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JIS K 6218-1 : 2005
(JRMA/JSA)

**Carbon black for rubber industry—
Secondary characteristics—
Part 1 : Determination of loss on
heating**

ICS 83.040.20

Reference number : JIS K 6218-1 : 2005 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal of establishing a Japanese Industrial Standard from The Japan Rubber Manufacturers Association (JRMA)/Japanese Standards Association (JSA) with a draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law. Consequently **JIS K 6218 : 1997** is replaced with this Standard.

This Standard has been made based on **ISO 1126 : 1992** *Rubber compounding ingredients—Carbon black—Determination of loss on heating* for the purposes of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

JIS K 6218 series consists of the following 5 parts under the general title “*Carbon black for rubber industry—Secondary characteristics*”:

Part 1 : Determination of loss on heating

Part 2 : Determination of ash

Part 3 : Determination of sieve residue

Part 4 : Determination of light transmittance of toluene extract

Part 5 : Determination of solvent extractable material

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Carbon black for rubber industry— Secondary characteristics— Part 1 : Determination of loss on heating

Introduction This Japanese Industrial Standard has been prepared based on the third edition of **ISO 1126** *Rubber compounding ingredients—Carbon black—Determination of loss on heating* published in 1992 with some modifications of the technical contents of the original International Standard.

Portions given sidelines or dotted underlines are the matters in which the contents of the original International Standard have been modified. A list of modifications with the explanation is given in annex 2 (informative).

WARNING : Persons using this Standard should be familiar with normal laboratory practice. This Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices.

1 Scope This part of **JIS K 6218** specifies a method for determining the loss on heating of carbon black for use in the rubber industry (hereafter referred to as “carbon black”). This loss on heating is due primarily to loss of moisture, but traces of other volatile materials may also be lost.

This method is not applicable to treated carbon blacks which contain added volatile materials.

There are the following three kinds of method for the determination of loss on heating.

Method A is the method to be standard, however, if the same results can be obtained, method B or method C may be used.

- Method A the method using an oven
- Method B the method using a moisture balance
- Method C the method using an infrared moisture meter (rapid method)

Remarks : The International Standard corresponding to this part of **JIS K 6218** is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and **JIS** are **IDT** (identical), **MOD** (modified), and **NEQ** (not equivalent) according to **ISO/IEC Guide 21**.

ISO 1126 : 1992 *Rubber compounding ingredients—Carbon black—Determination of loss on heating* (**MOD**)

2 Normative reference The following standard contains provisions which, through reference in this text, constitutes provisions of this Standard. If the indication of the year of publication is given to this referred standard, only the edition of indicated

year constitutes the provision of this Standard but the revision and amendment made thereafter does not apply. The normative reference without the indication of the year of coming into effect applies limiting only to the most recent editions (including amendments).

JIS Z 8401 *Guide to the rounding of numbers*

Remarks : **ISO 31-0** : 1992 *Quantities and units—Part 0 : General principles* is identical with the said standard.

3 Method A the method using an oven

3.1 Principle A test portion of carbon black is heated for 1 h at a temperature of $125\text{ }^{\circ}\text{C}$ in a weighing bottle. The weighing bottle plus contents are allowed to cool in a desiccator to room temperature and weighed, and the percentage loss on heating calculated.

3.2 Apparatus

- a) **Oven**, preferably gravity-convection type, capable of controlling at $125\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, and the temperature distribution is within $\pm 5\text{ }^{\circ}\text{C}$.

NOTE : The loss on heating of a carbon black may depend upon the test temperature chosen.

- b) **Weighing bottle**, 30 mm in height and 60 mm in diameter, fitted with a stopper (hereafter referred to as “stopper”).

When larger samples are required for other tests, use an open vessel of dimensions such that the depth of the black is no greater than 10 mm during conditioning.

- c) **Analytical balance**, accurate to $\pm 0.1\text{ mg}$.

- d) **Desiccator**

3.3 Procedure The test method shall be in accordance with the following procedure.

3.3.1 Precautions

- a) Take the sample of carbon black in a tightly stoppered glass bottle or friction-top can. Allow the closed container to reach ambient temperature before starting the test.
- b) Keep the weighing bottle stoppered when transferring to and from the desiccator, to prevent loss of carbon black due to air currents.

3.3.2 Determination

- a) Dry the weighing bottle [3.2 b)] and the stopper, with the stopper removed, in the oven [3.2 a)] at a temperature of $125\text{ }^{\circ}\text{C}$ for 30 min. Place the bottle and the stopper in the desiccator [3.2 d)] and allow to cool to ambient temperature. Weigh the bottle with stopper to the nearest 0.1 mg.

- b) Weigh to the nearest 0.1 mg about 2 g of carbon black into the weighing bottle.
- c) Place the weighing bottle, test portion and stopper in the oven for 1 h at a temperature of 125 °C, with the stopper removed.
- d) Replace the stopper and transfer the bottle and contents to the desiccator. Remove the stopper and allow to cool to ambient temperature. Replace the stopper on the weighing bottle and reweigh to the nearest 0.1 mg.

3.4 Expression of results The loss on heating shall be calculated according to the following formula and rounded off to the first decimal place according to **JIS Z 8401**.

$$H = \frac{m_1 - m_2}{m_1 - m_0} \times 100$$

where, H : loss on heating (%)

m_0 : the mass of the weighing bottle and stopper (g)

m_1 : the mass of the weighing bottle, stopper and test portion before heating (g)

m_2 : the mass of the weighing bottle, stopper and test portion after heating (g)

NOTE : The precision and bias shall be referred to annex 1.

4 Method B the method using a moisture balance

4.1 Principle The sample of carbon black is heated at the temperature not exceeding 125 °C, and the loss is measured by using a moisture balance (closed type moisture meter).

4.2 Apparatus

4.2.1 Moisture balance, shall have 0.1 mg in precision. That should have an indirect heat source.

4.3 Procedure The test method shall be in accordance with the following procedure.

4.3.1 Precautions Take the sample of carbon black in a tightly stoppered glass bottle or friction-top can. Allow the closed container to reach ambient temperature before starting the test.

4.3.2 Measurement

- a) The temperature should not exceed 125 °C.
- b) Place approximately 2 g of the sample on the moisture balance and weigh the mass precisely to the nearest 0.1 mg.
- c) Close the cover and start the apparatus.