

INTERNATIONAL  
STANDARD

**ISO**  
**2881**

Third edition  
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**Tobacco and tobacco products — Determination  
of alkaloid content — Spectrometric method**

*Tabac et produits du tabac — Détermination de la teneur en  
alcaloïdes — Méthode spectrométrique*



Reference number  
ISO 2881:1992(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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 2881 was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products*.

This third edition cancels and replaces the second edition (ISO 2881:1977), which has been technically revised.

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# Tobacco and tobacco products — Determination of alkaloid content — Spectrometric method

## 1 Scope

This International Standard specifies a reference method for the spectrometric determination of alkaloids, expressed as nicotine, in tobacco.

The method is applicable to unmanufactured tobacco, manufactured tobacco and tobacco products.

## 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 565:1990, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings.*

ISO 3401:1991, *Cigarettes — Determination of alkaloid retention by the filters — Spectrometric method.*

ISO 4874:1981, *Tobacco — Sampling of batches of raw material — General principles.*

ISO 6488:1981, *Tobacco — Determination of water content (Reference method).*

ISO 8243:1991, *Cigarettes — Sampling.*

## 3 Principle

Submission of the ground tobacco sample to steam distillation under strongly alkaline conditions, spectrometric measurement of the absorption of the distillate and calculation of the alkaloid content, expressed as the percentage of nicotine.

## 4 Reagents

Use only reagents of recognized analytical grade and distilled water or water of at least equivalent purity.

### 4.1 Sodium chloride

4.2 Sodium hydroxide solution,  $c(\text{NaOH}) = 8 \text{ mol/l}$ .

4.3 Concentrated sulfuric acid,  $c(\text{H}_2\text{SO}_4) = 1 \text{ mol/l}$ .

4.4 Dilute sulfuric acid,  $c(\text{H}_2\text{SO}_4) = 0,025 \text{ mol/l}$ .

4.5 Nicotine, minimum purity 98 %.

## 5 Apparatus

Usual laboratory apparatus and the following items:

5.1 **Steam distillation apparatus**, as described in ISO 3401 or any other apparatus giving the same results.

Test the system according to the indicated procedure (see clause 7) with the pure nicotine (4.5) at the maximum expected level. Recovery shall be at least 98 % of the theoretical value. If not, optimize by modification of the distillation rate.

For routine tests it is possible to use nicotine hydrogen tartrate calibrated against the pure nicotine (4.5).

5.2 **Spectrometer**, covering a wavelength range from 230 nm to 290 nm.

5.3 **Matched quartz cells**, having an optical path length of 1 cm.

5.4 **Sieve**, aperture size 500  $\mu\text{m}$ , conforming to ISO 565.