar will dedicate areas to technology, data analytics, equipment life-cycle management and the global Cat dealer network.

"At our core, we're committed to making quality products that are safe and reliable," says Johnson. "But we also recognise that the step-change results our customers need don't rely solely on the machines. In the 'age of smart iron' it's technology, data and automation that will be the game-changer. And when we combine this with a focus on site performance, analytics and knowledge-partnering with our customers, we'll deliver the sustainable efficiencies our customers need today, and in the future."

Sandvik will be revealing the DD422iE battery trampling jumbo, among other products designed to increase profitability and decrease operational costs. Optional 3D scanning is one of several innovative features available for this jumbo. It automatically scans overbreak and underbreak to save valuable time during the drilling cycle, helping operations develop more metres every month.

This simple automatic scanning process uses

Coupled with its smart battery charging system, the DD422iE jumbo will help maximise utilisation of a mine's electrical infrastructure

lasers to guide the drill to its exact position, saving valuable setup time each drilling cycle. It measures angles and distances around the rig, comparing them with previous scans in its memory to locate a drilling location with perfect precision. Just press a button, either from the cabin or from a remote controller, and the automated rig navigation will start immediately.

Performing a continuous overbreak and underbreak analysis, the scanning unit helps optimise the drilling and blasting cycle and produces an accurate profile. 3D scanning analyses blasts and continuously relays information. Using smart iteration cycles it analyses the geomechanical plane of the rock, increasing accuracy, reducing cycle times and ultimately enabling more drilling at less cost. The also analyses blasts and relays information back allowing the development of even better profiles for future use.

The scanning technology works with iSURE,

Sandvik's integrated solution to combine tunnel line, theoretical profile design, drill plan design and data collection analysis.

By using electric energy from an onboard battery during trampling, the Sandvik DD422iE produces zero emissions while manoeuvring between headings. This improves health and safety for miners working underground and reduces ventilation costs.

The jumbo's intelligent power management system helps you meet ever-increasing productivity requirements despite often limited underground electric power capacities.

Revolutionary Sandvik driveline technology enables the battery to recharge during the drilling cycle using the mine's existing electric infrastructure. The battery will even recharge as Sandvik DD422iE is trampling downhill by using energy generated by the braking system.

The company will demonstrate its extensive experience in surface and underground drilling – whether top hammer, ITH, DTH or rotary. This includes the launch of the latest addition to the modular 400 underground range of ITH long hole drill rigs with automation capability.

Visitors will learn more about the latest in the series of diesel powered, self-propelled, crawler-mounted surface blasthole drills (automation-ready) featuring forward-thinking design and technology for bulk mining operations. Coupled with the patented Sandvik Compressor Management System fuel consumption can be improved by up to 25%.

Sandvik continues to innovate in drill bit design. The newly-introduced top centre drill bits, incorporating the most significant upgrade to face drilling bits in decades, is one of the MINExpo highlights. The new design features a so-called "raised front", elevating two or three front buttons – depending on diameter size – a few millimeters above the gauge buttons



located on the periphery of the bit. Additionally, the front buttons are set at a slight angle relative to the symmetric axis of the bit.

The raised front creates a slightly recessed hole bottom pattern that alters the rock-breaking action in order to achieve improved performance. This, together with a new cemented carbide grade GC80, which combines toughness with a softer centre, further extends the service life and long grinding intervals.

There will be news of advances in comminution and the latest in the range of crushers that aim for more eco-efficient comminution solutions - one of these being CH865, Sandvik's mid-range mining crusher for high-reduction tertiary and pebble applications. The intelligent systems on this unit enable real-time performance optimization, while smart, compact design solutions reduce dynamic loads and minimize engineering and installation work.

Some time ago Sandvik and Getman entered into a global distribution agreement under which Sandvik will be the exclusive global distributor of Getman's products. Getman representatives will be available at the Sandvik booth to discuss the Sandvik and Getman solutions and aftermarket services.

With its display of the Surface Miner 2500 SM and the mobile impact crusher MOBIREX MR 110 Z EVO2 from Kleemann, the **Wirtgen Group** is showcasing two innovative solutions from its



range of products. Mining ore deposits and processing mineral raw materials imposes high demands on man and machine. Powerful and durable equipment is essential. From mining to processing the material, the robust Wirtgen surface miners and crushing and screening plants from Kleemann offer high reliability and efficiency.

The Wirtgen 2500 SM surface miner is used for the selective mining of raw materials with unconfined compressive strengths of up to 80 MPa. Heavy-duty components such as the 2.5 m

The Wirtgen surface miner cuts, crushes and loads rock in a single working pass. The economical and environmentally friendly process dispenses with the need for drilling and blasting, creating stable, precise cross-sections that allow immediate trafficking by trucks

wide mechanically driven cutting drum, separately height-adjustable track units and the direct material loading system provide the efficient continuous operation. The 2500 SM offers three different operating modes: the cut

wirtgen

Experts from across Joy Global's worldwide network will be on hand at the show to answer questions on the company's full line of direct service offerings, including everything from field services to life cycle management

material can be directly loaded into trucks via the miner's conveyor system, discharged to the side of the machine by means of the slewing discharge conveyor, or deposited as a windrow between the machine's track units.

The universally adaptable Kleemann mobile impact crusher MOBIREX MR 110 Z EVO2 is suitable for processing both blasted natural stone as well as demolition rubble of mineral origin, producing a first-class final product quality. Despite its comparatively small crusher inlet size of 1,100 x 800 mm, the MR 110 Z EVO2 achieves throughput rates that have up to now only been achievable with considerably larger systems. As a result, maximum feed capacities of up to 350 t/h can be easily attained.

Availability of the machines is a crucial factor in this business, where the machines remain in operation up to 24 hours a day. In addition to the technology, Wirtgen Group also offers a comprehensive range of services. Amongst others an all-embracing concept for major projects that even includes financial support. Striving to provide customers with optimum support through individual made-to-measure solutions, the Wirtgen Group has positioned itself as the ideal mining partner.

With a focus on helping its customers do more with less, **Joy Global** will highlight new products and services designed to lower operating costs remove people from harm's way. Products on display will include a new P&H surface drill, Joy underground hard rock loaders and industry-leading hydraulic drifters and drilling attachments from Montabert.

Technology featured will include Joy's SR Hybrid Drive, which allows power generation that is fully regenerative, resulting in efficient machine operation across several of Joy Global's product lines. A key feature of the company's new LHD series, SR Hybrid Drive enables these new machines an up to 20% reduction in fuel consumption, and 100% capture and utilisation of all braking energy during the loading cycle. Major components of the system include power electronics, motor/generator, control system, and gear train. SR Hybrid Drive is also featured in the new P&H 2650 hybrid excavator (for hoist, crowd and swing), which will be highlighted at the show.

The company's fully integrated JoySmart Solutions offerings will be highlighted for their ability to tie together smart connected products, data, analytics and direct service to achieve or exceed operating and financial goals.

Famur Group's main areas of activity are



HAYER AND BOKER

underground mining, open-pit mining, transport and bulk material handling. All will be represented on the booth, in particular longwall systems, roadheading equipment, underground transportation systems and machinery for open-pit mining.

Famur says it “has easily transferred its domestic market experience [Poland] onto the international arena. Our machines work in the most extreme conditions, meeting the most specific demands of our customers worldwide.”

These equipment and services are provided to customers on nearly all continents. “The global reach of our operation commits us to undertake new challenges and set the high standards for the products tailored to the individual needs of our customers worldwide, the success and satisfaction of whom are our priority.”

Apart from manufacturing and supplying equipment, Famur provides operator training and extensive maintenance services and technical support. It also offers investment finance and implementation support.

“We offer our customers options for financing the purchase of our products including comprehensive financial solutions serving entire investment projects. The Famur team of experienced specialists offers financial solutions, taking your needs in the scope of: capital cost, tax advantages and presentation in financial reports into account.



Export drives the group's development. Famur machines and equipment were delivered mainly to Russia, Ukraine, Czech Republic, Belarus, Kazakhstan, Germany, Hungary, Bosnia & Herzegovina, China, Vietnam, Columbia, Mexico, Argentina, Turkey and Iran.

Modular Mining (MMSI) will preview new technologies designed to increase operators' situational awareness, minimize vehicle incidents, and assist in load-cycle optimization. Visitors to its Integrated Solutions Center will

Modular's MineCare Maintenance Management solution offers instantaneous access to data captured through 175+ ModularReady® original equipment manufacturer (OEM) interfaces – the largest range of OEM interfaces in the industry, MMSI reports – enabling immediate corrective action for maintenance events

learn how Modular's DISPATCH® Fleet Management, ProVision® High Precision Guidance, and MineCare® Maintenance Management technologies work together to deliver a complete mine management solution.

provix

They will be able to follow the progress of a haul truck and see how the solutions optimise, identify, track, and respond to production activities and maintenance events in real time. In addition, find out how Modular's SmarTrain® Integrated Rail Management System can help mines plan, supervise, and dispatch train movements.

MMSI will showcase its communications solutions (including the MasterLink Enterprise® Wireless Network) which focus on the design, integration, deployment, and ongoing support of mining operations wireless networks.

Other highlights will include the entire IntelliMine® Mine Management platform.

The DISPATCH open-pit FMS (fleet management system), the ground-breaking flagship product, has more than 35 years of field-proven acceptance for its proprietary optimisation algorithm. Considered an industry standard for mine management, the DISPATCH system is deployed at more than 250 sites, including 18 of the 20 largest mines in the world.

The DISPATCH Underground FMS is designed to address the unique challenges of the underground mining environment. The system automates all development and production workflows and processes and supports all common underground mining methodologies. Rugged, field-proven mobile hardware exchanges critical information with workers at the face in real time—improving productivity and equipment utilisation.

The ProVision Machine Guidance solutions use high-precision GPS to provide continuous navigation and guidance to equipment operators, increasing productivity and facilitating the realisation of planned targets and tasks. ProVision solutions are available for shovels, loaders, backhoes, drills and dozers.

The MineCare Maintenance Management solution helps mines increase fleet uptime and availability, and reduce mobile equipment lifecycle costs through the pro-active, real-time monitoring of asset health and maintenance processes. Through the use of cloud-based software as a service (SaaS) technologies, the MineCare solution streamlines upgrades, expansion, and support. Centralised management capability provides a simplified approach to the monitoring, managing, and cost-reduction efforts of system operations.

The MineAlert™ Collision Awareness system (CAS), part of the MineAlert Safety Management toolkit, monitors and notifies operators of potential vehicle-to-vehicle collisions based on intelligent path-prediction algorithms, helping to increase operator awareness and reduce the risk of equipment damage. The CAS addresses more than 100 of the most common vehicle collision scenarios, including forward path, take-off, overtaking, and intersections.

VIST Group will have two booths, one demonstrating traditional automation technology for mining companies: a modern mine fleet management system, high precision drill guidance, a payload system for dump trucks, enterprise health and safety management system, ore quality control system and other IT solutions for mining. Visitors will find an interactive demonstration of a dispatch system with different criteria of optimisation in real-time, which is the basis for the creation of unmanned autonomous technology for surface mining.

Also, VIST will show the concept of unmanned technology for surface mining, which will be deployed this year in cooperation with mining company SUEK. In 2011 - 2013, VIST's Intelligent Mine project gathered institutional support from the Agency for Strategic Initiatives (ASI) and the Skolkovo foundation – Russian governmental ventures. The main point of the project is the development of the first technology for autonomous mining in Russia and CIS countries. VIST says "System Intelligent Mine will bring Russian mining enterprises to advanced levels of profitability, safety and performance as well as serve as a catalyst for the development of innovative technologies in Russia. Project Intelligent mine also got the support of AutoNet and it is one of the priority projects of the country.

maclean



BELAZ is a major global manufacturer of haul trucks with super-size load capacity, as well as other heavy vehicles. Its modern dump trucks are already equipped with on-board equipment to allow efficient operations: video review system, a remote monitoring and diagnostic techniques based on unification of onboard equipment, the use of common management and software algorithms. This approach allows users to gradually move to robotic trucks. Today BELAZ is ready to install the equipment for robotic control for any electromechanical transmission model of truck with capacities from 90 to 450 t

Development and testing of the technology in real conditions of mining production will create demand in the mining industry and contribute to the development and application of innovative technologies. Implementation of unmanned autonomous mining technology radically changes the system of production and organisation of labour and fosters the emergence of new modern process control technology of exploration, production, transportation and processing of minerals.”

On the **BELAZ** stand, VIST will demonstrate the joint IT platform for BELAZ dispatch and predictive algorithms for maintenance and production planning as well as Mine Fleet Management System. Collaboration between IT vendor and OEM aims to allow successful cooperation, targeting the appearance of new technologies in mining.

VIST is a world leader in the development of Mine Fleet Management Systems KARIER. Currently MFMS Karier is used in the largest mining enterprises in Russia, Ukraine, Kazakhstan, Mongolia, Morocco etc. VIST clients are large enterprises like as: OCP Group, SUEK, Severstal Resource, Polyus Gold, Polymetal, Mechel, Metalloinvest, MMK, NLMK, ArcelorMittal, Metinvest Holding, ERG, Eurochem, Erdenet, etc.

At the **Dos Santos International (DSI)** booth, visitors will be able to see a working model of its flagship conveyor system - the DSI Sandwich Belt High Angle. This conveyor uses two smooth, surfaced belts, face-to-face, to gently, but firmly contain the products being carried, hence making steep incline and even vertical-lift runs “easily achievable,” DSI says. These conveyor systems are available in widely ranging profiles of C- and S-shape. A long bottom belt approach is possible to the sandwich entrance, and the discharge may be on the high incline or may be after the extension of the carrying belt beyond the mouth of the sandwich. The model shows attendees how material is conveyed between the belts by allowing them to place various materials in the conveyor and watch it go through the motions of transport.

Sandwich Belt High Angle Conveyors are used in a variety of applications. From coal, to cement plant raw feed materials, to large rock ore and waste from open pit mines, the abilities of the

Short of seeing an actual DSI Sandwich Belt High Angle Conveyor in the field, this interactive model offers the best visual to demonstrate how this acclaimed conveyor system works



DSI Sandwich Belt High Angle Conveyor are myriad. Not only will attendees be able to experience the education of the model, but they can also speak to the inventor of the highly reliable system. Joe Dos Santos will be on hand to answer any questions about the sandwich belt high angle conveyor along with his well experienced staffs. Visitors to the DSI booth will find a touch screen map and database through which to search installations. Find an installation near you, or search specific material handled for relevant installations around the world.

DSI will also show its new innovations and products, like the patent pending Adder Sandwich which finally facilitates the addition of high angle conveying at any existing or new conventional conveyor without transfer and without any cost premium to the base system. DSI will also update the industry on its customer service and quality control.

Underground utility

GHH Fahrzeuge will display its well proven and recently upgraded LF-7HB shearing scaler. It says that “in comparison with conventional impact scalers the shearing principle drastically increases scaling performance in soft rock applications (up to 100 MPa) and provides a high quality scaling and safer underground work environment.”

The unit offers a maximum scaling height of 7.85 m. “The highly efficient shearing scaling principle is combined with the proven hydrostatic



A larger version of this upgraded GHH LF-7HB shearing scaler (shown here) is based on the new LF-21H with a maximum permissible scaling height of 11 m and will be available soon

drive EDS, which enables quick reversing and sensitive roof as well as side wall scaling.” The Efficient Drive System (EDS) offers high productivity and reduced maintenance costs.

In order to comply with the highest safety requirements, the cabins are designed for a load of 200 t and provide a very good overview in all working conditions – in particular at the scaling tools. The intelligent scaling safety system protects both the operator and machine during operation.

Its wide spur and low centre of gravity guarantee high stability even in extreme gradients.

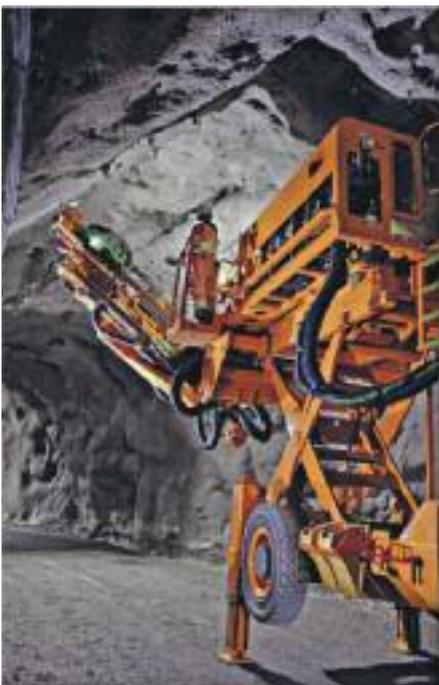
The vehicle frame of the LF-7HB is based on the proven Super Low Profile (SLP) concept and consequently offers an excellent overview with its spacious cabin. Furthermore, the vehicle is also available in a SLP option with a low profile operator’s cabin to carry out efficient scaling in thin-seam deposits.

The ecofriendly 180 kW, Deutz TCD7.8L6 engine complies with the highest emission standard EU Stage IV and EPA Tier 4 final, thus minimising ventilation requirements.

Optionally this machine is offered with a remote control with cameras as well as collision avoidance systems.

Other features include intuitive two pedal control for faster cycle times, and advanced controls and condition monitoring systems. Different scaling arm lengths are available.

The latest chapter in **MacLean’s** mining R&D focus is the development of battery power, engineered for life underground. Its electric propulsion system leverages high power, high efficiency, and long cycle life battery chemistry,



MacLean has been innovating for mobile equipment safety and productivity in the hard rock environment since 1973



sophisticated battery management and vehicle monitoring capabilities, as well as onboard charging that ensures compatibility with existing mine infrastructure.

The MacLean booth at MINExpo will mark the formal unveiling of the battery powered version of the next generation of the company’s signature ground support offering, the 975 Omnia Bolter. In addition, the booth will feature a stand-alone display of the battery propulsion system components at the heart of the company’s battery power value proposition. Attendees will be able to get an ‘inside look’ at underground electrification, welcomed by the inter-disciplinary MacLean delegation on-hand, representing expertise from across the company’s engineering, product management, account management and marketing functions.

BTI will be launching its new ScaleBOSS 3D scaler at the event. The ScaleBOSS offers a five-axis boom, providing enhanced flexibility and superior coverage in a light, compact design. The Mine Runner APV will also be on display, a mining utility vehicle offering more power and increased safety with less maintenance and a lower total cost of ownership.

Both vehicles offer BTI’s Advanced Breaking and Trimming (ABT Control- patent pending) and hydraulic wheel drive (HWD), providing more traction and power with reduced emissions. BTI says its “mining utility vehicles are a modern day solution for a new generation of mining productivity and safety.”

ScaleBOSS features an ergonomic ROPS/FOPS certified operator cabin, in which the HVAC system maintains excellent personnel safety, comfort and visibility. The machine is optimised for 3 x 3 to 5.5 x 5.5 m headings; the ScaleBOSS 3D Scaler meets the demands of a new generation of mining and safety.

Mine Runner has been engineered from the ground up to be a leader in personnel safety and operational flexibility. “The ever increasing payload requirements and tramping distances have exceeded the capabilities of the typical

Heavy-duty, compact construction makes BTI’s ScaleBOSS easy to manoeuvre and it withstands severe conditions. The breaker function’s dedicated, open-centre hydraulic circuit helps simplify identification of maintenance needs

repurposed highway 4x4 style truck. Unlike many over the road type vehicles being modified for use underground, the Mine Runner is purpose designed and built for the underground environment,” explains Andy Jackson, BTI Engineering Project Leader, Mobile Equipment Systems.

Both the primary braking (service brakes) and the secondary braking (emergency brakes) have been designed and tested to meet and exceed the CSA Braking Standard and Performance for Underground Mining Machines. CAN/CSA - M424.3-M90.

Powered by BTI’s HWD fluid controlled power train, the Mine Runner is capable of easy customisation to optional configurations without hindering performance or longevity of components.

Aramine’s miniLoader L120B is specially designed for narrow section and narrow vein underground mining. With a width of 0.95 m and a tramping capacity of 1.1 t, the L120 is ideal to raise productivity without the need to increasing drift cross sections. Its modern transmission and components offer “high reliability with simple maintenance and fully safe operation,” Aramine reports. Rechargeable battery power offers a purer and safer working environment. This small LHD uses a lithium iron phosphate (LiFePO₄) battery.

The operator’s compartment is side seated to comply perfectly with underground requirements, with smooth and ergonomically located joysticks to offer comfort and safety to the operator and maintenance personnel.

Aramine stresses the safety advantages compared to units with electric cables because there is no cable lying around in the way. Therefore it is safer for the operator and other employees working in the mine. It also means a larger perimeter of work and greater freedom of

Aramine's L120B chassis and articulation unit are designed for the toughest application, providing high availability with a longer life time



movement. There is no need for a cable reel, enhancing the reliability of the machine. Plus, there is the saving of the expensive cable. Aramine's new engine technology using battery power "allows a general structure without hydrostatic system, this also improves the reliability of the machine," the company says.

"Battery charge requiring constant power, there will be no peak of current or voltage drop on your electrical network. Thus, this kind of machines needs smaller electric network infrastructure in the mine therefore you will have a better reliability of your network and considerable economy on the installation of the electric infrastructure."

Machines are delivered with two batteries packs to ensure constant productivity.

Rockmore International will unveil its new Vector Rod System. Conceived to be a major breakthrough in improving performance and service life of extension drill tools in surface and underground percussive drilling applications, the new line of drill tools promises tremendous advantages in productivity and reliability.

After several years of intense research and development followed up with monitored field tests in various ground conditions, Rockmore engineers developed a new thread design, XT, for the Vector Rod. The new XT design incorporates revolutionary new guided cylindrical contact zones between the male and female thread joints. These guided surface features are located in the



Rockmore International's new Vector Rod System is offered in multiple configurations of button bits, MF rods, and shank adapters. These drill string components are available in XT38, XT45, XT51, and XT60 thread types, designed to improve drilling productivity and reduce extension drilling operating costs in surface and underground percussive drilling

nose and rear of the thread connections and serve various benefits and improvements over traditional threads.

The XT thread profile is based on the traditional trapezoidal 'T' thread design and is therefore compatible with industry standard thread types such as T38, T45, and T51. Thus, one can interchange and connect standard 'T' style threaded components with the new XT thread, although the guiding advantages aforementioned would be neglected. For example, a T45 threaded bit or shank adapter can be connected to a XT45 threaded rod with full compatibility.

In order to achieve the full engineered benefits of the XT thread, however, one must consider the drill string as a system of connections between the shank adapter, rods, and the bit in extension drilling applications. Thus, the XT thread design employed in the Vector Rod System enables many performance and reliability benefits leading to major overall cost savings in the drilling cycle.

"We specifically targeted to increase thread service life while enhancing drilling performance in extension drilling applications," says Pejman Eghdami, Executive Vice President of Rockmore International, in explaining the goal of developing the Vector Rod

System. The dual cylindrical contact zones in the nose and rear of the XT threads significantly increase the lateral support between thread joints and stabilize the connections with more rigidity to provide better energy transfer. The enhanced thread support and geometry extends thread life and increases the overall component service life of the shank adapters, rods, and bits with XT threads that comprise the Vector Rod System.

Because the XT thread guide feature improves thread alignment, the impact duration when 'rattling' rods, as required in uncoupling connections, is

minimised. This leads to lower wasted energy transmission, cooler couplings on rods, and ultimately to longer rod life. Thread grease is also better retained on the thread pitches resulting from the new XT geometry, further increasing thread life in all XT components.

Another key advantage of this rod system over traditional threaded components is providing straighter holes and minimizing its deviation, so inherently critical in modern drill and blast techniques. The guided XT thread feature increases the rigidity and stability of the connections between the shank adapters, rods, and bits so significantly that overall rod bending is minimised and hole straightness improved. In fact, this improvement allows for larger and deeper blast holes to be achieved using existing rod diameters, but only by converting to XT threaded components. In underground mining long-hole and production applications where up to 30 rod connections are common, hole deviation can be reduced substantially by using Vector Rods.

Eghdami comments that "As a major breakthrough for extension drilling systems, we have significantly improved drilling productivity and increased drill string lifetime by introducing new design features in the XT thread configuration. And just as important, the new XT design is fully reverse compatible with industry standard "T" style threads, enabling the Vector Rod System to be truly remarkable, yet a practical choice for premium drilling tools."

New to **Redpath's** fleet of raiseddrills, the Redbore 80 will be exhibited at MINExpo. This mid-sized raiseddrill is ideally suited for surface and underground raises, ore and waste passages, along with infrastructure raises all in



Redpath's Redbore 80 raiseddrill preparing for work in Chile

the 3-4 m diameter range, with depths up to 450 m. The machine's compact and lightweight design, allows for a convenient fit into smaller underground excavations resulting in savings of time and money. Drill operation includes state of the art PLC and digital controls. It is also fully compatible with directional drilling technology, allowing the drill to deliver vertical excavation when needed. Redpath's entire Redbore fleet of raisedrills is designed and built for raisedrillers by raisedrillers. Redbore drills are currently working worldwide, include the Redbore 100, the world's largest proven capacity drill. The fleet includes the Redbore 30, 40, 50, 60, 70, 80, 90 and 100 models and is capable of completing the full spectrum of underground development. The Redbore 80, along with several other drill series, can be paired with a RedTrax drill transporter, offering independent and swift underground mobilization. RedTrax is purpose built for the mobility of a drill and its related materials. Using Redtrax when raiseboring frees previously required mine equipment such as telehandlers, forklifts and LHDs to perform other duties simultaneously, elsewhere at the mine site.

Automation and more

Canary Systems has a major update to its MultiLogger® Suite software platform for automated data acquisition. The 2016 release version provides over 30 new enhancements to one of the leading data integration, data reduction and data visualisation tools on the market, programmed by engineers, for engineers. This includes dozens of completely new major features that further enhance the ability to integrate geo-monitoring data from a multitude of sources – and locations – into a single, combined, easy to use software platform. MultiLogger Suite 2016 is free for existing customers.

Below is a sampling of the top five most important new features in MultiLogger Suite 2016.

3D Element Charts allow for quick 3D visualisation of data, such as groundwater contours and more. Users can automatically generate contour lines and color-coded overlays from any data type on any type of view. Sample applications include generating groundwater contours from piezometer data, ground movement overlays for 3D data such as prisms and GPS, or even load and pressure data from load cells and pressure cells.

Enhanced Applications Mode for 3D Data Analysis - working with and analysing 3D data (e.g. GPS, Prisms) has never been easier, right within the browser. With dozens of calculations supported for 3D ground movement, velocity, inverse velocity, scatter plots, just to name a few, and support for custom calculations, MLWeb

becomes the only integrated data analysis tool you'll need, the company says.

Additional database management operations are now available in MLWeb browser client. New web features include database operations such as backup and restore, auditing, upgrading, validating data and setting tolerances, just to name a few.

Active Directory support – there is no need to remember your login – Active Directory integration means: automatic single-sign on with your Windows credentials

MLSuite can be run over intranet/Internet, or installed locally on a desktop. MLSuite offers extensive data visualisation and management options, including: powerful notifications and reporting features that help translate raw data into decisions and actions quickly; full GIS map server integration, 3D visualization, comprehensive document management including photos and videos, and a free field data entry app, MLField®.

Provox remote control/video systems enable equipment operators to work from a safe location when poor ground conditions exist. To maintain production performance levels, it is critical that both the video and the control systems offer reliable uptime and ease of operation for personnel.

Depending on the nature of the application, both wired and wireless systems are available and each offers its own benefits and drawbacks. While wireless systems offer the convenience of cable free operations, wired systems offer increased range and a variety of power choices.

In Canada, many mine sites have operations that require different solutions. The ability to customise systems based on the specific nature of their operations is critical to successful remote operation. As a preliminary step, any remote equipment vendor needs to understand the scope of the operation in order that the remote controls and video system can be tailored to provide the required functionality.

Provox designs and manufactures wired and wireless video systems to support its remote control platforms for any type of surface or underground equipment. Remote control and video systems are available to support operations such as remote drilling, bolting, mucking, loading, haulage and breaker operations in underground operations. Provox says its systems “offer enhanced safety during remote operations and allow for increased productivity, while remaining cost effective as well as easy to deploy.”

Analogue systems are used for local operation,



MultiLogger Suite is, Canary Systems says, “the most versatile integrated data management platform in the market, with an intuitive interface to collect, view and analyse all your monitoring data. MLSuite is suited for projects of all sizes, including very large deployments, and can be used seamlessly for manual and automated data collection. MultiLogger interfaces directly with most types of dataloggers, allowing you to program your data collection directly in a simple point-and-click interface without the need for third party tools (though it works with many third-party tools, too). MLSuite is used in thousands of projects worldwide across a number of markets and applications, including mining, as a web based application, workstation tool, and on mobile devices.”

while digital systems are used for operation from surface or for network viewing. Remote controls and video support for surface equipment operations are available also.

While most wireless systems rely on line of sight for communication, Provox systems have been proven to offer enhanced viewing around doglegs and into blind stopes. Additionally, remote range extenders are available to support



With Provox systems, performance metrics indicate up to a 50% increase in bolting rate. Operator uptake and familiarity is relatively quick, especially if the operator has any predilection towards video games!

enhanced range. Provox offers remote control and video systems in 2.4, 5.8 ghz and 900 mhz frequencies to suit the preference and operational requirements of each individual mine.

While Provox Remote Mucking Control and Video systems have been a mainstay for many years, it is only recently that more attention has been focused on remote drilling and bolting. With stricter regulations around working at the face becoming prevalent in many jurisdictions, the ability to provide close up viewing and operation from 75+m away has become a requirement.

Initially deployed over three years ago at Rio Tinto's Diavik Diamond mine with great success, these rugged camera systems have received widespread support from other mines where remote drilling and bolting operations are required. Goldcorp's Red Lake operation has deployed the PROVIX system on jumbos and bolters from various OEMs, and experienced the same rise in productivity.

For remote bolting operations, the equipment operator is positioned 15-80 m back from the face in the safety and comfort of a sea-can that has been established as a mobile control station. The operator runs both the TeleRemote controls and views the Provox video system from the safety of a sea can, where three large LCD monitors provide an up close and personal display of the back, the face, the booms, the screens and the positioning of the drill. Laser guidance allows for rapid boom alignment.

Post implementation feedback from both supervisors and operators stated conclusively that with the zoom lens on the cameras, the operator can view the face and drill positioning more effectively on the remote system than if they are actually sitting in the cab of the bolter.

RIEGL will have its VZ-4000 very long range terrestrial laser scanner available for demonstrations on the show floor, as well as the RiCOPTER high performance unmanned aircraft system on display.

The scanner's unique echo digitisation and online waveform processing technology are the keys to enabling the scanner to perform long range measurements with high accuracy and high precision, even allowing the scanner to operate in poor visibility and demanding situations caused by dust, haze, rain, snow, and other difficult environmental situations as mine sites are.



RIEGL says the VZ-4000 offers "superior and unrivalled long range measurement performance of up to 4,000 m without reflectors while maintaining completely eye safe operation"

The scanner can also be operated in different modes: stand-alone operation with an integrate graphical touchscreen user interface, remote operation on a notebook via LAN or WiFi, remote control VNC Viewer with any standard tablet PC or mobile device via WiFi, or a customized operation by third party tools/applications based on RIEGL's interfaces and scanner libraries.

The RIEGL RiCOPTER is a high performance unmanned multi-rotor aircraft system equipped with RIEGL's VUX-SYS sensor system to offer a fully integrate turnkey solution for professional UAS surveying missions.

The excellent measurement performance of the VUX-1 SYS, comprised of a VUX-1UAV LIDAR unit, an IMU/GNSS unit, antenna, control unit, and digital cameras, result in survey grade measurement accuracy. RIEGL claims the RiCOPTER "is the first complete, turnkey UAS LIDAR solution from one manufacturer."

Motion Metrics will launch PortaMetrics™ with Deep Learning at MINExpo. PortaMetrics is a point-and-shoot portable tablet for instant fragmentation analysis. By integrating three high-resolution cameras into a

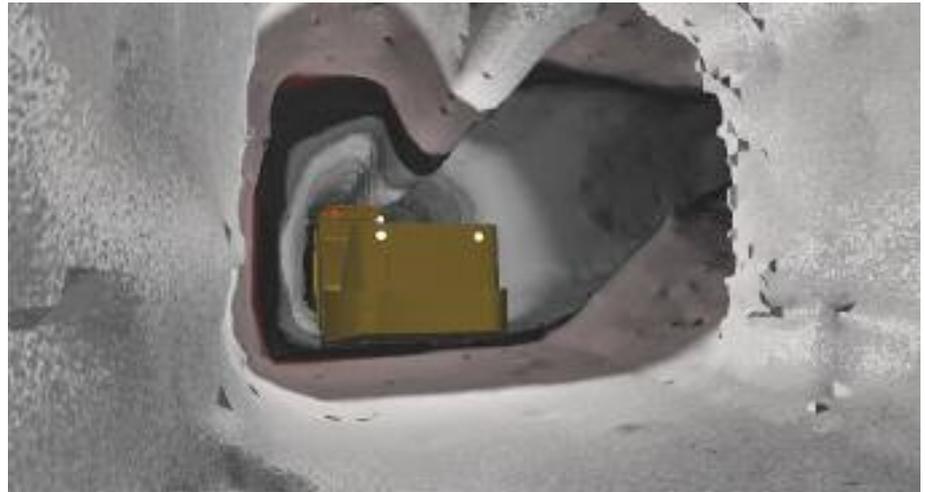
CANARY SYTEMS

rugged industrial package, PortaMetrics eliminates the need for reference objects. Users can safely capture, process, and manually alter images in any environment, including underground operations. Using Artificial Intelligence and Deep Learning algorithms, human-level fragmentation results can be achieved in seconds.

ShovelMetrics™ is Motion Metrics' flagship solution for shovels and excavators uses advanced imaging techniques to detect missing shovel teeth and monitor tooth wear, while also offering in-bucket fragmentation analysis, proximity detection, and payload monitoring for hydraulic shovels.

LoaderMetrics™ for wheel loaders uses a thermal camera to capitalise on hot bucket teeth and detect when teeth are missing. An innovative Lens Cleaning System ensures the camera is kept clear of dirt and debris. LoaderMetrics also provides Blind Spot surveillance to help prevent dangerous collisions and costly equipment damage.

ShovelMetrics, LoaderMetrics and PortaMetrics are designed to integrate with Motion Metrics' latest solution: MetricsManager™ Pro – to be launched at MINExpo. This cloud-based web application provides a single centralised platform to access all Motion Metrics system data. Customisable dashboards allow mine personnel and support



specialists to easily monitor the health of each Motion Metrics solution. With laptop, tablet and smartphone compatibility, detailed equipment productivity reports can be easily generated by mine personnel. MetricsManagerPro provides real-time equipment status updates, tooth wear prediction reports, shovel productivity reports, and bucket-based rock fragmentation analysis.

Motion Metrics backs all of its solutions by providing comprehensive support, from on-site installation and commissioning, to training, to scheduled maintenance and performance reports.

Hard-Line, a trusted remote control company and global leader in the design, manufacture and installation of radio and tele-remote control

A sample 3D image from a drift scan in Hard-Line's Teleop Auto

systems (Teleop) for heavy machinery. It develops new and innovative products that save lives while increasing productivity. These remote control systems facilitate mining operations via line of sight, extended line of sight, or Teleop operation; enhancing worker safety, continuous production, and mine profitability. Hard-Line is diverse and flexible; the systems can be installed and customised for any make or model of machine. Research and development is essential to the growth of the company, with ground-breaking products constantly being designed and

MODULAR MINING

perfected. These innovations allow Hard-Line to raise the efficiency of mines all over the world.

At MINExpo, Hard-Line will be revealing the latest upgrade to Teleop; Teleop Auto. This allows the teleoperation of one machine from one operators station with autonomous driving features. Teleop Auto will automatically drive a machine through a predetermined path. Once the operator has acquired a full load; the automatic steer, speed, and braking functions can be used to send the machine to dump at a specified location. From its booth in Las Vegas, Hard-Line will be operating in real time an Aramine scoop located in Sudbury, Ontario using Teleop Auto.

Tyre management

Kal Tire's Mining Tire Group, a world leader in mining tyre management and supply, will be showcasing several of its newest innovations designed to help maximise tyre life and productivity. While its reputation in the mining industry grew from supplying and servicing tyres on mine sites around the world, over the last 45 years, the company has also become known for developing solutions to drive tyre performance and safety.

“Kal Tire has always believed in looking for a better way to do things, and often that’s meant getting our hands dirty to come up with the solution ourselves,” says Dan Allan, Senior Vice President, Kal Tire’s Mining Tire Group. “Innovation in tyre management has become a



Kal Tire's Ultra Repair™ technology for repairing large injuries on ultra-class tyres

critical part of what we do and how we help our customers remain competitive.”

The company will be showcasing its award-winning Ultra Repair™ technology—Kal Tire’s exclusive product and process for repairing large injuries on ultra-class tyres. The process involves replacing damaged or broken steel belts in ultra-

class tyres to restore the tyre’s original strength, integrity and performance at a fraction of the cost of new tyres. Ultra Repair™, launched in Canada in 2014, has since been brought to customers in the UK, Africa, Chile, and it’s coming this year to Australia.

Other projects and new tools, developed wholly or in part by Kal Tire, being showcased include: a zeroG® arm—a mechanical arm that allows technicians to weightlessly, precisely and safely manoeuvre tools such as torque guns; a service trolley capable of operating two bead breakers with electrical or hydraulic air; a tyre deflator tool that significantly reduces the amount of time it takes to deflate OTR tyres; and a ram mount tool that securely holds the ram in place when breaking the bead.

Kal Tire is keen to invest in and protect innovation through patents. To-date, two ram mounts designed for the CAT 797 and Komatsu 930E haul trucks have been patented by Kal Tire, and other projects are in the patent process. With exclusive rights, the company’s patents preserve and enhance its leadership position as well as develop and protect a portfolio of products that drive value and performance for customers.

Mine operators in western Canada now have a solution for one of their major environmental concerns thanks to Kal Tire’s new OTR recycling service located in Alberta. In 2016, Kal Tire partnered with a leader in tyre recycling to give

STELLAR INDUSTRIES

tsunami

mine operators an opportunity to have scrap tyres (including ultra-class tyres) disposed, shredded and converted into products such as sports field flooring.

Chilean mines will soon be able to recycle scrap tyres when Kal Tire opens its first pyrolysis recycling facility. The chambers in the Antofagasta plant, which will one day have the capacity to recycle nearly 20,000 kg/d of tyres, use heat in the absence of oxygen to melt and decompose tyres into reusable steel wire, fuel oil and carbon black—repurposing nearly 100% of the tyre.

RIMEX is celebrating a major milestone this year, 40 years in the industry, and at MINExpo will roll out a new release of its powerful TyreSense technology.

Since its inception in the 1970s, RIMEX has evolved into a global leader in wheels and rims for mining. Plus, in the last 15 years, RIMEX says it “has come to dominate tyre pressure monitoring systems (TPMS) with its best-of-class TyreSense technology. TyreSense wheel sensors endure the uncompromising conditions inside mining truck tyres to deliver precise, accurate data that protects and preserves your wheels.”



TyreSense system aims at more than just tyre monitoring; it optimises the data it generates to provide clients with an overall asset and fleet management system

The brand new release – TyreSense 4.0 – features improvements such as:

New TyreSense display:

- Full colour touchscreen for enhanced visibility and ease of use
- Rugged construction to withstand all environmental conditions
- Low profile housing to reduce cab clutter.

New TyreSense client software:

- Access to the application from any device running a web browser with a network connection
- Comprehensive asset management that tracks tyres and wheels, along with automated sensor data reporting for lifetime performance information
- Data correlation that provides equipment performance metrics across entire fleets
- Enhanced user interface that delivers vital equipment information at a glance, with additional details available at the click of a mouse
- Updated event system that identifies and relays critical equipment events to operators and dispatchers, with progress tracking from creation to resolution
- Real-time equipment location monitoring with support for geo-fencing and haul cycle tracking
- Configuration of entire groups of vehicles, including alert trigger levels and general system settings, with a full audit trail
- Advanced application security and fine-grained access controls for

maximum flexibility in providing access to equipment configuration and data.

Though many features come standard with every TyreSense TPMS, RIMEX also offers a range of optional system components that allow users to customise tyre monitoring strategy. Here are just a few of the advanced features they provide:

- Internal mount sensor design
- Cold inflation tracking
- Connectivity options including Bluetooth, Ethernet, cellular and serial ports
- GPS tracking
- Fleet management integration.

The entire TyreSense system is supported by 24/7 client support so that questions and concerns are always addressed.

Comminution

The theme for the **Metso** exhibit is 'Welcome To Uptime', emphasising Metso's commitment to helping customers increase availability, improve safety, and reduce lifetime costs. It will feature equipment, systems, and service solutions designed to maximise uptime.

To help mines reduce costs and emissions as well as improve safety and productivity, Metso offers a wide portfolio of in-the-pit crushing and conveying (IPCC) solutions ranging from stationary installations to fully mobile Lokotrack® plants and Lokolink™ conveyors. Using an in-the-pit solution to reduce or replace conventional

truck haulage brings significant savings in operating costs, energy use, and water consumption.

Metso's new generation of upgrades aim to increase the productivity of older crusher models by up to 30%, while also reducing maintenance costs and bringing equipment into line with enhanced safety practices. Metso has an uncompromising attitude towards safety. The new generation of upgrades can be fitted to several of Metso's heritage branded crusher models.

This major mining event will also see the launch of Metso's heavy-duty MD Series mill discharge pumps for slurry pumping applications. Metso will also present its Energy-Efficient Comminution Circuit, combining its HRC™ high-pressure grinding roll with the proven Vertimill® stirred milling technology.

Building on a commitment to continuous innovation, Metso will showcase new mining solutions designed to help customers meet process and business goals. It will also present the extensive offering of spare and wear parts,



World-leading Metso helps customers improve operational efficiency, reduce risks, and increase profitability by using its unique knowledge, experienced people, and innovative solutions

and regional service centres located near customers to provide agility, excellence, and quality in aftermarket service. Visitors to the show will be able to engage with Metso experts to better understand how its people, knowledge and solutions make the big difference to customers.

Life Cycle Services (LCS) take the entire range of services Metso provides and conveniently bundles them into customisable, easily manageable packages. These packages can range from the basics to more complete

BECHTEL

solutions, depending on the scale of customer needs. With newly added enhancements to be launched at MINExpo.

The **Telsmith T900** cone crusher is a “true mine-duty machine designed and engineered to deliver maximum uptime, productivity, safety, and ease of maintenance,” the company says. Offering a capacity output range from 550 to 2,100 t/h, with up to a 15-in feed size, the T900 “is rated with the largest in-class clearing stroke, the highest in-class crushing force,” and boasts 670-kW performance.

“In designing the new T900, Telsmith places a key emphasis on safety and serviceability,” says Albert Van Mullem, Director of Engineering for Telsmith. “For example, its large clearing circuit is engineered to safely and quickly allow any uncrushable materials to pass; and its numerous innovative serviceability features differentiate the T900 from conventional units that typically require significantly more time in routine service,” he says.

Telsmith engineers outline a number of T900 reliability and ease-of-maintenance benefits. For reduced maintenance time and costs, the T900 is designed with eight cylinders (versus 12 cylinders in conventional units), yet offers the largest crushing force availability. The unit also offers a new and improved patent-pending anti-spin feature that prevents head spin to extend manganese life. Like other key components, it’s

mounted on top of the machine to offer top-service access. It’s also designed to operate with pressure lubrication oil, while eliminating the use of a gear box and a separate hydraulic circuit.

Next, the company states, “the T900 features the largest-in-class, patent-pending hybrid bearings. Unlike roller bearing machines, these large hybrid bearings offer both a static and dynamic lift – which results in far greater lift to efficiently carry the crushing forces. Also, hybrid bearings feature a washer and ramp design that replaces the conventional use of a socket, socket liner, and head ball – all of which typically require time-consuming removal when servicing the machine.

Additionally, the Telsmith T900 is nitrogen-free and is engineered with a patented release system that eliminates the need for maintenance-intensive hydraulic accumulators. Even more operational cost savings stem from features such as a patent-pending concave (bowl liner) retention system which consists of a specially-designed and positioned lip ring that centres the bowl and achieves retention.

Haver & Boecker introduces its Tyler F-Class Split-Bucket Mounting System, which offers simplified maintenance and bearings change outs for operators and, in turn, cuts service

Haver & Boecker’s new Tyler F-Class Dynamic Split-Bucket System offers operators simplified maintenance and, in turn, cuts service downtime in half



downtime in half. The rubber mount housing, or split-bucket system, provides operators easy access to critical components, such as rubber mounts and body brackets.

All new F-Class Vibrating Screens feature the upgraded mounting system, which includes 16 rubber mounts and four body brackets.

The split-bucket rubber mount includes a two-piece body bracket, which allows operators to remove the side arm and bucket in one piece. Prior to these improvements, in order to remove the side arm, technicians were required to disconnect the rubber mounts along with removing 15 bolts. Now, the process is simplified. Technicians can remove the side arm and split-buckets off of the screen as a whole assembly – reducing the number of bolts removed to eight.

Beyond the new split-bucket mounting system,

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the F-Class includes Haver & Boecker's exclusive four bearing Tyler design, which allows for multiple machine installations within the same building or structure. It's also ideal for screening situations that require consistent, load-independent performance at constant g-force in all operational modes. With the right media choice, it virtually eliminates blinding and pegging. The F-Class is designed to handle the toughest applications; it can easily scalp and classify ores, minerals, stones, sand and gravel.

"Our F-Class four bearing design is the best in the industry because it minimises structural vibration and delivers a consistent stroke, which two-bearing screens cannot provide. However, because of its unique design, common maintenance, such as changing the rubber mounts and accessing critical components took extra time," explained Karen Thompson, President of Haver & Boecker Canada. "This is why we worked with our customers to address this challenge and design the F-Class split-bucket design. Its innovative design provides the best, most efficient vibrating screen, while still being easy to service."

The F-Class includes a standard 18-month warranty from the date of shipment, 12 months from the installation date, or 6,000 operation hours — whichever comes first. This warranty can be increased with optional customer-specific warranty upgrade packages. Uptime, an



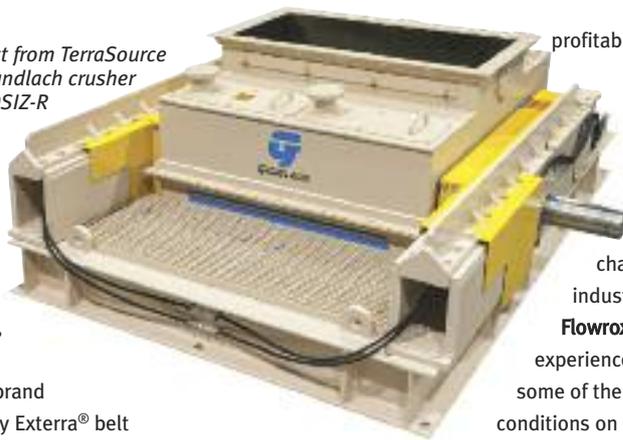
optional 36-month warranty package, offers customers a full-service approach to equipment optimisation — from parts inspection and equipment assessment to screen media evaluation.

Superior Industries plans to launch several new products. The manufacturer will display its new Patriot™ cone crusher, TeleStacker® Conveyor, mine duty idlers, mine duty pulleys, conveyor drive package solutions from it's Core

Superior says its Core Systems Design program offers drive and tail pulley assemblies custom-engineered for a specific application. "Core Systems Design creates cost efficiencies for customers by ensuring that drive components are ideally suited for the particular job specifications, while also making sure that power requirements are met. Each custom-engineered assembly is delivered as a pre-assembled package, which eliminates the costly labour involved in onsite assembly and greatly reduces installation time"

MATRIX

A new product from TerraSource Global's - Gundlach crusher model: NANOSIZ-R HC - High Capacity roll mill



Systems® Design group, Chevron® Pulley and a brand new mine duty Exterra® belt cleaner.

Last winter, Superior introduced its brand new cone crusher, marking a major milestone for its new crushing and screening division. Unique features include a tramp relief system design using significantly fewer accumulators, which greatly minimises maintenance. For the first time at MINExpo, Superior will debut a brand new option for mine duty belt scrapers.

Whether their operation is big or small, mining companies all over the world partner with **TerraSource Global**. Broad engineering expertise, in-depth knowledge of industry sectors, precision OEM parts, dependable and local customer-focused service and a broad application portfolio offers real product choice. There are three renowned flagship brands – Gundlach Crushers, Jeffrey Rader and Pennsylvania Crusher. Visitors to TerraSource Global's can check out some of its industry leading hammermills, roll crushers and vibrating feeders and talk with the company's knowledgeable staff about unique business challenges and how the TerraSource team can help achieve objectives for growth, efficiency and



profitability.

Ancillaries

MINExpo 2016 is all about Solutions and meeting the challenges of the industry, and so is **Flowrox**. It is well experienced in operating in some of the most challenging conditions on the planet, running extremely abrasive or corrosive processes, often in remote locations.

Flowrox has installed more than 100,000 products; valves and pumps, worldwide over the last four decades. Each of the installations has helped the company to better understand the demanding needs and environment of mining.

The 40 years of experience in flow control and elastomer technology are obvious benefits Flowrox can offer. Started as Larox and Larox Flowsys, its heritage forms the foundation of what it is; a benchmark for heavy duty valves, pumps and systems.

Flowrox was the first pinch valve manufacturer in the world to get awarded the ISO9001:2000 Quality Certificate in 1997. This certification covers all operations including product design, research and development, manufacturing, process application, sales and marketing, customer service, customer's application support and after-sales services.

Now, launched at MINExpo it is bringing valve and pump technology to the next level, meeting the future requirements with connectivity and IIoT environment. Find out more how its new Smart Solutions™ enable real-time analytics, documentation and visual information of your process 24-7.

AFEX Fire Suppression

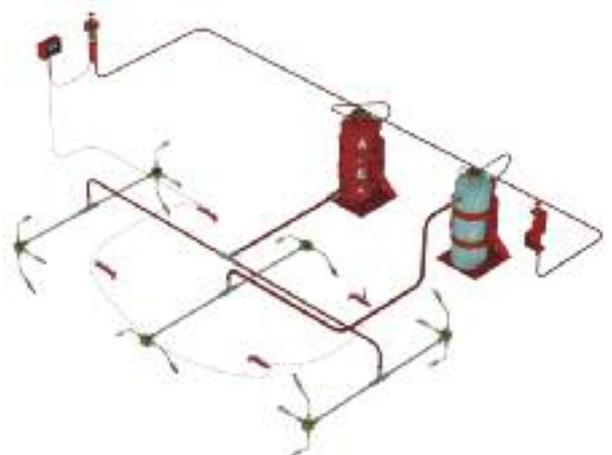
Systems reports that both Liebherr Group and Ground Force Worldwide will feature AFEX equipped machines at MINExpo. **Liebherr Mining Equipment** will feature the AFEX system on its T 264 mining truck. The T 264 is part of the 220-t size class, matching ultra-class hydraulic excavators, as well as electric shovels and wheel loaders. Its unique combination of a high-horsepower engine (2,015 kW), an efficient Litronic Plus AC drive system and powerful electric wheel motors (3,300 kW) allow for faster cycle times, making the T 264 exceptionally productive and cost-efficient.

Ground Force Worldwide designs, engineers,

and manufactures mine support equipment for surface and underground mining applications. It offers over 40 product lines, including the world's largest fuel and lube trucks, water trucks, and cable reel trucks. The designs provide the best return on investment in addition to keeping your revenue producing 'iron' running efficiently, reports AFEX. The Ground Force booth will have an AFEX equipped truck.

AFEX, which will also have its own booth, delivers rugged, reliable fire suppression solutions for mining equipment, aiming to maximise machine safety and productivity. With 50 years of industry experience and Factory Mutual, ActivFire, and CE approvals, AFEX is a leader in heavy equipment fire protection.

The need for dust suppressants in the mining industry continues to increase for health, safety, and regulatory reasons. One type of dust suppressant available, but not often considered, is a solid rather than a liquid product. In some circumstances, it is advantageous compared to a liquid product since it eliminates the need of an additional pump and mix tank, the strength of the suppressant solution can be adjusted quickly, or completely shut off, and the common appearance of this product is a cylindrical shaped solid, which can be manufactured to any diameter and length. Because much of the solid material consists of the dust controlling additive, it is compacted into a smaller container size than the liquid dust suppressant, which means less storage space is needed. **IM**



An AFEX fire suppression system is a pre-engineered fire protection solution for equipment fires on mobile heavy equipment. Once installed, the system becomes a permanent part of a machine and, with proper maintenance, can last that vehicle's entire service life. AFEX offers dry chemical, liquid agent, and dual agent systems that are designed to limit damage to machines in the event of a fire, reducing downtime and increasing productivity. The systems may be activated manually or automatically and are available in various configurations to accommodate any piece of equipment, large or small, from hydraulic mining shovels all the way down to skid steer loaders