Injectors or jets in flue gas treatment systems

I. Flue gas treatment system

The combustion of solid, liquid or gaseous fuels generates flue gases. The flue gas produced by combustion consists mainly of high temperature soot and various gases. Therefore, the treatment of flue gas usually consists of cooling, dust removal and degassing, followed by discharge. Due to the increasingly stringent environmental standards, the flue gas must meet the standards before discharge, so a large number of flue gas emissions must be taken before the relevant measures to meet the standards.

The most important part of the flue gas treatment process is the dedusting and degassing process. Dedusting mainly relies on wet dedusting (including venturi wet dedusting), bag dedusting, electric dedusting and other equipment. Degasification process is due to different fuels, flue gas contains different components that need to be processed and the use of different processes, but largely based on the evolution of coal desulfurization process, but also coal fuel combustion is the most typical, therefore, more often still referred to as the desulfurization process.

Desulphurization processes are classified as dry, semi-dry, wet, electron beam, seawater, etc., but the wet method is predominant, for example, about 85% of coal-fired power plants use wet desulphurization, followed by dry and semi-dry methods. The focus and difficulty of flue gas treatment is desulfurization and elimination of heavy metal vapors and so on.

The three processes are briefly described as follows:

1. Dry FGD involves the use of powdered absorbent to remove SO2 from the flue gas, and the typical methods commonly used include in-furnace calcium spraying (lime/limestone), etc. The advantages of in-furnace calcium spraying are no waste generation and no secondary pollution.

2. Wet flue gas desulphurization (FGD) process is currently the most widely used desulphurization process in flue gas desulphurization

(FGD), wet FGD accounts for more than 80% of the total amount of desulphurization. Wet desulfurization according to the choice of desulfurization agent can be divided into limestone / lime, ammonia, sodium-calcium double alkali method, magnesium oxide method, alkaline aluminum sulfate method, etc., of which limestone / lime, ammonia, sodium-calcium double alkali method, as well as magnesium oxide method is more commonly used.

3. Semi-dry method is an emerging desulfurization technology. At present, the use of more rotary calcium spray method, the lime will be made into a lime slurry, in the tower to absorb SO2 But the reaction efficiency is low, calcium and sulfur ratio is relatively large, according to relevant information, generally in the 2.5 or more.
   Mainly some large boilers used in thermal power plants.

In the above processes, jet equipment and devices such as venturi scrubbers/towers, liquid/gas jet aerators or activated carbon injectors are required. The following is a description of each of these types of jets/injectors.

II Venturi flue gas scrubber/tower

Scrubbing of flue gases usually includes physical scrubbing of soot, as well as chemical scrubbing and adsorption.

Physical scrubbing of flue gas is usually done by using clear water jets to roll the flue gas and carry out jet mixing scrubbing, and the soot content in the scrubbed flue gas can meet the requirements of emission standards. There is also the use of shaped jet device, the flue gas spray washing dust reduction.

Chemical scrubbing is the use of adsorbent solution as a jet medium, through the jet suction (or atomized spray), to strengthen the contact with the flue gas needs to be adsorbed (or reaction) media, chemical reaction, generate easy to remove the media, in order to achieve the purpose of purifying the flue gas.

The gas-liquid ratio in a venturi scrubber or scrubber tower is usually large.

III Liquid and gas jet aeration system

In wet FGD, jet aeration oxidation device is powered by slurry circulating pump, and negative pressure is generated by jet to pump

air (or oxygen) into the mixing chamber. In the turbulent mixing process, the gas-liquid close contact, oxidation efficiency is much higher than conventional oxidation device, and no oxidation fan, no rotating parts, and do not need any other mechanical mixing device (with a secondary efficiency device)

Jet aerator because there is no dense aeration pipe network, there is no mechanical operation parts, pipe diameter is large, so the operation reliability is very good, stable performance, not easy to clog. Moreover, the jet aerator system due to the unique superiority of mass transfer, its aeration process of the finest bubbles, stay in contact with a long time, stirring and mixing intensity is high, aeration efficiency is high wind less, do not need to oxidize the fan, therefore, more and more popular with users.

The desulfurization slurry aeration system consists of a slurry tank, a circulation pump, a jet, a secondary booster and related piping.

IV Activated Carbon Injection System

Dry and semi-dry desulfurization processes require the use of an injector with an adsorbent such as activated carbon. The activated carbon injector is an air-powered jet device. The air can come from a Roots fan or from a compressed air system in the station area. Since the operating pressure of the flue gas system is very low, the back pressure of the injector depends mainly on the distance between the activated carbon silo and the flue gas system

The activated carbon injection system mainly consists of Roots fans, air injectors, feeders and related piping.

V Summarize

Chengdu Greenwater Technology Co., Ltd. as a professional development of various types of jet injector jet company, can provide some of the stereotypes of the jet injector or injector products, but also according to the user's specific needs, optimization of the design and manufacturing

In some cases, such as aeration contact oxidation, or involving two-phase flow or multi-phase flow and other occasions, in order to ensure better use of the effect, the need to carry out more accurate design and calculation, our company will provide the relevant system design and construction drawings, the main part of the machine's

performance parameters and selection, and installation requirements.

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