

CORESTA RECOMMENDED METHOD N° 42

ATMOSPHERE FOR CONDITIONING AND TESTING FINE-CUT TOBACCO AND FINE-CUT SMOKING ARTICLES

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0. INTRODUCTION

CORESTA Recommended Method N° 21, revised in 1991 was produced in order to maintain a standard atmosphere for conditioning leaf tobacco, and cut tobacco destined for the manufacture of cigarettes and for the manufactured cigarettes themselves.

Fine-cut tobacco is produced and sold at much higher moisture levels than tobacco used for manufacturing cigarettes. Consequently CORESTA Recommended Method N° 21 is not applicable to fine-cut tobacco or smoking articles made from it. This CORESTA Recommended Method should be used for all products conforming to the definitions below.

It is known that many of the producers of fine-cut tobacco are small and medium sized companies and in many cases the equipment available for testing is not sophisticated. For this reason, this CORESTA Recommended Method contains suggestions which enable the less well equipped laboratories to confirm proper control of moisture content prior to further testing.

1. FIELD OF APPLICATION

This CORESTA Recommended Method specifies an atmosphere for conditioning and testing samples of fine-cut tobacco and test pieces made from it.

It is applicable to tests on fine-cut tobacco and products and materials used in the manufacture of fine-cut smoking articles for which a prior conditioning is necessary. It is not applicable in the case of test methods for which particular test conditions are laid down elsewhere, for example cigarette papers and board, which are given in ISO Recommendation R187.

2. DEFINITIONS

Note: Definitions 2.1., 2.2., and 2.3. are identical with ISO 558 which are reproduced here for completeness of this CORESTA Recommended Method

2.1. *Atmosphere*

Ambient conditions defined by one or more of the parameters:

- temperature
- relative humidity
- pressure

2.2. *Conditioning atmosphere*

The atmosphere in which a sample or test piece is kept before being subjected to test.

It is characterised by specified values for one or more of the parameters, temperature, relative humidity and pressure, which are kept within the prescribed tolerances for a given period of time.

Notes:

1. The term “conditioning” refers to the operation as a whole designed to bring a sample or test piece, before testing, into a specified condition in relation to temperature and humidity, by keeping it for a given period of time in the conditioning atmosphere.
2. The conditioning can be done either in a special enclosure termed “the conditioning chamber” or in the test chamber or in the laboratory.
3. The chosen values and period of time depend on the nature of the sample or test piece to be tested.

2.3. *Test atmosphere*

The atmosphere to which a sample or test piece is exposed throughout the test. It is characterised by specified values for one or more of the following parameters: temperature, relative humidity and pressure, which are kept within the prescribed tolerances.

Note: The test may be carried out either in the laboratory or in a special chamber termed “the test chamber” or in the conditioning chamber, the choice depending on the nature of the test piece and on the test itself. For example, close control of the test atmosphere may not be necessary if the change of properties of the test piece is insignificant in the test period.

2.4. *Fine-cut tobacco (FCT)*

Tobacco produced to be used by consumers for making into their own smoking articles with a wrapper specially prepared for this purpose .

2.5. *Wrapper (for fine-cut smoking articles)*

Material specially prepared and supplied in a form suitable for enclosing fine-cut tobacco so as to produce a fine-cut smoking article. These wrappers are normally sold in booklet form, in the form of a roll, or as pre-made tubes with or without a filter.

2.6. *Fine-cut smoking article (FCSA)*

An article, suitable for smoking, produced by combining *fine-cut* tobacco with a wrapper.

3. REFERENCES

CORESTA Recommended Method N° 21:1991

Atmosphere for conditioning and testing tobacco and tobacco products.

ISO 558:1980

Conditioning and testing - Standard atmospheres - Definitions.

ISO 3402:1991

Tobacco and tobacco products - Atmosphere for conditioning and testing.

ISO/DIS 6488-3:1996

Tobacco - Determination of water content - Karl Fischer method.

ISO 4677-1:1985

Atmospheres for conditioning and testing - Determination of relative humidity - Part 1: Aspirated psychrometer method.

4. ATMOSPHERE

4.1. *Conditioning atmosphere*

Temperature $22^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Relative Humidity $(75 \pm 3) \%$

The atmospheric pressure should be within the range $96 \text{ kPa} \pm 10 \text{ kPa}$. The pressure shall be measured and included in any test report if it is outside these prescribed tolerances.

The specified ranges listed above define the atmosphere immediately surrounding the test piece. Therefore, the atmosphere surrounding the test piece shall be maintained at a mean temperature of 22°C and a mean relative humidity of 75%.

Notes:

1. The tolerance on RH is given as $\pm 3\%$. This differs from the tolerance given in CORESTA Recommended Method N° 21 which is $\pm 2\%$. This is due to the higher relative humidity which is more difficult to control and recognition of the fact that some laboratories engaged in the analysis of fine-cut tobacco and fine-cut smoking articles may not be able to accomplish control tighter than $\pm 3\%$ RH.
2. This is also reflected in the tolerance of $\pm 2^{\circ}\text{C}$ compared to $\pm 1^{\circ}\text{C}$ in CORESTA Recommended Method N° 21. Control of temperature being affected by the high relative humidity and the extended time for conditioning.
3. Care should be taken to check the electronic control of humidity and the conditions in the cabinet should be checked regularly. See 4.3

4.2. *Test atmosphere*

Temperature $22^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Relative Humidity $(60 \pm 5) \%$

4.3. *Validation of conditioning atmosphere*

In order to ensure proper conditioning it is necessary to validate the conditioning atmosphere:

Temperature shall be validated by using a thermometer calibrated against a traceable standard.

Various means of testing relative humidity exist. In practice, in a small enclosure, their use may be inconvenient or their calibration may be difficult to demonstrate. The weight of tobacco is very sensitive to conditioning (especially humidity). If an atmosphere, validated against a traceable standard, is available, the weight of tobacco can be used as a secondary standard. This offers a very simple control procedure. In practice this procedure involves placing small samples (approximately 10 g) of fine-cut tobacco in shallow trays just large enough to hold the sample. Several (at least 4) trays should be distributed throughout the cabinet. The weight of tobacco, including the tray should be checked at least daily. Control charts should be constructed to indicate mean weight of each sample and tolerance boundaries of $\pm 0.2\%$. In this way any systematic or random deviation from the mean for any one position in the cabinet will be detected. Tobacco samples used for this purpose shall be replaced at least every 6 months.

5. CONDITIONING

5.1. *Duration of conditioning*

A duration of 72 h is generally found to be sufficient for fine-cut tobacco and fine-cut smoking articles, using a forced air flow. This shall be the minimum time allowed for conditioning. Samples shall not be kept in the conditioning cabinet for longer than 10 days.

The duration of conditioning shall be limited to the above time limits of 3 to 10 days to ensure proper equilibrium at the same time as avoiding loss of volatile compounds. If, for any reason, test samples are to be kept for longer than 10 days they shall be stored in the original packaging or in air tight containers just large enough to contain the sample.

A conditioning time of 72 hours can be insufficient for certain samples or test pieces, for example when smoking articles are conditioned without forced air flow; therefore, in all cases it should be verified that equilibrium has been properly attained (5.3).

If it is anticipated that the tobacco, or the fine-cut smoking articles, are to be kept for longer than three months, it is recommended that they be placed in sealed containers, frozen and stored at approximately -16°C until needed.

5.2. *Method of storage in the conditioning cabinet*

For fine-cut tobacco, the tobacco layer depth shall be restricted to 20 mm to ensure proper conditioning. (This depth is to be achieved without external pressure applied to the tobacco.) In the case of tobacco removed from a sample pouch destined for the market it is necessary to tease the sample apart in order to ensure adequate contact for conditioning.

Note: -Fine-cut smoking tobacco is also sold in packaging forms other than pouches but throughout this CORESTA Recommended Method the unit of sale is referred to as a pouch. The same principles of handling and conditioning apply to tobacco from all forms of packaging

Fine-cut smoking articles shall be conditioned by storing them in the cabinet on a tray in a single layer. If a device is constructed to hold more than one tray it shall be constructed such as to allow air to pass freely over all fine-cut smoking articles in the

stack and the distance above each layer of fine-cut smoking articles shall be at least 8 mm.

In both cases the trays used shall be perforated to allow circulation of conditioned air.

5.3. *Checking of equilibrium*

It is recommended, where possible, that the atmospheric relative humidity near the samples or test pieces be verified by the use of an hygrometer calibrated against a traceable standard hygrometer.

Equilibrium shall be considered to have been attained when the relative variation of the mass of the sample or test pieces is not greater than 0.2% in 3 hours.

The conditioned tobacco or fine-cut smoking article should be sampled and tested for moisture content immediately prior to any other tests being performed. A suitable method is given in ISO 6488:1996

Annex A

METHOD OF CONDITIONING WHERE ELECTRONIC CABINETS ARE NOT AVAILABLE.

(Informative, this annex does not form an integral part of this CORESTA Recommended Method)

A.1. *Introduction*

In laboratories not equipped with means of controlling the conditioning atmosphere electronically, it is possible to condition the samples in a sealed cabinet, containing a saturated salt solution, preferably with a low flow, forced air circulation.

A.2. *Method*

A.2.1. Making the salt solution

The saturated salt solution should be made up into a slurry with sodium chloride (general purpose reagent) in water such that the amount of sodium chloride does not dissolve and that a significant excess of the sodium chloride exists in the slurry.

A.2.2. Use in the cabinet

The amount to be used will depend on the size of the cabinet. The salt solution should be kept in a tray having shallow sides and with an area large enough to cover most of the bottom of the cabinet. The tray should be placed in the cabinet in such a way as a low air flow is forced over the salt solution.

Note: A dish should not be used as the sides may interfere with the natural air flow and prevent proper conditioning of the atmosphere.

A.3. *Validation of conditioning atmosphere*

The procedures given in 4.3. shall be used to test conditioning. The use of a salt solution does not, of itself, guarantee correct conditions.