MINING & CONSTRUCTION

MECHANIZED ROCK EXCAVATION WITH ATLAS COPCO - NO. 1 / 2014

Learning your APCs with Atlas Copco training

Swellex rock bolts around the globe

Page 6

Showing our finest to the construction industry

Page 10

New option for hole opening equipment

Page 15

EDITORIAL

Following one of the coldest and longest winters in recent memory, warmer temperatures have finally arrived in most of Canada. For Toronto Maple Leaf fans, springtime brings the annual ritual of following the golf scores of their favorite players. For the construction business it means that jobs and projects are underway, and equipment demand is at peak levels.

Within Atlas Copco, the construction equipment buying season culminates in the conversion of our strategic planning and activities into actions to secure orders. Tradeshows represent a key tenet of preparation for the months ahead, and Atlas Copco's presence and visibility were strong at numerous exhibitions aimed at several key market segments during this time.

Exhibitions provide an excellent forum to reinforce the company's core values of interaction and innovation. Atlas Copco sales and technical specialists meet with hundreds or even thousands of existing and prospective customers over a few days, and many new products are introduced to the market. All of these activities combine to develop customer relationships and support the final core value of commitment.

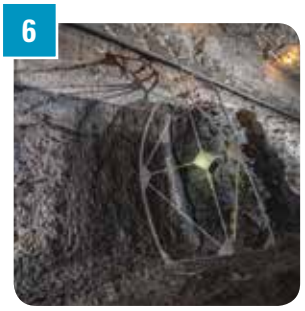
Tradeshows are featured prominently in this issue, as we have a full report on the recent ConExpo event in Las Vegas as well as an overview of new products introduced at the show.

Our core values are evident in feature stories on Atlas Copco's Diamec Automated Performance Control (APC) system and the success of the Swellex rock bolting system at the Toronto Island Airport Pedestrian Tunnel Project.

Whether it's the contractor who benefits from increased productivity and reduced cost of ownership, or the rental customer who visits their local rental store saying, "I want the yellow one," Atlas Copco's core values and commitment to Sustainable Productivity are always evident. Enjoy reading.

Wayne Ross
Vice President and Business Line Manager
Construction Tools Division

CONTENTS



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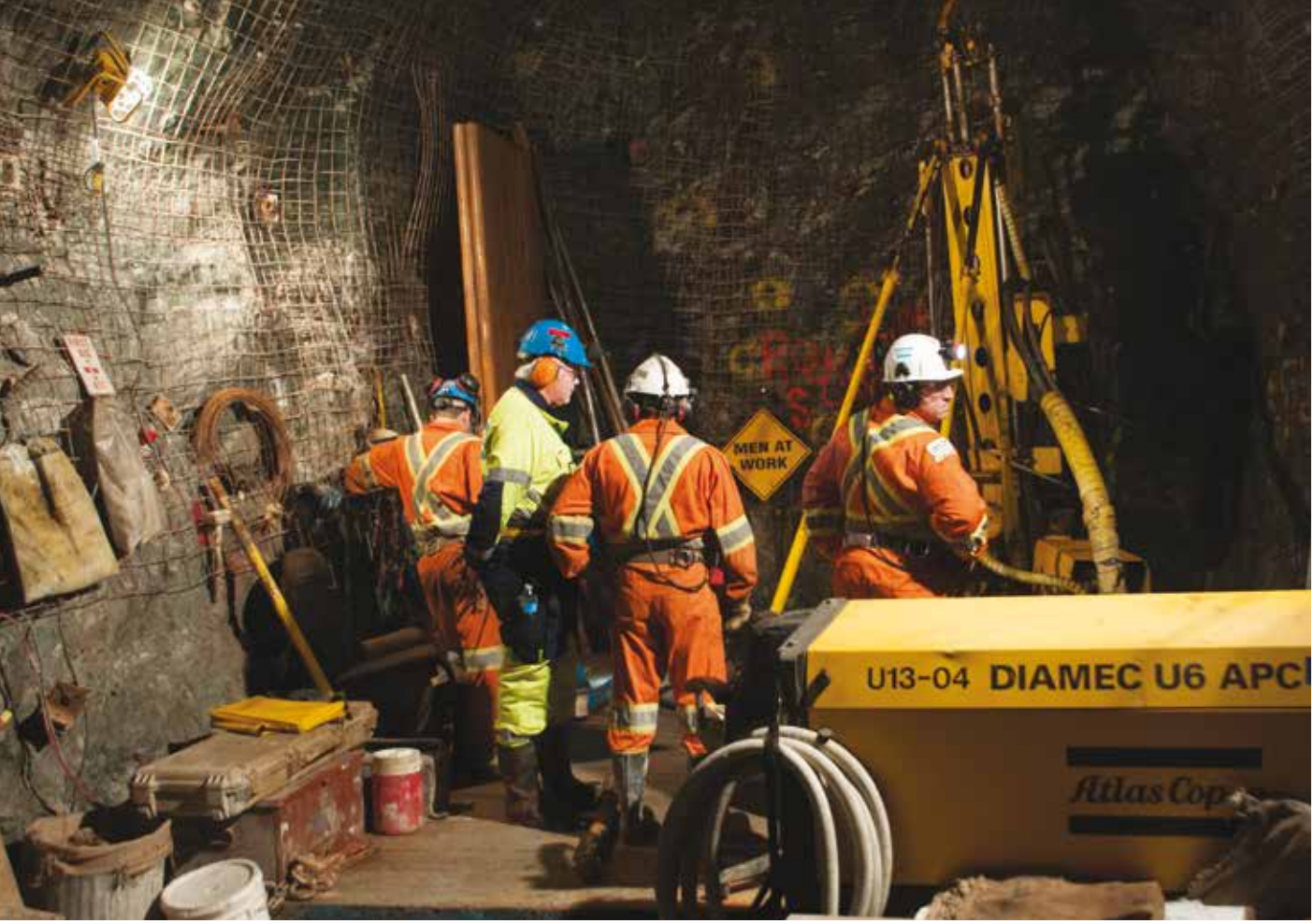
SAFETY FIRST
Atlas Copco is committed to comply with or exceed all global and local safety rules and regulations for personal safety. Some photographs in this magazine may, however, show circumstances that are beyond our control. All users of Atlas Copco equipment are urged to think safety first and always use proper ear, eye, head and other protection as required to minimize the risk of personal injury.

Atlas Copco

LEARNING YOUR APCs

World-renown training tech offers experience, knowledge to Diamec U6 APC drillers in Canada mine »



Having launched his career in diamond drilling as a drill mechanic in 1978, Krister Larsson has been involved with the development of the Atlas Copco Diamec Automated Performance Control (APC) system since its beginning.

In the past 16 years Larsson has circled the globe several times over to provide on-site consultation and training as an APC specialist. In his time working with APC operators worldwide, it's a safe bet he's just about heard it all—though he points out he is keenly listening so he can bring customer insights back to designers in Sweden.

Technology only goes forward

When drillers defend their favorite lever-operated hydraulic diamond drilling machine, Larsson doesn't argue. "Such drills were the absolute best drills in their time," he said. "They could drill rock well. And no doubt, today they still drill rock well."

But then Larsson reminds them that electronic-over-hydraulic is here to stay. And for diamond drilling underground, drilling operations can find greatest productivity from the cutting-edge technology of an Atlas Copco Diamec underground core drilling rig with APC.

"Your older lever-drill may have been the best of the best when it came out. But in today's market, can you make money with it?" Larsson challenged. "That is the question drilling companies are faced with. Can you keep your customer profitable and happy with it?"

Larsson said electronic operation has become so widely accepted now that asking to buy a lever-rig will be comparable to asking a car dealer for a brand new car with a carburetor. "They will look at you and ask, 'Where do you come from?'"

Continuous improvement

When Larsson comes to a new site, he hears familiar assertions. "Everyone says, 'Oh, all of our drillers are good drillers.' So I ask, 'If everyone always has good drillers, where are the bad ones then?'" Then he said his students correct themselves, realizing all drillers can improve.

Larsson said he also tries to make drillers honestly consider their performance over the long run. "Everyone is happy to tell me of a 100-meter shift they have drilled, but they do not talk about the 5-meter shifts before and after that one. Or that when one shift pushes the machine to its utmost, the next shift is left with tooling to replace and a rig to oil and a bit to change. That 100-meter driller is proud of how hard he worked, but I tell you it is the 5-meter driller who is the one having the hard day."

Larsson was reminded of an Australian drilling superintendent he worked with. "He told me, 'I prefer a 45-meter shift every shift, day after day, to a once-in-a-while 100-meter shift."

Bottom line, Larsson said, "The APC is not here to catch drillers having a bad day. It is here to help them. And when they realize that they become better drillers with APC, they accept it."

An APC-controlled rig can give a company higher productivity with shift-after-shift consistency. Built on the Atlas Copco's reputable Rig Control System (RCS). The CAN-based electronic control network has proved itself year after year. "Customers will ask for it specifically," Larsson said. "They will ask, 'Is that an RCS system?' They trust RCS and have confidence in it to perform like all the other RCS-based drill rigs Atlas Copco offers."

APC assumes control of the rig once the operator has entered key parameters. It maintains a constant penetration rate, reacting instantly to even slight changes in rock formation, adjusting feed force or torque automatically.

◀ *Krister Larsson makes a few input changes with the APC monitor and control panel during an advanced training session.*

> "I see training as about opening up communication, getting the drillers to ask their questions. My job is to create that opportunity."
>
> **Krister Larsson**
> APC Specialist

Opening the dialog

When Larsson visited a Canadian mine for training recently, he started in a classroom setting with a review of basic concepts and principles of efficient drilling. "I'm not here to correct anyone. I'm here to offer information. You have this, but you can have this. You have had the APC a while and know how to drill with it. Now it is time to maximize your use of its capabilities."

Larsson said newer drillers too often defer to older drillers. "I see training as about opening up communication, getting the drillers to ask their questions. My job is to create that opportunity. They will ask me things they won't ask someone else whom they work with every day. I will be here just a few days and leave."

Better drilling means fewer bits

Larsson reviewed drilling parameters and their effect on bits—something the APC can control more consistently than a human driller.

"The greatest penetration rate will be offset if you must keep stopping production to replace bits," Larsson said. "Bits themselves are a relatively low-cost part of the drilling formula. But all those hours tripping out and changing bits are lost drill meters, lost productivity, lost revenue."

Larsson also mentioned that drillers don't need to keep searching through a wide range of bits but should learn to drill with just a few types, since bit design ranges overlap considerably. He explained that the APC-controlled Diamec will help drillers use one type of bit in a greater range of formations than they thought possible, and in different setups. It's all about the drilling parameters.

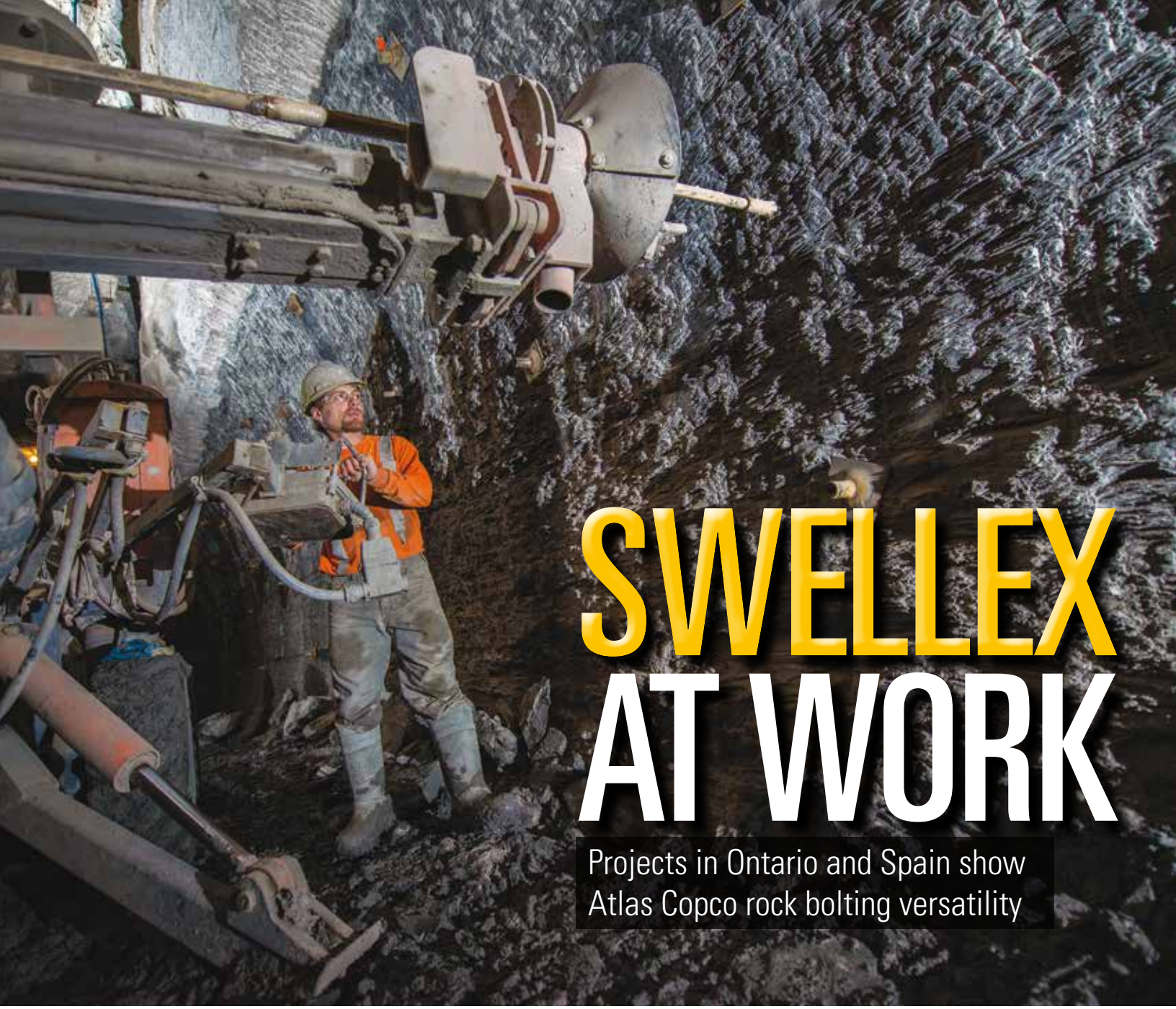
Weight-on-bit, Larsson reminded them, has no fixed parameter for optimum rate of penetration. It's the result of feed force, rod weight and liquid density.

He reviewed the purpose of design features such as width of water channels, what it showed them about a particular bit's capabilities, and reviewed with them what bit inspections should reveal about their parameters. Concave wear could mean they were drilling too slowly or there was not enough flushing. Convex wear could be produced by either a fractured formation or poor fluid flow. If there was excessive erosion, then the bit was too soft for the formation. A glazed bit revealed too high a rotation speed.

Larsson will use various teaching techniques as best suits the host company's schedule. In this case, a classroom session came first. When he went underground with them for the first time, Larsson accompanied the drillers to the Diamec solely as an informal observer while they completed their shift. He asked few questions, taking silent notice of several things he believed could be improved on.

"I am not here to correct anyone," Larsson repeated. "I am here to offer information. I have experience with drillers from all over the world and have been doing this for 16 years, so I have valuable information to offer. And I have numbers and charts. I will tell them what I see and then offer suggestions based on that experience and real-world data."

Larsson said, "Having me come for training is proof to the drillers that their company believes in the equipment." That's because a company that not only buys the Atlas Copco U6 APC but also has follow-up training for drillers is serious about getting the most productivity from leading-edge technology.



SWELLEX AT WORK

Projects in Ontario and Spain show Atlas Copco rock bolting versatility

Toronto Island Airport

The new Billy Bishop Toronto City Airport Pedestrian Tunnel provides a 240 meter walkway connecting the island airport and the mainland. Contractor Technicore Underground Inc. was tasked with constructing the tunnel in shale bedrock 38 meters underground, 10.5 meters feet below Lake Ontario.

Commonly known as the Toronto Island Airport, Billy Bishop Toronto City Airport is the ninth busiest airport in Canada, and operations could not be disrupted for the tunnel construction. Commuters needed this project for unrestricted access to the airport, which is now limited to ferry services. The tunnel will be equipped with moving sidewalks and escalators.

Technicore Underground Inc., founded in 1997 by owner and director Tony DiMillo, is based out of Newmarket, Ontario. Joey DiMillo, project manager, has seen the project through from groundbreaking to pouring concrete.

"We chose Atlas Copco rock bolts because of the ease of installation and inflation—the immediate support, minimum production time delay and peace of mind that the bolt is fully inflated and providing support. Additionally we were able to utilize the available pull-test equipment and benefit from outstanding product support," Joey Dimillo said.

The secant wall was supported by a combination of tiebacks and struts for both the mainland and island shafts. Rock bolting and mesh were installed as required to provide safe working conditions. The shale contained very little limestone. Strengths ranged from 80 to 100 MPa.

Excavation started at the surface with 15-meter-long secant piles through overburden into bedrock to stabilize the shaft opening. Several rows of tieback anchors were installed for the remaining 13 meters of shaft depth down to overall depth of 28 meters on the mainland side.

Atlas Copco sales representatives were on hand to make recommendations for use of the Swellex rock bolting system. Atlas Copco personnel completed onsite training on how to install Swellex bolts and use the inflation

A special template was designed by Technicore to outline the profile shape on the tunnel.

CHALLENGE

To construct a relatively shallow, large tunnel under a water body in shale bedrock working from very small work sites without impacting adjacent airport operations.

SOLUTION

Swellex PM12 x 1.2 m bolts
Swellex MN24 x 3.6 m bolts
Swellex PM12 x 3.6 m bolts
SP 300 RDP air operated pump
H1 hydraulic Swellex pump pull testing equipment

RESULTS

No grouting or setting time
Ease of installation and inflation
Superior product support

arm, using both the PSP 300 RDP air-operated pump and H1 hydraulic Swellex pumps. Atlas Copco also trained Technicore personnel in the use of pull-test equipment for both the PM12 and MN24 Swellex bolts.

The tunnel arch support is a unique design concept that Technicore developed for this project. With the use of twin tunnel boring machines, the main tunnel roof consisted of seven 2-meter-diameter interlocking horizontal secant tunnels filled with concrete. Swellex PM12 bolts 1.2 meters in length were installed in the above tunnels for temporary support prior to filling the secant tunnels with cement.

The main shaft undercut wall required the installation of 3.6-meter PM12 Swellex bolts. The overall main tunnel dimensions required were 11 meters wide, 7.3 meters high and 183 meters long. Once the profile of the tunnel had been excavated, five rows of 3.6-meter-long MN24 Swellex bolts were installed for ground support.

Technicore is responsible for the mainland and island shaft excavations, the main tunnel excavation, ground support and building the final concrete structure. Forms and concrete will be supplied by TecMix, which is another division of the Technicore Group of Companies.

PCL Construction Canada is the general contractor that will build the elevator shafts in the mainland and inclined escalators on the island. Arup Tunnel Designers are the engineering consultants responsible for the tunnel design. The tunnel is a PC3 project and is a design build. »

CHALLENGE
Wall and roof reinforcement in marble mine.

SOLUTION
Swellex Spartan

RESULTS
Efficiency in cost
Speed in installation
High degree of customer satisfaction

> "This is a case where the Swellex Spartan bolt truly shines, offering a very economical solution to challenging conditions with no compromise in performance or quality."
>
> **Chris Cranford**
> Product Line Manager, Atlas Copco Rock Reinforcement

Installing Swellex Spartan is a fast process.

Swellex Spartan

The new Swellex Spartan is making its mark. The latest addition to Atlas Copco's Swellex rock bolting system was used in Spain by AYMAR S.A.U., but it's a good fit for jobs in Canada as well.

Spartan is ideal in cases where the rock mass transfers little energy into the rock bolts. In such cases there is no need for a rock bolt that absorbs high energy, as some Swellex models do. The Spartan line is engineered to be extremely cost efficient and offers trouble-free installation.

AYMAR used Swellex Spartan bolts at 3-, 4-, and 6-meter lengths to reinforce roofs and walls that had areas affected by faults, blocks or simple breakages in an underground marble mine. AYMAR S.A.U. is dedicated to the mining and treatment of white marble aggregates and has expanded into other areas such as building materials, chemical industry and paint.

XAUXA mine, located north of Barcelona in the Monteseny Mountains, uses room and pillar excavation method.

Luis García Muñoz, Technical Director, AYMAR S.A.U. said, "Our intent was to include an additional phase consisting of the reinforcement of the walls and roof of the galleries in areas where the security is not totally guaranteed. Previously there was no need for reinforcement as the rooms were very stable."

With the technical support of Atlas Copco Spain's aftermarket team, bolts were installed in a wall with and without face plates. The pull test results showed a 6 percent elongation, which satisfied specifications.

"This is a case where the Swellex Spartan bolt truly shines, offering a very economical solution to challenging conditions with no compromise in performance or quality," said Chris Cranford, product line manager, Atlas Copco Rock Reinforcement.

A view of the underground marble quarry entrances in Sant Coloni (Barcelona).

The Atlas Copco XAS 185 Tier 4 Final air compressor with HardHat cover, is a popular size for construction sites.

If it's new, IT'S HERE

Atlas Copco at ConExpo-Con/Agg 2014

The March 2014 ConExpo-Con/Agg show in Las Vegas, USA, hosted nearly 130,000 registered attendees representing 170 countries, up from 159 in 2011. Held every three years, the show is one of the largest in the construction and aggregates industries.

Atlas Copco, under the theme "Sustainable Productivity," showcased its products in blasthole drilling, crushing, tools, air compressors and generators … and much more.

Big introductions in the generator, compressor and pump lines were all on display. For those who need large volume air, Atlas Copco introduced the new containerized XATS 1050 compressor that boasts a compact size to output ratio in a superior-engineered package. Free air delivery at 1050 cfm and 150 psi is easily switched on the control panel to 900 cfm at 200 psi for expanded versatility. Where Tier 4 Final engine requirements could mean sacrificing packaging size or option, the XATS 1050 is available with either a Caterpillar or John Deere engine.

The new XAS 400 compressor was also introduced to the public at the show. The addition of the 400 cfm compressor with the wear-resistant Hardhat canopy will reduce the customer's maintenance expense.

There was much to see in rock drilling tools: from geotechnical core drilling options when a project starts to the many foundation drilling options and tooling options for blast hole drill rigs both on the surface and in tunneling. Atlas Copco presented a full package of rock drilling tool options at ConExpo.

Bigger impact in a condensed package was certainly visible in the rock drilling tools display. The introduction of the new Secoroc COP 66 down-the-hole hammer was a featured product because of its complete redesign and greater efficiency. And in the top hammer offering, the T-WiZ line grew with the T60 class expanding the threaded line to 152 mm.

Shorter than its predecessor, the COP 64 Gold, the new Secoroc COP 66 penetrates 15 percent faster, translating to less time over the hole and decreased fuel consumption. The hammer has fewer parts, yet features the ability to rebuild the hammer twice in its life

under normal drilling conditions. This all equates to a lower cost per meter over the life of the product.

The bit design is also unique because the COP 66 has no exhaust tube. The solid bit design features no center-flushing hole, making it easier to operate.

Accompanying the newly introduced FlexiROC T45 was the T-WiZ60 threaded tooling. With a bit diameter range from 92 to 152 mm, the T60 increases drilling capacity by offering up to 30 percent longer service life and boosts productivity by drilling more holes per shift. The T-WiZ product line improves reliability by wearing out before breakage and enhances utilization by reducing rod and shank changes.

Also on display for foundation drillers was the 1,220 mm cluster drill and the Secoroc QL 300 down-the-hole hammer.

Atlas Copco also featured its Powercrusher PC3 impact crusher with the HS1 screen. This one–two punch combination was a hit with customers looking for perfectly-sized crushed material in one unit. Adding less than 3.6 tonnes to the PC3's operating weight, which is ideal for crushing recycled material, the HS1 screen sends larger material back to the hopper until it's minimized to the desired size. This crush-screen combination is a perfect example of how Atlas Copco can really put power to work and offer sustainable productivity.

The Powercrusher PC3 attracted customers with its all-in-one plant concept and ability to make spec products in a single pass.

LATEST PRODUCT RELEASES FROM ATLAS COPCO

ES 70 Breaker

- Tool diameter of 71 mm
- Hybrid technology (gas/oil), long piston stroke, energy recovery in a solid body
- Low service costs, simple maintenance
- Low vibration and noise levels
- Three lightweight models suitable for day-to-day construction
- Slim, compact design of the breakers provides easy handling with excellent visibility and maneuverability for the operator

Carrier Weight Class	4–9 tonnes
Service Weight	295 kg
Impact Rate	550–1500 bpm
Operating Pressure	100-140 bar
Flow Range	45-75 L/m @ 140 bar

HM 2000 Attachment Magnet

- 25% faster than conventional magnet plates
- Innovative electronic control system that ensures the material can load and unload in the shortest time
- Savings on equipment repair and downtime due to clean and safe jobsites
- Two models available
- Quick and easy installation
- Recycling of rebar, turning waste into profit

Carrier Weight Class	15–45 tonnes
Service Weight	2000 kg
Operating Pressure	120–350 bar
Flow	90–250 L/min

DC 2100 Drum Cutter

- Precise profiling of concrete and rock walls
- Narrow trenching with less excavation volume than that of a breaker
- 8 models (Cutting widths from 480–1240 mm)
- Cut material can be used as backfill

Carrier Weight Class	25–40 tonnes
Service Weight	2100 kg
Flow	190–320 L/min
Operating Pressure	350 bar
Cutting Head Width	1000 mm

BBD12 DSW D-Handle Rock Drill

- Ideal for horizontal rock drilling, plug hole drilling, concrete drilling, mining, anchor and wedge hole drilling
- Water flushed
- Silenced
- Easy to service
- Comfortable handle

Depth	Up to 2 m deep
Weight	11 kg
Air	24 L/s
Impact Rate	2580 blows/min
Shank	22 x 108 mm

LATEST PRODUCT RELEASES

XAS 185 JD Eco PE Final Tier 4 Compressor

- Easy to handle and transport into construction sites, fitted with a stepless, fully automatic unloader valve and speed regulator
- The thermostatic bypass helps reduce wear and tear on internal parts and ensures less down time
- Complies with all current regulations concerning safety, exhaust emissions and noise
- Zincor-coated canopy is corrosion resistant, increasing its life
- The new, quick access XC2003 electronic controller ensures that the XAS 185 Tier 4 Final is easy to operate in the field.

Model/Engine	Fad	Pressure
XAS 185 Cd CAT 2.2 FT4	87 L/s	7 bar
XAS 185 Kd Kubota FT4	87 L/s	7 bar

XATS 1050 JD Final Tier 4 Compressor

- Offers a flexible output with variable pressure and flow settings
- Easy to use—operator sets pressure and engine automatically responds with appropriate airflow
- Higher utilization and versatility
- Spillage-free frame and a small tandem axle enclosure to ensure maximum portability and flexibility at the job site
- As an option, customers can select from a John Deere 6090 or CAT C9.3 engine

Model/Engine	Fad	Pressure
XATS 1050 JD John Deere 6090 FT4	500/450 L/s	10/14 bar
XATS 1050 Cd CAT C9.3 FT4	500/450 L/s	10/14 bar

XAS 400 JD iT4 PE Compressor

- Operates under widely varying climatic conditions
- Available with optional air aftercooler and coalescing filtration for dry, clean air
- Thermostatic bypass valve helps reduce wear and tear on internal parts and ensures less downtime
- Zincor-coated canopy is corrosion resistant, increasing its lifespan
- Gull wing doors for easy access to engine and components

Fad	Pressure
350 L/s	7 bar

QAS 50 Final Tier 4 Generator

- Performs at full capacity in high temperature and high altitude conditions
- Superior component configuration, offering a wide range of control modules, electrical settings and mechanical options
- AREP excitation system designed for demanding loads and conditions
- Best in class in fuel efficiency
- Low noise levels
- Long service interval of up to 500 hours
- Simplified DeepSea Controller for operator ease
- Best in class in fuel efficiency
- Meets Tier 4 final emissions (Diesel Oxidation Catalyst)
- Spillage free frame

Output	Engine
50kVA (40kW) Prime	Isuzu 4LE FT4

FROM ATLAS COPCO

Dynapac CA 1300D Soil Roller

- Best suited for trench and housing site building applications
- Optimized compaction parameters for peak performance
- Cross-mounted engine for easy serviceability
- Ergonomically-designed simplified controls and spacious shock-proof operator platform
- Optimum design of 2-way blade helps to level out material prior to compaction
- Low noise
- Low fuel consumption with ECO mode

Engine	Kubota 56 kW FT4
Operating Mass	11,000 lb (5000 kg)
PLI	70
Drum Width	54 in (1372 mm)
Frequency	2100 vpm

Dynapac F800T Paver

- Power packed 8 ft (2440 mm) paver with 10 ft (3028 mm) paver capability
- 173 hp Cummins T4F engine with 10 ft (3028 mm) paver drive components
- Patented safe impact system prevents the truck driver from bumping into the paver causing mat quality issues
- World's thinnest center drive auger system with 17 in (432 mm) auger diameter producing best material flow
- Optional Integrated Hydraulic Tunnel
- Best in class all-around visibility
- Dual swing-out ergonomically designed, fully functional comfort operator station
- Heavy duty components for longer life (Conveyor floor plate, auger and traction systems)
- Proven Carlson EZIV 08-15 Screed combined with Dynapac Intuitive operator controls for superior mat quality and ease of operation
- Very low noise levels

Weight	17.85 ton (16 tonne)
Screed	Carlson EZIV 08-15
Working Width	8–19 ft (2.4–5.8 mm)
Capacity	900 t/hr (816 tonne/hr)
Paving Thickness	-6–12 in (-150–305 mm)

Dynapac CT3000 Tamping Compactor

- Tough roller for high speed
- Cohesive soil compaction up to 12.5 mph (20 km/hr) with production capacity of more than 1000 cu. yards/hr (765 m^3/hr)
- Unique pad drum fitted on rubber tires significantly reduces vibration to the operator
- Overlapping drum arrangement for full compaction coverage
- Best in class operator environment with choice of Whisper Cab or ROPS structure
- Rotating operator station with intuitive operator controls reducing operator fatigue
- 4 Speed Dana automatic transmission
- Heavy-duty scraper system reduces the buildup of clay on the drum and ensures traction
- Choice of 2-way or 6-way high-capacity blade to level out the material

Operating Mass incl. ROPS	49,600 lb (22.5 tonne)
Drum Width	4 x 39 in (100–990 mm)
Pad Height	7.3 in (185 mm)
Number of Pads/Drum	60
Contact Area of Pad	31 sq. in. (508 cc)
Engine	260 hp (194 kW) Cummins QSB 6.7 T4i

WEDA Range Small Pumps

- Lightweight and compact, less than 30 lb (13.6 kg)
- Two types of discharge outlets (smooth and threaded) standard
- Mud- and sand-resistant models
- Dry running capacity with thermal motor protection
- Triple shaft seal assures long life
- Semi-vortex wet end minimizes maintenance
- The polyurethane semi-vortex impeller reduces the risk of clogging
- Comfortable and easy operation
- 400-watt or 700-watt electric motor

Lowest Suction Model (WEDA 04B)	1 mm
Maximum Flow Range	140–325 L/min
Maximum Size of Solids Handled	4–25 mm
Maximum Head	15 m–99 m
Motor Rating	0.74 kW
Outlet	25–50 mm

LATEST PRODUCT RELEASES FROM ATLAS COPCO

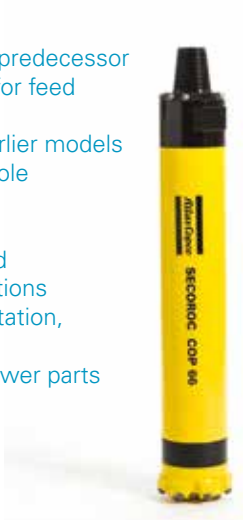
FlexiRoc T45 Top Hammer Drill Rig

- Powerful 30kW COP3060, COPLOGIC Drill Control system that adjusts impact, feed and rotation pressures depending on the ground conditions to insure straight holes
- Fuel efficient—consumes energy only as needed and with adjustable air flow
- Equipped with reverse camera
- On board diagnostics to assist in troubleshooting
- ROPS and FOPS certified cabin with great visibility in all directions without changing positions in the chair

Max Depth	36 m
Engine	242 kW
Hole Size	88.9–140 mm
Air	223 L/m

Secoroc COP 66 Down-the-Hole Hammer

- 15 percent faster penetration than its predecessor COP 64 Gold, more easily adjustable for feed force and rotation
- 30 percent shorter and lighter than earlier models
- No exhaust tube, no center flushing hole
- Longer service life – higher reliability
- Less wear and tear on the hammer
- E-kit allow two rebuilds with sustained performance in normal abrasive conditions
- Easily adjustable for feed force and rotation, making life easier for its operator
- Reduced air consumption, and with fewer parts



Drilling Parameters	
Rotation Speed	15–70 rpm
Max Pressure	30 bar

Secoroc 17 ½ Bit Third BI62C (PRV)

- Hard rock cutting structure
- Drills faster and stays in the hole longer
- Longer cutting structure and bearing life
- Pressure-compensated lubrication system
- Random cutting structure
- Proven bearing and seal packages

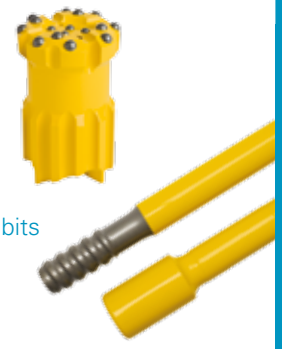
Diameter	445 mm
Max. Cutting Radius	203 mm
Models Available	171–445 mm

Secoroc GM RH Hydraulic Grinder

- Fully hydraulic powered – designed to be mounted on a surface crawler
- Simple to use, low noise levels

Air Pressure	6–7 bar
Air Consumption	40 L/m
Speed, Spindle	14,900 rpm

Secoroc T60 T-WiZ Tophammer Equipment



- Up to 30% longer service life
- Easy uncoupling
- Faster penetration rates
- Tough thread system with greater stability
- Fewer rod changes
- Pair T-WiZ with Secoroc top hammer bits
- More holes per shift
- Available sizes: T-WiZ38, T-WiZ45, T-WiZ51 and T-WiZ60

Secoroc Dirt Digger PDC Drill Bits

- Smoother drilling operations and increased penetration rates
- Force-balanced PDC cutter locations minimize bit whirl and drill precise holes
- Asymmetric blade design reduces harmonics
- Longer bit life
- Designed with economical steel
- Optimized cutter distribution
- Sizes: 76–311 mm

Secoroc Reverse Circulation Bit

- Sizes available: 136 mm, 140 mm, 143 mm, 146 mm, 152 mm, 165 mm

Secoroc Klaw-style Hole Opener

- Utilize random cutting structure bit thirds, precisely positioned load distribution
- Maximize cutter count for hard applications
- Forward/rear taper if required
- Wide range of manufacturer threads in variety of shaft diameters

Atlas Copco to launch mobile 'opening hole' equipment

Atlas Copco will launch a new mobile rig for boring "opening holes"—raiseboring, boxhole boring and downreaming. Named "Easer," the rig can boxhole bore and downream to 750 mm in diameter, as well as perform conventional raiseboring to 1200 mm in diameter.

The Easer provides a more efficient and much faster way to drill up to 60 meter in length using standard 200 millimeter boring rods with a 228 millimeter pilot drill bit.

All the necessary operating equipment is part of the carrier, with the exception of the rods. The setup procedure does not require any site preparation.

The Easer offers the same drilling modes as traditional raiseboring rigs: boxhole boring, downreaming and conventional raiseboring. To switch from boxhole boring to downreaming, the gearbox is rotated 180 degrees—a simple operation that can be carried out in an underground workshop.

Atlas Copco business line manager, Underground Rock Excavation, Travis Battley said: "The Easer was developed to speed up the operation. The timeframe for drilling a 40 meter opening hole from setup to take down is less than 30 hours and setup and takedown are both done in less than one hour each."

Introduced in the mid-1960s, raiseboring technique has been a safe, productive raise excavation technique for underground mining. In block caving and most sublevel mining techniques, engineers create a number of short raises that allow rock to expand toward them during a blast.

Canada has new manager of underground equipment

Travis Battley is the new business line manager for Underground Rock Excavation, Canada.

Battley is replacing Lori-Anne Fleming, who is now working in another sales and marketing position with Atlas Copco. She had served as a business line manager since 2008.

Battley was employed by Atlas Copco Rock Drills in Sweden as Regional Business Manager Asia and Australia in the Global Business Team for URE. Before that he was product manager for Tunneling and Mining in Australia.

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