
**Rubber, raw — Determination of
volatile-matter content —**

**Part 2:
Thermogravimetric methods using an
automatic analyser with an infrared
drying unit**

*Caoutchouc brut — Détermination des matières volatiles —
Partie 2: Méthodes thermogravimétriques utilisant un analyseur
automatique avec une unité de séchage infrarouge*

[ISO 248-2:2019](https://standards.iteh.ai/catalog/standards/iso/7f67d1be-a2d3-4932-90e0-12f6a1a088fb/iso-248-2-2019)

<https://standards.iteh.ai/catalog/standards/iso/7f67d1be-a2d3-4932-90e0-12f6a1a088fb/iso-248-2-2019>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 248-2:2019

<https://standards.iteh.ai/catalog/standards/iso/7f67d1be-a2d3-4932-90e0-12f6a1a088fb/iso-248-2-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	2
5 Reagents	2
6 Apparatus	2
6.1 Automatic analyser	2
7 Sampling and preparation of test portion	2
8 Procedure	3
8.1 General	3
8.2 Determination of endpoints for method A and method B	3
8.3 Method A (pre-defined drying time method)	4
8.4 Method B (in which drying ends when the mass loss rate has decreased to a pre-defined level)	5
8.5 Calculation of volatile-matter content	5
9 Precision	6
10 Test report	6
Annex A (informative) Examples of test conditions	7
Annex B (informative) Precision data	8
Bibliography	10

[ISO 248-2:2019](https://standards.iteh.ai/catalog/standards/iso/7f67d1be-a2d3-4932-90e0-12f6a1a088fb/iso-248-2-2019)

<https://standards.iteh.ai/catalog/standards/iso/7f67d1be-a2d3-4932-90e0-12f6a1a088fb/iso-248-2-2019>

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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document 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 second edition cancels and replaces the first edition (ISO 248-2:2012), which has been technically revised.

The main change compared to the previous edition is the addition of precision data for isoprene rubber in [Table B.2](#), following an additional ITP conducted by Japan in 2017.

A list of all parts in the ISO 248 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Rubber, raw — Determination of volatile-matter content —

Part 2:

Thermogravimetric methods using an automatic analyser with an infrared drying unit

WARNING — Persons using this document 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.

CAUTION — Some procedures specified in this document could involve the use or generation of substances, or the generation of waste, that could constitute a local environmental hazard. Reference should be made to appropriate documentation on safe handling and disposal after use.

1 Scope

1.1 This document specifies two thermogravimetric methods for the determination of moisture and other volatile-matter content in raw rubbers by using an automatic analyser with an infrared drying unit.

1.2 These methods are applicable to the determination of volatile-matter content in synthetic rubbers (SBR, NBR, BR, IR, CR, IIR, halogenated IIR and EPDM) listed in ISO 1629 and to various forms of raw rubber, such as bale, block, chip, pellet, crumb, powder and sheet. These methods might also be applicable to other raw rubbers only when the change in mass is proven to be due solely to loss of original volatile matter and not to rubber degradation.

1.3 The methods are not applicable to raw rubbers which need homogenizing as specified in ISO 1795.

1.4 The hot-mill method and the oven method specified in ISO 248-1 and the methods specified in this document might not give identical results. In cases of dispute, therefore, the oven method, procedure A, specified in ISO 248-1:2011, is the referee method.

NOTE These methods can be useful for routine determinations, e.g. quality control, when the measurement conditions for the automatic analyser are fixed for a particular raw rubber or grade of raw rubber.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 248-1, *Rubber, raw — Determination of volatile-matter content — Part 1: Hot-mill method and oven method*

ISO 1795, *Rubber, raw natural and raw synthetic — Sampling and further preparative procedures*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Principle

A test portion is continuously weighed to constant mass by a thermogravimetric method using an automatic analyser with infrared drying. The volatile-matter content is calculated as the mass lost during this procedure.

5 Reagents

Use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

5.1 Sodium L-tartrate dihydrate, purity ≥ 99 %, for use as a standard reference material.

6 Apparatus

Use ordinary laboratory apparatus and the following.

6.1 Automatic analyser

The automatic analyser shall consist of the following components:

- an infrared drying unit or a far-infrared drying unit or a near-infrared drying unit;
- a balance, capable of weighing to the nearest 1 mg;
- a microprocessor, capable of controlling drying conditions such as the temperature and the drying end point, and of continuously calculating volatile-matter content as the mass lost during drying.

The accuracy of the system shall be demonstrated by performing 10 successive determinations on the standard reference material sodium L-tartrate dihydrate (5.1). The mean of the 10 determinations shall be $(15,66 \pm 0,5)$ %. The relative standard deviation, obtained by [Formula \(1\)](#), shall be less than 1,0 %.

$$s_{\text{rel}} = \frac{S}{W} \times 100 \quad (1)$$

where

s_{rel} is the relative standard deviation, in percentage;

S is the standard deviation;

W is the mean volatile-matter content, in mass %.

7 Sampling and preparation of test portion

Take a laboratory sample in accordance with the method specified in ISO 1795, and then prepare a test portion of between 2 g and 15 g from the laboratory sample. The actual mass of the test portion depends on the type of analyser, the expected volatile-matter content, and the form of the sample. For raw rubbers in bale form, the test portion shall be cut into small pieces of volume less than about 350 mm³ (in the ideal case of a cubic piece, the length of a side should be about 7 mm). This operation shall be carried out as quickly as possible so as not to lose volatile matter.