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Replacing GB/T 2408-2008

Plastics - Determination of burning characteristics - Horizontal and vertical test

塑料 燃烧性能的测定 水平法和垂直法

(IEC 60695-11-10:2013, Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods, MOD)

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020, *Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents*.

This document replaces GB/T 2408-2008, *Plastics - Determination of burning characteristics - Horizontal and vertical test*. Compared with GB/T 2408-2008, the main technical changes, except editorial changes, are as follows:

a) Modify some contents of Terms and definitions (see Chapter 3; Chapter 3 of the 2008 edition);

b) Modify the arrangement of the chapters of "Test specimen", "Method A" and "Method B", and add relevant information to test specimen dimensions (see Chapter 7, Chapter 8 and Chapter 9; Chapter 7, Chapter 8 and Chapter 9 of the 2008 edition);

c) Modify the horizontal burning classification (see 8.4; 8.4 of the 2008 edition);

d) Add information on thickness to material classification [see 8.5m) and 9.5l)];

e) Add evaluation criteria for "burned to the holding clamp" (see 9.2.4);

f) Delete the figure of "Burner/operator/test specimen orientation" (Figure 6 of the 2008 edition);

g) Add the figures of "Clearance gauge", "Flame application", "Flame application when there are molten drips", "HB specimen gauge", "V specimen gauge (example)", "Flame front position not classified as 'burned to the holding clamp'" and "Flame front position classified as 'burned to the holding clamp'" (see Figure 6 ~ Figure 12).

This document uses the redrafting method to modify and adopt IEC 60695-11-10:2013 *Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods*.

The main technical differences, except editorial changes, between this document and IEC 60695-11-10:2013, and their reasons are as follows:

a) With regard to the normative references, this document makes technical adjustments to adapt to the technical conditions of China. The adjustments are concentrated in Chapter 2 "Normative references". The specific adjustments are as follows:

- Use GB/T 5169.22-2015 which is equivalent to the international standard to replace IEC 60695-11-4:2011 (see 6.2, 8.2.3, 9.2.2 and 9.2.3);

- Use GB/T 5471-2008 which is equivalent to the international standard to replace ISO 295:2004 (see 7.1);
- Use GB/T 9352-2008 which is equivalent to the international standard to replace ISO 293:2004 (see 7.1);
- Use GB/T 12006.1-2009 which is equivalent to the international standard to replace ISO 307:2007 (see 9.4);
- Use GB/T 17037.1-2019 and GB/T 17037.5-2020 which modify and adopt international standards to replace ISO 294 (all parts) (see 7.1);
- Use GB/T 2918-2018 to replace ISO 291:2008 (see the note of 6.7), and move it to the references;
- Delete the ISO/IEC guideline 51 and the ISO/IEC guideline 104.

b) Delete the terms of "as received", "combustion", "enclosure", "fire hazard assessment", "fire retardant", "fire risk", "flame" and "ignition", because such nouns are general terms and some of them are indicated with the forms like verb or noun, which is inconsistent with the requirements for national standards.

c) Modify horizontal burning classification to "The materials shall be classified as HB or HB below, as well as HB40 or HB75" instead of "The materials shall be classified HB, HB40 or HB75", because c in the requirements for HB classification partly coincides with c in the requirements for HB40 and HB70, while c in the requirements for HB40 is obviously differentiated from that for HB70; so, this modification is made to better guide the criteria for classification (see 8.4).

For convenience of use, this document also makes the following editorial changes:

a) Change the standard name from "Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods" to "Plastics - Determination of burning characteristics - Horizontal and vertical test".

b) Change "electrotechnical products" in the Scope to "plastic and non-metallic materials".

This document was proposed by China Petroleum and Chemical Industry Federation.

This document shall be under the jurisdiction of National Technical Committee 15 on Plastic of Standardization Administration of China (SAC/TC 15).

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Plastics - Determination of burning characteristics - Horizontal and vertical test

1 Scope

This document specifies small-scale laboratory test procedures intended to compare the burning behaviour of different materials used in plastic and non-metallic materials when vertically or horizontally oriented test bar specimens are exposed to a small flame ignition source with a nominal thermal power of 50 W. These test methods determine either the linear burning rate or the self-extinguishing properties of materials.

This document is applicable to solid and cellular materials that have an apparent density of more than 250 kg/m^3, determined in accordance with GB/T 6343-2009.

Two test methods are described in this document. Method A is a horizontal burning test and is intended to determine the linear burning rate of materials under specific test conditions. Method B is a vertical burning test and is intended to determine whether materials self-extinguish under specific test conditions.

Note 1: ISO 9772 describes a test method for the determination of the burning characteristics to be used for materials with an apparent density of 250 kg/m^3 or less.

ISO 9773 describes a test method for the determination of the burning behaviour to be used for materials that due to their thinness, either distort or are burned up to the holding clamp using Method B of this document.

Note 2: Guidance on pre-selection is given in IEC 60695-1-30.

2 Normative references

The following documents are normatively referenced in this document and are indispensable for its application. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 5169.22-2015, Fire hazard testing for electric and electronic products - Part 22: Test flames - 50 W flame - Apparatus and confirmational test method (IEC 60695-11-4:2011, IDT)

GB/T 5471-2008, Plastics - Compression moulding of test specimens of thermosetting materials (ISO 295:2004, IDT)

GB/T 9352-2008, Plastic - Compression moulding of test specimens of thermoplastic materials (ISO 293:2004, IDT)

GB/T 12006.1-2009, Plastics - Polyamides - Part 1: Determination of viscosity number (ISO 307:2007, IDT)

GB/T 17037.1-2019, Plastics - Injection moulding of test specimens of thermoplastic materials - Part 1: General principles, and moulding of multipurpose and bar test specimens (ISO 294-1:2017, MOD)

GB/T 17037.5-2020, Plastics - Injection moulding of test specimens of thermoplastic materials - Part 5: Preparation of standard specimens for investigating anisotropy (ISO 294-5:2017, MOD)

ISO 9773:1998/AMD 1:2003, Plastics - Determination of burning behaviour of thin flexible vertical specimens in contact with a small-flame ignition source - Amendment 1: Specimens Specimens)

ISO 16012:2015, Plastics - Determination of linear dimensions of test specimens

3 Terms and definitions

The following terms and definitions are applicable to this document.

3.1 Afterflame

Flame that persists after the ignition source has been removed.

3.2 Afterflame time

Length of time for which an afterflame persists.

Note: Designated in Method B by the parameters t_1 and t_2.

3.3 Afterglow

Persistence of glowing combustion after both removal of the ignition source and the cessation of any flaming combustion.

3.4 Afterglow time

Length of time for which an afterglow persists.

Note: Designated in Method B by the parameter t_3.

3.5 Burning behavior

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