



**Cooperation Centre for Scientific Research  
Relative to Tobacco**

**Heated Tobacco Products Task Force**

**CORESTA Recommended Method  
No. 99**

**DEFINITIONS AND STANDARD  
CONDITIONS: AEROSOL  
GENERATION AND COLLECTION  
FOR AEROSOL HEATED TOBACCO  
PRODUCTS**

February 2023



**CORESTA RECOMMENDED METHOD N° 99**

**Title:**

**DEFINITIONS AND STANDARD CONDITIONS: AEROSOL GENERATION AND COLLECTION FOR AEROSOL HEATED TOBACCO PRODUCTS**

**Status:** Valid

**Note:** This document will be periodically reviewed by CORESTA

**Document history:**

<b>Date of review</b>	<b>Information</b>
February 2023	Version 1

# CORESTA RECOMMENDED METHOD N° 99

## DEFINITIONS AND STANDARD CONDITIONS: AEROSOL GENERATION AND COLLECTION FOR AEROSOL HEATED TOBACCO PRODUCTS

(February 2023)

### 1. INTRODUCTION

This method includes the requirements found necessary for the generation and collection of aerosol from aerosol-heated tobacco products (aHTP) for analytical testing purposes. This method is based on the findings reported in the CORESTA Heated Tobacco Products (HTP) Task Force Technical Report, 2020: Heated Tobacco Products (HTPs): Standardized Terminology and Recommendations for the Generation and Collection of Emissions<sup>[1]</sup>.

### 2. FIELD OF APPLICATION

This method: - defines the parameters and specifies the standard conditions for the routine analytical generation and collection of aerosol from aHTPs; - specifies technical requirements for the routine analytical machine for aHTP generation and collection, termed as “machine” in this document, complying with the standard conditions stated within; - does not specify aerosol trapping nor subsequent sample preparation and analytical methods for analyses of components in the trapped aerosol or the gas phase; - may also be used for products other than defined in 4.15 if a specific testing requirement references this method.

### 3. NORMATIVE REFERENCES

- 3.1 ISO 20768: *Vapour products — Routine analytical vaping machine — Definitions and standard conditions*
- 3.2 ISO 3402: *Tobacco and tobacco products — Atmosphere for conditioning and testing*

### 4. TERMS AND DEFINITIONS

For the purposes of this recommended method the following terms and definitions apply.

#### 4.1 Conditioning atmosphere

Atmosphere in which the aerosol Heated Tobacco Products (aHTPs) are kept before being subjected to test.

#### 4.2 Test atmosphere

Atmosphere to which the Tobacco Heating System (THS) is exposed throughout the test.

**NOTE:** Although the pressure drop of a device or a pneumatic circuit is defined for a specific set of reference parameters to describe its physical properties, the device could be used for measurements under conditions other than the reference parameters.

#### **4.3 Puff number**

Number of puffs collected from an aHTP.

#### **4.4 Puff termination**

Termination of the connection of the aHTP to the suction mechanism.

#### **4.5 Aerosol Heated Tobacco Product (aHTP)**

A product containing a tobacco substrate that is heated by an aerosol from an e-liquid based consumable, without combustion of the tobacco substrate in order to produce a nicotine-containing aerosol.

#### **4.6 Tobacco substrate**

Material (substrate) that contains processed tobacco and may contain aerosol generation agents, flavourings, and other ingredients.

#### **4.7 Tobacco Heating Device (THD)**

Device providing the source(s) of heat required to directly or indirectly heat a heated tobacco product (HTP) without combustion of the heated tobacco substrate.

#### **4.8 Tobacco Heating System (THS)**

Specific combination of a HTP and a THD which, based on information made available to the consumer by the manufacturer, shall be used together to produce a nicotine-containing aerosol without combustion of the tobacco substrate.

### **5. STANDARD CONDITIONS**

The standard conditions described in ISO 20768 shall be followed.

### **6. SPECIFICATION OF THE SUCTION SOURCE**

The specification of the suction source described in ISO 20768 shall be followed with the exception of test atmosphere, which is described here under in 7.3.

### **7. SAMPLE CONDITIONING AND TESTING**

#### **7.1 Sample conditioning**

The aHTP consumables must be temperature equilibrated in sealed packs for a minimum of 48 hours and a maximum of 10 days at an ambient temperature of  $(22 \pm 1)$  °C. Samples should be removed from the pack immediately prior to testing, in order to avoid absorption of environmental moisture by the tobacco substrate which may influence aerosol yields. Samples removed from open packs may be kept in sealed containers for a maximum of 4 hours; after this time they should no longer be regarded as suitable for testing and must be discarded. This period may be extended if the testing laboratory is able to demonstrate that there is no influence on yields.

#### **7.2 THD preparation**

Battery state of charge may influence aerosol generation and composition. Therefore, THDs should be fully charged according to manufacturer's instructions prior to each test run.

### 7.3 Test atmosphere

The test atmosphere must be controlled as described in ISO 3402, summarised as follows:

- Temperature:  $(22 \pm 2)$  °C
- Relative Humidity  $(60 \pm 5)$  %

**NOTE:** For additional considerations/parameters refer to ISO 3402

### 7.4 Initiation of collection

If the aerosol generation process of the aHTP sample is started other than by drawing the puff, an additional activation mechanism shall be used that activates the product and is synchronized to the puff. The activation shall not start later than 0,1 s after starting the puff and shall not be stopped later than 0,1 s after the puff is finished.

**NOTE:** Some products may require a pre-heating time for proper function. In this case, follow the manufacturer's instructions of the product and note this in the reporting documents.

### 7.5 Termination of collection

The machine shall be capable of terminating and/or interrupting the aerosol generation and collection process after a pre-defined number of puffs. Current products have a manufacturer-indicated maximum number of puffs for the tobacco consumable, and termination of the aerosol collection process should be synchronised with this indication.

### 7.6 THD error or malfunction

If a THD indicates an error or ceases to operate during the test, the results will be deemed invalid.

## 8. REPEATABILITY AND REPRODUCIBILITY

An international proficiency study involving 17 laboratories which followed this CORESTA Recommended Method up to the point of aerosol collection and determination of Aerosol Collected Mass (ACM) was conducted by the CORESTA HTP Task Force in 2021<sup>[2]</sup>. Results were analyzed in basic conformance with ISO 5725-2:1994 and ISO 13528. The mean ACM values and the repeatability (r) and reproducibility (R) values are given in Table 1.

**Table 1. Estimates of test sample mean, standard deviations and repeatability and reproducibility for Aerosol Collected Mass (ACM).**

Product	N° of Labs	Mean mg/consumable	r	% r	R	% R	rSD ( $\sigma_r$ )	RSD ( $\sigma_R$ )
Sample A	12	119,82	26,74	22,3	63,80	53,2	9,551	22,78

## 9. BIBLIOGRAPHY

- [1] CORESTA Heated Tobacco Products Task Force Technical Report: Heated Tobacco Products (HTPs): Standardized Terminology and Recommendations for the Generation and Collection of Emissions. [HTP-259-CTR]
- [2] CORESTA Heated Tobacco Products Task Force Technical Report – Proficiency Study for Propylene Glycol, Glycerin, Nicotine, CO, NO, NO<sub>x</sub>, ACM, and DML in HTP Aerosol. [HTP-280-CTR]