

**ISO 24698-1:2018**



**NBN ISO 24698-1:2021**



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**Rubber, raw — Determination of bound acrylonitrile content in acrylonitrile-butadiene rubber (NBR) — Part 1: Combustion (Dumas) method (ISO 24698-1:2018)**

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Valid from 29-05-2021

ICS: 83.040.10



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**Rubber, raw — Determination of bound acrylonitrile content in acrylonitrile-butadiene rubber (NBR) —**

**Part 1:  
Combustion (Dumas) method**

*Caoutchouc brut — Détermination du contenu en acrylonitrile lié dans le caoutchouc acrylonitrile-butadiène (NBR) —*

*Partie 1: Méthode par combustion (Dumas)*



# ISO 24698-1:2018(E)



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Published in Switzerland

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## ISO 24698-1:2018(E)

### 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](http://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](http://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 the following URL: [www.iso.org/iso/foreword.html](http://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 24698-1:2008), which has been technically revised.

The main changes compared to the previous edition are as follows:

- addition in the scope of two types of raw rubbers, XNBR and NBIR, that contain acrylonitrile;
- addition of specified argon gas as carrier gas in [5.3](#);
- amendment of finishing condition of sample weight in [7.1](#) and [7.2](#).

A list of all the parts in the ISO 24698 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](http://www.iso.org/members.html).

# Rubber, raw — Determination of bound acrylonitrile content in acrylonitrile-butadiene rubber (NBR) —

## Part 1: Combustion (Dumas) method

**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** — Certain procedures specified in this document might 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

This document specifies a method for the determination of the bound acrylonitrile content in NBR by an automatic analyser which uses a combustion process. The method is also applicable to XNBR (carboxylic acrylonitrile-butadiene rubber) and NBIR (acrylonitrile-butadiene-isoprene rubber) as well as NBR latex.

**NOTE** This document and ISO 24698-2 can give different results on the same rubber sample.

### 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 123, *Rubber latex — Sampling*

ISO 1407:2011, *Rubber — Determination of solvent extract*

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

### 4 Principle

The nitrogen in a sample of raw rubber is converted into oxides of nitrogen in an atmosphere of high-purity oxygen in the combustion unit of the analyser. The oxides of nitrogen are then converted into elemental nitrogen by a catalyst in the reduction unit. The carbon dioxide and water vapour produced are removed by absorption or another means of separation. Finally, the resultant gas is passed, with a carrier gas, into a thermal conductivity detector (TCD) to determine the nitrogen content.