BS ISO 20193:2012

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Tobacco and tobacco products — Determination of the width of the strands of cut tobacco

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The UK participation in its preparation was entrusted to Technical Committee AW/40, Tobacco and tobacco products.

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

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Sommaire

Page

Foreword

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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.

ISO 20193 was prepared by Technical Committee ISO/TC 126, *Tobacco and tobacco products*, Subcommittee SC 1, *Physical and dimensional tests*.

NORME INTERNATIONALE **ISO 20193:2012(E)**

Tobacco and tobacco products — Determination of the width of the strands of cut tobacco

1 Scope

This International Standard specifies a method for the determination of the width of strands of cut tobacco. It is only applicable if there is a uniform cut width.

NOTE There are other ways of measuring the width of the strands of cut tobacco. A system with the same accuracy can be used, for example a microscope with an internal fitted ruler.

2 Normative references

The following referenced documents are indispensable for the application 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 216, *Writing paper and certain classes of printed matter — Trimmed sizes — A and B series, and indication of machine direction*

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

ISO 8243, *Cigarettes — Sampling*

ISO 15592-1, *Fine-cut tobacco and smoking articles made from it — Methods of sampling, conditioning and analysis — Part 1: Sampling*

ISO 15592-2, *Fine-cut tobacco and smoking articles made from it — Methods of sampling, conditioning and analysis — Part 2: Atmosphere for conditioning and testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
cut width
width of a strand of tobacco

4 Principle

Taking into consideration the fact that the tobacco samples to be analysed have a uniform cut width and that the mass of the individual tobacco strands may be disregarded, 20 strands of at least 20 mm long are randomly taken from the total test portion and measured at five equidistant points to determine their cut width.

A statistical conclusion for the population may be drawn from the resulting 100 values.

Apparatus

Normal laboratory apparatus and, in particular, the following items.

5.1 Sample holder, capable of holding the strands in a fixed position.

Annex A gives an example of a holder including guidance for its suitable dimensions.

5.2 Measuring device, with an accuracy of at least ± 0,1 mm.

6 Procedure

6.1 General

For production control, samples can be selected just after cutting and measured rapidly in order to minimize the influence of ambient conditions.

If packed samples are analysed, the atmosphere for the preparation of the strands and for the determination of the cut width of fine-cut tobacco shall be in accordance with the testing atmosphere specified in ISO 15592-2; for cigarettes, ISO 3402 shall be applied accordingly.

6.2 Sampling

Take the samples in accordance with ISO 15592-1 or ISO 8243.

6.3 Preparation of the samples

If samples are prepared from the packed product, a test portion of 50 g is taken.

If samples are prepared from the packed product, they shall be conditioned according to ISO 15592-2 for fine-cut tobacco or ISO 3402 for cigarettes. After conditioning, spread out the test portion.

Spread out the test portion as evenly as possible on an area of size A3 in accordance with ISO 216.

6.4 Preparation of the strands

Randomly take from the test portion 20 strands at least 20 mm long which have been cut in parallel. If it is not possible to select strands with a length of 20 mm, a single measurement shall be made on each of 100 shorter selected strands.

Secure the strands to a sample holder (5.1). Affix each strand to the surface of the sample holder perpendicular to the lines on the sample holder, taking care to ensure that the strands lie flat and are not twisted.

When the strands have been affixed to the sample holder, it is covered with a transparent strip in order to secure the strands' position.

When securing the strands, take care to avoid stretching. Artificial damage to the strands should be avoided.

6.5 Determination of cut width

6.5.1 General

Determine the cut width immediately after securing the strands.

Measure the cut width of each of the strands prepared in accordance with 6.4 in accordance with the procedure described in 6.5.2.

6.5.2 Single measurements

The single measurements shall be made either on or directly adjacent to the lines on the sample holder (5.1).

State the cut width to the nearest 0,05 mm.

7 Expression of results

Calculate the arithmetic mean per strand from the individual measurements and report to the nearest 0,1 mm.

Calculate the mean value and standard deviation from the respective mean values for the 20 or the 100 strands. Give the mean value to the nearest of 0,1 mm, the standard deviation to the nearest 0,01 mm.

Enter the evaluated data in a data sheet as illustrated in the example in Annex B.

8 Precision

The difference between the mean of five measurements per strand, obtained within the shortest feasible time interval by the same operator working on identical sample material and using the same apparatus will exceed the repeatability limit *r* on average not more than once in 20 cases in the normal operation of the method.

The difference between two results, reported by two laboratories for the same sample material will exceed the reproducibility limit *R* on average not more than once in 20 cases in the normal operation of the method.

A collaborative study involving 14 laboratories to determine the cut width yielded the values shown in Table 1 for the repeatability limit *r* and reproducibility limit *R* as well as for the standard deviations for repeatability and reproducibility, s_r and s_R (see References [1] and [2]).

Table 1 — Summary of results of the collaborative study

Precision data	Width of strands of cut tobacco mm			
	0,4	**1,0**	**1,6**	**3,0**
Repeatability limit *r*	0,11	0,21	0,30	0,81
Standard deviation for repeatability s_r	0,040	0,073	0,109	0,288
Reproducibility limit *R*	0,13	0,21	0,33	0,98
Standard deviation for reproducibility s_R	0,047	0,073	0,118	0,351
NOTE The high variability is caused by the cutters, producing a small cut of 0,4 mm.				

9 Test report

The test report shall contain at least the following information:

a) all particulars necessary for identification of the sample (type of sample, origin of sample, designation);

b) reference to this International Standard, i.e. ISO 20193;

c) time and manner of sampling;

d) information on conditioning;

e) time of delivery of the sample;

f) date and time of testing;

g) room temperature at the time of testing;

h) test results and units in which these are stated;

i) special features observed during the test.

Annex A
(informative)

Example of a sample holder

A.1 General

In the appendix, add the schematic diagram of measurement about the strands with some special shapes, such as furcation, slant. Regulate the position of measurement.

Date: _____ Lab: _____ Sample: _____

Lab. condition: _____ RH: _____ Temp.: _____

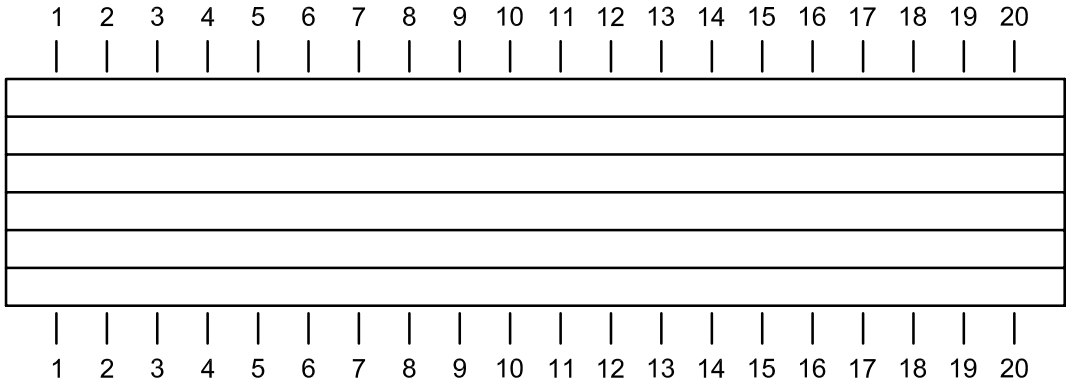

Figure A.1 — Example of a sample holder

A.2 Guidance for suitable dimensions

Sample holder with dimensions 20 mm × 110 mm, subdivided by five parallel lines, to the longer side, distance between the lines (3,5 ± 0,5) mm.

NOTE A microscope with an internal fitted ruler can be used.

Annex B
(informative)

Example of a data sheet

Laboratory:

Time and kind of sampling:

Measurement procedure applied:

	Cut width (mm)					**Mean per strand**	
	1st measurement	**2nd measurement**	**3rd measurement**	**4th measurement**	**5th measurement**		**Sample**
1st strand							
2nd strand							
3rd strand							Date of measurement:
4th strand							
5th strand							
6th strand							Room temperature:
7th strand							
8th strand							
9th strand							Package humidity:
10th strand							
11th strand							
12th strand							Start time of measurement:
13th strand							
14th strand							
15th strand							End time of measurement:
16th strand							
17th strand							
18th strand							Operator:
19th strand							
20th strand							

Measurements with an accuracy of ± 0,1 mm.

Comments:

Bibliography

[1] ISO 5725-1, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*

[2] ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of the repeatability and reproducibility of a standard measurement method*

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