

UNDERGROUND

Drill Versatility



A Cubex 6200 drill with a Machines Roger V30 head combines productivity with versatility at Boliden-Westmin's Myra Falls mine.

Better overall drilling performance with lower overall costs. That's been the result for Boliden-Westmin (Canada) Limited at its Myra Falls copper and zinc operation on Vancouver Island with a Finning-supplied Cubex 6200 ITH (in-the-hole) drill, matched with a Roger V30 hammer. The drill was built by Cubex, of Winnipeg, and the hammer by Machines Roger International, of Val-d'or.

The mine acquired the machine after contacting Machines Roger to drill slot raises and service holes, initially in 1996 and again in 1997. Costs and productivity with the drill and hammer - the first drill machine in this configuration in western Canada - were then closely evaluated.

"Our main objective here was to speed up the process of drilling slot raises for long hole stopes, which is the primary method used to extract ore," reports Ike Isagon, Boliden-Westmin project engineer. "Starting in 1996, the project was initiated specifically to test the viability of this drill machine."

With the V30 hammer and an external booster compressor, the 6200 has a drilling range that is unique in its class, encompassing holes from 6 inches to 30 inches in diameter.

"You can use the 6200 for production drilling but we mainly use it for slot raises, fill holes, drain holes and other service holes," says Isagon.

"It is very fast so we've added productivity and flexibility in our drilling schedule. You can blind-drill upholes, for example, which makes it unique. For the drilling range that it has, it is also very compact and mobile so you can move it around quickly."

Mining at Myra Falls is conducted by drilling and blasting ore blocks called stopes, between sub-levels, then loading out the blasted rock from the lower level. Mining it designed to increase drilling and blasting productivity in order to



After two years in service, the drill has lowered costs and improved overall drilling performance, the mine reports. Above, Herve Bedard (l.) and Robert Johnson examine 6" pilot hole.

lower costs with improved safety.

With the system, Cubex is used with a Digger 6200LH hammer to drill an initial 6-inch diameter pilot hole. The pilot hole can vary from 60' to 100', depending on the required length of hole. Switching to a bigger bit, the hole is then enlarged to 10" in diameter.

With the pilot hole completed, the 6200 drill stem is fitted with the V30 head. The V30, which requires 340 psi to 350 psi, is powered by the booster compressor, which increases mine air pressure from the standard supply at 90-100 psi.

As the V30 head pushed through the pilot hole, it enlarges the hole to 30 inches in diameter, by using two Digger hammers with eight-inch bits in a rotating action.

Once the 30-inch hole is completed, production holes at 2 1/2" to 3" diameter are drilled around it in a diamond pattern. The 30" hole acts as a 'free face' for blasting the stope.

Loose ore produced by blasting is carried by a rubber-tired scoop (loader) to an ore pass fitted with a grizzly to capture oversized material, which is later reduced in size by a rock breaker. Ore is collected at the lowest level of the mine for transport by railcars to the main loading station for crushing. The crushed ore is skipped to the surface and conveyed to the mill plant. Once the ore is removed, the void is filled with backfill material with or without cement.

Boliden-Westmin (MYRA FALLS)

On the surface, run-of-mine ore is further crushed and ground into finer material and mixed with chemical reagents, in order to recover copper and zinc sulphides by flotation process. Copper and zinc concentrates are eventually transported from the mine by trucks to the port at Campbell River.

Marty Klotz, drilling and blasting coordinator, says that with the Cubex/Roger combo the mine can drill a slot raise, 30 inches in diameter by 50 feet to 60 feet in length, in about three days.

"Before we got the Cubex, we had to drill an inverse and drop raise, using the long hole drill in an engineered pattern. Then we had to blast to create the void and muck out and clean up the hole before we could continue. With the Cubex and the V30 head, we do the same amount of work in three days that took 10 days before."

He adds: "With this configuration, the bit is 6-1/2" in diameter while the rods are 5" in diameter. That gives you excellent stability. So on top of being very fast, you get a nice straight hole."

Bob Stewart, of Finning's drills and compressors division, says that in addition to the two-piece configuration (separate drill and booster compressor) that Myra Falls is using, the Cubex 6200 ITH is available with an onboard compressor.

"It is a bit larger in overall size, but it has the same capability as the compact 6200 model. Both of these drills can be configured with huskier top head modules and reinforced frames to take the Roger V30 reaming heads."

Both the 6200 and V30 head were acquired initially via a six-month lease with a purchase option, viewed by the mine as the most cost-effective way to prove the new system out prior to purchase, says Klotz.

"We were pretty certain the drill would give us the results we wanted as we had done thorough studies on it, including previous drilling contracts in 1996 and 1997. At the same time, the lease provided a training period to gain operating and maintenance skills. It gave us extra confidence in achieving the main objectives

of the project. We particularly wanted to see how the 6200 stood up over time to the vibration you get with a head like the V30, which is a fairly heavy piece of equipment. We felt the 6200 could handle it because it has a heavy-duty chassis and feed system - and

that proved to be the case. We have long since converted the entire package (including the compressor) from lease to purchase."

After almost two years in service, Klotz says the drill has performed with "excellent" reliability, little downtime, and low operating and maintenance costs. "It's worked out quite well here."

Adds Isagon: "At a productivity level of 1.2 meters per man-shift, which is pretty good in our operating standard, our drilling costs have been substantially reduced. On top of that, we have a machine with a flexible drilling operation, i.e., from 6 inch holes to 30 inch holes in diameter. In effect, our overall drilling performance has improved, and our costs have gone down." ■