

Methods for

Chemical analysis of tobacco and tobacco products —

**Part 9: Determination of alkaloid
retention by filters of cigarettes
(spectrometric method)**

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Agriculture and Food Standards Policy Committee (AFC/-) to Technical Committee AFC/11, upon which the following bodies were represented:

Department of Trade and Industry (Laboratory of the Government Chemist)
Tobacco Advisory Council

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National foreword

This Part of BS 5202 has been prepared under the direction of the Agriculture and Food Standards Policy Committee. It is identical with ISO 3401:1991 “Cigarettes — Determination of alkaloid retention by the filters — Spectrometric method” published by the International Organization for Standardization (ISO), and in the preparation of which the UK played a full part.

This revision supersedes BS 5202-9:1977, which is withdrawn and from which it differs in that more details of the procedure have been given and the text has been clarified.

Cross-references

International Standard	Corresponding British Standard
ISO 3308:1991	BS 5668 <i>Routine analytical cigarette smoking machine</i> Part 1:1992 <i>Specification and standard conditions</i> (Identical)
ISO 3400:1989	BS 5202 <i>Methods for chemical analysis of tobacco and tobacco products</i> Part 7:1990 <i>Determination of alkaloids in smoke condensate of cigarettes</i> (spectrometric method) (Identical)
ISO 3402:1991	BS 5743:1991 <i>Specification for atmosphere for conditioning and testing tobacco and tobacco products</i> (Identical)
ISO 4387:1991	BS 5202 <i>Methods for chemical analysis of tobacco and tobacco products</i> Part 14:1992 <i>Determination of total and nicotine-free dry particulate matter using a routine analytical cigarette smoking machine</i> (Identical)
ISO 8243:1991	BS 6245 <i>Sampling tobacco and tobacco products</i> Part 3:1992 <i>Methods of sampling cigarettes</i> (Identical)

Additional information. With reference to clause 5, water complying with grade 3 of BS 3978 “*Specification for water for laboratory use*” is suitable.
A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.
This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This International Standard specifies two methods for the spectrometric determination of alkaloid retention by filters of cigarettes:

- the direct method;
- the indirect method.

The methods are applicable to filter cigarettes. The direct method shall be used unless it is not applicable owing to incomplete recovery of the retained alkaloids from the filter material (for example, with some types of charcoal filters). The indirect method is not applicable to cigarettes with perforated or porous filter tipping wraps. This International Standard is not applicable in the case of filters having an irreversible nicotine retention and equipped with perforated or porous wrapping.

NOTE 1 These methods determine the retention only of alkaloids of tobacco smoke, expressed as nicotine. The retention of other substances present in the mainstream smoke is not necessarily related to the alkaloid retention.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3308:1991, *Routine analytical cigarette-smoking machine — Definitions and standard conditions*.

ISO 3400:1989, *Cigarettes — Determination of alkaloids in smoke condensates — Spectrometric method*.

ISO 3402:1991, *Tobacco and tobacco products — Atmosphere for conditioning and testing*.

ISO 4387:1991, *Cigarettes — Determination of total and nicotine-free dry particulate matter using a routine analytical smoking machine*.

ISO 8243:1991, *Cigarettes — Sampling*.

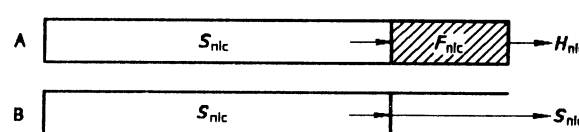
3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 alkaloid retention index R_{nic} of a cigarette filter

the ratio, expressed as a percentage by mass, of the alkaloids retained by the filter to those entering the filter:

$$R_{\text{nic}} = \frac{F_{\text{nic}}}{S_{\text{nic}}} \times 100$$



The alkaloid retention index may be determined as follows:

- a) *Directly*, by measurement of the mass of alkaloids retained by the filter and of the mass of alkaloids in the mainstream smoke leaving the filter:

$$R_{\text{nic}} = \frac{F_{\text{nic}}}{H_{\text{nic}} + F_{\text{nic}}} \times 100 = \frac{F_{\text{nic}}}{S_{\text{nic}}} \times 100$$

where

F_{nic} is the mass of alkaloids retained by the filter;

H_{nic} is the mass of alkaloids in the mainstream smoke leaving the filter;

S_{nic} is the mass of alkaloids entering the filter [see (A) above].

- b) *Indirectly*, by measurement of the difference between the mass of alkaloids contained in the mainstream smoke from a cigarette with filter (A) and of the corresponding mass from another cigarette with filter material removed (B), the smoked length of which is the same as that of the filter cigarette (A):

$$R_{\text{nic}} = \frac{S_{\text{nic}} - H_{\text{nic}}}{S_{\text{nic}}} \times 100 = \frac{F_{\text{nic}}}{S_{\text{nic}}} \times 100$$

where

H_{nic} the mass of alkaloids in the mainstream smoke from the cigarette with filter (A);

S_{nic} is the mass of alkaloids in the mainstream smoke from the cigarette with the filter material removed (B).