

Perennial Parsons

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CHINA National Coal Mining Equipment has been on a mission over the past 18 months to prove itself on an international stage. The first link to Australia is its Chinese-manufactured Parsons Chain product which has already found a home at Mandalong and Moranbah North mines.

CME's roof support assembling facility.

The Parsons Chain China factory.

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CME bought the Parsons Chain manufacturing plant and intellectual property rights for Parsons Mining Chain, picked up the factory and planted it in China. It had to prove to the world's longwall industry that it could make the same quality chain as the former United Kingdom owners.

With help from some former Parsons experts, rigorous quality standards and positive results from its first international buyer, the company believes it can reach its goal as number one longwall chain manufacturer in the world.

Operational since 1958 and in joint venture with Parson's UK for 10 years, CME's chain factory at Zhangjiakou (north of Beijing) was the obvious choice as a buyer when Parsons' UK parent company FKI decided to sell off its chain arm.

So in March 2006 negotiations began, and in August the factory began to be moved and installed in Zhangjiakou. The factory is now producing up to 48mm chain with Centennial Coal's Australian operation, Mandalong, the first international buyer, recently installing a 42mm Compact Xtra chain.

The Mandalong order was placed just as the transition began to China. While there was some trepidation at the beginning, Centennial agreed to proceed with distributor Elton Longwall under conditions. An acceptance criteria spreadsheet was developed to ensure the product out of the UK was the same quality as that made in China, including chemical, dimensional and heat treatment analysis.

During the manufacture of the chain, Elton Longwall managing director Mark Newton and Parsons Chain's Dr Jeff Price followed on site the chain through the factory and checked each item off the spreadsheet. The analysis showed the

Chinese product was exactly the same as the product made in the UK.

During July Newton took the first measurements of the monitoring he will do at Mandalong for the life of chain. With an excellent benchmark to work on, from previous Parson Chain's performances at the mine, the elongation and sprocket depth and smoothness of cut on the drive link of the chain showed the same as that of the UK product. Ellton will take the measurements every six weeks with a gauge developed by Newton for accurate elongation measurement so they "can be part of the solution, we are not just a sales organisation". Ellton also supplies chain maintenance and monitoring services for top performing mines in Australia.

During monitoring of the connectors, sprocket cut and overall appearance of the chain are also checked. The monitoring gives Ellton the opportunity to recommend when to end, for ending the chain or turning through 180 degrees is required during a longwall move. This allows the whole chain to be worn more evenly, increasing its overall life.

Anglo Coal's Australian mine Moranbah North has also placed an order, with delivery in October (also under an acceptance criteria spreadsheet) and Chinese domestic sales have hit the ground running with Shenhua ordering the Parson's chain.

"For the Centennial and Anglo chains we wanted to make sure, for our own safety, that we were supplying product the company wasn't going to throw back in our face. I wouldn't sell the chain if it wasn't the best "it is my reputation on the line too," Newton said.

CME has gone to great lengths to ensure the quality of chain produced is exactly the same as that of the former UK owner. Raw material and forgings are still sourced from Corus steel UK. CME vice president and China Coal Overseas Development managing director Julian Dai is confident the product is of the same quality as the past UK chain, "if not better".

Part of that focus on quality has been inherited by hiring four ex Parson's Chain experts who have spent a great deal of time in China over the past year, passing on project management, quality control procedures and research and development expertise to the Chinese factory.

Former Parson's MD, and now MD for FKI switchgear, Brian Gardner, said he was confident CME would reach its objective to become the number one mining chain supplier.

He said his optimism was for several: the "remarkable progress" made at Zhangjiakou with the purchase of new equipment installation of Parson's process line; "the same process, same raw material, same forging and same processing all supported by UK technical experts"; and during the evolution of the project the "desire and drive" at CME he witnessed for the project to be successful on a strategic and operational level. "They will hit their ambitious path," Gardner said.

The process at Parsons China begins with steel that arrives from the UK, which is first checked for roundness before it goes through a spark spectrograph to ensure all allowed elements before cropping to length and fed into a lacing machine. Forgings sourced from Premier Stampings in the UK are also fed into the machine for lacing of the compact chains.

It is then shot blasted to remove any outer imperfections and then fed into a fusion welder. Next is calibration (pulled to

length) before heat treatment. There is then the differential hardening and tempering process.

Unlike other manufacturers, the chain is tempered through a rotary hearth furnace (other manufactures use an induction coil) where the steel is heat soaked to give it a more consistent grain structure. It is then shot blasted to clean it again and laid out into matched pairs.

When Australian Longwall visited the Parsons Chain China factory it could see

Quality assurance - with every link inspected - at the Parsons Chain China facility.

CME had paid extreme attention to quality assurance with every link inspected and chains checked all the way through the process. Each 50m matched pair is over-manufactured by 1 metre so it can be destructively tested to check for hardness, charpy value of the weld, fatigue, tensile and maximum elongation before it breaks.

Parsons Chain China have also expanded or improved on the former UK owners. There is now a 400 tonne tester for the 48mm chain, whereas Parsons had a 300t; they have larger capacity with three MRP machines where Parsons UK had one, and the machines have fume extractors to make the factory environment better to work in.

When Parson's changed hands it left a hole in the chain market. None of its speciality products were available - including its patented COR-X especially made for corrosive conditions. The hole also meant chain has been hard to come by and mines have to suffer excruciating long lead times. Those lead-time are about to change with Parson's China up and running, and with additional capacity to Parsons UK.

The Zhangjiakou factory will manufacture all of Parson's flagship products including Xtra Quality and COR-X chains. The Xtra chain has more strength and less interlink wear which both equal increased life. The chain is made through a two-stage induction heating process to harden the crowns to resist wear but leave the legs softer for cyclic endurance. The Xtra product can be found at Consol Energy mines (under a prior contract supplied 13.5km per year of 42mm chain), Deserado, Mettiki, Australian mines BHP Billiton and Centennial, and mines in Russia, Poland and China.

The COR-X chain, a patented Parsons product, resists stress corrosion cracking. This cracking is created when fatigue cracks grow faster in a corrosive environment. The COR-X chain can be found at Oak Grove, San Juan, Dugout, Australian mines Moranbah North and Newstan, and in Poland. San Juan has had 48mm chain installed since 2002. The mine's last installation was in June 2006, and has produced over 8 million tonnes.

Parsons China plan to break back into their traditional markets, and increase their market share through price competitiveness - despite the increase in steel prices the chain has managed to hold at early 2006 prices; and reduced lead times - a full-face chain will spend 40 days at the factory, plus shipping times as low as 15 days from China.

Newton says the chain product is the first step in changing Western mines' perceptions of Chinese equipment. "The first new mine that bites the bullet and buys from the Chinese will open the flood gates. The chains are the first part of that. They prove the quality in the chain and are running that philosophy back through the entire company with all its longwall equipment," Newton said.

This month Elton Longwall's work with CME reached its climax at AIMEX, with the company's stand showing off a package of longwall equipment. On 170 square metres of stand, Elton will exhibit a full-size roof support, shearer ranging arm, Parsons Chain, sprocket, connectors, pan line, working mini-model of a shearer, AFC and BSL conveyor.

The mini-build is a full working model, built to scale at one sixth of the size, and made from steel. Newton said AIMEX was a culmination of 10 months of working with CME.

"The Chinese can offer a level of service and cooperation to the Australian market that it couldn't even conceive. The service, price and spare parts supply is second to none and sure to shake up the market. CME sells equipment on performance-based contracts so it is in their best interest to make sure the equipment produced is beyond expectations."

CME's Zhangjiakou AFC, BSL and crusher manufacturing plant makes various series of medium and heavy duty AFCs with highest capacity of 4500t/h. It dominates more than 60% of AFC market in China producing 200 face conveyors a year, exporting to countries such as India, Turkey, Russia, Bangladesh and Vietnam. It is the first to develop 3x1000kW AFC which will be delivered to Shenhua in August.

The Chinese certainly also have the capacity to serve the Australian market. CME's roof support factory in Beijing produces 5000 supports a year, with exports going to the US, Vietnam, India, Russia and Bangladesh.

The factory has produced 300 different types of roof supports, with heights ranging from 1.9m to a massive 6.5m. This year the facility aims to produce 90,000t of supports.

At the factory there are 3000 workers, with 150 people employed to supervise quality control. The latest C&C and robotic machines are used, imported from Japan and Germany to meet European standards. The raw materials are sourced internationally and domestically to meet the customers' requirements.

CME's shearers will be manufactured in Xi'an (1100km south-west of Beijing), by Xi'an Coal Mine Machinery, which CME is in the throes of buying.

The company has been operating for 51 years and has cooperated in the past with Eikhoff. Last year the facility produced 108 shearers - bound domestically and to India, Russia and Bangladesh. Shearers boast a six-month lead-time.

Interestingly during manufacture one cast is used for the ranging arm to ensure strength. It has also set up a control room on site to monitor its shearer performance via the internet from anywhere in the world.

At the end of this year 12 sets of machining centres will arrive, representing a \$10 million investment and increasing the

facilities capacity.