

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 1624

PLASTICS

PVC RESINS

SIEVE ANALYSIS IN WATER

1st EDITION
November 1970

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Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

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BRIEF HISTORY

The ISO Recommendation R 1624, *Plastics – PVC resins – Sieve analysis in water*, was drawn up by Technical Committee ISO/TC 61, *Plastics*, the Secretariat of which is held by the American National Standards Institute (ANSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1624 which was circulated to all the ISO Member Bodies for enquiry in May 1968. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Austria	Japan	Switzerland
Belgium	Netherlands	Turkey
Czechoslovakia	Poland	U.A.R.
Hungary	Portugal	United Kingdom
India	Romania	U.S.A.
Iran	South Africa, Rep. of	U.S.S.R.
Israel	Spain	
Italy	Sweden	

The following Member Bodies opposed the approval of the Draft :

France
Germany

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

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PLASTICS

PVC RESINS

SIEVE ANALYSIS IN WATER

1. SCOPE

This ISO Recommendation describes the measurement of particle size of PVC resins by sieve analysis in water.

2. PRINCIPLE

Sieving under a stream of water, using standard aperture sieves*.

3. REAGENT

Wetting agent, for example 5 to 10 % solution of sodium alkylsulphonate.

4. APPARATUS

- 4.1 *Series of 2 sieves*, diameter 200 to 300 mm, height 30 to 50 mm, having mesh sizes 0.063 and 0.250 mm** and fitted with deflectors to prevent loss by spray of sample. (See Figure, page 8).
- 4.2 *Balance*, accurate to ± 0.1 g, range and size sufficient to accommodate the sieves and the filtered resin. (See clause 5.1 (b)).
- 4.3 *Oven*, capable of being controlled at 80 ± 2 °C.
- 4.4 *Filter*, placed between the supply tap and the apparatus, and intended to exclude impurities in the water supply.
- 4.5 *Sprinkling device*, for one or, better, several sieves, designed so that
 - the mesh and inside walls of the sieve are thoroughly sprinkled over their entire surface;
 - the resin is agitated by the jets, for example by using jet apertures inclined to the screen of the sieve;
 - the inclination of the jets is such as to prevent track formation in the resin, for example by crossing of jet directions;
 - the sprayed water immediately goes through the screen and no bulk accumulation of water occurs on it during the sieving of resins.

The screening water should finally pass into a dark coloured vessel to check for the absence of resin particles in the water.

The Figure, page 8, shows a schematic apparatus including a rotating sprinkling device for several sieves, and given as an example meeting the requirements of this ISO Recommendation.

* Sieving under a stream of water gives truer results than a dry sieving method where static electricity interferes. The method is particularly suited to emulsion resins.

** Other mesh sizes may be used provided that

- the prescribed sieves are also used;
- new sieves are chosen from the series provided in ISO Recommendation R 565, *Woven wire cloth and perforated plates in test sieves - Nominal sizes of apertures*.

4.6 *Filter funnel or filter crucible* with adaptor, 40 mm diameter and pore size 20 to 40 μm mean diameter.

5. PROCEDURE

5.1 Preliminary remark

This ISO Recommendation permits several variations, namely :

(a) It is possible either

- to conduct a single test using two superimposed screens, provided a sprinkler device is fitted to each sieve (see Figure, page 8) (recommended method);
- or to carry out two tests on two separate samples using a different sieve each time.

(b) It is possible to dry the residue either

- in a filter funnel or in a filter crucible (recommended method);
- or directly on the sieve. *This method requires the sieves to be resistant to repeated heating and cooling* (for example constructed from stainless steel).

5.2 Screening

If at the end of the operation it is desired to weigh the resin on the sieve, weigh the sieves to the nearest 0.1 g after drying them in the oven at 80 ± 2 °C for 1 hour and cooling in a desiccator.

Place the sieve or sieves below the sprinkling device and arrange a container with perforated bottom beneath them to take the water away to a sink. If several superimposed sieves are used, they should be arranged from top to bottom according to decreasing mesh size.

Weigh, to the nearest 0.1 g, approximately 25 g (mass M) of the resin into a 400 ml beaker. Add wetting agent solution (3)* followed by two portions each of approximately 50 ml of water, with careful mixing after each addition.

Set the sprinkler system in operation, take care that the meshes are well moistened; introduce the prepared suspension, in one or several runs, into the upper sieve, and carefully rinse the beaker several times, the washings being poured each time into the upper sieve.

Apply the fastest rate of water flow, consistent with avoiding overflowing or splashing.

Complete the sieving by hand spraying until the drain-off liquid, received in a dark enamelled basin, is found free from particles.

Lift each sieve and, by water jets, transfer the few particles that might have remained adhering to its underside, to the next lower sieve.

5.3 Drying and weighing

5.3.1 *If the drying is to be carried out on a filter bed*, proceed as follows :

Wash the filter funnel or filter crucible, dry at 80 ± 2 °C and weigh to the nearest 0.1 g.

Transfer the residue on each sieve quantitatively, using water jets, to this funnel or crucible fitted on a vacuum filtering flask.

Dry the funnel or crucible (with the residue from one sieve) at 80 ± 2 °C in the oven to constant mass. Weigh to the nearest 0.1 g after cooling in a desiccator.

Calculate the mass of residue by subtracting the mass of the funnel or crucible from the mass of the funnel or crucible plus residue.

* IMPORTANT NOTE. - The suitable quantity of wetting agent solution depends on the type of resin to be tested. For some resins composed of very fine particles, it may be necessary to add this solution only progressively, mixing it with a glass rod to obtain a paste, which is then diluted gradually before pouring it on the upper sieve, where the resin should no longer form lumps nor conglomerate.