NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 2577-2005

Test method for resin content of glass fiber reinforced plastics

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Foreword

This Standard modifies-adopts ISO 1172.1996 "Textile-glass-reinforced plastics - Prepregs, moulding compounds and laminates - Determination of the textile-glass and mineral-filler - Calcination methods". Annex C describes the standard numbers in this Standard and the corresponding standard numbers in ISO 1172.1996.

The distinctions between this Standard and ISO 1172.1996 are as follows.

- This Standard specifies the dimensions of the specimen;

- This Standard does not contain the contents concerning the separation of mineral fillers which are not dissolved in hydrochloric acid.

This Standard replaces GB/T 2577-1989 "Test method for resin content of glass fiber reinforced plastics".

This Standard, compared with GB/T 2577-1989, has the following changes.

- Add the section "Principle" (see section 3);

- Add the method to convert the volume content of fiber (see annex A);

- Add the method to separate mineral filler (see annex B).

Annex A and B in this Standard are normative; annex C is for information only.

This Standard was proposed by China Building Material Federation.

This Standard shall be under the jurisdiction of National Technical Committee on Fiber Reinforced Plastic of Standardization Administration of China.

This Standard is responsibly drafted by Harbin Fiber Glass Research Institute.

Main drafters of this Standard. GUO Shuqi, ZHENG Yan, HOU Diyang, SHI Jianjun, WANG Rongqiu and WANG Hui.

This first edition of this Standard was issued in 1981 and revised in 1989. This is the second revised edition.

Test method for resin content of glass fiber reinforced plastics

1 Scope

This Standard specifies the specimens, apparatus, reagents, test procedure and test report concerning the determination of resin content in glass fiber reinforced plastics after calcination.

This Standard is applicable to glass fiber reinforced plastics of which resin matrix can be fully combusted.

This Standard is applicable to reinforced plastics containing mineral filler which is dissolved at low combustion temperature or not dissolved in hydrochloric acid.

2 Normative references

The following normative documents contain the provisions which, through reference in this text, constitute the provisions of this Standard. For dated references, the subsequent amendments or revisions of these publications do not apply. However, the parties who reach an agreement based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative reference referred to applies.

GB/T 1446 Fiber-reinforced plastics composites - The generals for determination of properties

3 Method and principle

A test specimen is weighed and subsequently calcinated at a specified temperature. The specimen is then reweighed. The mass difference before and after calcination is the resin content, in one of the following ways.

a) In the case of materials containing no fillers, the glass content is calculated directly from the difference in mass;

b) In the case of materials containing both glass and filler, the glass and filler remaining after calcination are separated by dissolution of the filler in hydrochloric acid. The difference BETWEEN the mass of the specimen before calcination AND the mass of the dried specimen after reaction with acid IS USED to measure the glass content.

7.7 Repeat the operations of calcination, reaching constant temperature, cooling and

weighing until the difference of the results of two successive measurements not exceeding 1mg.

8.1 Calculate resin content in accordance with formula (1).

Where,

Mt - the content of resin, in %;

m2 - the mass of crucible plus specimen, in milligrams (mg);

m3 - the mass of crucible plus residue after calcination, in milligrams (mg);

m1 - the mass of crucible, in milligrams (mg).

Note. the resin content in the formula above contains impregnating compound reinforcing material and a

slight amount of low molecule substance which can be combusted; if necessary, do blank test for

calibration.

8.2 If reinforced plastics exclude mineral filler, the calculation of volume content of fiber is shown in annex A.

8.3 If reinforced plastics contain mineral filler, calculate the volume content of fiber which

has been separated in accordance with the method given in annex B.

9 Expression of results

The average of each set of specimens which retains three effective numbers is expressed as the result of the test.

10 Test report

The test report shall include the following contents in part or fully.

a) The number of this Standard;

b) The test conditions, items and description.

c) The category and source of test use materials;

Annex B

(Normative)

Method to determine the content of fiber in glass fiber reinforced plastics containing mineral filler

B.1 Calcination of specimen

The specimen shall be calcinated in accordance with the method as stipulated in section 6.

B.2 Separation of mineral filler

B.2.1 Add hydrochloric acid in 250mL beaker in the quantity that 15mL of hydrochloric acid is added per gram of residue after calcination.

B.2.2 Use glass rod to transfer the residue in the crucible into the beaker containing hydrochloric acid; stir until the residue fully reacts with the acid (attention shall be drawn to bubbles generated from the reaction of acid and carbonate splashing out of beaker).

B.2.3 When bubbles disappear, add distilled water in the crucible to reach 3/4 of volume of crucible which is poured into 250mL beaker. Wash the crucible over and over again until the residue in it is poured into the beaker.