

ICS 13.040.20
CCS Z 50

HJ

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

HJ 618-2011

Replacing GB/T 6921-1986

**Determination of atmospheric particles PM₁₀ and PM_{2.5} in
ambient air by gravimetric method
(English Translation)**

Issued on: September 8, 2011

Implemented on: November 1, 2011

Issued by: Ministry of Ecology and Environment

Table of Contents

Foreword	
1 Scope of application	
2 Normative references	
3 Terms and definitions	
3.1 PM10	
3.2 PM2.5	
4 Principle of the method	
5 Instruments and equipment	
6.1 Sample Collection	
6.2 Sample storage	
7 Analysis steps	
8 Calculation and representation of results	
8.1 Calculation of results	
8.2 Results representation	
9 Quality Control and Quality Assurance	

Foreword

To implement the Environmental Protection Law of the People's Republic of China and the Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution this standard is formulated to ensure human health and to regulate the measurement methods of PM10 and PM2.5 in ambient air.

This standard specifies the gravimetric method for determining PM2.5 and PM10 in ambient air.

This standard is a revision of the "Measurement Method for Atmospheric Airborne Dust Concentration" (GB 6921-86).

This standard was first published in 1986 and this is the first revision. The main contents of the revision are as follows.

- Change the fly ash to respirable particulate matter (PM10);
- Added three chapters on normative references, terminology and definitions, quality control and quality assurance;
- Added terms and definitions for PM10 and PM2.5;

-- Modified the PM10 sampler performance index, changing the cutting particle size $Da_{50}=(10\pm 1)\mu\text{m}$ to $Da_{50}=(10\pm 0.5)\mu\text{m}$; the geometric standard deviation $\sigma_{\text{mag}} \leq 1.5$ of the collection efficiency is changed to $\sigma_{\text{mag}} = (1.5 \pm 0.1)$. All performance indicators are required to comply with PM10 Provisions in the Technical Requirements and Test Methods for Samplers (HJ/T 93-2003);

-- Increased PM2.5 sampler performance index, cutting particle size $Da_{50} = (2.5 \pm 0.2)\mu\text{m}$; geometric standard for capture efficiency the difference is $\sigma_{\text{mag}}=(1.2\pm 0.1)\mu\text{m}$; other performance indicators are required to meet the "PM10 sampler technical requirements and detection methods" (HJ/T 93-2003).

Since the implementation of this standard, the National Environmental Protection Agency approved and issued the national environmental protection on October 10, 1986.

The standard "method for measuring the concentration of atmospheric dust" (GB 6921-86) is abolished.

Appendix A of this standard is an informative annex.

This standard is revised by the Science and Technology Standards Department of the Ministry of Environmental Protection.

This standard is mainly drafted by. China-Japan Friendship Environmental Protection Center, National Environmental Analysis and Testing Center.

This standard was approved by the Ministry of Environmental Protection on September 8, 2011.

This standard has been implemented since November 1, 2011.

This standard is explained by the Ministry of Environmental Protection.

Determination of ambient air PM10 and PM2.5 gravimetric method

1 Scope of application

This standard specifies the gravimetric method for determining PM10 and PM2.5 in ambient air.

This standard applies to the manual determination of PM10 and PM2.5 concentrations in ambient air.

The detection limit of this standard is 0.010 mg/m³ (analytical balance with a sensitivity of 0.1 mg, sample loading of 1.0 mg, collection of 108 m³ Air sample meter).

2 Normative references

The contents of this standard refer to the following documents or their terms. For undated references, the valid version is appropriate.

Used in this standard.

HJ/T 93 PM10 sampler technical requirements and testing methods HJ/T 194 Technical Specifications for Manual Air Quality Monitoring

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 PM10

Particulate matter suspended in air with an aerodynamic diameter of $\leq 10\mu\text{m}$.

3.2 PM2.5

Particulate matter suspended in air with an aerodynamic diameter $\leq 2.5\mu\text{m}$.

4 Principle of the method

Quantitative volumetric air is drawn at a constant rate through a sampler with certain cutting characteristics to make PM2.5 and ambient air PM10 is trapped on a filter of known mass, and PM2.5 is calculated based on the difference in weight of the filter before and after sampling and the sample volume.

PM10 concentration.

5 Instruments and equipment

5.1

Cutter.

5.1.1

PM10 cutter and sampling system. the cutting particle size is $\text{Da}_{50}=(10\pm 0.5)\mu\text{m}$; the geometric standard deviation of the collection efficiency is $\sigma_{\text{mag}}=(1.5\pm 0.1)$. Other performance and technical indicators shall be in accordance with HJ/T 93-2003.

5.1.2

PM2.5 cutter and sampling system. the cutting particle size is $\text{Da}_{50}=(2.5\pm 0.2)\mu\text{m}$; the geometric standard deviation of the collection efficiency is $\sigma_{\text{mag}}=(1.2\pm 0.1)$. Other performance and technical indicators shall be in accordance with HJ/T 93-2003.

5.2

Sampler orifice flowmeter or other flowmeter that meets the requirements of this standard.

5.2.1

Large flow meter. range (0.8~1.4) m³/min; error ≤ 2%.

5.2.2

Medium flow flowmeter. range (60~125) L/min; error ≤ 2%.

6.1 Sample Collection

6.1.1

The requirements of sampling environment and sampling frequency in ambient air monitoring shall be carried out in accordance with the requirements of HJ/T 194. Sampling the height of the entrance to the ground shall not be less than 1.5m. Sampling should not be carried out under weather conditions such as wind speeds greater than 8 m/s. Sampling point should be avoided Open sources of pollution and obstacles. If the PM₁₀ and PM_{2.5} are measured at the transportation hub, the sampling points should be placed outside the edge of the sidewalk.

6.1.2

When using the intermittent sampling method to measure the daily average concentration, the number of times should not be less than 4 times, and the cumulative sampling time should not be less than 18h.

6.1.3

When sampling, put the weighed filter (5.3) into the filter net in the clean sampling clamp with tweezers.

Gas direction. Firmly press the filter to airtightness. If any concentration is measured, the filter needs to be replaced each time;

At the concentration, the sample can be collected on a filter. After sampling, remove it with tweezers. Put the dust surface twice in half and put it into the sample Box or paper bag, and make a sample record.

6.1.4

After weighing, the sample of the filter sample is weighed according to the analysis procedure in Chapter 7.

6.2 Sample storage

After the filter is collected, if it cannot be weighed immediately, it should be stored at 4 °C.