

Powerful Protection

Fluid Couplings for Armored-face Conveyors

C. Gold, Germany



Fig. 1: Voith has developed a new coupling for armored-face conveyors.

To meet China's enormous demand, more and more coal has to be mined within shorter times. During mining the coal is transported from the seam on armored-face conveyors. For the conveyor drives, Voith Turbo has developed one of the world's most powerful mining coupling with a transmission capacity of 1600 kW.

The figure alone is almost unthinkable: at present, Chinese mines extract about three billion tons of coal per year. This statistic from the International Energy Agency makes China the world's largest producer of bituminous coal, followed by the USA, India and Australia. And the output continues to increase. In order to meet the country's enormous demand, more and more coal has to be mined within shorter and shorter times.

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For the conveyor drives, Voith Turbo has developed one of the world's most powerful mining coupling with a transmission capacity of 1600 kW – the CPC 1600 (Chain Protection Coupling).

Increased Efficiency

The new coupling is a further development of the 1200 kW CPC 1200 launched by Voith only about a year ago. Since their market introduction, 20 CPC 1200 couplings have been successfully installed in various Chinese coal mines. In principle, both couplings have to fulfill the same requirements: they have to work reliably under extreme operating conditions in underground mines. Both are robust and cope with rough surroundings, for example high amounts of dust and debris from fallen coal.

Both couplings are fill-controlled and use water as an eco-friendly, non-flammable operating fluid. The CPC 1600 is currently the most powerful hydrodynamic AFC coupling for OEMs. In order to achieve this increase in output, Voith has developed a fundamentally new geometry of the runner parts.

A coupling of this output class offers a number of clear advantages to operators: compared to a standard coupling of a similar size, the transmission output of the CPC 1600 is 60 percent higher. In comparison with the CPC 1200, the increase in performance amounts to approximately one third. As a result of this improved capacity, the ten to twelve meter high coal faces in Chinese and Australian mines can be cut to their full height. In short, the CPC makes coal extraction even more efficient, as none of the seams remain unexploited.

Peak Periods

The CPC 1600 offers the same advantages as any other Voith hydrodynamic start-up coupling. It ensures that the armored-face conveyor starts reliably, even if fully load-

ed. At the same time, the coupling protects the drive motor against overloads.

If oversized lumps of coal cause the conveyor to jolt, the fill-controlled Voith coupling 'slips' as a result of its hydro dynamic characteristics. This 'slip' provides effective protection for the entire driveline and especially the conveyor chain. Should the conveyor be blocked, the CPC 1600 shows its particular strength: during several start-up attempts, it can transmit a peak output of 4 MW, until the conveyor finally breaks away. This output corresponds to the power of approximately 40 mid-range cars.

Miners appreciate this extra strength, because they do not have to clear the conveyor by hand. Additionally the cou-

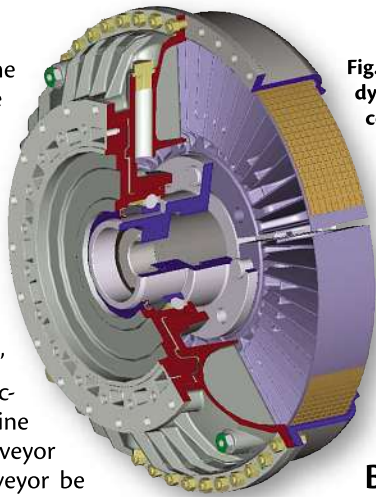


Fig. 2: The 'slip' of the hydrodynamic coupling protects the conveyor chain.

pling increases overall operating safety, because it is extremely reliably due to its wear-free power transmitting capabilities.

Big in China

During its inspection in front of Chinese customers, the CPC 1600 proved its function and its efficiency: a test run in Crailsheim demonstrated that the coupling meets all aspects of the required performance profile.

In the middle of January, the coupling was handed over to one of the leading mining equipment suppliers in China and

has since then successfully passed all tests. Chinese OEMs and mining operators have been relying on the advantages of hydrodynamic couplings in armored-face conveyors for many years. Voith is a regular supplier to Chinese AFC manufacturers and also provides round-the-clock service to its customers in China with its own country-wide sales and service network, offering installations, commissioning and maintenance of Voith couplings. ■

Contact

Voith Turbo

Mr. Christian Gold
 Voithstraße 1,
 74564 Crailsheim, Germany
 Tel.: +49 (0)7951 32 1333
 Fax: +49 (0)7951 32 665
 E-Mail: c.gold@voith.com