



Thin wall core barrels improve productivity

Lighter means faster

Vale Inco's ore body exploration in the T-1 shaft at its Thompson minesite in Manitoba, Canada is a situation where Atlas Copco has been quick to respond to the customer's need for innovative products and after market services for exploration in extreme conditions. To satisfy the rigorous demands of this project, Atlas Copco supplied a capital, consumable, and total care solution. Highly productive double tube thin wall core barrels with light weight wireline drill rods, complemented by high performance diamond bits, were chosen to optimize the mobility and ergonomics of the Diamec U6 core drilling rig design features and realize the full productivity efficiencies of the complete package.

Unique challenges

Developed in 1957, and located in the Canadian province of Manitoba, the Thompson T-1 shaft first began production in 1959 and to date has produced more than 70.7 million metric tons of ore, for a total of 1.95 million kg of nickel. It is currently at a depth of 1 341 m.

Exploration is now being conducted at the 2800 ft level (850 m), where unique challenges had Vale Inco's Manitoba Operations seeking innovative and efficient solutions. They needed to commission a new drill for the exploration project and, based on past experience, their first call was to the Atlas Copco office in the provincial capital of Winnipeg.

Until this point, they had been using a skid-mounted Diamec 252 core drilling rig, which had given consistently good performance. However, moving the rig to different drilling locations in a single operator environment made it an impractical proposition. In addition, Vale Inco needed a rig that would work on multiple levels in the same



Drilling with BOTW Thin wall core barrels in underground application.

mine, including older areas with space-restricted access and different electrical requirements. It needed to be portable enough to be moved from station to station, narrow enough to fit in the cage, and safe enough for one-man operation.

Diamec U6

The compact design and flexible positioner allows a single operator, working alone, to set the feed frame in any vertical position from +90 to -90 degrees without moving the wireline hoist. In addition, the turntable option enables the drill to quickly be positioned in the horizontal plane.

The improved control panel on the Diamec U6 enables full control over drilling, giving the driller more time for emptying core barrels and preparing equipment. Most drills run as a two-man operation because, at a 850 m hole depth (2789') it is hard to hold the tube,

drain the water and get the overshot off. With the Diamec U6, a helper is not required and, because it is an integrated unit, it is much faster to move around to different set-ups. The mine is also impressed with the drill's design, mechanical availability and durability, noting improvements over what they have used in the past.

Vale Inco Manitoba Operations is using exclusively Atlas Copco ITH products for this project, and Atlas Copco impregnated diamond core bits.

"I'm very pleased with both the ease of use, manoeuvrability and overall production. I would absolutely recommend this unit to my drilling colleagues".

Gerald Carrier
DI Diamond Driller
and Supervisor



Thin wall

The project is taking full advantage of the AOTW and BOTW double tube thin wall core barrel designs.

Thin wall systems are built around speciality application tubing having thinner cross sections, which translates into lighter weight drill rods and thinner diamond bits. For drill rods, the weight reduction is a benefit for Vale Inco operators, and effectively extends the depth capacity of their drill. Complementary diamond bits, having to cut less rock surface area, require less feed force and yield higher penetration rates.

Ruggedly built by design, thin wall core barrels are used in all borehole orientations at Vale Inco, and are often extended to increase the total amount of productive drilling time by reducing tripping of the tools in deeper holes.

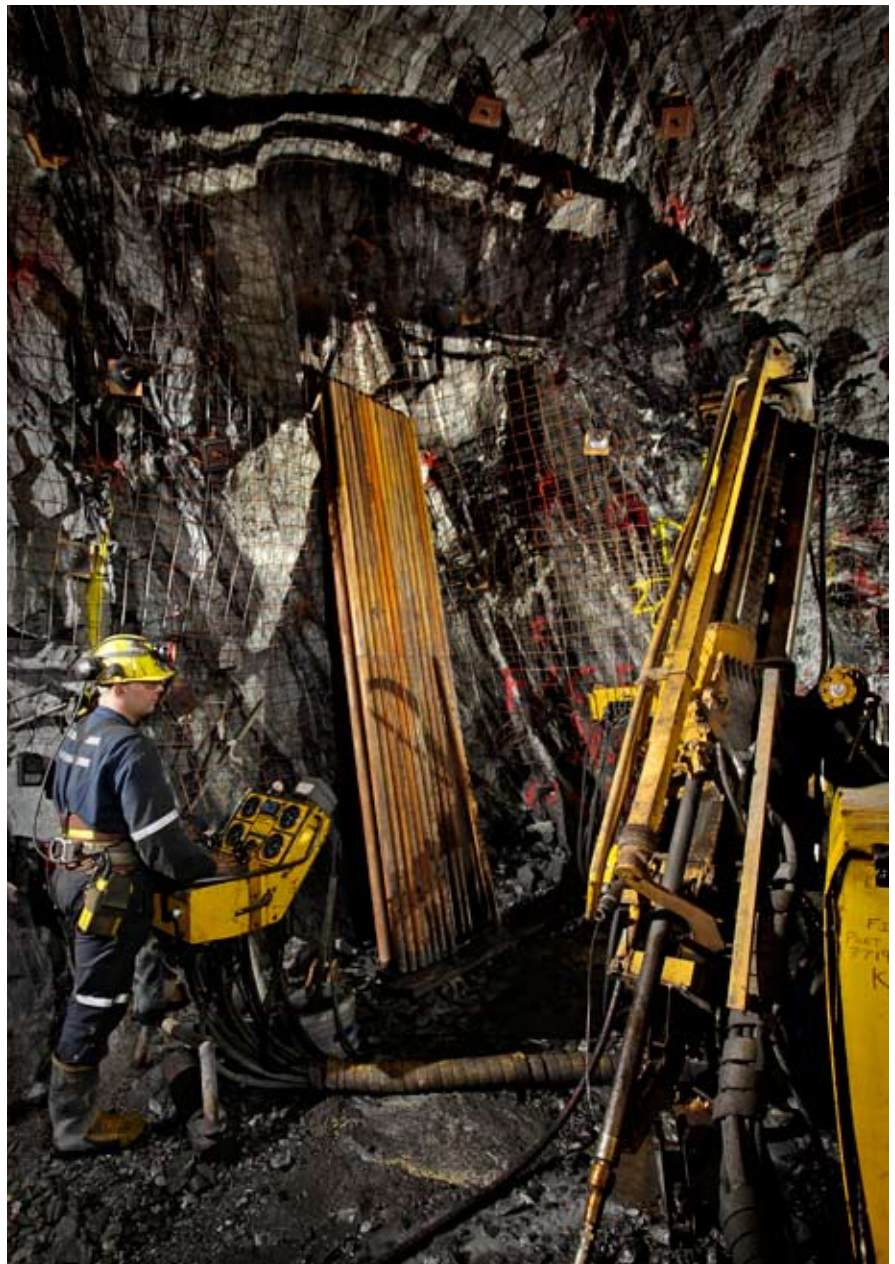
Vale Inco extract a more representative sample volume and increase measurable core recovery with a larger diameter core sample, without any increase to nominal borehole diameter. Some calculated trial and error is employed when finding the perfect combination of In-The-Hole tools for this type of underground project. Atlas Copco staff are experts on what the bits and core barrels have been designed for, supplying a range of products, testing them with the operator, checking the operating parameters against productivity and figuring out which product combinations work best under each specific condition.

“We’re averaging between 24 and 37 meters (80 to 100 feet) per shift. These are a little larger barrel, (core diameter) but they’re a lot more durable for the conditions and depths we’re dealing with here.”

Bradley Woytkiw
Driller

Customer communication

The commitment to superior productivity through dependable and innovative quality In-The-Hole products is a two way street. Like many other end users, Vale Inco Manitoba Operations uses



Diamec U6 core drilling rig using a Thin wall drilling package.

the full Atlas Copco line of exploration products and services, from the drilling rig to the bit, and all the tools in between. The Winnipeg location makes getting tools, parts and service to the operator much more streamlined.

Atlas Copco uses their Net Promoter Score (NPS), a customer-centric feedback survey, which assists them in product development and actively triggers improved service and communication with customers such as Vale Inco. The NPS survey involves the entire Atlas Copco organization and considers transactional surveys, such as when drills are delivered and when on-site

maintenance and technical services are performed. Atlas Copco and Vale Inco are taking their relationship to the next level by working together to develop an in-house drilling programme at the Thompson mine.

Acknowledgements

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