
**Latex, rubber — Determination of total
solids content**

Latex de caoutchouc — Détermination des matières solides totales



Foreword

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International Standard ISO 124 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 3, *Raw materials (including latex) for use in the rubber industry*.

This fourth edition cancels and replaces the third edition (ISO 124:1992). The vacuum-drying procedure, omitted from the 1992 edition, has been re-instated.

Annex A of this International Standard is for information only.

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Printed in Switzerland

Latex, rubber – Determination of total solids content

WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This International Standard specifies a method for the determination of the solids content of natural rubber latex concentrate and synthetic rubber latex. The method is not necessarily suitable for latex from natural sources other than *Hevea brasiliensis*, for vulcanized latex, for compounded latex or for artificial dispersions of rubber.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 123:1985, *Rubber latex — Sampling*.

3 Principle

A test portion is heated to constant mass in an oven under specified conditions, either at atmospheric pressure or under vacuum. The total solids content is determined by weighing before and after heating.

NOTE — The determination of the residue after drying for a specified period of time is the subject of ISO 1625, *Plastics — Polymer dispersions — Determination of non-volatile matter (residue) at specified temperatures* (to be published — revision of ISO 1625:1977).

4 Apparatus

Ordinary laboratory apparatus, plus the following:

- 4.1 Flat-bottomed dishes**, lipless, of diameter approximately 60 mm.
- 4.2 Oven**, capable of being maintained at $70\text{ °C} \pm 2\text{ °C}$ or $105\text{ °C} \pm 5\text{ °C}$.
- 4.3 Vacuum oven**, capable of being maintained at $125\text{ °C} \pm 2\text{ °C}$ and at a pressure below 20 kPa¹.
- 4.4 Analytical balance**, capable of being read to 0,1 mg.

1 1 kPa = 1 kN/m²

5 Sampling

Carry out sampling in accordance with one of the methods specified in ISO 123.

6 Procedure

For natural rubber latex concentrate, proceed in accordance with 6.1 and for synthetic rubber latex proceed in accordance with either 6.1 or 6.2. Perform the procedure in duplicate.

6.1 Heating at atmospheric pressure

Weigh, to the nearest 0,1 mg, a dish (4.1). Pour into the dish $2,0 \text{ g} \pm 0,5 \text{ g}$ of latex and weigh to the nearest 0,1 mg. Gently swirl the contents of the dish to ensure that the latex covers the bottom. If desired, approximately 1 cm^3 of distilled water or water of equivalent purity may be added and mixed with the latex by swirling.

Place the dish in the oven (4.2) so that it is horizontal, and heat it at $70 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ for 16 h or at $105 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ for 2 h or until the test portion has lost its whiteness. Remove the dish from the oven and allow it to cool to ambient temperature in a desiccator. Remove the dish and weigh. Return the dish to the oven for 30 min if the drying temperature used is $70 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$, or for 15 min if the drying temperature is $105 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$. Remove and allow to cool to ambient temperature in the desiccator as before and reweigh. Repeat the drying procedure for periods of 30 min or 15 min, as appropriate, until the loss in mass between two successive weighings is less than 0,5 mg.

If, after heating at $105 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$, the dried deposit becomes excessively sticky, repeat the determination either at $70 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ or in accordance with 6.2.

NOTE — Stickiness is symptomatic of oxidation of some rubbers when exposed to air at too high a temperature.

6.2 Heating at reduced pressure

Weigh, to the nearest 0,1 mg, a dish (4.1). Pour into the dish $1,0 \text{ g} \pm 0,2 \text{ g}$ of latex and weigh to the nearest 0,1 mg. Add approximately 1 cm^3 of distilled water or water of equivalent purity and mix by swirling, ensuring that the latex covers the bottom of the dish.

Place the dish in the vacuum oven (4.3) so that it is horizontal. Reduce the pressure slowly, to avoid foaming and splattering, and heat at $125 \text{ }^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ for 45 min to 60 min at a pressure below 20 kPa. Release the vacuum slowly, remove the dish from the oven and allow to cool in a desiccator. Remove the dish and weigh. Repeat the above drying procedure for periods of 15 min until the loss in mass between two successive weighings is less than 0,5 mg.

7 Expression of results

Calculate the total solids content TSC, expressed as a percentage by mass, using the equation

$$\text{TSC} = \frac{m_1}{m_0} \times 100$$

where

m_0 is the mass, in grams, of the test portion;

m_1 is the mass, in grams, of the dried material.

The results of the duplicate determinations shall not differ by more than 0,2 % (m/m).

NOTE — Over a large number of determinations, the vacuum method (6.2) tends to give marginally lower values but does not differ by more than 0,1 % (m/m).

8 Test report

The test report shall include the following particulars:

- a) a reference to this International Standard;
- b) details of the drying method and temperature employed;
- c) all details necessary for identification of the test sample;
- d) the results, and the units in which they have been expressed;
- e) details of any unusual features noted during the determination;
- f) details of any operation not included in this International Standard or in the International Standard to which reference is made, as well as any operation regarded as optional.

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Annex A

(informative)

Precision of the test method

With accurate operation and control, it is possible to attain the following precision data:

A.1 Repeatability

Within the range $\pm 0,2 \%$ (m/m).

A.2 Reproducibility

Within the range $\pm 0,4 \%$ (m/m).

NOTE — The work carried out to generate the precision data was initiated before the publication of ISO/TR 9272: 1986, *Rubber and rubber products — Determination of precision for test method standards*. Consequently, the data are not expressed in the format recommended by this Technical Report.

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