BS ISO 7725:2020

BSI Standards Publication

Rubber and rubber products — Determination of chlorine and bromine content

National foreword

This British Standard is the UK implementation of ISO 7725:2020. It supersedes BS 7164-22.2:1992, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/22, Testing and analysis of rubber.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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INTERNATIONAL STANDARD

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Rubber and rubber products — Determination of chlorine and bromine content

Caoutchouc et produits à base de caoutchouc — Détermination de la teneur en brome et en chlore

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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 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.

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This second edition cancels and replaces the first edition (ISO 7725:1991), which has been technically revised. The main changes compared to the previous edition are as follows:

— the ion chromatography method has been added in Clause 6;

— the titration procedure has been improved in Clause 7;

— the tubular furnace combustion method for sample preparation has been added in Annex A;

— the oxygen combustion flask method for sample preparation has been improved in Annex B;

— the oxygen combustion bomb method for sample preparation has been added in Annex C;

— mercury nitrate and hydrazine are no longer used due to their hazardous properties.

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.

Introduction

The two test methods in this document for quantitative analysis can be used for any type of rubbers (i.e. raw rubber, vulcanized rubber or unvulcanized rubber) containing chlorine and/or bromine in any form of existence, such as an element of polymer chain, chemical additives or a part of contaminations.

Three combustion methods are given for preparation of sample solution, i.e. tubular furnace combustion method, oxygen combustion flask method and oxygen combustion bomb method. After sample solutions are prepared, a content determination procedure, i.e. either ion chromatography or potentiometric titration, follows. The most convenient and efficient method from the testing time and safeness points of view, is the combination of tubular furnace combustion and ion chromatography, as ion chromatography is widely used in quality control of polymer/rubber products or in environmental analysis.

INTERNATIONAL STANDARD **ISO 7725:2020**

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WARNING 1 — 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 and to determine the applicability of any other restrictions.

WARNING 2 — 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 methods for the determination of chlorine and/or bromine present in raw rubber as well as vulcanized or unvulcanized rubber compounds.

The methods are applicable to natural rubbers and to the following synthetic rubbers: isoprene, styrene-butadiene, butadiene, butyl, halogenated butyl, nitrile, ethylene-propylene, chloroprene and epichlorohydrin.

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

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 4661-2, *Rubber, vulcanized — Preparation of samples and test pieces — Part 2: Chemical tests*

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 http://www.electropedia.org/

4 Principle

A sample solution is obtained by combustion of a test piece either burnt in a tubular furnace with a stream of oxygen-containing gas and passed into a prepared solution or burnt in an oxygenic atmosphere in a flask or a bomb which contains a solution to absorb the combustion gas. The sample solution is then analysed by ion chromatography (method A) or potentiometric titration (method B) to determine the content of chlorine and/or bromine in a sample.

For rubber samples of very low halogen content, method A is preferable since the inflection point might not be obtained by method B.