

Rotary Drum Coal Drying Technology and Plant Design

Coal Drying System Process Flow

Coal (Wet Basis) from Coal storage yard or coal mine is loaded into belt conveyor and conveyed to sealing feeder for a direct fed into the JNG energy saving drum dryer. After undergoing a process of medium heat exchange drying, the coal is loaded into discharging conveyor belt from the discharging box. Then the coal is conveyed to THE storage yard.

Hot medium (hot fuel gas) for coal drying is produced and prepared in coal-fired hot blast heater. The environment air, which is sucked into the flue pipe with air blower and hot fuel gas from the hot blast furnace, is sent to drum dryer after temperature adjustment where it heats the wet coal and absorbs the water vapor. The mixture of hot gas and water vapor go through discharging box and flue pipe and is sent to dust collect cyclone for powdered coal recovery. The preliminary purified gas is sent to bag filter for further purification. Then the waste gas goes through the exhaust funnel and is discharged to the atmosphere by the induced draft fan.

The powdered coal collected by First Stage dust collector is loaded onto discharging conveyor by discharging spiral and sealed coal discharger, then mix with the dried coal. The powder coal collected from the second stage bag filter is loading into discharging conveyor by discharging spiral.

The system process flow is as shown in Figure 1. The system principle of drying process is as shown in Figure 2. The real scene of the workshop is as shown in Figure 3. The dried Coal is as shown in Figure 4.

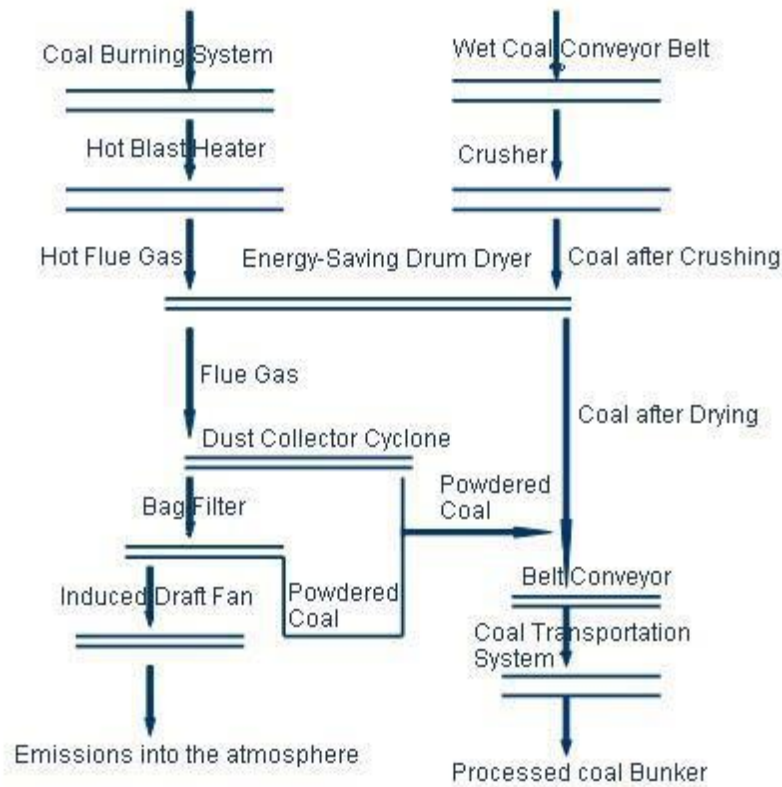


Figure 1 Drying System Process Flow

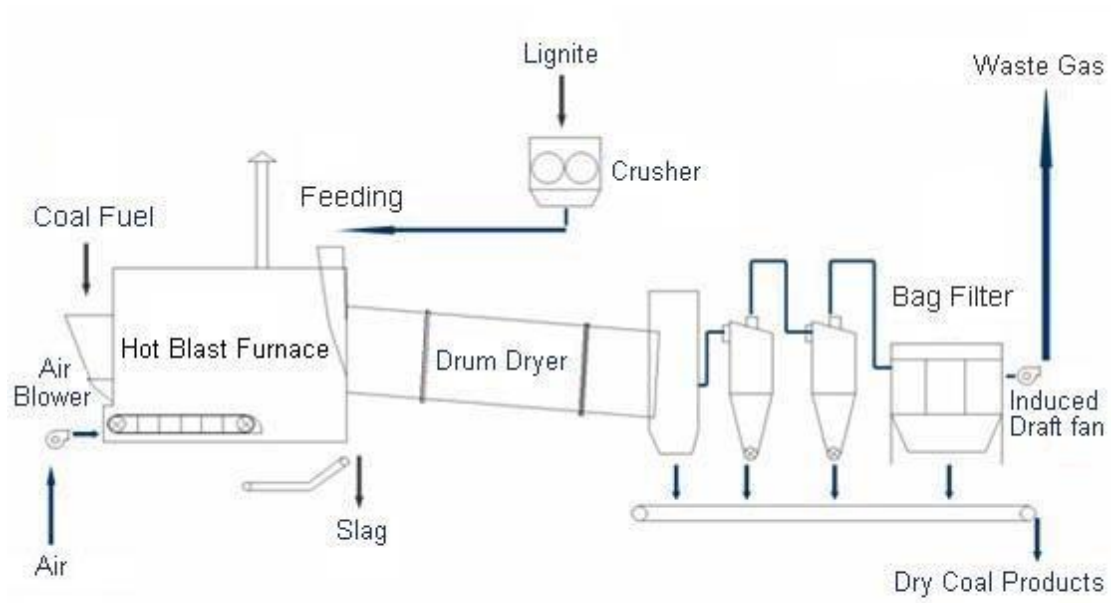


Figure 2 Principle of Drum Drying



Figure 3 Real scene of the workshop



Figure 2-4 Coal after Drying

Drum Coal Drying System

The drying machine is a rotary metal drum, which is set at an angle about 3-5 degree and rotates at a speed of 2-8 R/Min. The coal remains in the drum for 8-12min. The coal drum dryer are uniflow which mean the hot fuel gas and coal are fed in one end and discharged at the other. The heat exchange takes place during the process of gas-solids concurrent flow in the drum.◦

1. The process is simple and operation reliable. The factory is reasonably and compactly laid out as a whole with a combination of feeding,

crushing, drying and discharging. The total investment is low and service life is long.

2. The temperature of the heat transfer medium can be up to 600°C, and down to 100°C when discharging. The drying thermal efficiency is high compared with other drying system.

3. The feeding quantity is adjustable with sealed coal feeder. The coal flows fluent and unblocked.

4. Measures are adopted to collect the dust and prevent the smoke at the drying drum, hot blast furnace and system transfer point. You will not see the air rebounded with dust and smoke

5. Automatic monitoring system can monitor temperature and pressure at four points: furnace, dryer inlet, and dryer outlet, inlet of induced draft fans which guarantee the normal and safe production.

6. Big volume drum dryer is adopted to shorten the residence time of coal in the dryer to prevent coal burning and pulverization.

7. In designing the drum dryer, we consider reliable performance, high capacity, high thermal efficiency, avoidance of caking, etc. In designing furnace, we consider easy ignition, quick heating, etc. In designing the dust collector, we chose deducting cyclone, which is high temperature resistant and without moving components, and high efficient pulse bag filter.

Company Introductions and Project Case

Company Introduction

China Coal Research Institute, Tangshan (Coal Preparation) Branch, the only large science and technology institute in China engaged in professional research in coal separation, mine measurement, hydraulic mining and pipe transportation, was established in 1956. In July 1999, the institute was transformed into a scientific and technical enterprise resorting directly under the central government. Currently, the institute has 816 staff members which include 430 professional engineers and technicians. Among the professional engineers and technicians, 158 are professional researchers and senior engineers including 53 experts who enjoy a special subsidy of the state council.

The Drying Research Department of China Coal Research Institute, Tangshan (Coal Preparation) Branch enjoys a history of more than 40 years, which has succeeded in assuming numerous national-level development topics and transverse technical services. It has accumulated abundant experience in the study of new technologies on dewatering, frost protection and drying as well as development of new products. It has a good command of both domestic and foreign information on drying technologies and trend of development and research of new technologies. In recent years, it has made extensive

efforts on the development and research of technologies on crushing and drying of sludge, and has obtained numerous technological achievements and national-level patents of advanced international level. In this year, the company accumulated abundant practical experiences through profound study of drying for brown coal and successful application of drying proposal with energy-saving drum in drying of brown coal.

Our research office has high technical strength and abundant work experience, which can assume technical and equipment design as well as provision of supporting equipments for coal drying system. It can also provide hot blast stove, dust collector, feeding and discharge machines as well as system auto monitoring equipments compatible with drying system. Owing to the adoption of new technologies, new techniques and new equipments, this system has a profound application in coal selection industry, chemical industry and coking industry both domestically and abroad, and has brought considerable economic and social benefits for its customers.

In recent years, the research office has abundant experiences through extensive efforts on the research of coal drying technologies, and has obtained numerous technological achievements and national-level patents of advanced international level.

Project Case in Recent Years

1. Project Name:

First Stage Drying Project of Henan Tianhong Coking (Group) Company
Second Stage Drying Project of Henan Tianhong Coking (Group) Company
Pinmei Group Feixin Chemical Limited Company
Pindinshan Jianhong Coke Company Limited
Tianjin Soda Plant
Xiaoyi Jinhui Coking Company Limited
Pingdingshan Jiuding Trade & Industry Co.,Ltd
Pingdingshan Hongyao Coke Co.,Ltd
Inner Mongolia Yidong Keyu High Technology Development Co., Ltd
Handan Coal Prep Plant of Fengfeng Group
Coal Chemical Branch of Datang International
Juyi Coal Chemical Group
Coal Chemical Co.,Ltd of Inner Mongolia Qinghua Group
Banshi Coal Co.,Ltd of Yunchun Mining Group
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Photo of Drying Plant





Please provide the following information for a preliminary coal drying system design and quotation

1. What is the particle size distribution of the raw coal? Please note that the coal fed into our drying system should be less than 50mm.
2. What are the requirements of drying capacity per hour and per annual? What is the local work system about working hours per shift and per day? How many days they work per annual?
3. What is the moisture content of the raw coal as received basis? What is the moisture content on air dried basis?
4. What is the lower heating value of the raw coal?
5. What is the requirement of the moisture content of the dried coal?
6. What is the local climate condition?
7. What's the coal type?

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