



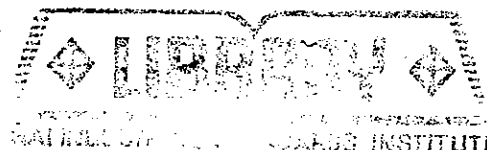
ISO 124:2011 (E)

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

INTERNATIONAL STANDARD

ISO
124

Sixth edition
2011-11-15



Latex, rubber — Determination of total solids content

Latex de caoutchouc — Détermination des matières solides totales

เอกสารนี้จัดให้ใช้เฉพาะของ สมอ. เท่านั้น
ห้ามมิให้เผยแพร่โดยไม่ได้รับอนุญาต

TISI Library
คลังมาตรฐาน



50110318

Thai Industrial Standards Institute : TISI
Rama VI Rd., Rajathevee Bangkok 10400 Tel : 202-3510



Reference number
ISO 124:2011(E)

24 JAN 2012
© ISO 2011



COPYRIGHT PROTECTED DOCUMENT

© ISO 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

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 sixth edition cancels and replaces the fifth edition (ISO 124:2008), in which: ISO 124:2008, 6.2 and 6.3 have been combined to form 6.2; Table B.1 has been updated to include data for drying at 105 °C.

Introduction

The need in commercial practice to determine solids content rapidly has led to the introduction of higher drying temperatures. The sixth edition of this International Standard takes account of drying temperatures in use at the time of publication.

Latex, rubber — Determination of total solids content

WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This document 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 methods for the determination of the total solids content of natural rubber latex concentrate and synthetic rubber latices. These methods are not necessarily suitable for latex from natural sources other than the *Hevea brasiliensis*, for vulcanized latex, for compounded latex or for artificial dispersions of rubber.

2 Normative references

The following referenced documents are indispensable for the application of this document. 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 of the latex is dried to constant mass under specified conditions, either at atmospheric pressure or under vacuum. The total solids content is determined by weighing before and after drying to constant mass.

NOTE The determination of the residue after drying for a specific period of time is the subject of ISO 3251^[1].

4 Apparatus

Usual laboratory equipment and in particular the following.

4.1 **Flat-bottomed dishes**, lipless, of diameter approximately 60 mm.

4.2 **Ovens**, capable of being maintained at $70\text{ °C} \pm 2\text{ °C}$, $105\text{ °C} \pm 5\text{ °C}$ or at another selected temperature between 100 °C and 160 °C accurate to $\pm 5\text{ °C}$.

4.3 **Vacuum oven**, capable of being maintained at $125\text{ °C} \pm 2\text{ °C}$ and at a pressure below 20 kPa ¹⁾.

4.4 **Analytical balance**, capable of being read to 0,1 mg.

5 Sampling

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

1) $1\text{ kPa} = 1\text{ kN/m}^2$.

6 Procedure

6.1 General

For natural rubber latex concentrate, proceed in accordance with 6.2 and for synthetic rubber latex proceed in accordance with 6.2, 6.3 or 6.4. Perform the determination in duplicate.

6.2 Heating at atmospheric pressure (70 °C and 105 °C) — Natural and synthetic rubber latex

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 determine the exact mass (m_0) by weighing 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 $70 \text{ °C} \pm 2 \text{ °C}$ for 16 h or at $105 \text{ °C} \pm 5 \text{ °C}$ for 2 h or until the test portion has lost its whiteness.

NOTE 1 The disappearance of whiteness is the first indication of dryness. Dry latex film is translucent.

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 at $70 \text{ °C} \pm 2 \text{ °C}$ or 15 min at $105 \text{ °C} \pm 5 \text{ °C}$. Remove the dish and allow it to cool to ambient temperature in a 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.

Record the mass of the dried latex (m_1).

If, after heating at $105 \text{ °C} \pm 5 \text{ °C}$, the dried deposit becomes excessively sticky, repeat the determination at $70 \text{ °C} \pm 2 \text{ °C}$.

NOTE 2 Stickiness is symptomatic of oxidation of some rubbers when exposed to air at too high a temperature.

6.3 Heating at atmospheric pressure (up to 160 °C) — Synthetic rubber latex

By agreement between the interested parties, the drying process can be carried out at temperatures up to 160 °C to shorten drying times.

NOTE The maximum drying temperature for CR latex is 130 °C, while any rubber latex except CR in Table A.1 may be dried at up to 160 °C.

Proceed in accordance with 6.2, but heat the dish containing the latex at for instance $130 \text{ °C} \pm 5 \text{ °C}$ for 40 min or $160 \text{ °C} \pm 5 \text{ °C}$ for 20 min (see Annex A). After allowing to cool in a desiccator and weighing, repeat the drying for periods of 10 min until the loss in mass between two successive weighings is less than 0,5 mg. In the event of a dispute over the results, drying shall be done in accordance with 6.2.

6.4 Heating at reduced pressure — Synthetic rubber latex

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 °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 mass fraction of the latex, using the equation

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

where

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

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

The results of the duplicate determinations shall not differ by more than 0,2 % mass fraction.

NOTE Over a large number of determinations, the vacuum method (6.4) tends to give marginally lower values, but does not differ by more than 0,1 % mass fraction.

8 Precision

See Annex B.

9 Test report

The test report shall include the following:

- a) a reference to this International Standard (ISO 124:2011);
- b) details of the drying method and temperature used;
- c) all details necessary for identification of the test sample;
- d) the average value of 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.

Annex A (informative)

Drying conditions for synthetic latices at atmospheric pressure

A.1 Suitable drying conditions for various synthetic latices have been determined, i.e. conditions which give a constant mass. These are summarized in Table A.1. The conditions given for each latex are not to be considered as required conditions, but as recommended conditions for the measurement of total solids content.

A.2 CR (chloroprene rubber) latex should not be heated at more than 130 °C, because of possible decomposition.

Table A.1 — Drying conditions at 130 °C and 160 °C

Latex ^a	Drying time	
	min	
	130 °C	160 °C
X-SBR	40	20
CR	30	Not applicable ^b
VP	40	20
SBR	40	20
X-SBR (with antidegradant)	40	20
NBR (with antidegradant)	40	20
X-NBR	40	20
X-NBR (with antidegradant)	40	20
X-MBR	40	20
^a "X-" means "carboxylated".		
^b See A.2.		

Annex B (informative)

Precision statement

B.1 The precision data presented in Tables B.1 and B.2 were obtained in separate interlaboratory test programmes (ITPs) carried out at different times employing the test methods specified in 6.2 and 6.3, respectively.

B.2 The precision was determined in accordance with ISO/TR 9272^[2]. Refer to ISO/TR 9272^[2] for terminology and other statistical details.

B.3 The precision details in this annex give an estimate of the precision of these test methods with the materials used in the particular ITP 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 protocols that include these test methods.

B.4 The precision results are given in Tables B.1 and B.2. The precision is expressed on the basis of a 95 % confidence level for the values established for repeatability, r , and reproducibility, R .

NOTE Bias is not applicable. 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.

B.4.1 The results contained in Table B.1 are average values and give an estimate of the precision of this test method as determined in an ITP in 2001, in which 13 laboratories performed triplicate analyses on two samples, A and B, which were prepared from high-ammonia natural-rubber latex concentrate. 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 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.

B.4.2 The results contained in Table B.2 are average values and give an estimate of the precision of this test method as determined in an ITP conducted in 2004. Triplicate analyses on three materials, X-SBR-1, X-SBR-2 and CR were performed by 11 laboratories. Each participating laboratory was required to carry out the test using these three materials, which had been given to the participants in the ITP, using the drying temperatures and times given in Table B.2.

B.5 In each case, a type 1 precision was determined, based on the sampling method used for the latex samples in the ITP in 2001 and 2004.

B.6 The repeatability, r (in measurement units), of each test method has been established as the appropriate value tabulated in Table B.1 or B.2. 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.

B.7 The reproducibility, R (in measurement units), of each test method has been established as the appropriate value tabulated in Table B.1 or B.2. 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.

Table B.1 — Precision for total solids content, drying at 70 °C and 105 °C (see 6.2)

Conditions	Material	Mean value ^a	Within laboratory		Between laboratories	
			<i>r</i>	(<i>r</i>)	<i>R</i>	(<i>R</i>)
70 °C 16 h	NR latex	61,68	0,11	0,18	0,23	0,37
105 °C 2 h	NR latex	61,83	0,22	0,35	0,44	0,71
<i>r</i> repeatability (in measurement units)						
(<i>r</i>) repeatability (in percent of mean level) ^b						
<i>R</i> reproducibility (in measurement units)						
(<i>R</i>) reproducibility (in percent of mean level) ^b						
^a Solids content in percentage (% mass fraction).						
^b As actual measurement units are in percentage (%), these values represent percent relative, i.e. percent of a percent.						

Table B.2 — Precision for total solids content, drying at 130 °C and 160 °C (see 6.3)

Conditions	Material	Mean value ^a	Within laboratory		Between laboratories	
			<i>r</i>	(<i>r</i>)	<i>R</i>	(<i>R</i>)
160 °C 20 min	X-SBR-1	50,7	0,46	0,91	0,46	0,91
	X-SBR-2	50,6	0,20	0,39	0,38	0,75
	CR ^c	50,1	0,18	0,36	0,33	0,66
130 °C 40 min	X-SBR-1	50,7	0,21	0,41	0,25	0,49
	X-SBR-2	50,6	0,08	0,16	0,11	0,22
	CR	50,2	0,12	0,24	0,40	0,80
160 °C 30 min	X-SBR-1	50,6	0,04	0,08	0,16	0,32
	X-SBR-2	50,6	0,05	0,09	0,16	0,32
	CR ^c	50,0	0,11	0,23	0,43	0,86
130 °C 50 min	X-SBR-1	50,7	0,10	0,20	0,18	0,36
	X-SBR-2	50,6	0,04	0,08	0,14	0,28
	CR	50,2	0,09	0,19	0,56	1,12
<i>p</i> = 11, <i>q</i> = 3, <i>N</i> = 2						
<i>r</i> repeatability (in measurement units)						
(<i>r</i>) repeatability (in percent of mean level) ^b						
<i>R</i> reproducibility (in measurement units)						
(<i>R</i>) reproducibility (in percent of mean level) ^b						
^a Solids content in percentage (% mass fraction).						
^b As actual measurement units are in percentage (%), these values represent percent relative, i.e. percent of a percent.						
^c Drying CR latex at this temperature is not recommended. (See A.2.)						



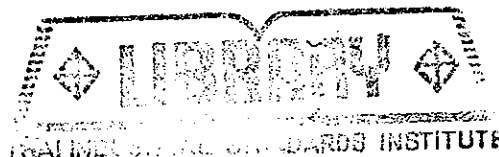
ISO 125:2011 (E)

Natural rubber latex concentrate – Determination of alkalinity

INTERNATIONAL STANDARD

ISO
125

Sixth edition
2011-11-15



Natural rubber latex concentrate — Determination of alkalinity

Latex concentré de caoutchouc naturel — Détermination de l'alcalinité

เอกสารมีลิขสิทธิ์ ใช้เฉพาะงานของ สมอ. เท่านั้น
ห้ามคัดลอกโดยไม่ได้รับอนุญาต

TISI Library
ห้องสมุดมาตรฐาน



S0110319

Thai Industrial Standards Institute : TISI
Rama VI Rd., Rajathevsee Bangkok 10400 Tel : 202-3510



Reference number
ISO 125:2011(E)

© ISO 2011



COPYRIGHT PROTECTED DOCUMENT

© ISO 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Principle	1
4 Reagents	1
5 Apparatus	2
6 Sampling	2
7 Procedure	2
7.1 General	2
7.2 Potentiometric titration	2
7.3 Titration using a visual indicator	2
8 Expression of results	2
9 Precision	3
10 Test report	3
Annex A (informative) Precision statement	4
Bibliography	5

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 125 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 sixth edition cancels and replaces the fifth edition (ISO 125:2003), which has been technically revised. The main changes are the following:

- instructions have been included in Clause 4 for standardizing the HCl solution used;
- more detailed instructions have been included in Clause 7 for the titration using a visual indicator;
- the precision data have been moved to an informative annex.

Natural rubber latex concentrate — Determination of alkalinity

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 alkalinity of natural rubber latex concentrate.

The method is not necessarily suitable for latices from natural sources other than *Hevea brasiliensis* or for synthetic rubber latices, compounded latex, vulcanized latex or artificial dispersions of rubber.

NOTE A method for the determination of the alkalinity of polychloroprene latex is specified in ISO 13773 (see the Bibliography).

2 Normative references

The following referenced documents are indispensable for the application of this document. 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*

ISO 976, *Rubber and plastics — Polymer dispersions and rubber latices — Determination of pH*

3 Principle

A test portion of latex concentrate is titrated with acid to pH 6 in the presence of a stabilizer to prevent coagulation, either electrometrically or with methyl red as a visual indicator. The alkalinity is calculated from the quantity of acid required.

4 Reagents

Distilled water or water of equivalent purity shall be used wherever water is specified.

4.1 Stabilizer solution: 5 % (by mass) solution of a non-ionic stabilizer of the alkyl phenol polyethylene oxide condensate type. Before use, the pH of the solution shall be adjusted to a value of $6,0 \pm 0,05$.

The following reagents shall be of recognized analytical quality:

4.2 Sulfuric acid, $c(\text{H}_2\text{SO}_4) = 0,05 \text{ mol/dm}^3$, or **hydrochloric acid,** $c(\text{HCl}) = 0,1 \text{ mol/dm}^3$, standard volumetric solution.

Standardize the $0,1 \text{ mol/dm}^3$ HCl by pipetting 10 ml of $0,05 \text{ mol/dm}^3$ Na_2CO_3 solution (4.4) into a flask and titrating with the $0,1 \text{ mol/dm}^3$ HCl, using methyl orange (4.5) as indicator.

4.3 Methyl red: 0,1 % solution in ethanol of minimum purity 95 % (by volume).

4.4 Sodium carbonate solution, $c(\text{Na}_2\text{CO}_3) = 0,05 \text{ mol/dm}^3$.

Dry the Na_2CO_3 used to prepare this solution at $120^\circ\text{C} \pm 5^\circ\text{C}$ for 2 h before preparing the solution.

4.5 Methyl orange, 0,1 % solution in ethanol of minimum purity 95 % (by volume).

5 Apparatus

Standard laboratory equipment together with:

5.1 Electric stirrer, with earthed (grounded) motor and non-metallic propeller-type blade, or magnetic stirrer.

5.2 pH-meter, equipped with a combined electrode suitable for use in solutions up to pH 12, as specified in ISO 976, and capable of being read to 0,02 pH-units.

5.3 Balance, capable of being read to 0,01 g.

6 Sampling

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

7 Procedure

7.1 General

Carry out the determination in duplicate.

To about 200 cm^3 of water in a 400 cm^3 beaker add, while stirring, 10 cm^3 of stabilizer solution (4.1).

Weighing to the nearest 10 mg, add by difference from a weighing bottle between 5 g and 10 g of the latex concentrate and stir until thoroughly mixed.

Ensure that the latex is added so that none runs down the side of the beaker (which could result in loss of ammonia) or down the side of the weighing bottle.

Titrate the resulting mixture either by the method described in 7.2 or by that described in 7.3.

7.2 Potentiometric titration

Insert the electrode of the pH-meter and, with continual stirring, add from a burette sulfuric acid or hydrochloric acid solution (4.2), adding the acid drop by drop on approaching the end point of $\text{pH } 6,0 \pm 0,05$.

7.3 Titration using a visual indicator

Add 2 or 3 drops of methyl red (4.3) to the mixture and titrate with $0,1 \text{ mol/dm}^3 \text{ HCl}$ (see 4.2), taking as the end point the colour change from yellow to pink.

8 Expression of results

8.1 Depending on whether the latex concentrate has been preserved with ammonia or potassium hydroxide, calculate the alkalinity as specified in 8.2 or 8.3, respectively.

8.2 If the latex concentrate is preserved with ammonia, calculate the alkalinity as the percentage (by mass) of ammonia (NH₃) in the latex concentrate, as follows:

$$\text{Alkalinity (as NH}_3\text{)} = \frac{F_1 c V}{m}$$

where

F_1 is a factor: 1,7 for hydrochloric acid or 3,4 for sulfuric acid;

c is the actual concentration, expressed in moles of HCl or H₂SO₄ per cubic decimetre of acid used;

V is the volume, in cubic centimetres, of acid used;

m is the mass, in grams, of the test portion.

Report the result as the mean of the duplicate determinations. If the individual results differ by more than 0,01 units from the mean where the actual alkalinity is above 0,5 units, or by more than 0,005 units from the mean where the actual alkalinity is 0,5 units or less, repeat the determination.

8.3 If the latex is preserved with potassium hydroxide, calculate the alkalinity as the percentage (by mass) of potassium hydroxide in the latex concentrate, as follows:

$$\text{Alkalinity (as KOH)} = \frac{F_1 c V}{m}$$

where

F_1 is a factor: 5,61 for hydrochloric acid or 11,22 for sulfuric acid;

c , V and m are as defined in 8.2.

Report the result as the mean of the duplicate determinations. If the individual results differ by more than 0,015 units from the mean, repeat the determination.

9 Precision

See Annex A.

10 Test report

The test report shall include the following information:

- a reference to this International Standard;
- all details necessary to identify the test sample;
- the mean of the determinations, and the units in which it is expressed;
- full details of any incident likely to have affected the result;
- full details of any operation not included in this International Standard or in any of the International Standards to which reference is made, together with details of any operation regarded as optional;
- the date of the test.

Annex A (informative)

Precision statement

A.1 The precision of this method has been determined in accordance with ISO/TR 9272. Refer to ISO/TR 9272 for terminology and other statistical details.

A.2 The precision data are given in Table A.1. The precision parameters shall not be used for acceptance or rejection of any group of materials without documentation stating that the parameters are applicable to those particular materials and specific test protocols that include these test methods. The precision is expressed on the basis of a 95 % confidence level for the values established for repeatability r and reproducibility R .

A.3 The results contained in Table A.1 are average values and give an estimate of the precision of this test method as determined in an interlaboratory test programme carried out in 2001 and including 13 laboratories performing triplicate analyses on two samples A and B which were prepared from high-ammonia latex. Before the bulk was subsampled into 1 l bottles labelled A and B, it was filtered and homogenized by thorough stirring. 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 given to them.

A.4 A Type 1 precision was evaluated based on the method of preparation of the latex samples used for the interlaboratory test programme.

A.5 Repeatability: The repeatability r (in measurement units) of the 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 method procedures, that differ by more than the tabulated r (for any given level) shall be considered to have come from different, or non-identical, sample populations.

A.6 Reproducibility: The reproducibility R (in measurement units) of the test method has been established as the appropriate value tabulated in Table A.1. Two single test results, obtained in different laboratories under normal test method procedures, that differ by more than the tabulated R (for any given level) shall be considered to have come from different, or non-identical, sample populations.

A.7 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 cannot therefore be determined for this particular method.

Table A.1 — Precision data

Average results	Within-laboratory		Between laboratories	
	s_r	r	s_R	R
0,64	0,007	0,02	0,013	0,04
$r = 2,83 \times s_r$ where r is the repeatability (in measurement units) and s_r is the within-laboratory standard deviation. $R = 2,83 \times s_R$ where R is the reproducibility (in measurement units) and s_R is the between-laboratory standard deviation.				

Bibliography

- [1] ISO/TR 9272, *Rubber and rubber products — Determination of precision for test method standards*
- [2] ISO 13773, *Rubber — Polychloroprene latex — Determination of alkalinity*

ISO 125:2011(E)

ICS 83.040.10

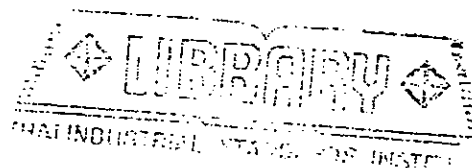
Price based on 5 pages

© ISO 2011 ~ All rights reserved

INTERNATIONAL STANDARD

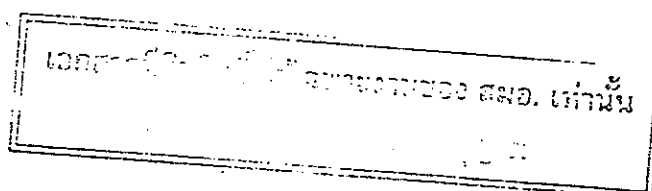
ISO
126

Fifth edition
2005-04-01



Natural rubber latex concentrate — Determination of dry rubber content

*Latex de caoutchouc naturel concentré — Détermination de la teneur
en caoutchouc sec*



TISI Library
สถาบันมาตรฐานอุตสาหกรรม



S0089810

Thai Industrial Standards Institute : TISI
Rama VI Rd., Rajathevee Bangkok 10400 Tel : 202-3510

Add

578

Downloaded



Reference number
ISO 126:2005(E)

13 DEC 2005

© ISO 2005

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2005

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office

Case postale 56 • CH-1211 Geneva 20

Tel. + 41 22 749 01 11

Fax + 41 22 749 09 47

E-mail copyright@iso.org

Web www.iso.org

Published in Switzerland

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 126 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 fifth edition cancels and replaces the fourth edition (ISO 126:1995), which has been technically revised and a statement of the precision of the method added.



HAI INDUSTRIAL STANDARDS INSTITUTE

Natural rubber latex concentrate — Determination of dry rubber 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 dry rubber content of natural rubber latex concentrate.

The method is not necessarily suitable for latices preserved with potassium hydroxide, latices from natural sources other than *Hevea brasiliensis*, or for compounded latex, vulcanized latex or artificial dispersions of rubber and it is not applicable to synthetic rubber latices.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

ISO 123, *Rubber latex — Sampling*

ISO 124, *Latex, rubber — Determination of total solids content*

ISO/TR 9272, *Rubber and rubber products — Determination of precision for test method standards*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

natural rubber latex concentrate

natural rubber latex containing ammonia and/or other preservatives and which has been subjected to some process of concentration

4 Principle

A test portion of latex concentrate is diluted to 20 % (by mass) total solids content and acidified with acetic acid. The coagulated rubber is then formed into a sheet and dried at $70\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.



5 Reagents

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

5.1 Acetic acid, 20 g/dm³ aqueous solution, for use with latex concentrate preserved with ammonia.

5.2 Acetic acid, 50 g/dm³ solution in aqueous propan-2-ol, prepared by adding 50 g of glacial acetic acid to 500 cm³ of propan-2-ol and then diluting the resultant solution to 1 dm³ with water. For use with latex concentrate preserved with potassium hydroxide.

5.3 Ethanol, 95 % (by volume).

6 Apparatus

Standard laboratory apparatus plus the following:

6.1 Dish, preferably made of glass or porcelain, approximately 100 mm in diameter and 50 mm deep.

NOTE Dishes made of aluminium are unsuitable for use with latex concentrate containing potassium hydroxide.

6.2 Balance, capable of weighing to an accuracy of 1 mg.

6.3 Circulating-air oven, capable of maintaining a temperature of 70 °C ± 5 °C.

7 Sampling

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

8 Procedure

8.1 If the total solids is not known, determine it in accordance with ISO 124.

8.2 Carry out the procedure in duplicate.

8.3 Weigh by difference from a conical flask fitted with a stopper, to the nearest 1 mg, 10 g ± 1 g of latex concentrate into the dish (6.1). Pour sufficient water down the inside edge of the dish to reduce the solids content of the latex concentrate to (20 ± 1) % (by mass). Carefully rotate the dish on a smooth surface to dilute the latex and ensure homogeneity. Proceed in accordance with 8.4 or 8.5 as appropriate, depending on whether the latex concentrate is preserved with ammonia or potassium hydroxide, respectively.

8.4 In the case of latex concentrate preserved with ammonia, add, over a period of 5 min, 35 cm³ ± 5 cm³ of 20 g/dm³ acetic acid solution (5.1), pouring it down the inside edge of the dish and slowly rotating the dish while the acid is being added.

Gently depress the coagulated sheet of rubber below the surface of the acid. Cover the dish with a watch glass and heat on a steam bath for 15 min to 30 min. If the serum remains milky, add 5 cm³ of 95 % (by volume) ethanol (5.3). Continue as described in 8.6.

8.5 In the case of latex concentrate preserved with potassium hydroxide, add 25 cm³ ± 5 cm³ of 50 g/dm³ acetic acid solution (5.2). Mix the acidified latex by means of a thin glass rod and wash any latex concentrate remaining on the rod into the dish with a little water.

Gently depress the coagulated sheet of rubber below the surface of the acid. Cover the dish with a watch glass and heat on a steam bath for 15 min to 30 min.

8.6 When the serum is clear, collect any small particles of coagulated rubber by rubbing with the main bulk. Soak the coagulated rubber in several changes of water until the water is no longer acidic to litmus.

Press the coagulated rubber to expel water and obtain a uniform sheet not exceeding 2 mm in thickness. A convenient method is to place the coagulated rubber carefully on a glass plate and with a glass stopper about 45 mm in diameter, or a small photographic roller, to press first around the circumference and then work towards the centre.

Rinse the sheet thoroughly in running water for at least 5 min in the case of latex concentrate preserved with ammonia, or at least 2 h in the case of latex concentrate preserved with potassium hydroxide. Allow the rinsed sheet to drip for a few minutes before transferring it to the drying oven (6.3).

8.7 Dry the sheet at a temperature of $70\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ until it has no white patches. If the sheet is dried on a watch glass, carefully turn it over two or three times during the first few hours of drying. Allow to cool in a desiccator for 30 min and weigh. Repeat the operation of drying, cooling and weighing until the loss in mass is less than 1 mg after heating for 30 min.

If the sheet becomes excessively sticky and it is suspected that significant oxidation is taking place at $70\text{ }^{\circ}\text{C}$, then use a lower drying temperature, for example $55\text{ }^{\circ}\text{C}$.

9 Expression of results

9.1 Calculate the dry rubber content (DRC) of the latex concentrate as a percentage by mass to the second decimal place from the equation:

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

where

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

m_1 is the mass, in grams, of the dry sheet.

9.2 The results of the duplicate determinations shall agree to within 0,1 % (by mass) of the mean value. If they do not, repeat the determination. Report the mean value.

10 Precision statement

10.1 The precision of this method was determined in accordance with ISO/TR 9272. Please refer to this document for terminology and explanations of statistical concepts. The precision results are given in Table 1. The precision parameters shall not be used for acceptance or rejection of any group of materials without documentation that the parameters are applicable to the particular group of materials and the specific test protocols of this test method. The precision is expressed on the basis of a 95 % confidence level for the values established for repeatability r and reproducibility R .

10.2 The results contained in Table 1 are average values and give an estimate of the precision of this test method as determined in an inter-laboratory test programme (ITP) conducted in 2001. Thirteen laboratories performed triplicate analyses on two samples, A and B, which were prepared from high-ammonia latex. Before the bulk was sub-sampled into 1-litre bottles labelled A and B, it was filtered and homogenized by thorough blending and stirring. 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.

10.3 A Type 1 precision was determined (the test samples used for the ITP were distributed in the prepared state, ready for testing).

10.4 Repeatability: The repeatability r (in measurement units) of this test method has been established as the appropriate value tabulated in Table 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) shall be considered to have come from different (non-identical) sample populations.

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

10.6 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 1 — Estimate of precision for DRC test method

Average	Within lab		Between labs	
	s_r	r	s_R	R
60,26	0,029	0,06	0,046	0,13
$r = 2,83 \times s_r$ where r is the repeatability (in measurement units) and s_r is the within-laboratory standard deviation. $R = 2,83 \times s_R$ where R is the reproducibility (in measurement units) and s_R is the between-laboratory standard deviation.				

11 Test report

The test report shall include the following particulars:

- a reference to this International Standard;
- all details necessary for the identification of the test sample;
- the mean value of the dry rubber content (DRC) of the latex concentrate, quoted to the nearest 0,01 % (by mass);
- the drying temperature, if other than $70\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$;
- any unusual features noted during the determination;
- details of any operation not included in this International Standard or in the International Standards to which reference is made, as well as details of any operation regarded as optional.