BUILDING MATERIALS: COMBUSTIBLE CONTENT

Key word: Building materials, test method, combustible content

0 INTRODUCTION

Users of this test method should observe the following warning:

SAFETY WARNING - To all concerned in fire tests - toxic or harmful gases may evolve during combustion of test specimens. Accordingly, suitable precautions should be taken to safeguard health.

1 SCOPE

This test method specifies a procedure to determine the amount of combustible content in building products.

2 FIELD OF APPLICATION

2.1 The test method described is primarily intended for insulating building products made of glass, rock or slag fibre.

2.2 The test method is a simple determination of the organic content and mainly intended for quality control purposes of fire classified products.

2.3 The test method is applicable for homogeneous products and products made of distinct and separable layers of homogeneous materials.

2.4 Reservation should be made in the expression of results from the testing of products with unknown composition and of products which are non homogeneous and not covered by 2.2 (see Annex).

3 REFERENCES

ISO 3261 Fire Tests - Vocabulary.

4 DEFINITIONS

For the purposes of this test method, the definitions given in ISO 3261 apply, together with the following:

4.1 Material
A basic single substance or uniformly dispersed mixture, e.g., stone, wood, concrete, mineral wool.

4.2 Specimen
A representative piece of the sample which is to be tested.

5 SAMPLING

The sample of the product to be tested shall be sufficiently large to be representative of the bulk product.

A product amount for at least ten specimens should be available.

6 METHOD OF TEST

6.1 Principle
The test specimens, predried at 105°C, are inserted into a muffle furnace having a temperature of 550°C. The combustible constituents of the product will then burn off.

The combustible content is expressed as percentage of the initial dry weight.
6.2 Equipment

6.2.1 Muffle furnace
The muffle furnace used to burn off the combustible components of the test specimens shall be capable of maintaining a constant temperature of \( 550 \pm 20 \) °C.

6.2.2 Specimen containers
The specimen containers shall be made of inert materials and must not change weight during test.

6.2.3 Oven
The oven used to predry the test specimens shall be forced ventilated and capable of maintaining a constant temperature of \( 105 \pm 2 \) °C.

6.2.4 Balance
The balance for weighing the test specimens shall have a nominal capacity of at least 100 g and an accuracy of ±0.01 g.

6.2.5 Desiccator
The desiccators used to store the specimens during cooling shall be capable of containing and keeping five specimens dry (see Annex).

6.3 Preparation of test specimens

6.3.1 The specimens shall weigh at least 10 but not more than 30 g.

6.3.2 The specimens shall be cut from various parts of the sample.

6.3.3 For homogeneous products the specimens shall be of the full thickness.

6.3.4 For products consisting of discrete layers of homogeneous material the determination can be done on each layer separately.

6.3.5 To promote combustion of dense products the specimens can be crushed.

6.3.6 The specimens shall be dry. They are dried in the oven at \( 105 \pm 2 \) °C until constant mass is obtained and cooled to ambient temperature in a desiccator prior to test. No more than five specimens should be kept in one desiccator. Minimum drying time for mineral wools (glass and rock wool or similar) is 2 h.

6.4 Test procedure

6.4.1 The furnace shall have a temperature of \( 550 \pm 20 \) °C prior to the test.

6.4.2 Weigh the specimens in the pre-weighed containers. The weighing process shall be finalized within one minute after taking the specimen from the desiccator in order to avoid moisture absorption.

6.4.3 Insert the containers containing the specimens into the furnace.

6.4.4 The specimens shall be kept in the furnace until all the combustible constituents have burnt off. A suitable testing time for mineral wools (glass and rock wool or similar) is 2 h. Other testing times may also be appropriate provided that it is shown that all combustibles are burnt off.

6.4.5 Remove the specimens from the furnace. After cooling to ambient temperature in the desiccator, weigh the specimens.

6.4.6 At least five specimens shall be tested.

6.4.7 If the measured combustible content of one or more of the specimens deviates by more than 0.5 per cent by weight from the mean value, an extra set of five specimens shall be tested. The mean value of all the specimens tested shall be reported.

6.5 Expression of test results

6.5.1 Calculate the weight loss as follows:
- the weight loss of each individual specimen, expressed as a percentage of the initial dry weight of the specimen.
- the arithmetic mean of the weight loss of all the burned specimens, expressed as a percentage.

6.6 Test report
The test report shall contain the following information:

a) Name and address of the testing laboratory
b) Date and identification number of the report
c) Name and address of the client
d) Purpose of the test
e) Method of sampling
f) Name of manufacturer or supplier of the product
g) Name or other identification marks and description of the product
h) Density and thickness of the product
i) Date of supply of the product
j) Description of the specimens and preparation technique
k) Date of test
l) Test method
m) Deviations from the test method, if any
n) Test results
o) Designation of the product according to criteria expressed in official standards or regulations.
COMMENTARY ON THE TEXT AND GUIDANCE NOTES FOR OPERATORS

A.0 Field of application

Products containing chemically bonded water or water of crystallization dehydrate at highly different temperatures, typically below 100 °C up to above 550 °C. Products containing carbonates or hydrogen carbonates can release carbon-dioxide without being combustible.

If this test method is used for quality control of products that very probably contain carbonates or chemically bonded water the composition must be known in order to avoid erroneous test results.

A.1 Hygroscopic moisture

If no measurable hygroscopic moisture is absorbed during the cooling process the use of a desiccator can be omitted.

A.2 Complementary literature

Handbook of Chemistry, table of Physical Constants of Inorganic Compounds.