



CORESTA Routine Analytical Chemistry Sub-Group – February 2009

CORESTA MONITOR TEST PIECE PRODUCTION AND EVALUATION REQUIREMENTS APRIL 2009

1. Introduction

Monitor test pieces are used to monitor the stability of the analytical processes involved when using a cigarette smoking machine for routine analysis. In particular, they are used to assess whether the analytical process related to the machine smoking of cigarettes is in statistical control. An International Standard, ISO 16055:2003 describes the requirements for and use of a monitor test piece. This guideline gives additional details on specification, production, packaging and evaluation of a CORESTA monitor test piece.

2. Monitor Test Piece Specification

It is recommended that the following specifications be met for CORESTA monitor test piece production:

Tobacco blend and cut rag

Type of tobacco	Flue cured lamina without stems
Additives	Preferably none, but absolutely no more than 2 % glycerol
Cut width	~ 0.9 mm

Monitor test piece dimensions

Test Piece length	~ 83 mm (king size)
Test Piece diameter	~ 7.8 mm
Test Piece weight	~980 mg
Test Piece pressure drop	~140 mmWG
Rod length	~ 62 mm
Rod weight	~ 820 mg
Tobacco weight	~ 780 mg
Tobacco density	~ 260 mg/cm ³
Tobacco moisture	~ 12.0 %

Monitor test piece non-tobacco materials

Filter rod diameter	~7.8 mm
Tow spec	2.5 Y32HK or similar
Filter pressure drop	In the range 75 - 80 mmWG
Plasticiser	~7 % triacetin
Plug wrap	nonporous
Filter length	~ 21 mm
Tipping	distinguishable from commercial products (i.e. grey tipping) with CM logo, no perforation preferable
Tipping width	~29 mm
Test Piece paper	wood pulp, filler precipitated calcium carbonate ~ 30%, ~ 40 to 50 CU, Citrate ~ 0.7%
Paper width	~ 26 mm

Smoke yields

NFDPM	~ 14 mg/monitor test piece
Nicotine	~ 1.4 mg/monitor test piece
CO	~ 14 mg/monitor test piece
Puff number	~ 9

If it is necessary to use humectants for the tobacco only glycerol is allowed. Propylene glycol cannot be used due to its high vapour pressure, which may lead to uncontrolled (undetected) weight loss during conditioning.

The product design must ensure that the smoke yields (NFDPM, Nicotine and CO) are sufficiently high (~14 mg NFDPM) so that the influence from a possible offset in the smoking machine settings can be distinguished from the normal variation of the smoke yields.

3. ISO 16055 Production Requirements

- The monitor test piece shall be produced from one production batch
- The number of monitor test pieces produced shall be sufficient to cover the needs of a period of at least 2 years. It is recommended that the production amount be set according to the maximum storage capacity of the suppliers.
- For reasons of homogeneity, the cut tobacco used shall be taken from one well-mixed batch. If possible, it is advisable to use a single grade tobacco with no further addition of materials, such as stems, humectants or flavours, to avoid unnecessary heterogeneity of the blend.
- The non-tobacco materials used, such as wrapping paper and filters, shall be taken from one production batch and strict quality-control measures shall be applied during the production of the filters.
- Specifications for the length and diameter of the monitor test piece and for its filter length, tipping length and filter material shall be set before the production. If the

design of the product includes filter ventilation, this shall also be specified prior to production. (See additional notes below.) The specifications must encompass not only the target values but also the maximum variability.

- The production tolerances for tobacco mass, circumference and draw resistance of the monitor test piece shall be controlled as precisely as possible. It will be necessary to increase the quality control measures and to decrease the production machine speed to obtain the required constancy in physical, chemical and smoke yields of the monitor test pieces. It is important that the variability is markedly lower than for normal commercial cigarette production.

4. Additional Notes Concerning Production Requirements

- The text of ISO 16055 was written before the demand for CO declaration became the norm. The requirements therefore must now include a stable CO yield which is best obtained with a non-ventilated filter. The recommendation is that the monitor test piece is unventilated.
- As the monitor test piece is frequently used as an indicator for stable conditioning the tobacco mass and total mass of the product must be controlled as tightly as possible.
- To facilitate the control of uniform rod filling and high end stability it may be advantageous to increase the weight of tobacco by up to 30 mg.
- Weight control is critical in the production of a reliable monitor test piece. Excessive weight variation contributes to unacceptable variation in smoke yields.
- Standard deviation of weight (1000 individual measurements) of up to 16 mg has proven to give good stability in the performance of the monitor test piece.
- It is recommended that the weight of individual monitor test pieces is controlled to a standard deviation of less than 16mg.

5. Packaging

It is essential that the monitor test piece be clearly distinguishable from commercial cigarettes. The products must be packed in hard boxes of 20 test pieces which shall carry a text similar to the text given below and as illustrated in the attached Figures 1-3:

**CORESTA approved
MONITOR No. 6**

**FOR NON-CONSUMER LABORATORY TESTING PURPOSES ONLY
NON-COMMERCIAL PRODUCT
DATE OF PRODUCTION: XXXXX**

10 packets are packed in outers carrying a similar text.

The shipping cartons should carry a text similar to the following

<p style="text-align: center;">CM 6</p> <p>Quantity: XXXX test pieces Producer: XXXXXXX Date of production: XXXXXX</p> <p style="text-align: center;">FOR NON-CONSUMER LABORATORY TESTING PURPOSES ONLY NON-COMMERCIAL PRODUCT</p>

6. Evaluation of CORESTA Monitor Test Piece

- The monitor test pieces in a production batch must show consistent values for the content of nicotine-free dry particulate matter, nicotine and CO in smoke. The consistency shall be assessed by means of a comparative study of sufficient size using samples representing the entire production run.
- This comparative study is coordinated by the CORESTA Routine Analytical Chemistry Sub-Group and results statistically evaluated to ensure acceptably low variation in physical parameters and smoke yields prior to the release of the monitor test piece for sale.
- The packaged monitor test pieces shall be stored at a temperature below +4 °C until they are to be used.

Figure 1 - Monitor Test Piece with CM Logo and Hard Box (*example*)



Figure 2 - CM6 outer carton and flat (example)

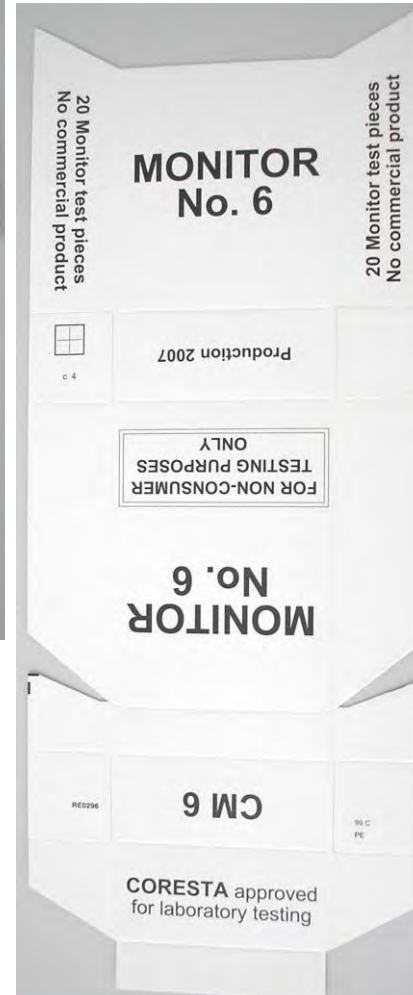
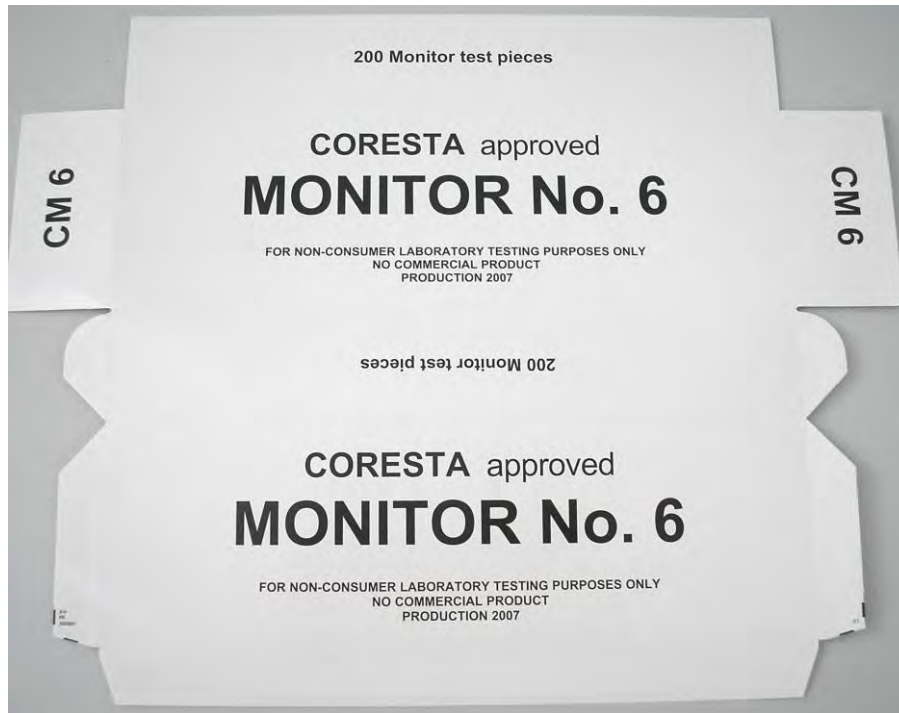


Figure 3 - Label for shipping carton (*example*)

