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**BS ISO 11235:2016**



**BSI Standards Publication**

# **Rubber compounding ingredients — Sulfenamide accelerators — Test methods**

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This British Standard is the UK implementation of ISO 11235:2016. It supersedes BS ISO 11235:1999 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/50, Raw materials (including latex) for use in the rubber industry.

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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## Rubber compounding ingredients — Sulfenamide accelerators — Test methods

*Ingrédients de mélange du caoutchouc — Accélérateurs de type  
sulfénamide — Méthodes d'essai*



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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](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 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 3, *Raw materials (including latex) for use in the rubber industry*.

This second edition cancels and replaces the first edition (ISO 11235:1999), which have been technically revised:

- the method to determine purity by high performance liquid chromatography (HPLC) is stated as the preferred method in the scope and in the new [5.2.1.3](#);
- the normative references in [Clause 2](#) and in the text have been updated;
- precision data in 4.2.12 have been moved in an informative [Annex B](#) and a Bibliography has been added.

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# Rubber compounding ingredients — Sulfenamide accelerators — Test methods

**WARNING** — Persons using this International Standard should be familiar with normal laboratory practice. This International 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 the methods to be used for the evaluation of sulfenamide accelerators:

- MBTS: benzothiazyl disulphide;
- CBS: *N*-cyclohexylbenzothiazole-2-sulfenamide;
- TBBS: *N*-*tert*-butylbenzothiazole-2-sulfenamide;
- DIBS: *N,N'*-diisopropylbenzothiazole-2-sulfenamide;
- DCBS: *N,N'*-dicyclohexylbenzothiazole-2-sulfenamide;
- MBS: *N*-oxydiethylenebenzothiazole-2-sulfenamide.

**NOTE** Although MBTS is not a sulfenamide, it is the primary decomposition product of these accelerators and quantitatively determined by the method specified in [5.2](#).

The analytical methods are applicable for most commercial sulfenamide accelerators:

- sulfenamides of primary amines (type I);
- sulfenamides of unhindered secondary amines (type II);
- sulfenamides of hindered secondary amines (type III).

The method ([5.2](#)) to determine purity by high performance liquid chromatography (HPLC) is the preferred method.

## 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 385, *Laboratory glassware — Burettes*

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

ISO 1772, *Laboratory crucibles in porcelain and silica*

ISO 3819, *Laboratory glassware — Beakers*

ISO 4788, *Laboratory glassware — Graduated measuring cylinders*

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

ISO 6556, *Laboratory glassware — Filter flasks*