MONITORING REPORT

Verification 2

Ningguo Cement Plant 9100 kW Waste Heat Recovery and Utilisation for Power Generation Project of Anhui Conch Cement Co. Ltd

CDM Registration Reference No. 0898

Monitoring Period:

Start Date: **01 March 2008**

End Date: **31 May 2009**

Date of Report: **24 February 2010**

Version 5

1 INTRODUCTION

This document reports the emission reductions generated by **Ningguo Cement Plant 9100 kW Waste Heat Recovery and Utilisation for Power Generation Project of Anhui Conch Cement Co. Ltd** in the following monitoring period:

From **01 March 2008** to **31 May 2009**

This report serves as the basis for the verification of these reductions and issuance of the CERs

2 SUMMARY FOR THE MONITORING PERIOD

The Ningguo CDM project was registered on 04 May 2007 with a crediting period from 04 May 2007 until 03 May 2017.

Total amount of emission reductions generated in the current monitoring report:

ERs =71，857 t CO_{2e}

3 GENERAL DESCRIPTION OF THE PROJECT

3.1 SHORT DESCRIPTION OF THE PROJECT ACTIVITY

General introduction

The Project Activity is a waste heat recovery and utilization for power generation project located at the Ningguo Cement Plant in Ningguo City of Anhui Province, the People's Republic of China. The Ningguo Cement Plant is a part of the Conch Cement Group Company Limited. There are 3 clinker production lines with pre-calcination technology.

This project is the waste heat power generation project of No.3 5000t/d clinker production line in the Ningguo Cement Plant. Two sets of heat recovery boilers and one set of mixed-pressure admission condensing turbine-generator unit with the rated power of 9,100kW have been installed.

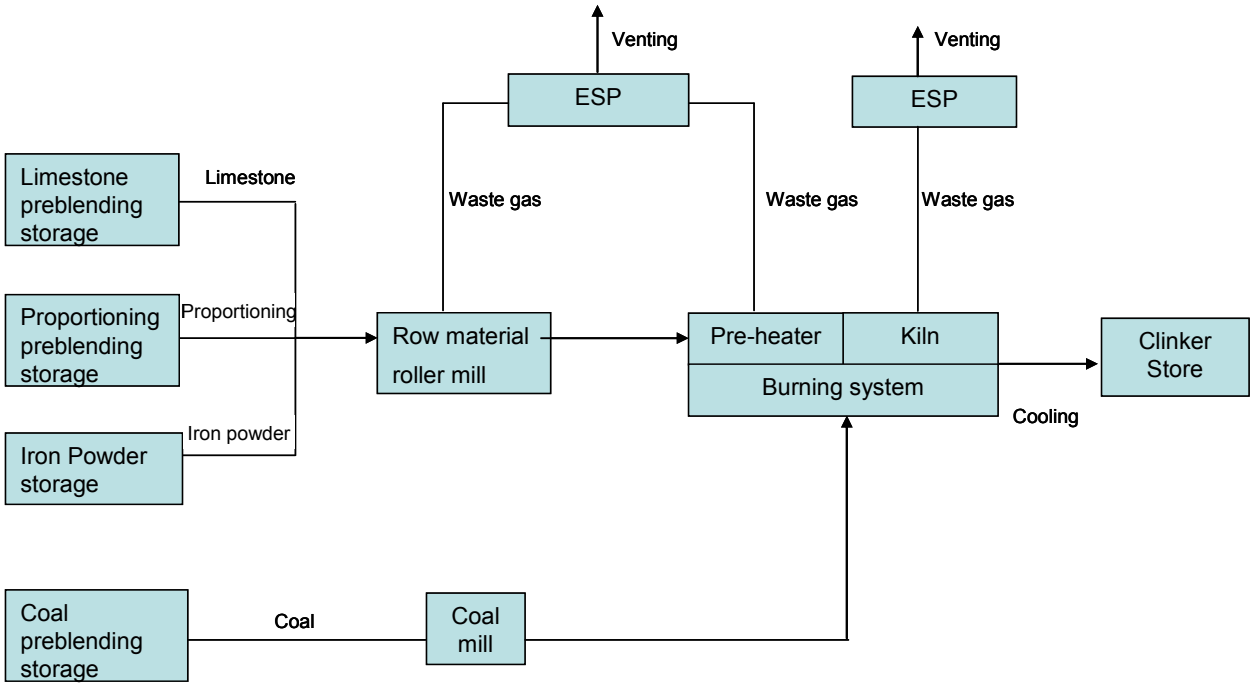
Additionally, the Project Activity also:

- significantly reduces harmful emissions (including SOx, NOx and floating particles), and thus improves the local environment
- leads to a reduction in the temperature of the vented hot air from over 360°C to 84°C and also reduces the volume of water that is consumed by the humidifying pump in the cooling towers and thereby saves water resources in this area.
- leads to an increase in local staff employed by about 19 persons.

Technology employed by the project activity

The production of cement relies on several processes:

Figure 1 Schematic Drawing of Clinker Production Line



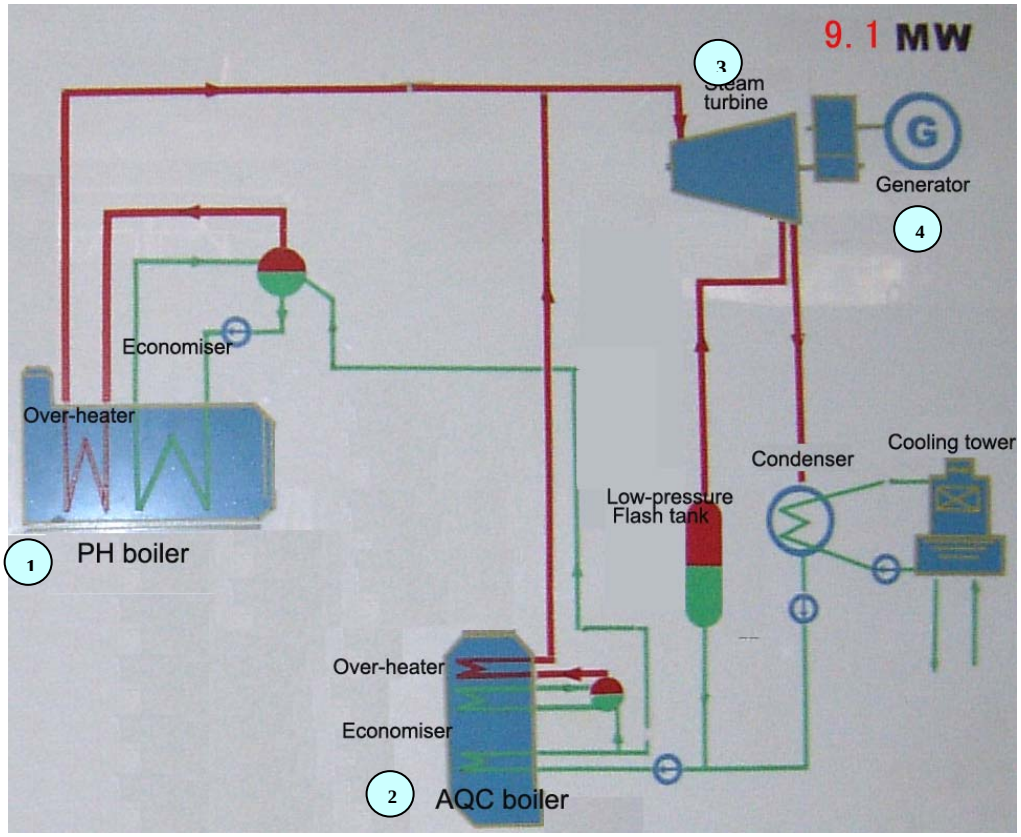
Raw material preparation → grinding → clinker production → clinker storage and grinding → cement silos and dispatch

A large portion of the energy consumption for the production of cement occurs in the calcination process in clinker production. This involves passing the ground raw materials through a pre-heater stack containing cyclone heaters to a long rotating kiln to create clinker and then cooling this in the clinker cooler. Waste heat is typically mainly vented to atmosphere and if captured and used for power generation, as proposed in this Project Activity, can lead to significant greenhouse gas emission reductions.

The production process of this project is an energy conversion process. Feedwater recovers the heat energy of low-temperature waste heat exhausted by 5000 t/d cement clinker production line through PH heat recovery boiler and AQC heat recovery boiler, to covert it into superheated steam, and then steam is fed into steam turbine through the steam pipe. The heat energy is converted into kinetic energy in steam turbine to enable turbine rotor to rotate at high speed, and then drive the generator to rotate, and final product – electric energy is generated.

A schematic presentation of the key equipment fitted as part of the Project Activity can be seen in Figure 2.

Figure 2 Schematic Drawing of Key Technology Employed by the Project Activity



The model numbers and performance characteristics of the main equipment are shown in the following table:

Name of major equipment	Model, specification and performance	Quantity (set)	Point on Figure 4	Manufacturer
PH boiler	KAWASAKIBLW forced circulation boiler	1	1	KAWASAKI HEAVY INDUSTRIES, LTD
AQC boiler	Natural circulation boiler	1	2	Jiangsu Nantong Wanda Boiler Co. Ltd.
Steam turbine and auxiliaries	Mixed-pressure admission condensing	1	3	Nan Jing Steam Turbine Co. Ltd.
Generator	Totally-enclosed self-cooling 3-phase AC synchronous generator	1	4	Nan Jing Steam Turbine Co. Ltd.

The output from the 9.1MW generator with a rated voltage of 6.3kV is connected to the power distribution system of Ningguo cement plant.

3.2 GEOGRAPHIC LOCATION

The project is located at the Conch Cement Company's Ningguo Cement Plant in Ningguo City of Anhui Province of China. The project's geographical coordinates are longitude 118° 54' and latitude is 30° 43'. Figure 3 shows the location of the Ningguo Cement Plant in Anhui Province.

Figure 3. Map of Anhui Province Showing Project Location

3.3 IMPLEMENTATION STAUS OF THE PROJECT

The project activity has been implemented for more than 2 years.

3.4 MONITORING SYSTEM AND QA/QC PROCEDURE

Monitoring system for EGy:
The internal meter (52F, 0.5% accuracy) are maintained and recorded on a monthly basis by the Measuring and Metering Department of Ningguo. The meter readings can be checked by two different staff, the meter is calibrated according to internal procedure and by qualified staff from the local power grid company. Meter inspections are carried out with all parties to the meter reading being present to witness the reading. Calibration process and frequency were verified by the related verification qualification department according to the national standard.

Electricity mters will be installed in 3 measure outlets of total power generation (52G), electricity used by plant (52H) and electricity connected to the company internal grid (52F). Their accuracy is all 0.5%. Details as shown in Annex 1.

Monitoring system for fuel consumption per unit output, the changes in fuel consumption per unit output of the 5000 ton per day production line will be monitored on a monthly basis by recording:

- The fuel consumed (weighed prior to going into the kiln) , measure by Pfister Rotor Scale;
- The output of clinker (value taken by calculation from the raw material input), measure by Solid Flow Meter;

- On an annual basis this will be checked against the baseline values. Currently this value is 0.14 tons of as used raw coal per ton of clinker produced which equate to 0.003130TJ/t clinker

Calibration of raw material weight and coal feeding weight will be carried on by Nigguo Cement.

3.5 PARAMETRS REQUIREMENTS OF MONITORING

EG_y (MWh) is the electricity supplied from the project activity to the cement plant; it is measured by power meter 52F, record frequency is continuously, actually the record interval is one day;

$O_{clinker}$ (t) is the production of clinker after implementation of project, it is measured by solid flow meter, record frequency is continuously; actually the record interval is one day;

Coal Consumption (t) is the quantity of coal consumption, it is measured by Pfister Rotor Scale, record frequency is continuously, and actually the record interval is one day;

$NCV_{fuel,y}$ (TJ/ton Coal) is the calorific value of fuel used in clinker production, record frequency is monthly, actually the record interval is one day. It is measured by Ningguo Cement laboratory.

Carbon Content (%) is used to calculate the parameter carbon coefficient is measured by the third party calibration organization, and actually the record interval is monthly.

4 EMISSIONS REDUCTION CALCULATION FOR THE PROJECT

According to the methodology, the emission reductions are calculated as:

$$ER_y = BE_y - PE_y$$

Where,

- ER_y: are the total emissions reductions during the monitoring period in tons of CO_2
- BE_y: are the baseline emissions for the project activity during the monitoring period in tons of CO_2
- PE_y: are the emissions from the project activity during the monitoring period in tons of CO_2

The leakage can be ignored according to the methodology

4.1 PROJECT EMISSIONS (PE_Y)

PE_y are the project emissions due to fuel consumption changes in the cement kiln of the cement plant as a result of the project activity and are calculated by using the following formula:

$PE_y = \Delta EI * O_{clinker} * COEF_{fuel}$

Where:

ΔEI is the impact of the Project Activity on the energy consumption of the clinker kiln in TJ/tClinker. Its calculation is described in detail as given below.

$O_{clinker}$ is the clinker output of the No. 3 clinker line of Ningguo Cement Plant during the monitoring period

$COEF_{fuel}$ is the carbon coefficient (tCO_2 / TJ of input fuel) of the fuel used in the cement plant to raise the necessary heat for clinker production.

ΔEI is calculated as follows:

$\Delta EI = EI_p - EI_B$

Where:

EI_B is the measured baseline energy consumption per unit output of clinker in TJ/ton of clinker. The validated value in the PDD is 0.003130 TJ/tClinker.

EI_p is the energy consumption per unit output of clinker in TJ/ton of clinker during monitoring period. It is calculated from total fuel consumption in TJ divided by the clinker output during the monitoring period.

Refer to the following table for EI_p and EI_B

Monitoring period	Clinker production $O_{Clinker}$ [tons]	Coal consumption (energy value) [TJ]	Energy Intensity, Production EI_P [TJ/tClinker]	Energy Intensity, Baseline EI_B [TJ/tClinker]
01/03/2008 - 31/05/2009	2,335,756	6,982	0.002989	0.003130

To be conservative and avoid negative project emissions, if ΔEI is negative, then $\Delta EI = 0$. Thus, the project emissions are calculated as follows:

Monitoring period	Clinker $O_{Clinker}$ [tons]	Diff. in Energy int. ΔEI [TJ/tClinker]	Emissions Factor $EF_{CO2,fuel,y}$ [tCO_2/TJ]	Project Emissions PE [tCO_2]
01/03/2008 - 31/05/2009	2,335,756	0.000000	100.060	0

$PE_y = 0\ tCO_{2e}$

4.2 LEAKAGE EMISSIONS

These are zero for the Project and are not monitored (Leakage can be ignored according to Methodology)

Leakage=0

4.3 BASELINE EMISSIONS

The avoided baseline emissions, EB_y, by the project activity during the monitoring period are calculated as:

$$BE_y = EG_y * EF_y$$

Where

EG_y is the electricity supplied from the Project Activity to the cement plant.
EF_y is the emission factor of the East China Power Grid

EGy is measured with three power meters as described in the monitoring plan of PDD. The three meters measure respectively the net power supplied from the power plant, total power generation, and auxiliary power consumption. EGy is obtained as follows:

- When the meter for net power supplied from the power plant is in normal operation, EGy is measured directly. This meter is a bidirectional power meter which can measure both the power exported from the power plant and power imported to the power plant. i.e. EGy = power export from the power plant – power import to the power plant
- When the meter for net power supplied from the power plant is in malfunction, EGy = total power generation – auxiliary power consumption

During the first verification, it was found that the meter accuracy for auxiliary power consumption is lower than what is required in PDD. A deviation was filed for the first verification and approved at EB47. During current monitoring period, the low-accuracy meter has been replaced with a new meter which meets the requirement of PDD.

Baseline emissions during this monitoring period are summarized as follows:

Monitoring period	Electricity Generated EG [MWh]	Emission Factor EF [tCO_2/MWh]	Baseline Emission BE [tCO_2]
01/03/2008 - 31/05/2009	85,240	0.843	71,857

BE_Y =71，857 tCO_{2e}

The avoided baseline emissions are 71，857 tCO_{2e}. Please see attached Ningguo Monitoring Records and Emission Reduction spreadsheet for more information.

4.4 EMISSION REDUCTIONS

The emission reductions, ER_y, by the project activity during the monitoring period are the difference between the baseline emissions (BE_y) and project emissions (PE_y), as follows:

$$ER_y = BE_y – PE_y$$

Monitoring period	Baseline Emission BE [tCO_2]	Project Emissions PE [tCO_2]	Emission Reduction ER [tCO_2]
01/03/2008 - 31/05/2009	71,857	0	71,857

The emission reductions, ER_y, by the project activity during the monitoring period are 71，857 tCO_2. Please see attached Ningguo Monitoring Records and Emission Reduction spreadsheet.

Decription	Unit	Performance according to PDD		actual performance	Change in percentage
		Annual data	equivalent to current monitoring period		
Net electricity	MWh	65,100	81,509	85,240	4.6%
Emission Reduction	CO2e	54,907	68,747	71,857	4.5%

The actual emission reduction is different from the estimated emission reduction in PDD (the difference is about 4.5%).

4.5 MONITORING RECORDS AND EMISSION REDUCTIONS CALCULATION

For detailed data refer to attached Ningguo Monitoring Records and Emission Reduction spreadsheet

4.6 INFORMATION ON CALIBRATION OF MONITORING

All the meters and measurement equipments have already calibrated as description of PDD or approved methodology, details as shown in spreadsheet of “meters calibration”.

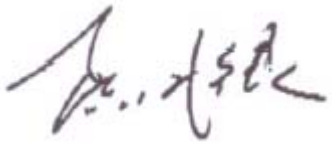
4.7 CLARIFICATION OF THE LAST DEVIATION

The last deviation is no impact to this period; because the last deviation is focus on lose accuracy of power meter 52H, detail diagram as shown in annex1

- In this period the power meter 52H have already exchanged into 0.5% accuracy from 2%;
- In this period the parameter EG is measured by power meter 52F, 52F is a double directions power meter, one direction is export to grid and the other one is import from grid. Data of two directions are all measured and recorded.

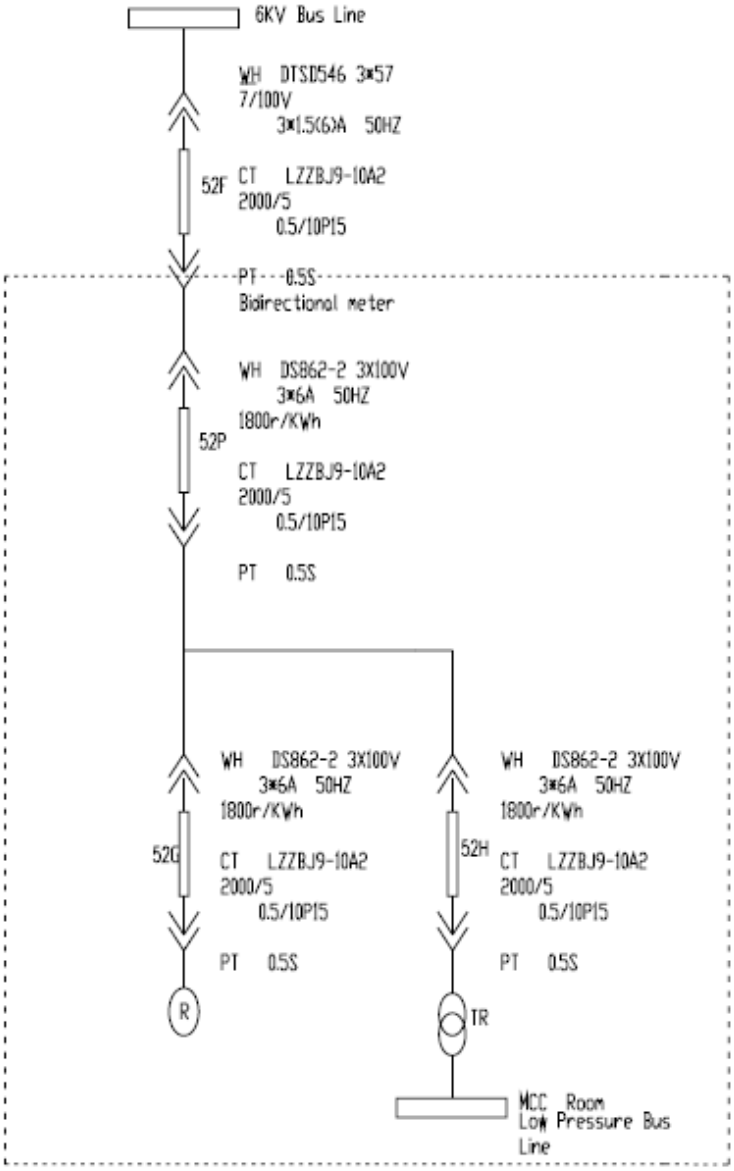
Therefore, the last deviation is no impact to this monitoring period.

Following person with signature below confirms the Monitoring Report of Ningguo Cement Plant 9100 kW Waste Heat Recovery and Utilisation for Power Generation Project of Anhui Conch Cement Co. Ltd



Anhui Conch Cement Company Limited
Technical Responsibility: Mr. Chen Fengyin
Date: 5 November 2009

Annex 1



Notes:

Meter 52F- Located in Main transfer room, monitors the power transmited to the grid.

Meter 52P- Located in MCC Roon, monitors the power transmited to the grid.

Meter 52G- Located in MCC Roon, monitors the power generation volumne.

Meter 52H- Located in MCC Roon, monitors on-site power use.

Annex 2 Meters Calibration Sheets

Meters Information				Calibration (1)					Calibration (2)					Calibration (3)					Calibration (4)				
Ref.NO	Position	SN	Calibration period	Calibration Result	Certification Date	Valide to	Certifiction Code	Calibration Department	Calibration Result	Certification Date	Valide to	Certifiction Code	Calibration Department	Calibration Result	Certification Date	Valide to	Certifiction Code	Calibration Department	Calibration Result	Certification Date	Valide to	Certifiction Code	Calibration Department
1	52F	650007	1year	Passed	4/25/2007	4/24/2008	742	Testing Center of Electrical Measurement Equipments, Ningguo City	Passed	3/31/2008	3/30/2009		Ningguo Measurement Equipment Orgnization	Passed	3/19/2009	3/18/2010		Ningguo Measurement Equipment Orgnization					
2	Pfister Rotor Scale（3824）	NG03-1+LCB	0.5 year	Passed	10/16/2007	4/15/2008	20071016	Ningguo Cement Co.,Ltd,Anhui Province	Passed	4/14/2008	10/13/2008	20080414	Ningguo Cement Co.,Ltd,Anhui Province	Passed	10/12/2008	4/11/2009	20081012	Ningguo Cement Co.,Ltd,Anhui Province	Passed	4/10/2009	10/9/2009	20090410	Ningguo Cement Co.,Ltd,Anhui Province
3	Pfister Rotor Scale（3823）	NG03-2+LCB	0.5 year	Passed	10/16/2007	4/15/2008	20071016	Ningguo Cement Co.,Ltd,Anhui Province	Passed	4/10/2008	10/9/2008	20080410	Ningguo Cement Co.,Ltd,Anhui Province	Passed	10/8/2008	4/7/2009	20081008	Ningguo Cement Co.,Ltd,Anhui Province	Passed	4/2/2009	10/1/2009	20090402	Ningguo Cement Co.,Ltd,Anhui Province
4	Solid Flow Meter（3423）	G750	0.5 year	Passed	10/13/2007	4/16/2008	20071013	Ningguo Cement Co.,Ltd,Anhui Province	Passed	4/10/2008	10/10/2008	20080411	Ningguo Cement Co.,Ltd,Anhui Province	Passed	10/8/2008	4/7/2009	20081008	Ningguo Cement Co.,Ltd,Anhui Province	Passed	4/6/2009	10/5/2009	20090406	Ningguo Cement Co.,Ltd,Anhui Province
5	52P	127552459	1year	Passed	7/28/2008	7/27/2009	80728001	Testing Center of Electrical Measurement Equipments, Ningguo City	Passed	3/29/2009	3/28/2010	On-site Calibration	Testing Center of Electrical Measurement Equipments, Ningguo City										
6	52G	1512061116	1year	Passed	4/25/2007	4/24/2008	741	Testing Center of Electrical Measurement Equipments, Ningguo City	Passed	3/31/2008	3/30/2009	On-site Calibration	Testing Center of Electrical Measurement Equipments, Ningguo City										
7	52H	78165	1year	Passed	4/25/2007	4/25/2008	743	Testing Center of Electrical Measurement Equipments, Ningguo City	Passed	3/31/2008	3/30/2009	On-site Calibration	Testing Center of Electrical Measurement Equipments, Ningguo City										
		127552458	1year	Passed	7/28/2008	7/27/2009	80728002	Testing Center of Electrical Measurement Equipments, Ningguo City	Passed	3/29/2009	3/28/2010	On-site Calibration	Testing Center of Electrical Measurement Equipments, Ningguo City										

Meters Information				Calibration (1)					Calibration（2）					Calibration（3）				
Ref.NO	Position	SN	Calibration period	Calibration Result	Certification Date	Valide to	Certificate Code	Calibration Department	Calibration Result	Certification Date	Valide to	Certification Code	Calibration Departement	Calibration Result	Certification Date	Valide to	Certificate Code	Calibration Department
1	Electronic Balance	317	1year	Passed	11/5/2007	11/4/2008	2007-L2-334	Quality and Technology Supervision Bureau of Nongguo City	Passed	10/28/2008	10/27/2009	2008-L2-212	Quality and Technology Supervision Bureau of Nongguo City					
2	Electronic Stopwatch	PC806	1year	Passed	10/26/2007	10/25/2008	DC2007-1-031947	Anhui Institute of Measurement Science	Passed	5/8/2009	5/7/2010	DC2009-1-321106	Anhui Institute of Measurement Science					
		PC2208	1year	Passed	10/17/2008	10/16/2009	DC2208-1-312348	Anhui Institute of Measurement Science										
3	Thermocouple（090#Box-type resistance furnace）	0709R3507	1year	Passed	11/7/2007	10/6/2008	RG2007-2-231568	Anhui Institute of Measurement Science										
		0805R2739	1year	Passed	10/27/2008	10/26/2009	RH2008-2-231922	Anhui Institute of Measurement Science										
		11TE-4A	1year	Passed	6/5/2009	6/4/2010	RH2009-2-230850	Anhui Institute of Measurement Science										
4	Temperature Controller（090#Box-type resistance furnace）		1year	Passed	5/29/2007	5/28/2008	2007-R1-307	Quality and Technology Supervision Bureau of Nongguo City	Passed	5/20/2008	5/19/2009	2008-R1-365	Quality and Technology Supervision Bureau of Nongguo City	Passed	5/18/2009	5/17/2010	2009-R1-339	Quality and Technology Supervision Bureau of Nongguo City
5	Temperature Controller(Dry box Type101-1)		1year	Passed	5/29/2007	5/28/2008	2007-R1-306	Quality and Technology Supervision Bureau of Nongguo City	Passed	5/20/2008	5/19/2009	2008-R1-364	Quality and Technology Supervision Bureau of Nongguo City	Passed	5/18/2009	5/17/2010	2009-R1-338	Quality and Technology Supervision Bureau of Nongguo City