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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Plastics — Phenolic resin powder — Determination of flow distance on a glass plate

Plastiques — Résines phénoliques en poudre — Détermination de l'écoulement à l'état fondu sur une plaque de verre

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Plastics — Phenolic resin powder — Determination of flow distance on a glass plate

1 Scope

1.1 This International Standard specifies a method for the determination of the flow distance of powdered heat-setting phenolic resins for production and control. With reference to tablet formation, test temperature and angle of inclination of the glass plate, measurement of the flow distance involves arbitrarily defined conditions.

1.2 The flow distance is dependent on the reactivity and melt viscosity of the resins. Rapid solidification and high melt viscosity shorten the flow distance.

2 Principle

Tablets are first produced under defined conditions and are placed on a glass plate which has been heated to 125 °C ± 1 °C in a naturally ventilated oven. The plate is kept in the oven for a further 3 min in the horizontal position and then for 20 min in a tilted position. The flow distance is then measured.

3 Apparatus

3.1 Oven with natural ventilation, capable of being maintained at a temperature of 125 °C ± 1 °C. A spirit level is used to check its horizontal position. The temperature is measured in the immediate vicinity of the test tablets.

3.2 Cylindrical tablet press, for producing tablets 12,5 mm ± 0,3 mm in diameter and 4,8 mm ± 0,2 mm thick.

3.3 Balance, accurate to 1 mg.

3.4 Tilting device, made of metal, which can be manipulated from outside the oven to position the glass plate (3.5) either horizontally or at an angle of 60° ± 1° (see figure 1).

3.5 Glass plate, of a suitable size to fit in the oven, for example length 100 mm to 150 mm, width 60 mm to 120 mm, thickness 2,7 mm to 3 mm. The glass plate shall be absolutely clean, smooth and without scratches. To make sure that the tablets have not become displaced during the experiment, a starting line may be drawn on the plate.

NOTE — The starting line is scored on the plate using a glass cutter. It has no influence on the result, and is simply used for precise positioning of the tablets and for measuring the flow distance.

4 Procedure

4.1 In case of dispute, dry the sample until constant mass is obtained, for example by storing the powdered resin in a desiccator for at least 48 h over phosphorus pentoxide.

4.2 Weigh, to the nearest 1 mg, 0,500 g of the powdered resin, and pour into the tablet press (3.2) [see figure 2a)]. Close the press and compress the powder [see figure 2b)] either using a rubber hammer or a lever handle. Eject the tablet from the mould by removing parts 3 and 4 [see figure 2b)] and by pushing the shaft of part 2 into part 1 [see figure 2c)]. Make two tablets in this way.

NOTE — With resin powders having a high apparent density (those containing inorganic additives, for example), more than 0,500 g of powder may be taken in order to produce a tablet with the required thickness (4,8 mm ± 0,2 mm).

4.3 Lay the glass plate (3.5) on the tilting device (3.4) in the horizontal position in the oven (3.1), maintained at a temperature of 125 °C ± 1 °C, and heat for at least 60 min. Without removing the plate from the oven, quickly lay the two tablets (see 4.2) flat on the glass, at least 1 cm apart and at least 1 cm away from the side edges and what will be the upper edge when the plate is tilted.

Alternatively, put the tilting device, without the glass plate, in the horizontal position in the oven, maintained at 125 °C ± 1 °C, and heat for at least 60 min. Lay the tablets flat on the unheated glass plate, at least 1 cm apart and at least 1 cm away from the side edges and what will be the upper edge when the plate is tilted. Put the plate on the preheated horizontal tilting device in the oven.

Keep the glass plate with the tablets on it for 3 min ± 3 s in the horizontal position. Then tilt the device quickly but without jolting the plate, within a maximum of 5 s, to an angle of 60° ± 1° (see figure 1).

4.4 After 20 min in the inclined position, remove the glass plate from the oven and allow it to cool. Then measure for each tablet the flow distance, including tablet diameter, to the nearest 1 mm.

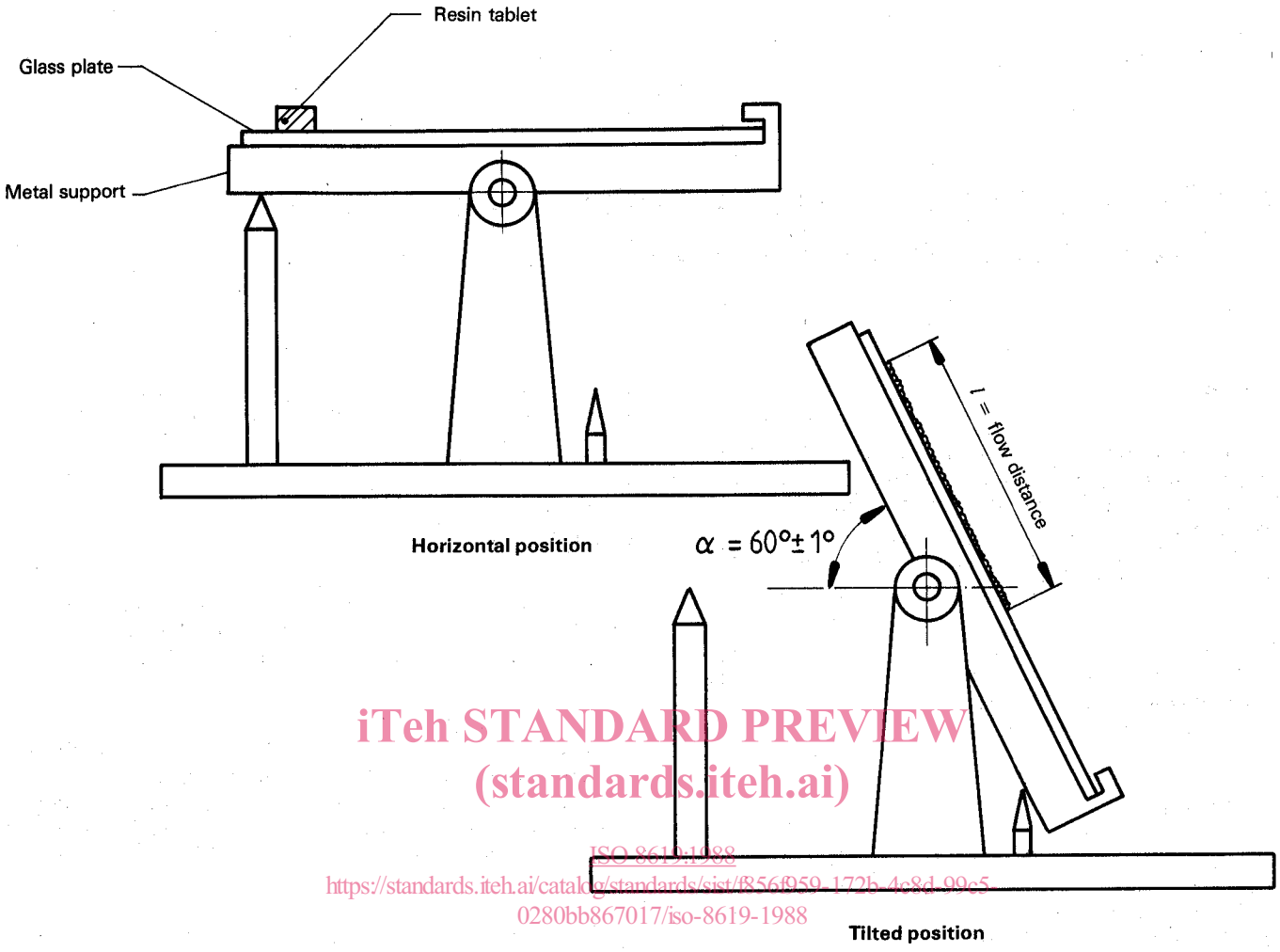
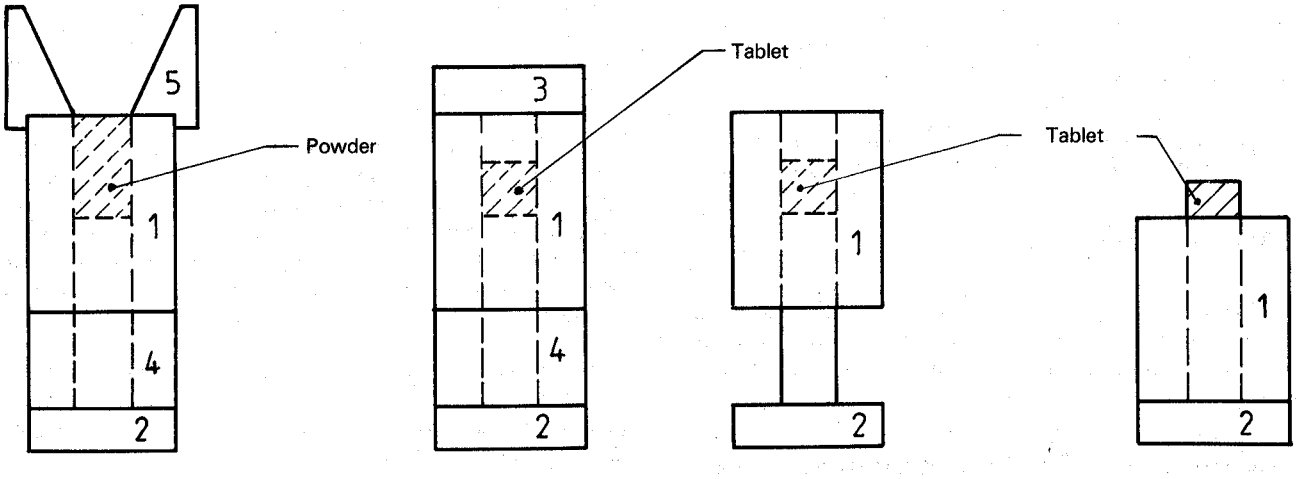


Figure 1 — Example of tilting device



a) Filling b) Compression c) Ejection

Figure 2 — Diagrammatic representation of tablet production

Should a tablet slip after the plate has been tilted to 60°, measure the distance from the point where it started to flow, including tablet diameter.

Calculate the arithmetic mean of the two distances. If the measurements differ by more than 5 %, repeat the test.

5 Expression of results

Express the result as the arithmetic mean of the two flow distances, in millimetres.

Example: Flow distance = 43 mm

When the measured distance is 12,5 mm (i.e. the diameter of the tablet) but the pellet has melted, the test result shall be reported as "melt and no flow".

6 Test report

The test report shall include the following particulars:

a) a reference to this International Standard;

b) a complete identification of the sample tested;

c) the individual test results and their arithmetic mean, as indicated in clause 5;

d) a description of any slippage of the tablets.

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