



Hengyi Industries Sdn Bhd
恒逸实业（文莱）有限公司

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Heating Furnace Management System



加热炉管理制度



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1 Purpose

目的

This System is formulated to reinforce the management of tube heating furnaces and realize safe, economical and long-term operation.

为加强管式加热炉的管理，实现安全、经济、长周期运行，特制订本制度。

2 Scope of Application

适用范围

This System is applicable to the operation department related to heating furnaces.

3 Terms and Definitions

术语和定义

N/A.

无。

4 Management Responsibilities

管理职责

4.1 Specified administrative authority

归口管理部门

4.1.1 The Equipment Management Dept. is the specified administrative authority of the heating furnace, which shall be responsible for preparing the heating furnace management system and supervising and inspecting this system.

机械动力部是公司加热炉的归口管理部门，制（修）订公司加热炉管理制度，并监督检查。

4.1.2 Be responsible for reviewing and approving the heating furnace overhaul, update, inspection and maintenance plan and organizing the implementation and acceptance.

负责审批加热炉大修、更新、检验与检修计划，并组织实施和验收。

4.1.3 Be responsible for checking the operation and maintenance of heating furnaces by the operation department, as well as the regular monitoring of the heating furnace efficiency and the dew point temperature test of flue gas.

负责检查运行部加热炉操作、维护以及加热炉效率定期监测、烟气露点温度测试工作。

4.1.4 Be responsible for the technical exchange of heating furnaces and auxiliary equipment and the signing of technical appendices, and organize the promotion and application of new technologies, new processes, new materials and new equipment.

负责加热炉及附属设备的技术交流和技术附件签订工作，组织做好新技术、新工艺、新材料、新设备的推广应用。

4.2 Coordinated management departments

协同管理部门

4.2.1 The Scheduling & Dispatch Dept. shall be responsible for the energy saving, optimal operation and protection and interlocking management of heating furnaces; Organize the formulation of furnace operation methods and process indicators, organize the review and approval of furnace process technical documents; Properly manage the dispatching of furnace fuels and control the fuel quality; Organize and coordinate the sampling and analysis of heating furnace fuel oil (gas).

计划调度部负责加热炉的节能、优化运行及其保护联锁管理；组织制定加热炉操作法及工艺指标，组织审批加热炉工艺技术文件；做好加热炉燃料的调度管理和燃料品质控制；组织协调加热炉燃料油（气）采样分析工作。

4.2.2 The HSE Dept. shall be responsible for regular environmental monitoring of flue gas emission of heating furnaces.

HSE 管理部负责定期对加热炉的烟气排放进行环保监测。

4.3 Executive departments

执行部门

4.3.1 Each operation department is the executive department.

各运行部为执行部门。

4.3.1.1 Be responsible for the operation, daily maintenance and inspection of heating furnaces involved in the department; Establish basic technical archives; Be responsible for implementing the maintenance and repair works of heating furnaces and organizing the acceptance.

负责本部门加热炉的运行操作、日常维护和巡检；建立基础技术档案；负责本部门加热炉维护、维修项目的实施并组织验收。

4.3.1.2 Be responsible for preparing and reporting the overhaul, update, inspection and maintenance plans of heating furnaces involved in the department; Participate in the technical exchange of heating furnaces and auxiliary equipment and the signing of technical appendices.

负责本部门加热炉大修、更新、检验、检修计划的编制和上报；参与加热炉及附属设备的技术交流和技术附件签订工作。

4.3.1.3 Be responsible for the formulation and implementation of the emergency plan for major defects of heating furnaces involved in the department; Guarantee regular efficiency monitoring and flue gas analysis for heating furnaces at least once a month; Be responsible for the analysis of fuel oil (gas) and water quality as entrusted.

负责本部门加热炉重大缺陷应急预案的制定和落实工作；做好每月不少于一次的加热炉定期炉效监测及烟气分析工作；负责燃料油（气）、水质等分析的委托工作。

4.3.2 The Instrument Control Dept. shall be responsible for the daily maintenance of all instruments of the heating furnace and process interlocking check and maintenance; The Equipment Maintenance Dept. shall be responsible for the professional daily maintenance of heating furnace equipment.

仪表控制部负责做好公司加热炉各类仪表的日常维护及工艺联锁校核维护工作；设备检修部负责加热炉设备专业日常维护保养工作。

4.3.3 The Lab Dept. shall be responsible for analyzing the heating furnace fuel oil (gas) at least once a month.

质量检验部负责做好每月至少一次的加热炉燃料油（气）分析工作。

5 Management Content

管理内容

5.1 Basic management work

基础管理工作

5.1.1 The operation department shall establish the basic files of heating furnaces, one file for one furnace, and make a complete operation record.

运行部应建立加热炉基础档案资料，做到一炉一档，并有完整的运行记录。

5.1.1.1 The basic files shall include:

基础档案资料应包括：

(1) Heating furnace equipment records;

加热炉设备台帐；

(2) Structural drawing of complete equipment;

全套设备结构图纸；

(3) Operating procedures of heating furnace;

加热炉操作法；

(4) Accident plan, fault and accident records and cause analysis report of heating furnace;

加热炉事故预案、故障、事故记录及原因分析报告；

(5) Summary of Periodic Efficiency Monitoring and Analysis for Heating Furnace;

加热炉定期炉效监测分析汇总表；

(6) Maintenance, repair and technical renovation records and completion data;

检修、抢修、技术改造记录及竣工资料；

(7) Inspection report of furnace tube and fittings

炉管及附件检测报告。

5.1.1.2 The operating records shall include:

运行记录应包括:

(1) Process operation record;

工艺操作运行记录;

(2) Maintenance and repair records;

检、维修记录;

(3) Sulfur content analysis report of fuel

燃料含硫量分析报告。

5.1.2 The operation department shall organize trainings and exams on the required knowledge of heating furnace operators who shall not take up their posts before passing the trainings and exams.

运行部应组织开展加热炉操作人员应知、应会知识培训和考试，合格后方可上岗。

5.1.3 Fuel oil (gas) for the heating furnace shall be measured separately; At the same time, thermocouples, negative pressure meters and online oxygen content analyzers shall be installed to ensure normal use.

加热炉燃料油 (气) 应单独计量; 同时安装热电偶、负压表和在线氧含量分析仪, 并保证正常使用。

5.1.4 Each heating furnace shall be equipped with flue gas sampling points, for which the requirements are shown in Appendix 1.

每台加热炉应设置烟气取样点, 烟气取样点的要求见附件 1。

5.1.5 Regularly organize the quality analysis of fuel oil (gas) and make records. Control the total sulfur content in fuel gas which shall be $\geq 100\text{ppm}$, the total sulfur content in fuel oil which shall be $\geq 1\%$, the content of solid particles which shall be $\geq 2000\text{ppm}$ and the Engler viscosity of fuel oil which shall be $\geq 4.5\text{E}^0$; The pressure of fuel oil (gas) and steam system shall be stable; The atomized steam shall be superheated with a pressure higher than that of the fuel oil 0.05MPa . The Equipment Management Dept., the Scheduling & Dispatch Dept. and the operation department shall be responsible for putting forward the requirements for fuel oil (gas) quality analysis, and the Lab. Dept. shall issue the analysis frequency and implement the analysis.

定期组织对燃料油 (气) 的品质分析并建立台帐。控制燃料气中总硫含量 $\geq 100\text{ppm}$, 燃料油中总硫含量 $\geq 1\%$, 固体颗粒含量 $\geq 2000\text{ppm}$, 燃料油的恩氏粘度 $\geq 4.5\text{E}^0$; 燃料油 (气) 、蒸汽系统压力稳定; 雾化蒸汽应为过热蒸汽, 压力高于燃料油压力 0.05MPa 。机械动力部、计划调度部、运行部负责提出燃料油 (气) 品质分析需求, 质量检验部下达分析频率并执行。

5.2 Operation and maintenance

运行维护

5.2.1 The heating furnace shall be operated in strict accordance with the operating procedures and control indexes. It is strictly prohibited to operate under excessive temperatures, pressures or loads. Also, try to avoid operating under excessively low loads (less than 60% of the design load).

加热炉操作运行要严格按操作法和控制指标进行，严禁超温、超压、超负荷运行，尽量避免过低负荷运行（指低于设计负荷的 60%）。

5.2.2 The average thermal efficiency (hereinafter referred to as thermal efficiency) of the heating furnace during the normal operation period shall reach the following indexes:

加热炉在正常运行周期内的平均热效率（以下简称热效率）应达到以下指标：

(1) The thermal efficiency of heating furnace with thermal load of 10MW or above shall reach 90% at least;

热负荷在 10MW 及以上的加热炉的热效率应达到 90%以上；

(2) The thermal efficiency of heating furnace with thermal load of less than 10MW shall reach the design value.

热负荷在 10MW 以下的加热炉的热效率应达到设计值。

5.2.3 Energy control indexes for heating furnace operation:

加热炉操作运行节能控制指标：

(1) The exhaust gas temperature generally shall not be greater than 170 °C. calibration and flue gas dew point test shall be carried out if the sulfur content in fuel significantly deviates from the design value, and then the reasonable flue gas temperature of the heating furnace shall be confirmed (generally 20 ~ 30 °C higher than the dew point temperature).

排烟温度一般应不大于 170℃，如燃料含硫量偏离设计值较大，则应进行标定和烟气露点测试，然后确定加热炉合理的烟气排放温度（一般应高于露点温度 20~30℃）；

(2) The CO content in flue gas shall be ≤100ppm in general;

烟气中 CO 含量一般≤100ppm；

(3) The oxygen content in the flue gas at the top of the flow chamber shall be controlled at 2% ~ 4% for the heating furnace burning gas and 2% ~ 4% for the heating furnace burning oil;

对流室顶部烟气中的氧含量，燃气加热炉应控制在 2%~4%；燃料油加热炉应控制在 3%~5%；

(4) The external wall temperature of heating furnace shall comply with relevant design regulations, generally ≤80°C for the body and ≤90°C for the bottom.

加热炉外壁温度应符合相关设计规定，一般炉体要求≤80℃，炉底≤90℃。

5.2.4 The operation department shall tighten up the inspection and management of the heating furnace operation and strictly implement the patrol inspection system.

运行部要加强加热炉运行情况的检查和管理，严格执行设备巡回检查制度。

5.2.4.1 The management personnel of the production equipment shall:

生产装置管理人员应做好下列工作：

(1) Inspect the operation of heating furnace at least once a day;

每日不少于一次的加热炉运行情况巡检；

(2) Inspect the operation and problems of heating furnace once a week and make records;

每周进行一次加热炉运行情况和问题检查，并做好记录备案；

(3) Prepare the analysis report on the operation of the heating furnace of this device every month, and complete the "summary table of heating furnace thermal efficiency monitoring" in the EM system before the 2nd of the following month, and postpone the holidays.

每月编写本装置加热炉运行情况分析报告，并于次月 2 日前完成 EM 系统中“加热炉热效率监测汇总表”的填报，节假日顺延。

(4) The bypass valve of the flue and air duct of the heating furnace must be flexible and intact, and each department shall formulate the activity test frequency (in principle, no more than 180 days) and maintenance contents of the valve plate of the bypass valve according to the situation of the department. For the valve plate with interlock, the interlock should be removed during the test and the corresponding records should be made.

加热炉烟道、风道旁路阀必须确保灵活、完好，各部门根据部门情况制定旁路阀阀板活动试验频次（原则上不超过 180 天）及保养内容。对于有联锁的阀板，试验时应摘除联锁，并做好相应的记录。

(5) The air door of the main burner of the heating furnace that has been shut down for a short period of time must be completely closed to keep the ever-burning lamp in a normal state of putting into use; Long-term deactivation of the heating burner must be completely isolated by blind plate, or the oil gun and air gun should be removed.

短期停运的加热炉主火嘴的风门必须全部关闭，保持长明灯处于正常投用状态；长期停用的加热炉火嘴必须打盲板彻底隔离，或将油枪、气枪拆下。

5.2.4.2 Operators of production equipment shall strengthen the regulation of the throttle, valve, air door and flue damper to ensure that the furnace chamber is bright and clear, to avoid the burner flame from being too long or too great and avoid smoking. Also, the flame shall not burn the furnace tube. Try to keep the nozzles generating consistent flames to maintain efficient operation.

生产装置操作人员要加强三门一板（油门、汽门、风门，烟道档板）的调节，保证炉膛明亮不浑浊，避免燃烧器火焰过长、过大、冒烟，严禁舔管。要尽量保持多火嘴齐火焰，维持高效运行。

(1) The outdoor operator shall check the following items during patrol inspection:

外操人员巡检时要检查：

1) Check whether the burner and fuel oil (gas) system are coked and blocked, whether the combustion is normal, and whether the pilot burner is normal; If the oil or gas gun is found damaged or abnormally burning, it shall be replaced, adjusted or cleaned in time; For the standby burner, the air door and valve shall be closed.

燃烧器、燃料油（气）系统是否结焦堵塞、燃烧是否正常，长明灯是否正常点燃；对油枪或瓦斯枪发现损坏或不正常燃烧、熄灭应及时更换或调整、清理等；对备用的燃烧器应关闭风门、汽门。

2) Check whether the sight glass, fire hole, ignition hole, explosion-proof door, manhole door and elbow box are tight to prevent air leakage. Also, check whether the steel frame and steel plate of furnace body are intact and tight and over-temperature.

看火窗、看火孔、点火孔、防爆门、人孔门、弯头箱是否严密，防止漏风。检查炉体钢架和炉体

钢板是否完好严密，是否超温。

3) Each shift shall check whether the radiation furnace tube is subjected to local over burning, cracking, bulking, bending and other abnormal phenomena, whether the inner lining of the furnace is free of falling off, whether the components in the furnace are free from abnormalities and whether the instrument monitoring system is normal.

每班检查辐射炉管有无局部过烧、开裂、鼓包、弯曲等异常现象，检查炉内壁衬里有无脱落，炉内构件有无异常，仪表监测系统是否正常。

4) Each shift shall check whether the burner's air regulation system, air door and damper are flexible and easy to use, whether the induced draft fan and blower of waste heat recovery system are in normal operation, and whether the steam fire-extinguishing system is in good condition.

每班检查燃烧器风量调节系统、风门挡板是否灵活好用，余热回收系统的引风机、鼓风机是否正常运行，蒸汽灭火系统是否完好。

5) The heating furnace with a soot blower shall be subjected to soot blowing at least once a day. The soot blower shall be checked for any fault, flexibility and convenience, and any damaged one shall be repaired immediately. The steam blower, if used, shall be thoroughly drained prior to soot blowing.

有吹灰器的加热炉，每天至少吹灰一次，并检查吹灰器有无故障，是否灵活好用，对损坏的吹灰器应联系修复；使用蒸汽吹灰器的，吹灰前必须先彻底疏水。

(2) Indoor operators shall strictly follow the operating procedures for proper heating furnace process operation control and always pay attention to the heating furnace's feeding and discharging system, including flow control, branch flow control, pressure control and flow, pressure, temperature, oxygen content indications which shall be checked for abnormality or deflection. In addition, the operators shall track whether the furnace control indicators are normal in a real-time manner, and find out the cause for any abnormality and timely adjust and eliminate the abnormality.

内操人员检查要求：应严格按照操作法做好加热炉工艺操作控制，随时关注加热炉进出料系统，包括流控、分支流控、压控及流量、压力、温度、氧含量的指示是否正常、有无偏流等。实时跟踪加热炉各项控制指标是否正常，情况异常必须查明原因并及时调整处理。

5.2.5 Furnace shutdown must be strictly in accordance with the relevant provisions of the technical specifications and post operation methods. A strict and detailed shutdown plan shall be prepared before shutdown, specially indicating the requirements of preventing sulfides from spontaneous combustion in the convection chamber and austenitic stainless steel furnace tube from being stressed, corrosion and cracking due to polythionic acid. For this, dedicated personnel shall be arranged to manage these matters in actual implementation. For the austenitic stainless steel furnace tube of the convection chamber, spontaneous combustion can be prevented through chemical cleaning of the chamber. For the austenitic stainless steel furnace tube of the radiation chamber, alkali cleaning of furnace tube is available.

加热炉开停工必须严格按照技术规程、岗位操作法的有关规定执行，开停工前必须制定详细严谨

的开停工方案，停工方案中特别要注明防止硫化物在对流室内自燃，以及防止连多硫酸造成奥氏体不锈钢炉管应力腐蚀开裂要求，在实际执行中对硫化物自燃和防止连多硫酸造成奥氏体不锈钢炉管应力腐蚀开裂要落实专人管理。对于对流室奥氏体不锈钢炉管可以结合对流室化学清洗进行预防，辐射室奥氏体不锈钢炉管可安排炉管的碱洗。

5.2.6 The operation department shall make emergency plans and submit to the head of the operation division of the Company for approval in case the heating furnace needs to be monitored for operation due to major defects. The operators of production equipment must seriously implement the special maintenance program during daily inspection.

加热炉因存在重大缺陷需监控运行时，运行部应制定应急预案，并报公司分管领导批准执行。生产装置操作人员在进行日常检查时，必须认真落实特护方案。

5.2.7 The instrument control department shall check the integrity of the instrument once a day, and handle any abnormality in time. All zirconia used in the heating furnace shall be calibrated at least once every six months and quarters, and records shall be made, and the calibration results shall be fed back to the Operation Department for filing in time.

仪表控制部每天应检查一次仪表完好情况，发现异常应及时处理。每半年至少对加热炉使用的所有氧化锆校验一次，并做好记录，及时将校验结果反馈运行部备案。

5.2.8 The oxygen content in the daily operation of the heating furnace is that in zirconia. The operation department shall contact the Instrument Control Dept. for checking and report the processing information to the Equipment Management Dept. in a big difference lies between the analysis value given by the Lab. Dept., the monitoring value of furnace efficiency and the online zirconia display value.

加热炉日常运行氧含量以氧化锆为准，当质量检验部化验分析值、炉效监测值与在线氧化锆显示值差别较大时，运行部要及时联系仪表控制部进行校核并向机械动力部反馈处理信息。

5.3 Maintenance and repair 检维修

5.3.1 The operation department shall carefully prepare the furnace maintenance plan, fill in the overhaul, update and inspection items and report to the Equipment Management Dept. for approval before implementation according to the daily maintenance and shutdown inspection & testing results of the heating furnace as well as relevant provisions of the "Rules for Maintenance and Overhaul of Tubular Heating Furnace" (SHS01006-2004).

运行部根据对加热炉日常维护和停工检查、检测的结果，对照《管式加热炉维护检修规程》SHS01006-2004 的有关规定，认真编制加热炉检修计划，填报大修、更新和检验项目，报机械动力部批准后实施。

5.3.2 The operation department shall strengthen the daily maintenance of the heating furnace, especially the maintenance of the induced (forced) draught fan, flue damper, soot blower and other accessories and their actuators. In case of any problem, timely repair and troubleshooting

are necessary to guarantee normal operation of the heating furnace.

运行部加强加热炉的日常维护，特别是对引（鼓）风机、烟道挡板、吹灰器等附件及其执行机构的保养。发现问题要及时修理，排除故障，不得影响加热炉的正常运行。

5.3.3 For shutdown of heating furnace for overhaul, the Instrument Control Dept. shall check, maintain and verify all the oxygen content analyzers (including probes), thermocouples and negative pressure meters (including probes).

加热炉大修停运时，仪表控制部应对全部氧含量分析仪（包括探头）、热电偶和负压表（包括探头）进行检查维护和校核。

5.3.4 For shutdown for maintenance, the radiation furnace tube must be inspected and tested for such items as appearance inspection and measurement, thickness and hardness measurement, surface metallographic examination, ultrasonic testing, X-ray inspection of welding joints or other nondestructive testing and analysis of scale on the surface of furnace tube. The testing items shall be arranged and implemented by qualified testing units according to the actual situation, and the problems found in the inspection and testing shall be dealt with in time or preventive measures shall be taken.

停炉检修时，必须进行辐射炉管的检查检测，检测项目主要包括：外观检查及测量；测厚及硬度测量；表面金相检测；超声波检测、焊缝X射线拍片检测或其它无损检测；炉管表面垢物分析等。检测项目应根据实际情况安排并落实有资质的检测单位进行，检查检测中发现的问题应及时处理或制定防范措施。

5.3.5 For the heating furnace burning oil, ash removal of the radiant furnace tube shall be arranged during the shutdown for maintenance. Determine whether ash removal is necessary and how to remove ash based on ash accumulation of the flow tube. The necessity of ash removal shall be determined based on the actual conditions for the heating furnace burning gas.

烧油的加热炉在停工检修期间应安排辐射炉管清灰。对流管视积灰程度，决定是否清灰和清灰方法。烧气的加热炉根据情况决定是否清灰。

5.3.6 The inspected items shall be accepted according to the relevant rules and regulations. 检修完的项目应按有关规程、规范要求进行检查验收。

6 Inspection and Supervision

检查与监督

The Equipment Management Dept. shall be responsible for the supervision, inspection and assessment of the management and implementation of the heating furnace by the operation department.

机械动力部负责对运行部加热炉管理执行情况进行监督检查考核。

7 Associated Procedures and Records

关联程序和记录

7.1 Associated procedures

关联程序

7.1.1 Heating Furnace Management Procedure (HYBN-T2-07-0024-2024-2)

加热炉管理程序 HYBN-T2-07-0024-2024-2

7.2 Associated records

关联记录

7.2.1 Summary of Efficiency Monitoring and Analysis for Heating Furnace (HYBN-T6-07-0073-001-2018)

加热炉热效率监测汇总表 HYBN-T6-07-0073-001-2018

7.2.2 Summary of Periodic Efficiency Monitoring and Analysis for Heating Furnace (HYBN-T6-07-0074-001-2018)

加热炉定期炉效监测分析汇总表 HYBN-T6-07-0074-001-2018

8 Supplementary Rules

附则

8.1 This System is under the specific management of the Equipment Management Dept.
本制度由机械动力部归口管理。

8.2 This System is drafted by Equipment Management Dept.
本制度起草部门：机械动力部。

8.3 Equipment Management Dept. is responsible for the interpretation of this System.
本制度解释权归机械动力部拥有。

8.4 Revision, preparation and approval of this System are shown in Table 1:
本制度编报编制和审批情况见表 1:

Table 1 Revision, preparation and approval of document

表 1 文件版本编制和审批情况

2	2024-04-01	He Jiangang 何建刚	Zhao Tingyun 赵挺云	Xu Ye 徐野	Chen Liancai 陈连财
Revision 版本	Issued date 颁布日期	Prepared by 编制人	Reviewed by 审核人	Authorized by 审定	Approved by 批准人

9 Appendices

附件

9.1 Requirements for flue gas sampling point
烟气取样点要求

Appendix 1

附件 1

Requirements for Flue Gas Sampling Point**烟气取样点要求****1 Setting of flue gas sampling point****烟气取样点位置设置**

(1) Radiation chamber: for any heating furnace with two or more radiation chambers, each radiation chamber shall be equipped with flue gas sampling points at proper locations to check whether the chambers are provided with the same air supply. No flue gas sampling points shall be provided for the heating furnace with one radiation chamber.

辐射室：对有两个或两个以上辐射室的多室加热炉，每个辐射室的相应位置应安装烟气取样点，以便检查各室供风是否相同，单室可不装；

(2) Point before flue gas enters the convection chamber: Use this point to check the actual situation of air supply required by combustion and control the air flow of the burner (it can be shared if sampling points are available to the radiation chamber);

进对流室前：利用此点检验供给燃烧所需空气量的实际情况，控制燃烧器用风量（辐射室已设置取样点的，可以共用）；

(3) Point after flue gas leaves the convection chamber: Use the excess air coefficient at this point to calculate the thermal efficiency of the heating furnace and check the air leakage of the convection chamber;

出对流室后：利用此点的过剩空气系数计算加热炉的热效率，并检验对流室的漏风情况；

(4) In case the waste heat recovery system is used, the flue gas sampling points shall be set before and after the air preheater or the waste heat boiler, and the flue gas temperature after the air preheater shall be used to calculate the thermal efficiency of the furnace;

采用余热回收系统时，应在空气预热器或余热锅炉前后均装设烟气取样点，利用空气预热器后的烟气温度计算加热炉热效率；

(5) The dew-point temperature sampling point shall be set at the outlet of the last-level heated surface. The sampling point shall be set at the outlet of the convection chamber for the heating furnace without waste heat recovery system and at the outlet of the air preheater or waste heat boiler for the furnace with a waste heat recovery system.

露点温度取样点设置在最后一级受热面出口，对于无余热回收系统的加热炉应设在对流室出口，采用余热回收系统的加热炉设在空气预热器或余热锅炉出口。

2 Size of sampling hole**测孔大小**

(1) The flue gas sampling hole shall have a diameter of no less than 20mm;

烟气取样点孔径不小于 20mm;

(2) The dew-point temperature sampling hole shall have an inner diameter of no less than 40mm.

露点温度取样点孔内径不小于 40mm。

3 Precautions for installation of flue gas sampling point

烟气取样点安装注意事项

(1) No air leakage shall occur near the sampling point;

取样点附近不能有漏风;

(2) The sampling point should be set at the narrowest part of the flue duct if possible, where the velocity of flue gas is high enough to achieve thorough mixing of the combustion products; 取样点应尽可能选在烟道的最窄处, 在该处有较高的烟气流速, 促使燃烧产物充分混合;

(3) The sampling point shall extend to the middle of the flue gas flow section. In case of any difficulty, the sampling point shall strength into the flow section for at least 500mm. Multi-point sampling can reduce the measurement error;

取样点最好伸至烟气流通截面的中部, 有困难时, 伸入长度至少在 500 毫米以上, 多点取样可以减少测量误差;

(4) The sampling point for combustion control shall not be placed behind the convection chamber; The sampling point for measuring the thermal efficiency shall be set in the non-eddy area of the stack, that is, not in the turning area.

控制燃烧的取样点不应放在对流室以后; 测定热效率的取样点应放在烟囱内非涡流区, 即不应设在转向区域;

(5) The wide-section flues shall be provided with facilities with multiple sampling points, or sampling with a single tube shall be adopted.

对于宽截面烟道, 应设置多点取样设施, 或采用单管伸缩式取样法。