FOR IMMEDIATE RELEASE

Cutting Water Use While Optimising Coal Washing Efficiency

The growing scarcity of water is placing pressure on the coal mining industry in many countries. On the one hand mines must treat more lower quality coal as better coal reserves are depleted which coincides with increasing tonnages, and on the other they must reduce water consumption. The coal preparation process is normally water-based and uses substantial amounts of water, so optimising its performance will impact positively not only the environment but also the bottom line.

One important response to this pressure has been the move from the traditional technology of bath washers to centrifugal washers like cyclones, as this allows for a higher tonnage per footprint while maintaining optimal separation efficiency. Depending on the coal characteristics it may be possible to reduce the medium to ore ratio while still maintaining optimal separation efficiency and by doing so reduce the water use in the medium circuit. These types of changes can, however, only be made if the material characteristics, the separation process and factors affecting the separation process are properly understood.

To optimise the effectiveness of cyclones, the parameters surrounding the dense media separation (DMS) cyclone must be well understood. The cyclone's efficiency is determined by the nature of the feed, by the cyclone's dimensions and maintenance and by the circuit's influences on the equipment.

The cyclone appears to be a simple piece of equipment, but the operator needs to understand the physics of how it operates, as well as the mechanism of separation. For this reason, Multotec introduced short courses for customers, addressing topics like principles of separation, operation and fault-finding.

An additional process that is incorporated into modern designs to reduce water loss is the use of coal centrifuges which can reduce the surface moisture content of the dense medium circuit product from 8 to 15% to 5 to 12% depending of the size of particles being processed. A proper understanding of the design of this equipment and factors affecting the performance of centrifuges goes a long way in helping to optimise this process.

The performance of screens is also becoming an important point of focus in coal washing, in the light of rising tonnages per footprint and medium volumes. Factors such as bed depth, spray water addition and the open area on screen panels all affect the performance of desliming screens. Here, it is vital to understand screening principles, so that optimal screen performance is ensured; this not only improves screening efficiency but also conserves water.

With drain and rinse screens, it is crucial to drain higher volumes of medium associated with ever increasing tonnages being processed, to minimise medium losses. While it may not be practical to replace the screen with a larger version, alternative screen panel designs may be an option to improve drainage capability.

When drain sections perform optimally, they reduce the need to add more spray water on the rinse section of the screen, saving water. The Multotec short course on screening principles transfers knowledge to customers and industry on how to achieve this.

The fine coal circuit is also an area deserving of focus, especially with increasing feed tonnages being fed to coal preparation plants. Not only can this circuit become a bottleneck if it is unable to process the full fine fraction stream but as the separation process is mostly water-based this is where much of the water is used. The objective here would be to minimise excessive water use without sacrificing separation efficiencies. To achieve this objective a proper understanding is required of the limitations of each piece of equipment in the circuit as well as which process factors will contribute the most towards separation efficiency while reducing water consumption.

Again, Multotec's training courses focus on improving the operation's understanding of the equipment and how to improve its performance.

This kind of industry training can have a considerable impact on the sector's water footprint, if operators take the knowledge into their working environments and look proactively for opportunities to reduce water usage.

REDUCING PIC 01 : TeePee™ panels from Multotec provide significantly increased drainage capacity compared to conventional flat panels. The increased exposed surface areas enabling screens to operate at a higher capacity and ensures a 50% increase in effective drainage area.

REDUCING PIC 02 : This filter press is one of Multotec's large production designs and can treat 35 tonnes of coal per hours

REDUCING PIC 03 : Multotec has optimised dense medium separation in the pre-concentration of minerals, specifically in coal and diamonds, for over 40 years.

REDUCING PIC 04 : Multotec offers an extensive programme of customer training workshops that focus on principles of separation, operations and fault finding.

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