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Replacing GB/T 13931-2002

Electrostatic precipitator - Methods of performance tests

电除尘器 性能测试方法

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard replaces GB/T 13931-2002 "Test method for performance of electrostatic precipitators". Compared with GB/T 13931-2002, except editing The main technical changes outside the sexual modification are as follows:

--- Revised the requirements of the filter device requirements (see 4.1.5,

4.1.4 of the.2002 version);

---Modified the filter cartridge preparation and sampling requirements (see 4.1.7,.2002 version of 4.1.6);

--- According to the integrity of the main technical indicators of product performance, the electric precipitator power consumption test (see 4.4). This standard was proposed by the National Development and Reform Commission of the People's Republic of China. This standard is under the jurisdiction of the National Environmental Protection Industry Standardization Technical Committee (SAC/TC275). This standard was drafted. Zhejiang

Feida Environmental Protection Technology Co., Ltd., Guodian Environmental Protection Research Institute, machinery industry environmental protection machinery products Quality Supervision and Inspection Center, State Grid Zhejiang Electric Power Company Electric Power Research Institute. The main drafters of this standard. Zhu Shaoping, Wu Quanming, Zhu Fahua, Yi Yuping, Yuan Weifeng, Zhou Xiaotong, Li Haitao, Zhou Xusheng, Zhao Jinda, Chen Li, Zhong Jianfeng. The previous versions of the standards replaced by this standard are.

---GB/T 13931-1992, GB/T 13931-2002. Electrostatic precipitator performance test method

1 Scope

GB/T 13931-2017 is the Chinese national standard on electrostatic precipitator - methods of performance tests, in the field of environment and health protection, safety. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 12 May 2017 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 December 2017. Classification: ICS 13.030.40, CCS J88. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This standard specifies the test items, test methods and report preparation requirements for the performance of the electrostatic precipitator. This standard is applicable to the performance test of electrostatic precipitators. The wet electrostatic precipitator and electric bag composite dust collector can be referred to for implementation.

2 Terms and definitions

The following terms and definitions apply to this document.

2.1 Standard state of gas standardizedstatusoffluegas The gas state of the flue gas at a temperature of 273 K and an atmospheric pressure of 101,325 Pa, referred to as "standard state".

Note. The concentration of atmospheric pollutants specified in this standard refers to the value of dry flue gas under standard conditions.

2.2 Constant velocity sampling isokineticsampling The sampling method of the velocity of the dust-containing gas entering the sampling nozzle is equal to the velocity of the dust-containing gas at the sampling point on the cross section of the flue.

2.3 Equivalent diameter equivalentdiameter The diameter of the flue when the flue is a circular pipe; when the flue is a rectangular pipe, it is equal to twice the product of length and width divided by the sum of length and width (unit. m).

2.4 Internal sampling internalsampling Place the sample nozzle and filter in the flue for direct sampling.

2.5 Multi-point moving sampling method multi-pointsmovingsampling A sampling method in which sampling is performed at each determined sampling point by the same sampling device, and the sampling time of each point is equal.

2.6 Flue gas moisture content fluegashumidity The amount of water vapor in the flue gas coexisting with 1kg of dry flue gas.

2.7 Electric precipitator power consumption powerconsumptionofelectrostaticprecipitator The total active power (unit. kW) consumed by the ESP high and low voltage power supply unit per unit time.

3 Test items

Test items include.

a) dust removal efficiency test;

b) body pressure drop test;

c) body air leakage rate test;

d) Electrostatic precipitator power consumption test.

4.1 Dust removal efficiency test

4.1.1 Overview At the same time, the dust concentration of the flue gas at the inlet and outlet of the electrostatic precipitator and the air leakage rate of the main body of the electrostatic precipitator are tested, and the dust removal efficiency is obtained through calculation.

4.1.2 Provisions for sampling position, sampling hole and sampling point

4.1.2.1 Sampling position The sampling position should be selected in the straight pipe section where the airflow is stable, and other interference sources such as elbows and reducers are more than 6 times equivalent diameter in the downstream direction. The upstream direction is greater than 3 equivalents in diameter. When selecting a position, the vertical pipe section should be given priority. When the length of the flue cannot meet the above requirements, it can be rooted. According to the actual situation, a relatively suitable pipe segment is selected as the sampling position.

4.1.2.2 Sampling hole The size of the sampling hole should be sufficient to insert the largest sampling device into the flue. The short tube of the orifice should not be too long, and the structure of the sampling hole can be determined by itself.

4.1.2.3 Number of sampling points 4.1.2.3.1 Circular flue On the selected test section, set two sampling holes perpendicular to each other, and then divide the flue section into a certain number of concentric circles. Ring, through the sampling hole along the diameter direction of the section, take 4 points on each of the equal area rings as sampling points, as shown in Figure 1. Figure

1 Circular flue sampling point The number of sampling points is determined according to Table 1. Table

1 Circular ring and other area ring and sampling points Flue diameter/m number of sampling points (total of two holes) D<=1 1 \u003cd<=2 2 \u003cd<=3 3 \u003cd<=5 5 \u003cd<=7 1~2 2~3 3~4 4~5 5~6 4~8 8~12 12~16 16~20 20~ 24

Note. When the diameter d of the flue exceeds 7m, it is calculated as not less than 4m2 per ring area. The distance between each sampling point from the center of the flue is calculated according to formula (1). Ri=Rx 2i-1 2n (1) In the formula. Ri

--- the distance of the sampling point from the center of the flue, in meters (m); R

--- flue radius, in meters (m); i

--- the sequence number of the sampling point from the center of the flue; n

--- The number of rings divided. The position of the sampling point can be expressed by the distance of the sampling point from the inner wall of the flue. See the multiple of the diameter of the flue from the inlet end of the sampling hole to each sampling point. Table 2. Table

2 Flue diameter multiple of the sampling point from the inner wall of the flue Sampling point number Ring number 0.146 0.854 0.067 0.250 0.750 0.933 0.044 0.146 0.294 0.706 0.854 0.956 0.033 0.105 0.195 0.321 0.679 0.805 0.895 0.967 0.022 0.082 0.145 0.227 0.344 0.656 0.773 0.855 0.918 0.978 4.1.2.3.2 Rectangular flue Divide the flue section into a number of small rectangles of equal area, so that the ratio of the adjacent sides of the small rectangle is close to 1, and the center of each small rectangle is Samples, as shown in Figure 2. Figure

2 Location of rectangular flue sampling points (N, n are the number of rows and columns of sampling points respectively) The number of sampling points is determined according to Table 3. Table

3 Rectangular flue sampling points Flue stop area A/m2 equal area small rectangle number of sampling points A<=1 1 \u003cA<=4 4 \u003cA<=9 9 \u003cA<=16 16 \u003cA<=20 20 \u003cA<=24 2x2 3x3 3x4 4x4 4x5 5x 5

Note. When the flue cross-sectional area A is greater than 24m2, the length of the small