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World's First Suspended Superconducting Electromagnet

[Eriez Magnetics Europe](#), part of a worldwide group of companies, which presently holds the Guinness World Record for the world's largest suspended electromagnet, has designed and manufactured the world's first Suspended Superconducting Electro Magnet (SSE Magnet). This revolutionary technological achievement has taken magnetic separation into a new era. The Eriez SSE Magnet is by far the strongest suspended magnet ever built.



Eriez – Europe Plant in Caerphilly, United Kingdom

The Eriez SSE Magnet was purchased by China National Coal Industry Import & Export Group, for installation at the Qingdao Port in the Huangdao District of Qingdao City, China. The SSE Magnet will be suspended over a conveyor to attract and remove small ferrous metal contamination present in the coal. The conveyor transports the coal to the dockside where it is loaded onto ships for transportation to locations around the world for use, for example, in power stations. Specifically, the SSE Magnet will be used for the removal of detonating caps. These detonating caps present not only a fire and explosion hazard, but could also damage valuable coal processing and transporting equipment as well as degrade the value of the coal being exported.

The SSE magnet system incorporates a cryogenic superconducting magnet placed in a sealed vacuum enclosure incorporating two Cryo-cooler heads and a recycling liquid helium reservoir. This results in the coil temperature being maintained below 4 degrees Kelvin and therefore in a “Superconducting” state. Once ramped up, the magnet requires only a trickle of power to maintain its very high magnetic field. Until recently

superconducting magnet technology has mainly been used in medical environments, but now its benefits can be applied to industrial advantage. The new magnetic system, by harnessing and adapting superconducting technology, means that iron contamination in coal can be substantially reduced. Conventional suspended electromagnets have up to now been limited in the separation levels obtainable over high capacity conveyors, especially with regard to small ferrous tramp metals and detonating caps. The new magnet provides a field intensity of 4,000 Gauss at a suspension height of 550mm. This results in an extremely high force density, leading in turn to a significant improvement on the separation performance previously attainable.



Eriez representatives (L to R) Xuan Kou, Sales Engineer from Eriez – USA and Andy Lewis, Managing Director of the Eriez – Europe operation, congratulate Huang Shu Cheng, General Manager and Tian Guo Chen, Project Manager of China National Coal Qingdao facility.

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The commercial benefits of such superior tramp metal separation performance include improved end product value and increased productivity, since damage caused by contamination can result in serious downtime problems. Achieving a cleaner grade of coal is also of paramount importance to China National Coal in terms of meeting the stringent quality standards of its export customers.

China National Coal's choice of the Eriez SSE Magnet is an important endorsement of Eriez as a supplier and of the continued development of advanced and groundbreaking magnetic separation technology. [Click here](#) to read the story, as published in the