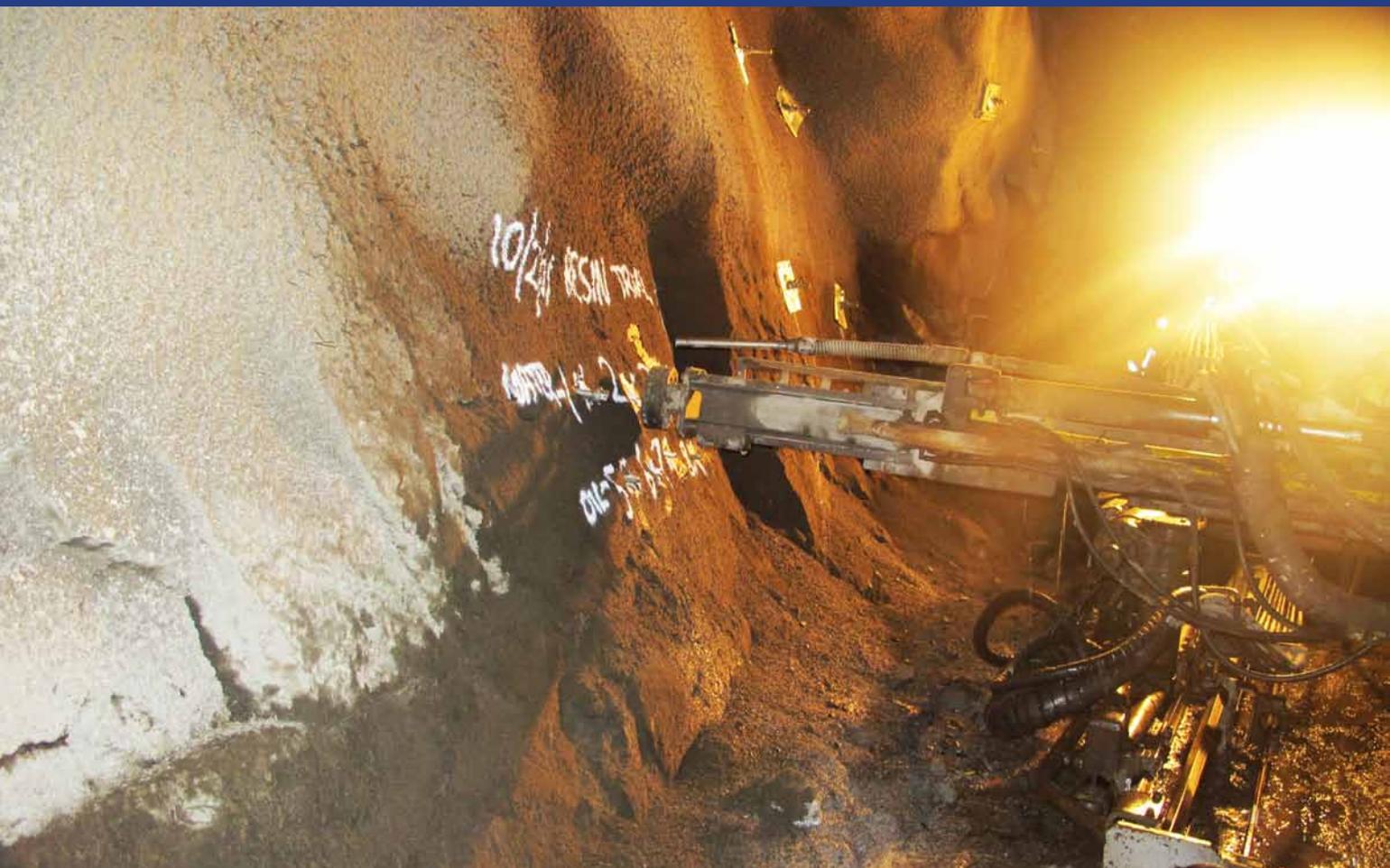


JENNMAR AUSTRALIA

INNOVATIONS IN GROUND SUPPORT



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Australia's underground mining industry is a challenging arena to work in, yet for mining and tunnelling services provider Jennmar Australia, it is these challenges that have brought about its success

In recent years, challenges within the mining sector have revolved around solving the problems encountered with adverse geological structures and high stress conditions—critical issues which can drastically reduce production and the income flows from record high commodity prices. Although adverse geological structures and high stresses are nothing new, the requirements of ground support vary greatly at each mine site depending on the experience of the mine personnel, the bolting equipment used, materials transport logistics and the strata conditions. These challenges have led to innovations that have been trialled and implemented in coal and metalliferous mines across Australia.

Jennmar's commitment to innovation and a systematic approach to solving site-specific problems has led to the development of a broad product range that significantly enhances workplace safety, quality and productivity.

In the base and precious metals market, Jennmar Australia provides a full range of products to metalliferous mines, utilising innovations designed for specific applications and tested onsite. Jennmar's commitment to technical support and services continually underpins these research initiatives, and this has resulted in the metalliferous division becoming a division in high demand.

Jennmar's metalliferous mining manager Anthony Dodds highlighted the Jennmar Yield Lok Bolt and the Jennmar Shotcrete Depth Indicator as two recently-patented ground support technologies that have been trialled, tested and implemented



Jennmar testing of ground support at hardrock mine

at major mine sites. The Yield Lok Bolt plays a crucial role in preventing rock bursts, one of the greatest challenges to ground control in the mining industry. It was developed as the solution for seismically-active geotechnical domains in underground metalliferous mining operations. The redistribution of stresses in the rock strata during mining activities can trigger the rocks to break in explosive events as the strata re-establishes equilibrium.

“These bursts, which can also be triggered by natural or induced seismic activity in the mining environment, have increased the need for yielding rock support,” explained Trent Roberts, geotechnical engineering manager at Jennmar.

Development started in 2008 with the first conceptual designs of the Yield Lok Bolt. The next stage saw the testing of the bolt at the Canment laboratory in Canada, where it underwent large scale dynamic testing to prove the product’s capacity under dynamic loading. The initial bolt was made with the minimum yield and ultimate tensile load of 12.7 tonnes and 17 tonnes respectively. The bar is upset to specified dimensions at one end and partially or fully encapsulated in an engineered polymer coating to achieve designed yielding performance under dynamic loading.

The end profile of the polymer coating is configured to aid insertion of the bolt and provides shredding of the resin cartridge

“IN THE BASE AND PRECIOUS METALS MARKET, JENNMAR AUSTRALIA PROVIDES A FULL RANGE OF PRODUCTS TO METALLIFEROUS MINES”

film. The other end of the bar is threaded for tensioning with a standard 36AF nut. A dome plate washer is used for angle compensation and to load the bolt axially. The bolt is designed to be installed by Jumbo into a standard 35mm diameter borehole.

Jennmar’s Shotcrete Depth Indicator was developed to counteract the challenges that surface when installing rockbolts

and the application of shotcrete to secure underground strata, a daily practice in many hard rock mines.

“Controlling the thickness of applied shotcrete is a critical process and a principal component for a permanent ground support system,” Dodds said. “When the ground support system requires the application of shotcrete over installed rock reinforcement, an accurate measurement of shotcrete thickness is required to achieve the full potential of the ground support system.”

The Shotcrete Depth Indicator maximises the efficiency of this process, as it provides a visual indication of shotcrete thickness during application in real time. The process involves the use of a separate component ‘cup’ to change the height requirement of the installed ground reinforcement element or extending the height of existing fixing element or nut to achieve the specified height. The reinforcing element is then used to provide an effective visual indicator for measuring shotcrete or fibrecrete depth. “By changing the height of the element, an accurate thickness of shotcrete and fibrecrete can be applied quickly and efficiently to reinforce existing support,” Dodds explained.

Jennmar’s metalliferous division has



Yield Lok trials



Workers underground during Yield Lok trials

“JENNMAR’S METALLIFEROUS DIVISION HAS ESTABLISHED ITSELF AS A LEADER IN PROVIDING SITE-SPECIFIC SOLUTIONS TO THE HARDROCK MINING INDUSTRY”

established itself as a leader in providing site-specific solutions to the hardrock mining industry, working with the largest mining companies across a broad spectrum of commodities and geographical locations.

A working relationship with Mandalay Resources has enabled Jennmar to develop a complete range of products that have increased safety and efficiencies in narrow

vein mining conditions. This includes the use of air leg bolting systems where installation processes have been made more practical for the safe installation of resin bolts compared to previous methods used. “There was a lot of work carried out through trial and error to get a resin bolt system to work effectively by eliminating a process which was previously used on site,” said

Dodds. “This was a process that the onsite geotechnical staff worked in conjunction with Jennmar site personnel to develop, and that relationship, with a determined attitude, was the catalyst for the successful bolting method.”

Regular training was an important part of the process and Jennmar provided operator training to ensure the new process was accepted with complete understanding of the requirements for a safe and effective installation. The training is an ongoing service provided by Jennmar to capture new staff and ensure any transition is as seamless as possible. “Training is a critical factor whenever change is introduced,” said Dodds.

A total commitment to quality, safety, service and continuing innovation: these are the principles that guide Jennmar Australia at every stage of the manufacturing and supply process, said Fernando Gesto, Jennmar Australia’s national commercial manager, in providing a product range that is backed up by technical support from industry experts that is second to none. This is what makes Jennmar the provider of support you can trust underground. **BE**

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