INTERNATIONAL STANDARD

ISO 2005

Fourth edition
2014-12-15

Rubber latex, natural, concentrate — Determination of sludge content

Latex concentré de caoutchouc naturel — Détermination de la teneur en sédiment

Reference number
ISO 2005:2014(E)

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Published in Switzerland

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is 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 2005:1992), which has been technically revised. It also incorporates the amendment ISO 2005:1992/Amd1:2006.

The following changes have been made:

— in the last paragraph of Clause 7, the temperature was changed from (70 ± 2) °C to (70 ± 5) °C, and the period of 30 min for the loss in mass was deleted;

— the precision statement was updated following an interlaboratory test programme conducted in 2012; it was moved to informative Annex A;

— a Bibliography was added.

Rubber latex, natural, concentrate — Determination of sludge content

1 Scope

This International Standard specifies a method for the determination of the sludge content of natural rubber latex concentrate.

The method is not necessarily suitable for latices from natural sources other than Hevea brasiliensis.

It is not suitable for compounded latex or vulcanized latex.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 123, *Rubber latex — Sampling*

3 Principle

A test portion is centrifuged and the resultant sludge washed repeatedly with ammonia-alcohol solution. The sludge is then dried to constant mass.

4 Reagents

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

4.1 Ammonia and alcohol, solution having the following composition:

—	ammonia solution, ρ (0,90 ± 0,02) g/cm^3	10 cm^3
—	ethanol, 95 % (by volume) minimum purity	340 cm^3
—	water	1 000 cm^3

5 Apparatus

Use ordinary laboratory apparatus and the following.

5.1 Centrifuge, producing a mean acceleration of approximately 12 000 m/s^2 (1 200 g), with two 50 cm^3 conical centrifuge tubes or round centrifuge tubes.

5.2 Pipette, of suitable capacity, having a tip opening of diameter approximately 2 mm.

6 Sampling

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

7 Procedure

Carry out the determination in duplicate, using the two centrifuge tubes (5.1) to counterbalance each other. Into each tube weigh, to the nearest 0,1 g, between 40 g and 45 g of latex concentrate.

Treat each tube as follows.

— Cover the end of the tube to prevent formation of a surface skin during centrifuging, and centrifuge for 20 min at a mean acceleration of approximately 12 000 m/s^2. Scoop off most of the cream layer and, using the pipette (5.2), carefully draw off the supernatant liquid to approximately 10 mm above the top of the sludge.

— Fill the tube to the top with the ammonia-alcohol solution (4.1), re-centrifuge for 25 min, and pipette off the supernatant liquid to approximately 10 mm above the top of the sludge. Repeat this procedure until the supernatant liquid is clear after centrifuging.

— Decant the supernatant solution to the 10 mm mark and transfer the sludge quantitatively, using some of the ammonia-alcohol solution to a tared heat-resistant beaker of about 200 cm^3 capacity. Evaporate to a low level and then dry at 70 °C ± 5 °C, until the loss in mass is less than 1 mg.

8 Expression of results

Calculate the sludge content, as a percentage by mass, using Formula (1):

$$\frac{m_1}{m_0} \times 100 \qquad (1)$$

where

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

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

A difference of less than 0,002 % (by mass) between the two results shall not be considered significant.

9 Precision

See Annex A.

10 Test report

The test report shall include the following:

a) a reference to this International Standard, i.e. ISO 2005:2014;

b) all details necessary for identification of the test sample;

c) the results and the units in which they were expressed;

d) any unusual features noted during the determination;

e) 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;

f) the date of the test.

Annex A
(informative)

Precision

A.1 General

The precision of this method was determined in accordance with ISO/TR 9272. Refer to this document for terminology and explanations of statistical concepts.

The precision details in this precision statement give an estimate of the precision of this test method with the materials used in the particular interlaboratory programme as described below. The precision parameters should not be used for acceptance/rejection testing of any group of materials without documentation that the parameters are applicable to those particular materials and the specific test protocol of this test method.

The precision results are given in Table A.1. The precision is expressed on the basis of a 95 % confidence level for the values established for repeatability, *r*, and reproducibility, *R*.

The results contained in Table A.1 are mean values and give an estimate of the precision of this test method as determined in an interlaboratory test programme (ITP) conducted in 2012. Six laboratories performed duplicate analyses on two samples, A and B, which were prepared from highly ammoniated latex. The bulk latex was strained and then homogenized by thorough blending and stirring prior to being sub-sampled into 1-l bottles labelled A and B. Thus, essentially, samples A and B were the same and were treated as such in the statistical computations. Each participating laboratory was required to carry out the test using these two samples on the dates which had been given to the participants in the ITP.

A type 1 precision was determined, based on the sampling method used for the latex samples in the ITP.

A.2 Repeatability

The repeatability, *r,* (in measurement units) of this test method has been established as the appropriate value tabulated in Table A.1. Two single test results, obtained in the same laboratory under normal test conditions, that differ by more than the tabulated value of *r* (for any given level) should be considered to have come from different (non-identical) sample populations.

A.3 Reproducibility

The reproducibility, *R,* (in measurement units) of this test method has been established as the appropriate value tabulated in Table A.1. Two single test results, obtained under normal test conditions, that differ by more than the tabulated value of *R* (for any given level), should be considered to have come from different (non-identical) sample populations.

A.4 Bias

In test method terminology, bias is the difference between an average test value and the reference (or true) test property value.

Reference values do not exist for this test method since the value (of the test property) is exclusively defined by the test method. Bias, therefore, cannot be determined for this particular test method.

Table A.1 — Estimate of precision of determination of sludge content

Mean	Within-laboratory		Between laboratories	
% (m/m)	s_r	r	s_R	R
0,006	0,000 7	0,002	0,0024	0,007
$r = 2{,}83 \times s_r$ $R = 2{,}83 \times s_R$				
r is the repeatability (in measurement units) s_r is the within-laboratory standard deviation R is the reproducibility (in measurement units) s_R is the between-laboratories standard deviation				