
**Rubber — Determination of metal
content by atomic absorption
spectrometry —**

**Part 4:
Determination of manganese content**

*Caoutchouc — Détermination de la teneur en métal par
spectrométrie d'absorption atomique —*

Partie 4: Dosage du manganèse



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Contents

	Page
Foreword.....	iv
1 Scope	1
2 Normative references	1
3 Principle	1
4 Reagents	2
5 Apparatus	2
6 Sampling	3
7 Procedure	4
7.1 Test portion.....	4
7.2 Preparation of test solution.....	4
7.3 Preparation of the calibration graph.....	4
7.4 Determination.....	5
7.5 Blank determination.....	6
7.6 Number of determinations.....	6
8 Expression of results	6
9 Test report	7
Annex A (normative) Method of standard additions	8
Annex B (informative) Precision	10
Bibliography	11

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 2, *Testing and analysis*.

This third edition cancels and replaces the second edition (ISO 6101-4:1997), which has been technically revised.

ISO 6101 consists of the following parts, under the general title *Rubber — Determination of metal content by atomic absorption spectrometry*:

- *Part 1: Determination of zinc content*
- *Part 2: Determination of lead content*
- *Part 3: Determination of copper content*
- *Part 4: Determination of manganese content*
- *Part 5: Determination of iron content*
- *Part 6: Determination of magnesium content*

Rubber — Determination of metal content by atomic absorption spectrometry —

Part 4:

Determination of manganese content

WARNING — Persons using this part of ISO 6101 should be familiar with normal laboratory practice. This part of ISO 6101 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 part of ISO 6101 specifies an atomic absorption spectrometric method for the determination of the manganese content of rubbers.

The method is applicable to raw rubber and rubber products having manganese content above 0,5 ppm. Manganese contents below this limit can be determined, provided that suitable adjustments are made to the mass of the test portion and/or to the concentrations of the solutions used. The use of the standard additions method might lower the bottom limit of detection.

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*

ISO 247, *Rubber — Determination of ash*

ISO 648, *Laboratory glassware — Single-volume pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 1772, *Laboratory crucibles in porcelain and silica*

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

ISO 4793, *Laboratory sintered (fritted) filters — Porosity grading, classification and designation*

3 Principle

A test portion is ashed at $550\text{ °C} \pm 25\text{ °C}$ in accordance with ISO 247, method A. The ash is dissolved in hydrochloric acid or nitric acid. The solution is aspirated into an atomic absorption spectrometer and the absorption is measured at a wavelength of 279,5 nm, using a manganese hollow-cathode lamp as the manganese emission source. Any silicates are volatilized by sulfuric and hydrofluoric acid.

NOTE ISO 6955:1982, *Analytical spectroscopic methods — Flame emission, atomic absorption, and atomic fluorescence — Vocabulary*, defines the spectrometric terms used in this part of ISO 6101.