



BSI Standards Publication

**Exhaust system for multi position small engine machines — Test procedures and performance requirements for spark arrestors**

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## National foreword

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The UK participation in its preparation was entrusted to Technical Committee AGE/29, Forestry machinery.

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

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**Exhaust system for multi position  
small engine machines — Test  
procedures and performance  
requirements for spark arrestors**

*Système d'échappement pour machines à petit moteur multi-positions — Méthodes d'essai et exigences de performance pour les pare-étincelles*



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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 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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 17, *Manually portable (hand-held) powered lawn and garden equipment and forest machinery*.

This second edition cancels and replaces the first edition (ISO 9467:1993), which has been technically revised.

The main changes are as follows:

- the normative references have been updated;
- multi-position small engine equipment pole pruners, edgers, hedge trimmers and blowers have been added.

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).

## Introduction

During dry seasons, forest fires can be ignited by small internal combustion engine-powered equipment such as portable chain-saws, brush-cutters, grass-trimmers, pole-mounted pruners, edgers, hedge trimmers and blowers. The exhaust system of such equipment presents three potential sources of ignition to dry vegetation: hot exhaust gas, hot exhaust system surfaces and the emission of glowing carbon particles. The potential for ignition depends on the specific vegetation involved, environmental factors, equipment usage patterns, the size of carbon particles that can be emitted, and temperatures of the exhaust gas and exhaust system surfaces.

This document highlights the minimum performance and maintenance requirements of spark arrestors for single and multi-position small internal combustion engines used in proximity to grass, brush, timber, and similar cellulose materials. This document provides methods for arrestor performance evaluation, size selection, and determination of application position.

The requirements include:

- maximum temperatures for exhaust gases and exhaust system surfaces;
- maximum opening size for screen-type spark arrestors;
- restriction on debris accumulation.

The test methods include:

- uniform procedures for measuring exhaust gas and exhaust system surface temperatures; and
- a procedure to evaluate opening size for screen-type spark arrestors.

Local laws can govern when and where the use of spark arrestors is required. During periods of very high or extreme fire danger, arrestors meeting the requirements of this document cannot give complete protection against exhaust spark fires. Additional measures, including complete shutdown of operations, can be required during such periods.



# Exhaust system for multi position small engine machines — Test procedures and performance requirements for spark arrestors

## 1 Scope

This document establishes requirements and test procedures for determining the performance of spark arrestor exhaust systems of multi position small engines used in portable applications, such as chain-saws, brush-cutters, grass-trimmers, pole-mounted pruners, edgers and similar shaft-drive machines, hedge trimmers and hand-held and back-pack blowers.

It is not applicable to spark arrestors used in vehicles or stationary equipment.

## 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 6531, *Machinery for forestry — Portable chain-saws — Vocabulary*

ISO 7112, *Machinery for forestry — Portable brush-cutters and grass-trimmers — Vocabulary*

ISO 7914, *Forestry machinery — Portable chain-saws — Minimum handle clearance and sizes*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6531, ISO 7112 and the following apply.

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

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1

#### **contact plane**

imaginary flat surface defined by at least three points of contact on the surface of MSE power unit extremities

### 3.2

#### **exhaust gas temperature test**

test to determine exhaust gas temperature at the points where the hottest gases impinge a *contact plane* (3.1)

### 3.3

#### **exhaust gas temperature**

temperature of the exhaust gas at any point where it crosses a *contact plane* (3.1)

### 3.4

#### **exhaust system**

device(s) used to contain and direct gas from the cylinder exhaust port to the atmosphere, including spark arrestor and all directly attached shields for hot surface contact prevention