

Coal Preparation Plant | Coal Preparation Process | Coal Washing

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What is Coal Preparation Plant



Coal preparation plant is a coal processing plant that include a series of processes: raw coal screening, crushing, coal washing, separation, clean coal dewatering and slime recycling. Which can separate coal from impurities, remove mineral impurities from raw coal and divide it into different specifications of products.

The main products of the coal preparation plant are clean coal and lump coal, as well as by-products such as medium coal and slime. Usually coal preparation plants are divided into:

- **Coking Coal Preparation Plant:** It produces low ash clean coal for coking.
- **Steam Coal Preparation Plant:** It produces fuel coal for thermal power generation, steam locomotives, boilers and raw coal for chemical industry.

Why is Coal Preparation Need

Raw coal is mixed with various mineral impurities in the process of formation, and inevitably mixed with rocks and other impurities in the roof and floor in the process of mining and transportation. So the raw coal must be prepared, the main purpose of coal preparation can be summarized as follows:

- (1) Remove impurities in run-of-mine coal, reduce ash and sulfur, improve coal quality and meet the needs of users;
- (2) Divide coal into different quality and specifications to meet the needs of users, so as to make effective and rational use of coal and save cost;

- (3) After coal washing, gangue can be discarded on the spot, which can reduce invalid transportation and create conditions for comprehensive utilization of gangue;
- (4) Coal washing can remove most of the ash and 50% – 70% pyrite sulfur, and reduce the air pollution caused by coal combustion. It is the premise of clean coal technology.

Coal Preparation Process



Crushing & Screening: Raw coal is transported to crushing workshop by belt conveyor. First, it is pre screened by a circular vibrating screen with a sieve opening of 50 mm. +50mm materials and extra large gangue enter the crusher and are crushed to – 50mm, and then transported to the coal washing plant together with -50mm raw coal that under the vibrating screen.

Coal washing usually include two main coal preparation processes: density separation and flotation separation.

Jig Density Separation: Raw coal in the coal washing plant is distributed to two raw coal buffers by scraper transporters, and two chain coal feeders are fed into two jigs respectively. Raw coal is divided into clean coal, medium coal and gangue in the jigs.

After the medium coal and gangue are dewatered by the bucket elevator, they enter the medium coal and gangue bunker respectively, and then transported by the automobile as the final products. The clean coal is graded and dewatered by a linear vibrating screen with sieve hole of 13mm, and the coal under the screen enters the pit for grading.

Clean Coal Dewatering: The 13-0.5mm clean coal in pit is first dewatered by bucket elevator, secondly dewatered by centrifuge machine, and then transported to the clean coal storage yard by belt conveyor as the final product together with the clean coal on the screen.

Flotation: The overflow from the pit enters the flotation feed pool and is pumped to the pulp preprocessor through the slurry pump. The foaming agent and collector are added to the pulp preprocessor, and the coal slime water after adding auxiliaries flows into the flotation machine.

-0.5mm slime is separated into clean coal and tailings in the flotation machine. The flotation clean coal flows into the flotation concentrate pool and is pumped to the clean coal filter press for dewatering. The dehydrated flotation clean coal is mixed with jigging clean coal as the final product.

Tailings Concentration: Flotation tailings flows into the tailings pool of the concentrator workshop and then pumped to the paste thickener, usually 2 paste thickeners are required to stand by each other to ensure that when an accident occurs in the thickener, the slime water will not be drained out.

Slime Management: The bottom flow of the concentrator is dehydrated by the filter press, and the filtered slime is transported to outside of the coal preparation plant. The overflow of the concentrator and the filtrate of the filter press flow into the circulating pool in the concentration workshop, which is pumped to the jig and recycled.