

JIS

JAPANESE INDUSTRIAL STANDARD

**General Rules for Sampling,
Analysis and Testing
of Coal and Coke**

JIS M 8810—1989

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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General Rules for Sampling, Analysis and
Testing of Coal and Coke

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1. Scope

This Japanese Industrial Standard specifies the general matters commonly applicable to the methods for sampling, analysis and testing of coal and coke specified in the Standards listed below.

JIS M 8811

JIS M 8812

JIS M 8813

JIS M 8814

JIS M 8815

JIS M 8816

JIS M 8817

JIS M 8818

Remark: The units and numerical values given in { } in this Standard are based on the International System of Units (SI) and are appended for informative reference.

2. Definition of Terms

The definitions of principal terms used in this Standard shall be as given in JIS M 0104.

3. Weighing Instrument

3.1 Balance and Weight The balance and weight specified in Table 1 shall be used. A verified weight having a precision suitable for the reciprocal sensibility of the balance shall be used.

Further, the type of balance used in the Standard shall be indicated with the symbol given in Table 1 in the shoulder portion of the relevant item.

Table 1. Types of Balances

Symbol	Weighing capacity ⁽¹⁾	Reciprocal sensibility ⁽²⁾ g	Example
A	100 g 200 g	0.001 0.001	Chemical balance ⁽³⁾
B	50 g	0.005 to 0.01	Compounding balance
C	5 kg	0.5	Mine balance
D	5 kg	1	Desk platform scale
E	100 kg	50	Small size platform scale
F	100 g	0.1	Even balance
G	200 g	0.2	
H	500 g	0.5	
I	1 kg	1	
J	2 kg	2	
K	5 kg	1	
L	5 kg	5	
M	10 kg	10	
N	Electromagnetic type balance ⁽⁴⁾		Electronic force balance

Notes ⁽¹⁾ The weighing capacity is defined as the maximum limit to be weighed safely and correctly, and this value is indicated on the balance.

⁽²⁾ The reciprocal sensibility is defined as the minimum mass which the balance can sense in accordance with the approval standard of the Measurements Law.

⁽³⁾ A Grade 1 weight shall be used.

⁽⁴⁾ The electromagnetic type balances are classified as given in Table 2.

Table 2. Electromagnetic Type Balances

Weighing capacity	Limit of reading	Standard deviation	Linearity	Example
120 mg	0.1 μ g	0.2 μ g	± 0.2 μ g	Microelectronic force balance
150 mg	1 μ g	1 μ g	± 1 μ g	
30 g	0.01 mg	0.02 mg	± 0.03 mg	Electronic force balance
100 g	0.1 mg	0.1 mg	± 0.2 mg	
200 g	0.1 mg	0.1 mg	± 0.2 mg	
300 g	0.001 to 0.1 g	—		Electronic force even balance
600 g	0.01 to 1 g			
3 kg	0.01 to 1 g			
6 kg	0.1 to 1 g			
10 kg	0.1 to 1 g			

Remark: The weighing instruments to serve for this Standard shall, as a rule, be preliminarily verified in accordance with the Measurements Law, and further corrected, as required.

3.2 Chemical Volumeters Measuring flask, pipette, burette, measuring cylinder, etc.

3.3 Thermometer

3.3.1 Glass Thermometer Ordinary mercury thermometer or Beckmann thermometer and others.

3.3.2 Thermoelectric Thermometer The thermoelectric thermometer shall be composed of the following.

- (1) Indicating Instrument A moving coil-type indicator of Grade 0.5 specified in JIS C 1601 or an indicating recorder specified in JIS C 1802.
- (2) Thermocouple The thermocouple of grade R (or S) 0.25 or the thermocouple of grade K (former symbol CA) 0.4 specified in JIS C 1602.
- (3) Protecting Tube for Thermocouple The porcelain protecting tube or quartz glass protecting tube of JIS R 1401.
- (4) Compensating Conductor The compensating conductor specified in JIS C 1610.
- (5) Reference Contact Point Apparatus The freezing point type reference contact point apparatus of JIS Z 8705 shall be used, except that this is not used for a thermometer fitted with a reference contact point compensating circuit.

The room temperature type reference contact point may be used, provided that, in that case, the temperature of reference contact point shall be measured by another thermometer and corrected.

Remark: The measurement of temperature with the thermoelectric thermometer shall be in accordance with grade B measuring method specified in JIS Z 8704.

3.4 Pressure Gauge Indicating pressure gauge of Aneroid type of JIS B 7505.

3.5 Calorimeter B type calorimeter or automatic calorimeter shall be used.

3.6 Hydrometer Float type liquid hydrometer shall be used.

4. Names of Samples

4.1 Samples for Total Moisture and Hygroscopic Moisture, and Test Samples for Total Moisture and Hygroscopic Moisture The sample which has been taken by the specified method (3.7.1 or 3.7.2 of JIS M 8811) in order to estimate the averaged total moisture or hygroscopic moisture in a lot is generically called the samples for total moisture or the sample for hygroscopic moisture.

The sample which has been prepared by the specified method (3.7.3 of JIS M 8811) from the above-mentioned sample and is ready for submission to the measurement of total moisture or hygroscopic moisture as it is called the test sample for total moisture or the test sample for hygroscopic moisture.

4.2 Sample Taken for Analysis and Test, and Analysis and Test Sample The sample which has been taken by the specified method (3. of JIS M 8811) in order to estimate the averaged quality of the content in a lot is generically called the sample for analysis and for test, and the sample which has been prepared by the specified method (4.3 to 4.7 of JIS M 8811) from the above-mentioned sample and is ready for submission to the analysis and the test as it is should be called the analysis and test sample. The analysis and test sample is grouped as follows.

- (1) Equilibrated Sample The equilibrated sample shall be prepared as follows. Obtain a sample not more than 250 μm in grain size in accordance with 4.5 of JIS M 8811, and allow it to stand at room temperature to a constant mass in a humidistat in which the saturated solution of sodium chloride has been put.
- (2) Air-dried Sample The air-dried sample shall be prepared as follows. Obtain a sample not more than 250 μm in grain size in accordance with 4.5 of JIS M 8811 and spread it in a thin stratum to equilibrate it approximately with the atmosphere of laboratory.

5. Handling of Sample

5.1 Container for Sample The container for sample shall have a capacity for the whole quantity of samples, shall be clean and durable and further can be covered or sealed securely. Especially, the container of sample for measuring the total moisture content and the hygroscopic moisture shall be airtight, wetproof and resistant to rust generation in the inside.

Remark: The straw bag, jute bag, wooden container, etc. shall not be used as the container of samples for measuring the total moisture content and the hygroscopic moisture.

5.2 Marking of Sample The containers for sample shall be marked with the following details, as a rule.

- (1) Name of sample, name of lot or sample number
- (2) Place of sampling
- (3) Date and time of sampling with weather
- (4) Name of person in charge of sampling
- (5) Sampling method
- (6) Mass and grain size of sample, if required
- (7) Date of sample preparation
- (8) Name of person in charge of sample preparation

5.3 Sending of Sample The sending of sample shall be carried out as follows.

- (1) At the time of sending the sample, put it in a container for sample and seal the container. Package the container durably against damage and deterioration of the sample and mixture of foreign matters. Care shall be exerted to protect the markings of sample specified in 5.2 from damage.
It is preferable that the sample container should carry literature listing each item of 5.2.
- (2) At the time of forwarding the sample for total moisture content and for hygroscopic moisture, weigh the mass of sample, put it into a sample container and seal the container and send out the package appending a note stating the mass of sample and if required the loss on predrying (%) (4.8 of JIS M 8811).

Remark: A sample in an appropriate stage of reduction should be selected for forwarding.

5.4 Storage of Sample The storage of sample shall be as follows:

- (1) The sample shall be stored in a container fit for hermetic sealing to avoid the weathering of sample and the change in moisture content of sample.
- (2) The period of storage of sample shall be three months, as a rule, after preparation and sealing. However, the period of storage of sample related to export and import shall be six months, as a rule.
- (3) In storing the sample, it is necessary to pay attention to the storing place so that the sample is free from influences of temperature, direct rays of the sun and moisture in order to avoid the deterioration of sample.

6. Reagents and Water

6.1 Reagents The reagents shall, as a rule, be those of extra grade specified in Japanese Industrial Standard.

6.2 Standard Reagents The standard reagents shall be those specified in JIS K 8005.

6.3 Preparation of Reagents The reagent solutions, standard solutions, indicators, and indicators for titration, which are to be used for analysis and tests, and their preparation, shall be in accordance with JIS K 8001.

6.4 Water Any water termed only "Water" shall be the water which has been demineralized by means of distillation or the ion exchange resin. Further, the temperature of warm water shall be about 60 to 70°C and that of hot water shall be about 100°C.

7. Matters to Be Attended to in Analysis or Test

7.1 Sample Industrial analysis, ultimate analysis, measurements of heating value and determination of mineral matters shall make use of the equilibrated sample or the air-dried sample.

7.2 Weighing Out of Sample Weigh out a specified amount (e.g., 1 g) of the sample (equilibrated sample or air-dried sample) for analysis and test from a container preferably little by little from each portion of the container after mixing the sample sufficiently. The above operation should be carried out quickly because errors are easy to occur due to the adsorption or diffusion of moisture.

7.3 Measurement of Moisture Content

7.3.1 In the case of indicating the results of analysis or test on the equilibrium moisture basis, when the air-dried sample is to be analyzed or tested, the moisture content of equilibrated sample as well as that of air-dried sample shall be previously measured for the convenience of conversion to equilibrium moisture basis.

7.3.2 In the case of indicating the results of analysis on the dry basis, when the equilibrated sample is to be analyzed or tested, the moisture content of equilibrated sample shall be determined, and when the air-dried sample is to be analyzed or tested, the moisture content of the air-dried sample shall be determined.

7.3.3 If the air-dried sample is hermetically sealed and stored, its moisture content changes little for about seven days, so that its moisture content need not be measured at each time of analysis or test.

7.4 Storage of Sample Since the moisture content, heating value, coking property, etc. of coal easily change by efflorescence during storage, the sample should preferably be analyzed or tested as soon as possible after preparation. When a long period of time is anticipated for preparing the equilibrated sample, the air-dried sample should previously be analyzed or tested.